Floods of March–May 1965 in the Upper Mississippi River Basin

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1850–A

Prepared in cooperation with the States of Minnesota, Wisconsin, Iowa, Illinois, and Missouri and with agencies of the Federal Government

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By D. B. ANDERSON *and* I. L. BURMEISTER

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UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1970

UNITED STATES DEPARTMENT OF THE INTERIOR

WALTER J. HICKEL, *Secretary*

GEOLOGICAL SURVEY

William T. Pecora, *Director*

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $2.25 (paper cover)

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FLOODS OF 1965 IN THE UNITED STATES

FLOODS OF MARCH–MAY 1965 IN THE UPPER MISSISSIPPI RIVER BASIN

By D. B. ANDERSON and I. L. BURMEISTER

ABSTRACT

The floods of March–May 1965 in the upper Mississippi River basin occurred as two different events, one during the latter part of February and early March and the other starting early in April and extending into May. Factors contributing to the floods were rapid melting of the winter accumulation of snow, heavy rains on the snow pack, and deeply frozen ground throughout much of the basin, which made the soil almost impervious and thereby greatly increased the amount of runoff.

Peak stages and discharges during the floods exceeded previous known maxima at many points. The maximum discharge at St. Paul, Minn., for example, was 137 percent of the previous known maximum, and the stage was 4 feet higher than the previous maximum during a period of known floods extending back to 1851. Flood magnitudes exceeding those corresponding to a 50-year recurrence interval occurred at 37 sites where discharge records have been collected.

Flood damage was estimated to be about $160 million in a five-State area comprising Minnesota, Wisconsin, Iowa, Illinois, and Missouri. Fifteen lives were lost and over 700 persons were injured or became ill as a result of the floods. More than 11,000 homes were flooded, and many thousand acres of rich agricultural land was inundated.

This report summarizes peak stages and discharges for this flood at 333 sites in the upper Mississippi River basin and presents the previous maxima at these sites where such data are available. The recurrence interval (the average period of time in which the 1965 flood is apt to be equaled or exceeded once) is tabulated for many sites. The report discusses flood damages and tabulates damage figures by States and by type of damage incurred. It also discusses briefly the effect of drainage and storage on flood peaks and describes the operations of the U.S. Geological Survey and other Federal agencies during the flood emergency.

INTRODUCTION

The floods of March–May 1965 were the most devastating in the history of the upper Mississippi River basin. Five States—Minnesota, Wisconsin, Iowa, Illinois, and Missouri—were affected (fig. 1). The

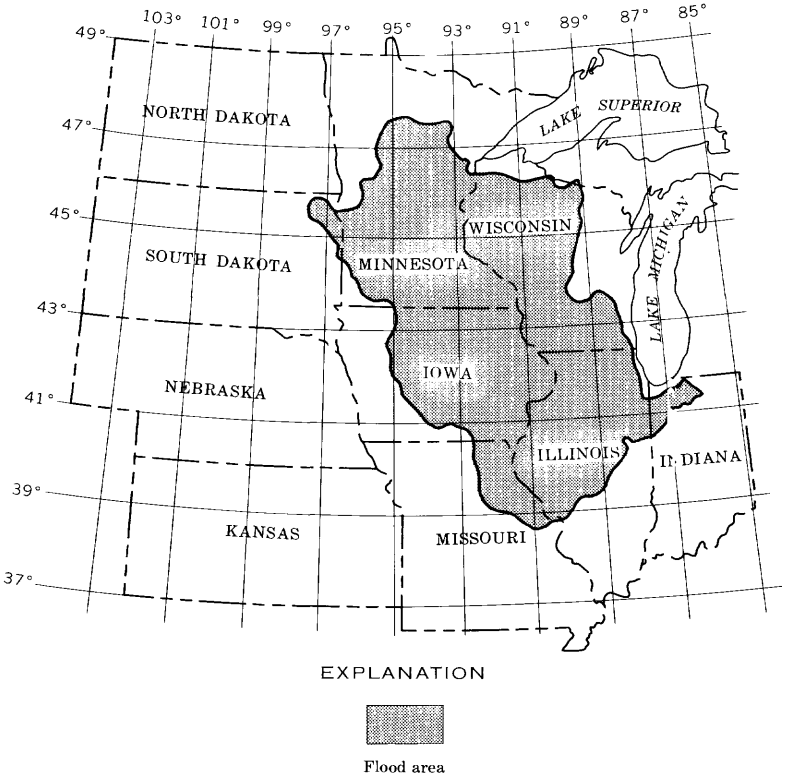


FIGURE 1.—Area covered by this report.

Mississippi River crested at stages higher than any ever recorded throughout a 680-mile reach between Fort Ripley, Minn., and lower lock and dam 22 near Saverton, Mo. From the mouth of the Minnesota River at St. Paul, Minn., to Muscatine, Iowa, the crest was 3–4 feet higher than any previously recorded. Recordbreaking floods occurred on the Minnesota River and its tributaries from Mankato to the mouth and on many other Mississippi River tributaries in Minnesota and Wisconsin.

The great volume of runoff was a significant feature of this flood. The Mississippi River remained above flood stage for almost a month. From Royalton, Minn., to the mouth of the Missouri River and in the Minnesota River, from Mankato to the mouth, the flood runoff was more than 25 percent greater than that of any previously recorded flood.

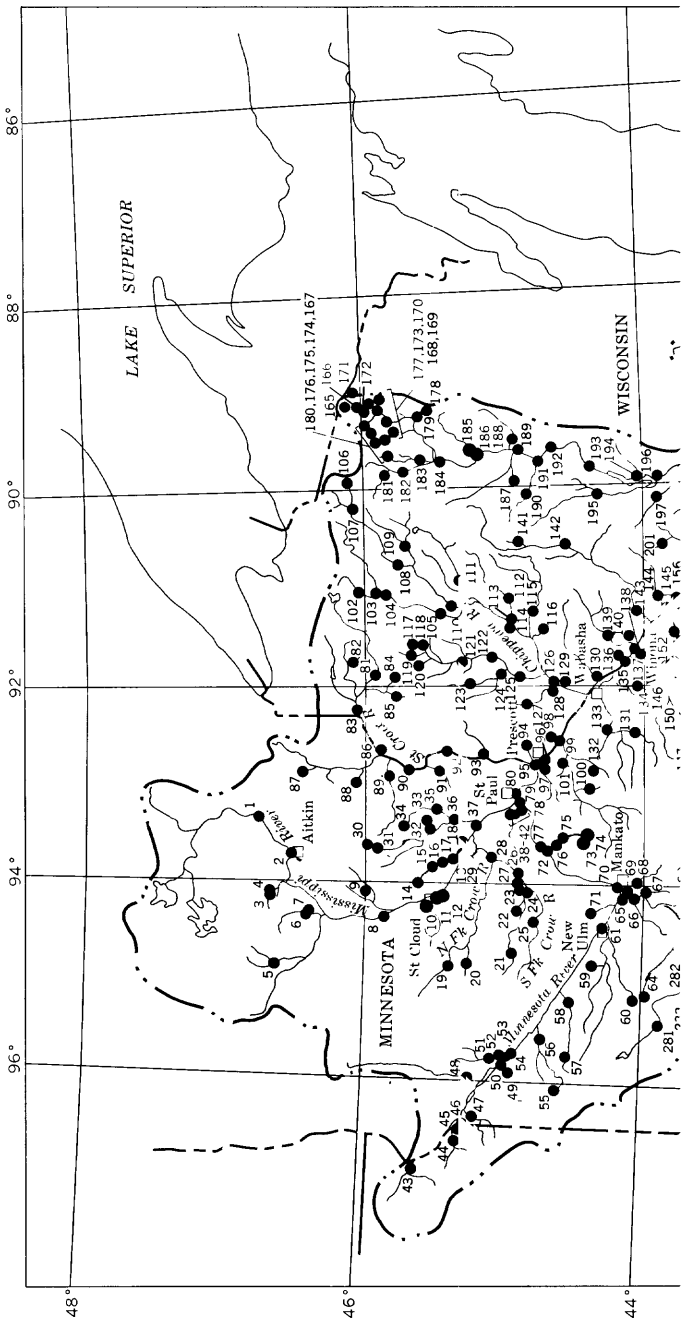
Throughout most of the upper Mississippi River basin, flooding occurred during two separate periods almost a month apart. During the first period warm temperatures during the latter part of February

and early March melted the winters accumulation of snow in southeastern Minnesota, northeastern Iowa, southwestern Wisconsin. The runoff from snowmelt and rainfall, which in some areas exceeded 2 inches during the first 3 days in March, caused severe flooding in the Zumbro and Root River basins in Minnesota and in the Cedar River basin in Minnesota and Iowa. During the second period, which started early in April and extended into May, floods occurred in the entire upper Mississippi River basin. These floods were caused by the rapid melting of the winter's accumulation of snow in northern Minnesota and Wisconsin and the March accumulation of snow in northern Iowa, southern Minnesota and Wisconsin. The water equivalent of snow in the upper part of the basin was as much as 11 inches. Warm temperatures moved northward into Minnesota during the last days of March and nighttime temperatures remained above freezing. As much as 3 inches of rain fell during the period April 3–7; it accelerated the snowmelt and increased the runoff. Frost penetrated the ground deeply, as a result of the severe winter, and consequently much of the rain and snowmelt ran off. Those streams which flooded early in March flooded again, but this time more extensively. Many of the streams which were covered by snow and ice in March were raging torrents in full flood in April. Fifteen lives were lost and more than 700 person were injured as a result of the floods or associated events. Property damage was estimated at $160 million. Damage would have more than doubled had it not been for the flood warning and crest predictions issued by governmental agencies and the enthusiastic response of thousands of volunteers who built emergency flood-protection works.

PURPOSE AND SCOPE

The purpose of this report is to provide a historical and statistical record of the extreme 1965 floods in the upper Mississippi River basin. Data presented may be used for planning and designing structures affected by floodwaters and for studying hydrologic events. Flood data are provided for 333 sites (fig. 2). Discharges at 192 sites are tabulated on a daily basis or for increments of time within each day during the flood period so that the discharge hydrograph can be accurately reconstructed. The antecedent and immediate conditions, flood descriptions, and damages are discussed by basins. If available, pictures of inundated areas in cities and towns are shown. Discharge hydrographs at selected gaging stations are presented. The recurrence interval of the peak discharge or the ratio of the peak discharge to the theoretical flood having a 50-year recurrence interval [1] is shown for many of the gaging

[1] For simplicity of expression in this report, a flood with a given recurrence interval, say 50 years, is expressed as a 50-year flood.


LAKE SUPERIOR
MINNESOTA
WISCONSIN
Aitkin
St Cloud
St Paul
New Ulm
Mankato
Minnesota River
Mississippi
Crow R
86°
88°
90°
92°
94°
96°
48°
46°
44°

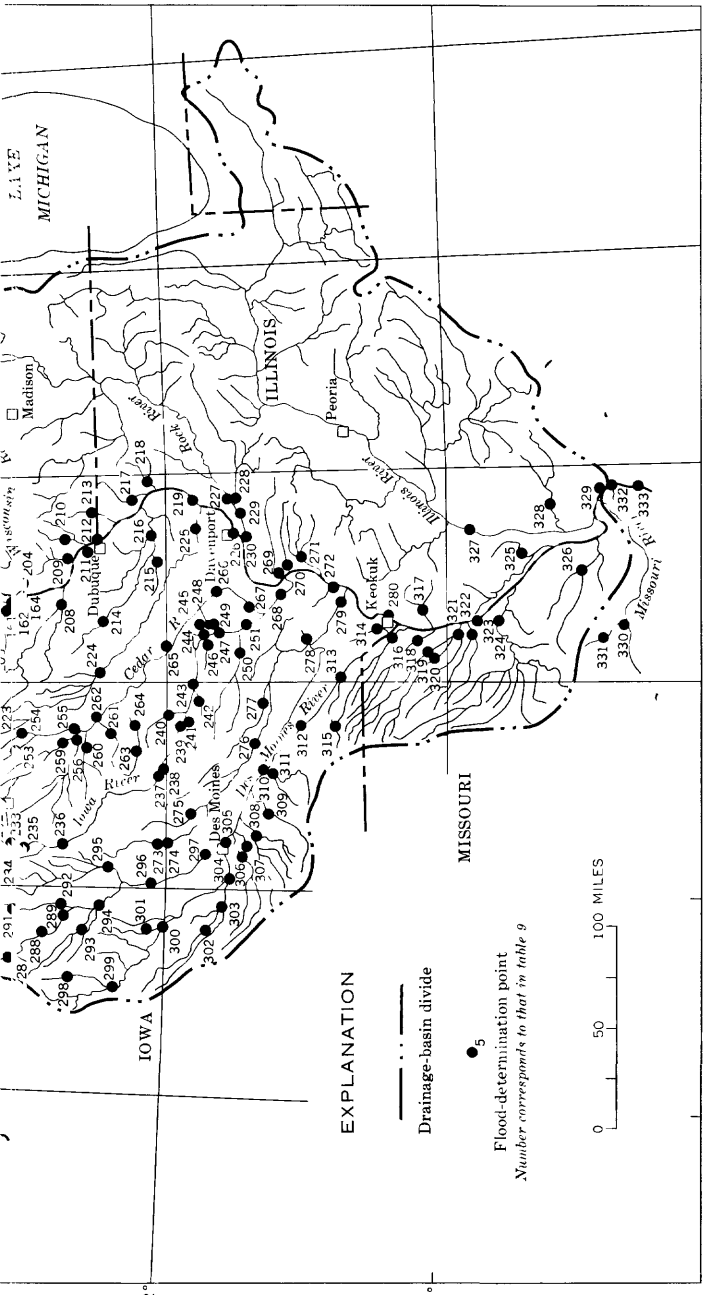


FIGURE 2.—Location of flood determination sites.

stations. Flood profiles for both the 1952 and 1965 floods in the Mississippi River are shown from Royalton, Minn., to St. Louis, Mo., and flood profiles of some Mississippi River tributaries are shown for the 1965 flood.

ACKNOWLEDGMENTS

Discharge records and other flood data appearing in this report were collected as part of cooperative programs between the U.S. Geological Survey and the States of Minnesota, Wisconsin, Iowa, Illinois, and Missouri, the St. Paul, Rock Island, and St. Louis Districts of the U.S. Army Corps of Engineers; and the U.S. Bureau of Sport Fisheries and Wildlife. Other Federal and State agencies, municipalities and corporations gave assistance, financial or otherwise, in the collection of flood data. Credit is given for this assistance in the appropriate station description.

Isohyetal maps were prepared from data furnished by the U.S. Weather Bureau, and damage figures were furnished by the U.S. Army Corps of Engineers. Aerial photographs taken near the flood crests in the Minnesota and Mississippi River basins were obtained from Mark Hurd Aerial Surveys Inc. These photographs were helpful in defining inundated areas in some urban communities.

The basic data for this report were computed and compiled under the direction of the following district engineers or acting district engineers of the Surface Water Branch, Water Resources Division: D. B. Anderson, Minnesota; K. B. Young, Wisconsin; H. H. Schwob succeeded by S. W. Wiitala, Iowa; W. D. Mitchell, Illinois; and A. Homyk, Missouri.

During the flood emergency, engineers and technicians of the U.S. Geological Survey were detailed to the Minnesota district from Nebraska, South Dakota, Ohio, California, and Michigan. Their assistance is gratefully acknowledged.

FLOOD FORECASTS

On March 19, the ESSA-Weather Bureau Office at Minneapolis–St. Paul, Minn., forecast spring floods for the Mississippi River and its tributaries in Minnesota and in parts of Wisconsin and Iowa. At this time, although it was recognized that there was a flood potential, the condition was not considered serious. For example, the peak stage of of the Mississippi River at St. Paul, was predicted to be 16.5 feet, 2.5 feet above flood stage and 9.5 feet lower than the actual peak which occurred on April 16. On March 30, the Weather Bureau stated that "if snowmelt takes 3 days or more, Minnesota streams will not crest as high as 1952 even though the water content of snow on the ground is comparable." On April 7, owing to warm temperatures and exces-

sive rainfall, the Minnesota River at Mankato, Minn., was predicted to crest at 26.5 feet on April 9, and the Mississippi River at St. Paul, Minn., was predicted to crest at 21.0 feet on April 14 or 15. Because on-the-spot streamflow measurements indicated runoff greater than anticipated, on April 8, these predictions were revised to 30.0 feet at Mankato to occur April 10 and 27.0 feet at St. Paul to occur April 16. Actual peaks were 29.09 feet at Mankato and 26.01 feet at St. Paul on the dates predicted. On April 9, the Weather Bureau predicted that crests on the Mississippi River below St. Paul would exceed the 1952 flood peaks at Winona, Minn., and La Crosse, Wis. A later prediction was issued on the morning of April 16 that the Mississippi River at St. Paul would crest at 26.9 feet on April 20. Actually, the crest at St. Paul occurred later in the day on April 16 and the additional 0.9 foot stage did not materialize.

Throughout the period in which the preceding predictions were being made, the Weather Bureau stressed that rapid thawing and rainfall during the snowmelt would intensify the flood threat. Temperatures were above freezing throughout most of the flood area during the first part of April when the Minnesota River and its tributaries reached their crests. During the first 14 days of April, precipitation ranged roughly from 2 to 4 inches over the Minnesota River basin and over much of the basin of the Mississippi River and its tributaries downstream from Minneapolis. Normal precipitation during April for this area is about 2 inches.

METEOROLOGICAL CONDITIONS CAUSING FLOODS

CONDITIONS PREVIOUS TO MARCH

Precipitation in the upper Mississippi River basin during the fall of 1964 was considerably higher than normal. For example, in September 1964, the U.S. Weather Bureau station at the Minneapolis–St. Paul airport recorded precipitation on 16 of the 30 days. The departure above normal at this station was 2.78 inches for the month. The station at Mason City, Iowa, recorded 7.96 inches of precipitation in September, which was 4.76 inches above normal. Generally, above normal precipitation was recorded throughout the basin during September. Precipitation was below normal during October and November, but because of the heavy rains in September, the ground was well saturated when winter set in.

Temperatures through the first half of November were unseasonably mild; then they plunged and severe freezing ensued. Temperatures ranged widely during the month. Britt, Iowa, for example, observed a high of 78° and a low of −10°. Record low temperatures for November were observed at many Weather Bureau stations. Temperatures re-

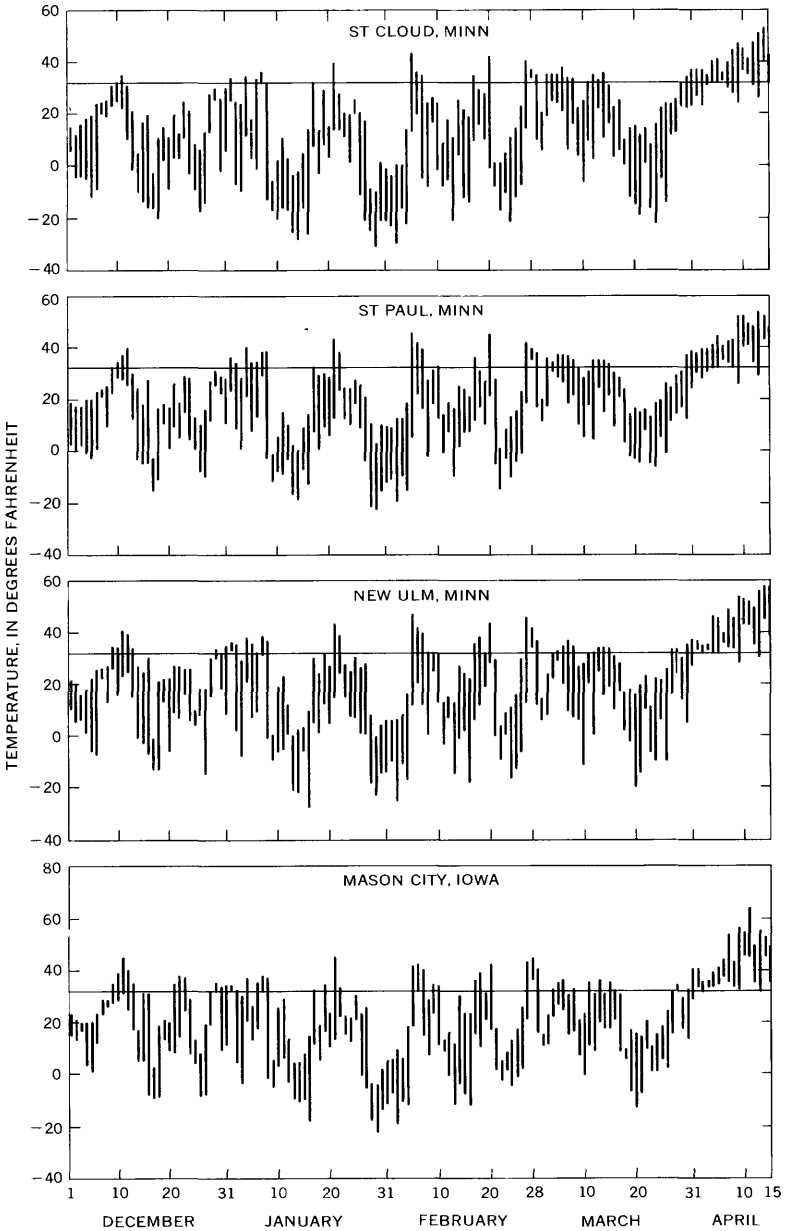


FIGURE 3.—Daily range in temperature at four U.S. Weather Bureau stations in Minnesota and Iowa for the period December 1, 1946, to April 15, 1965.

mained exceptionally low for much of the remainder of the winter (fig. 3). Frost penetration was unusually deep throughout most of the upper Mississippi River basin.

During December 1964 and January 1965, there was a normal amount of snowfall. An exceptional amount of sleet fell and glaze formed in Iowa during these 2 months. A January 24-hour rainfall record was broken when 5.11 inches of rain fell at Keokuk, Iowa, on New Year's day. The monthly precipitation at this station was 8.58 inches; it was the wettest January in 95 years. February precipitation in the southern half of Minnesota and Wisconsin exceeded the normal by an inch or more. The rain that fell early in February in this area compacted the winter snowpack and materially increased its water equivalent. Most of the rain was absorbed in the snowpack or was retained on the ground as a heavy glaze. The February precipitation in Illinois was generally below normal, but snow drifted heavily over most of the State on the 23d and 24th. A considerable amount of sleet fell and glaze formed in Iowa during February. Rain fell in the Southern counties and snow fell heavily in the northern and western counties, much of it over the glaze. A storm on the 11th, the worst in years, deposited 10 inches of snow over glaze in the north-central part of the State. Frost penetration was deeper than normal and extended to 5 feet in this area. In Iowa, the winter of 1964–65 was the fourth coldest since 1935–36. Temperatures rose however, at the end of February and started melting the snow as far north as the Minneapolis-St. Paul area in Minnesota, but did not begin to thaw the ground in the upper reaches of the Minnesota River basin.

MARCH CLIMATOLOGICAL EVENTS

The relatively warm temperatures at the end of February and during the first part of March created heavy snowmelt runoff in the Mississippi River basin in southeastern Minnesota, northeastern Iowa, and southwestern Wisconsin. Rainfall exceeded 2 inches at several Weather Bureau stations during the first 3 days of March. This combination of snowmelt and rainfall caused some of the highest floods of record in certain of the Mississippi River tributaries in southern Minnesota. The Cedar River at Austin, Minn., and the Root River near Houston, Minn., had the highest stages of record during this flood.

Heavy snowfall continued throughout March. A blizzard on March 17–18 spread over northern Iowa, Wisconsin, Minnesota, and eastern South Dakota depositing up to 18 inches of snow. The snow on the ground after this storm totaled up to 45 inches in the upper Rum, Snake, and Kettle River basins in Minnesota (fig. 4). The snow cover diminished slowly after this date in southern Minnesota and Wisconsin

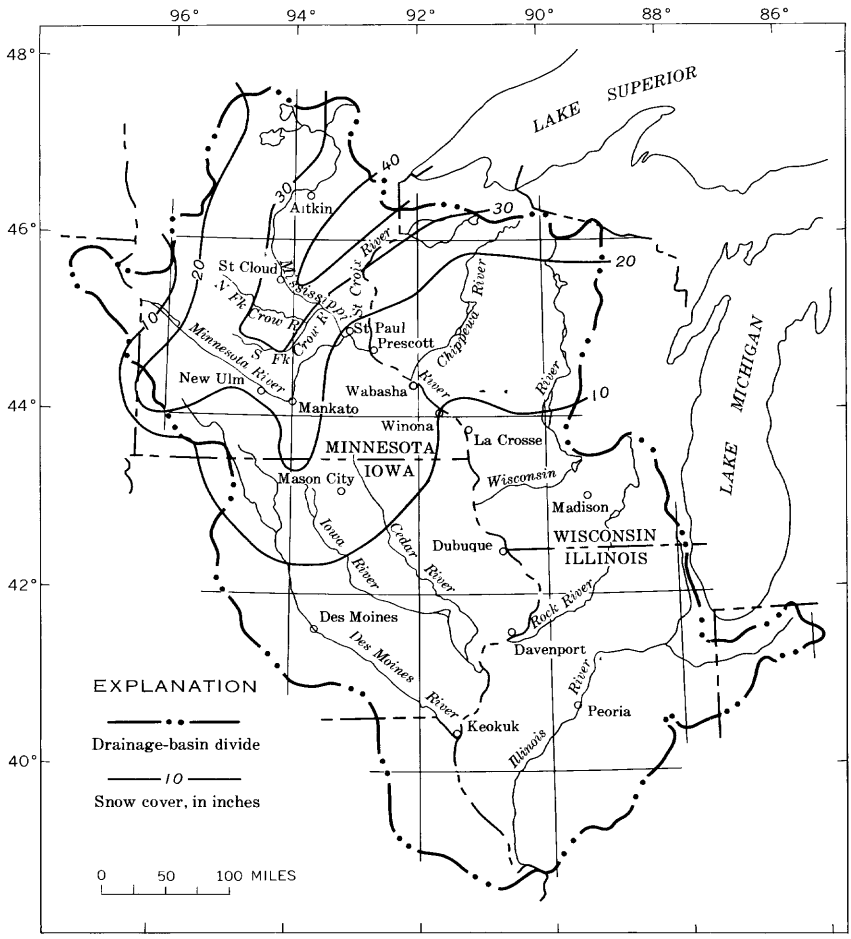


FIGURE 4.—Snow cover on the ground as of March 18, 1965.

and northern Iowa, but additional storms late in March maintained or increased the accumulation in northern Minnesota and Wisconsin. The water equivalent of the snow on the ground and the rate of thawing are important factors in forecasting runoff from snowmelt. The later that warm temperatures arrive in the spring, the greater the probability of rapid thawing and heavy runoff. On the basis of snow surveys conducted by the Weather Bureau and Corps of Engineers during the last 2 weeks in March, the water equivalent ranged from 2 inches in central Iowa to 11 inches in the vicinity of St. Cloud, Minn. (fig. 5).

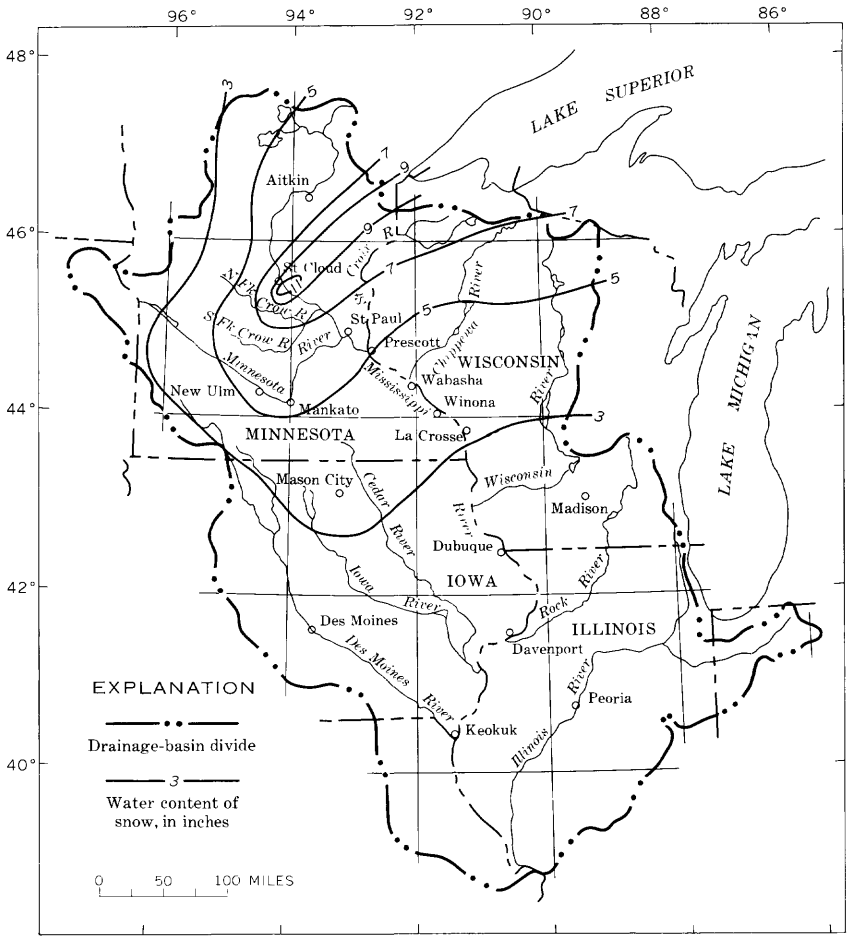


FIGURE 5.—Water equivalent of snow on the ground at the end of March 1965.

Records at the Weather Bureau station in St. Cloud showed 35 inches of snow on the ground on March 29. A record 51.7 inches of snow fell in this area during the month. Early in March, the Army National Guard was called out to remove snow from the streets of St. Cloud to expedite the flow of vehicular traffic. Where the snow had not been hauled away, traffic moved through deep snow chasms higher than an automobile. As a safety measure, automobile drivers tied brightly

colored streamers to their auto aerials to warn other drivers of their approach at intersections.

In many places in northern Wisconsin, the depth of snow on the ground on March 31 was the maximum recorded and was 2–4 inches above normal in water equivalent.

A study of Weather Bureau climatological data collected at Minneapolis, Minn., reveals some of the conditions prevalent in the upper Mississippi River basin during March. Precipitation at this station for the month was 4.75 inches or 1.38 inches more than the previous March high in 1949. Snowfall amounted to 37.1 inches, which was only exceeded by 40 inches in March 1952. Snowfall for the season at the end of March was 71.7 inches compared to the seasonal record of 88.9 inches in 1950–51. Precipitation, most of it as rain, amounted to 1.62 inches on March 1. This was a new 24-hour record for March. Average temperature was 19.4°, which was 8° below normal, the second coldest average temperature on record, and the coldest since March 1899. Record-low daily minimum temperatures were equaled or broken on 5 days during March.

The extremely cold temperatures during most of March caused deep frost penetration. In the extreme upper part of the basin where heavy snow cover existed, the average penetration was 1 foot. Farther south, where little or no snow cover existed, frost penetrated to 5 feet in some areas. There was heavy precipitation during the first part of March, followed by below freezing temperatures which reached the subzero range during the period March 19–26. In some areas, there was a layer of ice on the ground from the storm on March 1 and previous storms. The frozen ground covered with glaze was a very important factor in intensifying the spring flood of 1965.

In Iowa, two snowstorms with heavy snowfalls occurred on March 1–2 and on March 17–18. In the southern and central counties of Iowa, considerable sleet fell and ice formed as a result of the first storm, and in the northern counties, from 6 to 10 inches of snow fell. The second storm was concentrated in the northern part of Iowa and resulted in additional snow cover ranging from 4 to 12 inches. Snowfall in central and northern Iowa during the month of March was the fourth highest of record, and the average temperature at Des Moines for March was the second coldest of record. Below-normal temperatures continued until April 1. That part of Illinois which lies in the Mississippi River drainage basin had weather conditions similar to those in Iowa. As a result of the rainfall, snowfall and freezing temperatures, many of the small streams were locked with snow and ice in southeastern Minne-

sota and northeastern Iowa. This obstruction of the smaller drainage channels had an effect on the timing of runoff and may have increased the flood intensity on some streams.

APRIL CLIMATOLOGICAL EVENTS

By the second week of April, a warming trend had advanced northward in the upper Mississippi River basin into Minnesota and Wisconsin. Nighttime temperatures remained above freezing and daily maximums exceed 50° throughout most of the basin. Above-normal precipitation accompanied the warmer weather. Snow fell in the upper part of the basin in Wisconsin on April 1. Up to 3½ inches of rain fell over most of the basin during the period April 3–7 (fig. 6). Runoff

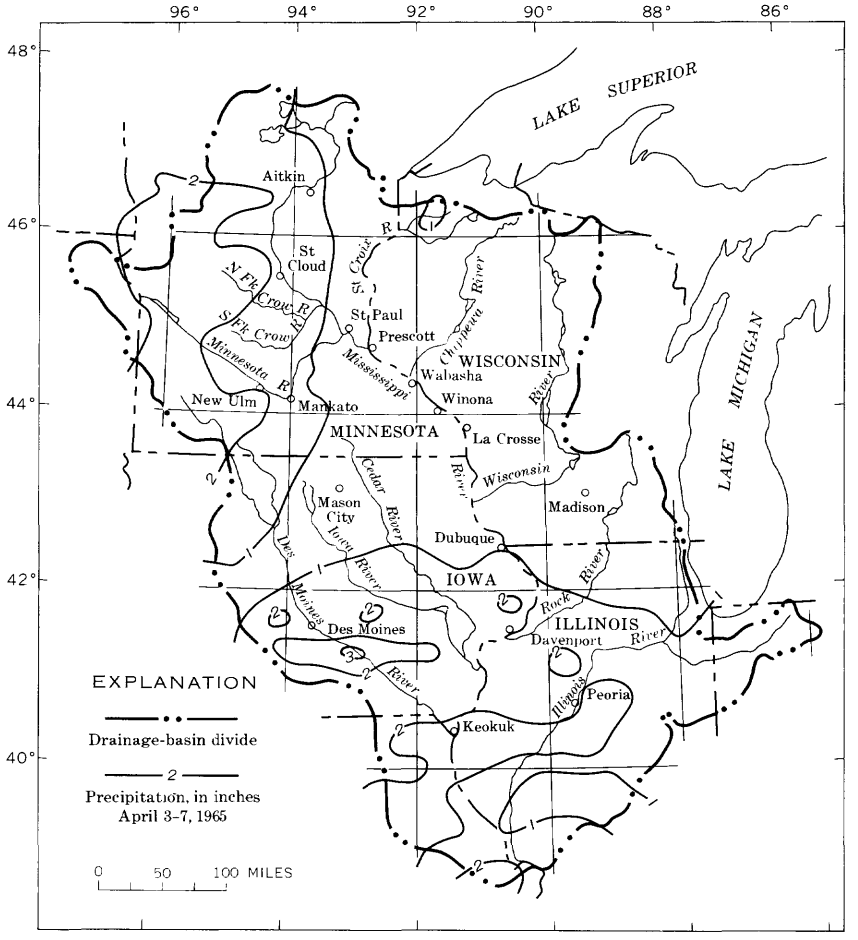


FIGURE 6.—Precipitation during the period April 3–7, 1965.

from these widespread rains was intensified by snowmelt runoff. Snow melted steadily and was gone in Iowa and Illinois by April 6 and in the area south of St. Paul, Minn., by April 11. The snow melted slower in the extreme north. A 17-inch snow cover remained at Eagle River, Wis., on April 14, and a 10-inch cover remained at Grand Rapids, Minn., on April 11. All of the snow had melted by April 29.

The combination of rainfall and snowmelt during the first few days in April set the stage for the severe floods which were to follow. Large amounts of ponded water were visible in the Minnesota River basin downstream from New Ulm and also in the basins of the small tributaries of the Mississippi River downstream from St. Paul. Personnel of the Corps of Engineers estimated from aerial observation that 40–50 percent of the Crow River basin in Minnesota was covered by water. This ponded condition, which was accentuated by the flat topography of the basin, resulted from rainfall and snowmelt which could not run off freely through normal channels because they were obstructed by snow and ice. The ponding affected the timing of runoff from many of the smaller basins. There were extremely high rates of runoff because of the abnormally high precipitation, rapid snowmelt, and the impervious condition of the soil which was still deeply frozen and covered with ice throughout much of the basin.

Precipitation for April at North Mankato and New Ulm, Minn., was nearly 5 inches, which was 2½ inches above normal. In Iowa, the departure above normal was 1 inch in the north-central part of the State and 5 inches in the southeastern part. Exceptionally severe thunderstorms, accompanied by hail and tornadoes, dumped up to 6 inches of rain over an area between Marshalltown and Muscatine, Iowa, on the 23d. This storm caused additional flooding in the area and hampered the Mississippi River flood fight on the already water-soaked levees. In Missouri and Illinois, showers and thunderstorms, during the period April 3–7, produced some rises on streams tributary to the Mississippi River. In general, these streams did not exceed bank-full stage. The widespread rains that fell in Illinois on April 15, 24, and 25 caused the Illinois River to rise above flood stage. Total precipitation during the month in the upper Mississippi River basin is shown in figure 7.

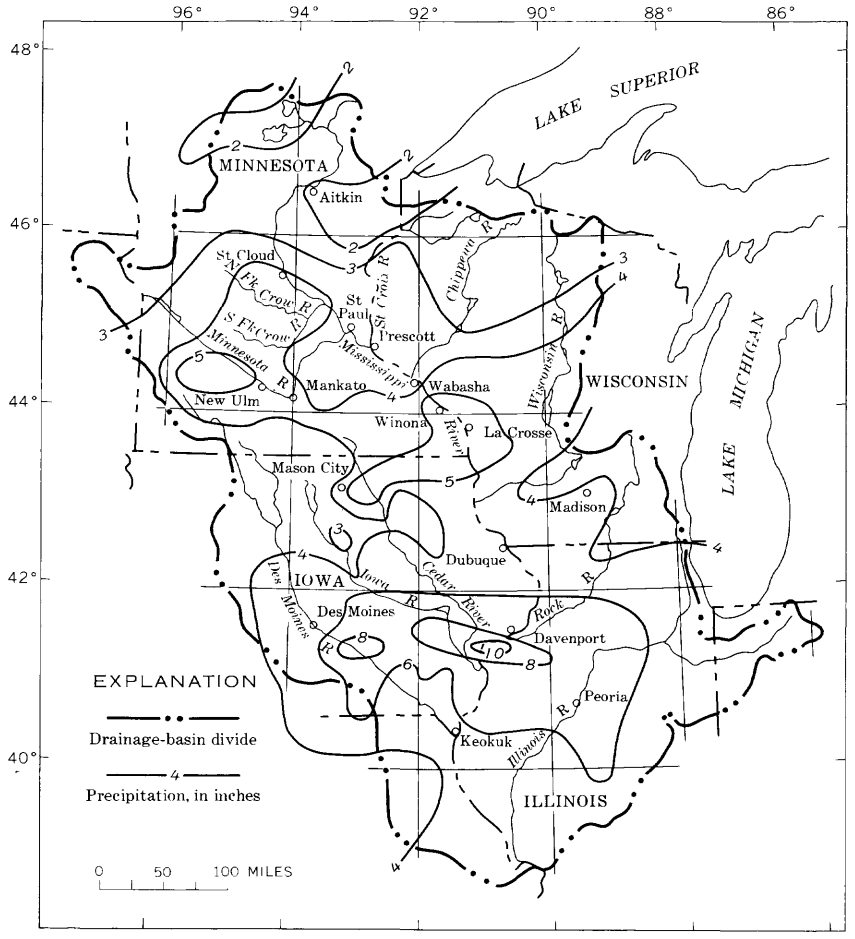


FIGURE 7.—Precipitation during April 1965.

THE FLOODS

MISSISSIPPI RIVER MAIN STEM

There was no severe flooding in the upper 350 miles of the Mississippi River basin. The farthest upstream discharge record in this report was collected at the gaging station near Libby, Minn., about 260 miles downstream from the source of the Mississippi River. In 25 years of record at this site, three previous floods exceeded the 1965 peak.

There are six headwater reservoirs on the main stem of the Mississippi River or its tributaries. These reservoirs, all in Minnesota, are Winnibigoshish Lake near Deer River, Leech Lake at Federal Dam, Pokegama Lake near Grand Rapids, Sandy Lake at Libby, Pine River Reservoir at Cross Lake, and Gull Lake near Brainerd. Data from Pine River Reservoir and Gull Lake are included in this report, and they show only a moderate amount of storage from the spring runoff. A diversion channel at Aitkin, 310 miles downstream from the source, handled the spring runoff well and reduced flood damages considerably in Aitkin and the surrounding area. The recurrence interval of the peak discharge at Aitkin was 13 years.

In the 100-mile reach between Aitkin and Royalton, flood runoff became severe. At Fort Ripley, Minn., about 25 miles upstream from Royalton, the maximum stage was higher than any previously recorded. This situation prevailed for about 680 miles downstream to lower lock and dam 22 near Saverton, Mo.

Flood damage resulted from Mississippi River overflow in St. Cloud, Minn. Ice started breaking up above the mouth of the Sauk River and moved downstream to two bridges in St. Cloud where it jammed and caused a sudden rise of 3–4 feet in river stage, which flooded 17th Street North to Third Street North. Fifth Avenue North was inundated with 5 or 6 feet of water between Third Street and the water treatment plant. There was $50,000 worth of damage to the bridge at Sartell, just upstream from St. Cloud.

At the town of Elk River, Minn., the Mississippi River makes a sharp horseshoe bend. Water cut across the open end of the horseshoe washing out several hundred yards of highway, flooding 26 homes and severely damaging 14 of them (fig. 8). The stage at Elk River was 2.7 feet higher than the highest stage of the 1952 flood, which was the previous maximum during the period of record. The discharge was 1.23 times that of a 50-year flood. Downstream, at the gaging station near Anoka, the 1965 flood peak was 2.0 feet higher than the 1952 peak, the previous maximum in 34 years of record.

In Minneapolis, severe damage was inflicted on the Great Northern Railway stone arch bridge just downstream from St. Anthony Falls. The scouring of the floodwaters caused one of the piers to settle; as a result the bridge needed extensive repairs. Lilydale, (fig. 9) a small, unincorporated community across the river from St. Paul and just downstream from the mouth of the Minnesota River, was flooded extensively. Floodwaters covered the town to a depth of 6–8 feet and swept some homes from their foundations. Many of the 33 homes in this community were damaged beyond repair.

At St. Paul, downstream from the mouth of the Minnesota River,

the peak stage of 26.01 feet was the highest since at least 1851.[2] It exceeded by 4 feet the 1952 peak stage which was the previous maximum. The 1965 peak discharge was 171,000 cfs (cubic feet per second); in 1952 it was 125,000 cfs. The recording gaging station on Shepard Road was inundated and rendered inoperative, but stages were read at frequent intervals on a temporary staff gage. Flooding in St. Paul was intensified by the high discharge of the Minnesota River; the peak discharge of the Minnesota River was greater than the peak discharge of the Mississippi River above the mouth of the Minnesota River. It was fortunate, indeed, that the Minnesota and Mississippi Rivers did not crest concurrently at St. Paul; the Mississippi River peak above St. Paul occurred 6 days after the Minnesota River peak.

Damages, including the cost of flood fighting, exceeded $4 million in St. Paul. If flood protective works on both banks of the Mississippi River had not been constructed, additional damages would have been about $8 million, according to Corps of Engineers' estimates. About 800 persons were evacuated from low-lying areas in St. Paul. Local overflow, undermining, and seepage on the left river bank along Shepard Road caused damage to industrial properties. Five of the flood-affected industries on Shepard Road, Northern States Power Co., Industrial Steel Container Co., West Publishing Co., The Farmers' Union Grain Terminal Association, and Pure Oil Co., shared in the cost of reinforcing the dikes. Shepard Road and several other streets were inundated and closed to traffic (fig. 10). The Union Depot was closed to rail traffic for more than 2 weeks and the Minneapolis-St. Paul sewage treatment plant could not operate for 4 weeks. Water lapped at the foot of the Post Office Building and prevented the handling of mail. The Golden Garter, a night club atop the 95-year old Minnesota Boat Club on Navy Island, wanted to stay open but was closed by police order. The morning after it was closed, part of the upstream wall of the boat club gave way to the rushing waters which flowed across the island. The Navy Island Bridge, a small, 150-foot long, timber bridge, broke loose from its moorings and was carried downstream. In order to prevent the St. Paul Yacht Club on Harriet Island from becoming a hazard to two downstream bridges and many moored boats, it was dynamited. Not according to plan, the building caught fire, and burned to the waterline thus averting the threat that it posed.

[2] Previous reports state that the period of known stages at St. Paul is "since at least 1870." A recent study by the Corps of Engineers of 1870 newspaper accounts and 1952 flood records reveals, however, that the 1870 peak stage and discharge were probably exceeded by the 1952 flood and were certainly exceeded by the 1965 flood. The 1870 newspaper accounts state that "a flood prevails which was only surpassed by that which occurred in the spring of 1851"; so it seems safe to say that the 1965 flood was the greatest since at least 1851. Newspaper accounts of 1851 are also available, and they state that the 1851 peak was the greatest since 1832.

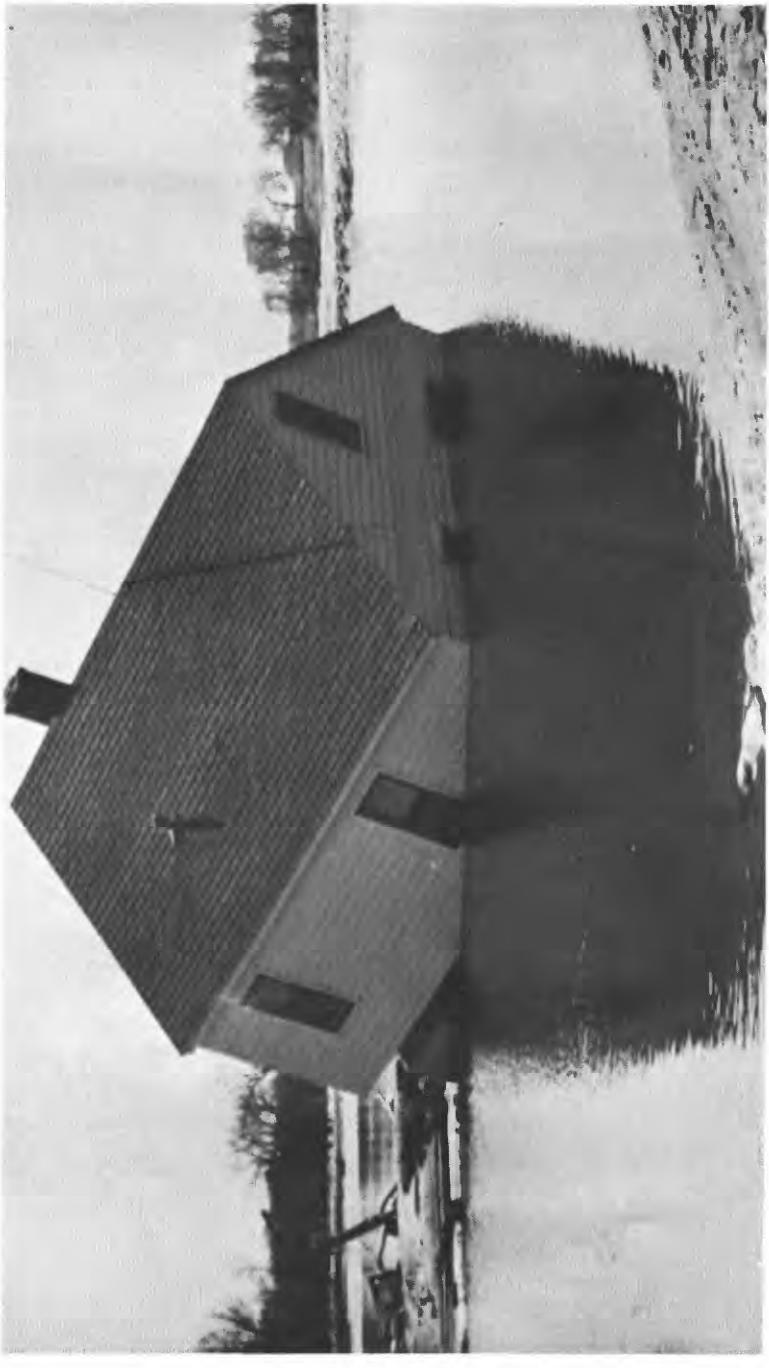


FIGURE 8.—The Mississippi River at Elk River, Minn., cut across a bend in the river washing out a highway and destroying homes. Photographs by U.S. Army Corps of Engineers, St. Paul, Minn.

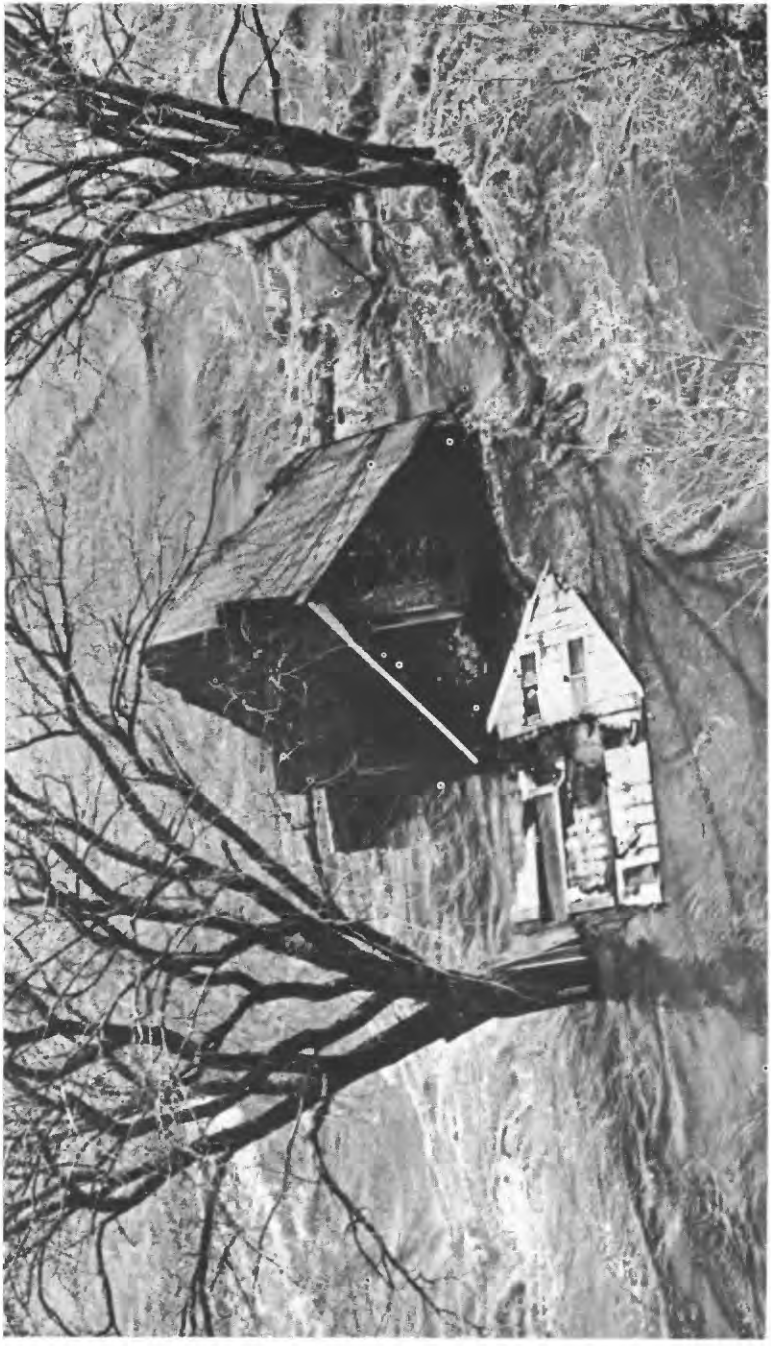


FIGURE 9.—Many homes in Lilydale, Minn., were damaged beyond repair. Photograph by Minneapolis Star and Tribune, Minneapolis, Minn.

On the right bank across the river from downtown St. Paul, the protected industrial area escaped damage; but the St. Paul municipal airport, which was outside the protective works, was flooded to a depth of 6–8 feet and was out of operation for 4 weeks (fig. 11).

In South St. Paul, a dike, which was built for the 1951 flood, was raised about 3 feet as an emergency measure to keep the 1965 floodwaters out of the stockyards and meatpacking plants. This dike, which was 3½ miles long, protected many South St. Paul facilities; nevertheless, considerable damage was done and many operations were disrupted. Railroad service was suspended for about 3 weeks. A number of storm sewers and sanitary sewers were damaged. The sewage treatment plant was inoperative for about a month, although a sandbag barrier minimized damage to the plant. Urban damage and the cost of emergency flood protection work in South St. Paul amounted to about $4 million.

Prescott, Wis., at the confluence of the St. Croix River and the Mississippi River was flooded by both rivers, and both rivers were in extreme flood. The maximum discharge of the St. Croix River was about 44,000 cfs, and the timing of its peak coincided very closely with that of the Mississippi River upstream from Prescott. At its peak the St. Croix River contributed 19 percent of the flow in the Mississippi River immediately downstream from Prescott. The discharge of Mississippi River at Prescott was 1.57 times that of a 50-year flood.

The Mississippi River at Red Wing crested at 20.72 feet on April 18, almost 4 feet above the crest of the 1952 flood. Most of the city was safe on high ground, but some levees were sandbagged and some residents were evacuated. One of three municipal water pumps and the sewage treatment plant were put out of operation. Floodwaters swirled around several grain elevators located on low ground near the river. U.S. Highway 63 was inundated on April 16, and a temporary ferry service was put into operation between Red Wing and the Wisconsin side of the river.

Between Red Wing and Wabasha the Mississippi River flows through Lake Pepin. At Lake City, on the shore of Lake Pepin, the crest was about 3 feet higher than the previous maximum in 1952. Local residents constructed about 2 miles of sandbag dikes, but in spite of this a number of homes and businesses suffered flood damage. Fifty summer homes on Central Point, north of town, were sheared off by ice floes or damaged by high water. Several boat marinas also were damaged.

On April 19 the Mississippi River crested at 20.05 feet at Wabasha, Minn. The crest was 8 feet over flood stage and 3.3 feet higher than the previous maximum which occurred in 1952. Wabasha became an island as the rampaging waters inundated a third of the city and

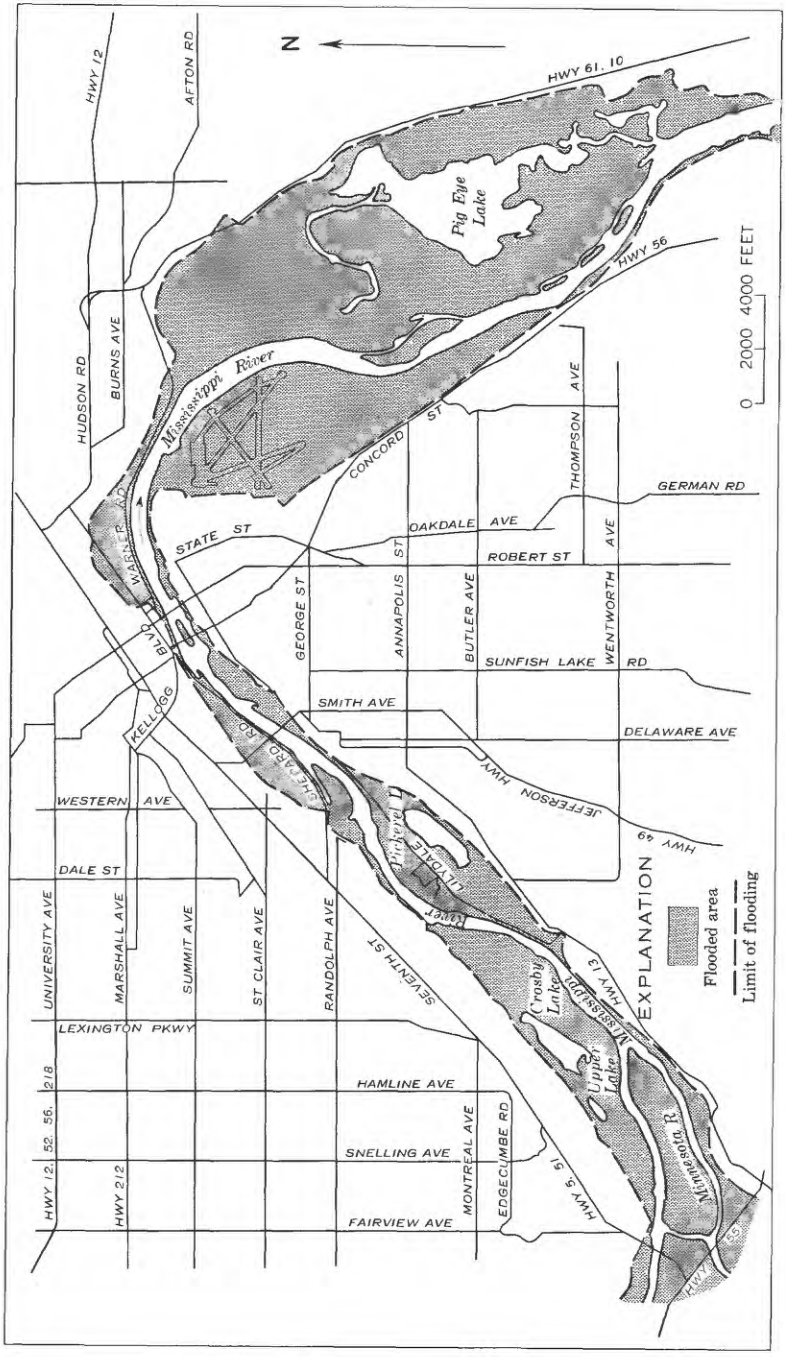


FIGURE 10.—Flooded area in St. Paul, Minn.

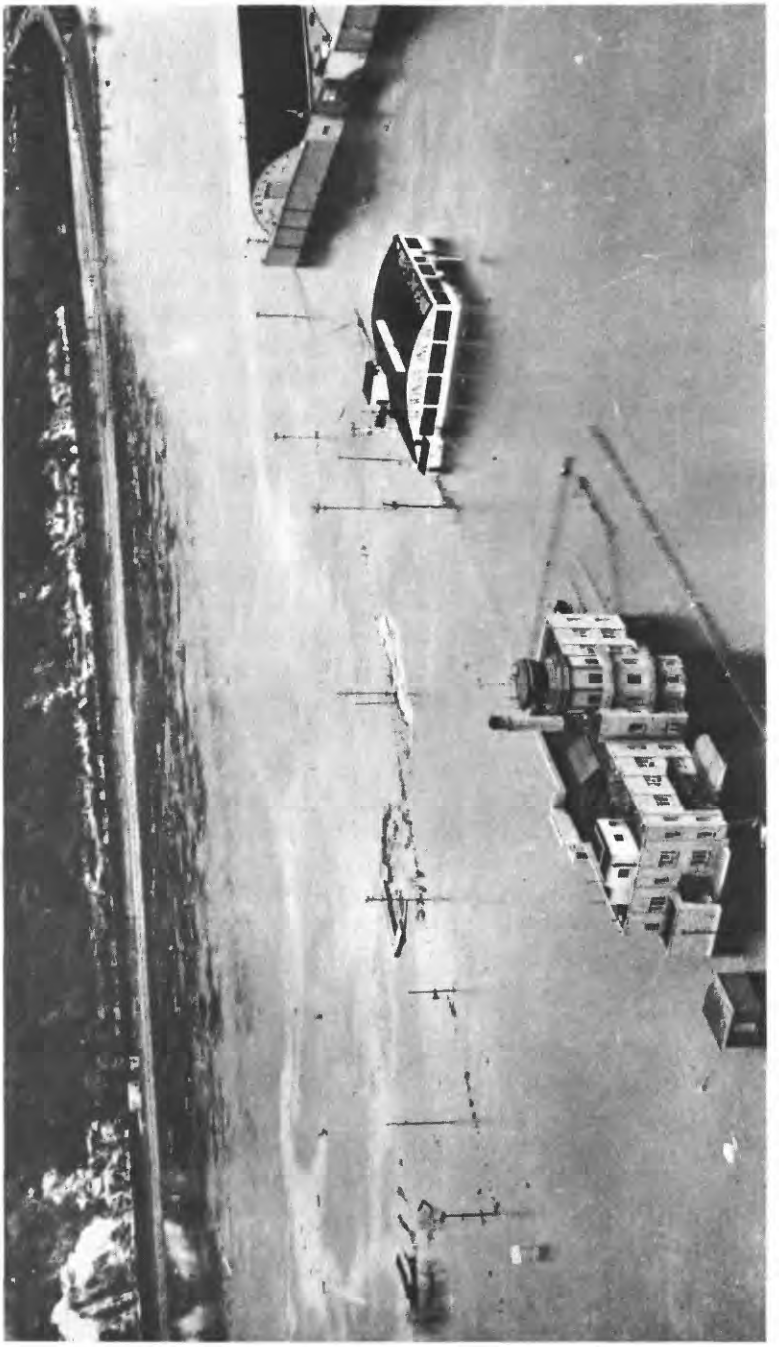


FIGURE 11.—The St. Paul, Minn., municipal airport was flooded and out of operation for 4 weeks. Photograph by St. Paul Dispatch and Pioneer Press, St. Paul, Minn.

encircled a large part of it. U.S. Highway 61, the main route through Wabasha, was closed for over a week, and Minnesota State Highway 60, leading to the interstate bridge and Nelson, Wis., was also closed. Water was almost 2 feet deep over U.S. Highway 61 in town and a greater depth occurred south of town. Highway 60, at the railroad underpass, was flooded to a depth of almost 7 feet (fig. 12). Heavy ice floes from Lake Pepin, just upstream from Wabasha, and from the Chippewa River in Wisconsin threatened the town. An ice floe, almost as wide as the river and a quarter of a mile long, smashed into a wooded area above town splintering and grinding the trees which absorbed its impact. After the 1952 flood, the Nelson-Wabasha dike was raised 4 feet. About 3,000 feet of the 2½-mile-long, 4-foot raise was washed away in the 1965 flood. Many business places were closed during the flood, and about 50 families were evacuated. Total damages to the city were about $350,000.

Four feet of water covered the lock walls at lock and dam 4 near Alma, Wis. The pool elevation was 676.45 feet, 3.15 feet higher than the 1952 flood which was the maximum previously recorded at the dam since it was completed in 1935.

In Buffalo and Trempeleau Counties, between the Chippewa and Black Rivers in Wisconsin, flood damages were estimated at $1.5 million. Cochrane, Fountain City, and Trempeleau all suffered damages in excess of $200,000. Water covered State Highway 35 at the south end of Alma, and forced the residents of Front Street to evacuate their homes. The switches on the power exchanges which direct power to Midwest States were endangered at the Alma substation. About 150 of Cochrane's 458 people were evacuated as backwater surged into town through Indian Creek. Dikes hurriedly erected at Buffalo also protected Cochrane about a mile distant and farther from the river but 18 feet lower. In Fountain City, 11 families and 10 businesses were evacuated. Almost 1,400 flood fighters, employed by the U.S. Boatyard in Fountain City, and 150 National Guardsmen transported sandbags by barge from the boatyard and emplaced 190,000 sandbags at lock and dam 5A. The Fountain City boatyard dispensed more than a million sandbags and sent pumps and men to other cities and villages to help fight the flood.

The river crested at Winona, Minn., on April 19 at 20.77 feet, almost 3 feet higher than the flood of April 20, 1952. The maximum discharge of 268,000 cfs was 1.34 times that of a flood of 50-year recurrence interval. Flood stage at Winona is 13.0 feet; the river remained above this stage for 24 days. Volunteer workers in Winona waged a tremendous battle against the flood. There was much at stake. Had Winona's dike system failed, only two small islands would have remained above water and about two-thirds of the city would have been flooded. The

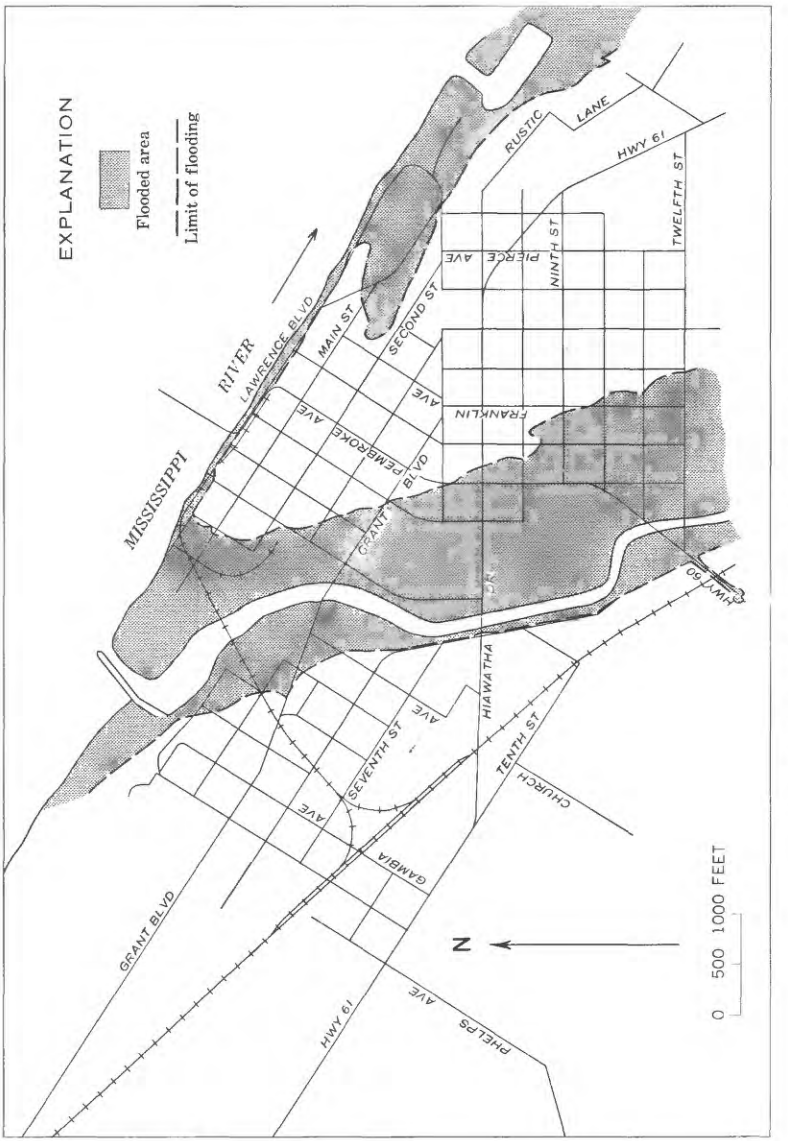


FIGURE 12.—Flooded area in Wabasha, Minn.

flood-fighting effort was costly, about $2.6 million, but it probably prevented about $20 million in damages. Total damages to the city including the flood-fighting effort were $3.7 million.

The massive effort at Winona involved ringing the city with 9 miles of dikes at the 22-foot gage elevation. Some existing dikes were raised and new ones were built. Over 250,000 cubic yards of earth was required to build the dikes, and during peak periods of operation, over 400 trucks, bulldozers, earthmovers, power shovels, and draglines were used at one time. Dozens of pumps were required to remove water seeping through and under the floodwalls. On April 18 and 19 high winds and lapping waves threatened to destroy some critical sections of the dikes, but because sandbagging and earthfilling operations were accelerated the dikes held. Though there was no physical loss to the 510-city-block residential and business area, there was a substantial loss to business because of the disruption of transportation facilities and because of the diversion of many residents into flood-fighting work.

There was great danger also when storm sewers seemed about to erupt from the high water pressures. To counteract this threat, a pioneering effort was made by city officials who hired a professional diver to seal off critical storm sewers with inflatable rubber bags. This technique proved successful and was later used by several cities farther downstream. During the period when the eruption of storm sewers threatened, over a thousand persons were evacuated from the danger areas.

The area inundated in Winona at the flood crest is shown in figure 13.

The flood prevented rail and air travel to Winona, and by April 15 only buses remained in operation. Max Conrad Airport was under water. Railroad trackage suffered heavy damage. A break in the roadbed of the Burlington track on the Wisconsin side upstream from Winona released water to a flood plain area of 5,000 acres on the Delta Fish and Fur Farm lands and may have reduced the peak at Winona somewhat. The water which poured into the flood plain undermined the dike which carried the tracks of the Green Bay and Western Railroad (fig. 14) and rejoined the main channel just across the river from Winona. The Burlington Railroad lost additional trackage farther downstream near Trempealeau. The Chicago and North Western Railway and the Milwaukee Railroad also suffered severe flood damage. Rail transportation into Winona resumed on April 27 during the flood's recession, but it was several days before all the railroads were back in operation.

The two main highways through Winona, U.S. Highways 61 and 14, remained open although Highway 61 was flooded to the north in the Wabasha area. Across the river from Winona, State Highway

35 in Wisconsin was flooded both north and south of the interstate bridge.

At La Crosse, Wis., the Mississippi River crested at 17.96 feet on April 22, 2.6 feet higher than the 1952 flood and 1.5 feet higher than the flood of 1880. The maximum discharge of 278,000 cfs is 1.34 times as great as a flood of 50-year recurrence interval.

Extensive flood protection measures were undertaken in La Crosse. Construction of 5 miles of emergency dike required 350,000 sandbags and 59,000 tons of material. In La Crosse and its environs, over 600 homes and about 80 businesses were flooded. Over 1,200 persons were evacuated from their homes. Total damages at La Crosse, including the cost of flood fighting, were about $7.6 million; no other municipality except Dubuque, Iowa, suffered greater damage. A photograph of part of the flooded business area in La Crosse and a map showing the inundated area of the city are shown in figures 15 and 16.

At Lansing, Iowa, floodwaters cut off the south residential area from the rest of the town and closed the bridge across the Mississippi River. A mobile power unit, readied when floodwaters threatened the local power substation, supplied electrical power to the community when flooding occurred.

A peak stage of 25.38 feet, 7.38 feet above flood stage, occurred at McGregor, Iowa, on April 24. It exceeded all stages since at least 1828. An emergency levee on "A" Street and sandbags along some properties on Main Street confined the flooding to the immediate riverfront area. Marquette, Iowa, just 2 miles north, was isolated when all highways leading into the city were inundated. The city was separated into three parts by the floodwaters and water stood 3½ feet deep at the Main Street intersection. Supplies and emergency aid were brought in by National Guard "ducks" and other boats. At Prairie du Chien, Wis., just across the river, about 250 houses and 25 business establishments were flooded. One-third of the town was under water and over 1,000 persons were homeless. The approaches to the Mississippi River bridge between Marquette and Prairie du Chien were inundated and closed to traffic on April 19 (fig. 17). The topography at Prairie du Chien does not lend itself to flood protection works because an old channel runs behind the city; consequently dikes would have to encircle the city to protect it. Flood losses in Prairie du Chien were great—almost $2½ million, of which over $1 million was to residential property.

The stage at Guttenberg, Iowa, reached 23.65 feet on April 24, about 8½ feet above flood stage. About 70 percent of the town was protected from flooding by about 1 mile of emergency levees. At Cassville, Wis., 9 miles downstream from Guttenberg, the flood crest

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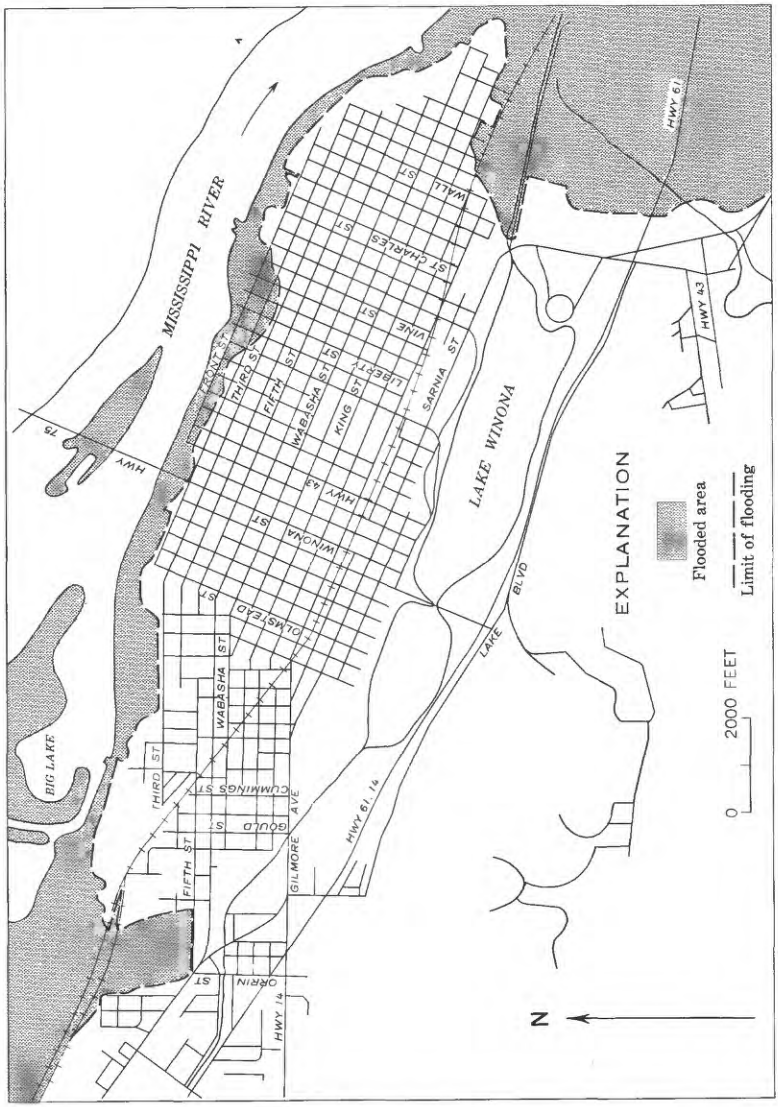


FIGURE 13.—Flooded area in Winona, Minn.

FIGURE 14.—Railroad trackage near Winona, Minn., suffered heavy damage. Photograph by Minneapolis Star and Tribune, Minneapolis, Minn.

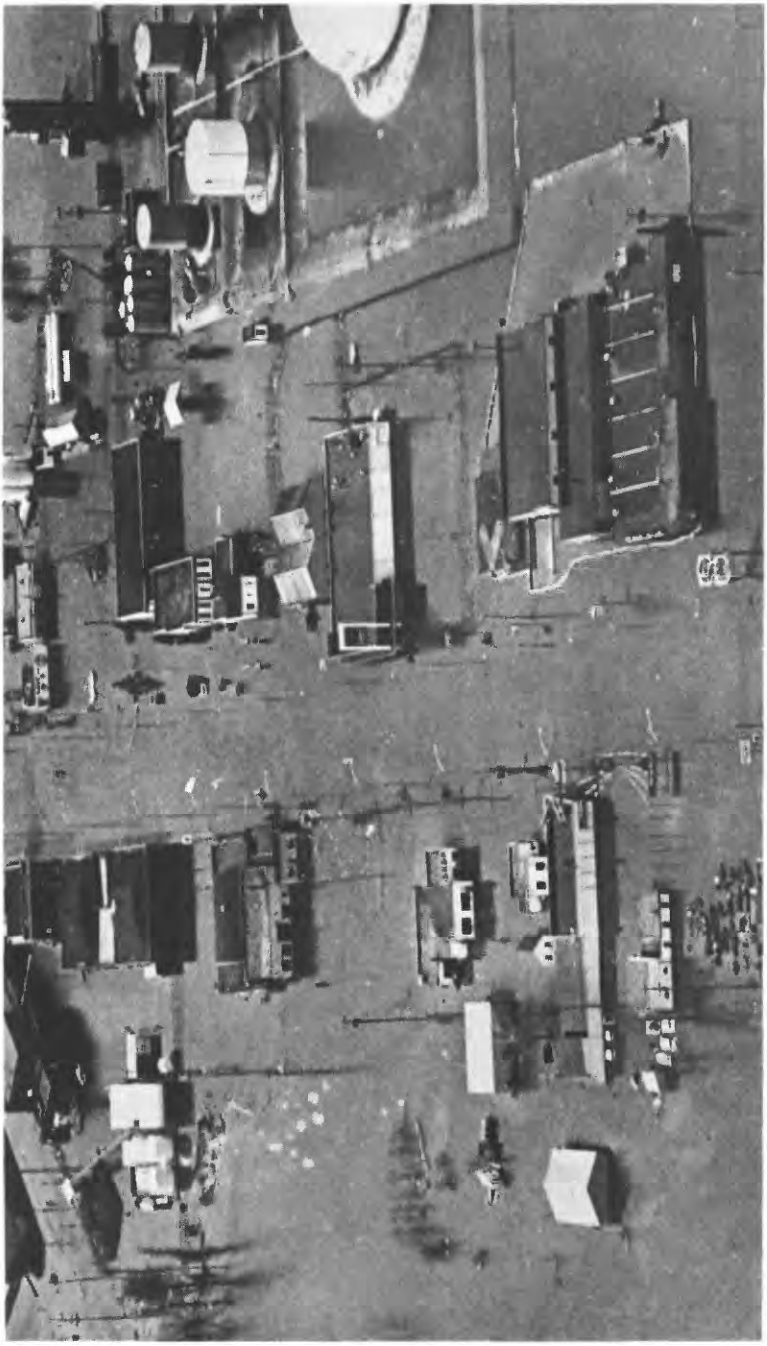


FIGURE 15.—Many businesses and homes were flooded in La Crosse, Wis. Photograph by St. Paul Dispatch and Pioneer Press, St. Paul, Minn.

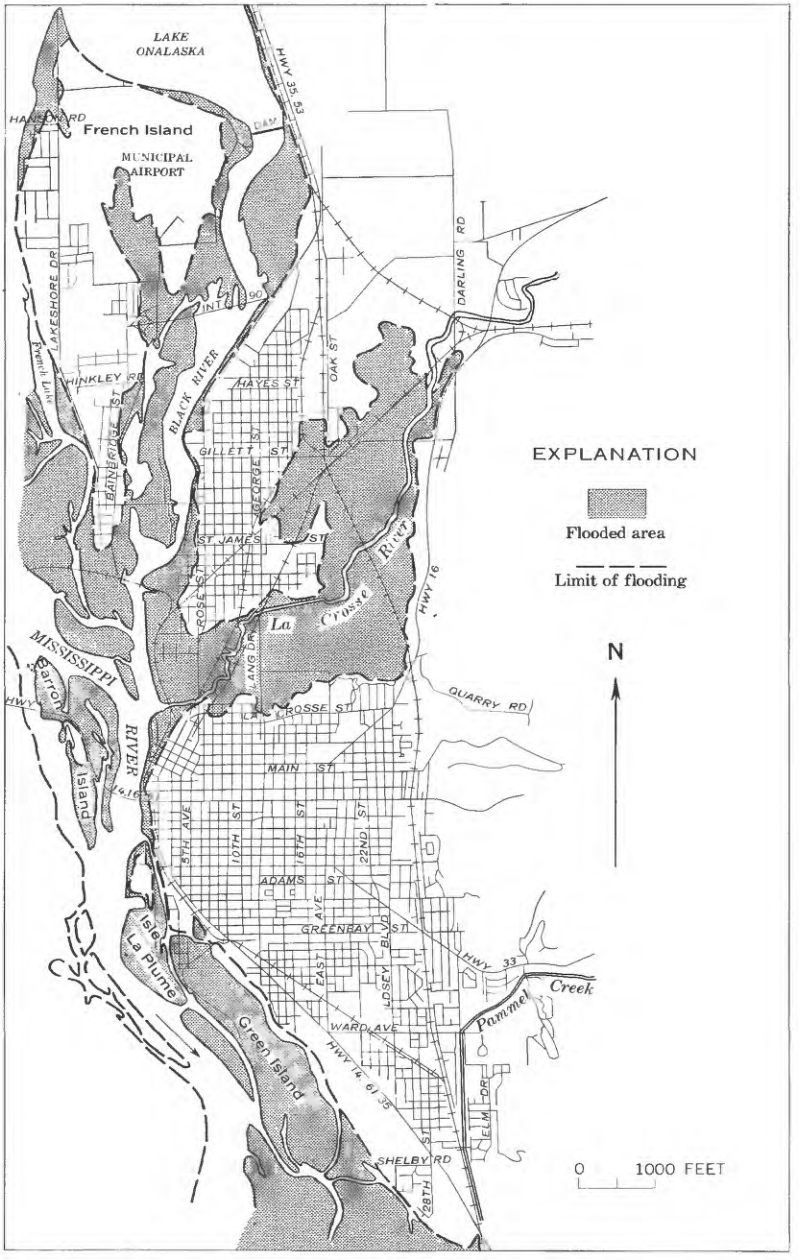


FIGURE 16.—Flooded area in La Crosse, Wis.

exceeded the previous maximum stage by about 4 feet. About 220 persons were evacuated from this small town of 1,290 population. Flood damage was estimated to be about $300,000.

The stage at Dubuque, Iowa, was above the 17-foot flood stage for 28 days. The peak stage of 26.71 feet on April 26 was 4 feet higher than the previous maximum of record which occurred in 1952. The southern tip of the business district and several industrial areas were flooded (fig. 18). Most of the residential areas were protected from the floodwaters by dikes along the riverfront and on Eighth Street, but about 350 persons were evacuated from their homes. About 3,500 volunteers placed 400,000 sandbags on 3½ miles of emergency dikes. This effort saved 450 houses and many industries from inundation and kept the Julien Dubuque Bridge open to traffic. For several days, at the height of the flood, this bridge was the only one open across the Mississippi River in the 200-mile reach between La Crosse, Wis., and Davenport, Iowa. The Illinois Central Railroad jacked up about 1½ miles of tracks to keep them above the rising waters, but the company had to discontinue service on the west side of the Mississippi River on April 23. The Iowa-Wisconsin bridge was closed on April 19 and the Milwaukee Railroad Company suspended service in the Dubuque area on April 21. The Dubuque sewage treatment plant was out of operation for several days beginning on April 24. Nineteen business and industrial concerns were closed, putting many people temporarily out of work. Flood protection works at John Deere and Dubuque Packing Plants successfully withheld the floodwaters and the plants remained open. A second line of dikes was constructed on 12th Street, Fengler Street, and Kerper Boulevard in case the first line was breached, but all dikes held. The water from seepage under the dikes and from local drainage was collected in a storage lagoon behind the dikes and was pumped into the river. Over $3 million was spent on flood protection which prevented about $7½ million of damages. The Corps of Engineers estimated the flood damages in Dubuque to be almost $7.7 million, the greatest loss sustained by any metropolitan area. The flooded area in Dubuque is shown in figure 19.

The Mississippi River crest, 3.6 feet higher than that of the 1952 flood, reached Clinton, Iowa, on April 28. The peak stage was the highest one recorded since 1828. Emergency dikes and strengthened levees saved the city's main business district and most of the residential and industrial areas from inundation (figure 20). Failure of the dikes would have caused 150 blocks to be flooded and an estimated additional $9.5 million in damages. In spite of the many flood protection structures built, over $5 million in damages occurred. The Lyon's business district in Clinton and over 50 industrial and commercial concerns were flooded (fig. 20). The Lyon's-Fulton Bridge and Gateway Bridge

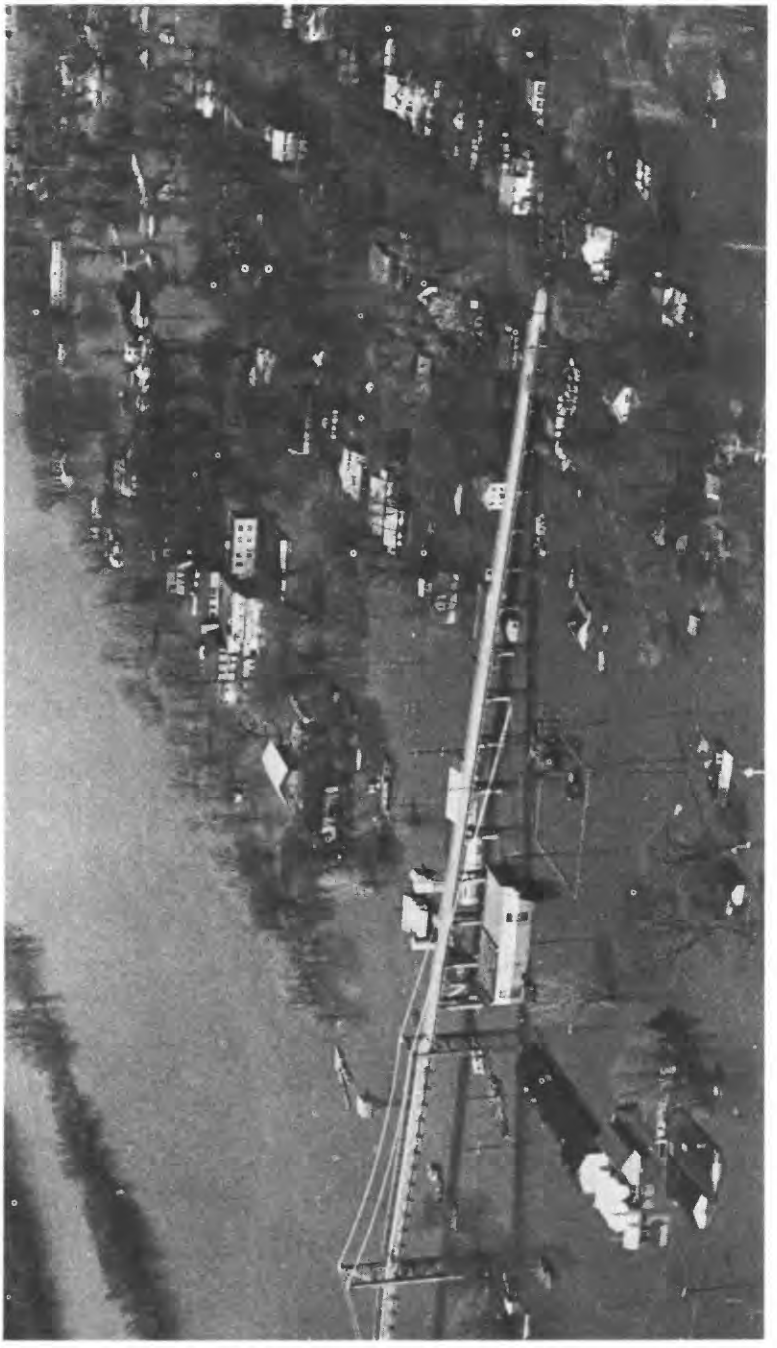


FIGURE 17.—The interstate bridge approach and one-third of Prairie du Chien, Wis., were under water. Photograph by Wisconsin State Journal, Madison, Wis.

FIGURE 18.—The southern tip of the business district and several industrial areas were flooded in Dubuque, Iowa. Photograph by U.S. Army Corps of Engineers, Rock Island, Ill.

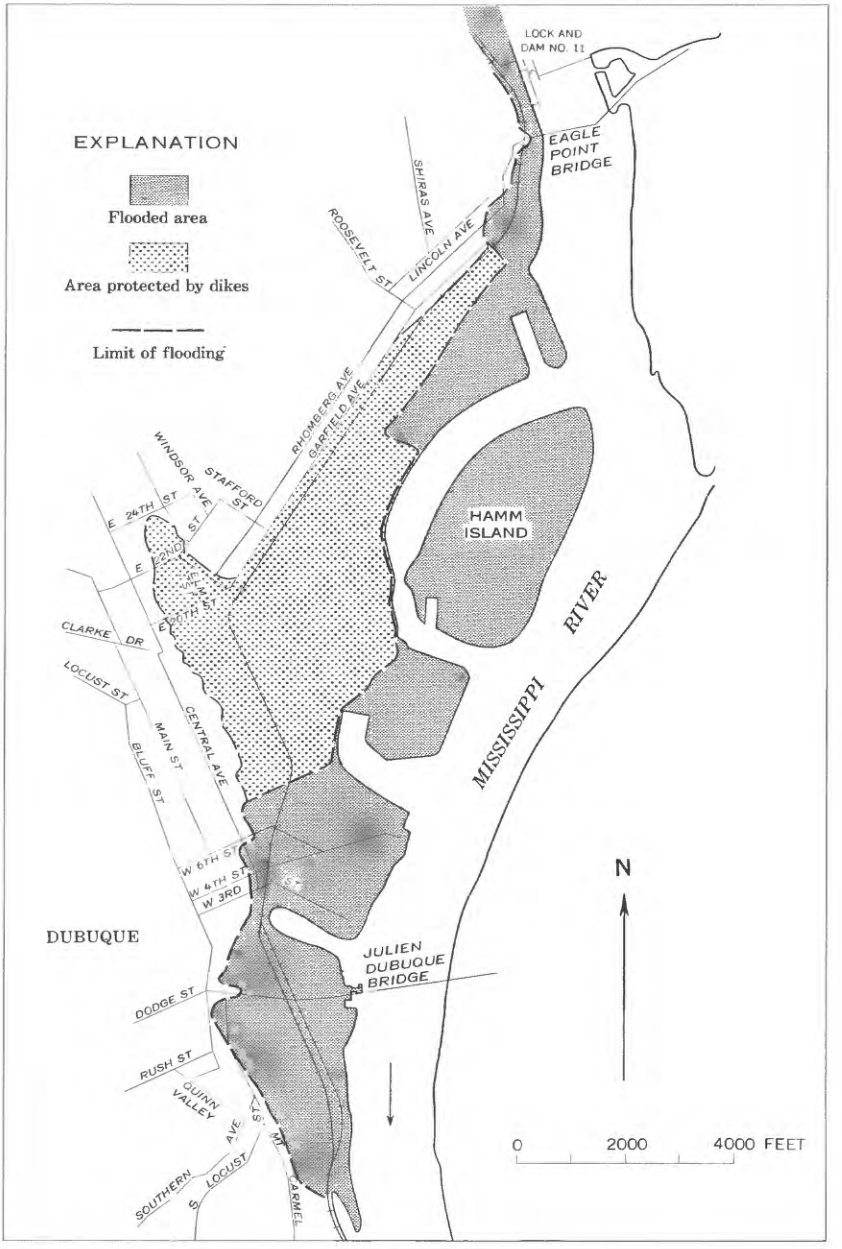


FIGURE 19.—Flooded area in Dubuque, Iowa.

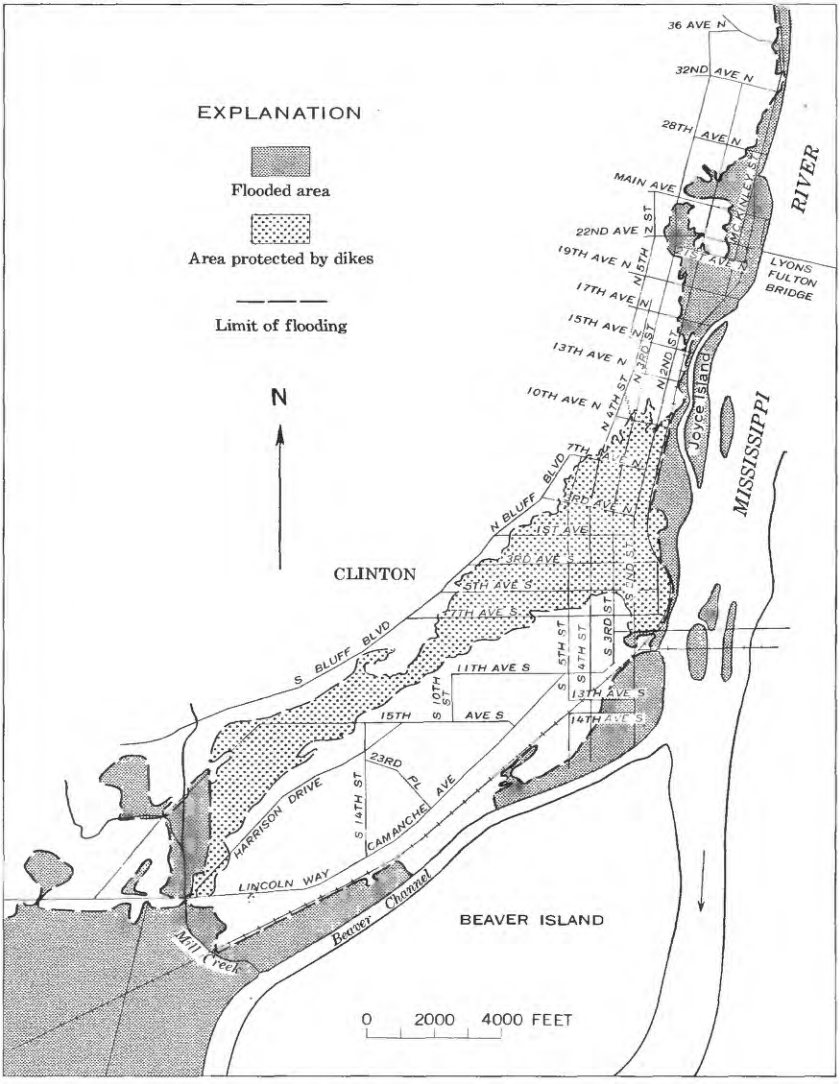


FIGURE 20.—Flooded area in Clinton, Iowa.

were closed April 23 for about 2 weeks and the Chicago and North Western Railway Company had to suspend operations through this area because of the floodwaters. Fourteen youths were injured when a cinder-block wall, being reinforced to serve as a floodwall, collapsed from the weight of earthfill placed against it.

An interesting story can be told about the efforts to save the Clinton First Avenue pumping station. Much of the city behind the levee would have been flooded from seepage water if the pumps had failed.

The sandbagged station, resembling a fortified island in the rampaging waters became known as Fort Johannsen, named after Lt. Johannsen of the Iowa National Guard. He, along with a band of fellow National Guardsmen, manned the station day after day and kept the pumps operating and the dikes intact.

Another interesting story was that of "Silent Henry" Steele. Silent Henry, about 72 years old, had lived for 30 years on his small island near Clinton. Throughout the 1965 flood, he floated above his shack on a raft tied to the top of a tree; he not only refused evacuation but also any assistance for food and supplies.

In Whiteside County, Ill., the Johnson Creek and Cat Tail Drainage District levees were breached, flooding more than 9,000 acres. Fulton, Ill. was completely surrounded and engulfed by these floodwaters (fig. 21). Damages were about $1.7 million, and more than 2,000 persons were forced to leave their homes. Downstream, at Albany, Ill., the 12-mile section of Meredosia Dike threatened to fail. If it had, 19,000 acres of farmland and neighboring communities would have been flooded. Hundreds of volunteers worked against tremendous odds and successfully reinforced the dike and Meredosia pumping station.

The metropolitan area of Davenport and Bettendorf, Iowa, and Rock Island, Moline and East Moline, Ill., was inundated on both banks along more than 10 miles of the Mississippi River (figs. 22 and 23). The 1965 flood in this entire area caused about $12 million in damages and drove 12,000 persons from their homes. According to Corps of Engineers estimates, $101 million in damages were prevented by the tremendous flood emergency measures. The peak stage of the tailwater at dam 15 at Davenport on April 28 was 22.48 feet, 7.48 feet above flood stage.

At Bettendorf, Iowa, emergency dikes built across River Drive and State Street confined street flooding to less than three blocks. The failure of a 25-foot section of dike in Rock Island caused floodwaters to inundate many blocks of houses and industrial buildings. Throughout the metropolitan area, many industrial plants had to shut down. A few industries succeeded in keeping the floodwaters out of their buildings, but in many plants water was waist deep or higher. More than 200 houses were flooded in the Garden Addition in Davenport as well as some businesses in the downtown area. The Government Bridge was closed April 26 for several days when floodwaters inundated the approach.

At Muscatine, Iowa, the flood fight was hampered by 6 inches of rain which fell a few days before the flood crested. Several industries and business houses, protected from the river by dikes and levees, were flooded by the ponding of interior drainage when the power failed for 5 hours at the Mad Creek pumping station. More than 3,500 feet of

FIGURE 21.—Fulton, Ill., was surrounded and engulfed by floodwaters. View of southeastern part of town, April 27, 1965. Photograph by U.S. Army Corps of Engineers, Rock Island, Ill.

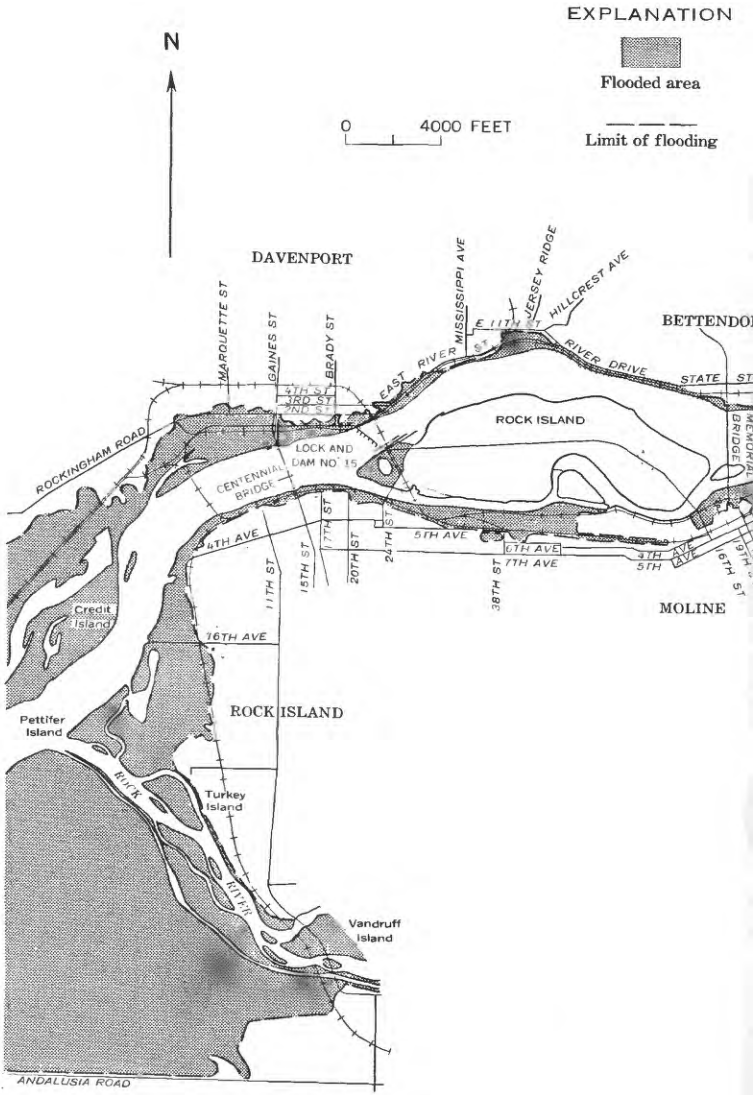
earthen dikes were built in 10 days in the Port Louisa and Michael Creek areas south of the city. These dikes prevented the flooding of 47,000 acres of farmland and a huge industrial and residential area valued at $50 million. Damages and flood-fight costs in the Muscatine area were about $628,000. The closure structures, from Second Street to Seventh Street in the Mad Creek levee system, were very successful in sealing off floodwaters. Other than a section of floodwall that gave way on April 26, all the structures and rain-soaked levees and dikes held and confined most flood damages to the riverfront areas and about 500 houses (fig. 24). The Muscatine High Bridge was closed on April 23 for over 2 weeks. The peak stage of 24.8 feet, which was 8.8 feet above flood stage and 3.8 feet above the 1952 flood, occurred on April 29.

Most businesses at Buffalo, Iowa, were forced to close because of the floodwaters. Damages in the Buffalo area were approximately $167,000. At Keithsburg, Ill., over half the business district was engulfed by floodwaters in spite of the more than 40,000 sandbags used to contain the flood.

The peak stage of 21.0 feet, 6 feet above flood stage, occurred at Burlington, Iowa, on April 30 and May 1. The previous maximum stage of record was 18.9 feet in 1851. The river remained above flood stage for more than 50 days, and many of the riverfront industries and streets were flooded. A 1,000-foot break in the Tama Levee north of the city flooded 3,200 acres of farmland. Just north of this area, the Yellow Springs Levee was raised and strengthened so that it kept 20,000 acres from flooding. Across the river from Burlington, floodwaters poured through several levee breaks and spread over 28,400 acres in Henderson County, Ill., creating a floodway 8 miles wide in places. Gulfport, Ill. was entirely flooded up to rooftop levels. U.S. Highway 34 underpass east of the city was washed out, thus cutting the Burlington Railroad main line.

Several levees of Federal organized levee and drainage districts failed between Dubuque, Iowa, and Quincy, Ill. The Green Island Levee in Jackson County, Iowa, failed on April 15; 7,200 acres were flooded. The Henderson County, Ill., levees failed April 21, 26 and 27; a total of 15,200 acres were flooded. The Des Moines County, Iowa, levee failed April 26 flooding 3,800 acres. When the Indian Grave and South Quincy Levees failed, 17,800 and 5,500 acres, respectively, were flooded in Adams County, Ill.

Damages, including flood-fight costs, at Fort Madison and Keokuk, Iowa, amounted to about $690,000. Most of the flooding was in the heavy industrial areas of both communities. At Fort Madison, the railroad yards were flooded, but the main line track was raised about 3 feet to enable rail service to continue. Riverview Park was under


EXPLANATION
Flooded area
Limit of flooding
N
0 4000 FEET
DAVENPORT
MARQUETTE ST
GAINES ST
BRADY ST
MISSISSIPPI AVE
JERSEY RIDGE
HILLCREST AVE
E 11TH ST
EAST RIVER DR
RIVER DRIVE
STATE ST
BETTENDOR
4TH ST
3RD ST
2ND ST
ROCK ISLAND
ROCKINGHAM ROAD
LOCK AND DAM NO. 15
CENTENNIAL BRIDGE
MEMORIAL BRIDGE
6TH AVE
11TH ST
15TH ST
17TH ST
20TH ST
24TH ST
5TH AVE
6TH AVE
7TH AVE
4TH AVE
5TH AVE
38TH ST
16TH ST
MOLINE
Credit Island
16TH AVE
ROCK ISLAND
Pettifer Island
Turkey Island
Vandruff Island
ANDALUSIA ROAD

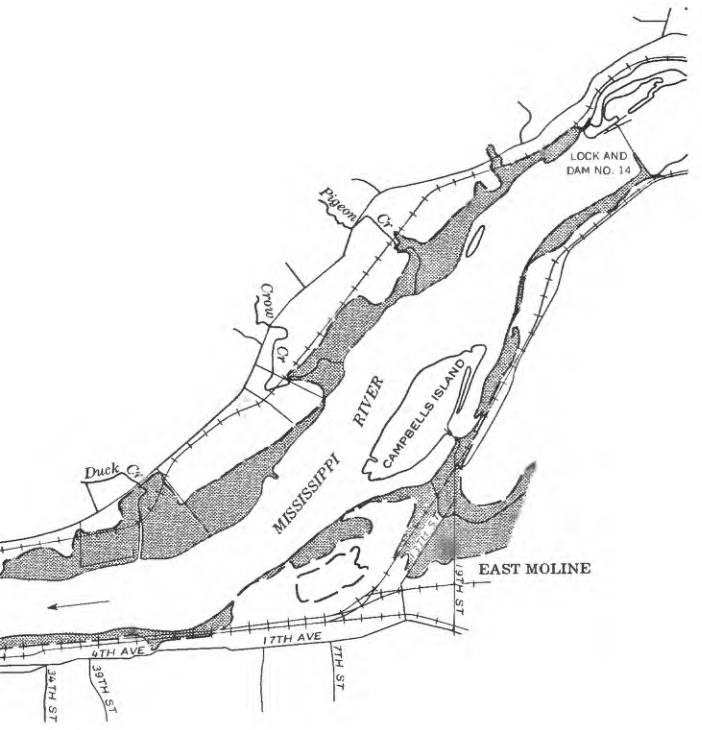


FIGURE 22.—Flooded area in Davenport and Bettendorf, Iowa, and Rock Island, Moline and East Moline, Ill.

FIGURE 23.—Peak stage at Davenport, Iowa, was about 7½ feet above flood stage. View from dam 15, May 1, 1965. Photograph by U.S. Army Corps of Engineers, Rock Island, Ill.

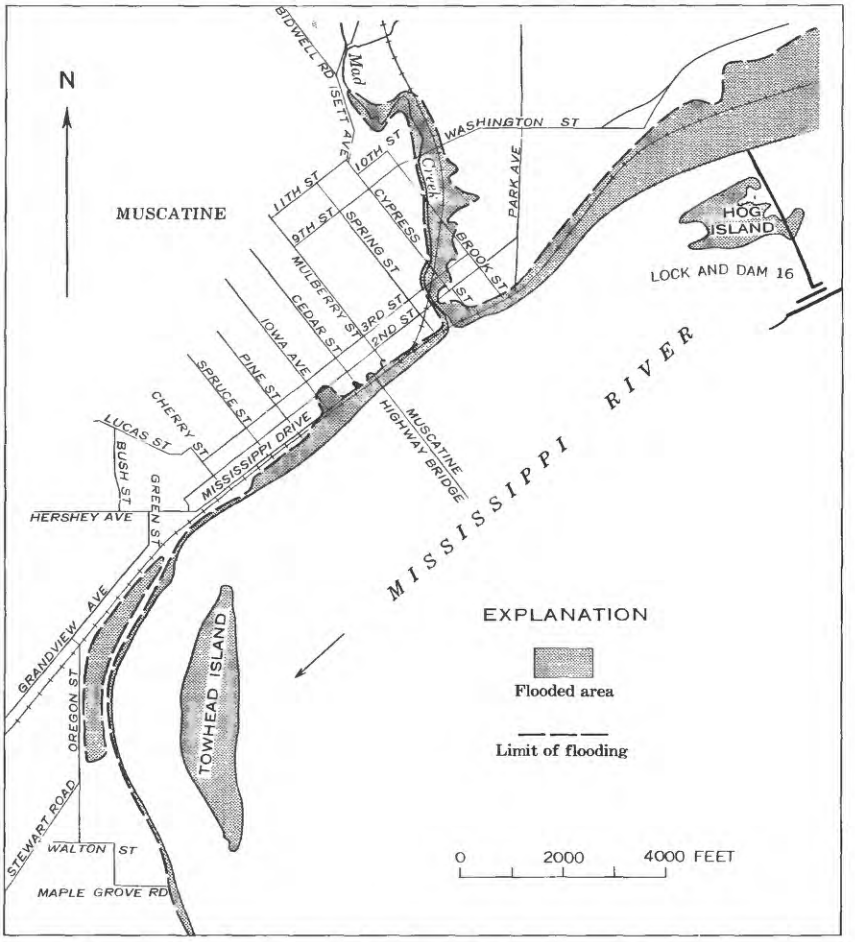


FIGURE 24.—Flooded area in Muscatine, Iowa.

water. During the extremely high discharge period, the pool elevation of the Union Electric dam at Keokuk was more than half a foot lower than the elevation a month earlier at much lower discharges. Many of the gates of the dam were open during the peak discharge permitting the natural flow of the river to pass. The maximum stage of 22.14 feet, which was 6.14 feet above flood stage, occurred on May 1 at Keokuk. This stage, which is the tailwater elevation at the Union Electric dam, exceeds the previous maximum historic flood stage of 21.0 feet which occurred in June 1851. The 1965 maximum discharge is the highest since May 1878. Keokuk's waterfront industrial area, Commercial Alley, was flooded during both the April and May high water periods.

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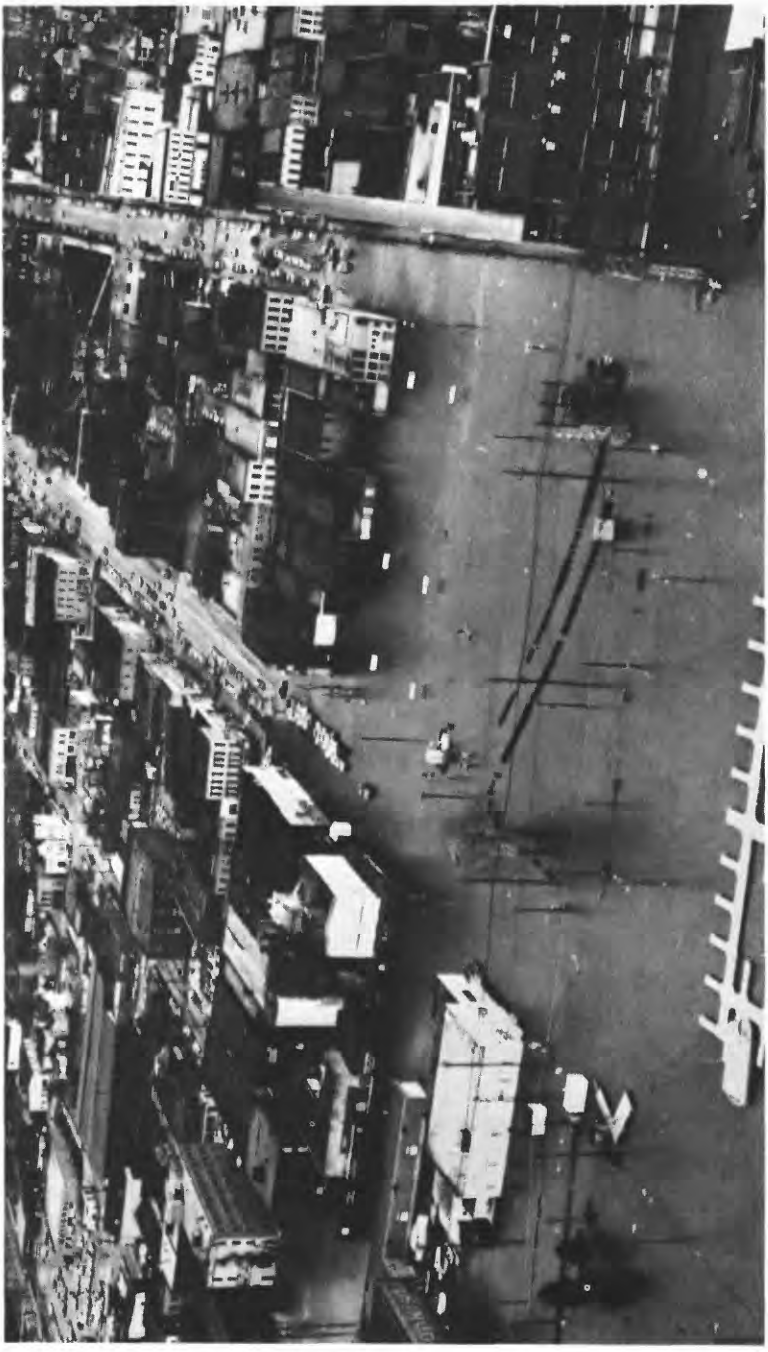


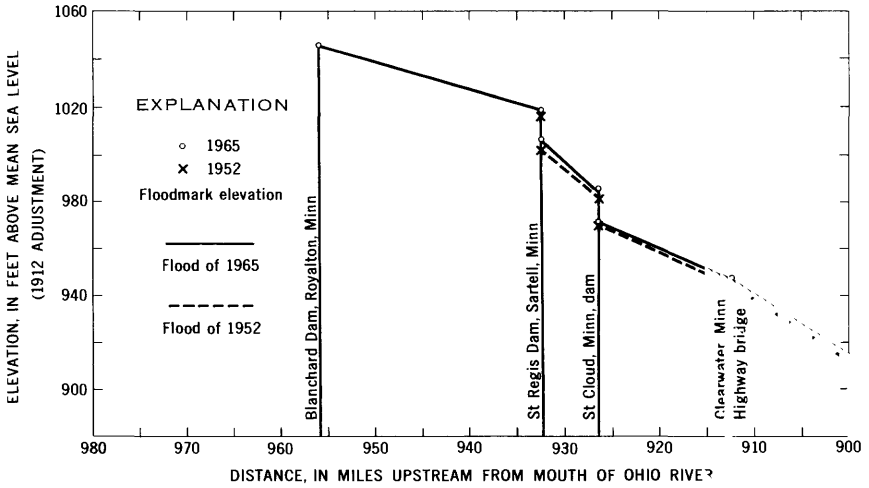
FIGURE 25.—Floodwaters inundated Main Street and low-lying business and residential areas in Hannibal, Mo. Photograph by St. Louis Post-Dispatch, St. Louis, Mo.

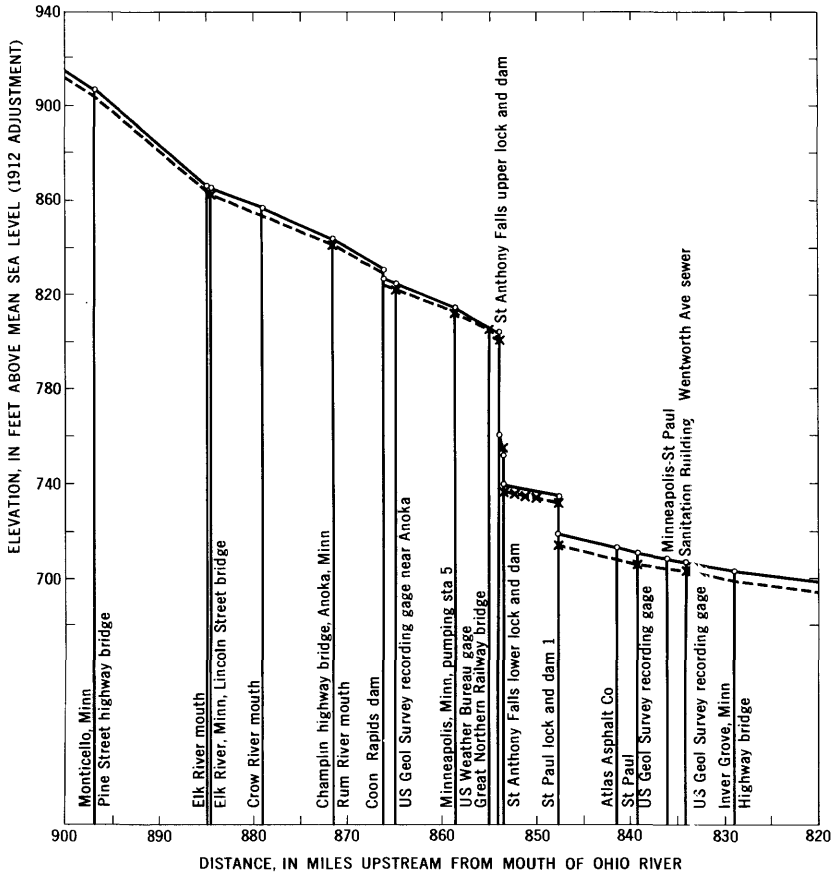
All waterfront industries except one closed for 2–3 weeks. Over 1,000 persons were temporarily dismissed from work. Downstream from the Union Electric dam at Keokuk, Iowa, there were two major crests on the Mississippi River during the period March–May 1965. The first crest occurred in April as a result of high inflow from the Des Moines River and other tributaries. The second crest occurred early in May. The May crest exceeded the April crest except in the reach between La Grange and Palmyra, Mo., where levee breaks lowered the peak stage in May, and in the reach downstream from Grafton, Ill., where less backwater from the Missouri River, occurred in May.

Downstream from Mundy's Landing, Mo., the 1965 crest was lower than the previously known maximum at each point of determination. Two peaks about equal in discharge occurred at Alton, Ill., on April 19 and May 13. Higher peaks discharged at Alton in 1943 and 1944, and a peak discharge in 1947 was equal to that of 1965, but in each of the 3 earlier years, overflow from the Missouri River, caused by levee breaks, entered the Mississippi River upstream from Alton. After deducting this overflow, the peak discharges in 1943, 1944, and 1947 were lower than the peak discharge in 1965 when there was no overflow. The peak discharge of 380,000 cfs at Alton has a recurrence interval of 11 years.

The 1965 maximum discharge at St. Louis, below the mouth of the Missouri River, was 525,000 cfs on April 16, about equal to a 2-year flood. This peak was relatively small because the Missouri River, which is now extensively regulated, did not contribute greatly to the flood condition. The Missouri River inflow was greater in April than in May, and as a result the maximum discharge at St. Louis occurred during the April peak. The highest discharge at St. Louis in May was 431,000 cfs on May 1.

Most of the flood damage below Keokuk, Iowa, resulted from inundation of farmland, river cottages, highways, and business houses. The residents of Alexandria, Mo., were evacuated during both the April and May crests. The system of previously constructed levees, floodwalls, pumping plants, and closure structures successfully protected Canton, Mo., and prevented more than $2 million damages. Quincy, Ill., incurred damages of about $367,000 including cost of flood fighting. The floodwaters in April and May inundated Main Street and low-lying business and residential areas in Hannibal, Mo. (fig. 25). Sandbagged storefronts and improvised walkways permitted most stores to remain open for business. Hannibal incurred damages and flood-fighting costs of about $875,000. The Mark Twain Memorial Bridge at Hannibal and U.S. Highway 36 in Kinderbrook, Ill., were closed. The main river levee failed near Saverton, Mo., and the floodwaters spread


ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (1912 ADJUSTMENT)
1060
1020
980
940
900
EXPLANATION
○ 1965
× 1952
Floodmark elevation
Flood of 1965
Flood of 1952
Blanchard Dam, Royalton, Minn
St Regis Dam, Sartell, Minn
St Cloud, Minn, dam
Clearwater Minn Highway bridge
980
970
960
950
940
930
920
910
900
DISTANCE, IN MILES UPSTREAM FROM MOUTH OF OHIO RIVER


ELEVATION, IN FEET ABOVE MEAN SEA LEVEL (1912 ADJUSTMENT)
940
900
860
820
780
740
700
Monticello, Minn
Pine Street highway bridge
Elk River mouth
Elk River, Minn, Lincoln Street bridge
Crow River mouth
Champlin highway bridge, Anoka, Minn
Rum River mouth
Coon Rapids dam
US Geol Survey recording gage near Anoka
Minneapolis, Minn, pumping sta 5
US Weather Bureau gage
Great Northern Railway bridge
St Anthony Falls upper lock and dam
St Anthony Falls lower lock and dam
St Paul lock and dam 1
Atlas Asphalt Co
St Paul
US Geol Survey recording gage
Minneapolis-St Paul Sanitation Building
US Geol Survey recording gage
Wentworth Ave sewer
Inver Grove, Minn
Highway bridge
900
890
880
870
860
850
840
830
820
DISTANCE, IN MILES UPSTREAM FROM MOUTH OF OHIO RIVER

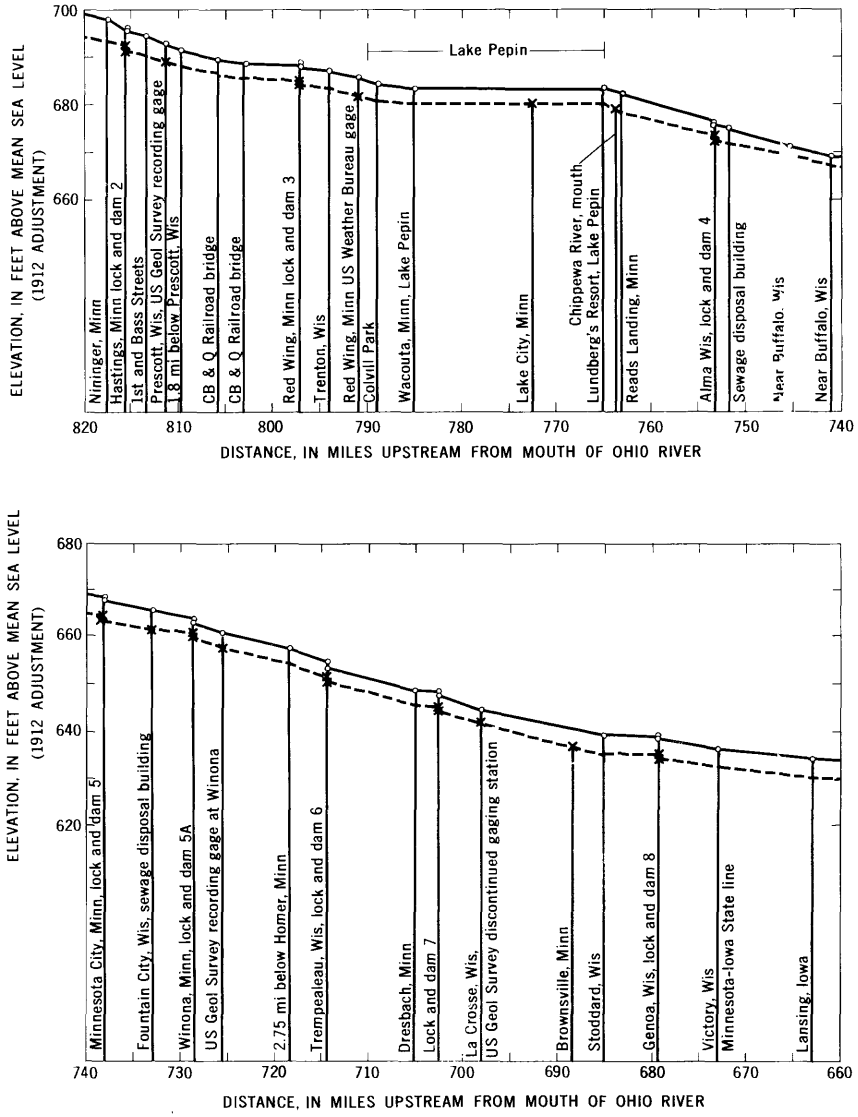


FIGURE 26.—Flood-crest profiles of Mississippi River. Water-surface elevations were obtained at U.S. Geological Survey gages or were selected ffrom high-water data furnished by the U.S. Army Corps of Engineers.

(Figure 26 continues on nert page.)

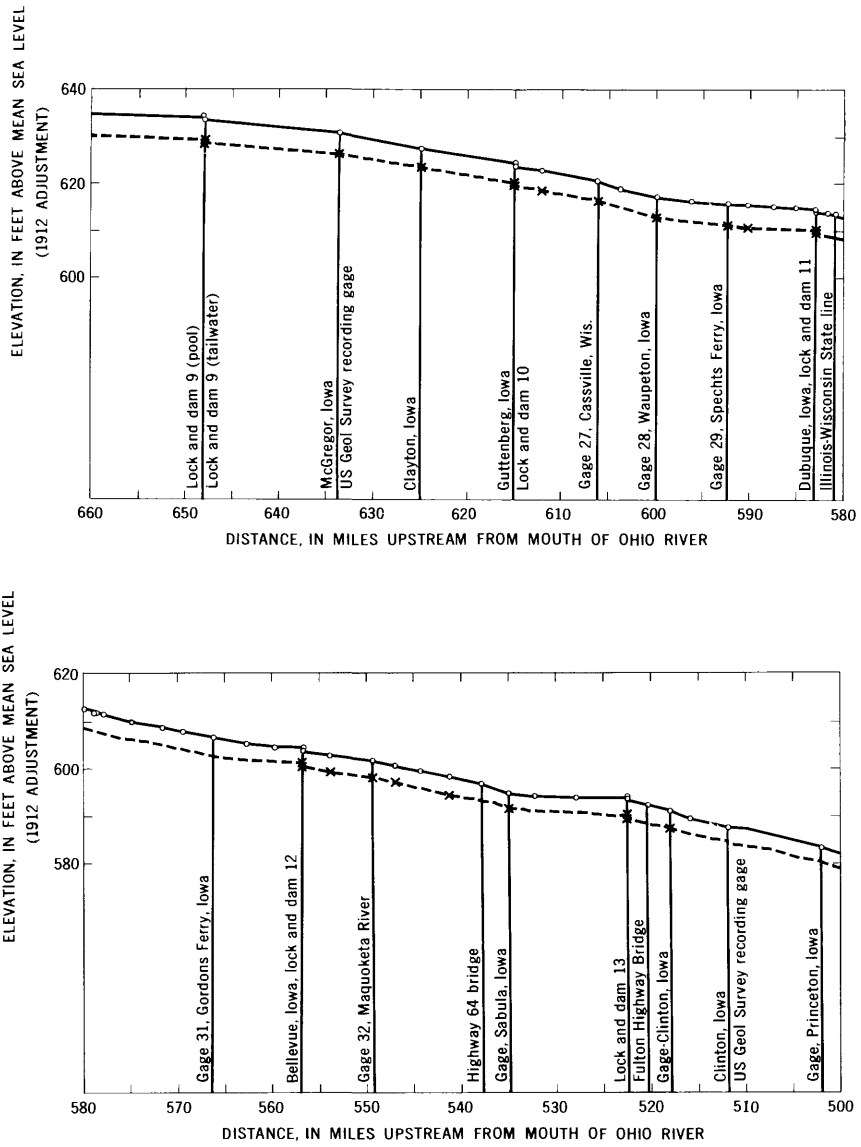


FIGURE 26.—Continued. (Flood-crest profiles of Mississipp' River. Water-surface elevations were obtained at U.S. Geological Survey gages or were selected from high-water data furnished by the U.S. Army Corps of Engineers.)

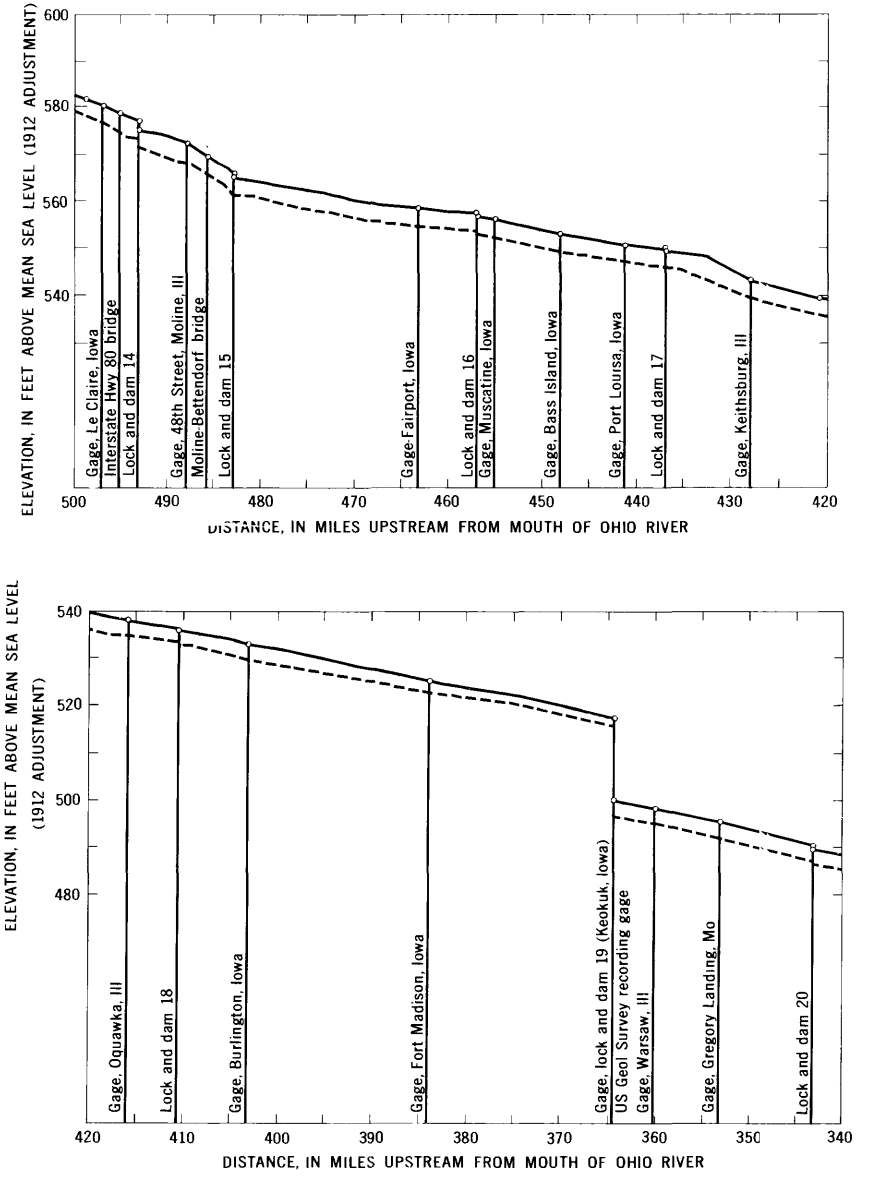


Figure 26.—Continued.

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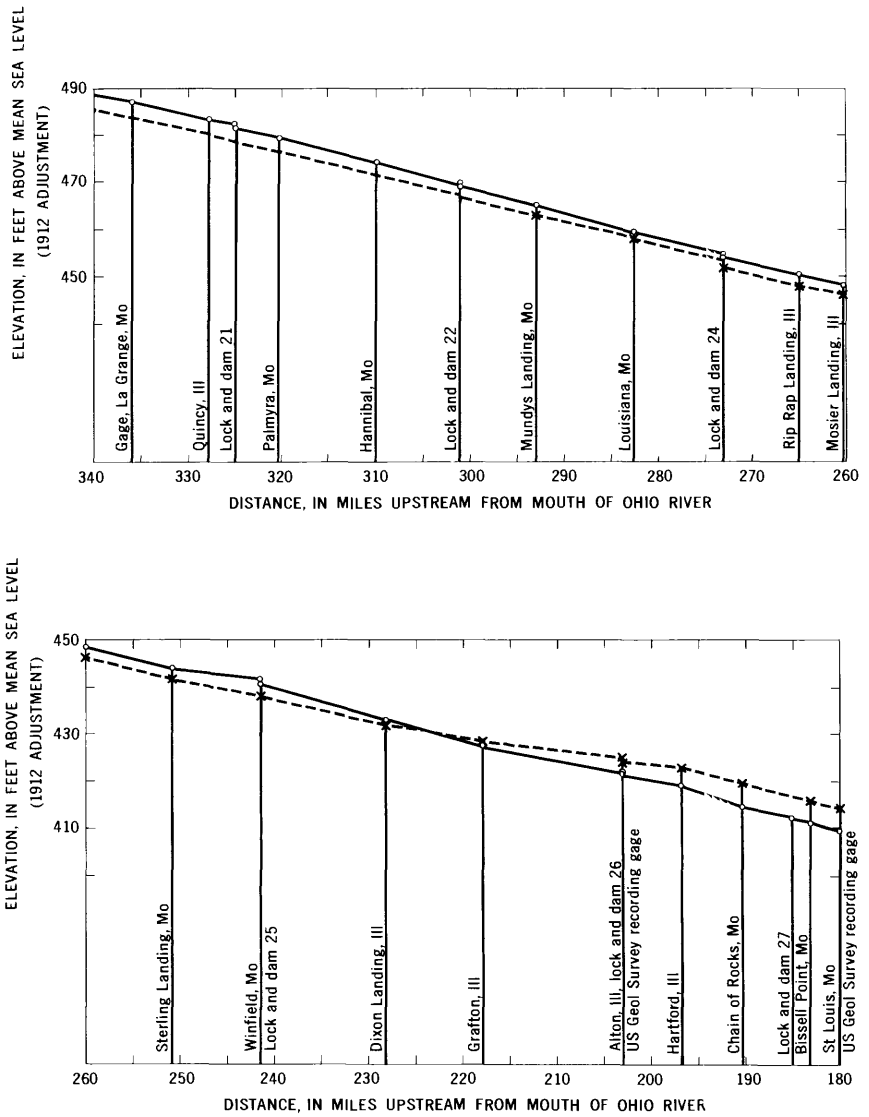

FIGURE 26.—Continued. (Flood-crest profiles of Mississipp' River. Water-surface elevations were obtained at U.S. Geological Survey gages or were selected from high-water data furnished by the U.S. Army Corps of Engineers.)

(End of figure 26.)

over 1,000 acres of farmland engulfing the small community of Hull, Ill., to depths of 4–6 feet. The 535 residents had been evacuated earlier.

Flood crest profiles, which are graphs of maximum flood elevations plotted against river miles, are shown for the Mississippi River in figure 26. The 1965 maximum elevations are compared with those which occurred in the 1952 flood. Table 1 describes and tabulates the 1965 flood elevations used in plotting the profiles. Comparative discharge hydrographs for the 1965 flood are shown for Mississippi River gaging stations in figure 27.

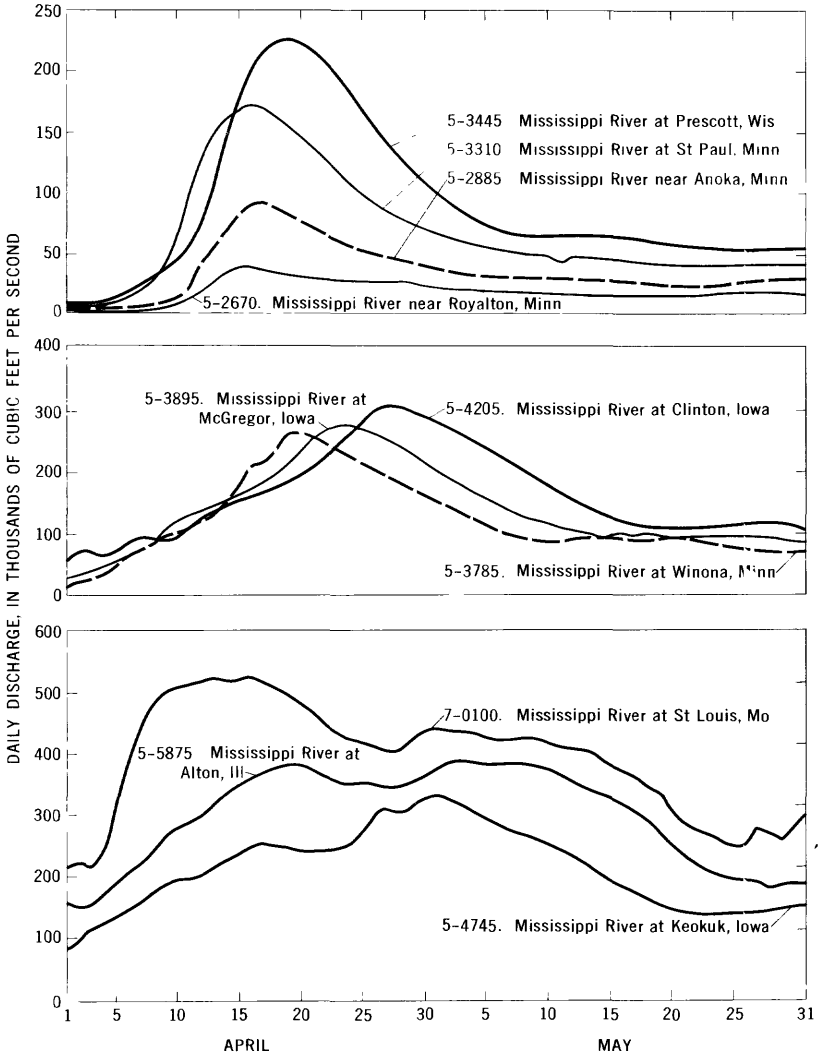

FIGURE 27.—Comparative discharge hydrographs at selected gaging stations on the Mississippi River, April–May 1965.

TABLE 1.—*Flood-crest elevations, Mississippi River*

[Based on data furnished by U.S. Army Corps of Engineers except at U.S. Geological Survey gaging stations]

Location	Miles above mouth of Ohio River	1952		1965	
		Date	Elevation in feet (1912 adjustment)	Date	Elevation in feet (1912 adjustment)
Blanchard Dam, tailwater	956.0	----	----	Apr. 15, 16	1,045.4
Sartell, Minn.:					
St. Regis Paper Co. dam, pool	----	Apr. 12	1,015.87	Apr. 14	1,019.10
St. Regis Paper Co. dam, tailwater	932.5	Apr. 13	1,001.95	Apr. 14	1,005.95
St. Clond, Minn.:					
Northern States Power Co. St. Cloud dam, pool	----	Apr. 12	983.0	----	984.9
Northern States Power Co. St. Cloud dam, tailwater	926.5	Apr. 12	971.0	Apr. 14	971.2
Clearwater, Minn., at Minnesota State Highway 24 bridge	912.6	----	945.4	Apr. 15	946.96
Monticello, Minn., at Pine St. bridge	896.9	----	----	Apr. 15	906.82
Elk River mouth	884.8	----	----	Apr. 16	866.23
Elk River, Minn., at Lincoln St. bridge	884.6	Apr. 12	862.42	Apr. 16	865.12
Crow River mouth	879.3	----	----	Apr. 16	857.06
Anoka, Minn.:					
Upstream side of U.S. Highway 52 bridge	871.46	Apr. 11–18	842.1	Apr. 17	844.1
Downstream side of U.S. Highway 52 bridge	----	----	----	Apr. 17	843.8
Northern States Power Co. Coon Rapids dam, pool	866.3	----	----	----	831.4
Northern States Power Co. Coon Rapids dam, tailwater	866.3	----	----	----	826.6
U.S. Geological Survey recording gage near Anoka, Minn	864.8	Apr. 14	822.53	Apr. 17	824.55
Minneapolis, Minn.:					
Pumping station 5 and U.S. Weather Bureau gage	858.6	Apr. 14	813.80	----	814.30
Plymouth Ave. bridge, west end, downstream	855.0	Apr. 15	806.50	----	----
Plymouth Ave. bridge, east end, downstream.	855.0	Apr. 15	805.98	----	----
Left end Great Northern Railway bridge	854.8	Apr. 15	802.14	----	----
Right end Great Northern Railway bridge	854.8	Apr. 15	802.54	----	----
St. Anthony Falls upper lock and dam, pool.	853.85	Apr. 14	802.6	Apr. 17	803.43
St. Anthony Falls upper lock and dam, tailwater.	853.85	Apr. 14	----	Apr. 17	760.0
St. Anthony Falls lower lock and dam, pool	853.5	Apr. 12	753.20	Apr. 17	751.42
St. Anthony Falls lower lock and dam, tailwater.	853.5	Apr. 12	737.10	Apr. 17	739.02
Minneapolis barge terminal	852.6	Apr. 14	736.70	----	----
Franklin Ave. bridge, east end, upstream	851.46	Apr. 15	734.86	----	----
Franklin Ave. bridge, west end, downstream.	851.46	Apr. 15	734.54	----	----
Lake St.-Marshall Ave. bridge	849.55	Apr. 15	733.20	----	----
Lock and dam 1, pool	847.6	Apr. 14	733.02	Apr. 17	734.47
Lock and dam 1, tailwater	847.51	Apr. 15	714.02	Apr. 16, 17	719.02
Ford Bridge, west end, upstream	847.40	Apr. 15	732.71	----	----
St. Paul, Minn.:					
Ford Bridge, east end, upstream	847.40	Apr. 15	732.48	----	----
Atlas Asphalt Co. garage, 375 ft upstream from railway bridge.	841.5	----	----	Apr. 16	713.89
U.S. Geological Survey recording gage	839.3	Apr. 16	706.18	Apr. 16	710.17
Minneapolis-St. Paul Sanitary District building.	836.35	----	----	----	708.5
Chicago Great Western Ry. bridge, southwest corner.	835.9	Apr. 17	704.00	----	707.59
Wentworth Ave. sewer outlet	834.2	Apr. 17	703.13	----	707.50
South St. Paul, U.S. Geological Survey recording gage.	833.7	Apr. 16	703.15	----	----
Inver Grove, Minn., at highway bridge	829.5	----	----	----	702.88
Nininger, Minn	817.6	----	----	----	698.03
Hastings, Minn. at:					
Lock and dam 2, pool	815.42	Apr. 16, 17	692.40	Apr. 17	697.07
Lock and dam 2, tailwater	814.99	Apr. 16	691.59	Apr. 17	696.13
Northeast corner East and Bass St	813.45	----	----	----	694.81
Prescott, Wis., U.S. Geological Survey recording gage.	811.4	Apr. 16–18	689.03	Apr. 18	693.11
Profile point, 1.8 miles below Prescott, Wis	809.7	----	----	----	691.21
Riverward side and upstream end of CB&QRR bridge.	805.79	----	----	----	689.66

TABLE 1.—*Flood-crest elevations, Mississippi River*—Continued

Location	Miles above mouth of Ohio River	1952		1965	
		Date	Elevation in feet (1912 adjustment)	Date	Elevation in feet (1912 adjustment)
Downstream landward end of CB&QRR bridge.	803.00				688.86
Lock and dam 3, pool, near Red Wing, Minn.	797.06	Apr. 17	684.68	Apr. 18	688.22
Lock and dam 3, tailwater, near Red Wing, Minn.	796.69	Apr. 17	684.14	Apr. 18	687.93
Trenton, Wis., at Evert's Resort	794.10				687.10
Red Wing, Minn.:					
U.S. Weather Bureau gage	790.90	Apr. 18	681.98		685.98
Colvill Park, upstream riverward corner of tennis court.	788.92				684.17
Wacouta, Minn., on right bank of Lake Pepin	785.0				683.41
Lake City, Minn., on right bank Lake Pepin, on bridge L136 at Lundberg's resort.	764.9				683.22
Chippewa River mouth	763.48	Apr. 18, 19	679.55		
Reads Landing, Minn.	763.00	Apr. 18, 19	678.82		682.06
Alma, Wis.:					
Lock and dam 4, pool	753.4	Apr. 19	673.33		676.45
Lock and dam 4, tailwater	753.2	Apr. 19	672.33		675.78
Sewage disposal building	751.8				675.06
Profile point near Buffalo, Wis.	745.5				671.05
Profile point near Buffalo, Wis.	741.3				669.46
Lock and dam 5, pool	738.27	Apr. 19, 20	664.56	Apr. 19	668.73
Lock and dam 5, tailwater	737.90	Apr. 20	663.85	Apr. 19	667.85
Fountain City, Wis., at sewage disposal building.	732.7				665.74
Winona, Minn.:					
Lock and dam 5A, pool	728.65	Apr. 19, 20	660.40	Apr. 19	663.74
Lock and dam 5A, tailwater	728.28	Apr. 20	659.88	Apr. 20	663.35
U.S. Geological Survey recording gage	725.7	Apr. 20	658.03	Apr. 19	660.89
Railroad bridge on right bank, 2.75 mi below Homer, Minn.	718.55				657.42
Lock and dam 6, pool, near Trempealeau, Wis.	714.44	Apr. 20	651.07	Apr. 20	654.65
Lock and dam 6, tailwater near Trempealeau, Wis	714.07	Apr. 20	649.97	Apr. 20	653.02
Lock and dam 7, pool, near Dresbach, Minn.	702.61	Apr. 20	644.85	Apr. 21	648.18
Lock and dam 7, tailwater, near Dresbach, Minn	702.24	Apr. 20	644.30	Apr. 21	647.38
La Crosse, Wis.;					
Discontinued U.S. Geological Survey gaging station.	697.78	Apr. 20	641.64	Apr. 22	644.28
Brownsville, Minn.	688.60	Apr. 22	636.75		
Stoddard, Wis.	685.00				639.86
Genoa, Wis.:					
Lock and dam 8, pool	679.39	Apr. 22	635.30	Apr. 22	639.05
Lock and dam 8, tailwater	679.02	Apr. 22	634.52	Apr. 22, 23	630.40
Minnesota-Iowa State line	673.70				
Victory, Wis.	673.00				636.17
Upper Iowa River mouth	663.7				
Lansing, Iowa	663.0	Apr. 23	630.40	Apr. 24	634.8
Lynxville, Wis.:					
Lock and dam 9, pool	648.1			Apr. 24	633.8
Lock and dam 9, tailwater	647.7			Apr. 24	633.2
McGregor, Iowa:					
U.S. Geological Survey recording gage	633.4	Apr. 24	626.19	Apr. 24	630.7
Clayton, Iowa	624.8	Apr. 24	623.15	Apr. 24	627.2
Guttenberg, Iowa:					
Lock and dam 10, pool	615.3	Apr. 24	620.20	Apr. 24	624.2
Lock and dam 10, tailwater	615.1	Apr. 24	619.68	Apr. 24	623.6
Profile point	612.0	Apr. 24	618.93		622.7
Turkey River mouth	608.1				
Gage at Cassville, Wis.	606.3	Apr. 24	616.47	Apr. 25	620.4
Profile point	603.7				618.9
Gage at Waupeton, Iowa	599.9	Apr. 24	612.9	Apr. 25	617.0
Profile point	596.1				616.0
Grant River mouth	593.3				
Gage at Specht's Ferry, Iowa	592.1	Apr. 24	611.19	Apr. 25	615.5
Profile point	590.2		610.80		615.3
Platte River mouth	588.3				
Profile point	587.5				615.1
Little Maquoketa River mouth	586.5				
Profile point	585.2				614.8

TABLE 1.—*Flood-crest elevations, Mississippi River*—Continued

Location	Miles above mouth of Ohio River	1952		1965	
		Date	Elevation in feet (1912 adjustment)	Date	Elevation in feet (1912 adjustment)
Dubuque, Iowa:					
Lock and dam 11, pool	583.1	Apr. 25	610.31	Apr. 26	614.5
Lock and dam 11, tailwater	582.9	Apr. 25	609.77	Apr. 26	613.9
Profile point	581.7				613.5
Profile point	581.0				613.2
Wisconsin-Illinois State line	580.0				
Gage 30 at Dubuque, Iowa	579.9			Apr. 26	612.3
Profile point	578.9				611.9
Profile point	578.5				611.7
Profile point	577.6				611.2
Profile point	574.6				609.9
Profile point	571.5				608.6
Profile point	569.4				607.7
Sinsinawa River mouth	568.9				
Gage 31 at Gordon's Ferry, Iowa	566.2			Apr. 26	606.4
Galena River mouth	564.9				
Profile point	562.6				605.2
Profile point	559.7				604.6
Bellevue, Iowa:					
Lock and dam 12, pool	556.7	Apr. 25	600.95	Apr. 26	604.5
Lock and dam 12, tailwater	556.7	Apr. 25	600.31	Apr. 26	603.7
Profile point	553.9		599.19		602.9
Gage 32 near Maquoketa River mouth	549.4		598.28		601.7
Maquoketa River mouth	548.6				
Profile point	547.0		597.06		600.5
Apple River mouth	545.2				
Profile point	544.1				599.5
Profile point	541.2		594.58		598.2
Profile point, Iowa State Highway 64 bridge	537.8				596.8
Plum River mouth	536.6				
Gage at Sabula, Iowa	535.0	Apr. 26	591.87	Apr. 27	595.0
Profile point	532.2				594.1
Profile point	528.0				593.9
Elk River mouth	527.7				
Lock and dam 13, pool	522.5	Apr. 27	590.44	Apr. 28	593.7
Lock and dam 13, tailwater	522.5	Apr. 27	590.29	Apr. 28	593.4
Profile point, at Fulton, Mo., highway bridge	520.3				592.2
Gage, at Clinton, Iowa	518.0	Apr. 28	587.21	Apr. 28	591.1
Profile point	515.9				589.2
U.S. Geological Survey recording gage at Clinton, Iowa.	511.8			Apr. 28	587.8
Profile point	509.8		583.85		587.3
Profile point	507.0				586.0
Wapsipinicon River mouth	506.8				
Gage at Princeton, Iowa	502.1			Apr. 28	583.7
Profile point	499.3				582.0
Gage at LeClaire, Iowa	497.0			Apr. 28	580.2
Profile point at Interstate Highway 80 bridge	495.4				578.6
Lock and dam 14, pool	493.3	Apr. 28	573.33	Apr. 28	577.0
Lock and dam 14, tailwater	493.3	Apr. 28	571.08	Apr. 28	574.8
Profile point	491.0				574.2
Profile point	489.8		569.44		573.3
Gage at 48th St., Moline, Ill	487.9	Apr. 27, 28	568.14	Apr. 28	572.1
Profile point at Moline-Bettendorf bridge	485.9				569.6
Profile point	484.4				567.7
Profile point	483.9				567.2
Lock and dam 15, pool	482.9	Apr. 28	561.13	Apr. 28	565.9
Lock and dam 15, tailwater	482.9	Apr. 28	561.13	Apr. 28	565.0
Profile point	482.4				564.9
Profile point, Galbraith Highway bridge	481.9				564.8
Profile point, DRI & NW Ry. bridge	481.4		561.02		564.6
Lock 32, Rock River mouth	479.1	Apr. 27, 28	559.85	Apr. 28	563.8
Profile point	475.4		558.37		562.3
Profile point	473.0		557.60		561.5
Profile point	471.1				560.6
Profile point	467.7				559.8
Gage at Fairport, Iowa	463.5	Apr. 27, 28	554.86	Apr. 28	558.8
Profile point	460.0				557.9
Lock and dam 16, pool	457.2	Apr. 27, 28	553.63	Apr. 29	557.5
Lock and dam 16, tailwater	457.2	Apr. 27, 28	553.10	Apr. 29	556.9
Gage at Muscatine, Iowa	455.2	Apr. 28	552.52	Apr. 29	556.3
Profile point	453.0				555.3
Gage at Bass Island, Iowa	448.4	Apr. 27, 28	549.50	Apr. 28	553.1

TABLE 1.—*Flood-crest elevations, Mississippi River*—Continued

Location	Miles above mouth of Ohio River	1952		1965	
		Date	Elevation in feet (1912 adjustment)	Date	Elevation in feet (1912 adjustment)
Profile point	443.7				551.9
Gage at Port Louisa, Iowa	441.3		547.48		551.0
Lock and dam 17, pool	437.2	Apr. 28	546.41	Apr. 28	550.1
Lock and dam 17, tailwater	437.0	Apr. 28	546.14	Apr. 28	549.8
Iowa River mouth	433.5				
Profile point	432.9		543.75		547.4
Edwards River mouth	431.3				
Gage at Keithsburg, Ill	428.0	Apr. 28	540.05	Apr. 27	543.6
Pope Creek mouth	427.9				
Profile point	425.9				542.2
Profile point	420.6				539.8
Profile point	418.2				538.6
Gage at Oquawka, Ill	415.9	Apr. 28, 29	534.64	Apr. 30	537.4
Profile point	413.0				536.6
Lock and dam 18, pool	410.5	Apr. 28	533.24	Apr. 30	535.9
Lock and dam 18, tailwater	410.5	Apr. 28	532.75	Apr. 30	535.4
Henderson River mouth	409.9				
Profile point	408.4				534.8
Profile point	406.5				534.1
Profile point	404.1				533.0
Gage at Burlington, Iowa	403.1	Apr. 28	529.30	Apr. 30	532.4
Profile point	400.5			May 1	531.9
Profile point, Skunk River mouth	396.0				530.1
Profile point	392.6				528.5
Profile point	389.5				527.3
Profile point	388.1				527.0
Profile point	387.0				526.6
Gage at Fort Madison, Iowa	383.9	Apr. 29	522.67	May 1	525.1
Profile point	382.7				524.7
Profile point	381.5				524.3
Profile point	379.0				523.5
Nauvoo, Ill., and Montrose, Iowa	374.9				522.2
Profile point	368.4				519.5
Keokuk, Iowa:					
Lock and dam 19, pool	364.3			May 1	517.2
Lock and dam 19, tailwater and U.S. Geological Survey recording gage.	364.2			May 1	499.9
Des Moines River mouth	361.4				
Gage at Warsaw, Ill	359.9			May 1	498.2
Fox River mouth	353.6				
Gage at Gregory Landing, Mo	352.9			May 1	495.42
Lock and dam 20, pool	343.2			May 1	490.71
Lock and dam 20, tailwater	343.2			May 1	489.92
Gage at LaGrange, Mo	335.9			May 1	487.0
Quincy, Ill	327.9			Apr. 28	483.4
Lock and dam 21, pool	324.9			Apr. 28	482.69
Lock and dam 21, tailwater	324.9			Apr. 28	481.69
Palmyra, Mo	320.3			May 1	479.79
Hannibal, Mo	309.9			May 1	474.02
Saverton, Mo.:					
Lock and dam 22, pool	301.2			May 1	469.88
Lock and dam 22, tailwater	301.1			May 1	469.36
Mundy's Landing, Mo	293.0	Apr. 26	463.0	May 1, 4	465.2
Louisiana, Mo	282.9	Apr. 26	457.5	May 1, 4	459.6
Clarksville, Mo.:					
Lock and dam 24, pool	273.5			May 1	455.00
Lock and dam 24, tailwater	273.2	Apr. 26	452.3	May 1, 2	454.29
Rip Rap Landing, Ill	265.0	Apr. 27	448.4	May 2	450.7
Mosier Landing, Ill	260.3	Apr. 27	446.4	Apr. 18, May 2, May 4–6.	448.6
Sterling Landing, Mo	250.8	Apr. 27	441.8	May	444.0
Winfield, Mo.:					
Lock and dam 25, pool	241.5			May 2	440.85
Lock and dam 25, tailwater	241.2	Apr. 27, 28	438.1	May 2	440.07
Dixon Landing, Ill	228.3	Apr. 30	432.3	May 3, 6	433.1
Grafton, Ill	218.0	Apr. 30, May 1.	428.7	Apr. 19	427.7

TABLE 1.—*Flood-crest elevations, Mississippi River*—Continued

Location	Miles above mouth of Ohio River	1952		1965	
		Date	Elevation in feet (1912 adjustment)	Date	Elevation in feet (1912 adjustment)
Alton, Ill.:					
Lock and dam 26, pool	203.0	----------	----------	Apr. 16	421.90
Lock and dam 26, tailwater and U.S. Geological Survey recording gage.	202.7	Apr. 30	424.75	Apr. 16	421.03
Hartford, Ill	196.8	Apr. 30	423.58	Apr. 16	419.11
Chain of Rocks, Mo	190.4	Apr. 30	420.0	Apr. 16	414.6
Lock and dam 27, pool	185.3	----------	----------	Apr. 16	------
Lock and dam 27, tailwater	185.1	----------	----------	Apr. 16	412.23
Bissell Point, Mo	183.3	Apr. 30, May 1.	416.1	Apr. 16	411.1
St. Louis, Mo., U.S. Geological Survey recording gage.	180.0	May	414.05	Apr. 16	409.05

SAUK AND ELK RIVER BASINS

The Sauk River was the farthest upstream tributary in which major flooding occurred. Maximum water equivalent of snow in the Sauk River basin at the end of March was 10–11 inches (fig. 5), more than anywhere else in the upper Mississippi River drainage basin.

The maximum discharge of the Sauk River at St. Cloud was 9,100 cfs, and the maximum daily discharge was 7,940 cfs (fig. 28), by far the greatest during the 35 years of record. The stage exceeded the previous maximum, which occurred in 1951, by 2.8 feet. The maximum discharge was 1.82 times that of a 50-year flood. In spite of the heavy runoff in the Sauk River basin, there was not a great deal of flood damage. The Sauk River banks in the city of St. Cloud are relatively high, and water did not overflow them. Five counties in the Sauk River basin reported a total of $165,000 damage to public property such as roads, streets, and bridges. Further damage was sustained at Melrose where the flood destroyed a recreational dam. There was also damage to homes, agricultural land, fences, and other private property throughout the basin.

Flooding in the Elk River basin resulted principally from the melting of a heavy snow cover. The Elk River and its tributaries flow through flat, marshy land in a sand plain area throughout most of their reaches. There is little cultural development along the river; so flood damage was small. The maximum discharge at the gaging station near Big Lake was 7,360 cfs, 1.47 times the 50-year flood, and the highest in 40 years of record.

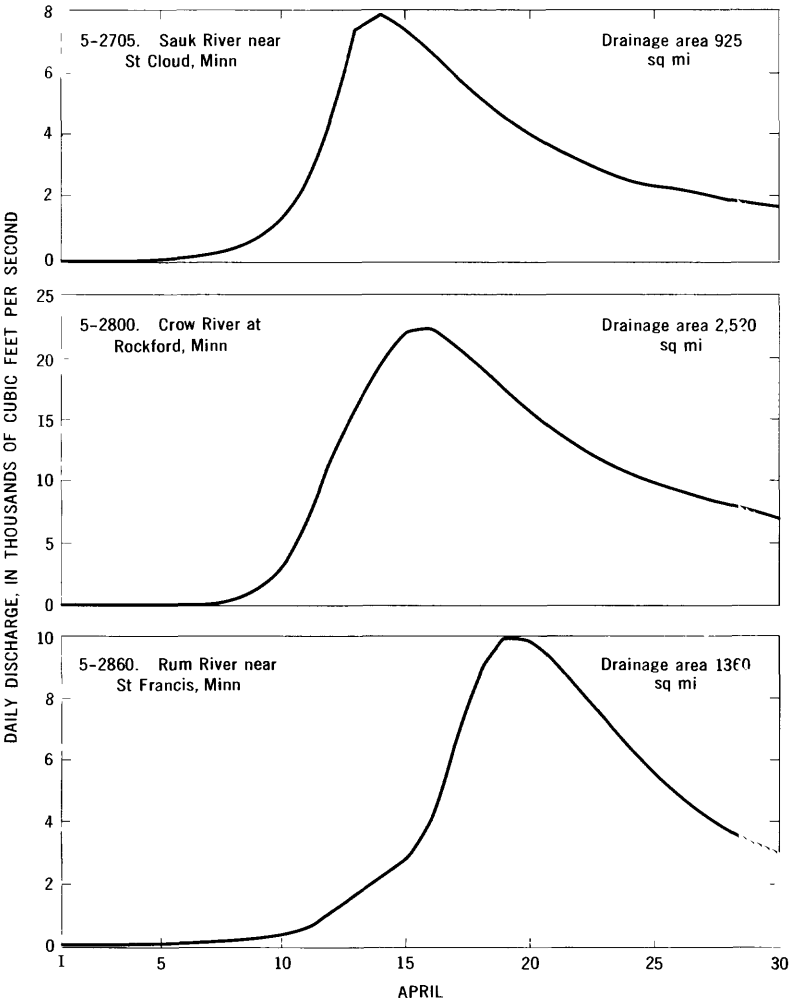

FIGURE 28.—Discharge hydrographs at selected gaging stations on Mississippi River tributaries upstream from St. Paul, Minn., April 1965.

CROW RIVER BASIN

Flooding in the Crow River basin was very heavy as the result of the melting of a very dense snow cover. On April 1, the water equivalent of the snow in the basin ranged from 6 to 8 inches. Two to three inches of precipitation, most of which was rain, fell in the basin during the period April 1–12 and intensified the flood condition.

Flooding was heavy at the South Fork from Cosmos, Minn., to the confluence with the North Fork and throughout the entire reach of the main stem. At the discontinued gaging station on the North Fork

near Regal, Minn., the stage and discharge were about the same as those in the 1951 and 1952 floods. The discharge was 1.39 times a 50-year flood. Flood-crest profiles of the North and South Forks of the Crow River are shown in figure 29, and flood-crest elevations are tabulated in table 2.

At Hutchinson, Minn., the South Fork crested on April 11 about 4 feet above flood stage, exceeding by 1.3 feet the previous record set by the 1952 flood. To prevent extensive flooding of the town, flood workers constructed emergency sandbag dikes which they connected to each abutment of a small recreation dam located upstream from State Highway 15 bridge. These sandbag dikes extended upstream about 800 feet along each riverbank and prevented flow around the dam. By preventing this flow, the dikes kept much of the business district from being flooded. The Great Northern Railway crossing, about 1 mile downstream from the dam, was breached to prevent backwater from raising the stages of the river in Hutchinson. In spite of these measures, three highway and two railway bridges were severely damaged. Also, about 50 homes and 22 businesses between the dam and the railway

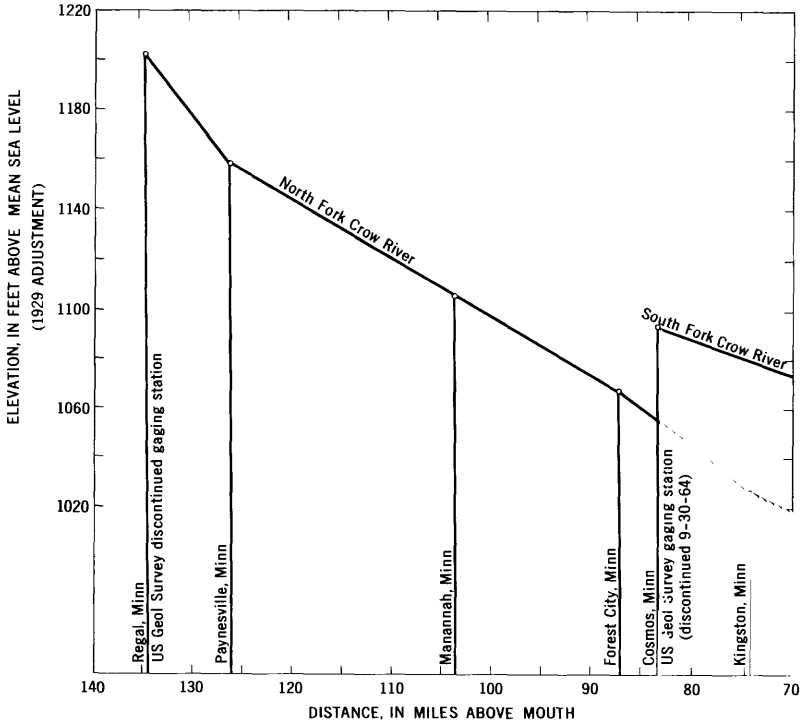

FIGURE 29.—See explanation on next page.

crossing sustained flood damages; the residents of these homes were evacuated. The continuous force of the floodwaters finally destroyed the recreational dam on April 19, as the water was receding. It was fortunate, however, that this dam remained in place during the earlier higher stages, because at the time of the dam's destruction, flood levels were too low to cause much damage. The dam provided the means for computing the maximum discharge by indirect methods.

The crest of the South Fork occurred at Watertown, Minn., on April 13, it was about 4.5 feet above flood stage and 3.5 feet above the previous record set in 1952. Watertown was effectively protected by an emergency sandbag-and-earth dike, and only three homes outside the protected area were flooded.

The South Fork Crow River at Delano, Minn., crested on April 13, reaching a level 8.5 feet above flood stage; it was 3.0 feet higher than the 1925 flood, the previous maximum. Emergency sandbagging measures protected many residences and businesses of Delano. The first-

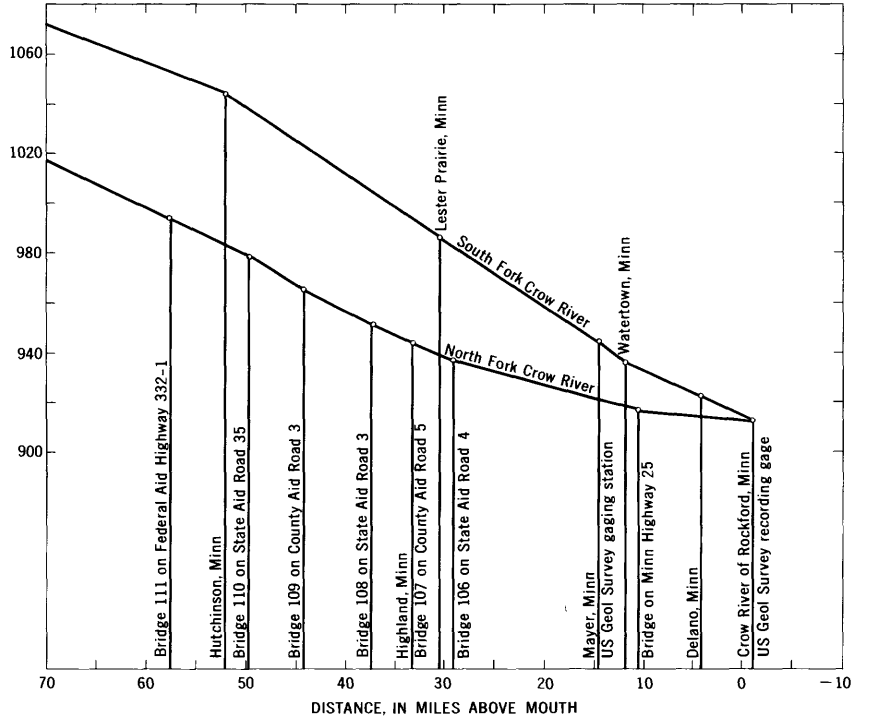

FIGURE 29.—Flood-crest profiles of the North and South Forks of Crow River. Water-surface elevations were obtained at U.S. Geological Survey gages or were selected from high-water data furnished by the U.S. Army Corps of Engineers.

TABLE 2.—*Flood-crest elevations, North Fork and South Fork Crow River*

[Based on data furnished by U.S. Army Corps of Engineers except at U.S. Geological Survey gaging stations]

	Miles above confluence	Date	Elevation in feet (datum of 1929)
North Fork Crow River			
Regal, Minn., at U.S. Geological Survey discontinued gaging station	134.5	Apr. 9	1,202.60
Paynesville, Minn., at bridge on Minnesota Highways 4 and 55	126	----------	1,157.7
Manannah, Minn., at bridge on County Road 30	103.5	----------	1,105.7
Forest City, Minn., at bridge on Minnesota Highway 24	86.8	----------	1,066.5
Kingston, Minn., at bridge on Minnesota Highway 15	74	----------	1,025.0
Bridge 111 on Federal Aid Highway 332–1	57.6	----------	994.5
Bridge 110 on State Aid Road 35	49.7	----------	978.9
Bridge 109 on County Aid Road 3	44.2	----------	965.8
Bridge 108 on State Aid Road 3	37.1	----------	951.6
Highland, Minn., at bridge 107 on County Aid Road 5	33.2	----------	944.0
Bridge 106 on State Aid Road 4	29.2	----------	936.6
Bridge 103 on Minnesota Highway 25	10.4	----------	917.1
Rockford, Minn., at U.S. Geological Survey recording gage	−1.0	Apr. 16	912.93
South Fork Crow River			
Cosmos, Minn., at U.S. Geological Survey discontinued gaging station	83.0	Apr. 11	1,092.14
Hutchinson, Minn	51.9	Apr. 11	1,044.10
Lester Prairie, Minn	30.4	----------	986.2
Mayer, Minn., at U.S. Geological Survey gaging station	14.4	Apr. 13	944.96
Watertown, Minn	11.9	Apr. 13	936.04
Delano, Minn.	4.3	Apr. 13	923.3
Rockford, Minn., at U.S. Geological Survey recording gage	−1.0	Apr. 16	912.93

floors of about 90 homes and 20 businesses were flooded as were the basements in a number of other homes and businesses. About 90 families were evacuated.

The Crow River at Rockford, Minn., crested at 19.27 feet on April 16, 9.3 feet above flood stage and about 3 feet above the previous maximum which occurred on April 13, 1952. Maximum discharge was 22,400 cfs, 1.78 times a 50-year flood. Daily discharges during April are shown in figure 28. Almost 6 inches of runoff occurred from the basin upstream from Rockford during the months of April and May. The runoff in April from the basin was 4.00 inches, exceeding the April precipitation of about 3.5 inches. This fact points out the substantial contribution of snowmelt runoff to the flood situation. In Rockford, there was no

community-wide project to protect the town against flood damage, but local residents endeavored to protect individual homes and businesses. About 45 families were evacuated. First floors were flooded in 35 homes and 15 businesses, and basements flooded in an additional 10 homes and five businesses.

At Hanover, Minn., ice floes destroyed a new timber bridge on County Highway 19. Other bridges, roads, and urban property in the lower part of the basin were damaged. Extensive inundation of agricultural lands damaged crops, and the floodwaters destroyed fences.

The total damage in the basin was estimated at $2.9 million by the Corps of Engineers; a major share represents costs for flood-fighting activities in the river communities.

RUM RIVER BASIN

Flooding in the Rum River basin was caused principally by the melting of heavy snow cover augmented by more than an inch of rain which fell during the first part of April. At the end of March, water equivalent of snow in the basin ranged from 6 to 9 inches (fig. 5). The heaviest snow cover was in the upstream or north end of the basin. Daily discharges at the gaging station near St. Francis are shown in figure 28. The maximum discharge of 10,100 cfs was 1.11 times a 50-year flood and was the maximum of record during a continuous period since 1929. Mille Lacs Lake, a natural reservoir in the upper part of the basin, partly regulated the floodflow.

The floods inundated agricultural lands, roads, and bridges in the reach between Princeton and Isanti. Residences in the community of Isanti were also damaged by floodwaters. Total damage in the basin was estimated at $200,000 by the Corps of Engineers.

MINNESOTA RIVER BASIN

The upper part of the Minnesota River basin is formed by the Little Minnesota River, which originates on the eastern slope of the Dakota foothills (Coteau des Prairies) in South Dakota about 30 miles west of Lake Traverse. The Little Minnesota River flows into the upper end of Big Stone Lake on the South Dakota–Minnesota border. Big Stone Lake, which is only about a mile and a half in width, extends southeastward for 26 miles. Although the extreme upper end of the Minnesota River basin is in South Dakota, modern maps indicate that the source of the Minnesota River is at the lower end of Big Stone Lake. The river flows southeastward through Minnesota for 225 miles to Mankato where it turns abruptly to the northeast and flows another 106 miles to its mouth near Fort Snelling, Minn. on the southern outskirts of the Twin Cities.

During the glacial epoch, the River Warren, which flowed in the present Minnesota River valley, drained glacial Lake Agassiz, a vast body of water in the Northwestern part of the State. As a consequence of the great volume of this early drainage, the Minnesota River flows through wide flood plains, which intensify flood problems in the basin. At the downstream gaging station near Carver, Minn., measurements of flood discharge were made by boat across a valley 2 miles wide. In other locations the valley is as much as 3 miles wide, but throughout much of its reach it is from 1 to 1½ miles in width. The Minnesota River itself has little slope, but its tributaries are comparatively steep; their steepness compounds the flood problem.

The flood in the upper part of the Minnesota River Basin was not severe. In fact, the Little Minnesota River had its annual peak in June, after the flood period. The recurrence intervals of maximum discharges in tributaries upstream from the Lac qui Parle River varied from 4 to 11 years. Peak discharge of the Lac qui Parle River, which joins the Minnesota River 41 miles downstream from Big Stone Lake, was 8,370 cfs, a 40-year flood, and the second highest peak discharge in 38 years of record.

The next major tributaries downstream from the Lac qui Parle River are the Chippewa River, draining an area on the north, and the Yellow Medicine and Redwood Rivers, which drain areas on the south. The recurrence interval of peak discharges in these tributaries in their lower reaches varied from 8 to 20 years. The Minnesota River is gaged at Montevideo, Minn. just downstream from the mouth of the Chippewa River. Flood discharge at this location was 12,900 cfs, a 13-year flood. Records have been collected at this site for 56 years. The 1965 flood was exceeded only by the thunderstorm flood of June 1919 and the snowmelt flood of April 1952. The discharge of the 1952 flood, however, was almost twice that of the 1965 flood.

The discharge of the Minnesota River and its tributaries from New Ulm Minn., to the mouth 145 miles downstream, exceeded all previously known peak discharges. The runoff from the area south of New Ulm and Mankato, Minn., was particularly intense. The April runoff from the Blue Earth and Le Sueur River basins was 6.08 inches and 6.66 inches, respectively, which was greater than that from any other large gaged area in Minnesota with the exception of the Cannon River basin.

Severe urban and agricultural damages occurred in the Minnesota River basin downstream from New Ulm. Because of the wide river valley, a great deal of rich agricultural land was flooded. Flandrau Dam on the Cottonwood River and Rapidan Dam on the Blue Earth River were damaged. The greatest damage by far, however, was to

communities along the Minnesota River at Mankato and downstream.

Le Hillier, on the outskirts of Mankato, suffered heavy damages when a temporary levee was overtopped and all the community's business establishments and 125 residences were flooded by the Blue Earth River. Floodwaters in Le Hillier were as much as 12 feet deep. Another levee protecting Mankato failed, and a large business area and about 225 residences were flooded by the Minnesota River (figs. 30 and 31). A strenuous effort was carried on in North Mankato to protect that community from the floodwaters. This effort was largely successful, but its cost over $250,000 and about 5,000 persons were evacuated because of the flood danger. Total damages, including the flood-fighting effort in Mankato and its environs, Le Hillier and North Mankato, were about $7 million and more than 8,000 persons were evacuated.

The large flow contributed by the Blue Earth and Cottonwood Rivers to the Minnesota River did much to increase the flooding at Mankato. The mouth of the Cottonwood River is only 33 miles upstream from the Blue Earth River, which joins the Minnesota River at the southwest edge of Mankato. The major tributaries of the Blue Earth River are the Watonwan and Le Sueur Rivers and major tributaries of the Le Sueur River are the Cobb and Maple Rivers. All these rivers drained areas where the runoff was exceptionally high.

Records from gaging stations on the Minnesota River at Mankato and on tributaries in the vicinity of Mankato gave evidence of the great volume of runoff. The Cottonwood River near New Ulm crested on April 8 at 26,000 cfs, almost twice the previous maximum during the 38 years records have been collected. Discharge of the Blue Earth River was over 1½ times the previous maximum in 23 years of record, and discharge of the Le Sueur River was greater than the maximum in 22 years of record. The maximum discharge of the Minnesota River at Mankato, 94,100 cfs, was greater than the previously known maximum, 90,000 cfs, which occurred in 1881. The maximum stage in 1881, however, was about 0.8 foot higher. The recurrence intervals of the flood discharges of the Minnesota River at Mankato and its tributaries in the vicinity varied from 1.20 to 3.30 times the 50-year flood.

In communities downstream from Mankato, flood damage was also heavy. Residential areas and city streets were damaged in St. Peter, Minn., not from Minnesota River floodwaters, but from a small drainage basin which released its runoff through the town. Damages were about $500,000. In the small town of Henderson (population 765), about 400 persons were forced to exacuate their homes. Water was 6–8 feet deep in some areas and half the town was under water (figs. 32 and 33). Total damages exceeded $600,000.

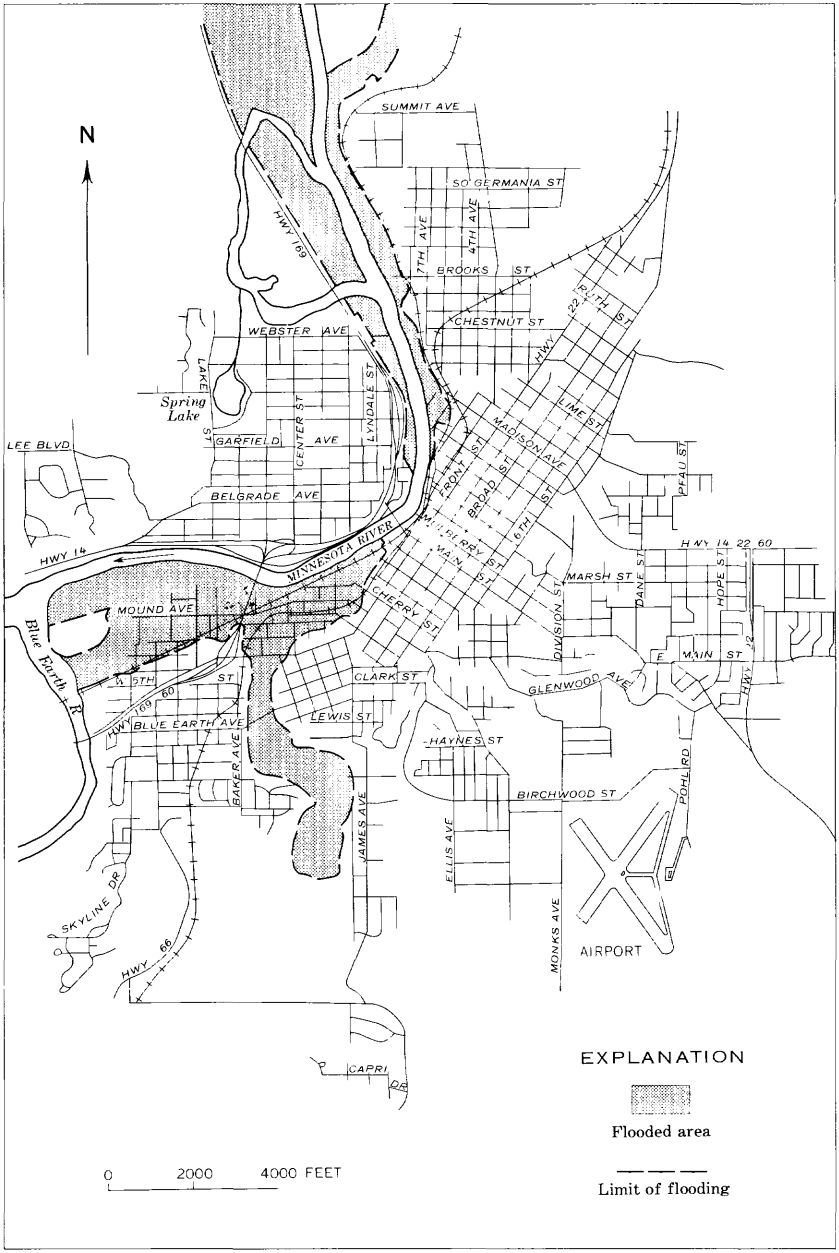

FIGURE 30.—Flooded area in Mankato, Minn.

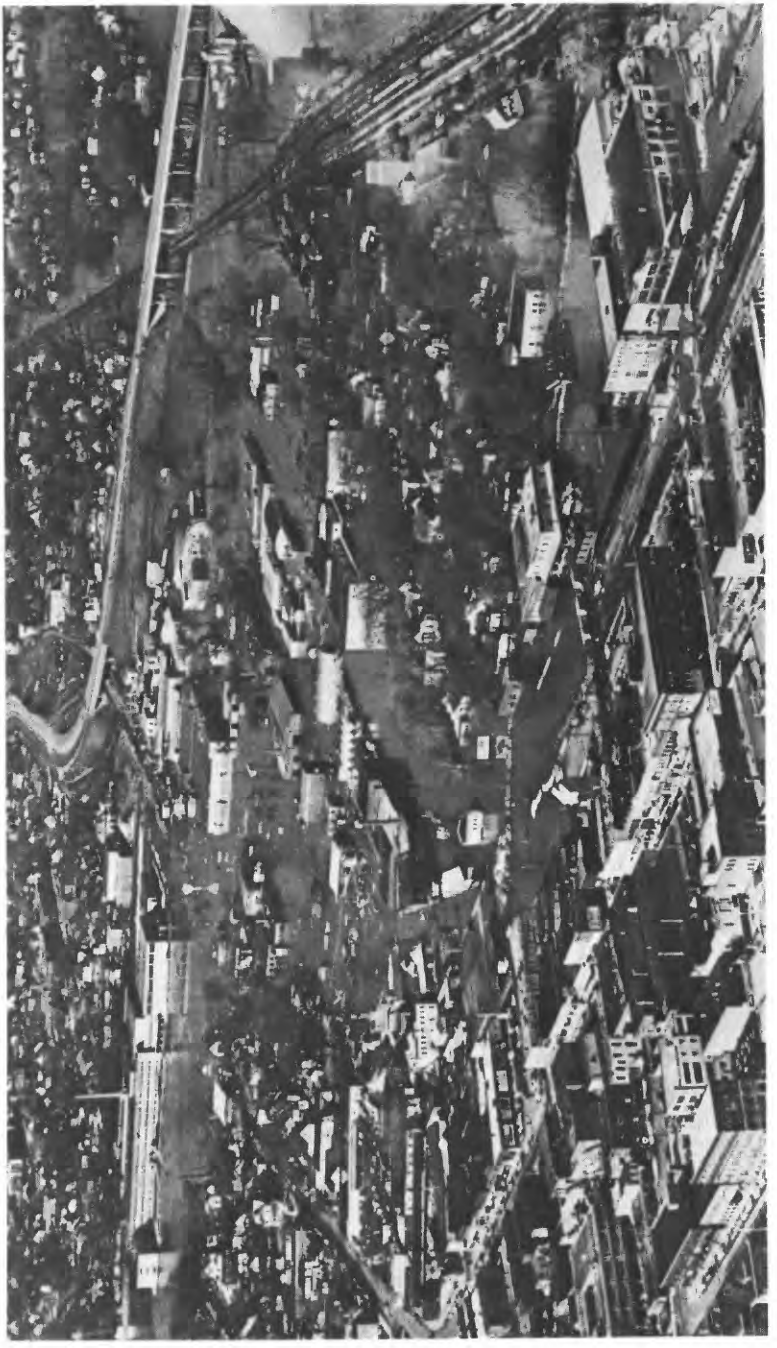

FIGURE 31.—A large business area and 225 residences were flooded by the Minnesota River in Mankato, Minn. Photograph by Minneapolis Star and Tribune, Minneapolis, Minn.

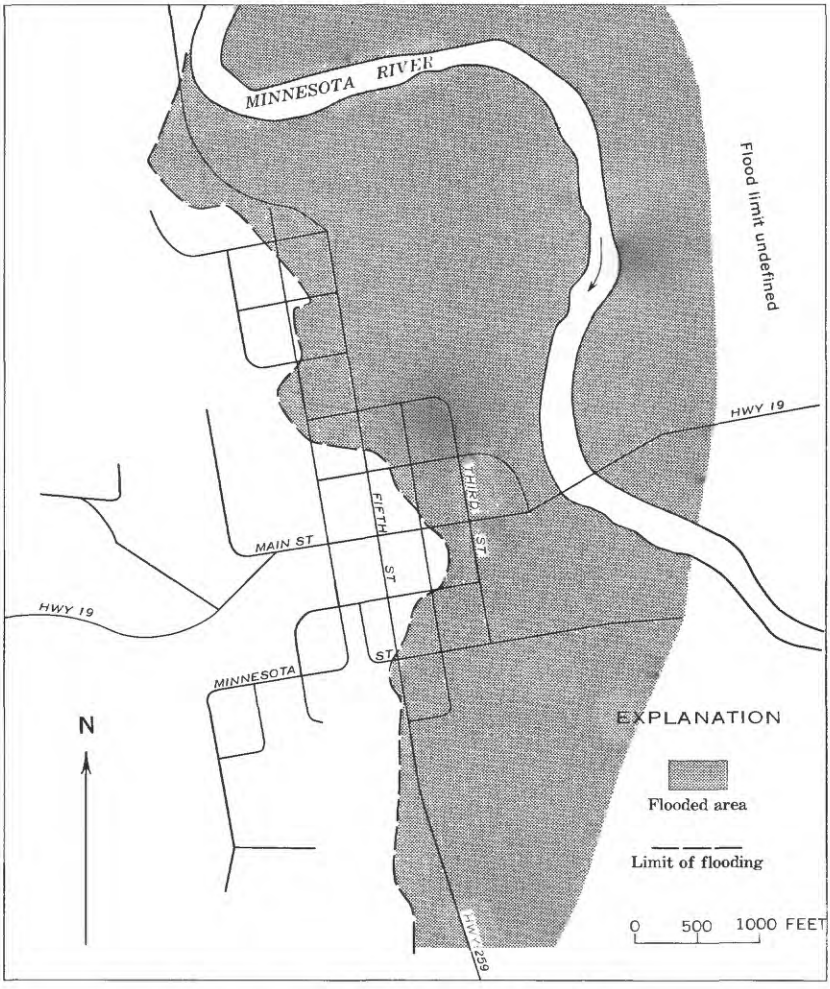

FIGURE 32.—Flooded area in Henderson, Minn.

At Carver, Minn., the Minnesota River crested 16 feet over flood stage and damaged a large part of the town's business district and residential area (figs. 34 and 35). About 60 families were forced to leave their homes. The gaging station on the Minnesota River, 3 miles upstream from Carver, was inundated, and the concrete structure was severely damaged when struck by trees and debris which were carried downstream by the current. The maximum stage at this site, determined from floodmark, was 34.37 feet, more than 6 feet higher than the maximum previous stage of record which occurred in 1952. The maximum discharge, 117,000 cfs, was 1.83 times that of a 50-year flood.

FIGURE 33.—About 400 persons were forced to evacuate their homes in Henderson, Minn. Photograph by Minneapolis Star and Tribune, Minneapolis, Minn.

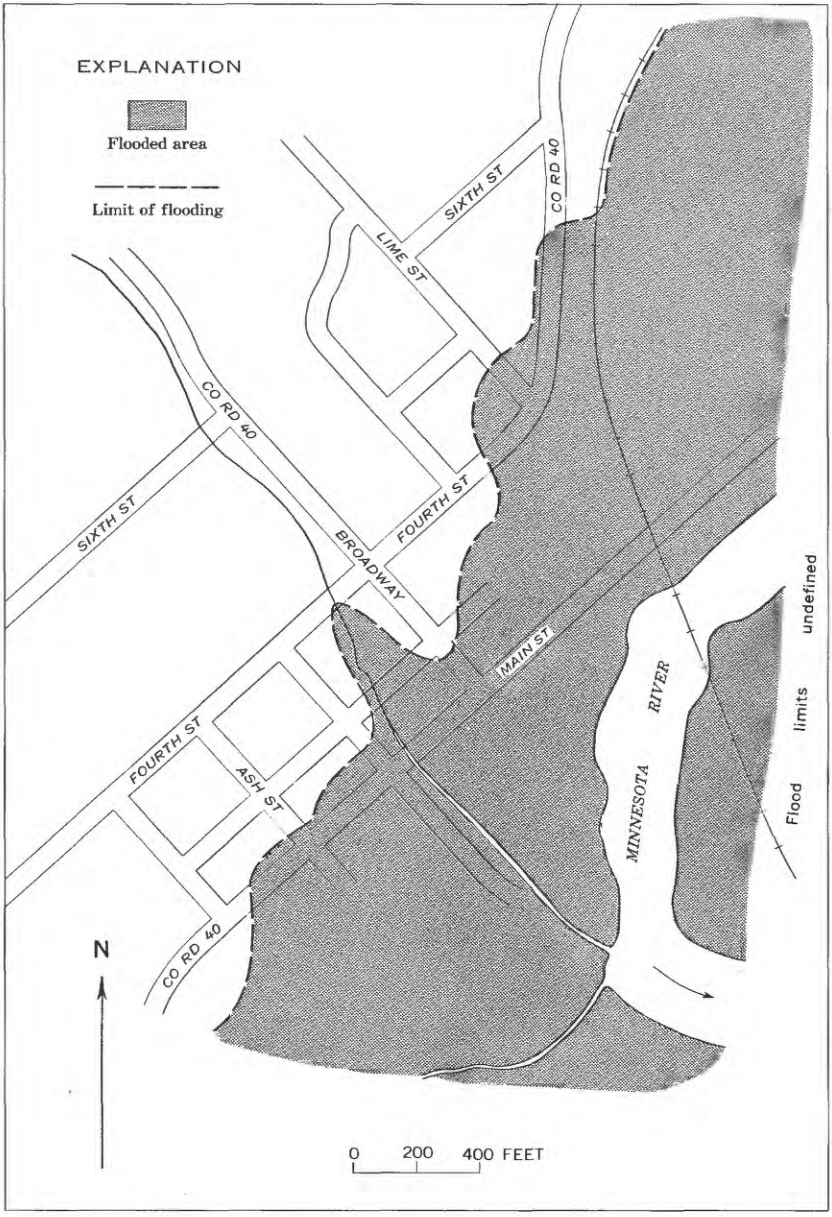

FIGURE 34.—Flooded area in Carver, Minn.

FIGURE 35.—The Minnesota River crested 16 feet above flood stage at Carver, Minn., and damaged a large part of the town's business district and residential area. Photograph by Minneapolis Star and Tribune, Minneapolis, Minn.

About 500 persons in Chaska, Minn., were forced to leave their homes when the floodwaters overtopped a 1,600-foot-long dike constructed by local residents (figs. 36 and 37). The new Carver County Courthouse and sewage disposal plant were protected, however, by emergency sandbag dikes.

Several oil and grain terminals at Savage, Minn., suffered severe damage from the recordbreaking floods, which exceeded the 1952 stages by almost 5 feet. The residential part of the community and a 14-million-bushel grain elevator complex were protected by emergency sandbag dikes.

There was a great deal of damage to highways and railways in the Minnesota River valley. For several days during the flood, only one highway, U.S. Highway 169 at Le Sueur, was open across the Minnesota River in the area from the mouth to Mankota, 106 miles upstream. Of the three bridges crossing the Minnesota River in the Twin City area, only Mendota Bridge at the mouth was open. It was choked by commuter traffic for hours each day. Water was about 12 feet deep on Cedar Avenue near Cedar Avenue Bridge, and Interstate Highway 35 W was inundated by about 2 feet of water south of the bridge. Railroads suffered losses to track, roadbed, and bridges as well as operational losses from interruption of service.

Total damages in the Minnesota River basin, including the cost of flood fighting, were estimated by the Corps of Engineers to be over $38 million.

A profile of 1965 flood elevations for the Minnesota River is shown in figure 38, and tabulated elevations are given in table 3. Discharge hydrographs for Le Sueur, Blue Earth, and Minnesota Rivers are shown in figure 39.

TABLE 3.—*Flood-crest elevations, Minnesota River*

[Based on data furnished by U.S. Army Corps of Engineers except as noted]

Location	Miles above mouth	Date	Elevation in feet (datum of 1929)
Profile point on left bank 100 ft northeast of bridge at Wegdahl, Minn.	263. 6	----------	920. 83
Granite Falls, Minn.:			
Gage on left bank at crest of city waterworks dam.	253. 0	----------	905. 04
Right bank 30 ft upstream from U.S. Highway 212.	252. 2	----------	889. 88
Gage at right upstream corner of Northern States Power Co. Minnesota Valley Steam Plant.	250. 3	Apr. 15---	888. 6
Highwater mark on left bank in pool at NSP Minnesota Falls Hydro Plant.	249. 5	----------	887. 45
Highwater mark at Pete's Point Resort downstream from NSP Minnesota Falls Hydro Plant.	249. 0	----------	880. 00
In NW¼ sec. 34, T. 115 N., R. 38 W., near bridge on road from Sacred Heart, Minn., to Minnesota State Highway 67 at Eugene Eber farmhouse.	238. 3	----------	871. 86
At bridge on Redwood County Highway 7, 6 miles north of Belview, Minn.	228. 5	----------	863. 76
At bridge on Redwood County Highway 6, 4 miles north of Delhi, Minn.	223. 7	----------	855. 78
At downstream side of bridge on Redwood County Highway 17, 2¼ miles northwest of Delhi, Minn.	219. 6	----------	849. 87
At bridge on Redwood County Highway 21, 0.8 mile northwest of North Redwood, Minn.	212. 2	----------	840. 7
At bridge on U.S. Highway 19 near Morton, Minn.	202. 9	----------	831. 20
At bridge on Redwood County Highway 11, 1 mile south of Franklin, Minn.	192. 4	----------	823. 43
At right downstream side of bridge on Minnesota State Highway 4.	175. 5	----------	814. 14
New Ulm, Minn.:			
Downstream left abutment of bridge on U.S. Highway 14.	146. 8	Apr. 9 or 10.	806. 26
Right bank, 250 ft west of Courtland bridge in southeast New Ulm.	143. 8	Apr. 9 or 10.	805. 05
Right bank on line between sec. 11 and 12, T. 109 N., R. 30 W., near New Ulm, Minn., 1 mile north of Minnesota State Highway 68.	138. 4	----------	801. 48

TABLE 3.—*Flood-crest elevations, Minnesota River*—Continued

[Based on data furnished by U.S. Army Corps of Engineers except as noted]

Location	Miles above mouth	Date	Elevation in feet (datum of 1929)
Courtland, Minn., 50 ft east of center line of road which leads to Minnesota State Highway 68.	134. 3	----------	797. 14
Cambria, Minn., on right bank at farthest downstream house on street closest to river.	130. 6	----------	793. 98
Judson, Minn., on west side of land leading to bridge near school.	120. 3	----------	787. 6
Mankato, Minn.:			
Right bank Blue Earth River at southwest cor. of Sibley Park.	108. 2	Apr. 10---	781. 66
U.S. Geological Survey recording gage at left downstream side of Main Street bridge.	106. 4	Apr. 10---	[1] 777. 01
Right bank, 1000 ft downstream from main building of sewage plant.	105. 3	Apr. 10---	774. 08
On left bank in NW¼ sec. 24, T. 109 N., R. 27 W., near Mankato.	99. 8	Apr. 10---	768. 1
Kasota, Minn., near downstream limits of town---	92. 5	----------	762. 01
St. Peter, Minn.:			
Gage on powerhouse----------	90. 1	----------	758. 27
Terminal power pole for new St. Peter sewage plant.	89. 2	----------	756. 4
On left bank 3 miles downstream from St. Peter, at NW cor. sec. 4, T. 110 N., R. 26 W.	85. 2	----------	754. 0
On right bank, 1.2 miles upstream from Le Sueur, Minn., along railroad from Le Sueur Post Office Bldg., at same location as USC and GS BM D–3.	76. 9	----------	748. 3
At left downstream corner of bridge on U.S. Highway 169 north of Le Sueur, Minn.	72. 2	----------	743. 67
Henderson, Minn.:			
Right bank, 115 ft upstream and 40 ft riverward from C&NW Ry overpass on Minnesota State Highway 19.	67. 1	----------	740. 23
Downstream side of above bridge----------	67. 1	----------	739. 63

See footnote at end of table.

TABLE 3.—*Flood-crest elevations, Minnesota River*—Continued

[Based on data furnished by U.S. Army Corps of Engineers except as noted]

Location	Miles above mouth	Date	Elevation in feet (datum of 1929)
On right bank at C&NW Ry bridge 269, in NW¼ sec. 31, T. 113 N., R. 25 W.	62.8	----------	739.18
On right bank at C&NW Ry bridge 264, near east line sec. 24, T. 113 N., R. 26 W	60.7	----------	738.84
Blakeley, Minn., on right bank, 63 ft west of railroad and 60 ft south of road to bridge.	56.4	----------	734.95
Belle Plaine, Minn.:			
Upstream side of bridge on Minnesota State Highway 25.	48.9	Apr. 11	730.84
Downstream side of above bridge	48.9	----------	730.15
On right bank on Richard Klehr farm near Belle Plaine, Minn., in SE¼ sec. 21, T. 114 N., R. 24 W.	44.3	----------	728.63
On right upstream bank at Corps of Engineers gage site near Jordan, Minn.	39.4	----------	725.06
U.S. Geological Survey recording gage near Carver, Minn.	36.0	Apr. 12	[1] 724.37
Carver, Minn., at County Road 40 opposite railroad water tank.	31.9	Apr. 12	723.46
Chaska, Minn., at Corps of Engineers gage	29.6	Apr. 13	722.25
Shakopee, Minn., on right bank, 100 ft upstream from bridge on U.S. Highway 169.	25.2	----------	721.27
Savage, Minn., on left bank, downstream from combination highway and railroad bridge.	14.3	----------	719.15
Bloomington, Minn., at bridge on Interstate Highway 35W.	11.0	Apr. 15	[1] 718.20
Cedar Ave. at Nicols railroad siding, Dakota County.	7.4	----------	717.42
Mendota, Minn.:			
Downstream landward corner of C&NW Ry bridge.	1.0	----------	716.71
Mouth of Minnesota River	0.0	Apr. 16	716.40

[1] From U.S. Geological Survey.

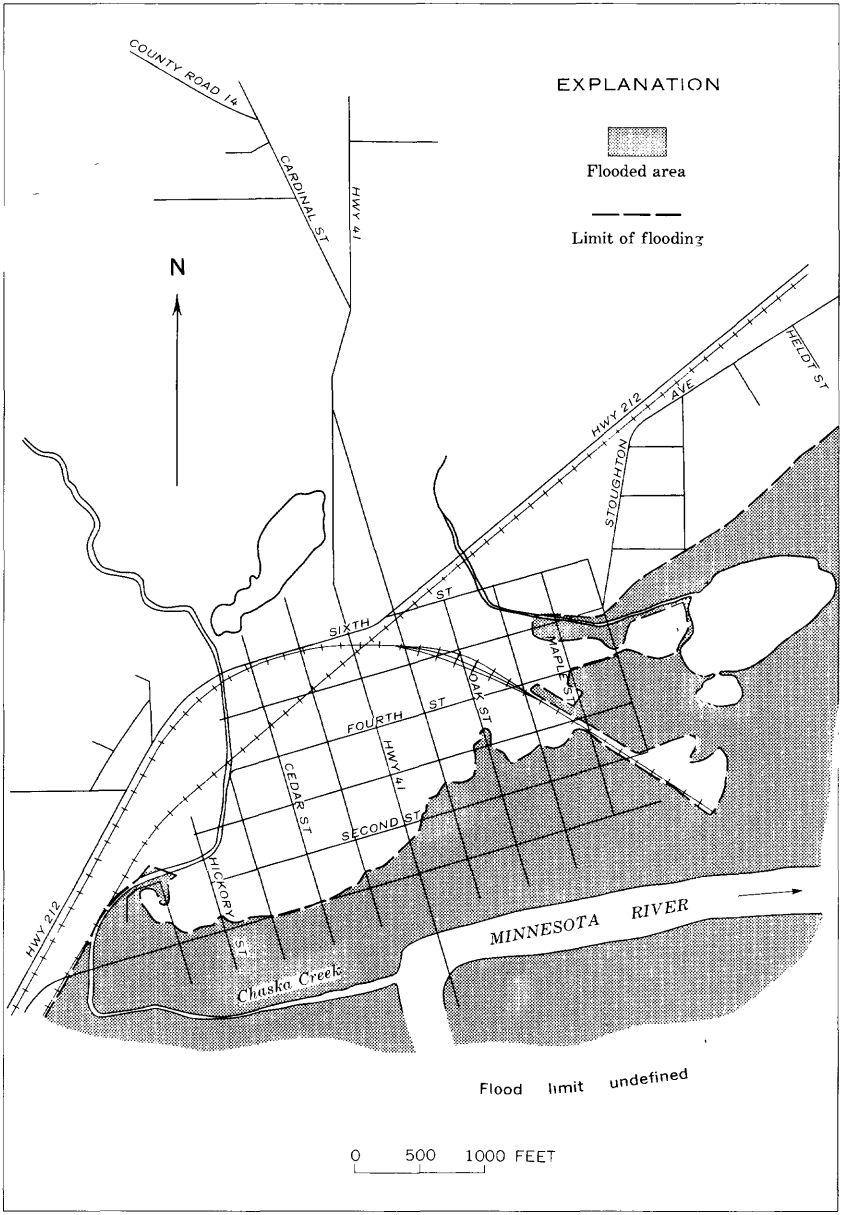

FIGURE 36.—Flooded area in Chaska, Minn.

FIGURE 37.—Floodwaters at Chaska, Minn., overtopped a 1,600-foot dike. Photograph by Minneapolis Star and Tribune, Minneapolis, Minn.

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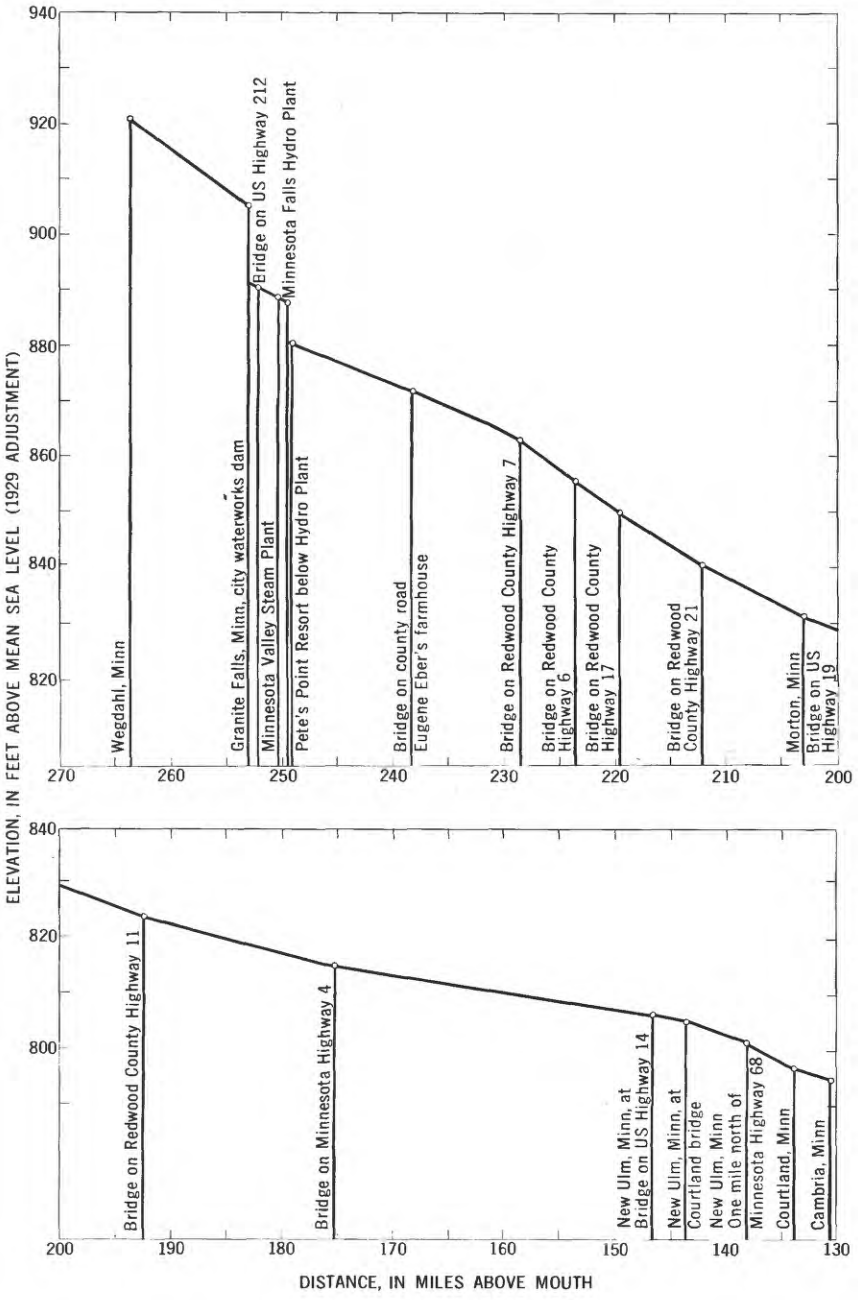

FIGURE 38.—See explanation on next page.

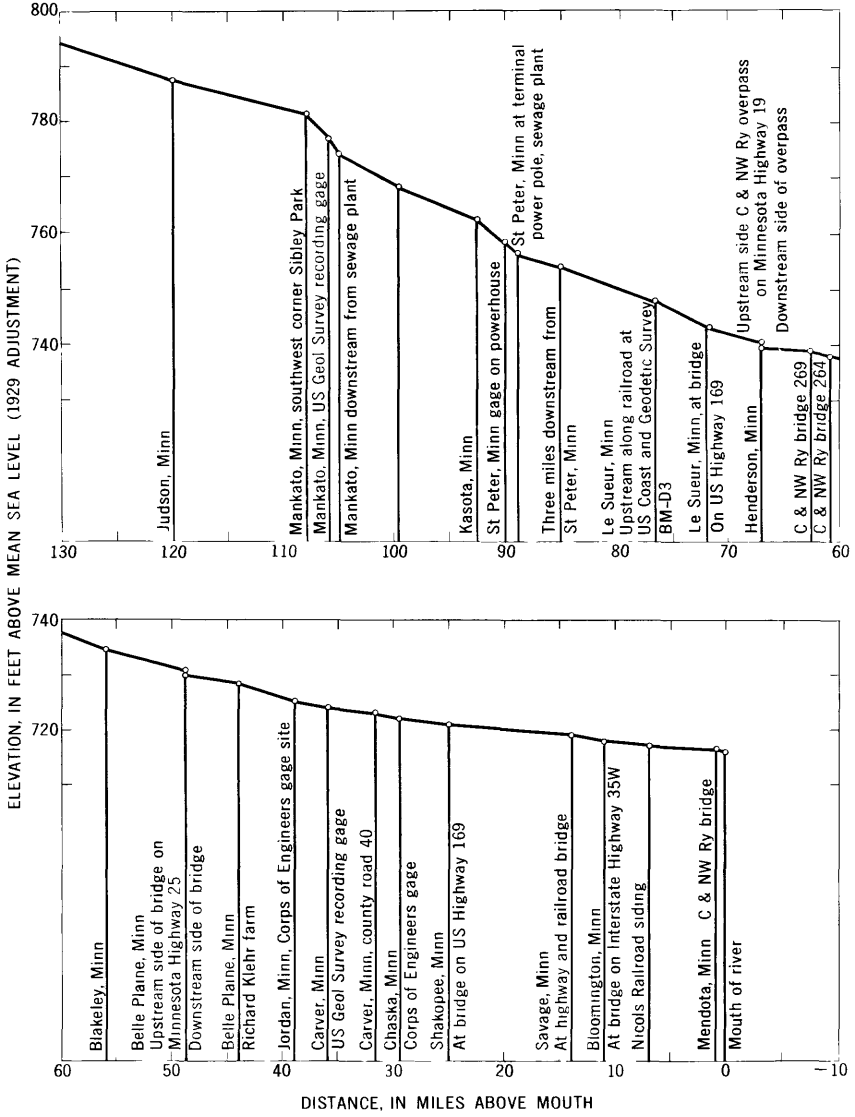

FIGURE 38.—Flood-crest profiles of Minnesota River water-surface elevations were obtained at U.S. Geological Survey gages or were selected from high-water data furnished by the U.S. Army Corps of Engineers.

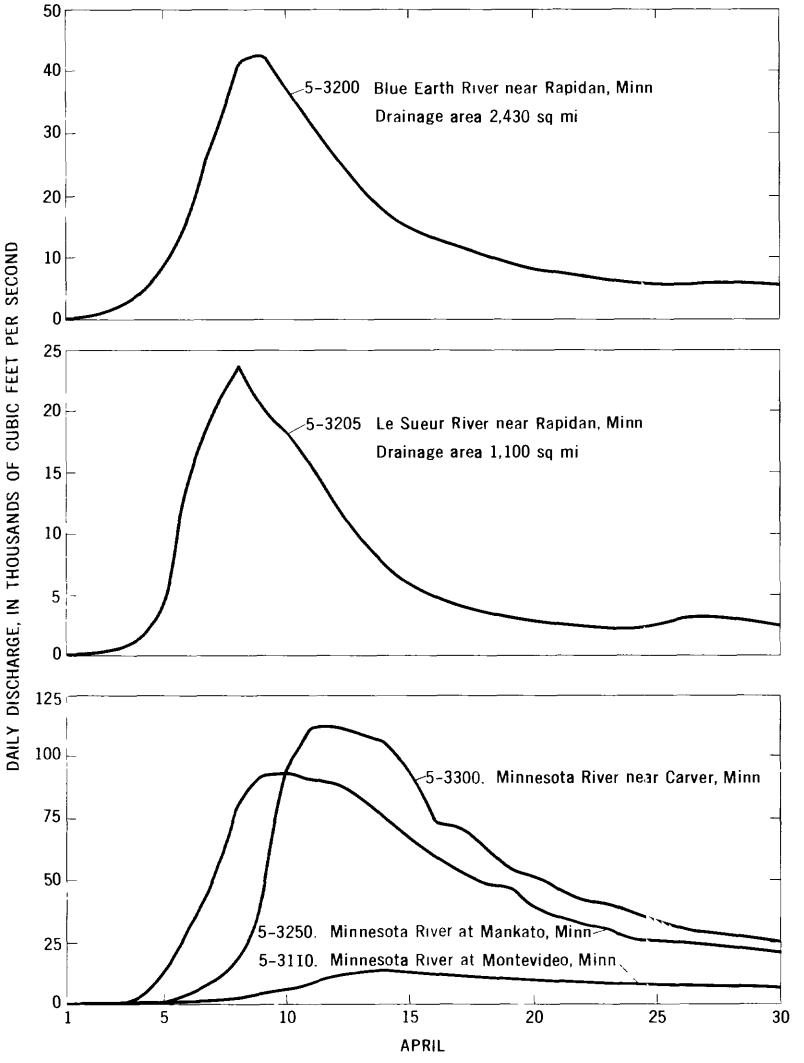

FIGURE 39.—Discharge hydrographs at selected gaging stations in the Minnesota River basin.

ST. CROIX RIVER BASIN

Most of the winter precipitation was still on the ground in the St. Croix River basin at the end of March (figs. 4 and 5) in the form of 20–30 inches of wet snow and ice (water equivalent, 5–7 inches; 2–4 inches above normal). Snow on April 1 and rain on April 6 and 7 contributed approximately another inch of precipitation. An average of almost half an inch of rain fell April 10, followed by a lighter rain April 15. Snow on the ground gradually melted from early April to the middle of the month. Runoff over the deeply frozen ground was rapid.

Small streams began rising by April 6, and the St. Croix River main stem, by April 10. Because the cool nights caused a diurnal pattern of snowmelt, the runoff from the small basins extended over a long period of time; thus, the weather prevented extremely high instantaneous peaks, but the discharge on the main stem increased rapidly for a week to 10 days after April 10. Peak discharges between Danbury and St. Croix Falls, Wis., occurred at approximately the same time, but they increased in magnitude in a downstream direction. Recurrence intervals were 5 years, 16 years and 25 years, respectively, for the peaks near Danbury on April 19, near Grantsburg on April 18, and at St. Croix Falls on April 18. The 1965 maximum discharges of 6,460 cfs near Danbury and 45,700 cfs at St. Croix Falls were the highest at these stations since the 1950 maxima of 10,200 cfs and 54,900 cfs, respectively. The river remained high at St. Croix Falls for a long period. Daily discharge exceeded 40,000 cfs for 1 week (April 16–22) and exceeded 25,000 cfs for 2 weeks (April 14–27) as shown in figure 40. From Stillwater, Minn., to the mouth, stages were about 4½ feet higher than any previously recorded. Because the high stage of the Mississippi River prevented the movement of ice near the mouth, large ice rafts were created there.

In the small basins, many culverts and small bridges were damaged, and roadways and shoulders suffered wash damage. Heavy ice damaged farm fences and outbuildings. In the large basins, many parks, recreation areas, sewage disposal plants, and summer homes were inundated or damaged. Records for the gaging station on the Apple River in the southern part of the basin showed that the peak daily discharge was the highest in 65 years. Two small dams on the Apple River were washed out, as were several bridges. Water damaged generators at one small power plant. On the lower St. Croix River, a hugh ice pack threatened the Minnesota-Wisconsin interstate bridge. The greatest damage in the St. Croix River basin was along St. Croix Lake at Hudson and Prescott, Wis., and at Stillwater, Bayport, Lakeland, St. Croix Beach, St. Mary's Point, and Afton, Minn. Damage

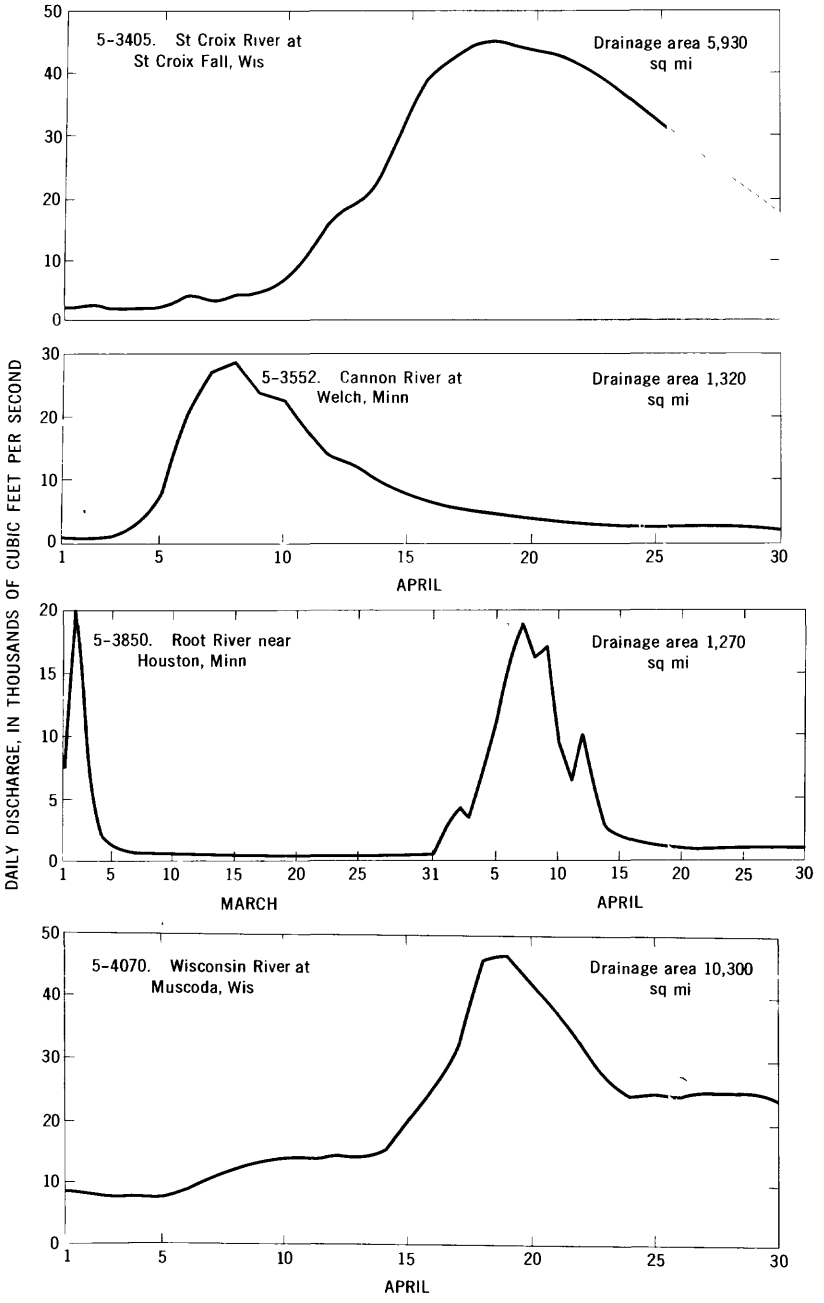

FIGURE 40.—Discharge hydrographs at selected gaging stations on the Mississippi River tributaries in Wisconsin and southeastern Minnesota.

also occurred to homes, cottages, resorts, and boat marinas along the St. Croix River upstream from Stillwater.

The total damage in the St. Croix basin was over $5 million, about half of which occurred in Stillwater. Temporary levees at Stillwater, Bayport, and Hudson prevented additional damages which might have amounted to several million dollars.

The flood damaged about 200 homes and caused the closing of two major highways across the St. Croix River. Rail travel was affected, but the Chicago and North Western Railway bridge at Hudson, Wis., remained open and provided a crossing for trains of four railroad companies operating between the Twin Cities and Chicago. About $500,000 damage occurred to railroads, highways, and railroad and highway bridges.

MISSISSIPPI RIVER TRIBUTARY BASINS IN SOUTHEASTERN MINNESOTA

The Vermillion River is an ungaged stream which flows into the Mississippi River at Hastings, Minn. Floodwaters from this river caught many residents by surprise during the night of April 5–6 when the normally placid stream overflowed its banks and inundated much of the Westwood Addition, a new housing area which had been built since the 1952 flood (figs. 41 and 42). Overflow from the Vermillion River backed up behind County Highway 47 and increased the flood threat to residents in the southwestern part of Hastings. To alleviate this situation, county highway crews breached a 30-foot section of highway so that the impounded water could return to the channel. About 280 families were evacuated, many of whom were previously unaware that their homes were subject to flood inundation. About 42 city blocks were flooded, and water was as much as 5 feet deep in some of the streets. Total damages from the Vermillion River flood were more than $725,000. The Mississippi River crest arrived at Hastings almost 2 weeks later on April 18, but damages from the main stem, about $50,000, were minor when compared with those resulting from the flooding Vermillion River.

Runoff from the Cannon River basin was exceptionally heavy. During April, it amounted to 6.96 inches in the basin upstream from Welch, Minn. This was the maximum computed from data collected at any of the more than 100 gaging stations in Minnesota, although it probably was exceeded in some small basins where continuous records of discharge were not maintained. The maximum discharge of 36,100 cfs at the Welch gaging station on April 8 was more than twice that of the 1952 flood and 1.54 times the discharge of a 50-year flood.

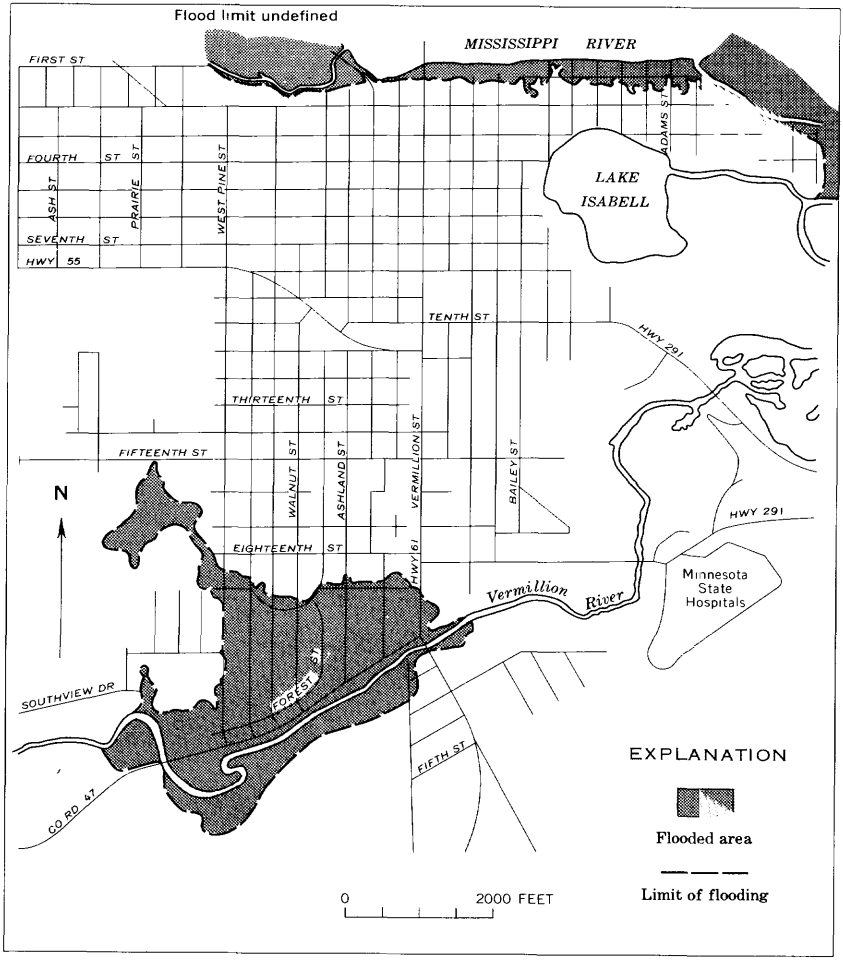

FIGURE 41.—Flooded area in Hastings, Minn.

FIGURE 42.—The Vermillion River overflowed much of the Westwood Addition in Hastings, Minn. Photograph by Minneapolis Star and Tribune, Minneapolis, Minn.

The flood hydrograph of daily discharges is shown in figure 40. Urban damage in the basin was about $182,000, and agricultural damage was $97,000. Greatest urban damage occurred in the towns of Faribault, Northfield, and Cannon Falls, Minn.

Most streams in Minnesota crested in April, but a few streams in the southeastern part of State crested in early March (table 4). The Zumbro River, which flows into the Mississippi River downstream from Lake Pepin and lock and dam 4, is the northernmost of these streams. On the South Fork Zumbro River near Rochester, Minn., the 1965 maximum stage of 19.12 feet, 7 feet over flood stage, was 0.66 foot higher than the March 1962 peak and more than 1½ feet higher than any other peak which has occurred since 1908. At the downstream gaging station at Zumbro Falls, Minn. the maximum discharge on March 2 was 29,600 cfs, a 29-year flood.

Another peak occurred on April 7, but the April flooding was not as severe because the winter snow cover had already melted and run off during the March flood. Urban damages in the Zumbro River basin, most of which occurred in Rochester, were over $458,000, and agricultural damages were about $78,000. Flood-crest elevations in the Zumbro River basin are shown in profile (fig. 43) and described and tabulated (table 4).

TABLE 4.—*Flood-crest elevations, South Fork Zumbro River and Zumbro River*

[Based on data furnished by U.S. Army Corps of Engineers except at U.S. Geological Survey gaging stations]

Location	Miles above mouth	Date	Elevation in feet (datum of 1929)
Rochester, Minn.:			
U.S. Weather Bureau gage at bridge on U.S. Highways 52 and 14	80.5	Mar. 1	1,002.20
U.S. Geological Survey recording gage	75.1	Mar. 1	968.68
Rochester power dam, pool	59.0	Mar. 2	925.75
Rochester power dam, tailwater	59.0	Mar. 2	873.2
Zumbro Falls, Minn., at U.S. Geological Survey recording gage	48.5	Mar. 2	839.66
Theilman, Minn., at U.S. Geological Survey discontinued gaging station	24.5	Mar. 2	745.27
Kellogg, Minn., at bridge on U.S. Highway 61	4.5	Mar. 2	687.90
Zumbro River mouth	0	Mar. 3	664.52

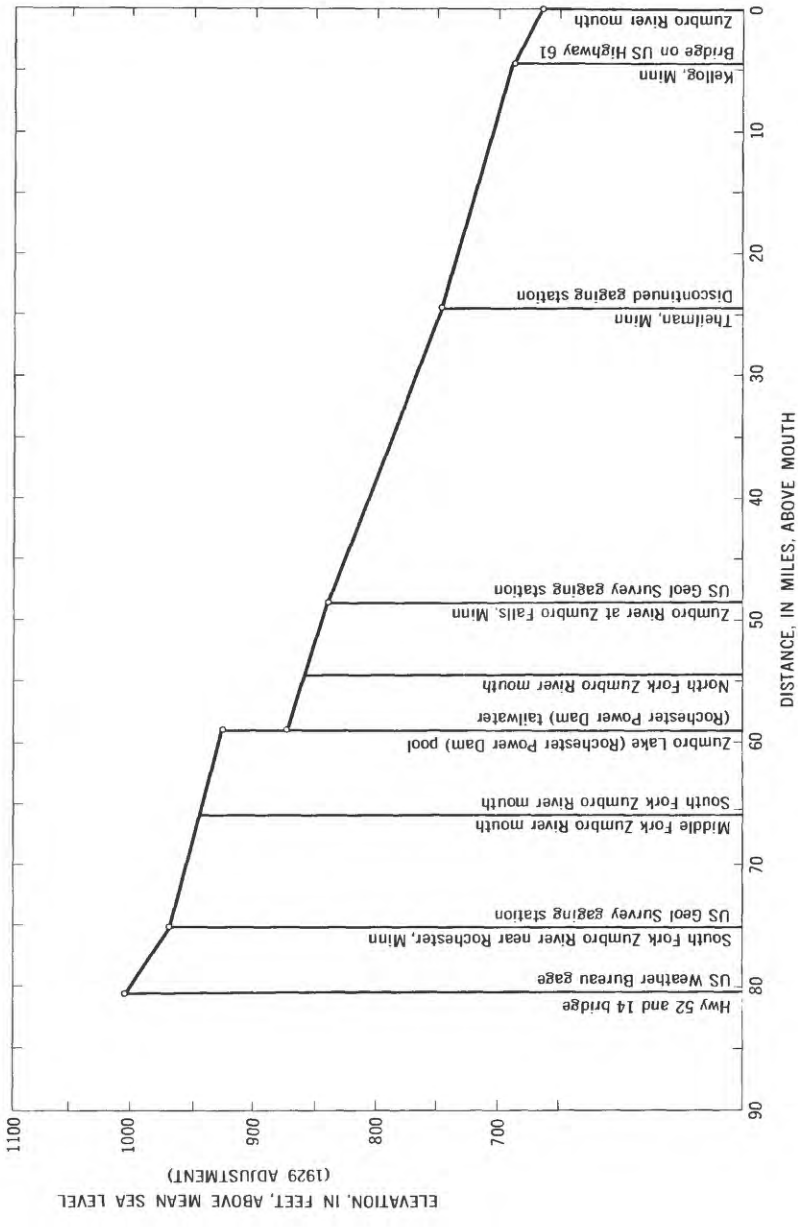

FIGURE 43.—Flood-crest profiles of South Fork Zumbro River and Zumbro River. Water-surface elevations were obtained at U.S. Geological Survey gages or were selected from high-water data furnished by the U.S. Army Corps of Engineers.

The only gaging station in the Whitewater River basin is on a relatively small drainage area on the South Fork Whitewater River near Altura, Minn. Flooding and damages in this basin were not severe. The maximum stage at the Altura gaging station, with occurred on March 1, was largely the result of rapid snowmelt runoff and ice backwater. The maximum discharge of 2,360 cfs which occurred during a later peak on April 7 was only a 2-year flood.

The Root River, which joins the Mississippi River about 3 miles downstream from La Crosse, Wis., drains an area in extreme southeastern Minnesota and also a few square miles on northeastern Iowa. The topography of the Root River basin is characteristic of southeastern Minnesota. It is rolling and undulating and contains a number of steep bluffs. The greater part of the basin is under cultivation, but the plateaus at the top of the bluff and many of the hillsides are forested. The topographic relief varies more than 650 feet within the basin, and as a consequence, runoff is more rapid than in many areas in Minnesota.

Runoff from snowmelt started in the Root River basin at the end of February, as the result of warm temperatures, and was intensified by a heavy rain which fell on March 1. This condition created very sharp ice-affected peaks in the basin on March 1 and 2 (fig. 40). Stages exceeded any previously known from Lanesboro, Minn., to the mouth. At the gaging station near Houston, Minn., the maximum stage of 18.32 feet was more than 3 feet higher than the previous maximum stage in 44 years of record, but the maximum discharge of the 1965 flood was exceeded twice during the period of record. Recurrence intervals of the maximum discharge varied from 19 years at Lanesboro to 30 years near Houston. Paradoxically, the recurrence intervals of tributary peaks on Rush Creek and South Fork Root River were only 5 years and 3 years, respectively.

The economy of the Root River basin, which depends largely upon agriculture, was not seriously affected because most of the damage was urban. Greatest damage occurred in Houston where most of the business establishments and about 255 homes were flooded. Streets and sewerlines also were damaged. In Rushford, 150 homes and 40 businesses were flooded, and in Peterson, 35 homes were flooded. Total damages in the basin exceeded $2 million to urban property and about $320,000 to agricultural property.

CHIPPEWA RIVER BASIN

The major flooding in the Chippewa River basin occurred in the lower reaches of the main stem and along the Red Cedar River, the second largest tributary, which flows into the Chippewa River 23 miles above its mouth. The most significant flooding in the upper part of the basin occurred in medium-sized subbasins. Reservoirs stored much of the northern runoff and greatly reduced the flood threat on the upper Chippewa River and its major tributary, the Flambeau River.

On April 14, the Chippewa River at Durand, Wis., near the mouth, peaked at 66,200 cfs, which is a flood of 5-year recurrence interval. The river crested and receded slowly, it remained above 50,000 cfs for about 8 days. The Red Cedar River, which flows into the Wisconsin River 9.5 miles above Durand, peaked at Menomonie, Wis., on April 12 at 28,700 cfs, which is 1.24 times a 50-year flood. The major tributary of the Red Cedar River, the Hay River, peaked near its mouth on April 11 at 10,900 cfs, a 22-year flood.

High runoff occurred later in the headwaters of the Chippewa and Flambeau Rivers. The big reservoir, Lake Chippewa, began storing water on April 5 and rose steadily until it became full in mid-May. The Flambeau Flowage filled between April 10 and May 10.

Lake Wissota on the Chippewa River, just upstream from Chippewa Falls, Wis., stored over 3,200 million cubic feet of water during the period April 10–14, or an equivalent average discharge of 7,400 cfs. The head on the powerplant service pond exceeded its normal operating elevation throughout the period of maximum discharge April 14–18. At the gaging station at Chippewa Falls, the maximum discharge, which occurred on April 16, was 44,700 cfs, a 3-year flood. Daily discharge exceeded 35,000 cfs during the period April 14–20.

Huge ice cakes damaged many business places in Durand. The floodwaters filled many basements, snapped telephone and electric power poles, and lifted propane tanks from their foundations. Most communities in the low areas along the Red Cedar River experienced minor damage from the floodwaters and floating ice cakes. The Red Cedar River passes through Tainter Lake between Colfax and Menomonie, Wis., and the Hay River joins the Red Cedar River in Tainter Lake. Here flood and ice damage to cottages and homes was extensive. Many students from Stout State University in Menomonie joined homeowners on Tainter Lake in building sandbag barricades and breaking up threatening ice rafts.

WISCONSIN RIVER BASIN

Flood severity during the period March–May 1965 varied considerably throughout the Wisconsin River basin. Early in March, little runoff occurred in the northern part of the basin, but heavy runoff from snowmelt and rainfall occurred in the southern part. Major runoff began in the upper basin about April 7, but backwater from ice jams was still in effect on some streams as late as April 14. Numerous reservoirs in the north and the Big Eau Pleine Reservoir and power reservoirs in the central part of the basin reduced peak discharges on the main stem of the Wisconsin River.

On the main stem at Merrill, Wis., the mean flow for March was less than that for February. The reservoir system registered a slight gain, which was almost entirely in the Big Eau Pleine Reservoir during the first week of March. Streamflow at Rothschild and Wisconsin Rapids was up slightly the first 2 weeks of March, but daily discharges did not exceed 4,500 cfs. The maximum daily discharge in March of the Lemonweir River was about 1,600 cfs compared with almost 3,000 cfs in April. The Lemonweir River enters the Wisconsin River below Castle Rock power dam and upstream from Wisconsin Dells. At Wisconsin Dells, daily discharges ranged from 8,000 to 10,000 cfs during the period March 4–26 as a result of increased runoff from the mid-basin tributaries and lowering of Petenwell and Castle Rock power reservoirs in anticipation of high streamflow in April. In the southern part of the basin, the March floods on the tributaries exceeded the April floods. The Baraboo River near Baraboo, Wis., peaked on March 6 at 4,500 cfs, a 7-year flood. The highest crests on the Kickapoo River, the farthest downstream major tributary of the Wisconsin River, also occurred in March, but frequency intervals were only 3–4 years.

Peak discharges in the mid-basin and upper-basin tributaries and the Wisconsin River downstream from the mouth of the Eau Claire River occurred in April. The maximum discharge of 6,980 cfs on April 12 on the Eau Claire River at Kelly, 5 miles southeast of Wausau, was the second highest in the periods of record, 1914–26, 1940–65. Recurrence intervals of the April maximums on the tributaries on the upper part of the basin ranged from 6 to more than 50 years, and those in the lower part of the basin ranged from 3 to 14 years. The highest runoff in the basin occurred on the Eau Claire and Rib Rivers, which enter the Wisconsin River just upstream from Rothschild.

At Rothschild, the Wisconsin River crested on April 12 at a discharge of 49,200 cfs, a 12-year flood. The maximum discharge known at this station was 75,000 cfs in September 1941. At Wisconsin Rapids, the next gaging station downstream, the river crested at 64,000 cfs, a 10-year flood, on April 13. Farther downstream at Wisconsin Dells, the peak discharge was 50,200 cfs, a 4-year flood, which occurred on April 15. Pentenwell and Castle Rock Reservoirs, between Wisconsin Rapids and Wisconsin Dells, stored almost 7,600 mcf (million cubic feet) in the 5 days April 11–15, which is the equivalent of an average discharge of 17,600 cfs during the 5-day period. The equivalent average discharge for the maximum 2-day rate of storage is over 25,000 cfs. The crest continued to attenuate as it moved downstream. The peak discharge at Muscoda, 44 miles upstream from the mouth, was 48,500 cfs, a 3-year flood, occurring on April 18. A hydrograph of the daily discharges at the Muscoda gaging station is shown in figure 40.

Discharges in the reach of the Wisconsin River upstream from the mouth of the Eau Claire River peaked in May after the major flood crest in the lower reach. At Merrill, the peak discharge, which occurred on May 18, was 12,300 cfs, a 2-year flood. An earlier peak of 11,300 cfs occurred on April 17. Storage in the 20 upstream reservoirs impounded about 6,700 mcf during the period April 8–25 and another 2,300 mcf during the last week of April. The Big Eau Pleine Reservoir stored an additional 3,000 mcf during the period April 4–18.

Flood damage in the Wisconsin River basin was generally on the main stem and on the tributaries joining the main stem between Wausau and Wisconsin Rapids. Ice was thick as a result of the long, cold winter, and the breakup was quite rapid. Some destruction was caused by large ice jams. Flood conditions in Schofield, Wis. (fig. 44), at the mouth of the Eau Claire River were intensified by ice backwater. The flood disrupted the operations of many paper mills. It threatened power dams and destroyed a 100-foot section of timber dam at the Mosinee Paper Mills Company. Business places and residences in the Wausau, Schofield, and Antigo areas suffered flood damage. Many highway pavements were undermined and shoulders washed out, but early warning provided time for precautionary measures which kept property damage low in the Wisconsin River basin.

FIGURE 44.—Business places and residences in Schofield, Wis., suffered flood damage from the Eau Claire River. Photograph by Wausau Daily Record-Herald, Wausau, Wis.

OTHER MISSISSIPPI RIVER TRIBUTARY BASINS IN WISCONSIN

The magnitude of floods in the smaller basins in Wisconsin, tributary to the Mississippi River, varied considerably. The recurrence intervals of peak discharges on the Trempealeau River were about 30 years, on the Black River about 4 years, and in the southern basins such as the Platte and Galena Rivers less than 2 years.

Severity of peak flow varied with drainage area. On several small basins (drainage areas less thn 30 square miles) between the St. Croix and Trempealeau Rivers, the recurrence intervals of the maximum discharges were from 2 to 4 years, but in the larger basins they were considerably higher. This phenomenon is characteristic of snowmelt runoff. In the small basins, runoff increased during the day, peaked in late afternoon, then decreased sharply as night temperatures dropped below freezing. Daily minimums were reached in midmorning and runoff increased again as temperatures rose. In the larger basins, however, these diurnal fluctuations were less extreme as the flow from individual tributaries was integrated into the larger systems.

The Trempealeau River at Dodge, Wis., about 9 miles upstream from the mouth, peaked on April 7 at 12,100 cfs, a 7-year flood. This flood was considerably less severe than the maximum of record, which was 17,400 cfs on April 4, 1956.

Near the mouth of the Black River the maximum discharge, which occurred on April 13, was 33,000 cfs, a 3-year flood. At Neillsville, Wis., where the drainage area is about one-third that at the mouth, a maximum discharge of 18,300 cfs on April 12 was also a 3-year flood. Flood damage in the Black River basin was confined mostly to country roads, but several highways were inundated for a short time.

The La Crosse River peak on April 12 was slightly lower than an earlier peak of 2,610 cfs on March 3, which was a 2-year flood. South of the La Crosse River basin in Wisconsin, major snowmelt runoff occurred in February and March, and April runoff was consequently reduced. Rivers in small basins in southwestern Wisconsin such as the Grant, Platte, and Galena Rivers rose several times in January, February, and March. Maximum discharges generally occurred March 1 or March 31, and recurrence intervals were less than 2 years. The relatively low peaks were due to the frequent melting periods and resultant runoff in January and February.

MISSISSIPPI RIVER TRIBUTARY BASINS IN NORTHEASTERN IOWA

Temperatures in the forties in the latter days of February melted the 1–5 inches of snow on the ground in northeastern Iowa. This snowmelt, which was accompanied by some rainfall, produced sharp rises on

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the tributary streams from the upper Iowa River basin to the Wapsipinicon River basin. Maximum discharges, however, had recurrence intervals of only 2–4 years.

Streams also crested at about the same magnitude at the end of March as a result of the melting of snow that had accumulated to depths of 6–12 inches during the March 16–18 storms. The ½–2 inches of rain which fell during the period April 3–7 in the Maquoketa and Wapsipinicon basins produced only minor crests.

All the tributaries had peaked well before the Mississippi River crested in this reach. The Upper Iowa River, Paint Creek, and Little Maquoketa River had no significant rises after April 1. The latest crests on the Turkey and Maquoketa Rivers occurred about April 6. The Wapsipinicon River discharged its latest crest into the Mississippi River on April 14, 2 weeks before the peak flow on the main stream.

IOWA RIVER BASIN

Minor crests occurred the first week in March as a result of snowmelt in the upper part of the basin. The most significant runoff was in April. Ten to eighteen inches of snow had accumulated in the upper part of the basin in March. The melting of this snow during the period March 27 to April 5 and rainfall of 1–1½ inches on April 3–7 caused extreme floods. The East Branch Iowa River at Klemme, Iowa, crested at 10.67 feet on April 6 during a period of ice backwater. The maximum discharge of 4,090 cfs, 1.33 times the 50-year flood, occurred 2 days later. Downstream at Rowan, the maximum discharge of the Iowa River was 1.05 times the 50-year flood. An ice jam 2½ miles long formed upstream from Iowa Falls. When it broke loose, the surging water deposited huge ice cakes in the city and inundated some areas to depths of 5 feet. The communities of Tama and Chelsea were cut off or inundated by the rampaging waters. Coralville Reservoir was used very effectively to control the floodflow on the Iowa River. During the period April 2–17, storage in the reservoir eliminated flood damages between the reservoir and the mouth of the Cedar River and reduced the Mississippi River stage at Burlington by about 0.4 foot.

The second crest in April occurred during the third week. Heavy rains of 1½–5½ inches on April 24–25 produced sharp rises on all tributaries of the Iowa River. The Iowa River did not crest nearly as high as earlier in the month, but this flow was more significant because the timing coincided with the Mississippi River crest. The Coralville Reservoir storage on this occasion reduced the Mississippi River crest at Burlington by 0.3 foot. Inflow from tributaries downstream from the reservoir, principally the Cedar River, produced a peak discharge of 38,000 cfs on the Iowa River at Wapello during the second crest on

April 26, just 3 days prior to the arrival of the crest of the Mississippi River at the mouth of the Iowa River. At the time of the Mississippi River crest, discharge from the Iowa River was approximately 5 percent of the total discharge of the Mississippi River below the mouth of the Iowa River.

Discharge hydrographs at selected gaging stations in the Iowa River basin are shown in figure 45.

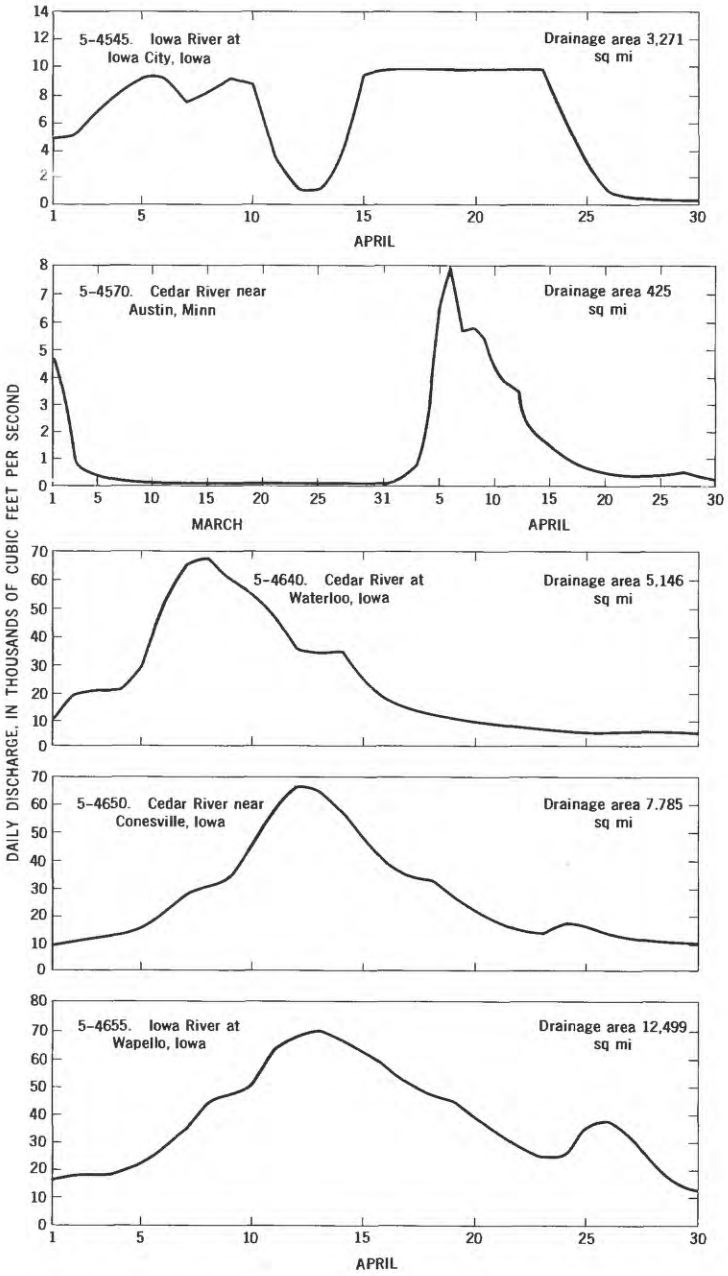

FIGURE 45.—Discharge hydrographs at selected gaging stations in Iowa River basin.

CEDAR RIVER BASIN

Rain which fell during the first part of February created a very dense snow pack in southeastern Minnesota; at the end of February, warm weather occurred and on the 1st of March about 1½ inches of rain fell. These factors caused rapid runoff, which commenced in the upper part of the Cedar River basin on February 28. The rapidity of runoff is indicated by the fact that the daily mean discharge increased from 100 cfs on February 28 to 5,820 cfs on March 1, at the gaging station near Austin, Minn. The peak instantaneous discharge of 9,400 cfs on March 1 was almost equal to the maximum for the 26-year period of record. The peak discharge at the Austin gaging station was affected by backwater, and the stage was about a foot higher than any previously recorded. The recurrence interval of the March peak at Austin was 5 years.

Adding to the flood flow on the Cedar River were crests from several large tributaries in northern Iowa. The Little Cedar River at Ionia, Iowa, peaked the same day as the Cedar River at Charles City, Iowa. The Winnebago River, Shell Rock River, Beaver Creek, and Blackhawk Creek all crested within a 2-day period. High flows during the early March peak from Cedar River tributaries just upstream from Waterloo, Iowa, contributed to a crest on March 4 at Waterloo of 14.72 feet, 0.28 foot below flood stage.

Later in March, snowfall accumulated to a depth of 6–15 inches over the basin upstream from Waterloo. The melting of this snow in late March and early April plus additional precipitation during the first few days of April created a second peak at Austin of 8,400 cfs on April 6. At this time, however, no ice backwater was present at Austin and the maximum stage was 2.67 feet less than that recorded on March 1. Farther downstream in northern Iowa, ice jams formed during the early April flood, and caused much destruction at Floyd, Charles City, Nashua, and Waverly, Iowa. Backwater flooded homes and businesses and huge ice cakes caused much damage as they moved with crushing force through the inundated areas. Additional damage resulted from the grinding, crushing force of the ice as it raced downstream after the jam broke. The rapid rise of the river at Charles City, caused by the heavy runoff and an ice jam, necessitated the evacuation by boat of over 40 families. Many highways throughout the area were closed and damaged. An ice jam at Greene, Iowa, on the Shell Rock River backed water into the business district.

The Cedar River and its several major tributaries upstream from Waterloo, Iowa, had significant floodflows early in April. The peak discharge on the Cedar River at Janesville was 29,200 cfs, a 14-year

flood. The recurrence interval of the peak discharges on the West Fork Cedar River at Finchford, Iowa, and Beaver Creek at New Hartford, Iowa, were 30 and 32 years, respectively. Shell Rock River at Shell Rock, Iowa, had a 7-year flood and Blackhawk Creek at Hudson, Iowa, had a 16-year flood. Fortunately, the crests from all the tributaries did not occur simultaneously with the crest on the Cedar River, but the combined flow on the Cedar River at Waterloo, Iowa, was 69,500 cfs almost 80 percent of the potential peak discharges from the upstream stations. The recurrence interval of the Waterloo peak discharge was 34 years. The peak stage reached 21.67 feet, 6.67 feet above flood stage and only 0.19 foot below the record flood of 1961. More than 400 families were forced from their homes in Waterloo, Cedar Falls, and Evansdale. Many homes were saved from the flood by the gallant efforts of the local residents and a detachment of the Iowa National Guard, who carried out the flood fight as planned by the respective city officials.

The crest at Cedar Rapids, Iowa, was 18.51 feet on April 10, 1.49 feet below the record stage of March 1929 and 1.15 feet below that of March 1961. The Cedar River joins the Iowa River downstream from Cedar Rapids. The Iowa River floodflow above the junction was controlled by Coralville Reservoir, but the Cedar River crest continued down the Iowa River below the junction and reached the mouth of the Iowa River 2 weeks before the crest on the Mississippi River arrived. High flow continued in the Iowa River for the remainder of the month.

SKUNK RIVER BASIN

A blizzard in the upper Skunk River basin and a 1-inch rain in the lower basin occurred during the period March 16–18. The runoff from the snowmelt and rain produced peaks with recurrence intervals up to 2½ years. Crests in the lower part of the basin were more significant than those upstream. The stage at the downstream station at Augusta, Iowa, reached 16.99 feet, 2 feet above flood stage, on March 18.

During the storm of April 3–7, 1½–3 inches of rain fell in the basin. The recurrence intervals of flood peaks resulting from this storm ranged from 3 to 5 years. The crests at the upstream stations were more significant than those in March, but the Augusta crest in April was 0.54 foot lower. This crest reached the mouth 2 weeks before the Mississippi River crest.

A minor flood crested the last week in April as a result of heavy rains in the southeastern part of Iowa. This crest was perhaps more significant in relation to the Mississippi River flood because the peak

outflow at the mouth occurred almost simultaneously with that of the Mississippi River crest. The discharge from the Skunk River, however, was only about 3 percent of the peak flow of the Mississippi River at the mouth of the Skunk River.

DES MOINES RIVER BASIN

Minor flooding of the Des Moines River and its tributaries between the North Raccoon River and Cedar Creek was caused by the 1–1½ inches of rain that fell during the middle of March. The recurrence interval of the tributary floods ranged from 3 to 18 years.

The outstanding flood occurred early in April. At the end of March, snow on the ground in the West Fork Des Moines River basin in Minnesota varied from 7 to almost 30 inches. Warm temperatures beginning March 27 began to melt this snow. During the period April 3–7, rainfall, varying from 1½ to 2 inches in the upper part of the basin, increased the amount of runoff and intensified the flood condition. A rainfall of up to 3 inches in the lower part of the basin produced floods on the tributaries and a rise on the Des Moines River ahead of the main crest moving downstream. Rapid runoff over the frozen ground caused streams to rise, breaking up the heavy ice cover. Numerous ice jams caused flooding and damage.

A maximum stage of 18.62 feet, determined from floodmark occurred on West Fork Des Moines River at Jackson, Minn., on April 6. Heavy ice floes destroyed the gaging station at this time. The maximum discharge of 9,530 cfs, 1.23 times the 50-year flood, was greater than any previous discharge during the 30 years of record, and the maximum stage was 1.2 feet higher than any previously recorded (fig. 46). The flood on the West Fork Des Moines River at Estherville, Iowa, was 1.17 times the 50-year flood; on the East Fork Des Moines River near Burt, Iowa, the recurrence interval was 50 years; and on the East Fork at Dakota City, Iowa, it was 1.03 times the 50-year flood.

At Fort Dodge, Iowa, a large ice jam on the Des Moines River broke and damaged the hydroelectric power dam necessitating hurried construction of a rock fill to prevent failure of the dam. The maximum discharge of 35,600 cfs was greater than any previous discharge during 34 years of record, but the stage was 1.83 feet lower than the flood of June 1947. The recurrence interval of the 1965 flood is 17 years.

The peak stage of Boone River near Webster City, Iowa, reached 15.91 feet, 2.64 feet lower than the flood of June 1954 and 3.2 feet lower than the flood of 1918. The peak discharge had a recurrence interval of 21 years.

The Raccoon River flows into the Des Moines River at the City of Des Moines, Iowa. Fortunately, the flood crest on the Raccoon River preceded the crest on the Des Moines River by about 5 days. The peak

FIGURE 46.—The maximum stage of the West Fork Des Moines River at Jackson, Minn., was 1.2 feet higher than any previously recorded. Photograph by Paul's Studio, Jackson, Minn.

discharge of the Des Moines River below the Raccoon River had a recurrence interval of 19 years and has been exceeded in 1947, 1954, and 1960. Considerable areas adjacent to the Raccoon and Des Moines Rivers were flooded in Des Moines. Many streets, including Riverside Drive, University Avenue, and Vandalia Road, were closed to traffic. The 63d Street Bridge over the Raccoon River was closed because of road damage on each side of the bridge. On April 17, a 100-foot section of the Sixth Avenue Bridge collapsed into the channel of the Des Moines River. The failure was due to the poor condition of the aging concrete bridge as well as to the swollen floodwaters. More than 10,000 telephone circuits and vehicular traffic were cut off when the bridge collapsed. Total damages to city property and cost of the flood fight were about $671,000.

As the crest moved downstream from Des Moines, the peak discharge continued to increase as a result of the high runoff from the lower tributaries. At Keosauqua, Iowa, on April 12 the peak discharge was 79,800 cfs at a stage of 19.36 feet, 4.35 feet above flood stage. The recurrence interval of the flood at this location was 9 years. The Des Moines River crest reached the mouth 2 weeks before the Mississippi River crest, but the discharge from the Des Moines River remained high for the remainder of the month. Another minor crest occurred at Keosauqua on April 26 as a result of heavy rains in the lower part of the basin. The peak discharge of this flood was 33,000 cfs, about 10 percent of the peak flow of the Mississippi River below the mouth of the Des Moines River.

A profile of flood stages in the Des Moines River basin and discharge hydrographs at selected gaging stations are shown in figures 47 and 48. Descriptions and elevations of profile points are given in table 5.

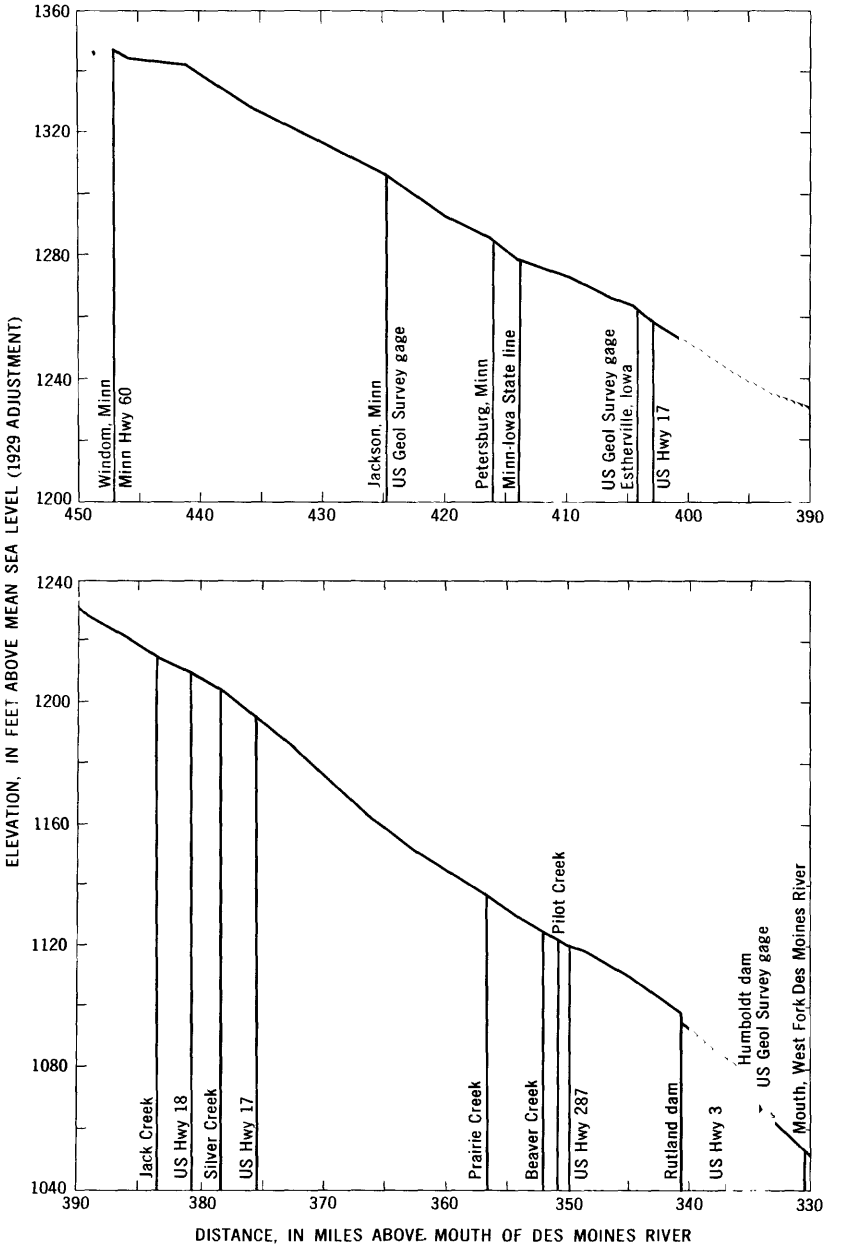

FIGURE 47.—Flood-crest profile of West Fork Des Moines River.

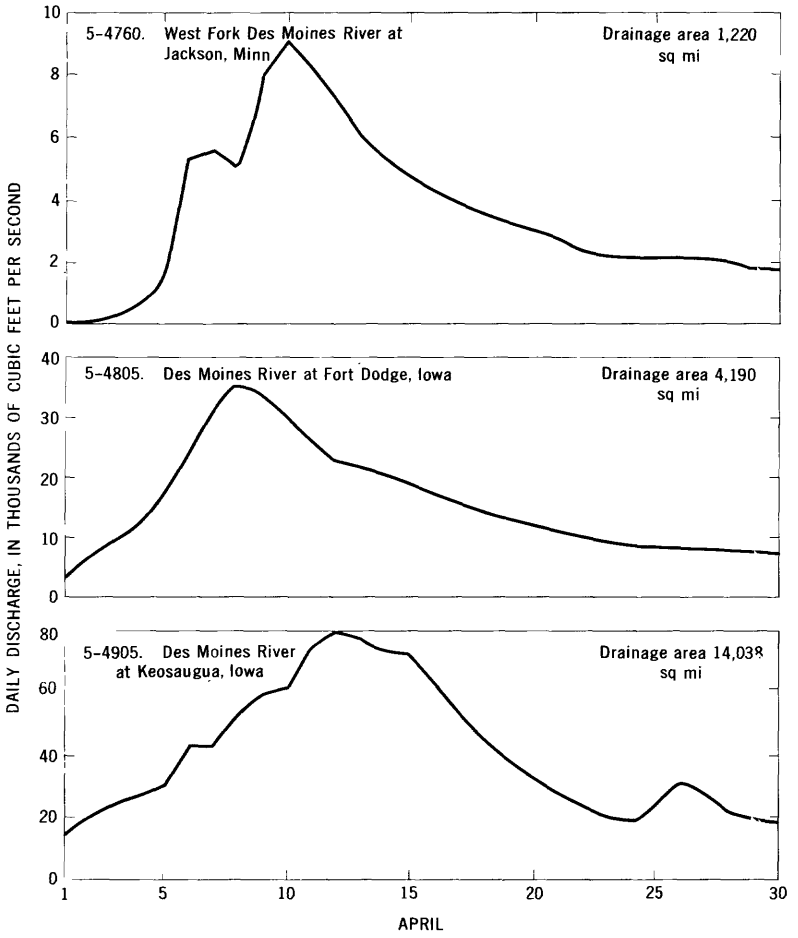

FIGURE 48.—Discharge hydrographs at selected gaging stations in Des Moines River basin.

TABLE 5.—*Flood-crest elevations, West Fork Des Moines River, April 6–13, 1965*

Location	Miles above mouth of Des Moines River	Elevation in feet (datum of 1929)
Windom, Minn.:		
Upstream side of bridge on State Highway 60	447. 0	1, 348. 1
Downstream side of bridge on State Highway 60	447. 0	1, 347. 1
Downstream side of county bridge in NE¼, sec. 1, T. 104 N., R. 36 W., Jackson County	445. 66	1, 344. 0
Upstream side of county bridge in SW¼, sec. 19, T. 104 N., R. 35 W., Jackson County	441. 18	1, 342. 8

TABLE 5.—*Flood-crest elevations, West Fork Des Moines River, April 6–13, 1965*—Continued

Location	Miles above mouth of Des Moines River	Elevation in feet (datum of 1929)
Upstream side of county bridge near center of line between sec. 16 and 17, T. 103 N., R. 35 W., Jackson County	435. 16	1, 327. 2
County bridge in SE¼, sec. 28, T. 103 N., R. 35 W., Jackson County	431. 69	1, 321. 2
Jackson, Minn.:		
Upstream side of bridge on U.S. Highway 16	425. 59	1, 308. 5
Downstream side of bridge on U.S. Highway 16	429. 59	1, 307. 9
Upstream side of Ashley Street Bridge	424. 79	1, 306. 9
Upstream from powerplant dam	424. 59	1, 306. 7
U.S. Geological Survey recording gage downstream from powerplant dam	424. 59	1, 306. 37
Upstream side of county bridge at south edge of Jackson	424. 14	1, 304. 1
Downstream side of county bridge on line between sec. 7 and 8, T. 101 N., R. 34 W., Jackson County	419. 55	1, 292. 3
Downstream side of county bridge at Petersburg, Minn	415. 98	1, 285. 6
Minnesota–Iowa State line	413. 88	1, 278. 5
Upstream side of county bridge in NW¼, sec. 28, T. 100 N., R. 34 W., Emmet County	409. 80	1, 274. 0
Downstream side	409. 80	1, 273. 2
Upstream side of county bridge in SE¼, sec. 34, T. 100 N., R. 34 W., Emmet County	407. 40	1, 268. 5
Downstream side	407. 40	1, 266. 9
Estherville, Iowa:		
Upstream side of Fifth Street Bridge	405. 05	1, 265. 0
Downstream side	405. 05	1, 264. 7
Upstream side of CRI&PRR bridge	404. 60	1, 263. 9
Downstream side	404. 60	1, 263. 9
Upstream side of bridge on State Highway 9	404. 35	1, 263. 8
Downstream side	404. 35	1, 263. 5
U.S. Geological Survey recording gage	404. 20	1, 263. 16
Upstream side of bridge on State Highway 17	402. 90	1, 259. 3
Downstream side	402. 90	1, 259. 1
Upstream side of CRI&PRR bridge	402. 75	1, 258. 6
Downstream side	402. 75	1, 257. 9
Upstream side of county bridge in NW¼, sec. 31, T. 99 N., R. 33 W., Emmet County	399. 50	1, 250. 8
Downstream side	399. 50	1, 250. 5
Upstream side of county bridge in SE¼, sec. 7, T. 98 N., R. 33 W., Emmet County	396. 65	1, 243. 6
Downstream side	396. 65	1, 242. 8
Upstream side of county bridge in NE¼, sec. 29, T. 98 N., R. 33 W., Emmet County	393. 10	1, 235. 6
Downstream side	393. 10	1, 235. 0
Emmet—Palo Alto County line	390. 70	1, 231. 7
Upstream side of county bridge "J" in NE¼, sec. 9, T. 97 N., R. 33 W., Palo Alto County	389. 70	1, 230. 9
Downstream side	389. 70	1, 230. 0
Upstream side of CRI&PRR bridge	388. 90	1, 228. 6
Downstream side	388. 90	1, 227. 5
Upstream side of county bridge in SE¼, sec. 27, T. 97 N., R. 33 W., Palo Alto County	384. 95	1, 219. 0
Downstream side	384. 95	1, 218. 8
Below mouth of Jack Creek	383. 50	1, 215. 1
Upstream side of bridge on U.S. Highway 18	380. 60	1, 210. 1

TABLE 5.—*Flood-crest elevations, West Fork Des Moines River, April 6–13, 1965*—Continued

Location	Miles above mouth of Des Moines River	Elevation in feet (datum of 1929)
Downstream side	380. 60	1, 209. 6
Upstream side of CMStP&PRR bridge	379. 60	1, 208. 0
Downstream side of county bridge in NW¼, sec. 26, T. 96 N., R. 33 W., Palo Alto County	379. 55	1, 206. 8
Above mouth of Silver Creek	378. 40	1, 203. 6
Below mouth of Silver Creek	378. 40	1, 203. 8
Upstream side of county bridge in SE¼, sec. 35, T. 96 N., R. 33 W., Palo Alto County	377. 65	1, 202. 0
Downstream side	377. 65	1, 201. 4
Upstream side of bridge on State Highway 17	375. 55	1, 195. 5
Downstream side	375. 55	1, 194. 8
Upstream side of county bridge in NE¼, sec. 21, T. 95 N., R. 32 W., Palo Alto County	372. 10	1, 184. 3
Downstream side	372. 10	1, 183. 3
Upstream side of county bridge in NW¼, sec. 25, T. 95 N., R. 32 W., Palo Alto County	369. 15	1, 173. 2
Downstream Side	369. 15	1, 172. 9
Upstream side of county bridge "C" in SW¼, sec. 29, T. 95 N., R. 31 W., Palo Alto County	367. 10	1, 166. 3
Downstream side	367. 10	1, 164. 9
Below mouth of Cylinder Creek	365. 20	1, 159. 9
Upstream side of county bridge in NE¼, sec. 8, T. 94 N., R. 31 W., Palo Alto County	364. 95	1, 159. 3
Downstream side	364. 95	1, 158. 4
Upstream side of county bridge in SE¼, sec. 17, T. 94 N., R. 31 W., Palo Alto County	363. 40	1, 154. 6
Downstream side	363. 40	1, 154. 3
Upstream side of county bridge in NE¼, sec. 29, T. 94 N., R. 31 W., Palo Alto County	361. 95	1, 151. 2
Downstream side	361. 95	1, 149. 7
Palo Alto–Pocahontas County line	358. 60	1, 142. 2
Upstream side of county bridge in NW¼, sec. 1, T. 93 N., R. 31 W., Pocohantas County	357. 80	1, 140. 5
Downstream side	357. 80	1, 139. 3
Pocahontas–Humboldt County line	356. 65	1, 137. 0
Upstream side of bridge on State Highway 44	356. 60	1, 137. 0
Downstream side	356. 60	1, 136. 7
Humboldt–Pocahontas County line	355. 70	1, 134. 2
Upstream side of county bridge in NW¼, sec. 25, T. 93 N., R. 31 W., Pocahontas County	353. 45	1, 128. 1
Downstream side	353. 45	1, 127. 3
Below mouth of Beaver Creek	352. 00	1, 124. 8
Upstream side of county bridge "T" in NE¼, sec. 1, T. 92 N., R. 31 W., Pocahontas County	350. 75	1, 122. 7
Downstream side	350. 75	1, 122. 3
Below mouth of Pilot Creek	350. 70	1, 122. 2
Pocahontas–Humboldt County line	350. 60	1, 122. 0
Upstream side of C&NWRy bridge	350. 25	1, 121. 4
Downstream side	350. 25	1, 120. 7
Upstream side of bridge on State Highway 287	349. 90	1, 120. 2
Downstream side	349. 90	1, 119. 5
Upstream side of county bridge in NW¼, sec. 17, T. 92 N., R. 30 W., Humboldt County	348. 45	1, 118. 0
Downstream side	348. 45	1, 117. 6
Upstream side of county bridge in NW¼, sec. 23, T. 92 N., R. 30 W., Humboldt County	344. 25	1, 108. 0

TABLE 5.—*Flood-crest elevations, West Fork Des Moines River, April 6–13, 1965*—Continued

Location	Miles above mouth of Des Moines River	Elevation in feet (datum of 1929)
Downstream side	344.25	1,107.8
Upstream of Rutland Dam	340.70	1,098.6
Downstream of Rutland Dam	340.70	1,095.1
Upstream side of county bridge in SE¼, sec. 29, T. 92 N., R. 29 W., Humboldt County	340.30	1,093.9
Downstream side	340.30	1,093.0
Upstream side of country bridge in SE¼, sec. 34, T. 92 N., R. 29 W., Humboldt County	337.50	1,084.5
Downstream side	337.50	1,084.4
Humboldt, Iowa:		
Upstream side of bridge on State Highway 3	336.85	1,083.4
Downstream side	336.85	1,083.0
Upstream of Humboldt Dam	335.15	1,078.2
Downstream of Humboldt Dam	335.15	1,073.1
Upstream side of bridge on State Highway 169	334.85	1,070.5
Downstream side	334.85	1,070.5
Upstream side of Sumner Avenue Bridge	334.40	1,069.1
Downstream side	334.40	1,068.0
U.S. Geological Survey wire-weight gage on upstream side of First Avenue Bridge	334.30	1,067.8
Downstream side	334.30	1,067.5
Upstream side of county bridge in SW¼, sec. 9, T. 91 N., R. 28 W., Humboldt County	330.85	1,054.0
Downstream side	330.85	1,053.9
Mouth of West Fork Des Moines River	330.40	----------

MISSISSIPPI RIVER TRIBUTARY BASINS IN ILLINOIS

Minor floods occurred on streams tributary to the Mississippi River in Illinois. Flooding along these streams was confined principally to the lower reaches and was due almost entirely to backwater from the Mississippi River.

At the gaging station on Mill Creek at Milan, Ill., the peak stage of 11.53 feet exceeded the previous maximum by 2.17 feet. Conditions at this station were unique in comparison with other tributary streams in Illinois because it was the only station at which both the peak stage and discharge exceeded previous maxima.

Backwater on the Rock River caused flooding at Rock Island. About 300 homes were flooded and about 1,000 persons were evacuated.

Extensive flooding occurred along the Mississippi River particularly in the reach from the Illinois-Wisconsin State line downstream to Quincy. Many families were evacuated when some levees failed after withstanding floodwaters for nearly 3 weeks. An area of about 60,000 acres, most of which was rich farmland, was inundated.

MISSISSIPPI RIVER TRIBUTARY BASINS IN MISSOURI

During the period March–May 1965, only minor crests occurred on the streams in Missouri that are tributary to the Mississippi River upstream from the mouth of the Missouri River. Peak discharges having recurrence intervals of 1 or 2 years occurred in March or April prior to the time of the peak discharge on the Mississippi River. The runoff from the tributary basins was less than 1 percent of that of the Mississippi River at Alton, Ill., during the period March–May 1965.

FLOOD OPERATIONS

The President of the United States declared a total of 183 counties in the five-State area eligible for natural-disaster assistance under Public Law 875. Eighty-seven of these counties were in Iowa, 65 in Minnesota, 14 in Wisconsin, 10 in Illinois, and seven in Missouri.

The Office of Emergency Planning set up disaster field offices in Mankato and St. Paul, Minn., La Crosse, Wis., and Iowa City, Iowa, to provide information for local communities on the procedures for applying for Federal disaster assistance under Public Law 875.

All the military services were involved in the flood-fighting effort. The Army National Guard expended 7,186 man-days on flood-fighting activities in Minnesota and 2,410 man-days in Wisconsin. Records show that 2,830 guardsmen were called to duty during the flood in Iowa; 612 were called in Illinois, and 279 in Missouri. In addition, the National Guard furnished mobile equipment, airplanes, and helicopters. The U.S. Navy and U.S. Air Force provided helicopters for reconnaissance and rescue missions and the Coast Guard provided emergency communications equipment and patrol boats for rescue and security missions. Navy and private planes obtained aerial photographs of the Mississippi River and the Minnesota River at or near their crests.

Early in March the U.S. Army Corps of Engineers made snow surveys in the Minnesota and upper Mississippi River basins. During the flood, the Corps of Engineers North-Central Division office in Chicago and the district offices in St. Paul, Minn., and Rock Island, Ill., established emergency operations centers in 60 major disaster areas. These centers assisted the local communities and provided vital information concerning flood-fighting techniques. The Corps also made surveys of damage during and after the flood.

The U.S. Bureau of Public Roads, in cooperation with the State Highway Departments, provided cost estimates for emergency road repairs and restoration of damaged highway structures. The Bureau of Public Roads also provided assistance to States and counties in implementing the provisions of Public Law 875.

The Department of Health, Education, and Welfare, in cooperation with State Departments of Health, inspected public water supply and sewage disposal systems and evaluated applications for disaster relief from the stricken communities.

The Federal Housing Commission surveyed damage to public buildings in the flood-stricken area and informed flood-affected communities on its programs for granting low-interest loans.

The National Red Cross provided staff workers in the flooded areas to assist local chapters. Total expenditures by the National Red Cross were about $1,800,000. More than 150,000 flood victims and workers received Red Cross care and assistance.

Recognition should be given to the inhabitants of the stricken communities for the great effort they put forth to diminish damages to public property, businesses, and homes. Volunteer flood workers turned out by the thousands and great quantities of equipment and supplies were donated to the flood-fighting effort. High school and college students, in particular, endeared themselves to many communities by their selfless and tireless efforts to control and minimize the damage caused by floods of unprecedented magnitude.

In the five-State flood-affected area, about 50 engineers and technicians of the Water Resources Division, U.S. Geological Survey, collected the stage and discharge data which are tabulated in this report. Many of the discharge measurements upon which the computation of data depends were made under extremely adverse conditions involving inclement weather, impassable roads, ice floes, submerged gages, high stream velocities, deep soundings, and wide overflow channels. Discharge measurements in channels and overflows up to a mile and a half wide had to be made by boat. The U.S. Geological Survey Flood Coordinator in St. Paul forwarded discharge data as soon as they were available to the Weather Bureau and the Corps of Engineers. These data were very useful in forecasting flood stages.

In addition to data obtained at gaging stations, flood information was obtained at many other sites. At the request of the Corps of Engineers district office in St. Paul, the U.S. Geological Survey made discharge measurements at lock and dams 3, 4, 5, and 7 at the peak and during the recession. Measurements made at gaging stations at Prescott, Wis., and Winona, Minn., provided discharges for dams 2 and 5A, respectively. Discharges at dams 3 and 7 were measured from highway bridges in Red Wing, Minn., and La Crosse, Wis., respectively. Discharges at dams 4 and 5 were obtained by working over the upstream side of the dam in a basket suspended from a crane located on the dam. The discharge at Lansing, Iowa, was measured from the highway bridge and from a boat and the inflow of the Wisconsin River measured from the highway bridge near its mouth was added to it.

In spite of the hazardous conditions under which flood data were collected, no U.S. Geological Survey employees were injured excepting one engineer assigned to the St. Paul office, whose arm was hurt when a power sounding crane collapsed.

FLOOD DAMAGES

Hundreds of communities and several million persons were affected directly or indirectly by the 1965 spring floods in the five-State area of Minnesota, Wisconsin, Iowa, Illinois, and Missouri. For floods of this magnitude, it is difficult to assess flood damages, and estimates ranged widely from $100 million to $190 million. A summation of total damages prepared from figures furnished by the Corps of Engineers appears in table 6. In addition to the direct and tangible damages, the economy of the affected region suffered in many ways and the flood caused much human anguish. The losses to the economy and the human suffering can never be evaluated in terms of dollars and cents.

In the upper Mississippi River Basin, 15 lives were lost because of the floods or flood-associated events, 13 lives were lost in Minnesota, and one life each was lost in Wisconsin and Illinois. More than 700 persons were injured or became ill as a result of the floods. Of the injured, about 60 were hospitalized. More than 11,000 homes were flooded and of these, more than 2,000 suffered major structural damage. Damages to agriculture due to loss of crops, land erosion, deposition of debris, wrecked fences, and destruction of soil conservation structures were great.

The 1965 flood damages in the upper Mississippi River basin totaled almost $160 million, far exceeding those caused by any previous flood. In comparison, damages resulting from the 1952 flood were only about

TABLE 6.—*Flood damage by States in thousands of dollars*

[Compiled from figures provided by St. Paul, Rock Island, and St. Louis districts, U.S. Army Corps of Engineers]

State	Urban communities					Agriculture [1]	Transportation	Locks, dams, levees, and navigation	Total
	Commercial	Residential	Public	Flood fight and cleanup	Subtotal				
Minnesota	$14,143	$9,536	$6,209	$9,577	$39,465	$26,033	$17,197	----------	$82,695
Wisconsin	6,844	3,578	1,457	1,320	13,199	557	2,740	----------	16,496
Iowa	8,417	2,097	1,162	7,665	19,341	[2] 3,521	723	----------	23,585
Illinois	7,186	2,387	1,087	8,180	18,840	[2] 11,408	603	----------	30,851
Missouri	767	37	17	559	1,380	1,431	250	----------	3,061
----------	----------	----------	----------	----------	----------	----------	----------	$2,728	2,728
Total	$37,357	$17,635	$9,932	$27,301	$92,225	$42,950	$21,513	$2,728	$159,416

[1] Includes cost of flood fight in agricultural areas.
[2] Organized levee districts suffered about $2.4 million damage in Iowa and $10 million damage in Illinois.

$20 million. It is interesting to conjecture as to the reasons for the eight-fold increase in flood damages. One of the reasons for this great increase in damage is that the magnitude of the 1965 flood was greater than any other previously known. Also property values have increased over the years, and the cost of materials and labor for flood-fighting has also increased. Perhaps the greatest consideration is the increased occupancy of flood plains. The tremendous property damage that results from major floods points out the need for flood-plain zoning.

A special congressional subcommittee headed by Congressman John Blatnik of Minnesota was appointed by the chairman of the House Committee on Public Works to visit the flood-devastated areas, the committee inspected the damages and met with Federal, State, and local officials. The information obtained was provided to the Committee on Public Works so that this committee could consider legislative matters pertaining to flood control and water resources development (89th Cong., 1st sess., House Committee Print No. 13). The subcommittee made early estimates of flood damages including the cost of flood fighting.

Extensive flood damages occurred in many communities. Twenty-three urban and industrial areas suffered damages in excess of $1 million each (table 7). More detailed information concerning flood losses in the individual basins is presented in the discussion pertaining to the basin.

The losses arising from the 1965 floods would have been much greater had not many communities, industries, and individuals undertaken emergency flood-protection measures which curtailed flood damages by many millions of dollars. The flood-fighting effort in itself was costly. In the urban areas flood-fighting costs amounted to over $27 million, about equal to 30 percent of total urban damages. According to Corps of Engineers estimates, additional losses of almost $300 million would have occurred if emergency flood-fighting measures had not been undertaken.

TABLE 7.—*Communities where flood damages exceeded $1 million*

[Based on data furnished by St. Paul and Rock Island districts, U.S. Army Corps of Engineers]

City	Flooded by—	Damages in thousands of dollars				
		Business	Residential	Public	Flood fight and cleanup	Total
Le Hillier, Minn.	Blue Earth	$146	$676	$109	$156	$1,087
Mankato, Minn.	Minnesota River	1,833	800	842	1,618	5,093
Savage, Minn.	Minnesota River	2,945	----	10	450	3,405
Chaska, Minn.	Minnesota River	101	995	369	242	1,707
St. Paul, Minn.	Mississippi River	2,713	----	870	509	4,092
South St. Paul, Minn.	Mississippi River	2,158	30	622	1,190	4,000
Stillwater, Minn.	St. Croix River	627	----	1,066	594	2,287
Bayport, Minn.	St. Croix River	355	310	20	700	1,385
Winona, Minn.	Mississippi River	654	66	355	2,625	3,700
LaCrosse, Wis.	Mississippi River	4,900	1,273	732	691	7,596
Houston, Minn.	Root River	425	875	130	30	1,460
Prarie du Chien, Wis.	Mississippi River	953	1,017	221	278	2,469
Guttenberg, Iowa	Mississippi River	488	716	140	143	1,487
Dubuque, Iowa	Mississippi River	4,068	27	333	3,226	7,654
East Dubuque, Ill.	Mississippi River	85	140	193	631	1,049
Fulton, Ill.	Mississippi River	473	370	194	653	1,690
Clinton, Iowa	Mississippi River	2,490	415	71	2,318	5,294
Camanche, Iowa	Mississippi River	1,035	28	34	544	1,641
Bettendorf, Iowa	Mississippi River	283	----	62	826	1,171
East Moline, Ill.	Mississippi River	105	169	106	1,241	1,621
Moline, Ill.	Mississippi River	428	38	87	967	1,520
Rock Island, Ill.	Mississippi River	2,174	35	196	948	3,353
Davenport, Iowa	Mississippi River	1,309	492	332	1,691	3,824

DRAINAGE AND STORAGE EFFECTS

Whenever a major flood occurs, the causes of the flood and the measures that can be taken to diminish or eliminate future flood losses become topics of interest. The effect of agriculture, drainage ditches, and drain tile often are discussed. Although it might be safe to say that the existence of drainage ditches and drain tiles has some effect on local peak discharges of short duration, there is little basis for assuming that such drainage works had much effect on the peak discharges of large streams in this flood. In the areas of heaviest runoff during the 1965 flood, water was temporarily impounded in thousands of small depressions and did not run off freely because snow and ice obstructed the smaller drainage channels and drain tiles. This condition created the same effect as that which would result from numerous farm ponds, and no doubt played a small part in actually decreasing the magnitude of flood peaks on some of the major streams. Many peak discharges on streams draining small basins of 10 square miles or less occurred about the same time as the crests on major streams.

Another controversial issue is the effectiveness of farm ponds and small reservoirs in eliminating or decreasing flood damage. Certainly such reservoirs can play a part in changing the runoff pattern in small and moderate floods, and any effect they have would tend to diminish the magnitude of flood peaks. There is a tendency, however, to overemphasize the effectiveness of such reservoirs, especially in major

floods. For example, consider a hypothetical effort to store the flood-flows of the Minnesota River and its tributaries between Montevideo and Mankato, Minn. The area drained in this part of Minnesota, 8,720 square miles, is almost entirely agricultural land of good quality and is worth about $300 to $400 per acre. Flood stage at Mankato is 19.0 feet and the corresponding discharge is about 30,000 cfs. Flood stage on the Minnesota River at Mankato was exceeded for 17 days in April. During this time 1,108,000 acre-feet in excess of the discharge which occurs at flood stage passed the Mankato gage. During the same period, 265,000 acre-feet ran off at Montevideo. Therefore, the area between Montevideo and Mankato contributed 843,000 acre-feet in excess of the discharge at Mankato flood stage. If this runoff excess were stored in the basin between Montevideo and Mankato, 97-acre-feet would have to be stored for each square mile of drainage area.

Most conservation reservoirs or farm ponds cover an acre or two in area and probably would not exceeed a usable capacity of 6 acre-feet on the average. Their cost of construction is from about $2,000 to $3,000 each. It follows, then, that to contain the discharge in excess of flood stage which occurred at Mankato, about 140,000 farm ponds would have to be constructed at a cost of about $350 million. In addition, about 200,000 acres of land worth about $70 million would be removed from agricultural use. Perhaps the total storage volume in the preceding computation could be reduced somewhat because storing water in headwaters basins would have the effect of flattening out the crest of the unstored water which found its way into the Minnesota River. Nevertheless, providing the farm-pond storage capacity which would have maintained the flow below flood stages at Mankato would have been a formidable undertaking and would have been economically infeasible. It is a fallacy to contend that farm ponds can prevent floods of great magnitude. Knowledgeable proponents of farm-pond construction make no such claim. They do claim, with justification, that farm ponds are an important conservation measure. Proper upstream land management is very effective in minimizing the damages which occur in the many floods of low recurrence intervals.

Large storage reservoirs played an important part in minimizing flood damages. In the Wisconsin River basin, Pentenwell and Castle

Rock Reservoirs stored about 174,000 acre-feet during the 5 days of maximum flow and materially reduced the discharge of the Wisconsin River below the reservoirs. The peak discharge at Wisconsin Dells was 50,200 cfs, a 4-year flood; it would have been over 70,000 cfs, a 15-year flood, without the storage in Pentenwell and Castle Rock Reservoirs. It is apparent that these reservoirs performed an important flood-control function although they were designed primarily for power production.

A further example of the effect of large reservoirs on the magnitude of flooding is illustrated by the Coralville Reservoir on the Iowa River 9 miles upstream from Iowa City. This reservoir is designed to store floodflows temporarily during high-water periods. Its capacity for flood storage is 458,000 acre-feet, equivalent to 2¾ inches of runoff. The reservoir is operated to minimize flood damages along the Iowa River and the Mississippi River below the mouth of the Iowa River.

During the period April 1–15, the reservoir stored about 300,00 acre-feet. Maximum discharge above the reservoir at Marengo, Iowa, was 19,900 cfs; below the reservoir at Iowa City it was 9,400 cfs. Reservoir release was maintained at about 10,000 cfs to draw down the reservoir to provide more storage for possible future floods. On April 23, storage was resumed, and during the period April 23 to May 5, an additional 123,000 acre-feet was stored. During this period, the peak discharge of the Iowa River upstream from the reservoir was 7,770 cfs, not nearly so high as early in April; so it was possible to reduce the release from the reservoir to about 150 cfs. The operation of this reservoir during these two periods reduced the flood crest by 0.4 foot on the Mississippi River downstream from the mouth of the Iowa River.

Two reservoirs (Red Rock and Saylorville) are under construction on the Des Moines River. The effect on the Mississippi River stage by the Coralville Reservoir operation during the 1965 flood period, and the predicted future effect that Coralville, Red Rock, and Saylorville Reservoirs would have on the same flood conditions are shown in table 8.

TABLE 8.—*Effectiveness of reservoirs in upper Mississippi River basin during flood of 1965*

[Data from House Committee Print No. 13, 89th Cong., 1st sess., Upper Mississippi River Basin Floods of April-May 1965]

Station	Stream	No regulation		Observed conditions [1]				Future conditions [2]			
						Reductions [3]				Reductions	
		Stage (feet)	Discharge (thousand cfs)	Stage (feet)	Discharge (thousand cfs)	Stage (feet)	Discharge (thousand cfs)	Stage (feet)	Discharge (thousand cfs)	Stage (feet)	Discharge (thousand cfs)
Iowa City, Iowa	Iowa River	16.0	22.5	11.7	11.1	4.3	11.4	11.7	11.1	4.3	11.4
Lone Tree, Iowa	do	18.2	30.7	16.9	21.7	1.3	9.0	16.9	21.7	1.3	9.0
Wapello, Iowa	do	[4] 19.2	86.5	17.2	70.8	2.0	15.7	17.2	70.8	2.0	15.7
Burlington, Iowa	Mississippi River	21.4	342.0	21.0	333.0	.4	9.0	21.0	333.0	.4	9.0
Des Moines, Iowa [5]	Des Moines [6]	28.6	50.0	28.6	50.0	0	0	21.5	22.0	7.1	28.0
Do	do [7]	20.3	64.5	20.3	64.5	0	0	15.8	36.5	4.5	28.0
Ottumwa, Iowa	do	18.3	78.6	18.3	78.6	0	0	14.9	49.0	3.4	28.0
Quincy, Ill. [8]	Mississippi River	[9] 25.2	355.0	24.8	346.0	.4	9.0	24.0	329.8	1.2	25.2
Hannibal, Mo. [8]	do	[9] 25.0	358.0	24.6	349.0	.4	9.0	23.8	332.8	1.2	25.2

NOTE.—Some minor revisions made in original table based on later, more complete data.

[1] Regulated by existing Coralville Reservoir.
[2] Effect when regulated by existing Coralville Reservoir plus reservoirs under construction; Red Rock and Saylorville.
[3] Reductions are the difference between the regulated values and the corresponding values, had there been no regulation.
[4] This stage would have resulted in levee failures along Iowa River.
[5] The Des Moines River discharges could be much more severe than those experienced in 1965.
[6] Second Avenue Bridge.
[7] Scott Street Bridge.
[8] Variations in hydrologic events in the upper Mississippi would result in variations in the reductions at Quincy and Hannibal.
[9] These stages would probably have resulted in additional levee failures along the Mississippi River.

EFFECT OF TIMING OF TRIBUTARY FLOW ON MAIN STEM PEAKS

Under slightly different meteorological conditions some of the flood crests could have been considerably higher, a disconcerting thought.

Since March 1951 there have been 5 years in which the annual maximum discharges resulted from snow-melt floods in both the Mississippi River and the Minnesota River above their confluence at the southwest edge of St. Paul. During these five periods of runoff, which include the three highest floods of record at most gaging stations in the upper Mississippi River basin, the crest on the Minnesota River arrived at the confluence before the crest on the Mississippi River on three occasions and after the crest on two occasions. In April 1965, the Mississippi River above the Minnesota River crested 6 days after the Minnesota River at its mouth. Meteorological conditions could be such that crests would occur simultaneously in the Minnesota and Mississippi Rivers above St. Paul. If this had occurred in 1965, peak discharge of the Mississippi River at St. Paul would have been more than 200,000 cfs and the stage would have been 2 or 3 feet higher (fig. 49). Other examples could be cited where slightly different meteorological conditions would have caused much greater flood stages and discharges.

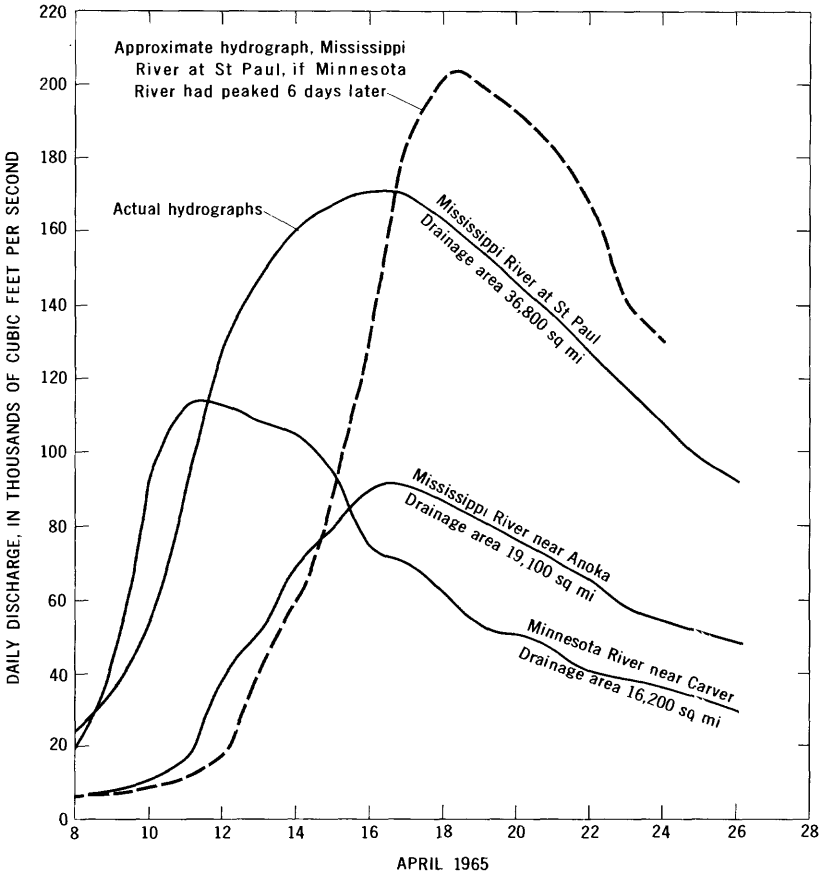

FIGURE 49.—Effect of timing of Minnesota River peak on maximum discharge of Mississippi River at St. Paul, Minn.

RECURRENCE INTERVALS OF PEAK DISCHARGES

The frequency of flooding is a major factor in the economical design of structures and in the use of land on or near a stream. There must be some balance between the cost of flood protection and the potential flood damages or liabilities. Because floods are caused primarily by nature's unpredictable events, this balance can only be estimated on the basis of average recurrence intervals. The "recurrence interval" of a flood of a given magnitude is defined as the average interval of time within which that flood will be equaled or exceeded once. The methods used by the U.S. Geological Survey to determine flood magnitude and frequency have been described by Dalrymple (1960) and Benson (1962a, 1962b, 1964). These methods have been used in the analyses

of flood data on streams in the upper Mississippi River basin. Magnitude and frequency relations have been analyzed and published on a regional basis (Patterson and Gamble, 1968); some have been published by the U.S. Geological Survey on a State basis, Wisconsin (Ericson, 1961) and Missouri (Searcy, 1955); and some have been published by States, Illinois (Mitchell, 1954), Minnesota (Prior, 1949; Prior and Hess, 1961), and Iowa (Schwob, 1953, 1966). Combining records for all gaging stations in an area with homogenic hydrologic characteristics provides a better basis for determining these relations than individual analyses of relatively short-term records. Flood discharges exceeding the 50-year recurrence interval are expressed as a ratio to the 50-year flood. The records on the Mississippi River main stem have ben analyzed on a station basis (fig. 50) because a large river does not have the same runoff characteristics as a smaller tributary.

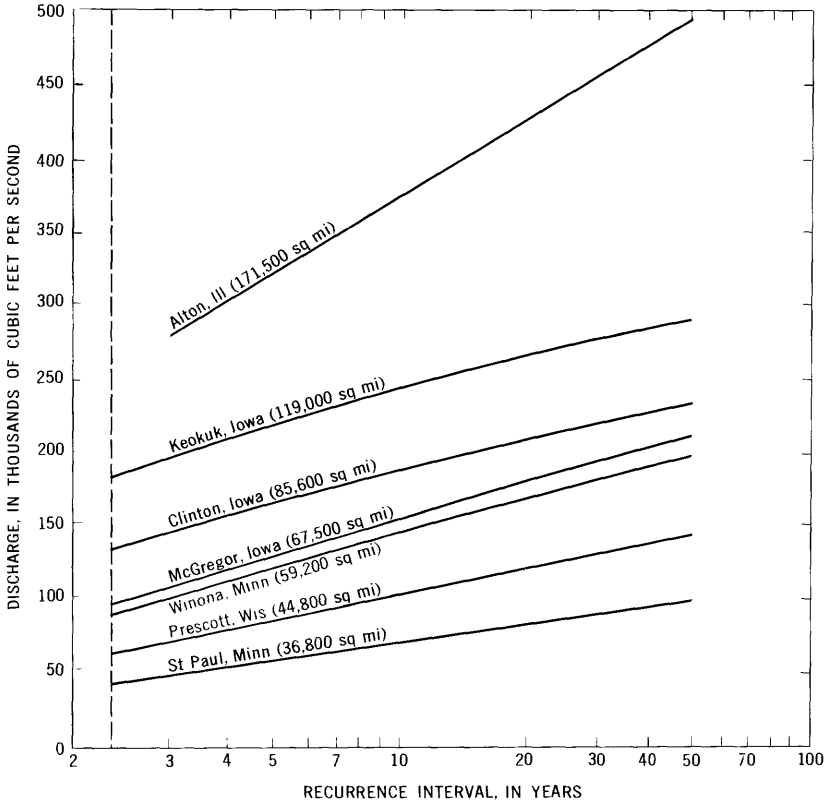

FIGURE 50.—Flood frequency curves for selected Mississippi River gaging stations.

The recurrence intervals for the floods during the period March to May 1965 on streams throughout the upper Mississippi River basin varied considerably. The Mississippi River main stem and its tributaries, originating mostly in Minnesota and northwestern Wisconsin, had the greatest recurrence intervals. On the main stem, these values increased from 4 years downstream from the Sandy River near Libby, Minn., to 1.68 times the 50-year flood at St. Paul, Minn., then diminished slowly to 11 years at Alton, Ill., and to only 2 years at St. Louis, Mo., below the mouth of the Missouri River. This pattern of flood-frequency values indicates or substantiates the flood-producing areas. The upstream tributaries, almost all having floods of 1–2 times the 50-year recurrence interval, added their flows to the main-stem flood. Fortunately, peaks from these tributaries did not occur simultaneously with the main-stem peak, but those entering the main stem upstream from the Root River, which flows into the Mississippi River in southeastern Minnesota, were close enough to contribute an abnormal share to the Mississippi River flow. On tributaries downstream from the Root River, the recurrence intervals of flood peaks were either less than those for upstream tributaries or the timing of the peaks was such that they did not contribute significantly to the main-stem flood. The upper parts of the Cedar and Des Moines River basins experienced floods having recurrence intervals of 5 years to 1.23 times the 50-year flood, but they attenuated considerably before they entered the Mississippi River ahead of the main-stem peak. The other tributaries generally had minor floods to 1–10 year recurrence intervals.

DETERMINATION OF FLOOD DISCHARGES

The flood data in this report were obtained principally at stream-gaging stations which are operated to provide stage and discharge data at the gaging site. A stage-discharge relation is developed by measuring discharge at the site at various stages throughout the range of recorded stages. A rating curve is then drawn by plotting discharge against stage, and the curve is translated into a table so that the discharge can be determined easily from the recorded or observed stages collected at the gaging site.

Discharges are usually measured by current meter, but during floods they may be determined indirectly by running surveys to high water marks and applying slope-area methods or by computing flow over dams or through contracted openings. These indirect methods are considerably more expensive and time-consuming than current-meter measurements, but they are often necessary because of the difficulties of obtaining current-meter measurements at all sites during flood

periods. Such difficulties are created by impassable roads to gaging stations, running ice floes and debris which make it impossible to make soundings and velocity observations, destruction of bridges and cableways from which discharge measurements are made, and rapid cresting of streams (many crest about the same time) so that there is insufficient time and manpower to obtain current-meter measurements near the crest. Most discharge measurements at gaging-station sites during the 1965 spring flood were made by current meter. Some indirect measurements were obtained, particularly at miscellaneous sites and at crest-stage partial-record stations, where only flood-peak information is obtained.

If a rating curve is fairly well defined throughout most of its range by discharge measurements, either direct or indirect, short extensions may be permissable. Such extensions are usually based on logarithmic plotting or velocity-area studies. At most gaging sites on alluvial streams, the stage-discharge relationship frequently changes as a result of varying control features or shifting control in the channel below the gage; consequently, it is necessary to make discharge measurements at gaging sites at fairly regular intervals even though the stage-discharge relationship is apparently well defined throughout the range in stage.

STREAMFLOW DATA AT GAGING STATIONS

One of the purposes of this report is to present detailed hydrologic information for streams in the upper Mississippi River basin during the period March–May 1965. Streams on the fringes of the flooded area are included so that the flood can be well defined on an areal basis. Detailed discharge data are presented so that flood hydrographs can be accurately reproduced and the data used in flood-control and watershed development studies. Some streams, particularly those in Minnesota and parts of Wisconsin, had only normal, low-flow discharges during March and for these no March discharge data are provided in this report.

The operation of a stream-gaging station requires a stage record, discharge measurements at various stages, and other information pertinent to the computation of the discharge record such as information on channel changes or ice formation. The stage record may be obtained from an automatic water-stage recorder which provides a continuous graphic record, from a digital recorder which punches stage on a paper tape usually at 15-minute intervals, or by reading a nonrecording gage. At many gaging sites which are included in this

report, the automatic gages were inundated and it was necessary to manually record the flood stages at these sites from nonautomatic temporary gages.

Included in this report are data collected at crest-stage stations which are generally on streams having small drainage areas. The primary function of these stations is to provide data pertaining to peak stages and discharges, and consequently a continuous record of discharge throughout the flood period is not available at these sites.

STATION DESCRIPTIONS AND DISCHARGE TABLES

The description of the gaging station gives information concerning location, datum and type of gage, area of the drainage basin, details of gage-height and discharge records, and miscellaneous remarks. The paragraph on discharge records briefly explains the methods used to define the stage-discharge relation over the range in stage that occurred during the flood period, use of auxiliary gages or other methods used to obtain discharge, and conditions that may have affected the stage-discharge relation.

The maximum stage and discharge are given for most stations for the flood period March–May 1965, for the previous period of gaging station record, and for any known maximum floods that occurred outside the period of record. Remarks on cooperation, regulation, and other pertinent information are included where applicable.

The table of daily mean discharge gives data for the period March–May 1965, a sufficient length of time in most cases, to show discharges during antecedent and recession periods. The table also shows the monthly mean discharge, in cubic feet per second, and the runoff, in inches, from the drainage basin.

The table of stages and discharges at indicated times defines the stage and discharge during significant flood flows during the report period so that accurate hydrographs can be drawn.

The stages of most stations were obtained from records of digital or continuous water-stage recorders. For a station with an incomplete record, the gage height for an indicated time may be selected from a graph which has been constructed from supplemental gage readings, high-water marks, and other pertinent information. Description of the methods used in defining the stage are given in the section of the description concerning gage-height record.

The stations are numbered and arranged in downstream order from headwater to mouth, with stations on tributaries inserted in corresponding order following the order in which the tributaries enter the main stream. The reference number in parentheses preceding the name of the gaging station is the same as that used in figure 2 and will aid in identifying the site.

SUMMARY OF FLOOD STAGES AND DISCHARGES

Maximum stages and discharges at stream-gaging stations, crest-stage stations, and miscellaneous sites are summarized in table 9. Most of the column headings are self explanatory. The numbers in the first column correspond to those designating the site in figure 2. Except for a few miscellaneous stations, all stations in the report have permanent station numbers (column 2) as used in the annual streamflow reports of the Geological Survey. Drainage-area determinations are not available for a number of streams.

The first column under maximum previously known floods shows the period prior to March 1965 for which information is available concerning the magnitude of previous floods. The length of this period may exceed that in which continuous records of discharge were obtained. More than one period is shown for some stations differentiating between the period of known maximum stages or discharges and the period of known maximum stages and discharges. At stations where the maximum discharge of the period did not occur simultaneously with the maximum stage, the maxima are given on separate lines and a dash inserted in the respective gage-height or discharge column.

The last column shows the average interval of time in which the peak discharge of the 1965 flood can be expected to be equaled or exceeded once. Whenever the interval exceeds 50 years, the ratio of the peak discharge to the discharge of the 50-year flood for that station is shown.

Table 9.—*Summary of flood stages and discharges*

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Mississippi River main stem									
1	5–2205	Mississippi River below Sandy River near Libby, Minn.	5,060	1930–65	1950	20.02	16,000	Apr. 24	14.50	7,340	4
2	5–2275	Mississippi River at Aitkin, Minn	6,140	1945–65	1950	19.49	20,000	Apr. 26	-------	[a]13,400	13
		Pine River basin									
3	5–2305	Pine River Reservoir at Cross Lake, Minn.	562	1886–1965	1916	18.24	[b]173,600	May 27, 28	13.18	[b]100,800	------
4	5–2310	Pine River at Cross Lake Dam at Cross Lake, Minn.	562	1886–1965	1896	-------	[c]2,250	Apr. 20	-------	[c]1,250	------
		Crow Wing River basin									
5	5–2440	Crow Wing River at Nimrod, Minn	1,010	1910–14, 1930–65	1950 1962	[d]7.64 -------	------- 2,750	Apr. 13	[d]7.57	2,890	22
6	5–2465	Gull Lake near Brainerd, Minn	287	1911–65	1914	7.30	[b]74,800	May 26, 27	6.31	[b]61,800	-------
7	5–2470	Gull River at Gull Lake Dam near Brainerd, Minn.	287	1911–65	1938	-------	[c]1,120	May 27	-------	[c]820	-------
		Mississippi River main stem									
8	5–2670	Mississippi River near Royalton, Minn	11,600	1924–65	1952	-------	[c]29,400	Apr. 16	-------	[c]37,700	[e]1.02
		Platte River basin									
9	5–2679	Hillman Creek near Pierz, Minn	52.6	1964–65	1964	14.55	2,040	Apr. 13	14.68	2,560	-------

		Sauk River basin									
10	5–2705	Sauk River near St. Cloud, Minn	925	1909–13, 1929–65	1951	7.89	5,580	Apr. 13	10.68	9,100	[e]1.82
		Johnson Creek basin									
11	5–2720	Johnson Creek tributary near St. Augusta, Minn.		1964–65	1964	6.45	39	Apr. 12	10.16	274	
12	5–2723	Johnson Creek near St. Augusta, Minn		1964–65	1964	12.85	227	Apr. 12	14.77	682	
		Otsego Creek basin									
13	5–2737	Otsego Creek near Otsego, Minn		1964–65	1964	[d]4.39	23	Apr. 9	[d]8.19		
								Apr. 11		202	
		Elk River basin									
14	5–2742	Stony Brook tributary near Foley, Minn	3.11	1960–65	1962	11.35	132	Apr. 12	[d]11.26	83	
15	5–2747	St. Francis River at Santiago, Minn						Apr. 14	12.17	2,940	
16	5–2749	St. Francis River near Big Lake, Minn						Apr. 16	11.34	2,700	
17	5–2750	Elk River near Big Lake, Minn	615	1911–17, 1931–65	1952	10.36	5,330	Apr. 16	10.86	7,360	[e]1.47
		Mississippi River main stem									
18	5–2755	Mississippi River at Elk River, Minn	14,500	1915–65	1952	14.49	49,200	Apr. 16	17.20	[f]62,000	[e]1.23
		Crow River basin									
19	5–2760	North Fork Crow River near Regal, Minn	215	1943–65	1951	[d]6.73		Apr. 9	6.68	2,630	[e]1.39
					1952		2,120				
20	5–2780	Middle Fork Crow River near Spicer, Minn	179	1949–65	1953		408	Apr. 9	[d]6.29		
					1957	6.67		May 26		343	
21	5–2785	South Fork Crow River at Cosmos, Minn	221	1945–65	1957	12.62	1,890	Apr. 11	13.05	2,130	[e]2.80
22		South Fork Crow River at Hutchinson, Minn.	462					Apr. 11	[g]1,044.10	[h]4,670	38

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Crow River basin—Continued									
23	5–2787	Otter Creek near Lester Prairie, Minn	---	1961–65	1962	[d]8.73	---	Apr. 6	[d]9.97	---	---
					1962	---	348	Apr. 13	---	525	---
24	5–2787.5	Otter Creek tributary near Lester Prairie, Minn.	---	1962–65	1962	10.83	79	Apr. 10	11.14	87	---
25	5–2788.5	Buffalo Creek tributary near Brownton, Minn.	9.45	1961–65	1962	[d]16.16	70	Apr. 7	[d]17.42	---	---
								Apr. 10	---	124	---
26	5–2790	South Fork Crow River near Mayer, Minn	1,170	1910–11, 1934–65	1952	15.70	11,000	Apr. 13	19.23	16,100	[e]2.46
27	5–2790.3	South Fork Crow River tributary near Mayer, Minn.	---	1962–65	1962	[d]6.56	---	Apr. 8	[d]9.06	306	---
28	5–2800	Crow River at Rockford, Minn	2,520	1909–17, 1929–65	1952	16.24	13,900	Apr. 16	19.27	22,400	[e]1.78
29	5–2803	School Lake Creek tributary near St. Michael, Minn.	2.04	1964–65	1964	7.34	---	Apr. 11	12.68	434	---
		Rum River basin									
30	5–2846	Robinson Brook near Onamia, Minn	7.21	1960–65	1963	16.75	232	Apr. 13	[d]15.85	130	---
31	5–2846.2	Rum River tributary near Onamia, Minn	1.84	1960–65	1963	13.37	172	Apr. 13	10.19	96	---
32	5–2847.5	Rum River at Spencer Brook, Minn	---	1960–65	1962	13.12	7,350	Apr. 14	15.36	(i)	---
33	---	Rum River at West Point, Minn	---	1958–65	1962	27.90	6,100	Apr. 16	29.38	[j]10,300	---
34	5–2849.2	Stanchfield Creek tributary near Day, Minn.	1.26	1961–65	1962	8.50	70	Apr. 10	[d]7.39	---	---
								Apr. 12	---	55	---
35	---	Rum River at Isanti, Minn	---	1958–65	1962	12.30	5,200	Apr. 19	16.63	[j]9,400	---
36	5–2860	Rum River near St. Francis, Minn	1,360	1905–06, 1910–13, 1929–65	1952	11.03	9,260	Apr. 20	11.57	10,100	[e]1.11

		Mississippi River main stem									
37	5–2885	Mississippi River near Anoka, Minn	19,100	1931–65	1952	17.51	75,900	Apr. 17	19.53	91,000	[e]1.43
		Bassett Creek basin									
38	---	Bassett Creek at Golden Valley, Minn	---	---	---	---	---	(i)	---	(i)	---
								Apr. 6	[d]4.73	---	---
39	---	Bassett Creek at Fruen Mill, Minneapolis, Minn.	---	1953–56, 1963–65	1954	1.78	122	Apr. 11	2.57	360	---
		Minnehaha Creek basin									
40	5–2895	Minnehaha Creek at Minnetonka Mills, Minn.	130	1953–65	1962	---	235	May 31	6.63	[j]245	---
					1963	[d]6.97	---				
41	---	Minnehaha Creek at 50th St., Edina, Minn	---	---	---	---	---	May 31	[g]885.90	368	---
42	---	Minnehaha Creek at Minnehaha Ave., Minneapolis, Minn.	---	---	---	---	---	May 31	[g]804.43	500	---
		Minnesota River basin									
43	5–2900	Little Minnesota River near Peever, S. Dak.	447	1939–65	1943	[d]13.35	---	May 21	9.48	2,880	7
					1952	---					
44	5–2910	Whetstone River near Big Stone City, S. Dak.	389	1899–1903, 1910–65	1919	26	(i)	Apr. 6	[d]8.57	1,740	4
				1910–12, 1931–65	1952	---	5,710				
45	5–2915	Big Stone Lake at Ortonville, Minn	---	1937–65	1952	12.73	---	May 27	9.30	---	---
46	5–2920	Minnesota River at Ortonville, Minn	1,160	1938–65	1952	12.92	3,060	May 27	9.28	934	---
47	5–2930	Yellow Bank River near Odessa, Minn	398	1939–65	1943	[d]17.98	---	Apr. 8	13.46	3,540	7
					1952	---	6,260				
48	5–2940	Pomme de Terre River at Appleton, Minn	905	1931–65	1952	[k]10.13	5,050	Apr. 9	9.63	2,310	11
49	5–3000	Lac qui Parle River near Lac qui Parle, Minn.	983	1910–14, 1931–65	1948	[d]18.52	---	Apr. 9	[d]19.37	8,370	40
					1952	---	11,100				
50	5–3010	Minnesota River near Lac qui Parle, Minn	4,050	1942–65	1952	37.98	19,700	Apr. 14	36.17	10,700	---
51	5–3045	Chippewa River near Milan, Minn	1,870	1937–65	1952	[d]12.29	---	Apr. 11	11.93	6,770	20
					1952	---	6,930				

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Minnesota River basin—Continued									
52	---------	Chippewa River diversion near Watson, Minn.	---------	1943–65	1952	[d]44.90	[j]4,300	Apr. 12	43.80	3,430	------
53	---------	Chippewa River below diversion dam near Watson, Minn.	---------	1943–65	1952	43.55	[j]3,180	Apr. 12	44.25	3,160	------
54	5–3110	Minnesota River at Montevideo, Minn ------	6,180	1909–65	1952	20.02	24,500	Apr. 14	16.64	12,900	13
55	5–3114	South Branch Yellow Medicine River near Minneota, Minn.	111	1960–65	1960	11.10	1,830	Apr. 6	[d]10.62	1,360	------
56	5–3135	Yellow Medicine River near Granite Falls, Minn.	653	1919–65	1919	17.5	(i)	Apr. 10	9.78	6,820	8
				1931–38, 1940–65	1957	12.41	11,800				
57	5–3150	Redwood River at Marshall, Minn ---------	307	1940–65	1951	11.05	-------	Apr. 6	[d]5.76	-------	------
					1957	-------	5,370	Apr. 9	-------	[a]2,200	8
58	5–3165	Redwood River near Redwood Falls, Minn --	697	1909–14, 1930–65	1957	15.92	19,700	Apr. 8	[d]15.88	-------	------
								Apr. 9	-------	7,050	10
59	5–3167	Spring Creek near Sleepy Eye, Minn -------	30.0	1959–65	1962	15.89	680	Apr. 10	17.79	930	------
60	5–3169	Dry Creek near Jeffers, Minn ------------	3.24	1961–65	1963	10.07	508	Apr. 6	[d]10.64	400	------
61	5–3170	Cottonwood River near New Ulm, Minn-----	1,280	1909–13, 1931–65	1947	16.94	14,200	Apr. 8	[d]20.86	26,000	[e]2.22
					1962	-------					
62	5–3180	East Branch Blue Earth River near Bricelyn, Minn.	132	1951–65	1951	10.68	1,320	Apr. 6	11.70	1,260	[e]1.20
33	5–3181	East Branch Blue Earth River tributary near Blue Earth, Minn.	---------	1960–65	1963	8.57	406	Apr. 6	6.54	187	------
64	5–3183	North Fork Watonwan River near Delft, Minn.	13.1	1960–65	1960	-------	549	Apr. 4	[d]18.42	810	------
					1962	[d]18.00					
65	5–3195	Watonwan River near Garden City, Minn ---	812	1940–45, 1953–65	1953	18.6	17,700	Apr. 7	18.89	19,000	------
											------

66	5–3200	Blue Earth River near Rapidan, Minn	2,430	1909–10, 1939–45, 1949–65	1951	14.97	26,100	Apr. 9	21.36	43,100	[e]2.15
67	5–3203	Cobb River tributary near Mapleton, Minn	7.25	1959–65	1960	22.24	526	Apr. 6	18.60	293	------
68	5–3204	Maple River tributary near Mapleton, Minn.	5.75	1959–65	1960	23.26	445	Apr. 6	[d]21.11	285	------
69	5–3205	LeSueur River near Rapidan, Minn	1,100	1939–45, 1949–65	1960	22.72	21,200	Apr. 8	22.10	24,700	[e]3.30
70	5–3250	Minnesota River at Mankato, Minn	14,900	1881–1965	1881	29.9	90,000	Apr. 10	29.09	94,100	[e]1.49
71	5–3262	Judicial Ditch 1–A near New Sweden, Minn	----------	1962–65	1962	[d]8.70	(i)	Apr. 8	13.35	[j]1,170	------
72	5–3300	Minnesota River near Carver, Minn	16,200	1934–65	1951	-------	64,100	Apr. 11	-------	117,000	[e]1.83
					1952	28.31	-------	Apr. 12	34.37	-------	------
73	5–3301.5	Sand Creek tributary near Montgomery, Minn.	.29	1961–65	1962	[d]10.35	-------	Apr. 6	[d]10.50	43	------
					1964	-------	27				
74	5–3302	Rice Lake tributary near Montgomery, Minn.	2.49	1960–65	1960	13.72	279	Apr. 6	[d]10.96	114	------
75	5–3303	Sand Creek near New Prague, Minn	65	1960–65	1960	14.84	1,100	Apr. 8	14.79	1,070	------
76	5–3305.5	Raven Stream tributary near New Prague, Minn.	23	1960–65	1960	17.34	929	Apr. 7	14.74	505	------
77	----------	Sand Creek at Jordan, Minn	238	1960–65	1960	13.71	8,650	Apr. 8	11.57	3,400	------
78	5–3309	Nine Mile Creek at Bloomington, Minn	----------	1963–65	1964	3.63	199	Apr. 8	4.32	535	------
79	----------	Minnesota River at Interstate Highway 35W at Bloomington, Minn.	----------	------	----	-------	-------	Apr. 15	[g]718.20	[j]120,000	------
		Mississippi River main stem									
80	5–3310	Mississippi River at St. Paul, Minn	36,800	1851–1965	1952	22.02	125,000	Apr. 16	26.01	171,000	[e]1.68
		St. Croix River basin									
81	5–3325	Namekagon River near Trego, Wis	503	1927–65	1941	-------	[c]5,200	Apr. 13	-------	[c]1,640	2
82	5–3331	Little Frog Creek near Minong, Wis	13.6	1961–65	1961	15.06	230	Apr. 15	14.31	190	1
83	5–3335	St. Croix River near Danbury, Wis	1,588	1914–65	1950	8.22	10,200	Apr. 15	[d]6.92	-------	------
								Apr. 19	-------	6,460	5
84	5–3341	Sawyer Creek near Shell Lake, Wis	.8	1960–65	1960	11.61	-------	Apr. 11	13.11	-------	------
85	5–3353.8	Bashaw Brook near Shell Lake, Wis	28.2	1959–65	1960	13.35	172	Apr. 11	14.90	600	2

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		St. Croix River basin—Continued									
86	5–3360	St. Croix River near Grantsburg, Wis	2,820	1923–65	1950	15.06	26,300	Apr. 16	[d]13.01	-------	------
								Apr. 18	-------	16,800	16
87	5–3362	Glaisby Brook near Kettle River, Wis	----------	1959–65	1962	6.17	628	Apr. 18	8.42	2,330	------
88	5–3365.5	Wolf Creek tributary near Sandstone, Minn	----------	1960–65	1962	17.80	121	Apr. 15	19.20	200	------
89	5–3385	Snake River near Pine City, Minn	958	1913–17, 1950–65	1950	(i)	[j]12,500	Apr. 18	9.56	11,500	50
90	5–3395	St. Croix River near Rush City, Minn	5,120	1923–65	1950	19.04	60,000	Apr. 18	[d]15.67	-------	------
91	5–3400	Sunrise River near Stacy, Minn	167	1949–65	1952	7.88	806	Apr. 15	-------	684	17
								May 11	[d]8.20	-------	------
92	5–3405	St. Croix River at St. Croix Falls, Wis	5,930	1902–65	1950	25.19	54,900	Apr. 18	20.98	45,700	25
93	5–3415	Apple River near Somerset, Wis	555	1901–65	1943	-------	[c]2,460	Apr. 13	-------	[c]2,510	9
94	5–3419	Kinnickinnic River tributary at River Falls, Wis.	7.26	1959–65	1959	11.98	-------	Apr. 8	12.14	-------	------
95	----------	St. Croix River at Prescott, Wis	----------	-------	----	-------	-------	Apr. 17	[g]693.11	[j]43,700	------
		Mississippi River main stem									
96	5–3445	Mississippi River at Prescott, Wis	44,800	1928–65	1952	89.03	155,000	Apr. 18	93.11	228,000	[e]1.57
		Vermillion River basin									
97	5–3459	Vermillion River tributary near Hastings, Minn.	14.3	1960–65	1962	18.50	(i)	Apr. 6	21.95	544	------
		Trimbelle Creek basin									
98	5–3466	Little Trimbelle Creek near Bay City, Wis	19.9	1961–65	1962	11.60	810	Apr. 7	12.74	1,700	4

Mississippi River main stem

99	---------	Mississippi River at Lock and Dam 3 near Red Wing, Minn.	---------	1938–65	1952	[gm]684.68 [gn]684.12	151,000	Apr. 18	[gm]688.22 [gn]687.93	228,000	------

Cannon River basin

100	5–3551.5	Pine Creek near Cannon Falls, Minn-------	20.2	1960–65	1962	2.78	133	Apr. 8	7.54	844	------
101	5–3552	Cannon River at Welch, Minn ------------	1,320	1910–14, 1930–65	1952	12.00	15,800	Apr. 8	14.01	36,100	[e]1.54

Chippewa River basin

102	5–3554	Moose Lake near Winter, Wis ------------	225	1926–65	1941	[g]1,375.6	[p]520	May 28	[g]1,374.1	[p]407	------
103	5–3556	Lake Chippewa near Winter, Wis ----------	775	1923–65	1926	[g]1,314.4	[p]11,000	May 19, 20	[g]1,313.0	[p]10,000	------
104	5–3560	Chippewa River at Bishops Bridge near Winter, Wis.	787	1912–65	1941	11.05	[q]7,520	May 19	7.35	[q]2,890	------
105	5–3565	Chippewa River near Bruce, Wis ----------	1,630	1913–65	1941	20.46	[q]25,800	Apr. 15	[d]15.19	[q]12,300	4
106	5–3573	Rest Lake near Manitowish, Wis----------	243	1926–65	1941	108.7	[p]1,054	May 21, 28	108.5	[p]1,010	------
107	5–3574	Flambeau Flowage near Mercer, Wis ------	666	1926–65	1927	[g]1,572.95	[p]6,620	May 11–15	[g]1,572.2	[p]6,052	------
108	5–3585	Flambeau River at Babbs Island near Winter, Wis.	1,000	1929–65	1946	9.45	[q]9,440	Apr. 17	6.03	[q]5,360	------
109	5–3595	South Fork Flambeau River near Phillips, Wis.	615	1929–65	1943	14.32	10,200	Apr. 19	11.64	5,690	4
110	5–3605	Flambeau River near Bruce, Wis ----------	1,897	1951–65	1954	10.90	[q]17,400	Apr. 20	8.19	[q]10,500	------
111	5–3620	Jump River at Sheldon, Wis --------------	574	1915–65	1941	18.8	46,000	Apr. 13	11.59	11,400	9
112	5–3640	Yellow River at Cadott, Wis--------------	351	1942–65	1943	[k]12.15	15,600	Apr. 11	[d]15.6	11,000	18
113	5–3642	Lake Wissota near Chippewa Falls, Wis ----	5,548	1934–65	1941	[g]901.12	[p]4,854	Apr. 16	[g]898.8	[p]4,221	------
114	5–3655	Chippewa River at Chippewa Falls, Wis ----	5,600	1884–1965	1884	[k]26.94	(i)	Apr. 16	16.47	[q]44,700	3
				1888–1965	1941	24.8	[q]102,000				
115	5–3665	Eau Claire River near Fall Creek, Wis----	758	1943–55, 1958–65	1955	16.11	17,200	Apr. 11	12.6	10,600	4
116	5–3670.3	Willow Creek near Eau Claire, Wis --------	4.38	1958–65	1959	14.12	(i)	Apr. 9	12.7	180	1
117	5–3671	Birch Lake at Birchwood, Wis------------	68	1928–65	1943	119.4	[p]1,061	Apr. 23	118.0	[p]824	------

See footnotes at end of table.

Table 9.— *Summary of flood stages and discharges*-- Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Chippewa River basin—Continued									
118	5–3672	Red Cedar Lake at Mikara, Wis	161	1928–65	1943, 1960	111.6	p779	Apr. 23	111.3	p740	------
119	5–3673	Long Lake near Brill, Wis	82	1928–65	1928	6.8	p565.1	May 28	6.3	p476	------
120	5–3674	Bear Lake at Haugen, Wis	60	1928–65	1928	90.8	p359.8	May 21	89.3	p230	------
121	5–3674.8	East Branch Pine Creek tributary near Dallas, Wis.	3.85	1960–65	1960	18.75	----------	Apr. 10	13.71	--------	------
122	5–3675	Red Cedar River near Colfax, Wis	1,100	1914–65	1934	k11.4	q21,900	Apr. 12	7.99	q16,200	50
123	5–3677	Lightning Creek at Almena, Wis	19.8	1958–65	1960	11.99	1,050	Apr. 11	12.18	1,200	2
124	5–3680	Hay River at Wheeler, Wis	426	1915–65	1934	16.6	(i)	Apr. 11	14.65	10,900	22
				1950–65	1953	12.36	6,700				
125	5–3690	Red Cedar River at Menomonie, Wis	1,760	1907–08, 1913–23, 1925–65	1934	16.0	q40,000	Apr. 12	11.56	q28,700	e1.24
126	5–3695	Chippewa River at Durand, Wis	9,010	1884	1884	18.4	(i)	Apr. 9	d13.68	--------	------
				1928–65	1954	15.40	q101,000	Apr. 14	13.36	q66,200	5
127	5–3700	Eau Galle River at Spring Valley, Wis	64.8	1894–1965	1942	18.98	f33,000	Apr. 10	10.50	4,130	7
128	5–3706	Arkansaw Creek tributary near Arkansaw, Wis.	2.56	1959–65	1962	12.80	----------	Apr. 10	13.37	-------	------
129	5–3709	Spring Creek near Durand, Wis	6.49	1962–65	1963	13.28	(i)	Apr. 7	12.92	390	1
		Mississippi River main stem									
130	---------	Mississippi River at Lock and Dam 4 near Alma, Wis.	---------	1935–65	1952	gm673.30 gn672.30	187,000 -------	Apr. 19	gm676.45 gn675.78	256,000 -------	------ ------

		Zumbro River basin										
131	5–3730	South Fork Zumbro River near Rochester, Minn.	304	1908–65	1962	18.46	18,000	Mar. 1	19.12	19,600	[e]1.16
132	5–3737	North Fork Zumbro River tributary near Wanamingo, Minn.	9.36	1960–65	1962	[d]18.14	(i)	Mar. 1	[d]14.81	-------	------
								Apr. 7	-------	870	------
133	5–3740	Zumbro River at Zumbro Falls, Minn-----	1,130	1888–1965	1951	30.80	35,900	Mar. 2	28.40	29,600	29
		Whitewater River basin										
134	5–3765	South Fork Whitewater River near Altura, Minn.	76.8	1939–65	1947	10.61	5,460	Mar. 1	[d]8.14	-------	------
								Apr. 7	-------	2,360	2
		Mississippi River main stem										
135	---------	Mississippi River at Lock and Dam 5 near Minneiska, Minn.	---------	1935–65	1952	[gm]664.59 [g n]663.84	190,500 -------	Apr. 19	[gm]668.73 [g n]667.85	263,500 -------	------ ------
		Waumandee Creek basin										
136	5–3782	Eagle Creek near Fountain City, Wis------	26.8	1961–65	1961	14.32	930	Apr. 7	14.82	1,060	2
		Mississippi River main stem										
137	5–3785	Mississippi River at Winona, Minn--------	59,200	1880–1965	1952	17.91	190,000	Apr. 19	20.77	268,000	[e]1.34
		Gilmore Creek basin										
138	5–3790	Gilmore Creek at Winona, Minn ----------	8.95	1939–65	1951	9.47	5,360	Apr. 7	[d]4.65	436	------
		Trempealeau River basin										
139	5–3794	Trempealeau River at Arcadia, Wis-------	552	1960–65	1961	6.85	7,840	Mar. 2	[d]8.04	-------	------
								Apr. 6	-------	9,740	4
140	5–3795	Trempealeau River at Dodge, Wis --------	643	1913–19, 1934–65	1956	10.35	17,400	Apr. 7	9.40	12,100	7

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Black River basin									
141	5–3809	Poplar River near Owen, Wis	159	1958–65	1958	19.46	8,250	Apr. 11	17.95	5,750	4
142	5–3810	Black River at Neillsville, Wis	756	1905–09, 1913–65	1938	23.8	48,800	Apr. 12	15.28	18,300	3
143	5–3820	Black River near Galesville, Wis	2,120	1931–65	1938	14.31	[r]58,000	Apr. 13	13.60	[q]33,000	3
		La Crosse River basin									
144	5–3830	La Crosse River near West Salem, Wis	398	1913–65	1935	12.2	[s]8,200	Mar. 3	8.76	2,610	2
		Mississippi River main stem									
145	5–3835	Mississippi River at La Crosse, Wis	62,800	1880–1965	1880	16.5	(i)	Apr. 22	17.96	278,000	[e]1.34
				1929–65	1952	15.32	196,000				
		Root River basin									
146	5–3837	Mill Creek tributary near Chatfield, Minn	2.36	1959–65	1960	15.46	703	Mar. 1	[d]15.1	-------	------
								Apr. 6	---------	506	------
147	5–3838.5	Bear Creek near Grand Meadow, Minn	13.6	1962–65	1962	21.18	3,730	Apr. 6	18.2	885	------
148	----------	South Branch Root River at Preston, Minn	188	1940–41, 1961	1941	[g]939.19	(i)	Mar. 1	[d g]938.78	(i)	------
149	----------	South Branch Root River at Lanesboro, Minn	297	1940–65	1950	19.2	21,000	Mar. 1	[d]14.30	(i)	------
								Apr. 6	---------	4,300	------
150	5–3840	Root River near Lanesboro, Minn	615	1910–17, 1940–65	1962	16.11	22,100	Mar. 1	[d]17.83	19,000	19
151	----------	Root River near Rushford, Minn	1,010	1952–65	1952	(i)	[k]34,600	Mar. 2	[d]44.08	(i)	------

152	5–3845	Rush Creek near Rushford, Minn.	129	1942–65	1950	13.54	11,600	Apr. 6	9.06	5,490	5
153	5–3850	Root River near Houston, Minn	1,270	1909–17, 1929–65	1952	---	37,000	Mar. 2	[d]18.32	31,000	30
					1961	15.10	---				
154	5–3855	South Fork Root River near Houston, Minn	275	1950, 1953–65	1961	[d]13.74	---	Mar. 2	[d]13.64	6,530	3
					1962	---	8,420				
155	5–3860	Root River below South Fork near Houston, Minn.	1,560	1938–65	1952	17.58	38,700	Mar. 2	[d]18.50	37,500	36
		Mormon Creek basin									
156	5–3863	Mormon Creek near La Crosse, Wis	25.5	1961–65	1961	11.57	---	Apr. 2	11.0	---	---
		Bad Axe River basin									
157	5–3871	North Fork Bad Axe River near Genoa, Wis.	80.7	1959–65	1959	18.62	---	Mar. 5	15.91	---	---
		Upper Iowa River basin									
158	5–3875	Upper Iowa River at Decorah, Iowa	511	1913–65	1941	[k]15.19	[k]28,500	Mar. 2	9.89	9,800	4
		Mississippi River main stem									
159	---	Mississippi River at Lansing, Iowa	66,280	---	---	---	---	Apr. 24	634.8	[j]272,000	---
		Wexford Creek basin									
160	5–3884	Wexford Creek near Harpers Ferry, Iowa	11.9	1953–65	1962	7.03	2,290	---	(s)	---	---
		Paint Creek basin									
161	5–3885	Paint Creek at Waterville, Iowa	42.8	1951–65	1951	17.35	9,100	Mar. 1	[d]7.60	---	---
								Apr. 3	---	1,920	2
162	5–3886	Paint Creek near Waterville, Iowa	56.0	1951–65	1951	17.00	10,800	Apr. 3	[d]10.35	2,190	2
163	5–3887	Little Paint Creek tributary near Waterville, Iowa.	1.09	1953–65	1959	4.34	404	---	(s)	---	---

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Mississippi River main stem									
164	5–3895	Mississippi River at McGregor, Iowa	67,500	1828–1965	1880	21.0	(i)	Apr. 24	-------	[c]276,000	[e]1.28
								Apr. 24	25.38	------	-------
				1936–65	1952	-------	197,000				
					1952	20.89	-------				
		Wisconsin River basin									
165	5–3901	Lac Vieux Desert near Land O'Lakes, Wis	28	1938–65	1951	2.56	[p]556	May 16	2.05	[p]444	-------
166	5–3901.5	Twin Lakes near Phelps, Wis	26	1938–65	1947	2.44	[p]330	May 16, 30	2.17	[p]286	-------
167	5–3902	Buckatabon Lake near Conover, Wis	14	1938–65	1943	3.62	[p]128	May 16	3.58	[p]126	-------
168	5–3902.5	Sevenmile Lake near Eagle River, Wis	14	1938–65	1953, 1961	4.67	[p]89	May 16	4.75	[p]91	-------
169	5–3903	Lower Ninemile Lake near Eagle River, Wis	25	1938–65	1961	6.25	[p]130	May 16	6.42	[p]136	-------
170	5–3903.5	Burnt Rollways Reservoir near Eagle River, Wis.	129	1938–65	(t)	1.50	[p]779	May 9,16, 23,30	1.50	[p]779	-------
171	5–3904	Long Lake near Phelps, Wis	35	1938–65	1953	3.42	[p]332	May 16	3.75	[p]371	-------
172	5–3906	Deerskin Lake near Eagle River, Wis	5	1938–65	(t)	2.00	[p]22	May 16	1.42	[p]14	-------
173	5–3906.5	Sugar Camp Reservoir near Eagle River, Wis.	59	1938–65	(t)	6.50	[p]471	May 9	6.50	[p]471	-------
174	5–3907	Little St. Germaine Lake near Eagle River, Wis.	19	1938–65	1941	3.08	[p]83	May 16	3.08	[p]83	-------
175	5–3907.5	Big St. Germaine Lake near Lake Tomahawk, Wis.	69	1938–65	1946	3.50	[p]202	May 9	3.42	[p]196	-------
176	5–3908	Pickerel Lake near Lake Tomahawk, Wis	78	1938–65	(t)	9.33	[p]306	May 16	9.00	[p]290	-------
177	5–3909	Rainbow Lake near Lake Tomahawk, Wis	740	1936–65	1951	28.08	[p]2,197	May 16	28.00	[p]2,181	-------

178	5–3911	Pelican Lake near Pelican Lake, Wis	22	1938–65	1939	2.17	P331	May 16	1.92	P292	
179	5–3913	North Pelican Lakes near Rhinelander, Wis	71	1938–65	1945	.65	P177	Apr. 25	.38	P160	
180	5–3921	Minocqua Lake near Minocqua, Wis	89	1938–65	1950	.47	P619	May 30	.00	P484	
181	5–3922	Squirrel Lake near Minocqua, Wis	17	1938–65	1951	4.12	P193	May 16, 23, 30	3.92	P175	
182	5–3923	Willow Reservoir near Hazelhurst, Wis	327	1938–65	1954	23.54	P3,316	May 23	23.25	P3,222	
183	5–3925	Lake Nokomis at Bradley, Wis	548	1938–65	1959	15.23	P1,852	May 16	14.92	P1,792	
184	5–3936	Spirit River Flowage near Tomahawk, Wis	174	1938–65	1953	17.04	P760	May 2	16.96	P752	
185	5–3945	Prairie River near Merrill, Wis	181	1914–31, 1939–65	1941	9.45	5,800	Apr. 12	6.60	2,530	6
186	5–3950	Wisconsin River at Merrill, Wis	2,780	1902–65	1941	18.26	q49,400	May 18	9.79	q12,300	2
187	5–3961	Scotch Creek tributary near Edgar, Wis	7.1	1962–65	1962	14.07	460	Apr. 11	16.67	1,380	
188	5–3975	Eau Claire River at Kelly, Wis	326	1914–26, 1939–65	1926	8.4	8,300	Apr. 12	10.04	6,980	e1.08
189	5–3980	Wisconsin River at Rothschild, Wis	4,000	1941	1941	22.3	q75,000	Apr. 12	18.46	q49,200	12
				1944–65	1959	17.81	q47,000				
190	5–3995	Big Eau Pleine River near Stratford, Wis	224	1914–25, 1937–65	1938	24.5	41,000	Apr. 11	18.43	13,700	7
191	5–3996	Big Eau Pleine River Reservoir near Knowlton, Wis.	365	1938–65	1959	31.62	P4,496	May 16	31.50	P4,457	
192	5–4002.95	Lake Dubay near Stevens Point, Wis	4,890					Apr. 13	g1,117.52	P5,120	
193	5–4008	Wisconsin River at Wisconsin Rapids, Wis	5,400	1914–50, 1957–65	1938	19.10	q70,400	Apr. 13		q64,000	10
194	5–4014	Petenwell Flowage near Necedah, Wis	5,860	1950–65	1954	136.05	P19,926	Apr. 17	136.08	P19,954	
195	5–4020	Yellow River at Babcock, Wis	223	1944–65	1952	17.38	11,600	Apr. 12	14.61	6,320	4
196	5–4032	Castle Rock Flowage near Mauston, Wis	6,860	1950–65	1954	94.20	P7,786	Apr. 18	94.20	P7,786	
197	5–4035	Lemonweir River at New Lisbon, Wis	500	1944–65	1960	12.94	6,880	Apr. 13	10.45	3,000	3
198	5–4040	Wisconsin River near Wisconsin Dells, Wis	7,830	1934–65	1938	23.83	q72,200	Apr. 15	18.95	q50,200	4
199	5–4050	Baraboo River near Baraboo, Wis	600	1913–22, 1942–65	1917	k17.5	7,900	Mar. 6	d19.8	4,500	7
200	5–4070	Wisconsin River at Muscoda, Wis	10,300	1902–03, 1913–65	1938	11.48	q80,800	Apr. 18	8.95	q48,500	3
201	5–4074	Morris Creek tributary near Norwalk, Wis	4.67	1960–65	1959	13.10	950	Apr. 2	11.80	490	14
202	5–4080	Kickapoo River at La Farge, Wis	266	1938–65	1950	d12.90		Mar. 2	d12.78	3,600	3
					1961		7,040				
203	5–4105	Kickapoo River at Steuben, Wis	690	1933–65	1961	12.33	10,800	Mar. 4	d11.18	6,500	4
204		Wisconsin River at Bridgeport, Wis	11,700					Apr. 19		r44,600	2

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Turkey River basin									
205	5–4116	Turkey River at Spillville, Iowa	177	1947	1947	18.4	10,000	Mar. 1	--------	3,900	-------
				1956–65	1962	15.32	7,380	Mar. 1	[d]16.11	------	2
206	5–4116.5	Crane Creek tributary near Saratoga, Iowa	4.06	1953–65	1962	6.32	1,830	Apr. 8	[d]5.70	800	4
207	5–4117	Crane Creek near Lourdes, Iowa	75.8	1953–65	1962	15.70	11,900	Mar. 1	[d]12.6	1,000	1
208	5–4125	Turkey River at Garber, Iowa	1,545	1890–1965	1922	28.06	32,300	Mar. 1	22.1	------	-------
								Apr. 1	-------	13,800	2
		Grant River basin									
209	5–4135	Grant River at Burton, Wis	267	1934–65	1950	24.82	25,000	Mar. 1	--------	7,000	2
								Mar. 6	[d]22.71	------	-------
		Platte River basin									
210	5–4140	Platte River near Rockville, Wis	139	1934–65	1950	17.26	43,500	Feb. 28	[d]10.86	3,000	1
		Little Maquoketa River basin									
211	5–4145	Little Maquoketa River near Durango, Iowa	130	1925–65	1925	22.1	29,000	Feb. 28	16.41	8,860	4
		Mississippi River main stem									
212	--------	Mississippi River at Dubuque, Iowa	81,600	1865–1965	1951, 1952	22.7	(i)	Apr. 26	26.71	304,000	[e]1.32
		Galena River basin									
213	5–4150	Galena River at Buncombe, Wis	128	1937–65	1937	17.1	18,000	Mar. 31	11.82	3,800	1

		Maquoketa River basin									
214	5–4170	Maquoketa River near Manchester, Iowa	305	1925–65	1925	(i)	25,400	Mar. 1	[d]12.77	------	-------
				1933–65	1947	21.36	20,000	Apr. 1	-------	5,150	2
215	5–4177	Bear Creek near Monmouth, Iowa	61.3	1944–65	1944	21.5	(i)	Mar. 29	[d]8.86	------	-------
				1957–65	1960	11.56	2,440	May 25	-------	846	1
216	5–4185	Maquoketa River near Maquoketa, Iowa	1,553	1913–65	1944	24.70	48,000	Apr. 1	12.45	9,880	2
		Apple River basin									
217	5–4190	Apple River near Hanover, Ill	244	1934–65	1946	[d]26.12	---------	Apr. 1	14.22	4,240	2
					1946	-------	12,000				
		Plum River basin									
218	5–4200	Plum River below Carroll Creek near Savanna, Ill.	231	1940–65	1946	28.74	11,600	Apr. 1	22.11	1,740	1
		Mississippi River main stem									
219	5–4205	Mississippi River at Clinton, Iowa	85,600	1873–1965	1880	-------	[c]250,000	Apr. 28	-------	[c]307,000	[e]1.31
					1880	14.5	---------	Apr. 28	24.65	------	-------
		Wapsipinicon River basin									
220	5–4205.6	Wapsipinicon River near Elma, Iowa	95.2	1958–65	1962	[d]14.84	5,700	Mar. 1	[d]14.08	------	-------
								Apr. 8	-------	2,430	2
221	5–4206	Little Wapsipinicon River tributary near Riceville, Iowa.	.90	1953–65	1962	5.03	703	Apr. 8	[d]4.55	230	-------
222	5–4206.2	Little Wapsipinicon River near Acme, Iowa	7.76	1953–65	1962	9.02	2,380	Mar. 1	[d]6.8	210	1
223	5–4206.4	Little Wapsipinicon River at Elma, Iowa	37.3	1953–65	1962	12.53	5,740	Mar. 1	[d]8.4	450	1
224	5–4210	Wapsipinicon River at Independence, Iowa	1,048	1901–65	1947	18.74	21,500	Apr. 7	12.19	8,880	3
225	5–4220	Wapsipinicon River near De Witt, Iowa	2,330	1934–65	1944	12.07	26,000	Apr. 14	11.05	10,200	2
		Mississippi River main stem									
226	-------	Mississippi River at Davenport, Iowa	88,500	1860–1965	1892	19.4	(i)	Apr. 28	22.48	(i)	-------

See footnotes at end of table.

Table 9.— *Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Rock River basin									
227	5–4465	Rock River near Joslin, Ill	9,520	1892–1965	1948	[d]16.23	(i)	Apr. 8	13.12	21,700	2
				1939–65	1948	14.46	46,200				
228	5–4475	Green River near Geneseo, Ill	958	1936–65	1965	[d]16.65	----------	Apr. 25	10.57	3,980	1
					1954	----------	8,900				
229	----------	Rock River at Moline, Ill	10,630	-------	----	----------	----------	Apr. 29	[r]12.57	[r]15,600	1
230	5–4480	Mill Creek at Milan, Ill	62.5	1939–65	1954	9.36	8,980	Apr. 24	11.53	9,060	[e]1.52
		Iowa River basin									
231	5–4486	East Branch Iowa River above Hayfield, Iowa.	2.23	1953–65	1954	7.15	209	Apr. 6	[d]7.31	250	--------
232	5–4487	East Branch Iowa River near Hayfield, Iowa.	7.94	1952–65	1954	13.01	457	Apr. 6	[d]13.67	370	--------
233	5–4488	East Branch Iowa River near Garner, Iowa	45.1	1952–65	1961	12.81	1,120	Apr. 6	[d]12.89	1,000	12
234	5–4489	East Branch Iowa River tributary near Garner, Iowa.	5.98	1952–65	1954	6.71	206	Apr. 6	[d]9.15	170	--------
235	5–4490	East Branch Iowa River near Klemme, Iowa	133	1948–65	1954	[k]11.2	5,960	Apr. 6	[d]10.67	-------	--------
								Apr. 8	-------	4,090	[e]1.33
236	5–4495	Iowa River near Rowan, Iowa	429	1940–65	1954	14.88	8,460	Apr. 6	[d]14.62	-------	--------
								Apr. 7	-------	6,700	[e]1.05
237	5–4515	Iowa River at Marshalltown, Iowa	1,564	1902–03, 1914–27, 1932–65	1918	17.74	42,000	Apr. 6	17.63	17,400	12
238	5–4517	Timber Creek near Marshalltown, Iowa	118	1947–65	1947	16.8	(i)	Apr. 1	[d]15.07	-------	--------
				1949–65	1950	15.77	4,940	Apr. 24	-------	3,130	2

239	5–4519	Richland Creek near Haven, Iowa	56.1	1918	1918	14.3	(i)	Apr. 24	9.98	2,090	2
				1949–65	1960	12.39	3,650				
240	5–4520	Salt Creek near Elberon, Iowa	201	1944–65	1944	19.9		Apr. 1	15.75	4,680	3
					1947		35,000				
241	5–4522	Walnut Creek near Hartwick, Iowa	70.9	1947–65	1947	17.7	(i)	Mar. 30	14.59	2,700	3
				1949–65	1958	15.67	4,930				
242	5–4530	Big Bear Creek at Ladora, Iowa	189	1945–65	1960	14.60	10,500	Mar. 30	[d]11.77		
								Apr. 1		3,580	2
243	5–4531	Iowa River at Marengo, Iowa	2,794	1956–65	1960	19.21	30,800	Apr. 7	17.84	19,900	3
244	5–4535.1	Coralville Reservoir near Coralville, Iowa	3,115	1958–65	1960	[g]706.77	[b]368,000	May 5	[g]708.50	[b]403,600	
245	5–4540	Rapid Creek near Iowa City, Iowa	24.6	1937–65	1962	13.64	5,200	May 23	14.10	6,100	[e]1.37
246	5–4543	Clear Creek near Coralville, Iowa	98.1	1952–65	1962	13.31	5,390	Apr. 24	12.50	4,060	4
247	5–4545	Iowa River at Iowa City, Iowa	3,271	1850–1965	1851	[f]24.1	[f]70,000	Apr. 24	11.74	[q]11,100	1
				1881–1965	1881	[k]21.1	51,000				
248	5–4550	Ralston Creek at Iowa City, Iowa	3.01	1924–65	1956	9.06	1,690	Apr. 24	4.25	198	1
249	5–4550.1	South Branch Ralston Creek at Iowa City, Iowa.	3.20	1963–65	1964	3.47	126	Apr. 24	6.57	652	
250	5–4555	English River at Kalona, Iowa	573	1930	1930	19.9	18,500	Apr. 25	17.65	9,300	3
				1939–65	1960	19.89	18,500				
251	5–4557	Iowa River near Lone Tree, Iowa	4,293	1944–65	1944	19.94	(i)	Apr. 24	16.92	[q]21,700	2
				1956–65	1960	17.90	[q]28,100				
252	5–4570	Cedar River near Austin, Minn.	425	1909–14, 1944–65	1950	17.81		Mar. 1	[d]18.87	9,400	5
					1962		9,530				
253	5–4577	Cedar River at Charles City, Iowa	1,054	1961–65	1961	21.6	29,200	Mar. 2	[d]21.64		
								Apr. 7		21,000	11
254	5–4580	Little Cedar River near Ionia, Iowa	306	1954–65	1961	15.58	10,800	Apr. 6	12.11	6,250	3
255	5–4585	Cedar River at Janesville, Iowa	1,661	1904–06, 1914–27, 1932–42, 1945–65	1961	16.33	37,000	Mar. 3	[d]16.33		
								Apr. 7		29,200	14
256	5–4589	West Fork Cedar River at Finchford, Iowa	846	1945–65	1951	17.28	31,900	Apr. 7	15.91	16,700	30
257	5–4590	Shell Rock River near Northwood, Iowa	300	1945–65	1961	[d]11.68	3,000	Apr. 8	[d]12.07	3,400	[e]1.03
258	5–4595	Winnebago River at Mason City, Iowa	526	1932–65	1933	[k]15.7	10,800	Apr. 11	14.27	9,700	34
259	5–4620	Shell Rock River at Shell Rock, Iowa	1,746	1956	1856	17.7	45,000	Apr. 7	15.09	24,400	7
				1953–65	1961	16.26	33,500				
260	5–4630	Beaver Creek at New Hartford, Iowa	347	1945–65	1947	13.5	18,000	Apr. 6	11.80	9,610	32

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
Iowa River basin—Continued											
261	5–4635	Blackhawk Creek at Hudson, Iowa	303	1952–65	1960	[d]16.93	9,000	Apr. 6	16.35	7,500	16
262	5–4640	Cedar River at Waterloo, Iowa	5,146	1940–65	1961	21.86	76,700	Apr. 8	21.67	69,500	34
263	5–4641.33	Half Mile Creek near Gladbrook, Iowa	1.33	1962–65	1963	6.84	126	Apr. 1	5.22	43.2	-------
264	5–4641.37	Four Mile Creek near Traer, Iowa	19.51	1962–65	1963	11.24	287	Mar. 1	--------	600	2
								Mar. 31	[d]12.30	----------	-------
265	5–4645	Cedar River at Cedar Rapids, Iowa	6,510	1902–65	1929	20.0	---------	Apr. 10	18.51	66,800	19
					1961	---------	73,000				
266	---------	Cedar River near Rochester, Iowa	7,245	1961–65	1961	[g]652.08	71,700	Apr. 11	[g]651.86	67,200	16
267	5–4650	Cedar River near Conesville, Iowa	7,785	1939–65	1961	16.62	70,800	Apr. 12	16.85	68,100	15
268	5–4655	Iowa River at Wapello, Iowa	12,499	1914–65	1947	---------	94,000	Apr. 13	17.25	[q]70,800	12
					1960	17.02	---------				
Edwards River basin											
269	5–4665	Edwards River near New Boston, Ill	434	1934–65	1950, 1951, 1954	--------- 21.46	7,280 ---------	Apr. 26	20.51	6,450	7
Pope Creek basin											
270	5–4670	Pope Creek near Keithsburg, Ill	171	1934–65	1937	[d]28.0	---------	Apr. 25	25.28	2,290	2
					1939	---------	4,230				
Henderson Creek basin											
271	5–4690	Henderson Creek near Oquawka, Ill	428	1934–65	1950	28.17	16,500	Apr. 26	24.84	4,280	1

		Mississippi River main stem									
272	---------	Mississippi River at Burlington, Iowa ------	114,000	1851–1965	1851	18.9	(i)	Apr. 30 May 1	21.0	(i)	------
		Skunk River basin									
273	5–4700	South Skunk River near Ames, Iowa --------	315	1920–27, 1932–65	1944 1954	13.90 ---------	--------- 8,630	Apr. 6	9.43	5,260	5
274	5–4710	South Skunk River below Squaw Creek near Ames, Iowa.	556	1944 1952–65	1944 1960	13 13.20	10,000 9,260	Apr. 6	12.59	7,340	5
275	5–4712	Indian Creek near Mingo, Iowa ----------	276	1944 1958–65	1944 1960	21.4 15.07	(i) 5,860	Apr. 6	14.32	4,610	5
276	5–4715	South Skunk River near Oskaloosa, Iowa ----	1,635	1944–65	1944	25.8	37,000	Apr. 9	19.87	11,200	3
277	5–4725	North Skunk River near Sigourney, Iowa ----	730	1945–65	1960	25.33	27,500	Mar. 17	[d]18.14	---------	------
								Apr. 8	--------	4,620	2
278	5–4735	Big Creek near Mount Pleasant, Iowa ------	106	1948 1955–65	1948 1960	27 15.30	(i) 4,460	Mar. 17	12.07	2,580	5
279	5–4740	Skunk River at Augusta, Iowa----------	4,303	1913–65	1960	25.00	51,000	Mar. 18	16.99	20,300	2
		Mississippi River main stem									
280	5–4745	Mississippi River at Keokuk, Iowa ---------	119,000	1851–1965	1851	21.0	360,000	May 1	--------	[c]327,000	[e]1.12
								May 1	22.14	---------	------
		Des Moines River basin									
281	---------	West Fork Des Moines River below Talcott Dam near Dundee, Minn.	---------	1963–65	1963	8.22	1,000	Apr. 7	11.51	4,700	------
282	5–4758	West Fork Des Moines River tributary near Jackson, Minn.	1.42	1960–65	1962	[d]16.34	69	Apr. 5	[d]17.86	38	------
283	5–4759	West Fork Des Moines River tributary near Lakefield, Minn.	4.52	1960–65	1962	[d]8.86	---------	Apr. 1	[d]10.65	---------	------
					1963	---------	119	Apr. 5	--------	112	------
284	5–4760	West Fork Des Moines River at Jackson, Minn.	1,220	1909–13, 1930–65	1953	17.43	8,360	Apr. 6	[d]18.62	---------	------
								Apr. 9	[d](i)	9,530	[e]1.23
285	5–4761	Story Brook near Petersburg, Minn -------	---------	1960–65	1962	[d]14.17	---------	Apr. 4	[d]18.58	---------	------
					1962	---------	2,110	Apr. 6	--------	1,200	------
286	5–4765	West Fork Des Moines River at Estherville, Iowa.	1,372	1951–65	1953	15.53	10,800	Apr. 10	15.61	10,200	[e]1.17
287	---------	West Fork Des Moines River near Emmetsburg, Iowa.	1,672	-------	-----	---------	---------	Apr. 11	[g]1,206.83	12,000	[e]1.08
288	---------	West Fork Des Moines River near Ottosen, Iowa.	2,018	-------	-----	---------	---------	Apr. 12	[g]1,136.68	14,000	[e]1.03
289	5–4767.5	West Fork Des Moines River at Humboldt, Iowa.	2,256	1940–65	1947	12.2	11,000	Apr. 8	13.90	14,400	43

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Des Moines River basin—Continued									
290	5–4780	East Fork Des Moines River near Burt, Iowa.	462	1951–65	1954	12.67	3,870	Apr.. 6	[d]14.21	5,000	50
291	----------	East Fork Des Moines River at Algona, Iowa.	882	-------	-----	--------	-------	Apr. 9	[g]1,118.78	11,400	50
292	5–4790	East Fork Des Moines River at Dakota City, Iowa.	1,308	1940–65	1954	24.02	17,400	Apr. 9	23.13	15,700	[e]1.03
293	5–4800	Lizard Creek near Clare, Iowa----------	257	1940–65	1947	16.0	10,000	Apr. 4	[d]11.61	-------	-------
								Apr. 7	--------	4,670	6
294	5–4805	Des Moines River at Fort Dodge, Iowa ------	4,190	1905–06,	1947	19.62	--------	Apr. 8	17.79	35,600	17
				1913–27, 1946–65	1954	--------	35,400				
295	5–4810	Boone River near Webster City, Iowa -------	844	1896–1965	1918	19.1	21,500	Apr. 6	15.91	15,200	21
296	5–4815	Des Moines River near Boone, Iowa---------	5,511	1920–65	1954	25.35	57,400	Apr. 9	22.89	51,600	37
297	5–4816.5	Des Moines River near Saylorville, Iowa ----	5,841	1893–1965	1954	24.5	60,000	Apr. 10	24.02	47,400	23
298	5–4821.7	Big Cedar Creek near Varina, Iowa---------	80.0	1959–65	1962	[d]14.49	--------	Apr. 6	[d]15.05	-------	-------
					1962	--------	2,080	Apr. 8	--------	1,060	2
299	5–4823	North Raccoon River near Sac City, Iowa----	713	1958–65	1962	18.12	10,800	Apr. 6	[d]15.59	6,960	4
300	5–4825	North Raccoon River near Jefferson, Iowa---	1,619	1940–65	1947	22.3	29,100	Apr. 4	[d]15.59	-------	-------
								Apr. 5	--------	9,890	3
301	5–4830	East Fork Hardin Creek near Churdan, Iowa.	24.0	1952–65	1960	8.92	413	Mar. 31	[d]8.28	-------	--------
								Mar. 31	--------	300	1
302	5–4836	Middle Raccoon River at Panora, Iowa ------	440	1953	1953	14.3	14,000	Mar. 2	[d]11.54	-------	--------
				1958–65	1958	11.87	9,150	Mar. 17	--------	6,890	6
303	5–4840	South Raccoon River at Redfield, Iowa ------	988	1940–65	1958	29.04	35,000	Mar. 17	19.60	15,800	18

304	5–4845	Raccoon River at Van Meter, Iowa	3,441	1915–65	1947	--------	41,200	Apr. 6	18.35	22,300	5
					1958	21.77	--------				
305	5–4855	Des Moines River below Raccoon River at Des Moines, Iowa.	9,879	1893–1965	1947	[k]20.8	77,000	Apr. 11	29.78	65,500	19
306	5–4860	North River near Norwalk, Iowa	349	1940–65	1947	25.3	32,000	Mar. 18	[d]22.86	8,000	16
307	5–4864.9	Middle River near Indianola, Iowa	503	1940–65	1947	28.27	34,000	Mar. 17	--------	9,700	4
								Apr. 6	21.00	-------	--------
308	5–4874.7	South River near Ackworth, Iowa	460	1940–65	1947	[k]24.60	34,000	Mar. 17	25.47	12,100	7
309	5–4879.8	White Breast Creek near Dallas, Iowa	342	1962–65	1962	28.87	[f]12,000	Mar. 17	22.49	6,640	3
310	5–4885	Des Moines River near Tracy, Iowa	12,479	1851–1965	1947	26.5	155,000	Apr. 11	23.17	77,300	10
311	5–4890	Cedar Creek near Bussey, Iowa	374	1946–65	1946	--------	31,500	Mar. 18	20.51	6,500	3
					1958	28.06	--------				
312	5–4895	Des Moines River at Ottumwa, Iowa	13,374	1850–1965	1947	[k]20.2	--------	Apr. 11	18.33	78,600	9
				1903–65	1903	[k]19.4	[f]140,000				
313	5–4905	Des Moines River at Keosauqua, Iowa	14,038	1903–06, 1910–65	1903	27.85	146,000	Apr. 12	19.36	79,800	9
314	5–4910	Sugar Creek near Keokuk, Iowa	105	1905–65	1905	20.6	[f]33,000	Apr. 6	12.65	4,580	5
		Fox River basin									
315	5–4943	Fox River at Bloomfield, Iowa	87.7	1953–65	1960	24.02	8,600	Apr. 8	19.67	5,060	8
316	5–4950	Fox River at Wayland, Mo	400	1922–65	1933	21.53	25,000	Apr. 6	15.97	5,370	2
		Bear Creek basin									
317	5–4955	Bear Creek near Marcelline, Ill	348	1944–65	1951	26.07	21,200	Apr. 6	19.46	11,400	2
		Wyaconda River basin									
318	5–4960	Wyaconda River above Canton, Mo	393	1932–65	1933	30.00	17,700	Apr. 7	20.05	4,850	2
		Fabius River basin									
319	5–4970	North Fabius River at Monticello, Mo	452	1874–1965	1933	30.8	17,400	Mar. 18	21.30	6,640	2
320	5–4980	Middle Fabius River near Monticello, Mo	393	(i)	(i)	26.6	16,800	Mar. 17	16.02	4,300	2
				1945–65	1947	26.28	16,200				

See footnotes at end of table.

Table 9.—*Summary of flood stages and discharges*—Continued

No.	Permanent station number	Stream and place of determination	Drainage area (sq mi)	Maximum previously known				Maximum March–May 1965			
				Period	Year	Gage height (feet)	Discharge (cfs)	Date	Gage height (feet)	Discharge	
										Cfs	Recurrence interval (years)
		Fabius River basin—Continued									
321	5–5000	South Fabius River near Taylor, Mo	620	1934–65	1947	19.5	19,700	Apr. 6	12.49	7,940	2
		North River basin									
322	5–5010	North River at Palmyra, Mo	373	(i) 1934–65	(i) 1944 1955	28.0 --- 24.42	(i) 27,400 ---	Apr. 6	20.89	9,620	2
		Bear Creek basin									
323	5–5020	Bear Creek at Hannibal, Mo	31.0	1938–42, 1947–65	1957	14.05	6,500	Apr. 5	5.79	1,020	1
		Salt River basin									
324	5–5080	Salt River near New London, Mo	2,480	1922–65	1958	29.92	64,700	Apr. 7	21.53	26,000	2
		The Sny basin									
325	5–5130	Bay Creek at Nebo, Ill	162	1939–65	1946	19.31	23,500	Apr. 11	9.49	2,140	1
		Cuivre River basin									
326	5–5145	Cuivre River near Troy, Mo	903	1888– 1965	1941	33.4	120,000	Apr. 6	20.54	11,200	1

Illinois River basin											
327	5–5855	Illinois River at Meredosia, Ill	25,300	1938–65	1943	28.61	123,000	Apr. 18	------	55,000	2
								Apr. 19	17.66	-------	--------
328	5–5870	Macoupin Creek near Kane, Ill	875	1921–33, 1940–65	1943	28.5	40,000	Apr. 11	12.30	2,120	1
Mississippi River main stem											
329	5–5875	Mississippi River at Alton, Ill	171,500	1844–1965	1844	[g]432.10	(i)	Apr. 16	[g]420.75	-------	--------
				1927–65	1943	[g]429.91	[u]437,000	May 3	------	380,000	11
Missouri River main stem											
330	6–9345	Missouri River at Hermann, Mo	528,200	1844	1844	35.5	892,000	Apr. 8	23.50	258,000	1
				1897–1965	1903	---------	676,000				
					1951	33.33	---------				
Loutre River basin											
331	6–9355	Loutre River at Mineola, Mo	202	1928	1928	28.9	(i)	Apr. 6	15.27	5,580	1
				1947–65	1957	20.88	12,900				
Coldwater Creek basin											
332	6–9365	Coldwater Creek near St. Louis, Mo	43.6	1959–65	1960	17.13	6,170	Apr. 6	6.94	1,210	
Mississippi River main stem											
333	7–0100	Mississippi River at St. Louis, Mo	701,000	1785	1785	[v]42.0	(i)	Apr. 16	28.83	525,000	2
				1844	1844	41.32	1,300,000				
				1861–1965	1903	---------	[c]1,019,000				
					1951	40.28	---------				

See footnotes on following page.

Table 9.—*Summary of flood stages and discharges*—Continued

[a]Includes discharge in diversion channel.
[b]Contents in acre feet.
[c]Daily mean discharge.
[d]Affected by backwater; see station description.
[e]Ratio of peak discharge to 50-year flood.
[f]Estimated or computed on basis of other records; see station description.
[g]Mean sea level elevation.
[h]Indirect measurement; flow over dam.
[i]Unknown.
[j]From discharge measurement at or near peak.
[k]At different site and (or) datum; see station description.
[m]Pool elevation.
[n]Tailwater elevation.
[p]Contents in millions of cubic feet.
[q]Affected or regulated by reservoirs.
[r]Observed; see station description.
[s]Peak stage did not reach bottom of gage.
[t]At various times.
[u]Includes 90,000 cfs floodwater overflow from Missouri River.
[v]May have reached this stage.

STATION DATA

MISSISSIPPI RIVER MAIN STEM

(1) 5-2205. Mississippi River below Sandy River, near Libby, Minn.

Location.—Lat 46°47', long 93°20', in sec.25,T.50 N., R.24 W., on right bank 600 ft downstream from Sandy River, three-quarters of a mile northwest of Libby, and at mile 1,106 upstream from Ohio River.

Drainage area.—5,060 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,204.55 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–17.

Maxima.—April–May 1965: Discharge, 7,340 cfs 1330 hours Apr. 24 (gage height, 14.50 ft).
1930 to March 1965: Discharge, 16,000 cfs May 17, 1950 (gage height, 20.02 ft).

Remarks.—Flow regulated by powerplants and by Winnibigoshish, Leech, Pokegama, and Sandy Lakes.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	2,000	6,690	11	2,850	6,130	21	6,400	5,290
2	2,050	6,670	12	3,000	5,940	22	6,910	5,340
3	2,050	6,660	13	3,300	5,700	23	7,220	5,340
4	2,050	6,600	14	3,900	5,450	24	7,290	5,340
5	2,100	6,510	15	4,360	5,250	25	7,100	5,280
6	2,300	6,470	16	4,600	5,130	26	6,850	5,170
7	2,550	6,440	17	4,850	5,100	27	6,700	5,040
8	2,650	6,500	18	5,200	5,120	28	6,610	4,880
9	2,700	6,460	19	5,480	5,150	29	6,560	4,540
10	2,750	6,340	20	5,830	5,180	30	6,600	4,170
						31	-----	3,740
Monthly mean discharge, in cubic feet per second							4,494	5,601
Runoff, in inches							0.99	1.28

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Mississippi River below Sandy River, near Libby, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	8.70	------	Apr. 17	2000	11.05	------	Apr. 23	1200	14.36	7,230
	1200	8.90	------		2400	11.12	------		2400	14.44	7,290
	2400	9.23	------	18	1200	11.25	------	24	1200	14.49	7,330
13	1200	9.50	------		2400	11.54	------		1330	14.50	7,340
	1400	9.50	------	19	1200	11.73	------		2400	14.29	7,180
	2400	10.06	------		2400	12.02	------	25	1800	14.16	7,080
14	1200	10.67	------	20	1300	12.25	5,780		2400	13.98	6,960
	2400	11.27	------		2400	12.85	6,170	26	1200	13.82	6,840
15	1000	11.50	------	21	1300	13.13	6,360		2400	13.69	6,750
	2400	11.34	------		2400	13.70	6,760	27	1200	13.60	6,690
16	1200	11.12	------	22	1200	13.88	6,890		2400	13.55	6,660
	2000	11.05	------		1600	13.95	6,940	28	1200	13.47	6,600
	2400	11.02	------		2400	14.22	7,120		1600	13.43	6,570
17	1200	10.94	------						2400	13.47	6,600

(2) 5-2275. Mississippi River at Aitkin, Minn.

Location.—Lat 46°32'26", long 93°42'26", in W½ sec.24, T.47 N., R.27 W., at upstream side of highway bridge at north edge of Aitkin, 1 mile downstream from Mud River and at mile 1,055.9 upstream from Ohio River.

Drainage area.—6,140 sq mi, approximately.

Gage-height record.—Water-stage recorder graph for river channel. Graph constructed on the basis of once or twice daily wire-weight gage readings for diversion channel for period Apr. 11 to May 17, once-daily wire-weight gage readings for remainder of the period. Datum of gage is 1,185.41 ft above mean sea level datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements at both the river and diversion sites. Backwater from ice Apr. 1–18 in the river channel and Apr. 1–17 in the diversion channel.

Maxima.—April–May 1965: Discharge, 13,400 cfs 1000 hours Apr. 26. (Includes discharge in diversion channel).
River channel: Discharge, 7,540 cfs 1400–1700 hours Apr. 18 (gage height, 14.50 ft).
Diversion channel: Discharge, 5,870 cfs 1800 hours Apr. 25 to 0500 hours Apr. 26 (gage height 14.81 ft).
1945 to March 1965: Discharge, 20,000 cfs May 20, 1950 (gage height, 19.49 ft).

Remarks.—Slight regulation by powerplants and by Winnibigoshish, Leech, Pokegama, and Sandy Lakes. Water diverted at medium and high stages into Aitkin diversion channel 6½ miles above station, bypasses station and returns to river 15½ miles below station. Diversion began Apr. 2, 1955. These records include flow in diversion channel.

Mean discharge, in cubic feet per second, 1965, of Mississippi River at Aitkin, Minn.

Day	April	May	Day	April	May	Day	April	May
1	2,180	11,600	11	3,660	8,930	21	13,000	7,180
2	2,140	11,200	12	4,080	8,660	22	13,000	7,390
3	2,140	10,800	13	4,820	8,360	23	13,100	7,510
4	2,150	10,400	14	6,100	7,980	24	13,200	7,860
5	2,300	10,000	15	7,550	7,660	25	13,300	8,080
6	2,420	9,770	16	9,350	7,290	26	13,300	8,050
7	2,650	9,600	17	11,500	7,160	27	13,200	7,940
8	3,000	9,510	18	13,000	7,110	28	12,900	7,680
9	3,100	9,430	19	13,100	7,070	29	12,500	7,480
10	3,290	9,140	20	13,000	7,050	30	12,100	6,990
						31	----------	6,680
Monthly mean discharge, in cubic feet per second							8,038	8,437
Runoff, in inches							1.46	1.58

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 13	0000	8.57	------	Apr. 17	1200	13.84	------	Apr. 22	1200	14.28	7,290
	0800	8.87	------		2400	14.22	------		2400	14.31	7,320
	1200	9.22	------								
	1600	9.68	------	18	1200	14.47	------	23	1200	14.33	7,340
	2000	10.18	------		1400	14.50	7,540		2400	14.34	7,350
	2400	10.55	------		1700	14.50	7,540				
					2400	14.37	7,390	24	1200	14.38	7,400
									2400	14.40	7,420
14	0800	11.06	------								
	1600	11.54	------	19	1200	14.33	7,340	25	1200	14.44	7,470
	2400	11.97	------		2400	14.28	7,290		2400	14.44	7,470
15	0800	12.31	------	20	1200	14.25	7,260	26	1000	14.46	7,490
	1600	12.66	------		2400	14.25	7,260		2400	14.42	7,440
	2400	12.94	------					27	1200	14.36	7,380
				21	1200	14.25	7,260		2400	14.29	7,380
16	1200	13.25	------		2400	14.28	7,290				
	2400	13.56	------								

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Mississippi River diversion near Aitkin, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	7.04	------	Apr. 17	1200	14.48	------	Apr. 23	2400	14.72	5,820
	1200	7.42	------		2400	14.58	5,740				
	2400	8.18	------					24	1200	14.76	5,850
				18	1200	14.57	5,740		2400	14.80	5,870
13	0600	8.77	------		2400	14.57	5,740				
	1200	9.45	------					25	1200	14.80	5,870
	2400	10.75	------	19	0800	14.60	5,760		1800	14.81	5,870
					1600	14.55	5,730		2400	14.81	5,870
14	0800	11.47	------		2400	14.53	5,720				
	1200	11.73	------					26	0500	14.81	5,870
	1600	12.02	------	20	1200	14.52	5,710		1200	14.78	5,860
	2400	12.40	------		2400	14.48	5,690		2400	14.73	5,830
15	0600	12.81	------	21	1200	14.49	5,700				
	1200	13.16	------		2400	14.55	5,730	27	1200	14.67	5,800
	1800	13.47	------						2400	14.55	5,730
	2400	13.66	------	22	1200	14.58	5,740				
					2400	14.64	5,780	28	1200	14.43	5,660
16	1200	13.93	------						2400	14.28	5,580
	2400	14.18	------	23	1200	14.68	5,800				

PINE RIVER BASIN

(3) 5-2305. Pine River Reservoir at Cross Lake, Minn.

Location.—Lat 46°40'09", long 94°06'44", in SW¼NW¼ sec.21, T.137 N., R.27 W., at dam on Pine River, at outlet of Cross Lake at village of Cross Lake.

Drainage area.—562 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,216.32 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Maxima.—March–May 1965: Contents, 100,800 acre-ft May 27, 28 (gage height, 13.18 ft). 1886 to February 1965: Contents, 173,600 acre-ft July 10, 1916 (gage height, 18.24 ft).

Remarks.—Reservoir operations began in 1886. Capacity between gage heights 10.00 ft and 18.50 ft (maximum allowable range) is 118,700 acre-ft of which 53,280 acre-ft is controlled storage between gage heights 10.00 ft and 14.00 ft (normal operating range).

Cooperation.—Records furnished by Corps of Engineers in terms of cfs-days and converted to acre-feet by Geological Survey.

Gage height, in feet, and contents, in acre-ft

Date	Gage height	Contents	Date	Gage height	Contents
Feb. 28	11.34	76,150	Apr. 18	11.68	80,650
Mar. 7	11.42	77,200	25	12.18	87,270
14	11.42	77,200	May 2	12.62	93,200
21	11.36	76,420	9	12.91	97,110
28	11.21	74,460	16	12.89	96,830
Apr. 4	11.12	73,270	23	13.01	98,480
11	11.05	72,360	30	13.13	100,100

(4) 5-2310. Pine River at Cross Lake Dam, at Cross Lake, Minn.

Location.—Lat 46°40'09", long 94°06'44", in SW¼NW¼ sec.21, T.137 N., R.27 W., at dam at outlet of Cross Lake at village of Cross Lake.

Drainage area.—562 sq mi.

Gage-height record.—Water-stage recorder graph for headwater and twice daily readings on tailwater tape float gage. Datum of gages is 1,216.32 ft above mean sea level, adjustment of 1929.

Discharge record.—Discharge computed by Corps of Engineers with one check measurement made by Geological Survey.

Maxima.—April–May 1965: Daily discharge, 1,250 cfs Apr. 20.
1886 to March 1965: Daily discharge, 2,250 cfs in June 1896 (does not include flow bypassing dam through crevasse).

Remarks.—Flow completely regulated by Pine River Reservoir.

Cooperation.—Computations of daily discharge furnished by Corps of Engineers; one discharge measurement made and records reviewed by Geological Survey.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	285	210	11	525	640	21	1,170	699
2	285	210	12	525	615	22	1,010	790
3	285	210	13	600	540	23	1,020	790
4	285	210	14	830	485	24	1,020	790
5	285	257	15	1,090	510	25	1,020	808
6	327	350	16	1,230	635	26	983	1,010
7	458	350	17	990	616	27	850	1,020
8	525	350	18	990	485	28	654	1,020
9	525	362	19	1,080	485	29	472	1,020
10	525	515	20	1,250	538	30	278	1,020
						31	----	1,030
Monthly mean discharge, in cubic feet per second							712	599
Runoff, in inches							1.41	1.23

CROW WING RIVER BASIN

(5) 5-2440. Crow Wing River at Nimrod, Minn.

Location.—Lat 46°39', long 94°53', in sec.32, T.137 N., R.33 W., on right bank 200 ft upstream from highway bridge, 0.2 mile north of Nimrod, and 0.7 mile upstream from Cat River.

Drainage area.—1,010 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,313.27 ft above mean sea level, datum of 1929 (levels by Wadena County Highway Department from Minnesota Highway Department bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–14.

Maxima.—April–May 1965: Discharge, 2,890 cfs 2230 hours Apr. 13 (gage height, 7.57 ft, backwater from ice).
1910–14, 1930 to March 1965: Discharge 2,750 cfs May 23, 1962 (gage height, 6.04 ft); gage height, 7.64 ft Apr. 20, 1950 (backwater from ice).

Remarks.—Flow affected by natural storage in many lakes.

Mean discharge, in cubic feet per second, 1965, of Crow Wing River at Nimrod, Minn.

Day	April	May	Day	April	May	Day	April	May
1	330	1,010	11	1,600	831	21	1,730	987
2	340	980	12	1,960	824	22	1,630	974
3	345	948	13	2,600	818	23	1,540	1,010
4	360	909	14	2,420	812	24	1,430	1,110
5	420	908	15	2,360	954	25	1,380	1,160
6	550	972	16	2,330	1,110	26	1,320	1,150
7	660	896	17	2,580	1,110	27	1,240	1,100
8	780	870	18	2,310	1,080	28	1,180	1,040
9	980	857	19	2,020	1,040	29	1,110	994
10	1,200	838	20	1,860	994	30	1,060	942
						31	--------	909
Monthly mean discharge, in cubic feet per second							1,388	972
Runoff, in inches							1.53	1.11

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0000	5.80	------	Apr. 13	2200	7.45	------	Apr. 16	1000	5.52	2,200
	1200	6.10	------		2230	7.57	2,890		1100	5.62	2,280
	2400	6.48	------		2400	7.35	------		1400	5.61	2,270
									1900	5.83	2,440
12	0600	6.61	------	14	0100	7.00	------		2400	5.91	2,510
	1200	6.72	------		0300	6.69	------				
	1500	7.00	------		0400	6.19	------	17	0600	5.90	2,500
	1800	7.28	------		0600	5.87	------		1200	5.78	2,400
	2000	7.55	------		0800	5.64	2,290		1400	6.06	2,630
	2400	7.45	------		1100	5.63	2,280		2100	6.27	2,800
					1800	5.85	2,460		2400	6.13	2,680
13	0600	7.16	------		2400	5.79	2,410				
	0900	7.05	------					18	0600	5.80	2,420
	1500	7.24	------	15	0600	5.76	2,390		1200	5.60	2,260
	1600	7.14	------		1200	5.66	2,310		1800	5.48	2,160
	1800	7.55	------		1800	5.73	2,360		2400	5.41	2,110
	2100	7.20	------		2400	5.68	2,320				

(6) 5-2465. Gull Lake near Brainerd, Minn.

Location.—Lat 46°24'40", long 94°21'26", in N½ sec.20, T.134 N., R.29 W., in pool of dam on Gull River, 800 ft south of outlet of Gull Lake, a quarter of a mile upstream from Gull Lake Dam, and 8 miles northwest of Brainerd.

Drainage area.—287 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,188.14 ft above mean sea level, adjustment of 1912.

Maxima.—March–May 1965: Contents, 61,800 acre-ft May 26, 27 (gage height, 6.31 ft). 1911 to February 1965: Contents, 74,800 acre-ft June 30, 1914 (gage height 7.30 ft).

Remarks.—Reservoir operations began in 1912. Capacity between gage heights 5.00 ft and 7.00 ft (maximum allowable range and normal operating range), 26,020 acre-ft.

Cooperation.—Records furnished by Corps of Engineers, in terms of cfs-days and converted to acre-feet by Geological Survey.

Gage height, in feet, and contents, in acre-ft, of Gull Lake near Brainerd, Minn.

Date	Gage height	Contents	Date	Gage height	Contents
Feb. 28	5.26	48,180	Apr. 18	6.14	59,580
Mar. 7	5.31	48,830	25	6.20	60,360
14	5.24	47,920	May 2	6.05	58,410
21	5.13	46,510	9	6.17	59,960
28	5.03	45,200	16	6.11	59,210
Apr. 4	4.99	44,690	23	6.14	59,580
11	5.16	46,890	30	6.21	60,500

(7) 5-2470. Gull River at Gull Lake Dam, near Brainerd, Minn.

Location.—Lat 46°24'40", long 94°21'12", in sec.20, T.134 N., R.29 W., in headwater and tailwater of dam at outlet of Gull Lake, 8 miles northwest of Brainerd.

Drainage area.—287 sq mi.

Gage-height record.—Water-stage recorder graph for headwater and twice-daily readings on tailwater staff gage. Datum of gages is 1,188.14 ft above mean sea level, adjustment of 1912.

Discharge record.—Discharge computed by Corps of Engineers with one check measurement made by Geological Survey.

Maxima.—April–May 1965: Daily discharge, 820 cfs May 27.
1911 to March 1965: Daily discharge, 1,120 cfs May 15, 1938.

Remarks.—Flow completely regulated by Gull Lake.

Cooperation.—Computations of daily discharge furnished by Corps of Engineers: one discharge measurement made and records reviewed by Geological Survey.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	162	354	11	249	534	21	670	458
2	160	354	12	336	525	22	670	453
3	162	352	13	441	346	23	670	453
4	163	261	14	584	193	24	580	552
5	162	223	15	630	281	25	580	607
6	192	352	16	660	366	26	575	688
7	240	460	17	670	360	27	625	820
8	238	458	18	670	368	28	625	765
9	236	460	19	670	362	29	443	740
10	238	550	20	670	362	30	358	740
						31		740
Monthly mean discharge, in cubic feet per second							444	469
Runoff, in inches							1.73	1.88

MISSISSIPPI RIVER MAIN STEM

(8) 5-2670. Mississippi River near Royalton, Minn.

Location.—Lat 45°51'40", long 94°21'30", in lot 2, sec.20, T.39 N., R.32 W., at plant of Minnesota Power and Light Co., 4 miles northwest of Royalton, and 4.5 miles downstream from Swan River, and at mile 956 upstream from Ohio River.

Drainage area.—11,600 sq mi, approximately.

Gage-height record.—Headwater and tailwater gages read hourly by company employees. Readings not reported to Geological Survey.

Discharge record.—Discharge computed by Minnesota Power and Light Company with two check measurements made by Geological Survey.

Maxima.—April–May 1965: Daily discharge, 37,700 cfs Apr. 16.
1924 to March 1965: Daily discharge, 29,400 cfs Apr. 13, 1952.

Remarks.—Flow partly regulated by powerplants, by Winnibigoshish, Leech, Pokegama, Sandy, and Gull Lakes and by Pine River Reservoir.

Cooperation.—Records collected by Minnesota Power and Light Co. under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	3,240	21,600	11	11,300	16,500	21	29,700	15,100
2	3,740	20,500	12	17,100	16,600	22	28,200	15,300
3	3,150	19,900	13	24,100	15,500	23	27,200	15,100
4	2,980	19,800	14	31,900	15,300	24	26,500	16,200
5	3,070	18,700	15	37,400	15,000	25	25,900	17,800
6	3,750	16,900	16	37,700	14,100	26	25,400	18,400
7	4,180	16,700	17	36,300	14,400	27	24,800	18,500
8	4,360	16,000	18	32,500	14,400	28	24,700	18,900
9	5,070	17,200	19	32,200	14,200	29	23,800	18,400
10	7,860	16,500	20	31,300	14,300	30	23,300	17,300
						31	--------	16,500
Monthly mean discharge, in cubic feet per second							19,760	16,810
Runoff, in inches							1.90	1.67

PLATTE RIVER BASIN

(9) 5-2679. Hillman Creek near Pierz, Minn.

(Crest-stage station)

Location.—Lat 45°58'27", long 94°04'21", in NE¼SE¼ sec.9, T.40 N., R.30 W., at bridge on county road, 1.1 miles upstream from mouth, and 1.5 miles east of Pierz.

Drainage area.—52.6 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 900 cfs and extended above by logarithmic plotting.

Maxima.—April–May 1965: Discharge, 2,560 cfs Apr. 13 (gage height 14.68 ft).
1964 to March 1965: Discharge, 2,040 cfs May 7, 1964 (gage height, 14.55 ft).

SAUK RIVER BASIN

(10) 5-2705. Sauk River near St. Cloud, Minn.

Location.—Lat 45°33'35", long 94°14'00", in SE¼SW¼ sec.8, T.124 N., R.28 W., on right bank half a mile northwest of Waite Park, 3 miles west of St. Cloud, and 5 miles upstream from mouth.

Drainage area.—925 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,034.95 ft above mean sea level, datum of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–13.

Maxima.—April–May 1965: Discharge, 9,100 cfs 2215 hours Apr. 13 (gage height, 10.68 ft). 1909–13, 1929 to March 1965: Discharge, 5,580 cfs Apr. 13, 1951 (gage height, 7.89 ft).

Remarks.—Flow regulated by powerplants and reservoirs above station.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	53	1,530	11	2,500	1,000	21	3,610	895
2	55	1,440	12	4,500	1,030	22	3,210	865
3	65	1,340	13	7,500	970	23	2,840	930
4	80	1,240	14	7,940	940	24	2,520	1,080
5	100	732	15	7,440	960	25	2,360	1,200
6	150	716	16	6,800	960	26	2,230	1,200
7	250	870	17	6,040	920	27	2,040	1,220
8	450	855	18	5,270	920	28	1,910	1,200
9	800	915	19	4,610	870	29	1,770	1,160
10	1,500	945	20	4,050	840	30	1,650	1,140
						31		1,140
Monthly mean discharge, in cubic feet per second							2,810	1,030
Runoff, in inches							3.39	1.29

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Sauk River near St. Cloud, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 9	0000	3.49	------	Apr. 12	0300	7.85	------	Apr. 13	2400	10.48	8,820
	0600	3.68	------		0600	8.00	------				
	1200	4.08	------		0700	8.05	------	14	0400	10.07	8,250
	1800	4.27	------		0800	7.54	------		0800	9.97	8,110
	2400	4.45	------		0900	7.50	------		1200	9.72	7,760
					1000	7.59	------		2400	9.59	7,580
10	0600	4.54	------		1200	7.93	------				
	0800	4.55	------		1300	7.56	------	15	1200	9.52	7,480
	0900	4.83	------		1400	7.67	------		2400	9.32	7,200
	1000	4.84	------		1600	7.85	------				
	1100	4.89	------		1700	7.96	------	16	1200	9.03	6,790
	1200	4.77	------		1800	8.64	------		2400	8.75	6,400
	1300	4.80	------		2000	8.70	------				
	1400	5.10	------		2100	9.01	------	17	1200	8.50	6,050
	1600	5.01	------		2400	9.05	------		2400	8.21	5,640
	1800	5.02	------								
	1900	4.90	------	13	0200	9.19	------	18	1200	7.94	5,270
	2100	5.05	------		0600	9.19	------		2400	7.66	4,910
	2300	5.25	------		1000	9.39	------				
	2400	5.29	------		1200	9.77	------	19	1200	7.43	4,610
					1400	10.50	------		2400	7.21	4,320
11	0800	5.89	------		1600	10.42	------				
	1200	6.15	------		1800	10.51	------	20	1200	6.99	4,040
	1600	6.94	------		2215	10.68	9,100		2400	6.79	3,800
	2400	7.65	------								

JOHNSON CREEK BASIN

(11) 5-2720. Johnson Creek tributary near St. Augusta, Minn.

(Crest-stage station)

Location.—Lat 45°26'52", long 94°12'00", in NE¼SE¼ sec.21, T.123 N., R.28 W., at culverts on county road, 0.7 mile upstream from mouth and 3.1 miles southwest of St. Augusta.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 39 cfs and by indirect measurement at 274 cfs.

Maxima.—April–May 1965: Discharge, 274 cfs Apr. 12 (gage height, 10.16 ft). 1964 to March 1965: Discharge, 39 cfs May 6, 1964 (gage height, 6.45 ft).

(12) 5-2723. Johnson Creek near St. Augusta, Minn.

(Crest-stage station)

Location.—Lat 45°27'49", long 94°09'19", in NW¼SW¼ sec.13, T.123 N., R.28 W., at bridge on County Highway 7, 1.0 mile south of St. Augusta, and 3.3 miles upstream from mouth.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 682 cfs Apr. 12 (gage height, 14.77 ft).
1964 to March 1965: Discharge, 227 cfs Apr. 13, 1964 (gage height, 12.85 ft).

OTSEGO CREEK BASIN

(13) 5-2737. Otsego Creek near Otsego, Minn.

(Crest-stage station)

Location.—Lat 45°17'19", long 93°38'59", in SW¼NE¼ sec.13, T.121 N., R.24 W., at culvert on County Highway 39, 1.3 miles upstream from mouth, and 1.9 miles west of Otsego.

Gage-height record.—Crest-stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 20 cfs and by flow-through-culvert computation at 202 cfs.

Maxima.—April–May 1965: Discharge, 202 cfs Apr. 11 (gage height, 7.48 ft); gage height, 8.19 ft Apr. 9 (backwater from ice).
1964 to March 1965: Discharge, 23 cfs Apr. 6, 1964 (gage height, 4.39 ft, backwater from ice).

ELK RIVER BASIN

(14) 5-2742. Stony Brook tributary near Foley, Minn.

(Crest-stage station)

Location.—Lat 45°38'40", long 93°54'50", in NW¼ sec.2, T.36 N., R.29 W., at culvert on State Highway 25, a quarter mile upstream from mouth, and 1½ miles south of Foley.

Drainage area.—3.11 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 51 cfs and by indirect measurement at 132 cfs.

Maxima.—April–May 1965: Discharge, 83 cfs Apr. 12 (gage height, 11.26 ft, backwater from ice).
1960 to March 1965: Discharge, 132 cfs May 23, 1962 (gage height, 11.35 ft, from high-water profile).

(15) 5-2747. St. Francis River at Santiago, Minn.

(Gaging station established June 1965)

Location.—Lat 45°32'30", long 93°48'50", in NE¼ sec.10, T.35 N., R.28 W., on right bank, 0.2 mile east of Santiago and 0.4 mile upstream from bridge on county road.

Gage-height record.—Floodmark and occasional gage readings on reference mark.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maximum.—April–May 1965: Discharge, 2,940 cfs about 0915–1100 hours Apr. 14 (gage height, 12.17 ft from floodmark).

(16) 5-2749. St. Francis River near Big Lake, Minn.

(Gaging station established, June 1965)

Location.—Lat 45°23'07", long 93°44'02", in NW¼NW¼ sec.5, T.33 N., R.27 W., on right bank 3.6 miles north of Big Lake and 4 miles upstream from mouth.

Gage-height record.—Occasional gage readings on reference mark. Altitude of gage is 925 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maximum.—April–May 1965: Discharge, 2,700 cfs 1340 hours Apr. 16 (gage height, 11.34 ft from floodmark).

(17) 5-2750. Elk River near Big Lake, Minn.

Location.—Lat 45°20', long 93°40', in sec.23, T.33 N., R.27 W., on right bank at upstream side of highway bridge, 4 miles east of Big Lake and 4 miles downstream from St. Francis River.

Drainage area.—615 sq mi.

Gage-height record.—Water stage recorder graph. Datum of gage is 899.60 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–14.

Maxima.—April–May 1965: Discharge, 7,360 cfs 1800 hours Apr. 16 (gage height, 10.86 ft).

1911–17, 1931 to March 1965: Discharge, 5,330 cfs Apr. 10, 1952 (gage height, 10.36 ft), from rating curve extended above 3,800 cfs.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	83	941	11	390	1,020	21	2,590	674
2	85	874	12	569	1,020	22	2,200	671
3	89	804	13	970	1,010	23	1,890	671
4	97	739	14	2,690	945	24	1,610	696
5	113	689	15	4,940	882	25	1,460	735
6	134	667	16	7,170	826	26	1,360	782
7	156	753	17	7,030	761	27	1,230	830
8	180	889	18	5,900	717	28	1,120	908
9	230	1,000	19	4,350	689	29	1,050	996
10	290	1,010	20	3,260	678	30	1,000	1,030
						31	--------	1,070
Monthly mean discharge, in cubic feet per second							1,808	838
Runoff, in inches							3.28	1.57

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Elk River near Big Lake, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 13	0000	4.56		Apr. 15	0600	8.79	4,220	Apr. 19	0600	9.20	4,690
	0400	4.62			0800	8.87	4,310		1200	8.88	4,320
	0600	4.61			1000	8.93	4,370		1800	8.56	3,990
	1000	4.52			1200	9.05	4,510		2400	8.27	3,720
	1100	4.57			1400	9.33	4,860				
	1200	4.61			1600	9.64	5,290	20	1200	7.66	3,240
	1300	4.57			1800	9.91	5,710		2400	7.12	2,860
	1400	4.60			2000	10.16	6,110				
	1500	4.82			2200	10.31	6,370	21	1200	6.65	2,570
	1600	5.05			2400	10.45	6,610		2400	6.32	2,370
	1700	5.16									
	1800	5.36		16	0200	10.57	6,830	22	1200	6.02	2,190
	1900	5.36			0400	10.65	6,970		2400	5.78	2,050
	2000	5.51			0600	10.72	7,100				
	2100	5.74			0800	10.75	7,160	23	1200	5.47	1,880
	2200	5.93			1000	10.77	7,190		2400	5.18	1,740
	2300	6.29			1200	10.81	7,270				
	2400	6.24			1400	10.82	7,290	24	0600	5.06	1,680
					1600	10.84	7,330		1200	4.90	1,600
14	0200	6.13			1800	10.86	7,360		1800	4.80	1,550
	0400	6.30			2000	10.84	7,330		2400	4.71	1,500
	0600	6.53			2200	10.83	7,310				
	0800	6.84			2400	10.82	7,290	25	0600	4.63	1,460
	1000	7.10							1200	4.62	1,460
	1200	7.53		17	0600	10.77	7,190		1800	4.62	1,460
	1400	8.58			1200	10.69	7,040		2400	4.59	1,440
	1600	8.21			1800	10.62	6,920				
	1800	8.16			2400	10.46	6,630	26	1200	4.41	1,360
	2000	8.23							2400	4.24	1,300
	2200	8.37		18	0600	10.28	6,320				
	2400	8.50	3,930		1200	10.04	5,910	27	1200	4.07	1,230
					1800	9.80	5,530		2400	3.92	1,170
15	0200	8.64	4,070		2400	9.50	5,090				
	0400	8.72	4,150								

MISSISSIPPI RIVER MAIN STEM

(18) 5-2755. Mississippi River at Elk River, Minn.

(Gaging station, discontinued 1956)

Location.—Lat 45°18', long 93°34', in SE¼ sec.34, T.33 N., R.26 W., fourth principal meridian, on left bank in town of Elk River and at mile 884.6 above Ohio River.

Drainage area.—14,500 sq mi, approximately.

Gage-height record.—Floodmark. Datum of gage is 847.92 ft above mean sea level, adjustment of 1912.

Discharge record.—Peak discharge computed on basis of records for Mississippi River near Anoka, Rum River near St. Francis, and Elk River near Big Lake and compared with discharge obtained from station record during the three years of high flow (1950–52) when the Mississippi River at Elk River gage was in operation.

Maxima.—April–May 1965: Discharge, 62,000 cfs Apr. 16 (gage height, 17.20 ft, from floodmark).
1915 to March 1965: Discharge, 49,200 cfs Apr. 12, 1952 (gage height, 14.49 ft).

CROW RIVER BASIN

(19) 5-2760. North Fork Crow River near Regal, Minn.

(Gaging station, discontinued 1954)

Location.—Lat 45°22'55", long 94°47'40", in S½ sec.11, T.122 N., R.33 W., on right bank 12 ft upstream from highway bridge and 3 miles southeast of Regal.

Drainage area.—215 sq mi.

Gage-height record.—Floodmark. Datum of gage is 1,195.92 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by two current-meter measurements below 900 cfs and extended above on the basis of logarithmic plotting.

Maxima.—April–May 1965: Discharge, 2,630 cfs Apr. 9 (gage height, 6.68 ft, from floodmark).

1943 to March 1965: Discharge, 2,120 cfs Apr. 11, 1952 (gage height, 6.11 ft); gage height, 6.73 ft Apr. 6, 1951 (backwater from ice).

Remarks.—At high stages a portion of flow bypasses gage from a point about 1 mile upstream, and returns to the main channel at a point about two-thirds of a mile below gage. This flow is included in the station record.

(20) 5-2780. Middle Fork Crow River near Spicer, Minn.

Location.—Lat 45°15'45", long 94°48'10", in NE¼ sec.27, T.121 N., R.33 W., on right bank 75 ft upstream from highway bridge, 1½ miles downstream from Lake Calhoun, 3 miles downstream from Green Lake, and 6.8 miles northeast of Spicer.

Drainage area.—179 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,147.93 ft above mean sea level, datum of 1929 (Kandiyohi County Highway Department bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–17.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
April–May 1965:		
April 9, 1630 hours	Unknown	[a]6.29
May 26, 0400 hours	343	6.12
1949 to March 1965		
June 29, 1953	408	---
June 25, 1957	---	6.67

Remarks.—Flow affected by natural storage and some regulation from lakes above station.

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965, of Middle Fork Crow River near Spicer, Minn.

Day	April	May	Day	April	May	Day	April	May
1	1.0	270	11	260	207	21	166	298
2	1.0	252	12	240	211	22	172	302
3	1.0	224	13	220	217	23	178	308
4	1.2	197	14	200	221	24	187	322
5	1.5	198	15	190	227	25	198	341
6	2.0	201	16	200	225	26	209	341
7	3.0	206	17	203	209	27	243	337
8	6.0	210	18	194	197	28	270	324
9	55	218	19	175	227	29	281	311
10	230	208	20	165	274	30	280	302
						31	------	297
Monthly mean discharge, in cubic feet per second							151	254
Runoff, in inches							0.94	1.64

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 7	0000	4.74	------	Apr. 10	2400	6.10	------	Apr. 15	1800	4.65	------
	1200	4.78	------						2400	4.72	------
	1800	4.94	------	11	0600	6.04	------				
	2400	4.94	------		1200	5.99	------	16	0600	4.78	------
					1800	6.04	------		1200	4.82	------
8	0600	4.97	------		2400	5.93	------		1800	4.78	------
	1100	5.03	------						2400	4.85	------
	1400	5.33	------	12	0600	5.82	------				
	1600	5.61	------		1200	5.70	------	May 23	2400	5.90	320
	1800	5.58	------		1800	5.51	------				
	2200	5.37	------		2400	5.35	------	24	1800	5.89	319
	2400	5.35	------						2000	5.97	327
				13	0600	5.19	------		2400	6.06	337
9	0200	5.37	------		1200	5.00	------				
	0700	5.45	------		1800	4.89	------	25	0700	6.11	342
	0900	5.44	------		2400	4.79	------		1400	6.11	342
	1100	5.40	------						2400	6.10	341
	1300	5.65	------	14	0600	4.70	------				
	1600	6.28	------		1200	4.68	------	26	0400	6.12	343
	1630	6.29	------		1500	4.65	------		1400	6.10	341
	1700	6.28	------		1700	4.65	------		2400	6.07	338
	2100	5.96	------		1900	4.68	------				
	2400	5.88	------		2000	4.65	------	27	1200	6.06	337
					2400	4.66	------		2400	6.03	333
10	0600	6.02	------								
	1200	6.10	------	15	0600	4.61	------	28	1200	5.94	324
	1800	6.11	------		1200	4.60	------		2400	4.87	317

(21) 5-2785. South Fork Crow River at Cosmos, Minn.

(Gaging station, discontinued 1964)

Location.—Lat 44°56'05", long 94°40'20", in SW¼ sec.14, T.117 N., R.32 W., on downstream side of bridge on State Highway 7, 1 mile east of Cosmos, 2¼ miles upstream from small tributary, and 3¼ miles west of Corvuso.

Drainage area.—221 sq mi.

Gage-height record.—Floodmark. Datum of gage is 1,079.09 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 2,130 cfs Apr. 11 (gage height, 13.05 ft, from floodmark).
1945 to March 1965: Discharge, 1,890 cfs June 17, 1957 (gage height, 12.62 ft).

(22) South Fork Crow River at Hutchinson, Minn.

(Miscellaneous site)

Location.—Lat 44°53'44", long 94°22'10", in SE¼SW¼ sec.31, T.117 N., R.29 W., at dam just upstream from State Highways 15 and 22 in Hutchinson, and 6.2 miles upstream from McCuen Creek.

Drainage area.—462 sq mi.

Discharge record.—Flow-over-dam measurement.

Maximum.—April–May 1965: Discharge, 4,670 cfs Apr. 11 (elevation, 1,044.10 ft above mean sea level, datum of 1929).

(23) 5-2787. Otter Creek near Lester Prairie, Minn.

(Crest-stage station)

Location.—Lat 44°54'23", long 94°04'24", in SE¼SE¼ sec.28, T.117 N., R.27 W., on right bank 33 ft upstream from culvert on State Highway 7, 2.1 miles northwest of Lester Prairie, and 4.4 miles upstream from mouth.

Gage-height record.—Water-stage recorder graph.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 525 cfs Apr. 13 (gage height, 9.24 ft); gage height, 9.97 ft Apr. 6 (backwater from ice).
1961 to March 1965: Discharge, 348 cfs May 22, 1962 (gage height, 8.66 ft); gage height, 8.73 ft Mar. 28, 1962 (backwater from ice).

(24) 5-2787.5 Otter Creek tributary near Lester Prairie, Minn.

(Crest-stage station)

Location.—Lat 44°53'34", long 94°04'24", in SE¼SE¼ sec.33, T.117 N., R.27 W., at culvert on County Highway 63, 1.7 miles northwest of Lester Prairie, and 3.3 miles upstream from mouth.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 49 cfs and by indirect measurement at 79 cfs.

Maxima.—April–May 1965: Discharge, 87 cfs Apr. 10 (gage height, 11.14 ft).
1962 to March 1965: Discharge, 79 cfs May 23, 1962 (gage height, 10.83 ft).

(25) 5-2788.5 Buffalo Creek tributary near Brownton, Minn.

(Crest-stage station)

Location.—Lat 44°45'55", long 94°22'33", in NE¼SE¼ sec.13, T.115 N., R.30 W., at culvert on State Highway 15, 0.6 mile upstream from mouth, and 2.6 miles northwest of Brownton.

Drainage area.—9.45 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 124 cfs Apr. 10; (gage height, 17.39 ft, backwater from ice); gage height, 17.42 ft Apr. 7 (backwater from ice).
1961 to March 1965: Discharge, 70 cfs Mar. 28, 1962 (gage height 16.16 ft, backwater from ice).

(26) 5-2790. South Fork Crow River near Mayer, Minn.

Location.—Lat 44°54'20", long 93°53'05", in SW¼SW¼ sec.30, T.117 N., R.25 W., near center of span on downstream side of bridge on State Highway 7, 1.3 miles north of Mayer, 4.3 miles southwest of Watertown, and 16 miles upstream from confluence with North Fork.

Drainage area.—1,170 sq mi, approximately.

Gage-height record.—Graph constructed on basis of once or twice-daily wire-weight gage readings and several engineers readings Apr. 1–30. For the period Apr. 11–18, gage readings obtained from temporary staff gage. Once-daily wire-weight gage readings, May 1–31. Datum of gage is 926.00 ft above mean sea level (levels by Hennepin County Park Board Survey).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice, Apr. 1–9.

Maxima.—April–May 1965: Discharge, 16,100 cfs 1530 hrs Apr. 13 (gage height, 19.23 ft, from floodmark).
1934 to March 1965: Discharge, 11,000 cfs Apr. 10, 1952 (gage height, 15.70 f.).

Mean discharge, in cubic feet per second, 1965, of South Fork Crow River near Mayer, Minn.

Day	April	May	Day	April	May	Day	April	May
1	2.0	2,360	11	10,800	1,970	21	5,160	1,160
2	2.4	2,120	12	14,500	1,760	22	4,710	1,100
3	4.0	1,950	13	15,900	1,730	23	4,060	1,060
4	9.5	1,760	14	15,200	1,600	24	3,630	1,040
5	34	1,640	15	13,600	1,430	25	3,330	1,070
6	68	1,510	16	11,400	1,310	26	3,170	1,230
7	250	1,550	17	9,120	1,280	27	2,990	1,320
8	1,160	1,670	18	7,390	1,190	28	2,840	1,430
9	2,060	1,820	19	6,330	1,160	29	2,710	1,630
10	5,910	1,950	20	5,510	1,160	30	2,540	1,740
						31	-----	1,700
Monthly mean discharge, in cubic feet per second							5,146	1,529
Runoff, in inches							4.91	1.51

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	3.04	------	Apr. 9	1500	10.42	------	Apr. 14	0600	19.01	15,600
	0600	3.05	------		1800	10.87	------		1200	18.83	15,300
	1200	3.25	------		2100	11.25	------		1800	18.64	14,900
	1800	3.82	------		2400	11.58	4,040		2400	18.45	14,500
	2400	4.10	------								
				10	0600	12.53	4,910	15	0600	18.23	14,100
6	0600	4.42	------		1200	13.42	5,800		1200	17.99	13,600
	1200	5.38	------		1800	14.33	6,840		1800	17.71	13,000
	1800	6.24	------		2400	15.19	8,140		2400	17.43	12,500
	2400	6.06	------								
				11	0600	16.12	9,840	16	0600	17.20	12,000
7	0600	6.16	------		1200	16.67	10,900		1200	16.93	11,500
	1200	6.98	------		1800	17.14	11,900		1800	16.62	10,800
	1800	7.42	------		2400	17.78	13,200		2400	16.31	10,200
	2400	7.81	------								
				12	0600	18.18	14,000	17	0600	16.00	9,600
8	0600	8.19	------		1200	18.50	14,600		1200	15.72	9,180
	1200	8.54	------		1800	18.74	15,100		1800	15.46	8,630
	1800	8.98	------		2400	19.00	15,600		2400	15.18	8,120
	2400	9.67	------								
				13	0600	19.06	15,900	18	0600	14.95	7,720
9	0300	9.86	------		1200	19.21	16,000		1200	14.72	7,400
	0600	10.03	------		1530	19.23	16,100		1800	14.48	7,020
	0900	10.14	------		1800	19.21	16,000		2400	14.25	6,740
	1200	10.15	------		2400	19.13	15,900				

(27) 5-2790.3 South Fork Crow River tributary near Mayer, Minn.

(Crest-stage station)

Location.—Lat 44°54'21", long 93°53'51", in NW¼NE¼ sec. 36, T.117 N., R.26 W., at culvert on State Highway 7, 0.7 mile above mouth, and 1.4 miles north of Mayer.

Gage-height record.—Crest stages only.

Discharge record.—Stage discharge relation defined by current-meter measurements below 22 cfs and by flow-through-culvert computation at 243 cfs.

Maxima.—April–May 1965: Discharge, 306 cfs Apr. 8 (gage height, 9.06 ft, backwater from ice).
1962 to March 1965: Gage height, 6.56 ft Mar. 28, 1962, backwater from ice (discharge not determined).

(28) 5-2800. Crow River at Rockford, Minn.

Location.—Lat 45°05'15", long 93°44'00", in sec.29, T.119 N., R. 24 W., on right bank at Rockford, 150 ft downstream from bridge on State Highway 55 and 1 mile downstream from confluence of North and South Forks.

Drainage area.—2,520 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except Apr. 13–20 when graph was constructed on the basis of readings made on temporary staff gage. Datum of gage is 893.65 ft above mean sea level, datum of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–11.

Maxima.—April–May 1965: Discharge, 22,400 cfs 0100 hours Apr. 16 (gage height, 19.27 ft, from floodmark).
1909–17, 1929 to March 1965: Discharge, 13,900 cfs Apr. 13, 1952 (gage height, 16.24 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	30	6,200	11	6,800	4,580	21	13,700	3,000
2	30	5,700	12	11,900	4,450	22	12,400	2,930
3	30	5,240	13	15,700	4,230	23	11,300	2,900
4	31	4,810	14	19,500	3,990	24	10,200	2,870
5	32	4,490	15	21,900	3,740	25	9,370	2,860
6	50	4,230	16	22,100	3,510	26	8,750	2,890
7	160	4,150	17	20,700	3,300	27	8,190	2,970
8	450	4,280	18	18,900	3,200	28	7,700	3,060
9	1,400	4,540	19	17,200	3,060	29	7,180	3,170
10	3,100	4,600	20	15,300	2,990	30	6,680	3,300
						31	--------	3,410
Monthly mean discharge, in cubic feet per second							9,026	3,827
Runoff, in inches							4.00	1.75

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Crow River at Rockford, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 7	0000	2.65	------	Apr. 11	0600	11.26	------	Apr. 17	1200	18.81	20,800
	0200	2.66	------		1200	12.15	------		2400	18.48	19,700
	0600	2.85	------		1800	13.11	------				
	1200	3.36	------		2200	13.87	------	18	1200	18.19	18,900
	1800	4.21	------		2400	13.43	10,100		2400	17.85	18,000
	2400	4.59	------								
				12	0600	14.28	11,200	19	1200	17.48	17,200
8	0600	4.75	------		1200	14.74	11,900		2400	17.03	16,200
	1200	4.87	------		1800	15.15	12,500				
	1800	5.19	------		2400	15.74	13,600	20	1200	16.60	15,300
	2400	5.41	------						2400	16.20	14,500
				13	1200	16.83	15,800				
9	0600	5.45	------		2400	17.69	17,700	21	1200	15.80	13,700
	1200	5.69	------						2400	15.41	13,000
	1800	6.65	------	14	1200	18.41	19,500				
	2400	7.11	------		2400	18.91	21,100	22	1200	15.06	12,400
									2400	14.75	11,900
10	0600	7.42	------	15	1200	19.18	22,100				
	1200	7.95	------		2400	19.26	22,400	23	1200	14.35	11,300
	1800	9.25	------						2400	13.94	10,700
	2400	10.58	------	16	0100	19.27	22,400				
					1200	19.19	22,100	24	1200	13.52	10,200
11	0200	10.86	------		2400	19.05	21,600		2400	13.13	9,720

(29) 5-2803. School Lake Creek tributary near St. Michael, Minn.

(Crest-stage station)

Location.—Lat 45°12'09", long 93°41'31", in NW¼SE¼ sec.15, T.120 N., R.24 W., at culvert on county road, 0.2 mile upstream from mouth, and 1.5 miles southwest of St. Michael.

Drainage area.—2.04 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Discharge obtained from indirect measurement.

Maxima.—April–May 1965: Discharge, 434 cfs Apr. 11 (gage height, 12.68 ft, from high-water profile).

1964 to March 1965: Gage height, 7.34 ft May 6, 1964 (discharge not determined).

RUM RIVER BASIN

(30) 5-2846. Robinson Brook near Onamia, Minn.

(Crest-stage station)

Location.—Lat 45°58'20", long 93°39'30", in NE¼SE¼ sec.11, T.40 N., R.27 W., at culvert on U.S. Highway 169, a quarter mile upstream from mouth, and 6-3/4 miles south of Onamia.

Drainage area.—7.21 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 80 cfs and by indirect measurement at 232 cfs.

Maxima.—April–May 1965: Discharge, 130 cfs Apr. 13 (gage height, 15.85 ft, backwater from ice).
1960 to March 1965: Discharge, 232 cfs June 8, 1963 (gage height, 16.75 ft).

(31) 5-2846.2 Rum River tributary near Onamia, Minn.

(Crest-stage station)

Location.—Lat 45°57'20", long 93°39'30", in E½ sec.14, T.40 N., R.27 W., at culvert on U.S. Highway 169, a quarter mile upstream from mouth, and 7-3/4 miles south of Onamia.

Drainage area.—1.84 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 24 cfs and by indirect measurements at 80 cfs and 172 cfs.

Maxima.—April–May 1965: Discharge, 96 cfs Apr. 13 (gage height, 10.19 ft).
1960 to March 1965: Discharge, 172 cfs June 8, 1963 (gage height, 13.37 ft, from high-water profile).

(32) 5-2847.5 Rum River at Spencer Brook, Minn.

(Gaging station, discontinued 1964)

Location.—Lat 45°31'45", long 93°26'21", in NW¼NE¼ sec.15, T.35 N., R.25 W., near center of right span on downstream side of county highway bridge, 200 ft downstream from Spencer Brook, ½ mile north of Spencer Brook store, and 7½ miles southeast of Princeton.

Gage-height record.—Floodmark, Datum of gage is 925.65 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Maxima.—April–May 1965: Discharge not determined, gage height, 15.36 ft Apr. 14 (backwater from ice).
1960 to March 1965: Discharge, 7,350 cfs May 25, 1962 (gage height, 13.12 ft).

Remarks.—Occasional regulation by Ogechie (also controls Mille Lacs Lake) and Onamia Lakes.

Cooperation.—Floodmark furnished by Corps of Engineers.

(33) Rum River at West Point, Minn.

(Miscellaneous site)

Location.—Lat 45°33', long 93°24', in $SE\frac{1}{4}SE\frac{1}{4}$ sec.36, T.36 N., R.25 W., at bridge on State Highway 56 at West Point and 8 miles west of Cambridge.

Gage-height record.—Occasional chain gage readings during flood. Datum of gage is 900.34 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 10,800 cfs Apr. 16 (gage height, 29.38 ft, from floodmark).
1958 to March 1965: Discharge, 6,100 cfs May 26, 1962 (gage height, 27.90 ft).

Cooperation.—Gage height readings and previous maxima furnished by Corps of Engineers.

(34) 5-2849.2 Stanchfield Creek tributary near Day, Minn.

(Crest-stage station)

Location.—Lat 45°41'29", long 93°23'45", in $NW\frac{1}{4}SE\frac{1}{4}$ sec.13, T.37 N., R.25 W., at culvert on County Highway 60, 0.5 mile upstream from mouth, and 1.5 miles southwest of Day.

Drainage area.—1.26 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by flow-through-culvert computations at 26 cfs and 55 cfs.

Maxima.—April–May 1965: Discharge, 55 cfs Apr. 12 (gage height, 7.01 ft); gage height, 7.39 ft Apr. 10 (backwater from ice).
1961 to March 1965: Discharge, 70 cfs May 23, 1962 (gage height, 8.59 ft).

(35) Rum River at Isanti, Minn.

(Miscellaneous site)

Location.—Lat 45°29', long 93°16', in $W\frac{1}{2}$ sec.30, T.35 N., R.23 W., at bridge on County Road 5, 0.8 mile west of Isanti.

Gage-height record.—Occasional chain gage readings during flood. Datum of gage is 891.53 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 9,400 cfs Apr. 19 (gage height, 16.63 ft, from floodmark).
1958 to March 1965: Discharge, 5,200 cfs May 29, 1962 (gage height, 12.30 ft).

Cooperation.—Gage height readings and previous maxima furnished by Corps of Engineers.

(36) 5-2860. Rum River near St. Francis, Minn.

Location.—Lat 45°19'40", long 93°22'20", in SE¼ sec.19, T.33 N., R.24 W., on left bank at upstream side of highway bridge, 4 miles south of St. Francis and 15-3/4 miles upstream from mouth.

Drainage area.—1,360 sq mi, approximately.

Gage height record.—Water-stage recorder graph. Datum of gage is 861.12 ft above mean sea level, datum of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–14.

Maxima.—April–May 1965: Discharge, 10,100 cfs 0030 hours Apr.20 (gage height, 11.57 ft). 1929 to March 1965: Discharge 9,260 cfs Apr. 13, 1952 (gage height, 11.03 ft).

Remarks.—Occasional regulation by Ogechie (also controls Mille Lacs Lake) and Onamia Lakes.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	129	2,700	11	500	2,200	21	9,180	1,420
2	132	2,490	12	1,080	2,250	22	8,060	1,320
3	136	2,260	13	1,600	2,250	23	7,290	1,220
4	144	2,000	14	2,200	2,230	24	6,320	1,160
5	160	1,760	15	2,740	2,150	25	5,480	1,190
6	182	1,550	16	4,040	2,010	26	4,720	1,230
7	202	1,520	17	6,710	1,800	27	4,130	1,310
8	227	1,630	18	8,890	1,680	28	3,640	1,490
9	268	1,830	19	9,900	1,570	29	3,250	1,710
10	310	2,040	20	9,880	1,480	30	2,940	1,940
						31	-----	2,130
Monthly mean discharge, in cubic feet per second							3,481	1,791
Runoff, in inches							2.86	1.52

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	4.16	------	Apr. 16	1200	6.84	3,890	Apr. 20	1800	11.36	9,760
	0600	4.31	------		1800	7.39	4,550		2400	11.27	9,720
	1200	4.33	------		2400	7.98	5,300				
	1800	4.46	------					21	0600	11.12	9,430
	2400	4.61	------	17	0600	8.56	6,070		1200	10.96	9,200
					1200	9.08	6,800		1800	10.77	8,940
13	0600	4.94	------		1800	9.47	7,350		2400	10.60	8,700
	1200	4.80	------		2400	9.88	7,920				
	1800	5.37	------					22	0600	10.43	8,460
	2400	5.40	------	18	0600	10.45	8,490		1200	10.28	8,250
					1200	10.79	8,970		1800	9.44	7,310
14	0600	5.35	------		1800	11.04	9,320		2400	9.77	7,770
	1200	5.43	------		2400	11.28	9,650				
	1800	5.50	------					23	1200	9.42	7,280
	2400	5.59	2,490	19	0600	11.42	9,850		2400	9.09	6,820
					1200	11.49	9,950				
15	0600	5.67	2,580		1800	11.52	9,990	24	1200	8.72	6,300
	1200	5.78	2,700		2400	11.56	10,000		2400	8.39	5,840
	1800	5.94	2,870								
	2400	6.20	3,160	20	0030	11.57	10,100	25	1200	8.12	5,490
					0600	11.52	9,990		2400	7.83	5,110
16	0600	6.48	3,470		1200	11.45	9,890				

MISSISSIPPI RIVER MAIN STEM

(37) 5-2885. Mississippi River near Anoka, Minn.

Location.—Lat 45°07'36", long 93°17'48", in SW¼ sec.12, T.119 N., R.21 W., on right bank half a mile downstream from Coon Creek 1½ miles downstream from hydroelectric plant of Northern States Power Co. at Coon Rapids, 6½ miles downstream from Anoka, and at mile 864.8 upstream from Ohio River.

Drainage area.—19,100 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at 15 minute intervals except 0100 hours Apr. 16 to 1125 hours Apr. 19 when the graph was constructed on the basis of once or twice daily readings on the temporary staff gage. No digital record 2000 hours May 17 to 1600 hours May 29. Datum of gage is 805.02 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–12. Discharge for the period May 17–29 was obtained from records for Coon Rapids Hydroelectric Plant which were adjusted for estimated flow from Coon Creek. Mean daily discharge computed from 96 punch-tape readings per day, Apr. 19 to May 16 and May 30, 31.

Maxima.—April–May 1965: Discharge, 91,000 cfs 0500 hours Apr. 17 (gage height 19.53 ft, from floodmark).
1931 to March 1965: Discharge, 75,900 cfs Apr. 14, 1952 (gage height, 17.51 ft).

Remarks.—Flow slightly regulated by six reservoirs on headwaters; total usable capacity, 1,640,600 acre-ft. Diurnal regulation caused by powerplant above station.

Cooperation.—Coon Rapids Hydroelectric Plant records furnished by Northern States Power Company.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	3,820	35,800	11	15,900	28,400	21	70,500	23,500
2	3,970	33,600	12	38,200	28,000	22	64,900	23,900
3	4,000	31,700	13	51,000	28,000	23	59,200	23,500
4	4,500	30,200	14	68,600	26,600	24	54,300	24,300
5	4,300	29,600	15	79,800	26,300	25	51,000	26,000
6	4,350	27,700	16	89,200	25,600	26	48,100	27,900
7	5,080	27,200	17	90,300	24,200	27	44,900	28,600
8	6,020	27,200	18	86,400	24,500	28	42,400	28,700
9	7,590	28,500	19	81,600	23,800	29	40,400	28,700
10	10,300	28,700	20	76,100	23,000	30	38,300	28,700
						31	----------	29,100
Monthly mean discharge, in cubic feet per second							41,500	27,470
Runoff, in inches							2.42	1.66

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Mississippi River near Anoka, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0000	6.10	------	Apr. 13	0200	12.40	45,900	Apr. 17	1200	19.48	90,600
	0600	6.17	------		0600	12.24	44,900		1600	19.40	90,000
	1200	6.93	------		1200	12.95	49,200		2000	19.31	89,300
	1800	8.00	------		1600	13.62	53,200		2400	19.21	88,600
	2000	9.15	------		2000	14.36	57,700				
	2400	9.32	------		2400	15.22	62,800	18	0600	19.05	87,400
									1200	18.88	86,200
11	0800	9.84	------	14	0600	16.00	67,500		1800	18.73	85,100
	1000	10.28	------		1200	16.21	68,800		2400	18.68	84,800
	1400	9.72	------		1800	16.54	70,700				
	1800	10.50	------		2400	16.82	72,400	19	0600	18.40	82,800
	2000	10.45	------						1200	18.24	81,700
	2400	11.05	------	15	0200	16.80	72,300		1800	18.03	80,200
					0600	17.05	73,800		2400	17.82	78,800
12	0200	11.48	------		1200	18.13	80,900				
	0400	11.30	------		1800	18.71	85,000	20	0600	17.61	77,500
	0600	11.54	------		2400	19.00	87,000		1200	17.40	76,100
	0800	11.47	------						1800	17.20	74,800
	1000	12.18	------	16	1200	19.32	89,400		2400	16.99	73,400
	1200	16.43	------		1800	19.44	90,300				
	1400	13.00	------		2400	19.52	90,900	21	1200	16.51	70,600
	1800	11.23	------						2400	16.00	67,500
	2000	11.45	------	17	0500	19.53	91,000				
	2400	12.38	45,800		0900	19.50	90,800				

BASSETT CREEK BASIN

(38) Bassett Creek at County Highway 66, Golden Valley, Minn.

(Miscellaneous site)

Location.—Lat 45°00'05", long 93°21'16", in W½ sec.28, T.118 N., R.21 W., at bridge on County Highway 66 in Golden Valley, Minn., and ¼ mile west of underpass on State Highway 100.

Discharge record.—Discharge obtained on the following days by current-meter measurements:

Date	Discharge, in cfs
Apr. 3	5.92
Apr. 6	67.0
May 10	79.5
June 1	84.8

Maximum.—April–May 1965: Discharge, not determined, gage height, 4.73 ft Apr. 6 (backwater from ice).

(39) Bassett Creek at Fruen Mill Co., Minneapolis, Minn.

(Miscellaneous site)

Location.—Lat 44°58'45", long 93°18'52", in SE¼ sec.20, T.29 N., R.24 W., at Fruen Mill, Minneapolis, Minn., and 700 ft downstream from Glenwood Ave.

Gage-height record.—Peak from graph based on once-daily staff gage readings. Datum of gage is 815.23 ft above mean sea level, adjustment of 1929. (Levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 360 cfs 0100 hours Apr. 11 (gage height, 2.57 ft).
1953–56, 1963 to March 1965: Discharge, 122 cfs (current-meter measurement) May 1, 1954 (gage height, 1.78 ft).

Cooperation.—Gage-height record furnished by Corps of Engineers.

MINNEHAHA CREEK BASIN

(40) 5-2895. Minnehaha Creek at Minnetonka Mills, Minn.

(Gaging station, discontinued 1964)

Location.—Lat 44°56'30", long 93°26'45", near center of E½ sec.15, T.117 N., R.22 W., on left bank 40 ft upstream from bridge on county highway at Minnetonka Mills, 2.2 miles downstream from outlet of Minnetonka Lake, and 2.9 miles northwest of Hopkins.

Drainage area.—130 sq mi.

Gage-height record.—Observed stage. Datum of gage is 916.11 ft above mean sea level, datum of 1929.

Maxima.—April–May 1965: Discharge, 245 cfs (current-meter measurement made near peak) May 31 (gage height, 6.63 ft).
1953 to March 1965: Discharge, 235 cfs May 23, 1962 (gage height, 6.66 ft); gage height, 6.97 ft Mar. 23, 1963 (backwater from ice).

Remarks.—Discharge affected by storage in Minnetonka Lake by fixed-crest dam.

(41) Minnehaha Creek at 50th Street, Edina, Minn.

(Miscellaneous site)

Location.—Lat 44°54'45", long 93°20'32", in NE¼SW¼ sec.18, T.28 N., R.24 W., at dam 150 ft upstream from bridge on 50th Street at Edina.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maximum.—April–May 1965: Discharge, 368 cfs May 31, (elevation 885.90 ft above mean sea level, datum of 1929, from floodmark).

(42) Minnehaha Creek at Minnehaha Ave., Minneapolis, Minn.

(Miscellaneous site)

Location.—Lat 44°54'56", long 93°12'44", in SE¼NE¼ sec.18, T.28 N., R.23 W., at bridge on Minnehaha Ave. at Minneapolis, 0.1 mile above Minnehaha Falls 0.8 mile upstream from mouth.

Gage-height record.—Floodmark.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maximum.—April–May 1965: Discharge, 500 cfs May 31, (elevation, 804.43 ft above mean sea level, datum of 1929).

MINNESOTA RIVER BASIN

(43) 5-2900. Little Minnesota River near Peever, S. Dak.

Location.—Lat 45°36'05", long 96°52'18", in SW¼ sec.13, T.125 N., R.50 W., on right bank, 2 miles northwest of town of Browns Valley, Minn., 3¼ miles upstream from proposed Lake Traverse diversion, 5.3 miles northeast of Peever, 7¼ miles downstream from Jorgenson River, and 8 miles upstream from Big Stone Lake.

Drainage area.—447 sq mi.

Gage-height record.—Water-stage recorder graph. Altitude of gage is 1,000 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–11.

Maxima.—Given in the following table:

April–May 1965	Discharge (cfs)	Gage height (feet)
Apr. 12, 1400 hours	920	6.27
May 21, 1530 hours	2,880	9.48
1939 to March 1965		
Apr. 8, 1952	4,730	12.16
Mar. 25, 1943	----------	[a]13.35

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	2.6	47	11	800	21	21	173	1,210
2	3.3	42	12	881	19	22	161	634
3	16	36	13	689	16	23	145	534
4	116	32	14	541	16	24	125	819
5	426	30	15	471	37	25	108	1,000
6	250	29	16	391	145	26	94	750
7	288	27	17	300	158	27	82	570
8	624	23	18	243	154	28	71	451
9	494	22	19	210	112	29	64	371
10	480	20	20	190	93	30	55	326
						31	----------	272
Monthly mean discharge, in cubic feet per second							283	259
Runoff, in inches							0.71	0.67

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Little Minnesota River near Peever, S. Dak.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 1	0000	2.24	------	Apr. 8	1500	6.00	------	Apr. 15	1200	4.92	462
	1200	2.23	------		1700	6.16	------		2400	4.89	454
	1800	2.58	------		2400	5.76	------				
	2400	2.85	------					16	1200	4.64	389
				9	0600	5.32	------		2400	4.42	332
2	0600	2.67	------		0900	5.25	------				
	1200	2.90	------		1200	5.23	------	May 19	2400	3.39	116
	1800	3.23	------		1400	5.27	------				
	2200	3.43	------		1500	5.18	------	20	1200	3.34	91
	2400	3.67	------		1800	5.29	------		2100	3.32	87
					2400	5.13	------		2400	3.38	98
3	0200	3.87	------								
	0600	3.98	------	10	0200	5.13	------	21	0600	3.65	161
	1500	4.41	------		0400	5.04	------		0900	4.99	514
	2200	4.42	------		0600	5.09	------		1100	6.01	866
	2400	4.46	------		0800	4.92	------		1200	7.17	1,410
					1000	5.05	------		1300	8.17	1,990
4	0700	4.45	------		1200	5.18	------		1500	9.40	2,810
	1000	4.56	------		1400	5.19	------		1530	9.48	2,880
	1100	4.48	------		1600	5.17	------		1800	8.75	2,390
	1800	5.06	------		1800	5.38	------		2100	7.46	1,600
	2400	5.49	------		2200	5.72	------		2400	6.57	1,150
					2300	5.45	------				
5	0800	5.53	------		2400	5.96	------	22	0600	5.73	773
	1200	5.67	------						1200	5.13	574
	2000	5.95	------	11	0200	5.91	------		1800	4.57	423
	2400	5.73	------		0235	6.52	------		2400	4.43	386
					0400	5.95	------				
6	1100	4.88	------		0600	6.16	------	23	1200	4.89	509
	1400	4.80	------		0800	5.99	------		2400	5.60	731
	2400	4.85	------		1000	6.08	------				
					1400	6.14	------	24	1100	5.96	884
7	0100	4.84	------		1600	6.16	------		2000	5.74	789
	0700	4.41	------		2000	6.15	------		2400	5.85	834
	0800	4.41	------		2400	6.12	852				
	0900	4.52	------					25	0900	6.12	960
	1100	4.59	------	12	0600	6.17	874		1300	6.44	1,100
	1300	4.87	------		1200	6.25	910		1600	6.55	1,160
	1600	5.39	------		1400	6.27	920		2400	6.09	951
	1800	5.66	------		1800	6.21	892				
	1900	5.78	------		2400	6.07	830	26	0600	5.67	769
	2100	6.03	------						1200	5.55	724
	2300	6.07	------	13	0600	5.84	738		1800	5.50	706
	2400	5.96	------		1200	5.64	669		2400	5.34	649
					2400	5.42	601				
8	0300	5.64	------					27	1200	5.06	565
	0900	5.53	------	14	1200	5.17	528		2400	4.83	501
	1200	5.77	------		2400	5.09	506				

(44) 5-2910. Whetstone River near Big Stone City, S. Dak.

Location.—Lat 45°17'32", long 96°29'14", in SE¼NW¼ sec.18, T.121 N., R.46 W., on right bank 20 ft downstream from highway bridge, 1½ miles west of Big Stone City, and 4½ miles upstream from Big Stone Lake.

Drainage area.—389 sq mi.

Gage-height record.—Water-stage recorder graph except Apr. 1–9. Graph was constructed on the basis of once or twice-daily wire-weight gage readings, Apr. 2–9. Datum of gage is 996.96 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge estimated Apr. 1 on the basis of two discharge measurements and weather records. Backwater from ice Apr. 2–7.

Maxima.—Given in the following table:

April–May 1965	Discharge (cfs)	Gage height (feet)
Apr. 6, 1030 hours	1,740	[a]8.57
May 24, 2300 hours	1,100	6.63
1910–12, 1931 to March 1965		
Apr. 8, 1952	5,710	----------
Apr. 11, 1947	---------	13.95

[a]Backwater from ice.

Maximum stage known, about 26 ft in June 1919, from information by local resident.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	6	41	11	1,000	35	21	100	48
2	27	38	12	905	33	22	92	50
3	130	37	13	498	30	23	88	149
4	427	35	14	354	31	24	78	683
5	1,010	35	15	313	40	25	73	909
6	1,680	38	16	281	177	26	65	608
7	1,630	36	17	187	132	27	61	345
8	1,460	33	18	130	79	28	54	174
9	976	36	19	107	58	29	50	126
10	705	35	20	103	48	30	46	108
						31	---------	100
Monthly mean discharge, in cubic feet per second							421	140
Runoff, in inches							1.21	0.40

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Whetstone River near Big Stone City, S. Dak.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 2	0000	4.58	------	Apr. 10	1200	5.72	657	May 23	0300	2.70	54
	1200	4.68	------		1500	5.57	610		0600	3.04	82
	2400	5.22	------		1800	5.69	647		0900	3.14	92
					2400	6.22	824		1200	3.38	124
3	0600	5.61	------						1500	3.80	204
	1200	5.65	------	11	0600	6.71	1,000		1800	3.98	247
	1800	5.51	------		0800	6.80	1,030		2100	3.88	222
	2400	5.37	------		1200	6.78	1,020		2400	4.10	279
					1600	6.73	1,000				
4	0600	5.33	------		1800	6.81	1,030	24	0400	4.35	350
	1200	5.65	------		2400	6.95	1,090		0800	4.65	439
	1800	6.77	------						1200	5.38	660
	2400	6.98	------	12	0600	6.88	1,080		1600	6.08	898
					1200	6.43	916		2000	6.52	1,060
5	0600	6.92	------		1800	6.00	765		2300	6.63	1,100
	1200	7.11	------		2400	5.58	629		2400	6.62	1,100
	1800	7.65	------								
	2400	8.17	------	13	1200	5.04	481	25	0400	6.54	1,070
					2400	4.77	400		0800	6.35	992
6	0600	8.50	------						1200	6.12	912
	1030	8.57	------	14	1200	4.60	364		1600	5.87	824
	1200	8.56	------		2400	4.34	290		2000	5.67	755
	1800	8.48	------						2400	5.51	701
	2400	8.38	------	15	0400	4.30	293				
					0800	4.35	307	26	0600	5.39	663
7	0600	8.32	------		1200	4.39	318		1200	5.23	613
	1200	8.22	------		1600	4.43	329		1800	5.04	556
	1800	8.08	------		2000	4.43	329		2400	4.84	496
	2400	7.93	1,650		2400	4.38	315				
								27	0600	4.58	418
8	1200	7.66	1,500	16	1200	4.28	287		1200	4.29	332
	2400	7.18	1,170		2400	4.08	234		1800	4.07	271
									2400	3.88	222
9	1200	6.67	972	17	1200	3.82	184				
	2400	6.15	790		2400	3.62	147	28	1200	3.63	168
									2400	3.46	137
10	0600	5.95	731	May 22	2400	2.68	52				

(45) 5-2915. Big Stone Lake at Ortonville, Minn.

Location.—Lat 45°18'18", long 96°26'57", in NW¼SW¼ sec.9, T.121 N., R.46 W., at powerplant intake at west edge of Ortonville, half a mile north of concrete dam at outlet, half a mile southwest of Ortonville.

Gage-height record.—Once-daily observer's readings on wire-weight gage. Datum of gage is 957.69 ft above mean sea level, datum of 1929.

Maxima.—March–May 1965: Gage height, 9.30 ft May 27.
1937 to February 1965: Gage height, 12.73 ft April 17, 1952.

Remarks.—Reservoir is formed by natural lake with concrete dam at outlet. Fixed crest of dam is at elevation 963.64 ft, with one 5-foot gate and two 2½-foot gates with lowest sill at elevation 958.40 ft (all elevations are referred to datum of 1929). Changes in gate openings are not made.

Gage height, in feet

Feb. 28	6.17	April 18	9.03
Mar. 7	6.10	April 25	8.86
Mar. 14	6.08	May 2	8.52
Mar. 21	6.20	May 9	8.06
Mar. 27	6.25	May 16	8.07
Apr. 5	6.80	May 23	7.94
Apr. 11	8.22	May 30	8.85

(46) 5-2920. Minnesota River at Ortonville, Minn.

Location.—Lat 45°17'44", long 96°26'38", in NE¼NW¼ sec.16, T.121 N., R.46 W., on left bank 400 ft downstream from bridge on U.S. Highway 12 and 1,300 ft downstream from dam at outlet of Big Stone Lake, at Ortonville.

Drainage area.—1,160 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except Apr. 1, 2 when once-daily readings were made on outside staff gage. Datum of gage is 956.38 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–7.

Maxima.—Given in the following table:

	Discharge (cfs)	Gage height (feet)
April–May 1965:		
April 7, 1800 hours	870	[a]9.00
May 27, 1030 hours	934	9.28
1938 to March 1965		
April 13, 1952	3,060	12.92

[a]Backwater from ice.

Remarks.—Flow affected by natural storage in Big Stone Lake above station.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	6.9	476	11	500	298	21	590	381
2	8.7	512	12	569	281	22	591	368
3	10	457	13	600	281	23	591	401
4	25	361	14	614	272	24	566	477
5	210	320	15	628	380	25	546	644
6	500	379	16	624	344	26	600	772
7	600	373	17	621	269	27	642	853
8	725	372	18	618	397	28	548	717
9	551	340	19	603	295	29	542	658
10	411	408	20	584	230	30	490	658
						31		612
Monthly mean discharge, in cubic feet per second							490	438
Runoff, in inches							0.47	0.44

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Minnesota River at Ortonville, Minn.

Date	Hour	Gage height	Discharge
Apr. 3	0000	1.44	------
	0400	1.86	------
	0800	2.12	------
	1200	2.92	------
	1600	3.86	------
	2000	3.62	------
	2400	3.28	------
4	0400	2.84	------
	0800	2.45	------
	1200	2.22	------
	1600	4.02	------
	2000	5.89	------
	2100	5.98	------
	2400	5.31	------
5	0200	4.92	------
	0600	4.58	------
	0800	4.55	------
	1200	4.94	------
	1400	4.99	------
	1600	4.96	------
	2000	5.70	------
	2200	6.58	------
	2400	7.06	------
6	0200	7.46	------
	0400	7.07	------
	0700	6.98	------
	1000	7.44	------
	1400	7.61	------
	1500	7.68	------
	1800	7.48	------
	2000	7.41	------
	2200	7.54	------
	2400	7.51	------
7	0200	7.72	------
	0400	7.73	------
	0800	7.52	------
	1100	7.23	------
	1400	8.01	------
	1600	8.94	------
	1800	9.00	870
	2000	8.96	------
	2200	8.89	------
	2400	8.80	830
8	0400	8.64	798
	0800	8.54	778
	1100	8.52	774
	1200	8.00	670
	1400	8.04	678
	1600	7.84	638
	1800	7.93	656
	2200	8.01	672
	2400	7.97	664
9	0200	7.79	628
	0600	7.69	614
	1200	7.26	549
Apr. 9	1800	6.94	501
	2400	6.44	435
10	0200	6.24	409
	0600	6.30	417
	0800	6.38	427
	1200	6.27	413
	1400	6.23	408
	1600	6.09	391
	1800	6.09	391
	2000	6.11	393
	2400	6.43	434
11	0400	6.59	455
	0500	6.60	456
	0800	6.90	495
	1000	7.07	520
	1200	6.99	508
	1600	7.05	518
	2400	7.21	542
12	1200	7.41	572
	2400	7.54	591
13	1200	7.59	598
	2400	7.68	612
May 20	0000	5.04	266
	0300	5.00	262
	0900	4.53	215
	1200	4.07	175
	1300	4.32	196
	1700	4.13	179
	1800	4.37	200
	2100	4.92	254
	2400	5.72	346
21	0300	5.30	296
	0500	5.69	343
	0700	5.58	330
	0900	6.19	403
	1100	6.49	442
	1400	6.71	470
	1800	6.18	402
	2100	5.69	343
	2300	5.81	357
	2400	5.78	354
22	0300	5.85	362
	0600	5.75	350
	0900	5.73	348
	1200	6.06	387
	1300	6.05	386
	1500	5.92	370
	1600	6.06	387
	1800	5.88	366
	1900	5.86	363
	2100	6.12	394
	2300	5.92	370
	2400	5.90	368
May 23	0300	5.60	332
	0500	6.41	431
	0600	6.49	442
	0900	5.95	374
	1000	5.83	360
	1200	6.28	414
	1300	6.30	417
	1500	5.97	376
	1800	6.42	433
	1900	6.50	443
	2100	6.27	413
	2300	6.48	440
	2400	6.34	422
24	0100	6.31	418
	0200	6.42	433
	0600	6.49	442
	1200	6.71	470
	1300	6.87	491
	1600	6.38	427
	1800	7.44	576
	1900	7.68	612
	2100	6.95	502
	2300	7.14	531
	2400	7.07	520
25	0200	6.95	502
	0400	7.35	562
	0600	7.35	562
	0900	8.05	680
	1100	8.08	686
	1300	8.33	736
	1600	8.03	676
	1900	8.13	696
	2200	8.00	670
	2400	8.17	704
26	0200	8.18	706
	0400	8.31	732
	0600	8.23	716
	0700	8.36	742
	1000	8.67	804
	1200	8.72	814
	1400	8.44	758
	1600	8.60	790
	1800	8.73	816
	2000	8.51	772
	2400	8.91	852
27	0100	8.74	818
	0300	8.97	864
	0500	8.86	842
	0800	9.03	876
	1030	9.28	934
	1200	9.17	904
	1400	8.82	834
	1600	9.12	894
	1900	8.86	842
	2200	8.49	768
	2400	8.54	778

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Minnesota River at Ortonville, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
May 28	0300	8.45	760	May 29	1500	8.06	682	May 30	2400	7.73	620
	0500	8.29	728		1800	8.02	674				
	0700	8.37	744		2000	8.04	678	31	0200	7.81	632
	0900	8.30	730		2400	7.99	668		0500	7.48	582
	1100	8.41	752						0600	7.44	576
	1300	8.23	716	30	0100	7.97	664		0800	7.43	574
	1800	8.07	684		0300	8.00	670		1000	7.91	652
	2400	7.91	652		0500	7.97	664		1300	7.51	586
					0900	8.03	676		1500	7.35	562
29	0300	7.80	630		1100	8.05	680		1700	7.81	632
	0600	7.81	632		1400	7.97	664		1900	7.69	614
	0700	7.95	660		1700	7.86	642		2100	7.98	666
	0800	7.80	630		2000	7.88	646		2300	7.83	636
	1100	8.03	676		2200	7.81	632		2400	7.88	646
	1300	7.91	652		2300	7.74	621				

(47) 5-2930. Yellow Bank River near Odessa, Minn.

Location.—Lat 45°13'35", long 96°21'12", in $SE\frac{1}{4}SE\frac{1}{4}$ sec.1, T.120 N., R.46 W., or left bank 150 ft downstream from highway bridge, $2\frac{1}{2}$ miles southwest of Odessa, and $4\frac{1}{2}$ miles upstream from mouth.

Drainage area.—398 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 953.34 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–7.

Maxima.—Given in the following table:

April–May 1965	Discharge (cfs)	Gage height (feet)
Apr. 8, 0800 hours	3,540	13.46
May 25, 1300 hours	806	6.37
1939 to March 1965		
Apr. 4, 1952	6,260	----------
Mar. 25, 1943	----------	[a]17.98

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965, of Yellow Bank River near Odessa, Minn.

Day	April	May	Day	April	May	Day	April	May
1	28	81	11	1,120	71	21	190	131
2	70	77	12	1,210	77	22	174	115
3	150	73	13	900	71	23	155	182
4	300	63	14	625	63	24	140	304
5	650	65	15	481	68	25	133	740
6	1,500	65	16	381	79	26	126	585
7	2,580	64	17	317	268	27	120	432
8	3,330	65	18	268	225	28	115	318
9	2,170	71	19	230	174	29	103	252
10	1,280	71	20	207	149	30	90	216
						31	----------	193
Monthly mean discharge, in cubic feet per second							638	174
Runoff, in inches							1.79	0.51

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 4	0000	4.79	------	Apr. 9	1200	10.52	2,160	May 23	0400	3.16	115
	1200	4.91	------		1800	9.43	1,760		1000	3.44	155
	1800	6.55	------		2400	8.63	1,480		1600	3.95	241
	2400	7.40	------						2400	3.94	239
				10	0600	8.14	1,340				
5	0600	8.01	------		1200	7.91	1,270	24	1200	4.05	259
	1200	7.98	------		2400	7.42	1,120		1800	4.33	312
	1300	7.91	------						2400	5.38	550
	1500	8.09	------	11	0600	7.30	1,080				
	2000	7.83	------		1200	7.41	1,120	25	0600	6.16	745
	2400	8.26	------		2400	7.62	1,180		1200	6.36	803
									1300	6.37	806
6	0100	8.33	------	12	0900	7.95	1,280		1400	6.36	803
	0700	10.71	------		2400	7.44	1,130		2100	6.18	750
	0800	10.47	------						2400	6.01	708
	1000	10.63	------	13	1200	6.61	878				
	1100	10.40	------		2400	6.03	712	26	0600	5.70	632
	1800	10.89	------						1200	5.46	572
	2400	11.32	------	14	1200	5.66	620		1800	5.29	532
					2400	5.37	548		2400	5.17	502
7	0600	11.94	------								
	1200	12.29	------	15	1200	5.11	482	27	1200	4.87	431
	1900	13.25	------		2400	4.83	415		2400	4.56	365
	2100	10.33	------								
	2400	13.18	3,400	16	0600	4.73	393	28	1200	4.30	316
					1200	4.68	382		2400	4.07	274
8	0600	13.43	3,520		1800	-----	367				
	0800	13.46	3,540		2400	4.52	349	29	1200	3.93	250
	1200	13.32	3,470						2400	3.83	234
	1500	12.96	3,290	17	1200	4.34	314				
	1800	12.70	3,160		2400	4.22	291	30	1200	3.72	216
	2100	12.51	3,060						2400	3.62	199
	2400	12.25	2,940	May 21	2400	3.21	121				
								31	1200	3.58	194
9	0200	12.00	2,810	22	1200	3.15	114		2400	3.53	185
	0600	11.44	2,530		2400	3.14	112				

(48) 5-2940. Pomme de Terre River at Appleton, Minn.

Location.—Lat 45°12'10", long 96°01'20", in SW¼NW¼ sec.14, T.120 N., R.43 W., on left bank at Appleton, 60 ft upstream from bridge on U.S. Highway 59 and State Highway 119 and 8 miles upstream from mouth.

Drainage area.—905 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 978.00 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–8.

Maxima.—April–May 1965: Discharge, 2,310 cfs 2130 hours Apr. 9 (gage-height, 9.63 ft). 1931 to March 1965: Discharge, 5,050 cfs Apr. 8, 1952 (gage height, 10.13 ft., at site 4 miles upstream at datum 25.17 ft higher).

Remarks.—Flow affected by lakes above station.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	5.8	402	11	1,750	361	21	894	324
2	6.4	384	12	1,660	338	22	826	333
3	7.3	374	13	1,880	315	23	772	370
4	8.9	361	14	1,930	319	24	708	407
5	17	351	15	1,720	328	25	660	439
6	62	347	16	1,460	342	26	612	444
7	230	342	17	1,290	333	27	564	439
8	1,940	338	18	1,180	310	28	526	425
9	2,170	351	19	1,080	301	29	478	430
10	1,950	370	20	973	306	30	435	435
						31		435
Monthly mean discharge, in cubic feet per second							927	366
Runoff, in inches							1.14	0.47

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	4.46	------	Apr. 8	1400	9.40	------	Apr. 10	1800	8.76	1,840
	0600	4.46	------		1800	9.38	------		2000	8.79	1,860
	1200	4.47	------		2400	9.36	2,160		2200	8.59	1,750
	1500	4.49	------	9	0200	9.29	2,130		2300	8.93	1,930
	1600	4.90	------		0500	9.31	2,140		2400	8.74	1,830
	1700	4.83	------		0600	9.28	2,120				
	1800	4.90	------		1000	9.17	2,060	11	0600	8.60	1,750
	2000	4.83	------		1100	9.23	2,090		1200	8.61	1,760
	2200	4.89	------		1200	9.15	2,040		2400	8.52	1,710
	2400	4.93	------		1300	9.28	2,120				
6	0600	4.78	------		1500	9.39	2,180	12	1200	8.34	1,620
	1200	4.99	------		1700	9.57	2,280		2400	8.49	1,700
	1400	5.66	------		1800	9.54	2,260				
	1800	6.11	------		1900	9.62	2,300	13	1200	8.88	1,910
	2000	6.35	------		2130	9.63	2,310		2400	9.04	1,990
	2400	6.04	------		2200	9.61	2,300				
7	0600	5.60	------		2400	9.49	2,230	14	1200	8.94	1,940
	1200	5.66	------	10	0200	9.41	2,190		2400	8.78	1,850
	1800	5.86	------		0600	9.14	2,050				
	2400	7.40	------		1000	9.93	1,930	15	1200	8.57	1,730
8	0600	8.59	------		1200	8.88	1,910		2400	8.29	1,580
	1200	9.07	------		1400	8.78	1,850	16	1200	8.03	1,450
									2400	7.84	1,350

(49) 5-3000. Lac qui Parle River near Lac qui Parle, Minn.

Location.—Lat 45°00', long 95°55', in SW¼SW¼ sec.27, T.118 N., R.42 W., on right bank 40 ft downstream from highway bridge and half a mile southwest of village of Lac qui Parle.

Drainage area.—983 sq mi.

Gage-height record.—Water-stage recorder graph except 1900 hours Apr. 8 to 1300 hours Apr. 9 when graph was constructed on the basis of engineer's gage reading on chain gage and floodmark. Datum of gage is 951.98 ft above mean sea level (Minnesota Highway Department bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–10.

Maxima.—Given in the following table:

April–May 1965	Discharge (cfs)	Gage height (feet)
April 9, 0900 hours	8,370	[a]19.37
May 26, 1200 hours	1,410	5.69
1910–14, 1931 to March 1965		
Apr. 6, 1952	11,100	----------
Mar. 24, 1948	----------	[a]18.52

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	2.0	330	11	4,960	210	21	737	263
2	10	305	12	4,220	215	22	700	284
3	30	276	13	3,630	204	23	610	796
4	75	256	14	2,850	210	24	540	1,260
5	125	239	15	2,260	220	25	498	1,340
6	445	229	16	1,850	220	26	470	1,400
7	1,000	217	17	1,520	227	27	454	1,300
8	5,600	215	18	1,250	232	28	436	1,030
9	7,200	217	19	1,070	225	29	407	792
10	5,800	206	20	922	217	30	336	658
						31	---------	566
Monthly mean discharge, in cubic feet per second							1,670	463
Runoff, in inches							1.90	0.54

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Lac qui Parle River near Lac qui Parle, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	1.72	------	Apr. 10	0600	13.44	------	Apr. 17	1200	5.77	1,510
	0600	1.81	------		1000	13.55	------		2400	5.48	1,380
	1200	2.00	------		1200	13.50	------				
	1800	2.55	------		1800	13.14	------	18	1200	5.19	1,250
	2400	3.44	------		2400	12.77	5,340		2400	4.98	1,150
6	0600	4.30	------	11	0600	12.54	5,180	May 23	0000	2.41	292
	1200	5.01	------		1200	12.23	4,960		0400	2.43	292
	1800	5.41	------		1800	11.90	4,740		0700	3.21	521
	2400	6.00	------		2400	11.63	4,560		1200	4.13	818
									1800	4.97	1,140
7	0600	6.53	------	12	0600	11.35	4,390		2400	5.46	1,360
	1200	7.10	------		1200	11.03	4,200				
	1500	7.65	------		1800	10.76	4,050	24	0200	5.48	1,350
	1600	8.25	------		2400	10.50	3,900		1200	5.22	1,230
	1700	12.50	------						1700	5.12	1,190
	2400	14.36	------	13	0600	10.35	3,820		2400	5.23	1,240
					1200	10.05	3,660				
8	0300	15.14	------		1800	9.69	3,460	25	1200	5.59	1,360
	0600	16.24	------		2400	9.25	3,240		2400	5.68	1,410
	0900	16.80	------								
	1200	16.71	------	14	0600	8.86	3,040	26	1200	5.69	1,410
	1500	16.69	------		1200	8.45	2,840		2400	5.65	1,390
	1800	17.76	------		1800	8.07	2,640				
	2100	18.30	------		2400	7.76	2,490	27	1200	5.50	1,310
	2400	18.71	------						2400	5.22	1,190
				15	0600	7.50	2,360				
9	0400	19.10	------		1200	7.27	2,240	28	1200	4.82	1,020
	0900	19.37	8,370		1800	7.08	2,150		2400	4.45	877
	1200	18.69	------		2400	6.88	2,050				
	1500	16.61	------					29	1200	4.22	787
	1800	15.86	------	16	1200	6.47	1,840		2400	4.01	719
	2400	14.32	------		2400	6.10	1,660				
10	0300	13.70	------								

(50) 5-3010. Minnesota River near Lac qui Parle, Minn.

Location.—Lat 45°01'17", long 95°52'05", in NW¼NE¼ sec.24, T.118 N., R.42 W., on left bank 200 ft downstream from dam at Lac qui Parle Outlet, 2.4 miles northeast of village of Lac qui Parle, and 3.5 miles west of Watson.

Drainage area.—4,050 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 900.00 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–8.

Maxima.—April–May 1965: Discharge, 10,700 cfs 0200 hours Apr. 14 (gage height, 36.17 ft).

1942 to March 1965: Discharge, 19,700 cfs Apr. 10, 1952 (gage height, 37.93 ft, from floodmark).

Remarks.—Part of flow from 2,050 square miles of Chippewa River basin at times diverted into Minnesota River above station. Some regulation by Big Stone Lake since Apr. 17, 1927, Lac qui Parle since January, 1938, and Marsh Lake since Nov. 1, 1939.

Mean discharge, in cubic feet per second, 1965, of Minnesota River near Lac qui Parle, Minn.

Day	April	May	Day	April	May	Day	April	May
1	108	3,320	11	7,270	2,260	21	5,930	1,720
2	109	3,260	12	9,560	1,970	22	5,460	1,710
3	110	3,190	13	10,500	1,660	23	5,070	1,810
4	111	3,090	14	10,600	1,500	24	4,700	1,920
5	112	3,000	15	10,200	1,540	25	4,390	1,840
6	120	2,930	16	9,640	1,540	26	4,120	1,970
7	380	2,830	17	8,880	1,520	27	3,920	2,130
8	2,000	2,620	18	7,940	1,650	28	3,700	2,060
9	3,110	2,500	19	7,050	1,700	29	3,540	2,020
10	4,700	2,470	20	6,300	1,680	30	3,420	2,120
						31		2,160
Monthly mean discharge, in cubic feet per second							4,770	2,184
Runoff, in inches							1.31	0.62

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 9	0000	30.10	2,640	Apr. 12	1200	35.90	9,680	Apr. 17	1200	35.67	8,880
	0100	30.10	2,740		2400	36.05	10,200		2400	35.56	8,490
	0800	30.49	2,900								
	1600	31.30	3,220	13	1200	36.14	10,600	18	1200	35.40	7,930
	2400	32.32	3,680		2400	36.16	10,700		2400	35.25	7,430
10	0400	32.70	4,020	14	0200	36.17	10,700	19	0600	35.17	7,210
	0600	32.77	4,080		1200	36.15	10,600		1200	35.16	7,180
	0700	32.32	3,740		2400	36.10	10,400		1800	35.01	6,800
	1100	33.30	4,540						2400	34.91	6,600
	1500	33.80	5,050	15	1200	36.06	10,300				
	2400	34.54	6,000		2400	35.97	9,920	20	1200	34.72	6,260
									2400	34.61	6,100
11	0700	34.88	6,540	16	1200	35.90	9,680				
	1700	35.40	7,930		2400	35.78	9,260				
	2400	35.62	8,700								

(51) 5-3045. Chippewa River near Milan, Minn.

Location.—Lat 45°06'39", long 95°47'57", in SE¼SE¼ sec.16, T.119 N., R.41 W., on right bank 800 ft upstream from bridge on State Highway 40, 2.0 miles upstream from small tributary, and 5½ miles east of Milan.

Drainage area.—1,870 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 959.69 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–10.

Maxima.—April–May 1965: Discharge, 6,770 cfs 1630 hours, Apr. 11 (gage-height, 11.93 ft). 1937 to March 1965: Discharge, 6,930 cfs Apr. 9, 1952 (gage-height, 12.12 ft), gage-height, 12.29 ft Apr. 7, 1952 (backwater from ice).

Remarks.—Part of flow from 2,050 square miles of Chippewa River basin at times diverted into Minnesota River above station.

Mean discharge, in cubic feet per second, 1965, of Chippewa River near Milan, Minn.

Day	April	May	Day	April	May	Day	April	May
1	3	1,150	11	6,170	995	21	1,880	946
2	3	1,120	12	6,270	951	22	1,730	940
3	4	1,080	13	5,710	912	23	1,610	1,490
4	5	1,040	14	5,160	902	24	1,510	2,930
5	11	1,030	15	4,620	946	25	1,440	2,550
6	40	1,030	16	3,920	1,160	26	1,390	2,120
7	500	1,010	17	2,990	1,060	27	1,330	1,780
8	1,750	973	18	2,450	968	28	1,270	1,570
9	3,100	1,040	19	2,190	907	29	1,230	1,460
10	3,900	1,040	20	2,020	885	30	1,190	1,380
						31		1,300
Monthly mean discharge, in cubic feet per second							2,180	1,247
Runoff, in inches							1.30	0.77

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	2.10	------	Apr. 8	0200	8.61	------	Apr. 10	0600	7.84	------
	0300	2.11	------		0600	8.98	------		0900	8.44	------
	1200	2.12	------		0900	9.20	------		1200	8.39	------
	1500	2.17	------		1000	8.23	------		1500	8.65	------
	1800	2.21	------		1200	8.45	------		1800	8.94	------
	2100	2.35	------		1400	8.50	------		2100	9.69	------
	2400	2.98	------		1500	8.32	------		2400	9.76	5,040
					1800	8.56	------	11	0300	9.86	5,120
6	0600	4.97	------		2000	8.53	------		0600	10.58	5,690
	0900	5.49	------		2400	8.47	------		1200	11.56	6,480
	1200	5.94	------						1500	11.91	6,670
	1300	6.04	------	Apr. 9	0600	8.77	------		1630	11.93	6,770
	1500	5.97	------		0900	8.80	------		1800	11.90	6,750
	1800	5.72	------		1000	9.27	------		2400	11.67	6,570
	2100	5.98	------		1100	7.98	------				
	2400	6.35	------		1200	9.72	------	12	1200	11.29	6,260
					1500	8.25	------		2400	10.95	5,990
7	0300	6.69	------		1700	8.02	------				
	0900	7.03	------		1800	8.13	------	13	1200	10.59	5,700
	1200	6.92	------		2100	7.91	------		2400	10.26	5,440
	1500	7.01	------		2400	7.89	------				
	2100	8.02	------					14	1200	9.91	5,160
	2400	8.38	------	10	0300	7.70	------		2400	9.57	4,890

(52) Chippewa River diversion near Watson, Minn.

(Miscellaneous site)

Location.—Lat 45°01', long 95°49', on line between sections 15 and 16, T.118 N., R.41 W., about 1½ miles north on S.A.R. No.3 from Watson.

Gage-height record.—Once-daily staff reading on tailwater gage during flood only. Datum of gage is 900.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by seven current-meter measurements.

Maxima.—April–May 1965: Discharge, 3,430 cfs Apr. 12 (gage height, 43.80 ft).
1943 to March 1965: Discharge, 4,300 cfs Apr. 12, 1952, from discharge measurement at or near peak, gage height, 44.90 ft, Apr. 10, 1952, backwater from Lac qui Parle reservoir.

Cooperation: Maximum gage heights furnished by Corps of Engineers.

(53) Chippewa River below diversion dam, near Watson, Minn.

(Miscellaneous site)

Location.—Lat 45°01', long 95°48', on line between sec.15 and 22, T.118 N., R.41 W., 1½ miles northeast of Watson, 2.4 miles downstream from Dry Weather Creek, and 10 miles above mouth.

Gage-height record.—Once-daily staff gage reading on tailwater gage. Datum of gage is 900.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by three discharge measurements.

Maxima.—April–May 1965: Discharge, 3,160 cfs Apr. 12 (gage height, 44.25 ft).
1943 to March 1965: Discharge, 3,180 cfs Apr. 12, 1952 (gage height, 43.55 ft) from discharge measurement near peak.

Cooperation.—Peak stage furnished by Corps of Engineers.

(54) 5-3110. Minnesota River at Montevideo, Minn.

Location.—Lat 44°56'00", long 95°44'00", in NW¼NW¼ sec.19, T.117 N., R.40 W., on right bank 100 ft upstream from bridge on U.S. Highway 212, at Montevideo, and 400 ft downstream from Chippewa River.

Drainage area.—6,180 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 910.87 ft above mean sea level, datum of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–10.

Maxima.—April–May 1965: Discharge, 12,900 cfs 0300 hours Apr. 14 (gage height, 16.64 ft).
1909 to March 1965: Discharge, 24,500 cfs Apr. 10, 1952 (gage height, 20.02 ft, from floodmark).

Remarks.—Flow regulated by Big Stone Lake since Apr. 17, 1937, Lac qui Parle since January 1938 and Marsh Lake since Nov. 1, 1939.

Mean discharge, in cubic feet per second, 1965, of Minnesota River at Montevideo, Minn.

Day	April	May	Day	April	May	Day	April	May
1	111	4,460	11	8,080	3,260	21	7,800	2,670
2	112	4,330	12	10,600	2,930	22	7,170	2,660
3	114	4,220	13	12,300	2,540	23	6,900	3,340
4	116	4,100	14	12,600	2,400	24	6,500	4,880
5	123	3,990	15	12,200	2,490	25	6,110	4,400
6	200	3,870	16	11,600	2,710	26	5,700	4,100
7	800	3,760	17	10,900	2,590	27	5,390	3,940
8	2,500	3,620	18	10,000	2,620	28	5,100	3,640
9	4,000	3,620	19	9,220	2,610	29	4,820	3,490
10	5,350	3,460	20	8,460	2,570	30	4,620	3,520
						31	--------	3,480
Monthly mean discharge, in cubic feet per second							5,980	3,429
Runoff, in inches							1.08	0.64

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	4.69	-----	Apr. 9	2400	13.50	4,600	Apr. 15	2400	16.37	12,000
	1200	4.67	-----	10	0600	14.09	5,100				
	1500	4.69	-----		1200	14.72	5,980	16	1200	16.26	11,600
	2100	4.85	-----		1500	15.02	6,520		1500	16.24	11,500
	2400	5.12	-----		1800	15.21	6,920		1800	16.27	11,600
					2100	15.20	6,900		2400	16.15	11,200
6	0600	5.89	-----		2400	15.17	6,830				
	1200	6.39	-----					17	0600	16.11	11,100
	1800	6.72	-----	11	0600	15.32	7,190		1200	16.06	10,900
	2100	7.01	-----		1200	15.60	8,040		1800	16.00	10,700
	2400	7.13	-----		1800	15.85	8,940		2400	15.94	10,500
					2400	16.00	9,480				
7	0300	7.08	-----					18	0600	15.84	10,200
	0600	6.92	-----	12	0600	16.16	10,100		1200	15.80	10,000
	0900	6.76	-----		1200	16.30	10,700		1800	15.73	9,780
	1200	6.73	-----		1800	16.38	11,200		2400	15.66	9,540
	1500	7.09	-----		2400	16.48	11,700				
	1800	7.73	-----					19	0600	15.60	9,340
	2100	8.38	-----	13	0600	16.54	12,100		1200	15.58	9,270
	2400	9.31	-----		0900	16.59	12,300		1800	15.52	9,070
					1200	16.55	12,200		2400	15.45	8,830
8	0300	10.17	-----		1800	16.58	12,500				
	0600	10.70	-----		2400	16.59	12,700	20	0600	15.42	8,730
	0900	11.07	-----						1200	15.32	8,400
	1200	11.33	-----	14	0300	16.64	12,900		1800	15.26	8,220
	1800	11.83	-----		0600	16.57	12,600		2400	15.23	8,130
	2400	12.33	3,900		1200	16.59	12,700				
					1800	16.56	12,600	21	0600	15.17	7,960
9	0600	12.68	4,110		2400	16.50	12,400		1200	15.12	7,820
	1200	12.87	4,220						1800	15.05	7,630
	1800	13.01	4,310	15	1200	16.46	12,300		2400	14.99	7,480
	2100	13.15	4,390								

(55) 5-3114. South Branch Yellow Medicine River at Minneota, Minn.

Location.—Lat 44°33'50", long 95°59'50", in SE¼ sec.26, T.113 N., R.43 W., on downstream side of bridge on State Highway 68, 0.5 mile northwest of Minneota, and 6 miles upstream from confluence with North Branch Yellow Medicine River.

Drainage area.—111 sq mi, approximately.

Gage-height record.—Graph drawn on basis of once-daily wire-weight gage readings Apr. 1–18 and May 9–12. Once-daily gage readings all other periods. Datum of gage is 1,150.00 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–11.

Maxima.—April–May 1965: Discharge, 1,360 cfs 1300 hours Apr. 6 (gage height, 10.62 ft, backwater from ice).
1960 to March 1965: Discharge, 1,830 cfs Apr. 6, 1960 (gage height, 11.10 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	0	43	11	620	137	21	62	132
2	0	39	12	472	83	22	56	102
3	0	40	13	329	64	23	53	68
4	0	36	14	240	54	24	51	98
5	100	36	15	172	64	25	69	137
6	900	37	16	117	120	26	76	123
7	860	39	17	113	86	27	68	95
8	820	41	18	105	64	28	56	75
9	770	136	19	81	54	29	49	62
10	710	196	20	67	47	30	44	60
						31	-----	57
Monthly mean discharge, in cubic feet per second							235	78.2

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	6.26	-----	Apr. 7	1400	9.64	-----	Apr. 10	1200	9.10	-----
	0300	7.21	-----		2400	9.54	-----		2400	9.12	-----
	0400	8.28	-----								
	0500	9.00	-----	8	0700	9.53	-----	11	0800	9.25	-----
	0700	10.05	-----		1200	9.38	-----		2400	8.43	-----
	1300	10.62	1,360		2400	9.34	-----				
	1800	10.22	-----					12	2400	7.52	372
	2400	9.65	-----	9	0900	9.30	-----				
					2400	9.15	-----				
7	0600	9.40	-----								

(56) 5-3135. Yellow Medicine River near Granite Falls, Minn.

Location.—Lat 44°43', long 95°31', in sec.35, T.115 N., R.39 W., on right bank 50 ft downstream from highway bridge, 6 miles upstream from mouth, and 8 miles south of town of Granite Falls.

Drainage area.—653 sq mi.

Gage-height record.—Water-stage recorder graph except for period 1900 hours Apr. 9 to 1300 hours Apr. 11 when graph was drawn based on four chain gage readings. Datum of gage is 971.59 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–9.

Maxima.—April–May 1965: Discharge, 6,820 cfs 0630 hours Apr. 10 (gage height, 9.78 ft, from floodmark).

1931–38, 1939 to March 1965: Discharge, 11,800 cfs June 18, 1957 (gage height, 12.41 ft).

Flood in June, 1919 reached a stage of 17.5 ft, from information by local residents.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	3.5	310	11	5,120	565	21	826	289
2	3.5	274	12	4,440	495	22	700	343
3	3.5	236	13	3,700	410	23	605	712
4	4.0	219	14	2,930	326	24	535	670
5	4.5	212	15	2,400	297	25	500	1,060
6	20	195	16	2,030	297	26	490	1,560
7	100	185	17	1,740	352	27	495	1,750
8	400	192	18	1,440	360	28	476	1,620
9	2,000	230	19	1,190	310	29	414	1,280
10	6,140	326	20	1,000	270	30	356	1,010
						31	-----	838
Monthly mean discharge, in cubic feet per second							1,336	555
Runoff, in inches							2.28	0.98

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	2.88	-----	Apr. 8	0900	4.33	-----	Apr. 9	1700	7.81	-----
	0300	2.91	-----		1200	4.40	-----		1900	7.57	-----
	0400	3.60	-----		1500	4.42	-----		2000	7.72	-----
	0600	3.90	-----		1700	4.57	-----		2200	8.07	-----
	0900	3.68	-----		1800	4.56	-----		2400	8.50	4,680
	1200	3.61	-----		2100	4.63	-----				
	1500	3.69	-----		2400	5.03	-----	10	0300	9.30	6,000
	1900	3.94	-----						0600	9.77	6,800
	2000	3.99	-----	9	0300	5.67	-----		0630	9.78	6,820
	2400	3.83	-----		0500	5.39	-----		0900	9.72	6,710
					0700	5.28	-----		1500	9.43	6,220
7	0600	3.42	-----		0800	7.82	-----		2100	9.17	5,780
	0900	3.40	-----		0900	6.12	-----		2400	9.05	5,580
	1200	3.34	-----		1100	6.51	-----				
	1800	4.22	-----		1300	6.85	-----	11	0600	8.85	5,240
	2400	4.63	-----		1400	7.01	-----		1200	8.76	5,100
					1500	7.50	-----		1800	8.66	4,940
8	0100	4.65	-----		1600	8.27	-----		2400	8.56	4,780
	0600	4.33	-----								

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Yellow Medicine River near Granite Falls, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	1200	8.34	4,440	Apr. 14	1200	7.16	2,910	Apr. 15	2400	6.37	2,180
	2400	8.12	4,120		2400	6.89	2,640				
								16	1200	6.20	2,040
13	1200	7.83	3,710	15	1200	6.61	2,390		2400	5.98	1,860
	2400	7.48	3,270								

(57) 5-3150. Redwood River at Marshall, Minn.

Location.—Lat 44°27'05", long 95°47'13", in SE¼NW¼ sec.4, T.111 N., R.41 W., on upstream side of highway bridge on Fourth Street in Marshall and 10 miles upstream from Threemile Creek.

Drainage area.—307 sq mi.

Gage-height record.—Graph drawn on basis of two or more daily chain gage readings Apr. 4–18 on river channel. Graph drawn on basis of one or more daily readings on staff gage Apr. 4–17 on diversion channel. One or more daily readings all other periods. Datum of gage is 1,144.88 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–11 on river, Apr. 1–7 on diversion channel.

Maxima.—April–May 1965: Discharge, 2,220 cfs 1500 hours Apr. 9 (includes flow in diversion).

River channel: Discharge, 1,150 cfs 1400 hours Apr. 11 (gage height, 5.70 ft, backwater from ice); gage height, 5.76 ft, 1500 hours Apr. 6 (from floodmark, backwater from ice).

Diversion channel: Discharge, 1,850 cfs 1500 hours Apr. 9 (gage height, 77.70 ft); gage height, 78.07 ft, 1200 hours Apr. 6 (backwater from ice).

1940 to March 1965: Discharge, 5,370 cfs June 17, 1957 (gage height, 10.14 ft); gage height, 11.05 ft Apr. 6, 1951 (from floodmark).

Remarks.—Water diverted at medium and high stages into diversion channel 3 miles above station, bypasses station and returns to river 1 mile below station.

Diversion began Mar. 18, 1964. These records include flow in diversion channel. Unknown amount of natural diversion into Cottonwood River basin at extremely high stages.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	3.0	143	11	1,560	301	21	285	207
2	3.2	127	12	1,110	232	22	255	196
3	3.3	115	13	979	186	23	228	205
4	3.5	114	14	864	176	24	223	200
5	138	115	15	761	242	25	246	218
6	574	110	16	616	290	26	260	239
7	758	104	17	534	285	27	235	239
8	1,500	101	18	440	244	28	198	193
9	1,880	174	19	373	212	29	176	174
10	1,500	292	20	320	189	30	159	159
						31		143
Monthly mean discharge, in cubic feet per second							540	191
Runoff, in inches							1.96	0.72

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Redwood River at Marshall, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 4	0000	2.07	------	Apr. 8	0800	2.98	------	Apr. 12	0600	4.13	741
	0600	2.29	------		0900	3.30	------		1200	4.00	699
	1200	2.78	------		1000	4.50	------		2400	3.93	677
	1600	3.50	------		1200	5.00	------				
	2000	3.13	------		1500	5.76	------	13	1200	3.86	655
	2400	3.01	------		1800	4.90	------		2400	3.73	615
					2400	4.36	------				
5	0800	2.87	------					14	1200	3.53	555
	1000	2.78	------	9	0600	4.31	------		2400	3.51	549
	2400	2.75	------		1000	4.48	------				
					1200	4.70	------	15	0800	3.51	549
6	0800	2.98	------		1400	5.00	------		2400	3.30	490
	0900	3.30	------		2400	4.67	------				
	1000	4.50	------					16	1200	3.22	469
	1200	5.00	------	10	0800	4.68	------		2400	3.11	441
	1500	5.76	------		1800	4.46	------				
	1800	4.90	------		2400	4.41	------	17	1000	3.16	454
	2400	4.36	------						1200	3.00	414
				11	0800	4.92	------				
7	0800	4.53	------		1400	5.70	1,150	18	1200	2.95	402
	1400	5.04	------		2400	4.74	936		2400	2.87	384
	2400	4.56	------								

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Redwood River diversion channel at Marshall, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	73.83	------	Apr. 9	0600	76.59	1,420	Apr. 12	1000	73.26	321
	0700	73.85	------		0800	76.90	1,540		1600	73.21	306
	1700	73.53	------		0900	76.77	1,490		2400	73.23	321
	2400	73.47	------		1200	77.08	1,610				
					1500	77.70	1,850	13	1200	73.31	336
6	0300	73.49	------		2400	76.72	1,470		2400	73.27	324
	0600	74.57	------								
	0800	77.12	------	10	0600	75.95	1,180	14	1200	73.18	297
	1200	78.07	------		1400	75.60	1,060		2400	73.03	267
	1800	77.68	------		1800	75.13	896				
	2400	77.00	1,580		2400	74.96	836	15	1200	72.97	234
									2400	72.82	191
7	0300	76.53	1,400	11	0600	74.76	771				
	1200	76.64	1,440		1200	74.68	747	16	1200	72.63	145
	2100	76.80	1,500		1800	74.64	735		2400	72.50	116
	2400	76.70	1,460		2400	74.22	609				
								17	1200	72.40	94
8	1200	76.29	1,310	12	0600	73.57	414		2400	72.30	72
	2400	76.12	1,240								

(58) 5-3165. Redwood River near Redwood Falls, Minn.

Location.—Lat 44°31'25", long 95°10'20", in SE¼NE¼ sec.9, T.112 N., R.36 W., on right bank 20 ft upstream from highway bridge, 3 miles west of town of Redwood Falls, and 8.5 miles upstream from mouth.

Drainage area.—697 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 972.33 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–10.

Maxima.—April–May 1965: Discharge, 7,050 cfs 0400 hours Apr. 9 (gage height, 13.32 ft, backwater from ice); gage height, 15.88 ft 2400 hours Apr. 8 (backwater from ice).

1909–14, 1930 to March 1965: Discharge, 19,700 cfs June 18, 1957 (gage height, 15.92 ft, from floodmark).

Remarks.—Natural discharge affected by unknown amount of interbasin flow between Yellow Medicine, Redwood and Cottonwood River basins during extreme floods.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	2.0	336	11	5,270	375	21	708	328
2	4.0	308	12	4,260	410	22	624	332
3	9.0	276	13	3,210	370	23	552	320
4	80	248	14	2,520	332	24	495	332
5	300	230	15	2,120	340	25	495	365
6	650	223	16	1,820	405	26	522	385
7	1,000	220	17	1,540	430	27	510	410
8	3,900	206	18	1,260	430	28	480	410
9	6,600	223	19	992	385	29	430	370
10	5,940	276	20	810	344	30	370	332
						31	----------	304
Monthly mean discharge, in cubic feet per second							1,580	331
Runoff, in inches							2.53	0.55

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	1.53	------	Apr. 5	0200	3.47	------	Apr. 6	1400	5.75	------
	0900	1.56	------		0400	3.50	------		1600	5.62	------
	1200	1.63	------		0600	3.40	------		1800	6.18	------
	1500	2.02	------		1000	3.30	------		2000	6.31	------
	1800	2.46	------		1200	3.27	------		2200	6.22	------
	2100	2.49	------		1400	3.19	------		2400	6.18	------
	2400	2.46	------		1800	3.12	------				
					2000	3.12	------	7	0200	6.18	------
4	0300	2.40	------		2200	3.34	------		0400	6.13	------
	0600	2.35	------		2400	4.08	------		0800	5.63	------
	0900	2.37	------				------		1000	5.61	------
	1200	2.38	------	6	0200	4.65			1200	5.52	------
	1500	2.80	------		0400	4.80	------		1400	5.45	------
	1700	2.73	------		0600	5.29	------		1600	5.70	------
	1800	3.04	------		0800	5.40	------		1800	6.03	------
	2100	3.51	------		1000	5.65	------		2000	6.09	------
	2400	3.53	------		1200	5.60	------		2200	6.12	------

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Redwood River near Redwood Falls, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 7	2400	6.36	-----	Apr. 8	2400	15.88	-----	Apr. 11	1200	9.04	5,320
									2400	8.58	4,840
8	0100	6.45	-----	9	0100	13.31	-----				
	0200	6.41	-----		0200	13.23	-----	12	1200	8.01	4,270
	0300	6.66	-----		0400	13.32	7,050		2400	7.39	3,650
	0400	6.63	-----		0500	13.11	-----				
	0500	6.80	-----		0700	13.13	-----	13	1200	6.92	3,180
	0600	7.21	-----		1000	12.89	-----		2400	6.54	2,820
	0800	8.64	-----		1100	13.20	-----				
	0900	8.71	-----		1300	13.07	-----	14	1200	6.16	2,490
	1000	8.94	-----		1500	12.89	-----		2400	5.89	2,270
	1100	8.96	-----		1600	13.08	-----				
	1300	8.92	-----		1700	12.86	-----	15	1200	5.68	2,120
	1400	9.70	-----		1900	12.88	-----		2400	5.48	1,980
	1500	9.59	-----		2000	12.83	-----				
	1600	9.68	-----		2200	12.59	-----	16	1200	5.25	1,820
	1700	9.58	-----		2400	12.22	-----		2400	5.04	1,680
	1800	9.77	-----								
	1900	10.00	-----	10	0400	11.05	-----	17	1200	4.81	1,530
	2000	11.50	-----		0800	10.28	-----		2400	4.61	1,400
	2100	12.45	-----		1200	9.64	-----				
	2200	13.85	-----		1600	9.52	-----	18	1200	4.38	1,250
	2300	15.05	-----		2400	9.29	-----		2400	4.17	1,120

(59) 5-3167. Spring Creek near Sleepy Eye, Minn.

(Crest-stage station)

Location.—Lat 44°24'15", long 94°44'55", in NE¼SE¼ sec.24, T.111 N., R.33 W., at culvert on county highway, 3-3/4 miles upstream from mouth and 7½ miles north of Sleepy Eye.

Drainage area.—30.0 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 88 cfs and by indirect measurements at 149 cfs, 416 cfs, and 740 cfs.

Maxima.—April–May 1965: Discharge, 930 cfs Apr. 10 (gage height, 17.79 ft).
1959 to March 1965: Discharge, 680 cfs July 7, 1962 (gage height, 15.89 ft).

(60) 5-3169. Dry Creek near Jeffers, Minn.

(Crest-stage station)

Location.—Lat 44°07'25", long 95°12'10", in NE¼NE¼ sec.31, T.108 N., R.36 W., on right bank 17 ft upstream from culvert on County Highway 10, 4½ miles north of Jeffers.

Drainage area.—3.24 sq mi.

Gage-height record.—Water-stage recorder graph.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 25 cfs and by indirect measurement at 508 cfs.

Maxima.—April–May 1965: Discharge, 400 cfs Apr. 6 (gage height, 10.64 ft, backwater from ice).
1961 to March 1965: Discharge, 508 cfs July 19, 1963 (gage height, 10.07 ft).

(61) 5-3170. Cottonwood River near New Ulm, Minn.

Location.—Lat 44°17'40", long 94°26'40", in N½ sec.33, T.110 N., R.30 W., on left bank 600 ft upstream from highway bridge, 1.8 miles south of New Ulm, and 2 miles upstream from mouth.

Drainage area.—1,280 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except for the period 2200 hours Apr. 6 to 1700 hours Apr. 28 when graph was drawn on the basis of one or more daily readings on temporary staff gage or inside staff gage. Datum of gage is 799.09 ft above mean sea level, datum of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–9.

Maxima.—April–May 1965: Discharge 26,000 cfs 1615 hours Apr. 8 (gage height, 20.86 ft, backwater from ice).
1909–13, 1931 to March 1965: Discharge, 14,200 cfs Mar. 30, 1962 (gage height, 15.88 ft); gage-height, 16.94 ft July 9, 1947 (from floodmark).

Remarks.—Some regulation by dam at Cottonwood Lake and several other small lakes above the station.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	16	985	11	14,100	3,620	21	1,820	1,540
2	17	904	12	11,700	2,460	22	1,660	1,540
3	20	845	13	8,940	1,720	23	1,330	1,620
4	80	778	14	7,010	1,500	24	1,240	1,490
5	350	727	15	5,340	1,520	25	1,340	2,210
6	1,640	698	16	4,300	2,280	26	1,580	2,650
7	10,700	712	17	3,440	2,770	27	1,460	2,370
8	23,000	1,160	18	2,890	2,850	28	1,310	1,820
9	21,000	4,030	19	2,440	2,440	29	1,170	1,400
10	15,900	3,800	20	2,130	1,970	30	1,080	1,180
						31	------	1,100
Monthly mean discharge, in cubic feet per second							4,967	1,829
Runoff, in inches							4.33	1.65

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Cottonwood River near New Ulm, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	1.12	-----	Apr. 6	0400	10.40	-----	Apr. 8	2400	19.03	-----
	0600	1.17	-----		0600	11.26	-----				
	1200	1.54	-----		0800	11.94	-----	9	0400	19.04	-----
	1800	1.58	-----		0900	-----	-----		0800	18.93	-----
	2400	1.47	-----		1200	12.79	-----		1200	18.60	-----
					1600	13.24	-----		1600	17.65	-----
4	0400	1.45	-----		2000	13.57	-----		2000	16.76	-----
	0800	1.44	-----		2400	16.00	-----		2400	16.31	-----
	0900	-----	-----								
	1200	1.81	-----	7	0400	16.89	-----	10	0600	15.98	16,800
	1600	2.90	-----		0800	17.20	-----		1200	15.50	15,400
	2000	3.16	-----		1000	-----	-----		1800	15.37	15,000
	2400	3.95	-----		1400	17.67	-----		2400	15.26	14,600
					1600	18.02	-----				
5	0300	4.15	-----		1800	18.37	-----	11	0600	15.19	14,400
	0600	4.34	-----		2000	18.76	-----		1200	15.08	14,100
	0900	4.76	-----		2200	19.22	-----		1800	14.98	13,800
	1200	5.64	-----		2400	19.60	-----		2400	14.80	13,300
	1500	5.82	-----								
	1800	6.18	-----	8	0600	19.65	-----	12	0600	14.59	12,600
	2100	7.13	-----		1200	20.16	-----		1200	14.30	11,800
	2400	8.88	-----		1615	20.86	26,000		1800	13.97	10,800
					1700	19.79	-----		2400	13.70	10,000
6	0200	9.80	-----		1900	18.86	-----				

(62) 5-3180. East Branch Blue Earth River near Bricelyn, Minn.

Location.—Lat 43°37'50", long 93°47'25", in NE¼NE¼ sec.23, T.102 N., R.25 W., in center of span on downstream side of highway bridge, 2 miles upstream from Brush Creek, 3 miles downstream from South Walnut Lake, and 5 miles northeast of Bricelyn.

Drainage area.—132 sq mi.

Gage-height record.—Graph drawn on the basis of twice-daily wire-weight gage readings Apr. 3–10. Average of twice-daily readings used for periods Apr. 1–2 and Apr. 11 to May 31. Datum of gage is 1,131.86 ft above mean sea level, datum of 1929 (Minnesota State Highway Department bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1 to Apr. 6.

Maxima.—April–May 1965: Discharge, 1,260 cfs 2400 hours Apr. 6 (gage height, 11.70 ft).
1951 to March 1965: Discharge, 1,320 cfs Apr. 7, 1951 (gage height, 10.68 ft).

Mean discharge, in cubic feet per second, 1965, of East Branch Blue Earth River near Bricelyn, Minn.

Day	April	May	Day	April	May	Day	April	May
1	10	242	11	1,070	100	21	448	104
2	50	219	12	994	90	22	414	100
3	100	196	13	921	81	23	384	111
4	300	176	14	840	72	24	358	125
5	500	159	15	781	72	25	345	137
6	900	149	16	714	92	26	343	167
7	1,240	141	17	652	102	27	332	174
8	1,210	134	18	586	110	28	316	178
9	1,160	121	19	534	111	29	293	174
10	1,110	110	20	490	108	30	269	171
						31	--------	163
Monthly mean discharge, in cubic feet per second							589	135
Runoff, in inches							4.98	1.18

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 4	0000	8.74	-----	Apr. 6	1200	11.46	-----	Apr. 8	1200	11.54	1,210
	0600	8.93	-----		1800	11.64	-----		1800	11.52	1,210
	1200	9.10	-----		2400	11.70	1,260		2400	11.50	1,200
	1800	9.35	-----								
	2400	9.66	-----	7	0600	11.69	1,260	9	1200	11.37	1,160
					1200	11.62	1,240		2400	11.30	1,140
5	0600	10.00	-----		1800	11.56	1,220				
	1200	10.40	-----		2400	11.53	1,210	10	1200	11.20	1,110
	1800	10.75	-----						2400	11.06	1,070
	2400	11.00	-----	8	0600	11.54	1,210				
6	0600	11.20	-----								

(63) 5-3181. East Branch Blue Earth River tributary near Blue Earth, Minn.

(Crest-stage station)

Location.—Lat 43°37'10", long 94°01'00", in W½SE¼ sec.24, T.102 N., R.27 W., at culvert on County Highway 13, a quarter mile upstream from mouth, and 4¼ miles east of Blue Earth.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 63 cfs and by indirect measurements at 233 cfs and 406 cfs.

Maxima.—April–May 1965: Discharge, 187 cfs Apr. 6 (gage height, 6.54 ft, backwater from debris).

1960 to March 1965: Discharge, 406 cfs July 19, 1963 (gage height, 8.57 ft, from high-water profile).

(64) 5-3183. North Fork Watonwan River near Delft, Minn.

(Crest-stage station)

Location.—Lat 44°00'00", long 95°07'20", in E½ sec.11, T.106 N., R.36 W., at culvert on U.S. Highway 71, 1-3/4 miles northwest of Delft, and 5½ miles southeast of Jeffers.

Drainage area.—13.1 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 40 cfs and by indirect measurement at 549 cfs.

Maxima.—April–May 1965: Discharge, 810 cfs Apr. 4 (gage height, 18.42 ft, backwater from ice).
1960 to March 1965: Discharge, 549 cfs Mar. 29, 1960 (gage height, 17.04 ft); gage height, 18.00 ft April 9, 1962 (backwater from ice).

(65) 5-3195. Watonwan River near Garden City, Minn.

(Gaging station, discontinued 1945)

Location (revised).—Lat 44°02'45", long 94°11'38", in SW¼NE¼ sec.28, T.107 N., R.28 W., on upstream side of highway bridge, 1.5 miles west of Garden City, 5 miles downstream from Perch Creek, and 7.3 miles upstream from mouth.

Drainage area.—812 sq mi.

Gage-height record.—Floodmark only. Altitude of gage is 907 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 4,500 cfs and extended above by logarithmic plotting and one discharge measurement made in 1953 at site 2.6 miles downstream.

Maxima.—April–May 1965: Discharge, 19,000 cfs Apr. 7 (gage height, 18.89 ft, from floodmark).
1940–45, 1953 to March 1965: Discharge, 17,700 cfs June 9, 1953 (gage height, 18.6 ft from floodmark).

(66) 5-3200. Blue Earth River near Rapidan, Minn.

Location.—Lat 44°05'44", long 94°06'33", in SE¼SE¼ sec.6, T.107 N., R.27 W., on left bank 0.2 mile downstream from powerplant of Northern States Power Co., 2 miles west of Rapidan, 3½ miles downstream from Watonwan River, and 7-3/4 miles upstream from LeSueur River.

Drainage area.—2,430 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except 2200 hours Apr. 7 to 1200 hours Apr. 12 for which graph was reconstructed on basis of daily gage readings on the outside staff gage, and floodmark. Digital recorder tape punched at 15 minute intervals, May 13–31. Datum of gage is 808.80 ft above mean sea level, datum of 1912.

Discharge record.—Stage-discharge relation defined by current-measurements. Backwater from ice Apr. 1–2.

Maxima.—April–May 1965: Discharge, 43,100 cfs 1220 hours Apr. 9 (gage height, 21.36 ft, from floodmark).
1909–10, 1939–45, 1949 to March 1965: Discharge, 26,100 cfs Apr. 8, 1951 (gage height, 14.97 ft) from rating curve extended above 16,000 cfs by logarithmic plotting.

Mean discharge, in cubic feet per second, 1965, of Blue Earth River near Rapidan, Minn.

Day	April	May	Day	April	May	Day	April	May
1	230	4,260	11	31,600	3,650	21	7,100	3,250
2	400	3,840	12	26,600	3,680	22	6,420	2,930
3	1,360	3,520	13	21,700	3,440	23	5,720	2,870
4	3,660	3,310	14	17,700	3,140	24	5,230	3,160
5	8,380	3,170	15	14,700	2,960	25	4,940	3,410
6	15,700	3,070	16	12,800	3,030	26	4,980	3,960
7	28,500	3,350	17	11,300	3,370	27	5,170	4,140
8	41,400	3,650	18	10,000	3,910	28	5,280	4,370
9	42,500	3,530	19	8,820	4,080	29	5,180	4,520
10	37,000	3,530	20	7,880	3,710	30	4,740	4,160
						31	------	3,700
Monthly mean discharge, in cubic feet per second							13,230	3,580
Runoff, in inches							6.08	1.70

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	2.50	560	Apr. 5	1400	8.20	8,670	Apr. 7	2100	18.38	34,100
	0200	2.51	566		1600	9.03	10,400		2200	18.69	34,900
	0400	2.54	586		1800	9.03	10,400		2300	18.94	35,600
	0600	2.56	599		2000	9.44	11,300		2400	19.20	36,400
	0800	2.58	612		2200	9.65	11,800				
	1000	2.62	638		2400	9.85	12,300	8	0300	20.00	38,800
	1100	3.72	1,540						0600	20.47	40,300
	1200	3.28	1,150	6	0200	10.06	12,700		0900	20.82	41,400
	1400	3.27	1,140		0400	10.39	13,500		1200	21.08	42,200
	1600	3.29	1,160		0600	10.61	14,000		1500	21.21	42,700
	1700	4.36	2,270		0800	10.77	14,400		1800	21.26	42,800
	1800	4.35	2,260		1000	11.15	15,200		2100	21.28	42,900
	2000	4.36	2,270		1200	11.33	15,700		2400	21.30	43,000
	2100	5.21	3,390		1400	11.66	16,400				
	2200	4.62	2,610		1600	12.20	17,700	9	0600	21.33	43,000
	2300	4.61	2,590		1800	12.03	17,300		1200	21.35	43,100
	2400	4.79	2,830		2000	12.05	17,300		1220	21.36	43,100
					2200	12.92	19,400		1500	21.33	43,000
4	0200	4.84	2,890		2400	12.95	19,500		1800	21.14	42,400
	0400	4.88	2,940						2400	20.42	40,100
	0600	4.98	3,070	7	0100	13.46	20,800				
	0800	5.00	3,100		0200	13.67	21,300	10	0600	19.79	38,100
	1000	5.00	3,100		0300	15.86	25,200		1200	19.37	36,900
	1200	5.07	3,200		0400	14.86	24,400		1800	18.95	35,700
	1400	5.12	3,270		0500	14.77	24,100		2400	18.52	34,500
	1500	5.28	3,490		0600	14.95	24,600				
	1600	5.43	3,700		0700	15.50	26,100	11	0600	18.00	33,000
	1700	6.02	4,550		0800	15.39	25,800		1200	17.47	31,500
	1800	5.91	4,380		0900	15.25	25,400		1800	16.97	30,100
	2000	5.99	4,500		1000	15.29	25,500		2400	16.55	28,900
	2200	6.29	4,960		1100	15.49	26,100				
	2300	6.75	5,750		1200	16.24	28,100	12	1200	15.67	26,600
	2400	6.82	5,880		1300	17.48	31,500		2400	14.77	24,100
					1400	17.23	30,800				
5	0200	6.65	5,520		1500	17.04	30,300	13	1200	13.82	21,600
	0400	6.72	5,640		1600	17.26	30,900		2400	12.97	19,500
	0600	6.88	5,930		1700	17.70	32,200				
	0800	7.05	6,270		1800	17.86	32,600	14	1200	12.15	17,600
	1000	7.38	6,950		1900	18.07	33,200		2400	11.50	16,000
	1200	8.06	8,380		2000	18.18	33,500				

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Blue Earth River near Rapidan, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 15	1200	10.92	14,600	Apr. 17	1200	9.47	11,300	Apr. 18	2400	8.60	9,370
	2400	10.48	13,600		2400	9.19	10,700				
								19	1200	8.34	8,810
16	1200	10.13	12,800	18	1200	8.90	10,000		2400	8.10	8,310
	2400	9.80	12,000								

(67) 5-3203. Cobb River tributary near Mapleton, Minn.

(Crest-stage station)

Location.—Lat 44°01'05", long 93°57'30", in SW¼NE¼ sec.4, T.106 N., R.26 W., at culvert on State Highway 22, 0.7 mile north of Beauford, 1.0 mile upstream from mouth, and 6.3 miles north of Mapleton.

Drainage area.—7.25 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 100 cfs and by indirect measurements at 258 cfs, 359 cfs, and 526 cfs.

Maxima.—April–May 1965: Discharge, 293 cfs Apr. 6 (gage height, 18.60 ft).
1959 to March 1965: Discharge, 526 cfs May 21, 1960 (gage height, 22.24 ft, from high-water profile).

(68) 5-3204. Maple River tributary near Mapleton, Minn.

(Crest-stage station)

Location.—Lat 43°55'20", long 94°01'20", in SW¼ sec.1, T.105 N., R.27 W., at culvert on State Highway 30, 1 mile upstream from mouth and 3¼ miles west of Mapleton.

Drainage area.—5.75 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 145 cfs and by indirect measurements at 273 cfs and 445 cfs.

Maxima.—April–May 1965: Discharge, 285 cfs Apr. 6 (gage height, 21.11 ft, from floodmark, backwater from ice).
1959 to March 1965: Discharge, 445 cfs May 21, 1960 (gage height, 23.26 ft, from high-water profile).

(69) 5-3205. Le Sueur River near Rapidan, Minn.

Location.—Lat 44°06'40", long 94°02'28", in SW¼ sec.35, T.108 N., R.27 W., on right bank 600 ft downstream from highway bridge, 1.8 miles northeast of Rapidan, and 2.3 miles upstream from mouth.

Drainage area.—1,100 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except for period 0820 hours Apr. 6 to 0915 hours Apr. 11 when graph was constructed on the basis of two or more daily gage readings on temporary staff gage, and flood mark. Datum of gage is 775.76 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–5.

Maxima.—April–May 1965: Discharge, 24,700 cfs 0500 hours Apr. 8 (gage height, 22.10 ft, from floodmark).
1939–45, 1949 to March 1965: Discharge, 21,200 cfs May 22, 1960 (gage height, 22.72 ft, from floodmark).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	150	2,030	11	15,500	1,210	21	2,500	1,300
2	270	1,790	12	12,100	1,070	22	2,280	1,190
3	600	1,640	13	9,670	944	23	2,130	1,140
4	1,500	1,540	14	7,490	854	24	2,050	1,180
5	4,700	1,470	15	5,710	894	25	2,300	1,340
6	14,600	1,410	16	4,660	1,320	26	2,800	1,470
7	20,200	1,460	17	4,030	1,420	27	2,900	1,640
8	23,400	1,570	18	3,540	1,640	28	2,850	1,820
9	20,000	1,540	19	3,130	1,460	29	2,570	1,730
10	18,200	1,370	20	2,770	1,400	30	2,290	1,540
						31	------	1,360
Monthly mean discharge, in cubic feet per second							6,563	1,411
Runoff, in inches							6.66	1.48

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 1	0000	4.40	-----	Apr. 4	0600	8.90	-----	Apr. 5	0500	8.67	-----
	1200	4.46	-----		0800	9.04	-----		0700	8.77	-----
	1800	4.55	-----		0900	8.99	-----		0800	9.82	-----
	2400	4.90	-----		1200	9.45	-----		0900	9.20	-----
					1400	9.86	-----		1000	9.32	-----
2	0000	5.24	-----		1600	9.78	-----		1100	10.10	-----
	0800	5.61	-----		1700	7.55	-----		1200	9.67	-----
	1200	5.84	-----		1800	7.42	-----		1300	10.49	-----
	1600	5.94	-----		1900	8.11	-----		1500	10.34	-----
	2400	6.18	-----		2000	8.31	-----		1700	10.67	-----
					2100	8.54	-----		1800	11.85	-----
3	0800	6.64	-----		2200	8.67	-----		1900	11.57	-----
	1600	6.94	-----		2300	9.26	-----		2200	12.37	-----
	2000	7.58	-----		2400	8.96	-----		2400	13.36	9,440
	2400	8.25	-----								
				5	0100	8.86	-----	6	0600	15.52	12,500
4	0300	8.83	-----		0200	8.90	-----		0900	16.34	13,800

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Le Sueur River near Rapidan, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	1200	17.40	15,500	Apr. 8	2400	20.93	21,700	Apr. 11	0600	17.98	16,400
	1500	17.87	16,200						1200	17.43	15,500
	1800	18.35	17,000	9	0600	20.56	20,900		1800	16.95	14,800
	2100	18.68	17,500		1000	20.30	20,400		2400	16.30	13,700
	2400	18.99	18,000		1800	19.41	18,800	12	0600	15.63	12,600
					2400	19.41	18,800		1200	15.26	12,100
7	0600	19.52	19,000						1800	14.84	11,500
	1500	20.07	20,000	10	0600	19.44	18,800		2400	14.42	10,900
	1800	21.03	21,900		0900	19.38	18,700				
	2400	21.61	23,300		1200	19.07	18,200	13	2400	12.64	8,440
					1800	18.78	17,700				
8	0500	22.10	24,700		2400	18.43	17,100	14	2400	11.13	6,540
	1200	21.77	23,800								

(70) 5-3250. Minnesota River at Mankato, Minn.

Location.—Lat 44°10'10", long 94°00'15", in sec.7, T.108 N., R.26 W., on left bank at downstream side of Main Street Bridge in Mankato, 1.8 miles downstream from Blue Earth River and at mile 106.4.

Drainage area.—14,900 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except May 18. Datum of gage is 747.92 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–4. Discharge for period of no gage-height record estimated on the basis of adjacent record.

Maxima.—April–May 1965: Discharge, 94,100 cfs 0100 hours Apr. 10 (gage height, 29.09 ft).

1903 to March 1965: Discharge, 66,600 cfs Apr. 9, 1951 (gage height, 26.20 ft from floodmark).

Maximum stage known, 29.9 ft, Apr. 26, 1881, from floodmark, (discharge, 90,000 cfs).

Remarks.—Some diurnal fluctuation at low and medium stages caused by powerplants on Blue Earth River.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	430	18,600	11	91,600	16,000	21	34,700	12,300
2	900	17,300	12	89,600	16,000	22	31,400	11,400
3	1,800	16,200	13	83,200	14,700	23	28,400	11,000
4	5,900	15,200	14	74,400	13,200	24	26,100	11,400
5	13,300	14,200	15	66,000	12,400	25	24,600	12,100
6	30,000	13,500	16	58,600	12,600	26	24,000	13,100
7	51,100	13,200	17	52,800	12,900	27	23,400	13,900
8	79,000	13,600	18	47,600	13,400	28	22,400	14,900
9	92,200	13,800	19	42,800	14,000	29	21,300	16,000
10	92,700	15,000	20	38,300	13,300	30	19,900	16,400
						31	------	15,800
Monthly mean discharge, in cubic feet per second							42,280	14,110
Runoff, in inches							3.17	1.09

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Minnesota River at Mankato, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	3.07	1,300	Apr. 7	2100	24.00	60,000	Apr. 15	0600	25.25	68,100
	0600	3.25	1,440		2400	25.09	67,100		1200	24.97	66,300
	1200	3.57	1,740						1800	24.57	63,700
	1800	4.24	2,400	8	0600	26.10	73,600		2400	24.27	61,800
	2400	5.23	3,420		1200	27.00	79,500				
					1800	27.71	84,500	16	0600	24.02	60,100
4	0300	5.88	4,140		2400	28.47	89,800		1200	23.78	58,600
	0600	6.24	4,570						1800	23.53	56,900
	0900	6.48	4,860	9	0600	28.70	91,400		2400	23.33	55,600
	1200	6.74	5,170		0900	28.69	91,300				
	1500	7.42	5,980		1200	28.77	91,900	17	0600	23.10	54,200
	1800	9.77	8,870		1800	29.00	93,500		1200	22.89	52,800
	2100	10.13	9,330		2400	29.08	94,100		1800	22.67	51,400
	2400	10.60	9,940						2400	22.47	50,100
				10	0100	29.09	94,100				
5	0300	10.97	10,500		0600	28.96	93,200	18	0600	22.47	48,800
	0600	11.19	10,800		1200	28.88	92,700		1200	22.09	47,700
	0900	11.46	11,200		1800	28.80	92,100		1800	21.87	46,400
	1200	11.91	11,800		2400	28.73	91,600		2400	21.66	45,200
	1500	13.40	14,100								
	1800	14.61	16,000	11	0600	28.72	91,500	19	0600	21.45	43,900
	2100	15.52	17,600		1200	28.75	91,800		1200	21.27	42,800
	2400	16.20	19,000		1800	28.72	91,500		1800	21.10	41,800
					2400	28.68	91,300		2400	20.86	40,400
6	0300	17.20	22,000								
	0600	18.00	25,000	12	0600	28.62	90,800	20	0600	20.69	39,300
	0900	18.58	27,700		1200	28.47	89,800		1200	20.50	38,200
	1200	19.00	29,800		1800	28.28	88,500		1800	20.33	37,200
	1500	19.51	32,600		2400	28.07	87,000		2400	20.19	36,300
	1800	20.06	35,600								
	2100	20.43	37,800	13	0600	27.84	85,400	21	0600	20.04	35,500
	2400	20.83	40,200		1200	27.55	83,400		1200	19.89	34,700
					1800	27.23	81,100		1800	19.73	33,800
7	0300	21.14	42,000		2400	26.92	79,000		2400	19.58	33,000
	0600	21.78	45,900								
	0900	22.21	48,500	14	0600	26.57	76,700	22	0600	19.43	32,200
	1200	22.49	50,200		1200	26.22	74,400		1200	19.30	31,400
	1500	22.90	52,800		1800	25.86	72,100		1800	19.13	30,500
	1800	23.37	55,900		2400	25.53	69,900		2400	19.01	29,900

(71) 5-3262. Judicial Ditch No. 1-A near New Sweden, Minn.

(Miscellaneous site)

Location.—Lat 44°25', long 94°15', NW¼NW¼ sec.19, T.111 N., R.28 W., on left bank, under bridge on Nicollet County Road No. 4. Two miles west of New Sweden and 4 miles southeast of Bernadette.

Gage-height record.—Occasional gage readings on staff gage during flood. Datum of gage is 962.07 ft above mean sea level, adjustment of 1929. (Levels by Minnesota Conservation Department, Division of Waters).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 1,170 cfs Apr. 8 (gage height, 13.35 ft).
1962 to March 1965: Discharge not determined, gage height 8.70 ft Mar. 28, 1962 (backwater from ice).

Cooperation.—Gage heights furnished by Minnesota Conservation Department, Division of Waters.

(72) 5-3300. Minnesota River near Carver, Minn.

Location.—Lat 44°43'28", long 93°37'58", in NE¼SW¼ sec.31, T.115 N., R.23 W., on left bank 2½ miles south of Carver and at mile 36 upstream from Mississippi River. Auxiliary chain gage at same datum 2-3/4 miles upstream.

Drainage area.—16,200 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except for the period 1000 hours Apr. 9 to 1400 hours Apr. 27 when graph was drawn on the basis of twice-daily gage readings on temporary staff gage. Auxiliary gage record obtained from a graph drawn on the basis of twice-daily gage readings. Datum of gages is 690.00 ft above mean sea level, datum of 1929.

Discharge record.—Fall-stage-discharge relation defined by current-meter measurements above stage of 7.0 ft. Below 7.0 ft, stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–10. Fall used as a factor Apr. 11 to May 31.

Maxima.—April–May 1965: Discharge, 117,000 cfs 0600 hours Apr. 11 (gage height, 33.89 ft); gage height, 34.37 ft 0100 hours Apr. 12.
1934 to March 1965: Discharge, 64,100 cfs Apr. 11, 1951 (gage height, 27.71 ft); gage height, 28.31 ft Apr. 16, 1952.

Cooperation.—Auxiliary gage readings furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	582	23,000	11	112,000	16,500	21	46,600	14,900
2	608	21,300	12	112,000	16,800	22	41,400	14,200
3	651	19,800	13	108,000	17,200	23	39,400	13,400
4	775	18,600	14	105,000	17,100	24	35,900	12,500
5	1 390	17,500	15	95,000	16,300	25	32,800	12,000
6	3,780	16,100	16	73,800	15,300	26	29,700	12,400
7	8,900	16,100	17	70,200	14,500	27	28,400	12,600
8	19,000	15,500	18	62,500	14,200	28	26,800	13,000
9	43,500	16,200	19	52,900	14,100	29	25,400	13,300
10	94,000	16,600	20	50,600	14,700	30	24,300	13,900
						31	------	14,800
Monthly mean discharge, in cubic feet per second							44,860	15,630
Runoff, in inches							3.09	1.11

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 1	0000	4.66	-----	Apr. 4	0600	5.83	-----	Apr. 5	1200	11.80	-----
	1200	4.69	-----		0900	6.00	-----		1400	12.32	-----
	2400	4.78	-----		1200	6.23	-----		1600	12.76	-----
					1500	6.54	-----		1800	13.24	-----
2	1200	4.89	-----		1800	7.00	-----		2000	13.61	-----
	2400	5.05	-----		2100	7.62	-----		2200	13.99	-----
					2400	8.30	-----		2400	14.51	-----
3	0600	5.13	-----								
	1200	5.22	-----	5	0200	8.79	-----	6	0200	14.79	-----
	1800	5.37	-----		0400	9.37	-----		0400	15.20	-----
	2400	5.56	-----		0600	9.96	-----		0600	15.62	-----
					0800	10.60	-----		0800	16.01	-----
4	0300	5.69	-----		1000	11.22	-----		1000	16.34	-----

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Minnesota River near Carver, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	1200	16.66	-----	Apr. 8	2400	27.41	-----	Apr. 14	2400	33.67	101,000
	1400	17.05	-----								
	1600	17.38	-----	9	0600	28.21	-----	15	0600	33.47	100,000
	1800	17.66	-----		1200	29.20	-----		1200	33.28	95,500
	2000	17.99	-----		1800	30.13	-----		1800	33.05	91,100
	2200	18.29	-----		2400	31.33	-----		2400	32.86	85,500
	2400	18.54	-----								
				10	0600	32.14	-----	16	0600	32.67	79,800
7	0200	18.75	-----		1200	32.56	-----		1200	32.44	74,700
	0400	18.92	-----		1800	33.10	-----		1800	32.23	66,200
	0600	19.07	-----		2400	33.57	107,000		2400	32.06	63,200
	0800	19.21	-----								
	1000	19.39	-----	11	0600	33.89	117,000	17	0600	31.87	66,000
	1200	19.64	-----		1200	34.16	115,000		1200	31.52	78,300
	1400	20.05	-----		1800	34.32	119,000		1800	31.24	70,500
	1600	20.60	-----		2400	34.37	109,000		2400	31.11	68,700
	1800	21.01	-----								
	2000	21.65	-----	12	0100	34.37	110,000	18	0600	31.00	66,500
	2200	22.13	-----		0600	34.36	113,000		1200	30.82	62,400
	2400	22.16	-----		1200	34.34	113,000		1800	30.53	58,900
					1800	34.33	112,000		2400	30.63	55,700
8	0200	23.33	-----		2400	34.31	112,000				
	0400	24.31	-----					19	0600	30.19	55,100
	0600	24.73	-----	13	0600	34.30	108,000		1200	29.96	52,900
	0800	25.07	-----		1200	34.28	105,000		1800	29.72	50,500
	1000	25.27	-----		1800	34.20	107,000		2400	29.48	50,200
	1200	25.53	-----		2400	34.10	108,000				
	1400	25.86	-----					20	0600	29.25	50,400
	1600	26.23	-----	14	0600	34.03	105,000		1200	29.00	49,200
	1800	26.55	-----		1200	33.91	105,000		1800	28.75	53,400
	2000	26.86	-----		1800	33.80	105,000		2400	28.51	48,700
	2200	27.16	-----								

(73) 5-3301.5 Sand Creek tributary near Montgomery, Minn.

(Crest-stage station)

Location.—Lat 44°25'40", long 93°30'30", in NE¼ sec.18, T.111 N., R.22 W., at culvert on State Highway 21, 3½ miles east of Montgomery.

Drainage area.—0.29 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by indirect measurement at 26 cfs and flow-through-culvert computations at 11 cfs and 56 cfs.

Maxima.—April–May 1965: Discharge, 43 cfs Apr. 6 (gage height, 10.50 ft, backwater from ice).

1961 to March 1965: Discharge, 27 cfs Sept. 8, 1964 (gage height, 8.75 ft); gage height, 10.35 ft March 27, 1962 (backwater from ice).

(74) 5-3302. Rice Lake tributary near Montgomery, Minn.

(Crest-stage station)

Location.—Lat 44°25'40", long 93°32'00", in N½ sec.13, T.111 N., R.23 W., at culvert on State Highway 21, 1¼ miles upstream from Rice Lake and 2½ miles east of Montgomery.

Drainage area.—2.49 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 20 cfs and by indirect measurement at 279 cfs.

Maxima.—April–May 1965: Discharge, 114 cfs Apr. 6 (gage height, 10.96 ft, backwater from ice).
1960 to March 1965: Discharge, 279 cfs May 21, 1960 (gage height, 13.72 ft).

(75) 5-3303. Sand Creek near New Prague, Minn.

(Crest-stage station)

Location.—Lat 44°32'37", long 93°32'16", in NE¼NW¼ sec.1, T.112 N., R.23 W., at culvert on State Highways 13 and 19, 1.9 miles east of New Prague.

Drainage area.—65 sq mi, approximately.

Gage height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 1,070 cfs Apr. 8 (gage height, 14.79 ft).
1960 to March 1965: Discharge, 1,100 cfs May 21, 1960 (gage height, 14.84 ft).

(76) 5-3305.5 Raven Stream tributary near New Prague, Minn.

(Crest-stage station)

Location.—Lat 44°34'21", long 93°35'58", in NW¼ sec.28, T.113 N., R.23 W., on left bank 24 ft upstream from culvert on county highway, 1.6 miles upstream from mouth, and 2.3 miles northwest of New Prague.

Drainage area.—23 sq mi, approximately.

Gage-height record.—Water-stage recorder graph.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 227 cfs and by indirect measurement at 929 cfs.

Maxima.—April–May 1965: Discharge, 505 cfs Apr. 7 (gage height, 14.74 ft).
1960 to March 1965: Discharge, 929 cfs May 21, 1960 (gage height, 17.34 ft, from high-water profile).

(77) Sand Creek at Jordan Minn.

(Miscellaneous site)

Location.—Lat 44°40'19", long 93°38'04", in NE¼ sec.19, T.114 N., R.23 W., at bridge on U. S. Highway 169 at north edge of Jordan.

Drainage area.—238 sq mi.

Gage-height record.—Floodmarks. Datum of reference point is 758.942 ft above mean sea level, adjustment of 1929. (Levels by Minnesota Highway Department).

Discharge record.—Stage-discharge relation defined by three current-meter measurements made during flood of May 1960.

Maxima.—April–May 1965: Discharge, 3,400 cfs Apr. 8 (gage height, 11.57 ft). 1960 to March 1965: Discharge, 8,650 cfs May 21, 1960 (gage height, 13.71 ft).

(78) 5-3309. Nine Mile Creek at Bloomington, Minn.

Location.—Lat 44°48'46", long 93°18'07", in NW¼ sec. 21, T.27 N., R.24 W., on left bank between 105th and 106th Streets in Bloomington, Minn., 1.2 miles downstream from bridge on Old Shakopee Road and 2.1 miles upstream from mouth.

Gage-height record.—Water-stage recorder graph. Altitude of gage is 731 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 535 cfs 1200 hours Apr. 8 (gage height, 4.32 ft). 1963 to March 1965: Discharge, 199 cfs Aug. 29, 1964 (gage height, 5.63 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	7.2	40	11	347	86	21	80	57
2	11	35	12	329	65	22	71	39
3	20	33	13	289	45	23	61	33
4	48	30	14	247	38	24	52	32
5	71	28	15	207	79	25	61	32
6	143	45	16	173	107	26	65	28
7	309	61	17	152	117	27	68	24
8	430	75	18	134	113	28	65	22
9	411	96	19	115	95	29	54	18
10	356	95	20	96	81	30	48	16
						31	------	36
Monthly mean discharge, in cubic feet per second							151	54.9
Runoff, in inches							------	------

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Nine Mile Creek at Bloomington, Minn

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 2	0000	1.68	4.8	Apr. 6	0400	3.15	136	Apr. 9	2400	3.96	359
	1000	1.64	3.8		0800	2.96	111				
	1200	1.82	9.9		1200	3.16	137	10	0700	3.86	324
	1600	2.04	26		1600	3.37	174		0800	4.04	395
	2000	1.91	16		2000	3.34	169		1200	3.95	356
	2400	1.78	8.0		2400	3.30	161		2000	3.82	312
									2200	4.20	475
3	0600	1.72	5.9	7	0600	3.32	165		2400	4.07	410
	1200	1.86	13		1200	3.78	285				
	1500	1.95	19		1600	4.25	500	11	0600	3.88	330
	1800	2.18	39		1700	4.10	425		1200	3.92	344
	2000	2.23	43		1900	4.18	465		2400	3.90	336
	2400	2.16	38		2400	4.05	400				
								12	0800	3.88	330
4	0800	2.00	26	8	0600	4.02	385		1000	3.95	356
	1200	2.17	40		0800	3.99	371		1200	3.86	324
	1600	2.60	76		1200	4.32	535		1800	3.87	327
	1900	2.57	73		1800	4.11	430		2400	3.87	309
	2400	2.30	50		2400	4.05	400				
								13	0600	3.75	293
5	0600	2.25	46	9	0700	3.94	352		1200	3.75	293
	1200	2.54	71		0900	4.09	420		1800	3.74	290
	1800	2.84	98		1000	4.00	375		1900	3.65	269
	2200	2.74	88		1300	4.27	510		2400	3.64	267
	2400	2.85	99		1800	4.12	435				

(79) Minnesota River at Interstate Highway 35W at Bloomington, Minn.

(Miscellaneous site)

Location.—Lat 44°47'30", long 93°17'19", on west line of sec.27, T.27 N., R.24 W., at bridge on Interstate Highway 35W and 2.8 miles south from 90th Street in Bloomington.

Gage-height record.—Elevations obtained during peak only. Datum of reference point is 753.31 ft above mean sea level, datum of 1929 (levels by Minnesota Highway Department).

Discharge record.—Peak discharge determined on the basis of one discharge measurement, comparison with discharge for Minnesota River near Carver and a plot of elevations obtained at site.

Maximum—April–May 1965: Discharge, about 120,000 cfs Apr. 15 (elevation, 718.20 ft).

(80) 5-3310 Mississippi River at St. Paul, Minn.

Location.—Lat 44°56'40", long 93°05'20", in SE¼NE¼ sec.6, T.28 N., R.22 W., on left bank in St. Paul, 300 ft upstream from Robert Street Bridge, 6 miles downstream from Minnesota River, and at mile 839.3 upstream from Ohio River. Auxiliary waterstage recorder in SE¼ sec.22, T.28 N., R.22 W., in South St. Paul, 5.4 miles downstream at same datum.

Drainage area.—36,800 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except 1545 hours Apr. 11 to 1630 hours Apr. 21 when graph was constructed on basis of several daily or hourly gage readings by Corps of Engineers made on temporary staff gage.

For auxiliary gage, water-stage recorder graph except 0600 hours Apr. 12 to 1330 hours Apr. 26 when several daily or bi-hourly gage readings by Corps of Engineers were made on temporary staff gage. Datum of gage is 684.16 ft above mean sea level, datum of 1912.

Discharge record.—Stage-fall-discharge relation affected by changes in slope and defined by current-meter measurements. Fall was a factor Apr. 5–7. Backwater from ice Apr. 1–4.

Maxima.—April–May 1965: Discharge, 171,000 cfs 1800 hours Apr. 16 (gage height, 26.01 ft from graph based on gage readings).

1851 to March 1965: Discharge, 125,000 cfs Apr. 16, 1952 (gage height 22.02 ft).

Remarks.—Slight regulation except during extreme floods by reservoirs on headwaters and by powerplants. Beginning June 20, 1938, sewage from Minneapolis and St. Paul, which formerly entered above station, was diverted to a sewage-disposal plant, thence to river below station. Figures of daily discharge do not include this diversion.

Cooperation.— Gage-height record at South St. Paul furnished by Corps of Engineers. Diversion through sewage-disposal plant furnished by Minneapolis-St. Paul Sanitary District.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	4,070	66,100	11	91,300	41,700	21	138,000	39,700
2	4,660	62,500	12	128,000	46,600	22	128,000	39,900
3	5,040	58,900	13	147,000	46,200	23	118,000	39,600
4	5,160	55,800	14	160,000	45,200	24	108,000	39,500
5	9,060	53,500	15	166,000	45,200	25	99,300	40,100
6	13,800	51,100	16	171,000	44,800	26	92,000	41,500
7	17,400	49,800	17	169,000	43,200	27	84,300	42,400
8	24,400	48,200	18	163,000	42,400	28	78,700	42,600
9	35,700	48,000	19	155,000	41,200	29	74,200	43,000
10	53,500	47,400	20	147,000	40,400	30	70,000	43,000
						31	-------	44,000
Monthly mean discharge, in cubic feet per second*							89,130	46,780
Runoff, in inches*							2.70	1.46

*Adjusted for diversion

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Mississippi River at St. Paul, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	2.84	8,080	Apr. 12	1500	22.21	133,000	Apr. 21	1600	22.55	136,000
	0600	2.78	8,120		1800	22.58	136,000		2000	22.39	134,000
	1200	2.88	8,700		2000	22.80	139,000		2400	22.23	133,000
	1800	3.12	9,680		2400	23.01	141,000				
	2400	3.33	11,400					22	0200	22.15	132,000
				13	0200	23.18	142,000		0400	22.06	131,000
6	0600	3.55	12,800		0600	23.40	145,000		0600	21.99	130,000
	1200	3.74	13,800		0800	23.54	147,000		0800	21.89	130,000
	1800	3.72	15,100		1200	23.71	148,000		1000	21.81	129,000
	2400	3.64	15,400		1400	23.85	149,000		1200	21.74	128,000
					1800	23.96	150,000		1400	21.65	127,000
7	0600	3.73	15,700		2000	24.10	152,000		1600	21.56	126,000
	1200	3.92	16,400		2400	24.20	153,000		1800	21.47	125,000
	1800	4.68	19,500						2000	21.40	125,000
	2400	4.98	20,800	14	0200	24.45	155,000		2200	21.40	125,000
					0600	24.61	157,000		2400	21.31	124,000
8	0300	5.06	21,300		0800	24.86	159,000				
	0600	5.17	21,700		1200	25.00	161,000	23	0400	21.10	122,000
	0900	5.57	23,000		1400	25.10	162,000		0800	20.84	119,000
	1200	6.02	24,400		1800	25.22	163,000		1200	20.68	118,000
	1500	6.35	25,600		2000	25.26	163,000		1600	20.50	116,000
	1800	6.65	26,700		2400	25.34	164,000		2000	20.32	114,000
	2100	7.54	27,800						2400	20.13	113,000
	2400	7.24	29,000	15	0600	25.47	165,000				
					1200	25.55	166,000	24	0400	19.95	111,000
9	0300	7.57	30,300		1800	25.69	168,000		0800	19.80	109,000
	0600	7.90	31,600		2400	25.85	170,000		1200	19.60	108,000
	0900	8.28	33,200						1600	19.44	106,000
	1200	8.76	35,300	16	0600	25.88	170,000		2000	19.28	105,000
	1500	9.36	37,800		1200	25.96	171,000		2400	19.12	103,000
	1800	9.82	39,600		1800	26.01	171,000				
	2100	10.17	41,600		2400	25.94	171,000	25	0400	18.93	102,000
	2400	10.48	43,200						0800	18.76	100,000
				17	0600	25.85	170,000		1200	18.64	99,000
10	0300	10.79	44,800		1200	25.80	169,000		1600	18.54	98,100
	0600	11.11	46,400		1800	25.64	169,000		2000	18.44	97,200
	0900	11.54	48,500		2400	25.52	166,000		2400	18.28	95,800
	1200	12.32	52,400								
	1500	13.00	55,900	18	0600	25.41	165,000	26	0600	18.08	94,000
	1800	13.65	59,500		1200	25.20	163,000		1200	17.86	92,000
	2100	14.35	64,000		1800	25.07	161,000		1800	17.63	89,900
	2400	15.20	70,200		2400	24.84	160,000		2400	17.42	88,000
11	0200	15.84	75,000	19	0600	24.70	158,000	27	0600	17.23	86,300
	0600	16.56	80,600		1200	24.47	155,000		1200	16.94	83,800
	0900	17.20	86,000		1800	24.23	153,000		1800	16.78	82,400
	1200	17.87	92,100		2400	24.08	151,000		2400	16.64	81,200
	1400	18.44	97,200								
	1800	18.98	102,000	20	0600	23.86	149,000	28	0600	16.46	79,800
	2000	19.50	107,000		1200	23.60	147,000		1200	16.30	78,500
	2400	19.98	111,000		1800	23.39	144,000		1800	16.18	77,600
					2400	23.18	142,000		2400	16.02	76,400
12	0200	20.44	116,000								
	0600	20.82	119,000	21	0400	23.02	141,000	29	0600	15.89	75,400
	0800	21.25	123,000		0800	22.86	139,000		1200	15.73	74,200
	1200	21.71	128,000		1200	22.69	138,000		1800	15.59	73,100

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Mississippi River at St. Paul, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 29	2400	15.44	72,000	May 4	1200	12.98	55,800	May 6	2000	11.83	50,000
					2400	12.70	54,300		2400	11.95	50,600
30	1200	15.16	69,900								
	2400	14.92	68,100	5	1200	12.55	53,600	7	0200	11.95	50,600
					2400	12.34	52,500		0600	11.86	50,100
May 1	1200	14.64	66,000						0800	11.88	50,200
	2400	14.39	64,200	6	0200	12.27	52,200		1200	11.85	50,000
					0600	12.18	51,700		1400	11.77	49,600
2	1200	14.15	62,600		0800	12.11	51,400		1800	11.73	49,400
	2400	13.84	60,600		1200	12.10	51,300		2000	11.65	49,000
					1400	11.98	50,700		2400	11.60	48,800
3	1200	13.54	58,800		1800	11.90	50,300				
	2400	13.26	57,300								

ST. CROIX RIVER BASIN

(81) 5-3325. Namekagon River near Trego, Wis.

Location.—Lat 45°56'50", long 91°53'15", in SW¼ sec.17, T.40 N., R.12 W., at powerplant of the Northern States Power Co., 4 miles downstream from Potato Creek and 5 miles northwest of Trego.

Drainage area.—503 sq mi.

Gage-height record.—Headwater and tailwater gages read hourly.

Discharge record.—Discharge computed by Northern States Power Co. from its powerplant records on basis of ratings developed by Geological Survey.
Rating checked by current-meter measurement Apr. 16, 1965, at 1,660 cfs.

Maxima.—March–May 1965: Daily discharge, 1,640 cfs Apr. 13.
1927 to February 1965: Daily discharge, 5,200 cfs Sept. 2, 1941.

Remarks.—Discharge affected by operation of dam and powerplant.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	359	281	825	11	323	650	1,100	21	278	1,230	940
2	328	290	749	12	314	1,280	1,050	22	297	949	903
3	347	307	712	13	308	1,640	957	23	287	1,150	974
4	308	328	740	14	321	1,590	680	24	294	1,230	956
5	304	334	684	15	317	1,490	855	25	303	1,160	847
6	351	400	691	16	307	1,560	965	26	291	1,110	854
7	352	436	1,040	17	282	1,500	956	27	299	1,010	840
8	320	552	1,120	18	290	1,430	967	28	306	935	807
9	327	503	1,130	19	288	1,350	990	29	284	849	788
10	336	556	1,200	20	278	1,240	937	30	291	830	810
								31	337	-----	704
Monthly mean discharge, in cubic feet per second									311	939	896
Runoff, in inches									0.71	2.08	2.05

(82) 5-3331. Little Frog Creek near Minong, Wis.

(Crest-stage station)

Location.—Lat 46°05'48", long 91°46'39", in NW¼ sec.29, T.42 N., R.11 W., at twin corrugated culverts on country road, 0.2 mile south of junction with State Highway 77 and 2.4 miles east of Minong.

Drainage area.—13.6 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 180 cfs.

Maxima.—March–May 1965: Discharge, 190 cfs Apr. 15 (gage height, 14.31 ft).
1961 to February 1965: Discharge, about 230 cfs May 15, 1961 (gage height, 15.06 ft).

(83) 5–3335. St. Croix River near Danbury, Wis.

Location.—Lat 46°04'30", long 92°14'50", in sec.33, T.42 N., R.15 W., on left bank at downstream side of bridge on State Highway 35, 3.5 miles downstream from Namekagon River, 10 miles northeast of Danbury, and at mile 129.2.

Drainage area.—1,588 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 882.21 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1 to Apr. 17

Maxima.—March–May 1965: Discharge, 6,460 cfs 1900–2400 hours Apr. 19 (gage height, 5.74 ft); gage height, 6.92 ft 1430 hours Apr. 15 (backwater from ice).
1914 to February 1965: Discharge, 10,200 cfs May 6, 1950 (gage height, 8.22 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	720	940	2,180	11	800	1,800	3,930	21	770	5,940	2,620
2	780	960	2,330	12	790	2,400	3,750	22	780	5,600	2,490
3	840	1,000	2,210	13	780	3,800	3,430	23	790	5,070	2,440
4	860	1,040	1,840	14	770	4,500	3,030	24	800	4,680	2,460
5	880	1,100	1,630	15	760	5,000	2,450	25	810	4,120	2,640
6	890	1,180	1,620	16	750	5,600	2,690	26	820	3,870	2,600
7	880	1,280	2,180	17	740	6,000	2,800	27	840	3,680	2,450
8	860	1,380	3,000	18	740	6,160	2,540	28	860	3,300	2,160
9	840	1,400	3,640	19	750	6,360	2,480	29	900	2,720	1,930
10	820	1,420	3,950	20	770	6,350	2,590	30	930	2,200	1,850
								31	940	-----	1,800
Monthly mean discharge, in cubic feet per second									815	3,362	2,571
Runoff, in inches									0.59	2.36	1.87

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of St. Croix River near Danbury, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	4.20	-----	Apr. 15	1430	6.92	-----	Apr. 18	2400	5.60	6,260
	0800	4.53	-----		1600	6.50	-----				
	1600	4.68	-----		1900	6.15	-----	19	1200	5.68	6,370
	2400	4.77	-----		2400	5.95	-----		1900	5.74	6,460
									2400	5.74	6,460
13	0800	5.01	-----	16	0800	5.91	-----				
	1600	5.24	-----		1600	5.75	-----	20	1200	5.69	6,390
	2400	5.66	-----		2400	5.59	-----		2400	5.53	6,160
14	0800	6.03	-----	17	1200	5.40	-----	21	1200	5.34	5,900
	1600	6.26	-----		2400	5.48	-----		2400	5.27	5,800
	2400	6.39	-----								
				18	0400	5.58	6,230	22	1200	5.12	5,600
15	0800	6.49	-----		0800	5.48	6,090		2400	4.97	5,400
	1100	6.67	-----		1600	5.53	6,160				
	1300	6.50	-----								

(84) 5–3341. Sawyer Creek near Shell Lake, Wis.

(Crest-stage station)

Location.—Lat 45°46'08", long 91°54'40", in SE¼ sec.13, T.38 N., R.13 W., at concrete box culvert on U.S. Highway 63, 2.0 miles north of Shell Lake and 4 miles south of junction with State Highway 70 in Spooner.

Drainage area.—0.8 sq mi (approximately).

Gage-height record.—Crest stages only.

Maxima.—March–May 1965: Gage height, 13.11 ft Apr. 11.
1960 to February 1965: Gage height, 11.61 ft Apr. 26, 1960.

(85) 5–3353.8 Bashaw Brook near Shell Lake, Wis.

(Crest-stage station)

Location.—Lat 45°47'02", long 92°07'51", in SW¼ sec.8, T.38 N., R.14 W., just upstream from twin concrete box culvert on country road 1.1 miles east from junction with County Trunk X, 2.2 miles south of State Highway 70, and 10.5 miles northwest of intersection of County Trunk B and U.S. Highway 63 in Shell Lake.

Drainage area.—28.2 sq mi, of which 2.5 sq mi is non-contributing.

Gage-height record.—Water-stage recorder graph.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 290 cfs.

Maxima.—March–May 1965: Discharge, 600 cfs 1800 hours Apr. 11(gage height, 14.90 ft).
1959 to February 1965: Discharge, 172 cfs Mar. 30, 1960 (gage height, 13.35 ft).

(86) 5–3360. St. Croix River near Grantsburg, Wis.

Location.—Lat 45°55'25", long 92°38'20", near center of sec.30, T.40 N., R.18 W., on left bank at Norway Point, 0.5 mile downstream from Sand Creek, 10 miles north of Grantsburg, and at mile 102.4.

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

Gage-height record.—Water-stage recorder graph. Datum of gage is 848.98 ft above mean sea level, adjustment of 1912 (levels by Northern States Power Co.).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1 to Apr. 17.

Maxima.—March–May 1965: Discharge, 16,800 cfs 0200 hours Apr. 18 (gage height, 12.64 ft); gage height, 13.01 ft 1300 hours Apr. 16 (backwater from ice).
1923 to February 1965: Discharge, 26,300 cfs May 7, 1950 (gage height, 15.06 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,120	1,420	4,830	11	1,340	2,600	8,300	21	1,260	15,200	4,550
2	1,180	1,460	4,490	12	1,340	3,800	8,020	22	1,260	14,200	4,480
3	1,240	1,500	4,340	13	1,320	5,400	7,290	23	1,260	12,900	4,170
4	1,300	1,600	4,010	14	1,300	9,000	6,460	24	1,260	11,500	4,070
5	1,340	1,700	3,370	15	1,300	11,600	5,620	25	1,280	10,200	4,390
6	1,360	1,760	3,830	16	1,280	12,000	4,950	26	1,300	9,140	4,600
7	1,380	1,800	5,080	17	1,280	14,000	4,640	27	1,320	8,170	4,530
8	1,380	2,000	6,310	18	1,260	16,400	4,840	28	1,340	7,350	4,220
9	1,360	2,200	7,100	19	1,260	15,700	4,730	29	1,360	6,610	3,690
10	1,360	2,300	7,790	20	1,260	15,700	4,590	30	1,380	5,680	3,260
								31	1,400	------	3,120
Monthly mean discharge, in cubic feet per second									1,303	7,496	5,022
Runoff, in inches									0.53	2.97	2.05

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	8.37	-----	Apr. 15	1200	12.23	-----	Apr. 18	2400	12.32	15,900
	0600	8.56	-----		1800	12.47	-----				
	1200	8.72	-----		2400	12.65	-----	19	1200	12.25	15,600
	1800	8.94	-----						2400	12.26	15,700
	2400	9.20	-----	16	0600	12.78	-----				
					1200	12.96	-----	20	1200	12.28	15,700
13	0600	9.39	-----		1300	13.01	-----		2400	12.24	15,600
	1200	9.59	-----		1800	12.80	-----				
	1800	9.89	-----		2400	12.93	-----	21	2400	11.99	14,900
	2400	10.21	-----								
				17	0600	12.60	-----	22	2400	11.56	13,600
14	0600	10.52	-----		1200	12.46	-----				
	1200	10.90	-----		1800	12.56	-----	23	2400	11.04	12,200
	1800	11.27	-----		2400	12.62	-----				
	2400	11.65	-----					24	2400	10.49	10,800
				18	0200	12.64	16,800				
15	0600	11.91	-----		1200	12.49	16,400	25	2400	10.01	9,690

(87) 5–3362. Glaisby Brook near Kettle River, Minn.

Location.—Lat 46°27'19", long 92°51'34", in SE¼NW¼ sec.22, T.46 N., R.20 W., on left bank 20 ft upstream from Bridge No. 2468 on State Highways 27 and 73, 1.0 mile upstream from mouth, and 2.4 miles south of Kettle River.

Gage-height record.—Water-stage recorder graph. Altitude of gage is 1,105 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 308 cfs and extended to peak stage by logarithmic plotting. Backwater from ice Apr. 1–15.

Maxima.—April–May 1965: Discharge, 813 cfs at 2200 hours Apr. 18 (gage height, 8.42 ft).
1959 to March 1965: Discharge, 476 cfs May 23, 1962 (gage height, 6.17 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	1.3	58	11	30	44	21	376	44
2	1.4	53	12	70	37	22	322	52
3	1.6	50	13	140	32	23	264	56
4	1.8	45	14	250	26	24	198	57
5	2.5	43	15	400	26	25	141	57
6	5.0	48	16	488	26	26	111	53
7	5.6	52	17	461	26	27	92	47
8	7.0	52	18	660	36	28	80	39
9	10	50	19	693	40	29	71	32
10	20	47	20	502	38	30	62	27
						31	-------	25
Monthly mean discharge, in cubic feet per second ----------							182	42.5

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	3.22	----	Apr. 15	2200	6.74	710	Apr.19	1000	7.63	690
	0100	3.29	----		2400	6.60	536		1700	7.37	650
	1100	3.16	----						2400	7.06	604
	1500	3.37	----	16	0400	6.19	479				
	1800	3.73	----		0900	5.96	450	20	0600	6.85	572
	2000	4.06	----		1400	6.34	500		1300	6.22	483
	2100	3.91	----		1600	6.27	490		2400	5.46	393
	2400	4.02	----		2000	6.43	512				
					2400	6.19	479	21	0600	5.48	395
13	0300	4.06	----						2400	5.12	344
	0900	3.99	----	17	0500	5.69	420				
	1200	3.88	----		0900	5.59	409	22	1200	4.97	322
	1500	4.08	----		1200	5.97	451		2400	4.85	298
	1600	4.06	----		1500	5.88	441				
	1800	4.80	----		1700	6.12	470	23	1200	4.67	262
	2000	5.28	----		2400	6.78	562		2400	4.53	234
	2400	5.20	368								
				18	0600	6.96	589	24	1200	4.34	196
14	0900	4.85	298		0900	6.65	543		2400	4.18	165
	1700	5.36	402		1300	7.32	643				
	2400	5.69	472		1700	8.03	751	25	1200	4.02	138
					2200	8.42	813		2400	3.92	124
15	0300	5.71	476		2400	8.37	805				
	1000	5.67	467					26	1200	3.81	110
	1400	6.25	595	19	0500	8.11	764		2400	3.73	101
	1700	6.60	677								

(88) 5–3365.5 Wolf Creek tributary near Sandstone, Minn.

(Crest-stage station)

Location.—Lat 46°09'45", long 92°51'58", in NE¼SE¼ sec.33, T.43 N., R.20 W., at culvert on U.S. Highway 61, 0.2 mile upstream from mouth and 2.2 miles north of Sandstone.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 33 cfs and by indirect measurements at 121 cfs and 200 cfs.

Maxima.—April–May 1965: Discharge, 200 cfs Apr. 15 (gage height, 19.20 ft).
1960 to March 1965: Discharge, 121 cfs May 23, 1962 (gage height, 17.80 ft).

(89) 5–3385. Snake River near Pine City, Minn.

Location.—Lat 45°50'30", long 92°56'00", in SE¼NW¼ sec.26, T.39 N., R.21 W., on left bank at site of former powerplant and dam, half a mile downstream from Cross Lake and 1½ miles northeast of Pine City.

Drainage area.—958 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 919.00 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1–11.

Maxima.—April–May 1965: Discharge, 11,500 cfs 0800 hours Apr. 18 (gage height, 9.56 ft).
1913–17, 1951 to March 1965: Discharge, 7,730 cfs May 28, 1962; gage height, 8.30 ft Apr. 12, 13, 1952.
A discharge measurement of 12,500 cfs was made May 9, 1950.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	60	3,740	11	630	2,460	21	10,700	1,300
2	60	3,190	12	1,350	2,420	22	10,500	1,160
3	65	2,720	13	2,460	2,310	23	10,200	1,090
4	65	2,330	14	4,400	2,150	24	9,550	1,110
5	65	2,060	15	6,680	1,980	25	8,660	1,210
6	80	1,940	16	9,620	1,810	26	7,670	1,370
7	95	2,000	17	10,900	1,620	27	6,580	1,530
8	120	1,980	18	11,300	1,620	28	5,680	1,590
9	160	2,270	19	11,200	1,500	29	4,940	1,600
10	250	2,420	20	10,900	1,390	30	4,320	1,540
						31	-------	1,410
Monthly mean discharge, in cubic feet per second							4,975	1,897
Runoff, in inches							5.79	2.28

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Snake River near Pine City, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0000	3.43	-----	Apr. 15	2000	8.09	7,640	Apr. 23	1200	9.09	10,200
	0600	3.46	-----		2400	8.34	8,280		2400	8.98	9,950
	1200	3.48	-----								
	1800	3.55	-----	16	0400	8.56	8,860	24	1200	8.84	9,580
	2400	3.66	-----		0800	8.74	9,320		2400	8.65	9,090
					1200	8.91	9,770				
11	0600	3.78	-----		1600	9.03	10,100	25	1200	8.49	8,670
	1200	3.88	-----		2000	9.11	10,300		2400	8.31	8,210
	1800	4.07	-----		2400	9.19	10,500				
	2400	4.21	-----					26	1200	8.10	7,670
				17	0600	9.28	10,700		2400	7.88	7,120
12	0600	4.34	1,090		1200	9.36	10,900				
	1200	4.46	1,220		1800	9.39	11,000	27	1200	7.65	6,560
	1800	4.82	1,650		2400	9.45	11,200		2400	7.45	6,090
	2400	5.05	1,930								
				18	0600	9.50	11,300	28	1200	7.26	5,680
13	0400	5.13	2,030		0800	9.56	11,500		2400	7.05	5,260
	0800	5.21	2,130		1200	9.51	11,300				
	1200	5.35	2,310		1800	9.52	11,400	29	1200	6.88	4,920
	1600	5.57	2,610		2400	9.51	11,300		2400	6.74	4,660
	2000	5.84	3,020								
	2400	6.06	3,400	19	0600	9.50	11,300	30	1200	6.56	4,310
					1200	9.48	11,200		2400	6.40	4,010
14	0400	6.25	3,740		1800	9.44	11,100				
	0800	6.42	4,050		2400	9.41	11,100	May 1	1200	6.25	3,740
	1200	6.60	4,390						2400	6.09	3,450
	1600	6.78	4,730	20	1200	9.34	10,900				
	2000	6.95	5,060		2400	9.29	10,800	2	1200	5.94	3,190
	2400	7.14	5,440						2400	5.78	2,930
				21	1200	9.26	10,700				
15	0400	7.32	5,800		2400	9.24	10,600	3	1200	5.64	2,720
	0800	7.50	6,200						2400	5.50	2,510
	1200	7.68	6,630	22	1200	9.21	10,500				
	1600	7.87	7,100		2400	9.20	10,500				

(90) 5–3395. St. Croix River near Rush City, Minn.

(Gaging station, discontinued 1961)

Location.—Lat 45°42'15", long 92°52'20", in SW¼ sec.8, T.37 N., R.20 W., on right bank 200 ft upstream from old site of Northern Pacific Railway bridge, 5 miles east of Rush City, 10 miles downstream from Snake River, and at mile 80.6.

Drainage area.—5,120 sq mi.

Gage-height record.—Crest stages only. Datum of gage is 772.47 ft above mean sea level, datum of 1929.

Maxima.—March–May 1965: Gage height, 15.67 ft about Apr. 18 (probable backwater from ice).

1923 to February 1965: Discharge, 60,000 cfs May 8, 1950 (gage height, 19.04 ft from floodmarks).

(91) 5–3400. Sunrise River near Stacy, Minn.

Location.—Lat 45°24'30", long 92°55'55", in NW¼NW¼ sec.26, T.34 N., R.21 W., on right bank on upstream side of highway bridge, 2½ miles northeast of Stacy, 2½ miles upstream from Minnesota Division of Game and Fish dam and 3 miles downstream from West Branch Sunrise River.

Drainage area.—167 sq mi.

Gage-height record.—Water-stage recorder graph. Altitude of gage is 865 ft (from topographic map).

Discharge.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Apr. 1-12, and from dam 2½ miles downstream Apr. 28 to May 31.

Maxima.—April–May 1965: Discharge, 684 cfs 0900 hours Apr. 15 (gage height, 8.11 ft); gage height, 8.20 ft 0700 hours May 11 (backwater from dam).
1949 to March 1965: Discharge, 806 cfs Apr. 12, 1952 (gage height, 7.88 ft).

Remarks.—Subject to backwater from Minnesota Division of Game and Fish dam approximately 2½ miles downstream. At high stages a small part of flow discharges into the Rum River and Coon Creek basins from West Arm of Coon Lake and South Coon Lake, respectively.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	15	241	11	100	406	21	511	314
2	16	254	12	326	376	22	480	325
3	17	264	13	469	324	23	456	321
4	19	265	14	634	276	24	420	296
5	22	268	15	681	234	25	410	283
6	27	277	16	667	193	26	410	272
7	33	336	17	628	180	27	395	250
8	40	361	18	598	181	28	355	232
9	46	384	19	574	191	29	335	226
10	52	402	20	544	255	30	303	228
						31	------	242
Monthly mean discharge, in cubic feet per second							319	279
Runoff, inches							2.13	1.93

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 9	0000	5.44	----	Apr. 13	1200	7.42	465	Apr. 17	2400	7.91	614
	0900	5.28	----		2400	7.75	558				
	2000	5.68	----					18	1200	7.86	596
	2400	5.70	----	14	1200	8.01	648		2400	7.83	586
					2400	8.10	680				
10	1200	5.82	----					19	1200	7.80	575
	2400	6.05	----	15	0900	8.11	684		2400	7.76	561
					2400	8.09	676				
11	1200	6.29	----					20	1200	7.71	544
	2400	6.53	----	16	1200	8.07	670		2400	7.66	528
					2400	8.02	652				
12	1200	6.80	----					21	1200	7.60	5.10
	2400	7.10	----	17	1200	7.94	624		2400	7.55	4.98

(92) 5–3405. St. Croix River at St. Croix Falls, Wis.

Location.—Lat 45°24'30", long 92°38'45", in NW¼ sec.30, T.34 N., R.18 W., on left bank 1,800 ft downstream from powerplant of Northern States Power Co., in St. Croix Falls, and at mile 52.2.

Drainage area.—5,930 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at fifteen-minute intervals except 1300 hours Apr. 15 to 1900 hours Apr. 23 for which graph was reconstructed on basis of high-water mark in gage house and twice-daily outside gage readings. Datum of gage is 690.47 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharges computed from 96 punch-tape recordings per day except Apr. 15–23. Backwater from ice Mar. 30, 31.

Maxima.—March–May 1965: Discharge, 45,700 cfs 1200 hours Apr. 18 (gage height, 20.98 ft).
1902 to February 1965: Discharge, 54,900 cfs May 8, 1950 (gage height, 25.19 ft).

Remarks.—Flow affected by powerplant upstream.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,100	1,890	15,200	11	2,100	11,400	17,400	21	1,870	42,900	9,110
2	1,550	2,130	13,800	12	2,060	17,100	17,200	22	1,870	41,100	8,970
3	1,800	1,760	12,100	13	2,000	19,300	15,900	23	1,930	38,400	8,760
4	1,750	1,840	9,620	14	1,900	25,000	14,200	24	1,910	35,500	8,570
5	2,060	2,090	8,960	15	2,020	34,400	12,900	25	1,850	32,400	8,980
6	2,040	4,030	9,830	16	2,050	40,500	11,700	26	1,960	29,700	9,430
7	2,020	3,370	14,200	17	2,000	43,500	10,200	27	1,850	26,300	9,640
8	2,140	4,250	16,000	18	1,910	45,100	10,600	28	2,080	23,100	9,160
9	2,040	4,710	16,500	19	2,140	44,400	10,500	29	2,000	20,300	8,510
10	2,080	7,030	17,500	20	1,850	43,400	9,600	30	1,880	17,800	7,780
								31	1,860	-----	7,300
Monthly mean discharge, in cubic feet per second									1,957	22,160	11,620
Runoff, in inches									0.38	4.17	2.26

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0000	4.43	8,120	Apr. 13	1200	9.18	19,000	Apr. 15	1500	18.7	40,500
	0600	4.45	8,180		1800	9.95	20,800		1600	18.4	39,800
	0800	4.80	9,020		2400	10.04	21,000		2400	18.2	39,300
	1000	5.76	11,300								
	1600	6.04	12,000	14	0600	10.46	21,900	16	0600	18.3	39,500
	2000	7.40	15,000		1000	12.32	26,100		1200	18.8	40,700
	2400	7.70	15,700		1400	11.52	24,300		1800	19.1	41,400
					2000	14.13	30,200		2400	19.3	41,800
12	0600	7.76	15,800		2200	12.27	25,900				
	1200	8.52	17,500		2400	13.20	28,100	17	0600	19.6	42,500
	1800	8.76	18,100						1200	20.1	43,700
	2400	8.82	18,200	15	0600	13.45	28,600		1800	20.5	44,600
					1200	15.00	32,100		2400	20.6	44,800
13	0200	8.63	17,800		1300	17.4	37,500				
	0600	8.82	18,200		1400	20.0	43,400	18	0300	20.7	45,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of St Croix River at St Croix Falls, Wis —Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 18	1000	20.9	45,500	Apr. 25	1200	15.01	32,100	May 8	2400	7.81	15,900
	1200	20.98	45,700		1800	14.84	31,800				
	1400	20.9	45,500		2400	14.56	31,100	9	0600	8.09	16,600
	1800	20.7	45,000						1200	7.85	16,000
	2400	20.5	44,600	26	1200	13.92	29,700		1400	8.14	16,700
					2400	13.21	28,100		2400	8.27	16,900
19	0600	20.4	44,400								
	1200	20.4	44,400	27	1200	12.44	26,400	10	0600	8.40	17,300
	1800	20.4	44,400		2400	11.66	24,600		1800	8.58	17,700
	2400	20.3	44,100						2400	8.56	17,600
				28	1200	11.01	23,100				
20	0600	20.0	43,400		2400	10.38	21,700	11	0600	8.55	17,600
	2400	19.9	43,200						0800	8.28	17,000
				29	1200	9.73	20,300		1200	8.42	17,300
21	1200	19.8	43,000		2400	9.16	19,000		2400	8.46	17,400
	1800	19.7	42,700								
	2400	19.5	42,300	30	1200	8.64	17,800	12	1200	8.40	17,300
					2400	8.06	16,500		2400	8.18	16,800
22	1200	19.0	41,100								
	2400	18.4	39,800	May 1	1200	7.49	15,200	13	0600	8.09	16,600
					2400	7.00	14,100		0800	7.39	15,000
23	1200	17.8	38,400						1200	7.92	16,200
	1800	17.5	37,700	6	2400	6.39	12,800		1800	7.75	15,800
	2400	17.3	37,300						2000	7.44	15,100
				7	0400	6.22	12,300		2400	7.44	15,100
24	0600	17.04	36,700		1200	7.08	14,300				
	1200	16.32	35,100		1400	7.64	15,600	14	0600	7.34	14,900
	2400	15.78	33,900		2400	7.63	15,600		1200	6.91	13,900
									1800	6.83	13,800
25	0800	15.33	32,900	8	0200	8.14	16,700		2400	6.77	13,600
	1000	14.74	31,500		1200	7.76	15,800				

(93) 5–3415. Apple River near Somerset, Wis.

Location.—Lat 45°09'30", long 92°43'00", in sec.21, T.31 N., R.19 W., at powerplant of Northern States Power Co., 3.5 miles downstream from Somerset.

Drainage area.—555 sq mi.

Gage-height record.—Headwater and tailwater gages read hourly.

Discharge record.—Discharge computed by Northern States Power Co. from its powerplant records on basis of ratings developed by Geological Survey.

Maxima.—March–May 1965: Daily discharge, 2,510 cfs Apr. 13.
1901 to February 1965: Daily discharge, 2,460 cfs June 17, 1943.

Remarks.—Flow affected by many powerplants upstream.

Cooperation.—Records of daily discharge furnished by Northern States Power Co.

Mean discharge, in cubic feet per second, 1965, of Apple River near Somerset, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	160	290	967	11	295	1,590	645	21	325	1,280	478
2	255	288	665	12	287	2,040	650	22	225	1,250	650
3	310	341	455	13	320	2,510	635	23	280	1,260	690
4	325	445	320	14	370	2,500	521	24	265	1,120	485
5	323	470	565	15	310	2,470	387	25	305	1,020	340
6	310	395	530	16	300	2,450	530	26	266	1,050	475
7	325	740	537	17	260	2,480	685	27	300	1,040	635
8	235	1,060	644	18	275	2,480	470	28	295	1,040	635
9	265	1,220	710	19	267	2,480	490	29	195	740	616
10	315	1,470	870	20	260	1,540	505	30	255	984	518
								31	285	-----	360
Monthly mean discharge, in cubic feet per second									283	1,335	570
Runoff, in inches									0.59	2.68	1.18

(94) 5–3419. Kinnickinnic River tributary at River Falls, Wis.

(Crest-stage station)

Location.—Lat 44°49'57", long 92°38'23", in NE¼ sec.14, T.27 N., R.19 W., at bridge on County Trunk FF, 0.5 mile west of intersection with State Highway 29, and 1.6 miles southwest of intersection of State Highways 29 and 35 in River Falls.

Drainage area.—7.26 sq mi.

Gage-height record.—Crest stages only.

Maxima.—March–May 1965: Gage height, 12.14 ft Apr. 8.
1959 to February 1965: Gage height 11.98 ft July 8, 1959.

(95) St. Croix River at Prescott, Wis.

(Miscellaneous site)

Location.—Lat 44°44'56", long 92°48'12", in sec.9, T.26 N., R.20 W., at bridge on U.S. Highway 10, 600 ft upstream from Mississippi River, and 500 ft north of Chicago, Burlington and Quincy Railroad bridge in Prescott.

Gage-height record.—Floodmark and gage heights are those for Mississippi River at Prescott, Wis. Datum of gage is 600.00 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Discharge record.—Discharge obtained on the following days by current-meter measurement.

Date	Discharge, in cfs
Apr. 14, 1965	12,900
Apr. 17	43,700
Apr. 26	36,600
May 7	12,600

MISSISSIPPI RIVER MAIN STEM

(96) 5–3445. Mississippi River at Prescott, Wis.

Location.—Lat 44°44'45", long 92°48'00", in sec.9, T.26 N., R.20 W., on left bank at Prescott, 200 ft downstream from St. Croix River, 300 ft south of Chicago, Burlington and Quincy Railroad bridge, 800 ft south of bridge on U.S. Highway 10, and at mile 811.4 upstream from Ohio River. Auxiliary water-stage recorder 10.7 miles downstream from base gage.

Drainage area.—44,800 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except 1810 hours Apr. 14 to 1730 hours Apr. 24 when graph was constructed on basis of several gage readings by engineers and twice-daily gage readings by Corps of Engineers on temporary staff gage.
For auxiliary gage, water-stage recorder graph except 1600 hours Apr. 12 to 1730 hours Apr. 14 and 2130 hours Apr. 15 to 1700 hours Apr. 26. Datum of gage is 600.00 ft above mean sea level, datum of 1912 (levels by Corps of Engineers).

Discharge record.—Stage-fall-discharge relation affected by changes in slope and defined by current-meter measurements. Fall was a factor for computing the discharge Apr. 5, 6. For the period Apr. 1–4, flow was computed on the basis of discharge for Lock and Dam No. 3 and adjusted for storage. These records furnished by Corps of Engineers.

Maxima.—April–May 1965: Discharge, 228,000 cfs 0600 hours Apr. 18 (gage height, 93.11 ft, from graph based on gage readings).
1928 to March 1965: Discharge, 155,000 cfs Apr. 16–18, 1952 (gage height, 89.03 ft).

Remarks.—Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	9,100	91,500	11	75,900	65,400	21	206,000	55,200
2	8,670	84,300	12	108,000	65,400	22	192,000	54,200
3	10,000	78,400	13	143,000	64,800	23	180,000	53,500
4	11,800	73,400	14	172,000	63,900	24	167,000	53,100
5	16,600	68,700	15	199,000	62,600	25	154,000	52,500
6	22,600	65,700	16	214,000	61,700	26	140,000	53,500
7	28,600	64,900	17	223,000	59,700	27	128,000	53,700
8	36,200	65,500	18	226,000	58,400	28	116,000	54,500
9	43,300	64,900	19	222,000	57,200	29	107,000	54,600
10	55,700	65,400	20	214,000	56,200	30	99,100	54,500
						31	-------	54,500
Monthly mean discharge, in cubic feet per second							117,600	62,320
Runoff, in inches							2.93	1.60

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Mississippi River at Prescott, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	75.05	------	Apr. 12	0600	85.65	99,100	Apr. 21	1200	92.00	207,000
	0300	75.06	------		1200	86.27	108,000		1800	91.76	202,000
	0600	75.04	------		1800	86.87	117,000		2400	91.58	199,000
	0900	75.02	------		2400	87.47	127,000				
	1200	74.95	------					22	1200	91.20	192,000
	1500	74.93	------	13	0600	88.02	135,000		2400	90.87	186,000
	1800	75.01	------		1200	88.51	144,000				
	2100	75.16	------		1800	88.95	151,000	23	1200	90.50	179,000
	2400	75.29	18,000		2400	89.30	157,000		2400	90.22	174,000
6	0300	75.39	19,800	14	0600	89.72	165,000	24	0600	90.05	171,000
	0600	75.54	20,400		1200	90.10	172,000		1200	89.85	167,000
	0900	75.77	21,600		1800	90.47	178,000		1800	89.60	163,000
	1200	75.94	22,400		2400	90.84	185,000		2400	89.42	160,000
	1500	76.20	23,700								
	1800	76.55	25,400	15	0600	91.19	192,000	25	1200	89.09	154,000
	2100	76.65	26,000		1200	91.59	199,000		2400	88.70	147,000
	2400	76.76	26,500		1800	92.04	208,000				
					2400	92.27	212,000	26	1200	88.32	140,000
7	0300	76.79	26,600						2400	87.91	134,000
	0600	76.85	27,000	16	0300	92.27	212,000				
	0900	76.88	27,100		0600	92.24	212,000	27	1200	87.61	129,000
	1200	76.94	27,400		0900	92.26	212,000		2400	87.21	122,000
	1500	77.18	28,600		1200	92.34	213,000				
	1800	77.54	30,400		1500	92.41	215,000	28	1200	86.83	116,000
	2100	77.84	31,900		1800	92.48	216,000		2400	86.52	112,000
	2400	78.02	32,800		2100	92.53	217,000				
					2400	92.59	218,000	29	1200	86.20	107,000
8	0600	78.40	34,700						2400	85.94	103,000
	1200	78.61	35,800	17	0600	92.71	220,000				
	1800	79.06	38,100		1200	92.84	223,000	30	1200	85.65	99,100
	2400	79.33	39,600		1800	92.94	225,000		2400	85.37	95,200
					2400	93.05	227,000				
9	0300	79.42	40,100					May 1	1200	85.11	91,500
	0600	79.59	41,000	18	0600	93.11	228,000		2400	84.83	87,700
	0900	79.70	41,600		1200	93.07	227,000				
	1200	79.81	42,300		1800	92.97	225,000	2	1200	84.58	84,100
	1500	80.02	43,500		2400	92.90	224,000		2400	84.37	81,400
	1800	80.38	45,800								
	2100	80.64	47,600	19	0600	92.86	223,000	3	1200	84.12	78,300
	2400	80.85	49,000		1200	92.83	223,000		2400	83.87	75,600
					1800	92.77	222,000				
10	0600	81.24	51,900		2400	92.66	220,000	4	1200	83.65	73,400
	1200	81.65	55,100						2400	83.45	71,400
	1800	82.15	59,200	20	0600	92.51	217,000				
	2400	82.71	64,100		1200	92.33	213,000	5	0600	83.34	70,300
					1800	92.18	210,000		1200	83.16	68,500
11	0600	83.26	69,500		2400	92.10	209,000		1800	83.00	66,900
	1200	83.82	75,100						2400	82.98	66,700
	1800	84.40	81,800	21	0400	92.10	209,000				
	2400	85.04	90,600		1000	92.00	207,000				

VERMILLION RIVER BASIN

(97) 5–3459. Vermillion River tributary near Hastings, Minn.

(Crest-stage station)

Location.—Lat 44°43'10", long 92°56'03", in NE¼SE¼ sec.35, T.115 N., R.18 W. at culvert on county highway, 2.0 miles upstream from mouth, and 4.1 miles west of Hastings.

Drainage area.—14.3 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurement at 182 cfs and by indirect measurement at 544 cfs.

Maxima.—March–May 1965: Discharge, 544 cfs Apr. 6 (gage height, 21.95 ft, from high-water profile).
1960 to February 1965: Gage height, 18.50 ft Mar. 30, 1962, backwater from ice (discharge not determined).

TRIMBELLE CREEK BASIN

(98) 5–3466. Little Trimbelle Creek near Bay City, Wis.

(Crest-stage station)

Location.—Lat 44°38'01", long 92°34'05", in S½ sec. 21, T. 25 N., R. 18 W., at bridge on County Trunk K, 0.9 mile north of intersection with County Trunk E, and 7.0 miles northwest of Bay City.

Drainage area.—19.9 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 1030 cfs.

Maxima.—March–May 1965: Discharge, 1700 cfs Apr. 7 (gage height 12.74).
1961 to February 1965; Discharge, 810 cfs Mar. 28, 1962 (gage height 11.69 ft).

MISSISSIPPI RIVER MAIN STEM

(99) Mississippi River at Lock and Dam 3 near Red Wing, Minn.

(Miscellaneous site)

Location.—Lat 44°37', long 92°37', on east and west section line between sections 4 and 9, T.113 N., R.15 W., at Lock and Dam 3, 13 miles northwest of Red Wing, and at river mile 797.06 above Ohio River.

Gage-height record.—Peak stages from pool and tailwater water-stage recorder graphs.

Discharge record.—Corps of Engineers stage-discharge relation extended on the basis of Geological Survey current-meter measurement.

Maxima.—April–May 1965: Discharge, 228,000 cfs 2400 hours Apr. 18 (elevations, 688.22 ft pool, 687.93 ft, tailwater).
1938 to March 1965: Discharge, 151,000 cfs Apr. 17, 1952 (elevations, 684.68 ft pool, 684.12 ft tailwater).

Cooperation.—Records furnished by Corps of Engineers.

CANNON RIVER BASIN

(100) 5–3551.5. Pine Creek near Cannon Falls, Minn.

(Crest-stage station)

Location.—Lat 44°32'27", long 92°53'40", in NE¼NE¼ sec.6, T.112 N., R.17 W., at culvert on State Highway 20, 2.0 miles upstream from mouth and 2.1 miles north of Cannon Falls.

Drainage area.—20.2 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 244 cfs and by indirect measurement at 844 cfs.

Maxima.—March–May 1965: Discharge, 844 cfs Apr. 8 (gage height, 7.54 ft from high-water profile).
1960 to February 1965: Discharge, 133 cfs May 12, 1962 (gage height, 2.78 ft).

(101) 5–3552. Cannon River at Welch, Minn.

Location.—Lat 44°33'50", long 92°43'55", in NW¼SW¼ sec.27, T.113 N., R.16 W., on right bank 0.3 mile downstream from highway bridge at Welch and 1.8 miles upstream from Belle Creek.

Drainage area.—1,320 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at 15 minute intervals except 0630 hours Mar. 1 to 2400 hours Mar. 6 (for this period the auxiliary recorder graph was reconstructed on the basis of flood mark and adjacent record) and 0830 hours Mar. 19 to 1000 hours Mar. 26. Datum of gage is 699.16 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1 to Apr. 4 (no gage-height record 0830 hours Mar. 19 to 1000 hours Mar. 26). Mean daily discharges computed from 96 punch-tape readings per day Apr. 5 to May 31.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 1, 1300 hrs	7,900	[a]14.00
Apr. 8, 0245 hrs	36,100	14.01
1909–14, 1930 to February 1965:		
Apr. 2, 1952	15,800	12.00

[a]backwater from ice.

Remarks.—Diurnal fluctuation caused by powerplants above station.

Mean discharge, in cubic feet per second, 1965, of Cannon River at Welch, Minn.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,500	360	2,030	11	720	17,500	1,470	21	250	3,570	1,660
2	4,800	250	1,890	12	720	13,500	1,180	22	430	3,190	1,480
3	3,400	500	1,790	13	710	11,100	896	23	450	2,980	1,340
4	2,000	2,500	1,710	14	700	9,480	860	24	440	2,800	1,280
5	1,300	7,340	1,700	15	700	7,800	814	25	430	2,760	1,290
6	950	19,800	1,700	16	700	6,620	1,570	26	410	2,890	1,340
7	940	27,200	1,780	17	690	5,790	2,500	27	250	2,960	1,360
8	980	28,700	1,980	18	680	5,190	2,370	28	200	2,720	1,270
9	940	23,800	1,760	19	650	4,590	2,080	29	350	2,470	1,200
10	750	22,600	1,610	20	470	4,030	1,750	30	360	2,210	1,120
								31	360	-------	1,050
Monthly mean discharge, in cubic feet per second									975	8,240	1,543
Runoff, in inches									0.85	6.96	1.35

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	3.10	------	Mar. 5	2400	5.87	------	Apr. 6	1000	12.54	20,300
	0600	2.28	------						1200	12.45	19,500
	1200	2.14	------	6	0600	5.40	------		1800	12.43	19,300
	2000	4.06	------		1200	5.00	------		2000	12.84	23,200
	2400	5.55	------		1500	4.22	------		2200	12.97	24,700
					1800	3.79	------		2400	13.32	28,500
Mar. 1	0200	6.28	------		2400	3.53	------				
	0600	7.86	------					7	0200	13.35	28,900
	0800	9.30	------	Apr. 2	0000	3.34	881		1200	12.66	21,600
	1000	11.40	------		0400	3.08	715		1600	13.16	26,800
	1100	13.35	------		1200	2.10	250		2400	13.81	33,900
	1200	13.86	------		1600	3.59	1,040				
	1300	14.00	7,900		2400	3.51	992	8	0200	13.86	34,500
	1600	13.20	------						0245	14.01	36,100
	1800	12.57	------	3	0600	2.73	517		0600	13.66	32,300
	1900	12.55	------		1200	2.64	472		0800	13.32	28,500
	2400	12.76	------		1800	3.97	1,290		1200	13.11	26,200
					2400	4.48	1,650		1600	12.99	24,900
2	0600	12.07	------						2400	13.20	27,200
	0900	12.06	------	4	0600	5.07	2,090				
	1200	12.08	------		1400	5.80	2,720	9	0600	12.93	24,200
	1800	12.05	------		1600	6.72	3,590		1200	12.60	20,800
	2400	11.86	------		1800	7.44	4,340		2400	13.08	25,900
					2100	7.78	4,740				
3	1200	11.29	------		2400	7.69	4,630	10	0600	12.94	24,300
	2400	10.73	------						1400	12.60	20,800
				5	0200	7.68	3,880		2400	12.79	22,700
4	1200	10.17	------		0800	8.38	4,980				
	2400	9.67	------		1400	9.76	7,780	11	0100	12.58	20,600
					2000	10.84	10,800		0600	12.38	18,800
5	1200	9.12	------		2400	11.56	13,600		1200	12.15	17,200
	1500	8.54	------						2400	11.81	15,100
	1800	7.37	------	6	0600	12.30	18,200				

CHIPPEWA RIVER BASIN

(102) 5–3554. Moose Lake near Winter, Wis.

Location.—Lat 46°02'00", long 91°04'30", in NE¼ sec.14, T.41 N., R.6 W., on West Fork Chippewa River, 15 miles north of Winter.

Drainage area.—225 sq mi.

Gage-height record.—Staff gage. Datum of gage is mean sea level (Northern States Power Co. benchmark).

Maxima.—March–May 1965: Contents at end of week, 407 million cubic feet May 28 (elevation 1374.10 ft).
1926 to February 1965: Contents on last day of month, 520 millior cubic feet Aug. 31, 1941 (elevation, 1375.6 ft).

Remarks.—Dam was completed and storage began in 1893. Usable capacity in winter, 400 million cubic feet between elevations 1367.0 ft and 1374.0 ft; in summer, no usable capacity (limits established by Northern States Power Co.).

Cooperation.—Elevations and capacity table furnished by Northern States Power Co.

Elevation, in feet, and contents, in millions of cubic feet, 1965

Date	Elevation	Contents	Date	Elevation	Contents
Feb. 26	1367.10	5	Apr. 16	1370.60	180
Mar. 5	1367.10	5	Apr. 23	1372.00	265
Mar. 12	1367.20	10	Apr. 30	1373.70	379
Mar. 19	1367.20	10	May 7	1373.90	393
Mar. 26	1367.20	10	May 14	1373.90	393
Apr. 2	1367.20	10	May 21	1373.85	390
Apr. 9	1367.50	25	May 28	1374.10	407

(103) 5–3556. Lake Chippewa near Winter, Wis.

Location.—Lat 45°53'20", long 91°04'40", in SE¼ sec.2, T.39 N., R.6 W., on Chippewa River just downstream from mouth of East Fork Chippewa River and 5.5 miles northwest of Winter.

Drainage area.—775 sq mi.

Gage-height record.—Chain gage. Datum of gage is mean sea level (Northern States Power Co. bench mark).

Maxima.—March–May 1965: Contents observed, 10,000 million cubic feet May 19–20 (elevation, 1313.00 ft).
1923 to February 1965: Contents observed, 11,000 million cubic feet Sept. 18, 19, 1926 (elevation, 1314.4 ft).

Remarks.—Dam was completed and storage began in 1923. Usable capacity, 10,000 million cubic feet between elevations 1287.0 ft and 1313.0 ft (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Elevations and capacity table furnished by Northern States Power Co.

Elevation, in feet, and contents, in millions of cubic feet, 1965, of Lake Chippewa near Winter, Wis.

Day	March		April		May	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
1			1294.70	875	1309.15	7,379
2			1294.30	775	1309.40	7,544
3			1294.00	700	1309.55	7,643
4			1294.00	700	1309.65	7,709
5	1297.15	1,614	1294.15	738	1309.80	7,808
6			1294.40	800	1310.00	7,940
7			1294.65	862	1310.35	8,171
8			1294.90	925	1310.65	8,369
9			1295.00	950	1310.95	8,567
10			1295.45	1,085	1311.30	8,804
11			1295.90	1,220	1311.60	9,008
12	1297.15	1,614	1296.65	1,452	1311.95	9,246
13			1297.30	1,668	1312.25	9,460
14			1298.00	1,920	1312.55	9,676
15			1299.00	2,320	1312.75	9,820
16			1300.05	2,741	1312.95	9,964
17			1301.10	3,184	1312.95	9,964
18			1302.10	3,624	1312.95	9,964
19	1297.05	1,578	1303.00	4,020	1313.00	10,000
20			1304.00	4,500	1313.00	10,000
21			1304.75	4,890	1312.95	9,964
22			1305.55	5,328	1312.95	9,964
23			1306.10	5,635	1312.90	9,928
24			1306.50	5,855	1312.80	9,856
25			1306.85	6,048	1312.80	9,856
26	1296.75	1,482	1307.25	6,268	1312.80	9,856
27			1307.75	6,542	1312.85	9,892
28			1308.10	6,740	1312.80	9,856
29			1308.50	6,980	1312.80	9,856
30			1308.85	7,190	1312.85	9,892
31					1312.80	9,856

(104) 5–3560. Chippewa River at Bishops Bridge, near Winter, Wis.

Location.—Lat 45°50'55", long 91°04'45", in sec.23, T.39 N., R. 6 W., on right bank 15 ft upstream from highway bridge, 3.2 miles downstream from Lake Chippewa Dam, and 3.7 miles northwest of Winter.

Drainage area.—787 sq mi.

Gage-height record.—Water-stage recorder graph. Altitude of gage is 1,270 ft (from Lake Chippewa datum).

Discharge record.—Stage-discharge relation defined by current meter measurements. Backwater from ice March 20–24.

Maxima.—March–May 1965: Discharge, 2,890 cfs, 2300 hours May 19 (gage height, 7.35 ft).
1912 to February 1965: Discharge, 7,520 cfs Sept. 4, 5, 1941 (gage height, 11.05 ft).

Remarks.—Flow completely regulated by Moose Lake and Lake Chippewa.

Mean discharge, in cubic feet per second, 1965, of Chippewa River at Bishops Bridge, near Winter, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	564	874	108	11	457	195	141	21	448	185	2,870
2	253	731	108	12	457	214	124	22	440	161	2,850
3	253	260	108	13	452	223	173	23	440	147	2,440
4	343	246	103	14	452	256	792	24	440	136	1,740
5	457	246	106	15	452	297	1,480	25	440	127	1,600
6	457	253	116	16	452	267	2,430	26	641	122	1,600
7	457	253	133	17	446	250	2,430	27	917	116	1,600
8	457	253	192	18	452	250	2,430	28	934	113	1,600
9	457	223	188	19	452	250	2,710	29	908	111	1,600
10	457	144	153	20	450	220	2,880	30	892	108	1,590
								31	883	------	1,590
Monthly mean discharge, in cubic feet per second									518	241	1,225

(105) 5–3565. Chippewa River near Bruce, Wis.

Location.—Lat 45°27'05", long 91°15'40", in SE¼ sec.5, T.34 N., R. 7 W., on right bank 1 mile east of Bruce and 1 mile downstream from Thornapple River.

Drainage area.—1,630 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals and crest-stage indicator. Datum of gage 1,059.62 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 20,000 cfs. Mean daily discharges computed from 24 punch-tape recordings per day. Backwater from ice Mar. 1 to Apr. 16.

Maxima.—March–May 1965: Discharge, 12,300 cfs 1630 hours Apr. 15 (gage height 15.19 ft, backwater from ice).
1913 to February 1965: Discharge, 25,800 cfs Sept. 1, 1941 (gage height, 20.46 ft, from floodmarks).

Remarks.—Flow from 48 percent of the drainage area regulated by Moose Lake and Lake Chippewa.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,000	1,420	1,610	11	880	4,000	3,900	21	780	6,330	4,360
2	900	1,450	1,460	12	860	7,000	2,950	22	800	5,930	4,060
3	640	1,300	1,360	13	880	9,000	2,210	23	800	5,340	3,840
4	620	800	1,280	14	860	11,000	1,810	24	770	4,740	3,050
5	700	720	1,130	15	860	11,700	2,520	25	760	3,870	2,540
6	920	820	1,170	16	840	11,200	4,300	26	770	3,300	3,040
7	900	1,000	1,710	17	860	10,100	5,330	27	1,100	2,990	3,520
8	920	1,300	3,010	18	840	8,650	5,090	28	1,400	2,550	3,160
9	920	1,500	5,310	19	800	7,360	4,840	29	1,450	2,150	2,870
10	880	2,200	5,170	20	820	6,700	4,700	30	1,400	1,850	2,610
								31	1,450	------	2,520
Monthly mean discharge, in cubic feet per second									915	4,609	3,111

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Chippewa River near Bruce, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0000	5.54	------	Apr. 19	0800	9.35	7,540	May 16	1000	6.16	4,110
	0800	5.74	------		1600	9.08	7,240		1800	7.07	5,030
	1600	6.01	------		2400	8.87	7,010		2400	7.32	5,300
	2400	6.59	------								
				20	1200	8.78	6,910	17	0800	7.36	5,350
11	0600	7.23	------		2400	8.49	6,590		1400	7.38	5,370
	1200	7.88	------						2400	7.26	5,240
	1800	8.85	------	21	1200	8.28	6,360				
	2400	10.01	------		2400	7.99	6,040	18	0800	7.14	5,100
									1600	7.13	5,090
12	0200	10.39	------	22	0800	8.02	6,070		2400	7.05	5,000
	0800	11.26	------		1600	7.86	5,900				
	1600	11.94	------		2400	7.66	5,680	19	1200	6.88	4,830
	2400	12.30	------						2400	6.83	4,780
				23	1200	7.36	5,350				
13	1200	12.37	------		2400	7.04	4,990	20	1200	6.79	4,740
	1800	13.18	------						2400	6.56	4,510
	2400	13.53	------	May 7	2400	4.04	2,230				
								21	1200	6.47	4,420
14	0600	14.09	------	8	0800	4.29	2,430		2400	6.21	4,160
	1200	14.42	------		1600	5.20	3,220				
	1800	14.32	------		2000	5.86	3,810	22	1200	6.13	4,080
	2400	14.38	------		2400	6.41	4,360		2400	6.00	3,950
15	0600	14.61	------	9	0600	7.01	4,960	23	1200	5.93	3,880
	1200	14.83	------		1400	7.57	5,580		2400	5.56	3,540
	1600	15.11	------		2000	7.67	5,690				
	1630	15.19	12,300		2400	7.63	5,640	24	1200	5.02	3,060
	2000	15.05	------						2400	4.57	2,660
	2400	14.66	------	10	0800	7.43	5,420				
					1600	7.07	5,030	25	0800	4.44	2,550
16	0600	14.21	------		2400	6.59	4,540		1800	4.36	2,490
	1200	13.96	------						2400	4.45	2,560
	1800	13.07	------	11	0800	6.14	4,090				
	2400	12.41	11,600		1600	5.77	3,730	26	0800	4.77	2,830
					2400	5.38	3,380		1600	5.19	3,210
17	0600	11.95	10,900						2400	5.49	3,480
	1200	11.36	10,100	12	0800	5.08	3,110				
	1800	10.72	9,240		1600	4.76	2,820	27	0800	5.60	3,580
	2400	11.38	10,100		2400	4.45	2,560		1600	5.54	3,530
									2400	5.39	3,390
18	0800	10.49	8,940	15	2400	4.89	2,940				
	1600	9.92	8,200					28	1200	5.13	3,160
	2400	9.55	7,760	16	0400	5.18	3,200		2400	4.96	3,000

(106) 5–3573. Rest Lake near Manitowish, Wis.

Location.—Lat 46°08'15", long 89°53'05", in NW¼ sec.9, T.42 N., R.5 E., on Manitowish River, 3.7 miles upstream from Circle Lily Creek and 6.2 miles east of Manitowish.

Drainage area.—243 sq mi.

Gage-height record.—Staff gage. Altitude of gage is 1,490 ft (by U.S. Geological Survey bench mark near lake).

Maxima.—March–May 1965: Contents at end of week, 1,010 million cubic feet May 21, 28 (gage height, 108.5 ft).
1926 to February 1965: Contents on last of month, 1,054 million cubic feet Aug. 31, 1941 (gage height, 108.7 ft).

Remarks.—Reservoir operation began in 1887. Reservoir consists of 9 lakes. Usable capacity July 1 to August 31, 260 million cubic feet between gage heights 107.25 ft and 108.50 ft, and September 1 to June 30, 660 million cubic feet between gage heights 105.00 ft and 108.50 ft (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity table furnished by Northern States Power Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 26	105	0	350	Apr. 16	105	10	491
Mar. 5	105	0	350	23	106	5	595
12	105	0	350	30	106	3	565
19	105	0	350	May 7	106	9	655
26	105	0	350	14	108	3	955
Apr. 2	105	0	350	21	108	6	1,010
9	105	0	350	28	108	6	1,010

(107) 5–3574. Flambeau Flowage near Mercer, Wis.

Location.—Lat 46°04'15", long 90°13'30", in SE¼ sec.34, T.42 N., R.2 E., on North Fork Flambeau River, 10.2 miles southwest of Mercer.

Drainage area.—666 sq mi.

Gage-height record.—Staff gage. Datum of gage is mean sea level (Northern States Power Co. bench mark).

Maxima.—March–May 1965: Daily contents observed, 6,052 million cubic feet May 11–15 (elevation 1572.20 ft).
1926 to February 1965: Contents observed, 6,620 million cubic feet Oct. 16, 1927 (elevation, 1,572.95 ft).

Remarks.—Dam was completed in 1926. Usable capacity 5,895 million cubic feet between elevations 1,552 ft and 1,572 ft (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Elevations and capacity table furnished by Northern States Power Co.

Elevation, in feet, and contents, in millions of cubic feet, 1965, of Flambeau Flowage near Mercer, Wis.

Day	March		April		May	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
1	----------	----------	1561.50	800	1569.75	4,285
2	----------	----------	1561.25	745	1570.00	4,440
3	----------	----------	1561.00	690	1570.25	4,620
4	----------	----------	1560.75	635	1570.50	4,800
5	1564.50	1,640	1560.50	580	1570.65	4,908
6	----------	----------	1560.35	559	1570.85	5,052
7	----------	----------	1560.30	552	1571.10	5,232
8	----------	----------	1560.20	538	1571.50	5,520
9	----------	----------	1560.10	524	1571.85	5,786
10	----------	----------	1560.20	538	1572.10	5,976
11	----------	----------	1560.75	635	1572.20	6,052
12	1564.00	1,470	1561.35	767	1572.20	6,052
13	----------	----------	1561.75	855	1572.20	6,052
14	----------	----------	1562.30	982	1572.20	6,052
15	----------	----------	1562.85	1,121	1572.20	6,052
16	----------	----------	1563.35	1,265	1572.10	5,976
17	----------	----------	1563.80	1,406	1572.05	5,938
18	----------	----------	1564.30	1,572	1572.05	5,938
19	1563.45	1,295	1564.75	1,735	1572.05	5,938
20	----------	----------	1565.30	1,956	1572.10	5,976
21	----------	----------	1565.80	2,172	1572.05	5,938
22	----------	----------	1566.30	2,398	1572.00	5,900
23	----------	----------	1566.85	2,658	1572.00	5,900
24	----------	----------	1567.30	2,886	1572.00	5,900
25	----------	----------	1567.70	3,094	1572.00	5,900
26	1562.65	1,069	1568.10	3,306	1572.05	5,938
27	----------	----------	1568.45	3,502	1572.00	5,900
28	----------	----------	1568.80	3,710	1572.05	5,938
29	----------	----------	1569.10	3,890	1572.05	5,938
30	----------	----------	1569.40	4,070	1572.10	5,976
31	----------	----------	----------	----------	1572.10	5,976

(108) 5–3585. Flambeau River at Babbs Island, near Winter, Wis.

Location.—Lat 45°46'10", long 90°45'45", in SE¼ sec.17, T.38 N., R.3 W., on right bank 3.6 miles upstream from Connors Creek, 11.5 miles upstream from South Fork Flambeau River, 13 miles east of Winter, and at mile 61.9.

Drainage area.—1,000 sq mi.

Gage-height record.—Water-stage recorder graph. Altitude of gage is 1,330 ft. (from river profile map).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 7,000 cfs. Backwater from ice Mar. 1 to Apr. 14.

Maxima.—March–May 1965: Discharge, 5,360 cfs 0400–1000 hours Apr. 17 (gage height, 6.03 ft).
1929 to February 1965: Discharge, 9,440 cfs June 25, 1946 (gage height, 9.45 ft).

Remarks.—Flow regulated by Rest Lake and Flambeau Flowage.

Mean discharge, in cubic feet per second, 1965, of Flambeau River at Babbs Island, near Winter, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	680	870	1,210	11	640	1,700	3,750	21	640	2,730	3,150
2	720	900	1,230	12	640	2,300	3,880	22	500	2,840	3,070
3	720	960	1,030	13	640	2,600	3,260	23	700	2,730	2,800
4	680	1,060	939	14	640	3,000	3,330	24	680	2,600	2,540
5	680	1,020	890	15	640	3,870	3,340	25	660	2,450	2,170
6	680	960	856	16	640	4,910	4,410	26	700	1,980	1,750
7	720	900	1,030	17	640	5,270	4,880	27	780	1,800	1,690
8	520	960	1,510	18	660	4,580	4,100	28	800	1,560	1,720
9	660	1,060	2,900	19	660	3,050	3,600	29	800	1,440	1,400
10	660	1,300	3,880	20	640	2,650	3,220	30	820	1,200	1,510
								31	820	------	1,460
Monthly mean discharge, in cubic feet per second									679	2,175	2,468

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 14	0000	4.07	------	May 8	2400	3.18	2,010	May 15	0600	4.02	3,160
	0600	4.15	------						1200	4.13	3,300
	1200	4.23	------	9	0300	3.42	2,250		1800	4.23	3,420
	1800	4.31	------		0600	3.63	2,470		2400	4.54	3,800
	2400	4.43	3,420		1200	4.03	2,940				
					1800	4.40	3,380	16	0300	4.76	4,060
15	0600	4.60	3,620		2400	4.61	3,630		0600	4.94	4,280
	1200	4.81	3,880						1200	5.12	4,490
	1800	5.00	4,110	10	0600	4.75	3,810		1800	5.21	4,600
	2400	5.17	4,310		1200	4.81	4,000		2400	5.33	4,750
					1800	4.68	3,970				
16	0600	5.47	4,670		2400	4.62	3,890	17	0600	5.45	4,900
	1200	5.70	4,960						1200	5.52	4,980
	1800	5.88	5,180	11	0400	4.30	3,500		1600	5.56	5,030
	2400	6.00	5,320		0800	4.36	3,570		2000	5.40	4,840
					1600	4.58	3,850		2400	5.14	4,520
17	0400	6.03	5,360		2400	4.70	3,990				
	1000	6.03	5,360					18	0600	4.99	4,310
	1200	6.00	5,320	12	0600	4.75	4,050		1200	4.84	4,130
	1800	5.95	5,260		1200	4.81	4,120		1800	4.62	3,870
	2400	5.71	4,970		1800	4.65	3,930		2400	4.43	3,630
					2400	3.78	2,880				
18	0600	5.45	4,650					19	0600	4.56	3,770
	1200	5.40	4,590	13	0200	3.72	2,800		1200	4.56	3,770
	1800	5.27	4,430		0600	3.93	3,060		1800	4.36	3,520
	2400	5.15	4,290		1200	4.18	3,360		2400	3.94	3,020
					1400	4.26	3,450				
19	0200	5.00	4,110		2400	4.30	3,500	20	0300	4.08	3,160
	0600	4.71	3,760						0600	4.24	3,360
	1200	3.83	2,700	14	0600	4.21	3,390		1200	4.27	3,390
	1600	3.47	2,300		1800	4.12	3,280		1800	4.00	3,070
	2400	3.75	2,600		2400	3.98	3,120		2400	4.06	3,140

(109) 5–3595 South Fork Flambeau River near Phillips, Wis.

Location.—Lat 45°42'15", long 90°36'55", in NW¼SW¼ sec.10, T.37 N., R.2 W., on downstream side of bridge on left span, 0.4 mile downstream from Big Elk River and 12 miles west of Phillips.

Drainage area.—615 sq mi.

Gage-height record.—Graph drawn on basis of crest-stage gage reading and once-daily wire-weight gage readings, except May 24–31. Altitude of gage is 1,360 ft (by barometer).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge for period of no gage-height record May 24-31 was estimated on basis of weather records and records for nearby stations. Backwater from ice Mar. 1 to Apr. 13.

Maxima.—March–May 1965: Discharge, 5,690 cfs 0200 hours Apr. 19 (gage height, 11.64 ft).
1929 to February 1965: Discharge, 10,200 cfs June 18, 1943 (gage height, 14.32 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	240	300	1,940	11	270	700	3,490	21	260	4,300	2,560
2	250	310	1,770	12	280	1,000	3,510	22	270	4,140	1,980
3	270	330	1,720	13	290	1,700	3,610	23	270	4,090	1,940
4	280	350	1,700	14	300	2,910	3,640	24	270	3,920	1,900
5	300	380	1,620	15	310	3,690	3,910	25	280	3,700	1,800
6	300	400	1,750	16	300	4,290	3,820	26	280	3,410	1,900
7	310	410	2,280	17	290	4,340	4,080	27	270	3,010	1,900
8	300	430	2,600	18	270	4,800	3,930	28	270	2,660	1,800
9	280	450	3,020	19	260	5,150	3,740	29	270	2,440	1,700
10	270	540	3,390	20	250	4,590	3,620	30	270	2,320	1,600
								31	290	-------	1,600
Monthly mean discharge, in cubic feet per second									278	2,369	2,575
Runoff, in inches									0.52	4.30	4.83

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0000	6.37	------	Apr. 14	1200	9.36	3,000	Apr. 18	0600	10.74	4,510
	0400	6.48	------		1800	9.46	3,100		1200	10.86	4,650
	1200	6.74	------		2400	9.50	3,140		1800	11.14	4,990
	1800	6.94	------						2400	11.58	5,600
	2400	7.04	------	15	0400	9.60	3,250				
					0800	9.74	3,400	19	0200	11.64	5,690
12	0600	7.12	------		1200	9.96	3,650		0800	11.48	5,450
	1200	7.16	------		1800	10.36	4,090		1200	11.24	5,120
	1800	7.30	------		2400	10.54	4,280		1800	10.96	4,770
	2400	7.47	------						2400	10.84	4,630
				16	0600	10.60	4,350				
13	0400	7.66	------		1200	10.56	4,310	20	1200	10.86	4,650
	0800	7.86	------		2400	10.46	4,200		2400	10.66	4,420
	1200	8.08	------								
	1800	8.42	------	17	0600	10.52	4,260	21	1200	10.56	4,310
	2400	8.76	2,430		1200	10.60	4,350		2400	10.44	4,170
					1800	10.66	4,420				
14	0400	9.00	2,650		2400	10.70	4,460				

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of South Fork Flambeau River near Phillips, Wis —Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 22	1200	10.40	4,130	Apr. 23	1200	10.38	4,110	Apr. 24	1200	10.22	3,930
	2400	10.40	4,130		2400	10.28	4,000		2400	10.14	3,840

(110) 5–3605 Flambeau River near Bruce, Wis.

Location.—Lat 45°22'20", long 91°12'35", in lot 7 of NW¼ sec.2. T.33 N., R.7 W., on right bank 2.5 miles downstream from Thornapple powerplant, 6 miles upstream from mouth, and 7 miles southeast of Bruce.

Drainage area.—1,897 sq mi.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals. Altitude of gage 1,060 ft (by river survey, WSP 417).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 11,000 cfs. Mean daily discharges computed from 24 punch-tape recordings per day. Backwater from ice March 1 to April 12.

Maxima.—March–May 1965: Discharge, 10,500 cfs 1000 hours Apr. 20 (gage height, 8.19 ft).
1951 to February 1965: Discharge, 17,400 cfs May 1, 1954 (gage height, 10.90 ft).

Remarks.—Flow regulated by several powerplants above stations and by Rest Lake and Flambeau Flowage.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,100	1,500	4,230	11	1,020	3,200	7,760	21	1,600	8,240	5,530
2	1,080	1,700	3,930	12	1,060	3,800	7,730	22	1,620	8,120	5,420
3	1,000	1,680	3,920	13	980	4,660	6,550	23	1,640	8,110	4,850
4	1,040	1,840	3,350	14	1,040	5,840	6,210	24	1,690	7,990	4,350
5	1,120	2,000	3,440	15	940	6,520	5,450	25	1,680	7,510	4,160
6	1,080	1,900	3,050	16	1,200	10,000	7,670	26	1,600	6,700	4,130
7	1,060	1,860	2,730	17	1,500	9,980	9,360	27	1,560	5,700	4,070
8	1,080	1,940	4,010	18	1,540	10,100	9,410	28	1,660	5,080	3,210
9	1,060	2,100	7,660	19	1,540	10,100	8,110	29	1,700	4,800	2,740
10	1,000	2,800	8,270	20	1,620	9,580	6,950	30	1,660	4,430	2,650
								31	1,640	------	2,610
Monthly mean discharge, in cubic feet per second									1,326	5,326	5,275

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 14	0000	6.18	5,800	Apr. 15	1400	6.37	6,200	Apr. 17	0600	8.03	10,100
	1000	6.22	5,880		1600	6.37	6,200		1200	8.01	10,000
	1200	5.78	7,110		2200	7.77	9,460		1800	7.87	9,720
	1600	5.92	5,250		2400	7.75	9,420		2200	8.01	10,000
	1800	5.87	5,150						2400	8.01	10,000
	2000	6.19	5,820	16	0400	8.10	10,300				
	2400	6.05	5,520		0800	7.90	9,790	18	0800	8.04	10,100
					1000	8.03	10,100		1200	7.92	9,830
15	0800	6.04	5,500		2400	8.01	10,000		2000	8.07	10,200
	1000	5.61	4,630								

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Flambeau River near Bruce, Wis.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 18	2400	8.04	10,100	Apr. 27	1000	6.74	7,020	May 14	1000	6.37	6,200
					1200	5.31	4,040		1200	6.49	6,470
19	0800	8.01	10,000		1400	5.35	4,120		1600	6.48	6,450
	1600	8.05	10,200		1600	6.00	5,420		2000	6.30	6,050
	2400	8.13	10,400		2400	5.95	5,320		2400	6.25	5,940
20	0800	8.16	10,400	May 7	2400	4.57	2,740	15	1000	6.21	5,880
	1000	8.19	10,500						1200	6.11	5,650
	1200	8.09	10,300	8	0800	4.53	2,680		1400	5.12	3,700
	1400	7.52	9,340		1200	3.88	1,770		1800	5.86	4,630
	2000	7.26	8,220		1400	5.43	4,270		2000	6.08	5,590
	2400	7.23	8,150		1800	6.23	5,900		2400	6.29	6,030
					2400	6.42	6,310				
21	0800	7.28	8,270					16	0600	6.38	6,230
	1600	7.27	8,220	9	0800	6.44	6,360		0800	6.52	6,530
	2400	7.25	8,200		1200	6.67	6,860		1000	7.52	8,850
					1600	7.24	8,180		1200	7.32	8,370
22	0800	7.26	8,220		1800	7.91	9,810		1800	7.36	8,460
	1000	6.85	7,260		2000	7.91	9,810		2400	7.29	8,300
	1200	7.16	7,980		2400	7.63	9,120				
	1400	7.35	8,440					17	0800	7.29	8,300
	1600	7.25	8,200	10	0800	7.59	9,020		1000	7.76	9,440
	2400	7.20	8,080		1200	7.25	8,200		1200	8.05	10,200
					1400	6.13	5,690		1800	7.99	9,980
23	0800	7.21	8,100		1600	7.26	8,220		2400	7.98	9,960
	1000	7.09	7,820		2000	7.15	7,960				
	1200	7.28	8,270		2400	7.17	8,010	18	0800	8.00	10,000
	2400	7.22	8,130	11	0800	7.23	8,150		1200	7.99	9,980
					1200	7.21	8,100		1800	7.48	8,750
24	0800	7.22	8,130		1600	7.15	7,960		2200	7.22	8,130
	1400	7.23	8,150		1800	6.49	6,470		2400	7.23	8,150
	1800	7.08	7,790		2000	6.58	6,670				
	2400	7.03	7,680		2200	6.99	7,590	19	0600	7.25	8,200
					2400	6.99	7,590		1200	7.17	8,010
25	0800	7.03	7,680						2400	7.20	8,080
	1600	7.00	7,610	12	0800	7.04	7,700				
	1800	6.67	6,860		1000	7.22	8,130	20	0800	7.20	8,080
	2000	6.84	7,240		1400	7.15	7,960		1000	6.26	5,970
	2400	6.88	7,330		1800	6.94	7,470		1200	6.22	5,880
					2000	6.93	7,450		1400	6.49	6,470
26	0800	6.88	7,330		2400	7.02	7,660		1800	6.51	6,510
	1200	6.53	6,560						2400	6.44	6,360
	1600	6.49	6,470	13	0600	7.03	7,680				
	1800	6.21	5,860		1000	6.97	7,310	21	1000	6.41	6,290
	2400	6.34	6,140		1200	6.36	6,180		1200	5.98	5,380
					1400	5.72	4,850		1600	5.61	4,630
27	0600	6.42	6,310		1800	6.25	5,940		2000	5.62	4,650
	0800	6.93	7,450		2400	6.30	6,050		2400	5.79	4,990

(111) 5–3620. Jump River at Sheldon, Wis.

Location.—Lat 45°18'30", long 90°57'20", in sec.26, T.33 N., R.5 W., on right bank just downstream from highway bridge in Sheldon, 1,500 ft upstream from Shoulder Creek and 11 miles upstream from mouth.

Drainage area.—574 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,092.75 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 13,000 cfs and by contracted-opening measurement at 46,000 cfs. Backwater from ice Mar. 1 to Apr. 11.

Maxima.—March–May 1965: Discharge, 11,400 cfs 2000 hours Apr. 13 (gage height, 11.59 ft).

1915 to February 1965: Discharge, 46,000 cfs Aug. 31, 1941 (gage height, 18.8 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	50	62	1,720	11	180	4,000	2,240	21	72	4,200	1,250
2	60	66	1,470	12	150	9,670	1,600	22	70	4,120	1,150
3	120	68	1,300	13	120	8,940	1,150	23	68	3,790	706
4	110	70	1,160	14	100	9,090	859	24	66	3,290	546
5	130	74	1,010	15	92	9,570	785	25	64	2,720	472
6	260	100	973	16	88	7,960	3,700	26	63	2,680	505
7	230	200	1,260	17	84	6,260	5,970	27	62	3,440	1,370
8	160	300	1,560	18	82	5,560	4,540	28	62	2,800	1,290
9	280	700	2,220	19	78	4,920	2,930	29	61	2,560	1,040
10	240	1,400	2,730	20	76	4,350	1,870	30	60	2,040	805
								31	60	------	631
Monthly mean discharge, in cubic feet per second									110	3,500	1,639
Runoff, in inches									0.22	6.80	3.29

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0000	7.37	------	Apr. 13	1800	11.00	9,600	May 15	2400	5.97	1,150
	0300	7.61	------		2000	11.59	11,400				
	0600	8.04	------		2400	11.00	9,600	16	0600	7.09	2,200
	0900	7.73	------	14	1200	10.77	8,910		1000	8.02	3,330
	1200	7.88	------		1800	10.75	8,850		1200	8.46	4,000
	1400	11.05	------		2400	10.84	9,120		1800	9.17	5,210
	1600	10.57	------	15	0600	11.07	9,810		2400	9.45	5,720
	1800	9.38	------		1200	11.07	9,810	17	0600	9.68	6,160
	2100	9.83	------		2400	10.87	9,210		1200	9.71	6,220
	2200	11.52	------						2400	9.35	5,540
	2400	10.81	9,030	16	1200	10.40	7,810				
12	0200	10.66	8,580		2400	10.08	6,990	18	1200	8.77	4,500
	0600	10.96	9,480						2400	8.21	3,600
	1200	11.06	9,780	17	1200	9.66	6,120				
	1800	11.23	10,300		2400	9.50	5,820	19	1200	7.70	2,900
	2400	11.07	9,810						2400	7.20	2,320
13	0600	10.51	8,130	18	1200	9.34	5,520	20	1200	6.73	1,830
	1200	10.26	7,430		2400	9.28	5,400		2400	6.38	1,490

(112) 5–3640. Yellow River at Cadott, Wis.

(Gaging station; crest-stage station beginning 1962)

Location.—Lat 44°57'10", long 91°09'00", in NE¼ sec.31, T.29 N., R.6 W., at bridge on State Highway 27 in Cadott, 1,000 ft upstream from Svetlik Dam, and 6.0 miles upstream from Drywood Creek.

Drainage area.—351 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 15,600 cfs.

Maxima.—March–May 1965: Discharge, about 11,000 cfs Apr. 11 (gage height, 15.6 ft, ice affected).
1942 to February 19, 1965: Discharge, 15,600 cfs June 28, 1943 (gage height 12.15 ft at site 1,400 ft downstream at different datum).

(113) 5–3642. Lake Wissota near Chippewa Falls, Wis.

Location.—Lat 44°56'20", long 91°20'25", in NW¼ sec.3, T.28 N., R.8 W., on Chippewa River, 2.0 miles east of city limits of Chippewa Falls.

Drainage area.—5,548 sq mi.

Gage-height record.—Float gage. Datum of gage is mean sea level (Northern States Power Co. bench mark).

Maxima.—March–May 1965: Daily contents observed, 4,221 million cubic feet Apr. 16 (elevation 898.80 ft).
1934 to February 1965: Contents observed, 4,854 million cubic feet Aug. 31, 1941 (elevation, 901.12 ft).

Remarks.—Dam was completed in 1917. This powerplant service pond has a capacity of 3,547 million cubic feet at normal operating elevation of 898.0 ft. Maximum elevation allowable is 902.0 ft. Usable contents below elevation 898.0 ft allowed by express permission of the Public Service Commission of Wisconsin in anticipation of increased runoff.

Cooperation.—Elevations and capacity table furnished by Northern States Power Co.

Elevation, in feet, and contents, in millions of cubic feet, 1965, of Lake Wissota near Chippewa Falls, Wis.

Day	March		April		May	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
1			882.34	77		
2			882.49	111		
3			882.86	195		
4			883.49	340		
5	891.81	2,379	883.81	414		
6			883.68	384		
7			883.65	377	897.88	3,973
8			883.92	440		
9			884.14	491		
10			886.16	971		
11			890.54	2,055		
12	888.30	1,494	896.11	3,500		
13			896.61	3,633		
14			898.69	4,191	897.98	3,999
15			898.65	4,180		
16			898.80	4,221		
17			898.65	4,180		
18			898.32	4,091		
19	885.95	920	898.07	4,024		
20			898.22	4,064		
21			897.97	3,997	897.95	3,991
22			897.98	3,999		
23			897.87	3,970		
24			898.05	4,018		
25			897.77	3,943		
26	883.45	331	897.90	3,978		
27			898.04	4,016		
28			897.95	3,991	898.11	4,035
29			898.30	4,086		
30			898.00	4,005		
31						

(114) 5–3655. Chippewa River at Chippewa Falls, Wis.

Location.—Lat 44°55'35", long 91°24'40", in lot 1, sec.12, T.28 N., R.9 W., on right bank at Chippewa Falls, 1 mile downstream from Duncan Creek.

Drainage area.—5,600 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at one-hour intervals. Datum of gage is 798.46 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharges computed from 24 punch-tape recordings per day.

Maxima.—March–May 1965: Discharge, 44,700 cfs 2200 hours Apr. 16 (gage-height, 16.47 ft).
1888 to February 1965: Discharge, 102,000 cfs Sept. 1, 1941 (gage height, 24.8 ft). Maximum stage known, 26.94 ft Sept. 10, 1884, site and datum in use to June 1932.

Remarks.—Flow regulated by many powerplants above station, and by five reservoirs, Moose Lake, Lake Chippewa, Rest Lake, Flambeau Flowage, and Lake Wissota.

Mean discharge, in cubic feet per second, 1965, of Chippewa River at Chippewa Falls, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,420	3,210	11,200	11	4,790	12,300	20,300	21	2,900	27,500	15,200
2	4,530	2,260	9,870	12	4,960	16,400	16,300	22	4,230	25,500	12,600
3	6,450	1,340	8,430	13	4,640	36,200	13,800	23	4,180	24,200	11,800
4	6,080	1,710	9,010	14	3,010	40,100	11,200	24	3,770	22,900	9,950
5	5,390	3,970	8,400	15	3,630	41,800	9,890	25	4,080	21,500	9,950
6	5,940	6,050	8,260	16	3,610	43,900	19,400	26	4,190	17,300	10,100
7	5,770	8,240	8,350	17	3,300	43,000	27,800	27	2,750	22,900	9,990
8	5,880	10,200	8,940	18	3,620	39,200	28,100	28	1,700	15,200	10,300
9	5,790	9,850	14,800	19	4,390	33,100	20,900	29	3,440	15,800	10,000
10	5,150	11,100	21,400	20	3,060	31,200	17,400	30	4,210	13,900	8,880
								31	4,270	-------	8,260
Monthly mean discharge, in cubic feet per second									4,327	20,060	13,250

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	8.45	12,500	Apr. 19	0600	14.74	36,000	Apr. 26	1800	9.33	15,000
	0600	8.46	12,500		1200	14.18	33,300		2200	9.49	15,500
	1200	8.12	11,500		1600	13.77	31,600		2400	9.61	15,900
	1600	8.16	11,600		1800	12.99	28,500				
	1800	9.00	14,000		2400	13.64	31,100	27	0800	10.55	19,100
	2000	10.41	18,600						1000	12.76	27,500
	2200	14.30	33,800	20	0600	13.81	31,700		1800	12.24	25,500
	2400	14.85	36,600		1200	13.75	31,500		2400	11.13	21,200
					1800	13.70	31,300				
13	0600	14.92	36,900		2400	13.29	29,700	28	0200	9.39	15,100
	1200	14.92	36,900						0800	9.09	14,300
	1800	14.59	35,200	21	0600	13.28	29,600		1000	9.29	14,700
	2400	14.52	34,900		1200	12.97	28,400		2400	9.55	15,700
					1800	12.10	24,900				
14	0600	14.96	37,100		2400	12.03	24,600	May 8	2400	7.59	10,100
	0800	15.95	42,000								
	1600	15.85	41,600	22	0600	12.46	26,300	9	0600	7.52	9,900
	2000	15.73	41,000		1200	12.36	25,900		0800	8.09	11,200
	2400	15.80	41,300		1800	12.13	25,000		1000	9.10	14,300
					2400	12.08	24,800		1200	8.87	13,600
15	0600	15.65	40,600						1600	9.19	14,600
	1200	15.59	40,200	23	0600	12.22	25,400		1800	10.95	20,500
	1800	16.25	43,600		1200	12.27	25,600		2400	11.13	21,200
	2400	16.36	44,100		1800	11.14	21,200				
					2400	11.45	22,300	10	0600	10.90	20,400
16	0600	16.19	43,200						1400	11.51	22,500
	1200	16.29	43,800	24	0600	11.71	23,300		2200	11.19	21,400
	1800	16.35	44,000		1200	11.61	22,900		2400	10.91	20,400
	2200	16.47	44,700		1800	11.53	22,600				
	2400	16.42	44,400		2400	11.37	22,000	11	0600	11.03	20,800
									1000	10.79	20,000
17	0600	16.32	43,900	25	0200	11.45	22,300		1600	11.04	20,800
	1200	16.21	43,400		1200	11.29	21,700		2400	10.66	19,500
	1800	16.01	42,400		2000	10.95	20,500				
	2400	15.79	41,200		2400	11.06	20,900	12	0600	10.33	18,400
									1000	8.89	13,700
18	0600	15.55	40,000	26	0200	11.14	21,200		1800	9.74	16,300
	1200	15.49	39,800		0800	10.94	20,500		2400	9.67	16,100
	1800	15.27	38,600		1000	9.75	16,400				
	2400	15.03	37,400		1200	9.09	14,300	13	0800	9.62	15,900

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Chippewa River at Chippewa Falls, Wis. — Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
May 13	1000	8.62	12,900	May 17	1200	12.81	27,700	May 19	2000	9.62	15,900
	1200	8.38	12,300		1800	12.80	27,700		2400	9.90	16,900
	2400	8.60	12,900		2200	12.87	28,000				
					2400	13.37	30,000	20	0600	10.15	17,700
15	2400	7.61	10,100						1000	10.20	17,900
				18	0200	13.45	30,300		1400	10.23	18,000
16	0200	8.33	12,100		1200	13.13	29,000		2000	9.90	16,900
	0400	10.43	18,700		1800	12.34	25,900		2400	9.88	16,800
	0600	11.29	21,700		2400	12.29	25,700				
	1200	10.95	20,500					21	0600	9.86	16,700
	2000	10.72	19,700	19	0200	12.14	25,100		1200	9.63	15,900
	2400	11.33	21,900		0800	11.75	23,500		1800	8.80	13,400
					1400	11.28	21,700		2000	8.98	14,000
17	0200	12.93	28,200		1600	10.69	19,600		2200	8.80	13,400
	0600	12.77	27,600		1800	9.67	16,100		2400	8.99	14,000

(115) 5–3665. Eau Claire River near Fall Creek, Wis.

(Gaging station; crest-stage station beginning 1958)

Location.—Lat 44°48'35", long 91°16'50", in NW¼ sec.19, T.27 N., R.7 W., 500 ft east of County Trunk K, 0.7 mile downstream from Beaver Creek, 1.3 miles upstream from Big Falls, and 3.2 miles north of Fall Creek.

Drainage area.—758 sq mi.

Gage-height record.—Crest stages only. Altitude of gage is 830 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 11,600 cfs and by slope-area measurement at 16,600 cfs.

Maxima.—March–May 1965: Discharge, 10,600 cfs Apr. 11 (gage height, 12.6 ft, from floodmarks).
1943–1955, 1958 to February 1965: Discharge, 17,200 cfs May 30, 1955 (gage height, 16.11 ft).

(116) 5–3670.3. Willow Creek near Eau Claire, Wis.

(Crest-stage station)

Location.—Lat 44°44'11", long 91°26'48", on common boundary of secs.14 and 15, T.26 N., R.9 W., at box culvert on State Highway 93, 0.5 mile upstream from Lowe Creek, and 4 miles south of intersection of U. S. Highways 12 and 53 in Eau Claire.

Drainage area.—4.38 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurement at 171 cfs.

Maxima.—March–May 1965: Discharge, 180 cfs Apr. 9 (gage height 12.7 ft).
1958 to February 1965: Gage height, 14.12 ft July 8, 1959.

(117) 5–3671. Birch Lake at Birchwood, Wis.

Location.—Lat 45°39'35", long 91°33'25", in W½ sec.25, T.37 N., R.10 W., on Red Cedar River at Birchwood, Wis.

Drainage area.—68 sq mi, approximately.

Gage-height record.—Staff gage. Altitude of gage is 1,090 ft (from nearby bench mark).

Maxima.—March–May 1965: Contents at end of week, 824 million cubic feet Apr. 23 (gage height, 118.0 ft).
1928 to February 1965: Contents on last day of month, 1,061 million cubic feet June 30, 1943 (gage height, 119.4 ft).

Remarks.—Reservoir operation began in 1882. Reservoir includes Lake Chetac and Birch Lake. Usable capacity in summer, 669.7 million cubic feet between gage height 114.0 and 118.5 ft, and winter, 908.3 million cubic feet between gage height 112.0 ft and 118.5 ft (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity table furnished by Northern States Power Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 26	116	8	618	Apr. 16	117	1	679
Mar. 5	116	7	602	23	118	0	824
12	116	6	587	30	117	11	808
19	116	5	572	May 7	117	8	776
26	116	4	557	14	117	10	792
Apr. 2	116	1	527	21	117	8	776
9	116	0	512	28	117	6	743

(118) 5–3672. Red Cedar Lake at Mikana, Wis.

Location.—Lat 45°35'20", long 91°36'05", on line between secs.21 and 22, T.36 N., R.10 W., on Red Cedar River at south edge of Mikana.

Drainage area.—161 sq mi.

Gage-height record.—Staff gage. Altitude of gage is 1,080 ft (Northern States Power Co).

Maxima.—March–May 1965: Contents at end of week, 740 million cubic feet Apr. 23 (gage height, 111.3 ft).
1928 to February 1965: Contents on last day of month, 779.0 million cubic feet, June 30, 1943, and Aug. 31, 1960 (gage height, 111.6 ft).

Remarks.—Reservoir operation began in 1882. Reservoir includes Balsam, Hemlock and Red Cedar Lakes. Usable capacity is 577.4 million cubic feet between gage height 105.0 ft and 110.0 ft (limits established by Northern States Power Co.).

Cooperation.—Gage heights and capacity table furnished by Northern States Power Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Red Cedar Lake at Mikana, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 26	109	6	516	Apr. 16	109	5	503
Mar. 5	109	5	503	23	111	4	740
12	109	5	503	30	111	0	702
19	109	1	466	May 7	110	7	652
26	108	11	442	14	110	11	690
Apr. 2	108	6	394	21	110	7	652
9	108	2	358	28	110	6	640

(119) 5–3673. Long Lake near Brill, Wis.

Location.—Lat 45°40'05", long 91°40'50", in SW¼ sec.24, T.37 N., R.11 W., on Brill River 1 mile east of Nobleton and 5.4 miles north of Brill.

Drainage area.—82 sq mi, approximately.

Gage-height record.—Staff gage. Altitude of gage is 1,210 ft (from nearby bench marks).

Maxima.—March–May 1965: Contents at end of week, 476 million cubic feet May 28 (gage height 6.3 ft).
1928 to February 1965: Contents on last day of month, 565.1 million cubic feet July 31, 1928 (gage height, 6.8 ft).

Remarks.—Reservoir operation began in 1883. Usable capacity June 15 to September 5, 385.7 million cubic feet between gage height 5.0 ft and 7.2 ft and September 6 to June 14, 636.8 million cubic feet between gage height 3.5 ft and 7.2 ft (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity table furnished by Northern States Power Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 26	5	8	371	Apr. 16	5	8	371
Mar. 5	5	8	371	23	5	8	371
12	5	8	371	30	5	7	354
19	5	8	371	May 7	5	10	389
26	5	6	336	14	5	11	406
Apr. 2	5	5	319	21	6	2	459
9	5	4	302	28	6	4	476

(120) 5–3674. Bear Lake at Haugen, Wis.

Location.—Lat 45°36'30", long 91°46'25", in NE¼ sec.18, T.36 N., R.11 W., on Bear Creek at Haugen.

Drainage area.—60 sq mi, approximately.

Gage-height record.—Staff gage. Altitude of gage is 1,140 ft (from nearby bench marks).

Maxima.—March–May 1965: Contents at end of week, 230 million cubic feet May 21 (gage height 89.3 ft).
1928 to February 1965: Contents on last day of month, 359.8 million cubic feet Apr. 30, 1928 (gage height, 90.8 ft).

Remarks.—Reservoir operation began in 1880. Reservoir includes Kekegoma and Bear Lakes. Usable capacity 413.3 million cubic feet between gage height 87.0 ft and 91.8 ft (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity table furnished by Northern States Power Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 26	88	8	182	Apr. 16	89	1	213
Mar. 5	88	10	190	23	88	8	182
12	88	8	182	30	88	7	175
19	88	8	182	May 7	89	0	205
26	88	5	160	14	89	0	205
Apr. 2	88	2	145	21	89	4	230
9	88	0	130	28	89	2	222

(121) 5–3674.8. East Branch Pine Creek tributary near Dallas, Wis.

(Crest-stage station)

Location.—Lat 45°16'50", long 91°48'30", in SW¼ sec.1, T.32 N., R.12 W., at culvert on County Trunk O, 1.5 miles north of Dallas.

Drainage area.—3.85 sq mi.

Gage-height record.—Crest stages only.

Maxima.—March–May 1965: Gage height, 13.71 ft Apr. 10.
1960 to February 1965: Gage height, 18.75 ft Aug. 28, 1960.

(122) 5–3675. Red Cedar River near Colfax, Wis.

(Gaging station, crest-stage station beginning 1962)

Location.—Lat 45°03'50", long 91°42'45", in SW¼ sec.22, T.30 N., R.11 W., 3.2 miles downstream from Trout Creek and 4.7 miles north of Colfax.

Drainage area.—1,100 sq mi (approximately).

Gage-height record.—Crest stages only. Altitude of gage is 940 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 15,800 cfs.

Maxima.—March–May 1965: Discharge, 16,200 cfs Apr. 12, 1965 (gage height 7.99 ft).
1914 to February 1965: Discharge, 21,900 cfs Apr. 3, 1934 (gage height, 11.4 ft at site 1 mile downstream at different datum), from rating curve extended above 4,900 cfs.

(123) 5–3677. Lightning Creek at Almena, Wis.

(Crest-stage station)

Location.—Lat 45°25'17", long 90°01'57", in NW¼ sec.19, T.34 N., R.13 W., at bridge on County Trunk P at the north edge of Almena, 0.8 mi north from intersection with U.S. Highway 8.

Drainage area.—19.8 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 334 cfs.

Maxima.—March–May 1965: Discharge, about 1,200 cfs Apr. 11 (gage height, 12.18 ft).
1958 to February 1965: Discharge, about 1,050 cfs Mar. 27, 1960 (gage height, 11.99 ft).

(124) 5–3680. Hay River at Wheeler, Wis.

Location.—Lat 45°02'50", long 91°54'40", in SW¼ sec.25, T.30 N., R.13 W., on right bank 25 ft downstream from highway bridge in Wheeler, 1.8 miles upstream from Otter Creek, and 2.4 miles downstream from South Fork Hay River.

Drainage area.—426 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 13–20. Datum of gage is 893.66 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 6,000 cfs and extended above by logarithmic plotting supported by inflow-outflow study at powerplant service pond downstream. Backwater from ice Mar. 1 to Apr. 4.

Maxima.—March–May 1965: Discharge, 10,900 cfs 0700 hours Apr. 11 (gage height, 14.65 ft).
1950 to February 1965: Discharge, 6,700 cfs Mar. 22, 1953 (gage height, 12.36 ft).
Maximum stage known since at least 1915, 16.6 ft in April 1934, from floodmarks.

Mean discharge, in cubic feet per second, 1965, of Hay River at Wheeler, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	300	176	376	11	440	9,490	376	21	180	660	255
2	500	180	379	12	360	7,720	342	22	170	595	258
3	1,000	186	366	13	320	5,470	310	23	166	558	251
4	900	200	349	14	290	3,950	293	24	164	528	249
5	780	232	334	15	270	2,950	281	25	164	505	247
6	700	895	332	16	240	2,340	334	26	166	573	281
7	620	3,930	334	17	220	1,520	349	27	164	627	293
8	570	4,990	485	18	210	1,100	314	28	162	549	255
9	520	3,460	776	19	200	881	293	29	166	466	240
10	480	5,740	469	20	190	722	267	30	170	424	232
								31	172	------	228
Monthly mean discharge, in cubic feet per second									353	2,054	327
Runoff, in inches									0.96	5.38	0.89

(125) 5–3690. Red Cedar River at Menomonie, Wis.

Location.—Lat 44°53'00", long 91°55'55", in NW¼ sec.26, T.28 N., R.13 W., on right bank at Menomonie, 900 ft downstream from powerplant of Northern States Power Co., and 1,000 ft downstream from Wilson Creek.

Drainage area.—1,760 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at fifteen-minute intervals. Datum of gage is 780 ft above mean sea level (Northern States Power Co. bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 19,000 cfs and extended above partly on basis of computed flow over Cedar Falls Dam 6 miles upstream. Mean daily discharges computed from 96 punch-tape recordings per day.

Maxima.—March–May 1965: Discharge, 28,700 cfs 0600 hours Apr. 12 (gage height, 11.56 ft).

1907–8, 1913–23, 1925 to February 1965: Discharge, 40,000 cfs Apr. 4, 1934 (gage height, 16.0 ft, from floodmarks).

Remarks.—Flow regulated by powerplants at Menomonie and Cedar Falls and by Birch, Cedar, Long, and Bear Lakes.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,240	1,010	1,870	11	1,250	22,200	2,080	21	777	3,000	1,420
2	2,220	1,380	1,500	12	1,170	27,900	2,080	22	962	2,660	1,340
3	1,920	1,430	1,510	13	1,080	22,600	2,110	23	856	2,580	1,370
4	2,190	1,370	1,180	14	1,100	16,000	1,610	24	855	2,520	1,320
5	2,020	1,730	677	15	852	11,200	1,920	25	892	2,620	1,350
6	1,840	3,280	1,020	16	1,210	8,290	1,840	26	949	2,540	1,520
7	1,580	6,250	1,360	17	1,000	6,300	1,550	27	873	2,540	1,680
8	1,820	11,200	1,620	18	1,010	4,560	1,620	28	786	2,560	1,790
9	1,560	11,500	2,400	19	802	4,270	1,610	29	1,100	2,420	1,700
10	1,510	13,300	2,650	20	884	3,300	1,430	30	1,010	2,050	1,340
								31	1,090	-------	1,290
Monthly mean discharge, in cubic feet per second									1,239	6,819	1,605

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Red Cedar River at Menomonie, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	3.26	2,380	Apr. 10	2000	7.70	14,400	Apr. 15	0200	7.41	13,300
	0200	3.24	2,350		2200	8.31	16,600		0400	7.00	11,800
	0400	3.52	2,770		2400	7.84	14,900		0800	6.96	11,700
	1200	3.67	3,010						1000	6.20	9,050
	1600	4.23	3,980	11	0200	9.79	22,100		1200	6.96	11,700
	2400	4.20	3,920		0400	8.24	16,400		1600	6.42	9,770
					0600	9.34	20,500		1800	6.62	10,400
7	0200	4.32	4,150		1200	9.27	20,200		2000	6.62	10,400
	0800	4.51	4,540		1400	10.18	23,600		2400	6.40	9,700
	1000	5.33	6,510		1600	10.14	23,400				
	1400	5.34	6,540		1800	10.50	24,800	16	0200	6.20	9,050
	1600	4.84	5,270		2000	11.10	27,000		0600	6.18	8,990
	1800	5.67	7,460		2200	11.23	27,500		0800	5.83	7,930
	2000	5.86	8,010		2400	11.06	26,800		2400	5.85	7,980
	2200	6.54	10,200								
	2400	6.72	10,800	12	0200	11.26	27,600	17	0600	5.84	7,960
					0400	11.39	28,000		0800	5.15	6,030
8	0200	6.59	10,300		0600	11.56	28,700		1600	5.19	6,130
	0800	6.59	10,300		1200	11.25	27,500		1800	4.86	5,320
	1000	6.94	11,600		1400	11.41	28,100		2400	4.65	4,840
	1200	5.98	8,370		2000	11.45	28,300				
	1400	6.78	11,000		2400	11.25	27,500	18	0200	4.72	5,000
	1600	7.39	13,200						1400	4.63	4,800
	2000	7.38	13,200	13	0800	10.96	26,500		1600	4.59	4,710
	2400	7.06	12,000		1000	9.82	22,200		1800	4.34	4,190
					1200	9.91	22,600		2000	4.64	4,820
9	0200	7.05	12,000		1400	8.34	16,800		2200	4.23	3,980
	0600	6.90	11,400		1600	9.01	19,200		2400	4.34	4,190
	0800	6.49	10,000		2400	9.05	19,400				
	1400	6.49	10,000					19	0800	4.33	4,170
	1600	7.36	13,100	14	0400	9.00	19,200		1000	4.71	4,970
	2400	7.33	13,000		0600	8.62	17,800		1400	4.70	4,950
					0800	8.66	17,900		1600	4.26	4,030
10	0200	7.32	13,000		1000	8.01	15,500		2400	4.27	4,050
	0800	7.05	12,000		1200	7.51	13,700				
	1200	7.04	11,900		1400	8.04	15,600	20	0600	4.25	4,100
	1400	7.29	12,900		1600	8.03	15,600		0800	3.37	2,540
	1600	7.30	12,900		2200	7.36	13,100		1000	3.61	2,920
	1800	7.57	13,900		2400	7.40	13,300		2400	3.82	3,250

(126) 5–3695. Chippewa River at Durand, Wis.

Location.—Lat 44°37'45", long 91°58'10", in SW¼ sec.21, T.25 N., R.13 W., on left bank at Durand, 75 ft downstream from highway bridge and 9.5 miles downstream from Red Cedar River.

Drainage area.—9,010 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals. Datum of gage is 694.59 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 93,000 cfs. Mean daily discharges computed from 24 punch-tape recordings per day. Backwater from ice Mar. 1 to Apr. 10.

Maxima.—March–May 1965: Discharge, 66,200 cfs 1200 hours Apr. 14 (gage height, 13.36 ft); gage height, 13.68 ft, probably Apr. 9 (result of ice jam).
1928 to February 1965: Discharge, 101,000 cfs May 3, 1954 (gage height, 15.40 ft). Maximum stage known, 18.4 ft Sept. 12, 1884.

Remarks.—Flow partly regulated by powerplants, Moose Lake, Lake Chippewa, Rest Lake, Flambeau Flowage, Lake Wissota, and Birch, Cedar, Bear, and Long Lakes on upper Red Cedar River.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	6,600	6,400	18,400	11	8,400	44,300	23,700	21	5,300	39,200	20,200
2	8,000	6,000	14,600	12	7,400	51,000	22,900	22	5,200	35,000	16,900
3	9,200	5,600	13,400	13	6,800	57,400	19,500	23	5,600	32,100	15,000
4	9,600	5,400	11,900	14	6,200	65,200	16,300	24	5,800	30,300	13,700
5	9,400	6,200	11,800	15	5,600	62,400	13,900	25	5,700	29,300	12,700
6	9,400	12,000	11,600	16	5,400	57,800	16,100	26	5,700	28,400	13,100
7	9,400	18,000	11,800	17	5,600	57,200	22,900	27	6,000	23,800	12,900
8	9,400	27,000	12,600	18	5,400	54,000	29,200	28	5,200	28,800	13,200
9	9,200	30,000	14,200	19	5,300	49,000	29,800	29	4,800	23,900	13,800
10	9,000	37,000	21,100	20	5,600	42,700	22,900	30	5,800	22,000	12,800
								31	6,200	------	11,300
Monthly mean discharge, in cubic feet per second									6,845	32,910	16,590

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	6.33	------	Apr. 9	0600	12.70	------	Apr. 11	2400	11.87	47,800
	0600	7.14	------		1400	12.17	------				
	1200	8.07	------		1800	12.66	------	12	0600	12.05	49,500
	1800	8.88	------		2200	13.11	------		1200	12.25	51,600
	2400	9.44	------		2400	12.00	------		1800	12.33	52,500
									2400	12.37	52,800
7	0600	9.81	------	10	0200	11.55	------				
	1200	10.07	------		0600	11.14	------	13	1200	12.65	56,400
	1800	10.54	------		1200	11.01	------		1800	12.98	60,700
	2400	11.13	------		1800	10.94	------		2400	13.19	63,700
					2400	11.00	40,700				
8	0600	11.95	------					14	0600	13.29	65,200
	1200	12.44	------	11	0600	11.18	42,000		1200	13.36	66,200
	1600	12.65	------		1200	11.46	44,200		1800	13.31	65,400
	2400	12.54	------		1800	11.69	46,100		2400	13.20	63,800

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Chippewa River at Durand, Wis.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 15	1200	13.14	63,000	Apr. 26	2400	8.55	26,400	May 11	1200	8.07	24,000
	2400	12.93	60,000						2400	7.92	23,400
				27	0600	7.92	23,200				
16	1200	12.74	57,500		1000	7.73	22,400	12	1000	7.90	23,300
	2400	12.70	57,000		1400	7.76	22,500		1200	7.87	23,200
					1800	7.96	23,500		1800	7.76	22,700
17	1200	12.76	57,800		2200	8.34	25,400		2400	7.31	20,900
	1800	12.70	57,000		2400	8.61	26,800				
	2400	12.63	56,100					17	0000	7.19	20,500
				28	0600	9.27	30,100		0600	7.47	21,600
18	1200	12.48	54,300		1200	9.43	31,000		1200	7.56	21,900
	2400	12.27	51,800		1800	8.87	28,000		1400	7.70	22,500
					2400	8.12	24,300		1800	8.12	24,300
19	1200	11.98	48,800						2400	8.61	26,800
	2400	11.78	46,900	29	1200	8.07	24,000				
					2400	7.98	23,600	18	0600	8.93	28,400
20	1200	11.28	42,700						1200	9.09	29,200
	2400	10.80	39,300	30	0600	7.92	23,400		1800	9.26	30,100
					1200	7.59	22,100		2400	9.38	30,700
21	1200	10.83	39,500		1800	7.32	21,000				
	2400	10.63	38,100		2400	7.16	20,300	19	0600	9.42	31,000
									1200	9.27	30,100
22	1200	10.13	35,100	May 9	2400	6.10	16,100		1800	9.05	29,000
	2400	9.74	32,700						2400	8.83	27,800
				10	0400	6.55	17,900				
23	1200	9.62	32,100		0600	6.80	18,900	20	0400	8.60	26,700
	2400	9.55	31,700		1200	7.39	21,300		0600	8.43	25,800
					1400	7.56	21,900		1000	7.89	23,300
24	1200	9.29	30,200		1800	7.80	22,900		1200	7.64	22,300
	2400	9.11	29,300		2000	7.87	23,200		1400	7.46	21,500
					2400	7.94	23,500		1800	7.32	21,000
25	1200	9.10	29,200						2400	7.17	20,400
	2400	9.12	29,300	11	0600	8.04	23,900				
26	1200	8.97	28,600								

(127) 5–3700. Eau Galle River at Spring Valley, Wis.

Location.—Lat 44°51'00", long 92°14'15", between secs.5 and 6, T.27 N., R.15 W., on downstream side near center of bridge at Spring Valley, 0.1 mile upstream from Mines Creek, 0.5 mile downstream from Lousy Creek, and at mile 29.96.

Drainage area.—64.8 sq mi.

Gage-height record.—Wire-weight gage read twice daily. Graph drawn on basis of numerous wire-weight gage readings daily and crest data during rises. Datum of gage is 910.45 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 4,700 cfs and a slope-area measurement at 4,700 cfs. Backwater from ice Mar. 9 to Apr. 2.

Maxima.—March–May 1965: Discharge, 4,130 cfs at 2000 hours Apr. 10 (gage height 10.50 ft).

1944 to February 1965: Discharge, 7,000 cfs Apr. 15, 1954 (gage height, 11.50 ft). Maximum stage known since at least 1894, 18.98 ft, Sept. 18, 1942, from floodmarks (discharge, 33,000 cfs, estimated by Corps of Engineers on basis of slope-area measurement by Geological Survey of peak discharge of 39,000 cfs at Elmwood, drainage area, 91.9 sq mi).

Mean discharge, in cubic feet per second, 1965, of Eau Galle River at Spring Valley, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,020	12	11	11	15	1,630	10	21	8	12	7.9
2	463	14	10	12	12	441	9.4	22	9	12	7.4
3	95	16	10	13	15	238	9.0	23	8	13	7.4
4	64	50	10	14	13	98	9.0	24	8	14	7.4
5	43	217	12	15	12	91	8.5	25	9	14	7.4
6	50	1,650	11	16	10	55	113	26	9	49	7.4
7	50	1,850	20	17	10	38	18	27	9	41	7.4
8	30	698	389	18	9	28	9.7	28	9	20	7.2
9	20	1,280	248	19	9	17	8.3	29	9	14	7.2
10	16	2,000	18	20	8	14	7.9	30	9	12	7.2
								31	10	------	8.1
Monthly mean discharge, in cubic feet per second									66.5	355	33.0
Runoff, in inches									1.18	6.11	0.59

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	2.30	50	Apr. 6	1800	8.15	2,400	Apr. 10	0800	5.10	680
	0200	2.55	66		2000	7.90	2,230		1200	6.00	1,080
	0600	3.40	179		2400	7.40	1,890		1600	9.00	3,000
	0800	3.92	305						1800	10.00	3,720
	1200	5.30	855	7	0600	6.95	1,620		2000	10.50	4,130
	1600	6.95	1,880		1200	6.70	1,470		2200	9.80	3,640
	1800	7.30	2,160		1600	7.05	1,680		2400	9.20	3,140
	2000	7.20	2,080		1800	8.00	2,300				
	2400	6.60	1,600		2000	8.80	2,860	11	0400	7.70	2,090
					2200	8.00	2,300		0800	6.30	1,230
2	0400	5.30	855		2400	7.15	1,740		1200	5.90	1,030
	0800	4.32	428						1400	6.50	1,350
	1200	3.85	298	8	0400	6.00	1,080		1800	7.40	1,890
	1800	3.30	160		0800	4.90	600		2000	7.00	1,650
	2400	3.00	112		1200	4.45	438		2400	5.50	845
					1600	4.60	490				
Apr. 4	2400	2.30	50		2000	4.80	560	12	0600	4.00	300
					2400	4.00	300		1200	3.80	250
5	1200	2.52	60						1800	4.60	490
	1600	3.75	240	9	0600	3.35	160		2000	4.85	580
	2000	4.76	546		1000	4.00	300		2400	4.70	525
	2400	5.00	640		1400	6.00	1,080				
					1800	9.60	3,420	13	0600	3.10	114
6	0200	4.82	568		2000	9.55	3,380		1200	2.85	77
	0400	5.10	680		2200	8.40	2,580		1600	3.60	210
	0800	6.90	1,590		2400	6.50	1,350		2000	4.40	420
	1200	7.40	1,890						2400	3.90	275
	1600	7.90	2,230	10	0400	5.30	760				

(128) 5–3706. Arkansaw Creek Tributary near Arkansaw, Wis.

(Crest-stage station)

Location.—Lat 44°38'31", long 92°03'09", in SW¼ sec.14, T.25 N., R.14 W., at box culvert on U.S. Highway 10, 0.6 mile east of intersection with County Trunk Z, 1.2 miles northwest of Arkansaw, and 4 miles west of Chippewa River bridge in Durand.

Drainage area.—2.56 sq mi.

Gage-height record.—Crest stages only.

Maxima.—March–May 1965: Gage height, 13.37 ft Apr. 10.
1959 to February 1965: Gage height, 12.80 ft Mar. 28, 1962.

(129) 5–3709. Spring Creek near Durand, Wis.

(Crest-stage station)

Location.—Lat 44°34'13", long 91°57'48", in S½ sec.9, T.24 N., R.13 W., at bridge on country road approximately 0.2 mile upstream from County Trunk AA crossing and 4 miles south of Chippewa River Bridge in Durand.

Drainage area.—6.49 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 335 cfs.

Maxima.—March–May 1965: Discharge, 390 cfs Apr. 7 (gage height, 12.92 ft).
1962 to February 1965: Gage height, 13.28 ft July 17, 1963.

MISSISSIPPI RIVER MAIN STEM

(130) Mississippi River at Lock and Dam 4 near Alma, Wis.

(Miscellaneous site)

Location.—Lat 44°20', long 91°56', in sec.2, T.21 N., R.13 W., at Lock and Dam 4 in Alma, and at river mile 752.87 above Ohio River.

Gage-height record.—Peak stages from pool and tailwater water-stage recorder graphs.

Discharge record.—Corps of Engineers stage-discharge relation extended on the basis of three Geological Survey current-meter measurements.

Maxima.—April–May 1965: Discharge, 256,000 cfs 1200 hours Apr. 19 (elevations, 676.45 ft pool, 675.78 ft, tailwater).
1935 to March 1965: Discharge, 187,000 cfs Apr. 19, 1952 (elevations, 673.30 ft pool, 672.30 ft tailwater).

Cooperation.—Records furnished by Corps of Engineers.

ZUMBRO RIVER BASIN

(131) 5–3730. South Fork Zumbro River near Rochester, Minn.

Location.—Lat 44°04'00", long 92°27'55", in SE¼ sec.14, T.107 N., R.14 W., on left bank 30 ft upstream from ford, a quarter of a mile downstream from sewage plant, 1.6 miles north of Rochester, 2 miles downstream from Cascade Creek, and 2½ miles downstream from Silver Lake Dam.

Drainage area.—304 sq mi.

Gage-height.—Water-stage recorder graph except Mar. 1–3, 10–11 and 19–25. Graph was reconstructed Mar. 1–3, on the basis of adjacent record and floodmark. Datum of gage is 949.56 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge Mar. 10–11 and 19–25 was estimated on the basis of one discharge measurement and weather records.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 1, 1900 hours	19,600	19.12
Apr. 6, 1130 hours	8,010	13.55
1952 to February 1965:		
Mar. 29, 1962	18,000	18.46

Previous maximum stage known since at least 1908, about 17.5 ft, July 21, 1951, from information by sewage plant superintendant.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	10,900	1,040	133	11	82	1,030	108	21	46	129	85
2	2,320	1,590	125	12	79	1,150	102	22	46	120	78
3	502	2,020	129	13	75	406	98	23	47	120	76
4	275	5,020	119	14	75	280	95	24	49	127	80
5	205	4,540	170	15	71	245	113	25	50	250	113
6	172	6,430	225	16	66	200	155	26	46	377	334
7	145	3,240	178	17	66	188	125	27	46	268	296
8	119	4,100	145	18	52	185	136	28	42	202	155
9	100	2,790	129	19	47	170	98	29	44	172	110
10	92	1,400	113	20	47	141	89	30	53	149	98
								31	119	------	94
Monthly mean discharge, in cubic feet per second									519	1,269	132
Runoff, in inches									1.97	4.66	0.502

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of South Fork Zumbro River near Rochester, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 27	0000	1.94	22	Mar. 31	0800	2.81	42	Apr. 6	2400	12.57	6,080
	0600	1.88	19		1400	3.12	80				
	1200	1.98	23		1800	3.66	203	7	0400	11.38	4,110
	1400	2.00	24		2200	3.65	213		0800	9.12	2,440
	1800	2.60	82		2400	4.13	460		1200	8.14	1,930
	2400	2.27	41						1600	9.00	2,340
				Apr. 1	0600	4.55	616		1700	8.28	2,000
28	0500	2.10	27		1200	5.33	802		2000	10.42	3,400
	1000	2.27	38		1600	6.24	1,220		2200	11.32	4,050
	1200	2.48	60		2000	7.20	1,740		2400	12.40	5,310
	1600	4.06	433		2400	7.80	2,070				
	1900	6.15	934					8	0400	11.59	4,340
	2400	7.75	1,390	2	0400	7.14	1,710		0800	10.07	3,120
					0800	6.28	1,240		1100	9.16	2,470
Mar. 1	0200	9.70	2,390		1100	5.99	1,100		1600	10.25	3,260
	0400	11.25	4,020		1800	7.16	1,720		1800	11.30	4,030
	0800	13.25	7,590		2200	7.66	1,990		2000	12.25	5,140
	1000	15.00	10,600		2400	7.37	1,830		2330	13.27	7,160
	1200	16.20	13,000						2400	13.23	7,120
	1400	17.00	14,700	3	0900	6.79	1,510				
	1600	17.85	16,600		1500	7.19	1,730	9	0400	11.84	4,640
	1800	18.60	18,300		2000	8.34	2,450		0600	10.74	3,660
	1900	19.12	19,600		2300	10.03	3,830		0800	9.50	2,740
	2000	18.30	17,600		2400	9.94	3,840		1200	8.13	1,920
	2200	16.25	13,200						1500	7.72	1,810
	2400	14.60	9,890	4	0600	10.73	4,630		1630	5.88	942
					0900	10.37	4,450		1800	6.94	1,430
2	0200	12.90	7,030		1000	11.56	5,380		2400	8.09	1,900
	0400	11.50	4,250		1400	11.25	4,980				
	0800	9.15	2,170		1700	12.02	5,660	10	0100	8.11	1,910
	1000	7.05	1,030		2100	11.58	5,180		0600	7.24	1,540
	1300	6.61	953		2400	13.18	6,940		1600	6.50	1,150
	1800	5.85	778						2400	6.74	1,270
	2400	5.30	640	5	0100	13.22	7,360				
					0500	12.63	6,160	11	0600	6.25	1,080
3	0600	5.05	580		1000	11.39	4,120		1200	5.80	870
	1800	4.54	430		1200	10.76	3,630		1600	5.53	762
	2400	4.24	346		1600	9.98	3,040		2400	6.89	1,400
					1800	10.39	3,330				
29	2400	2.82	43		2400	11.17	3,900	12	0500	8.15	1,930
									1200	6.06	980
30	0800	2.75	37	6	0600	12.02	4,890		2400	4.91	518
	1400	2.84	45		1130	13.55	8,010				
	1800	3.18	89		1400	13.46	7,870	13	1200	4.45	395
	2400	2.97	60		1800	13.38	7,740		2400	4.19	317

(132) 5–3737. North Fork Zumbro River tributary near Wanamingo, Minn.

(Crest-stage station)

Location.—Lat 44°17'10", long 92°52'20", in SE¼SE¼ sec.32, T.110 N., R.17 W., at culvert on County Highway 1, 3¼ miles upstream from mouth, and 4¼ miles southwest of Wanamingo.

Drainage area.—9.36 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by indirect measurements at 607 cfs and 1,310 cfs.

Maxima.—March–May 1965: Discharge, 870 cfs Apr. 7 (gage height, 13.00 ft, backwater from ice); gage height, 14.81 ft Mar. 1 (backwater from ice).
1960 to February 1965: Gage height, 18.14 ft Mar. 28, 1962, backwater from ice (discharge not determined).

(133) 5–3740. Zumbro River at Zumbro Falls, Minn.

Location.—Lat 44°17'12", long 92°25'26", in sec.36, T.110 N., R.14 W., on left bank in Zumbro Falls, 1,000 ft downstream from Spring Creek, 0.7 mile upstream from highway bridge on U.S. Highway 63, and 6.3 miles downstream from North Branch.

Drainage area.—1,130 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at 15 minute intervals except 0500 hours Mar. 1 to 1200 hours Mar. 29 when record was obtained from the auxiliary record graph. For the period Mar. 1–3 the graph was constructed on the basis of floodmark and partial gage height record. Datum of gage is 811.26 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharge computed from 96 punch-tape readings per day, Mar. 4 and Mar. 30 to May 31.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 2, 0500 hours	29,600	28.40
Apr. 7, 0200 hours	26,800	27.26
1909–17, 1929 to February 1965:		
July 22, 1951	35,900	30.80

Flood of April 1888 reached a stage of abour 30.5 ft at present site or 29.7 ft at original site. Flood in 1859 is known to have exceeded that of 1888 (gage height not determined).

Remarks.—Diurnal fluctuation at low and medium flows caused by powerplant above station.

Mean discharge, in cubic feet per second, 1965, of Zumbro River at Zumbro Falls, Minn.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	12,600	767	375	11	542	8,500	599	21	109	1,020	677
2	22,800	1,650	217	12	574	5,650	593	22	250	1,000	316
3	4,020	3,470	512	13	282	3,110	523	23	245	1,000	201
4	1,550	10,300	677	14	152	2,030	413	24	158	761	501
5	1,130	18,200	665	15	289	1,620	228	25	227	779	569
6	1,020	21,600	665	16	514	1,360	599	26	217	1,150	653
7	992	23,100	884	17	394	1,230	1,280	27	187	1,190	635
8	946	19,700	653	18	264	1,160	871	28	95	1,050	653
9	533	17,100	325	19	374	1,120	803	29	297	982	308
10	462	10,300	501	20	211	1,050	707	30	512	949	192
								31	527	------	177
Monthly mean discharge, in cubic feet per second									1,693	5,430	547
Runoff, in inches									1.73	5.36	0.56

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	6.51	97	Mar. 4	2400	8.81	1,250	Apr. 8	0000	23.42	18,300
	1000	6.48	91						0800	23.32	18,100
	2000	6.93	220	Apr. 1	0000	8.09	788		1400	24.19	19,900
	2200	7.44	435		1000	6.94	216		1800	24.98	21,600
	2400	8.10	794		1400	8.15	813		2400	24.19	19,900
					1800	8.84	1,260				
Mar. 1	0200	9.54	1,760		2400	9.00	1,370	9	0600	23.32	18,100
	0400	11.12	2,950						1200	23.01	17,600
	0600	13.46	4,860	2	1000	8.73	1,790		1800	22.22	16,200
	0800	15.60	7,060		1600	9.64	1,810		2400	20.24	13,200
	1000	17.35	9,260		2000	10.52	2,460				
	1200	18.85	11,200		2400	10.15	2,190	10	0600	18.42	10,600
	1400	21.20	14,600						1200	17.63	9,620
	1600	23.32	18,100	3	0200	9.92	2,020		1800	17.72	9,740
	1800	24.50	20,600		0800	11.06	2,890		2300	17.96	10,000
	2000	25.35	22,400		1600	11.89	3,550		2400	17.92	10,000
	2200	26.17	24,200		2000	13.31	4,720				
	2400	27.18	26,600		2400	15.06	6,440	11	0300	17.79	9,830
									0600	17.26	9,140
2	0200	27.75	28,000	4	0400	16.11	7,670		1200	16.59	8,270
	0500	28.40	29,600		0800	16.77	8,490		1900	15.99	7,530
	0900	27.84	28,200		1400	17.71	9,710		2000	15.98	7,520
	1200	26.87	25,800		1800	19.89	12,700		2400	16.51	8,160
	1400	25.85	23,500		2000	20.94	14,200				
	1600	24.50	20,600		2400	21.90	15,700	12	0400	15.41	6,840
	1800	23.00	17,600						1100	14.17	5,530
	2000	21.40	14,900	5	0600	22.39	16,500		1500	13.99	5,350
	2200	19.82	12,600		1000	22.79	17,200		1800	13.54	4,940
	2400	18.00	10,100		1600	23.95	19,400		2400	12.62	4,390
					2200	24.48	20,500				
3	0200	16.68	8,380		2400	24.37	20,300	13	0300	11.83	3,510
	0400	15.35	6,780						1200	11.14	2,960
	0600	14.00	5,360	6	0600	23.90	19,300		1800	10.79	2,680
	0800	12.35	3,930		1200	24.36	20,300		2400	10.42	2,400
	1000	11.23	3,030		1800	25.94	23,700				
	1200	10.98	2,830		2400	27.13	26,400	14	1200	9.93	2,040
	1800	10.37	2,370						2400	9.54	1,760
	2400	9.78	1,930	7	0200	27.26	26,800				
					0600	26.77	25,600	15	1200	9.36	1,630
4	0600	9.50	1,730		1200	25.00	21,600		2400	9.17	1,500
	1200	9.20	1,520		1800	25.19	22,000				
	1800	8.98	1,370		2400	24.17	19,900				

WHITEWATER RIVER BASIN

(134) 5–3765. South Fork Whitewater River near Altura, Minn.

Location.—Lat 44°04'10", long 91°58'49", in SE¼ sec.14, T.107 N., R.10 W., on left bank 500 ft upstream from highway bridge, 1.4 miles upstream from small tributary entering from the west, 2 miles west of Altura, and 2.4 miles upstream from Keefer Creek.

Drainage area.—76.8 sq mi.

Gage-height record.—Water-stage recorder graph except 1930 hours Feb. 28 to 0500 hours Mar. 2 when graph was constructed on the basis of floodmarks and adjacent record. Datum of gage is 761.80 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Feb. 28, Mar. 1, 12, 17–24.

Maxima.—Given in following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 1, 1300 hours	1,300	[a]8.14
Apr. 7, 1630 hours	2,360	7.23
1939 to February 1965:		
Aug. 31, 1947	5,460	10.61

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	700	217	15	11	11	298	18	21	10	17	14
2	274	385	14	12	10	290	17	22	10	16	13
3	32	392	15	13	12	54	16	23	10	16	14
4	22	994	14	14	12	38	14	24	11	16	14
5	18	968	16	15	11	32	14	25	11	19	14
6	15	1,500	34	16	11	26	22	26	11	29	17
7	15	1,100	32	17	11	23	21	27	11	27	19
8	12	1,140	24	18	10	22	18	28	10	21	16
9	12	492	22	19	10	21	16	29	11	19	14
10	11	228	19	20	10	18	14	30	11	17	14
								31	13	------	14
Monthly mean discharge, in cubic feet per second									43.2	281	17.4
Runoff, in inches									0.65	4.08	0.26

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	1.21	------	Mar. 1	1200	8.09	------	Mar. 2	1700	1.74	120
	0600	1.16	------		1300	8.14	1,300		2000	1.48	86
	1200	1.12	------		1400	8.13	------		2400	1.21	59
	1500	1.16	------		1800	6.88	------				
	1700	2.31	------		2400	4.70	820	Apr. 1	0000	.76	25
	1900	2.72	------						0200	1.02	43
	2100	3.85	------	2	0400	3.61	565		0300	.98	40
	2400	4.65	------		0600	3.11	411		0400	1.12	51
					0900	2.38	233		0500	1.20	58
Mar. 1	0600	6.65	------		1400	1.79	128		0600	1.70	114

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of South Fork Whitewater River near Altura, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 1	0700	1.66	108	Apr. 5	0800	4.00	690	Apr. 8	1900	7.10	2,240
	0800	1.70	114		1000	3.59	559		2100	6.48	1,780
	1100	1.59	99		1200	3.38	493		2400	5.14	1,130
	1200	2.05	170		1400	3.90	658				
	1300	2.34	225		1600	4.82	992	9	0200	5.00	1,070
	1500	2.75	315		1800	5.46	1,280		0400	4.00	690
	1700	3.08	402		2000	5.58	1,330		0600	3.19	435
	1800	3.22	444		2200	5.49	1,290		0800	2.63	287
	2000	3.18	422		2400	5.62	1,350		1000	2.30	217
	2400	2.75	315						1200	2.44	245
				6	0400	6.05	1,560		1400	3.77	490
2	0400	2.22	201		0600	6.04	1,550		1600	3.73	604
	0600	2.50	258		1000	5.61	1,340		2000	2.96	369
	0800	2.47	252		1200	5.83	1,440		2200	2.70	303
	1000	2.33	223		1600	6.52	1,810		2400	2.59	278
	1200	2.35	227		1800	6.27	1,660				
	1400	2.63	287		2200	5.59	1,340	10	0400	2.22	201
	1600	3.12	414		2400	5.17	1,150		0800	1.91	147
	1800	3.82	632						1000	1.90	145
	2100	4.17	744	7	0200	4.61	906		1200	2.00	162
	2400	3.68	588		0400	3.96	677		1400	2.40	237
					0600	3.77	490		1500	2.49	256
3	0400	2.88	348		0800	2.72	308		1800	2.41	239
	0800	2.34	225		1000	2.54	267		2000	2.85	340
	1000	2.18	193		1100	2.60	280		2400	2.60	280
	1100	2.15	188		1200	3.48	524				
	1200	2.19	195		1300	4.95	1,050	11	0600	2.11	181
	1400	2.33	223		1400	6.25	1,660		1200	1.67	110
	1800	3.15	423		1500	6.97	2,140		1700	2.13	184
	2000	3.70	594		1630	7.23	2,360		1800	3.55	546
	2200	4.18	748		1900	6.54	1,820		1900	4.11	725
	2400	4.24	768		2100	5.83	1,440		2000	3.78	620
					2400	4.86	1,010		2100	4.08	716
4	0200	4.15	738						2400	3.76	603
	0400	4.09	719	8	0200	4.26	774				
	0600	3.96	677		0500	3.22	444	12	0200	3.48	524
	1000	3.92	664		0900	2.50	258		0400	3.74	607
	1200	4.03	700		1000	2.73	310		0600	3.50	530
	1400	4.64	918		1100	3.32	474		1000	2.66	294
	1600	5.57	1,330		1200	4.33	799		1400	2.06	172
	1800	5.98	1,520		1300	5.15	1,140		1600	1.78	126
	2000	6.01	1,540		1400	6.16	1,610		2000	1.48	86
	2400	5.51	1,300		1500	6.66	1,900		2400	1.35	72
					1700	7.12	2,260				
5	0400	4.85	1,000								

MISSISSIPPI RIVER MAIN STEM

(135) Mississippi River at Lock and Dam 5 near Minneiska, Minn.

(Miscellaneous site)

Location.—Lat 44°10', long 91°50', in sec.7, T.108 N., R.8 W., at Lock and Dam 5, 3½ miles southeast of Minneiska, and at river mile 738.27 above Ohio River.

Gage-height record.—Peak stages from pool and tailwater water-stage recorder graphs. Datum of gages is 600.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Corps of Engineers stage-discharge relation extended on the basis of two Geological Survey current-meter measurements.

Maxima.—April–May 1965: Discharge, 263,000 cfs 1600 hours Apr. 19 (elevations, 668.73 ft, pool, 667.85 ft tailwater).
1935 to March 1965: Discharge, 190,500 cfs Apr. 20, 1952 (elevations, 664.59 ft pool, 663.84 ft tailwater).

Cooperation.—Records furnished by Corps of Engineers.

WAUMANDEE CREEK BASIN

(136) 5–3782. Eagle Creek near Fountain City, Wis.

(Crest-stage station)

Location.—Lat 44°09'49", long 91°42'28", in SW¼ sec.33, T.20 N., R.11 W., at bridge on County Trunk G, 2.5 miles north of Fountain City.

Drainage area.—26.8 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 431 cfs and by contracted-opening measurement at 930 cfs.

Maxima.—March–May 1965: Discharge, 1,060 cfs Apr. 7 (gage height, 14.82 ft).
1961 to February 1965: Discharge, 930 cfs Mar. 25, 1961 (gage height, 14.32 ft).

MISSISSIPPI RIVER MAIN STEM

(137) 5–3785. Mississippi River at Winona, Minn.

Location.—Lat 44°03'20", long 91°38'15", in sec.23, T.107 N., R.7 W., on right bank at Winona pumping station in Winona, $9\frac{1}{2}$ miles upstream from Trempealeau River and at mile 725.7 upstream from the Ohio River. Auxiliary water-stage recorder at navigation dam 5A in sec.9, T.107 N., R.7 W., 2.7 miles upstream.

Drainage area.—59,200 sq mi. approximately.

Gage-height record.—Water-stage recorder graph except 1200 hours Apr. 15 to 1600 hours Apr. 28 when graph was constructed on basis of several gage readings by engineers and twice-daily gage readings by Corps of Engineers on temporary staff gage and floodmark.

For auxiliary gage, water-stage recorder graph.

Datum of base gage is 639.64 ft above mean sea level, datum of 1929, and for the auxiliary gage, 600.00 ft above mean sea level, datum of 1912.

Discharge record.—Stage-fall-discharge relation affected by changes in slope and defined by current-meter measurements. Fall was a factor in computing discharge Apr. 4, 5. Backwater from ice Apr. 1-4.

Maxima.—April–May 1965: Discharge, 268,000 cfs 2400 hours Apr. 19 (gage height, 20.77 ft, from floodmark).

1880 to March 1965: Discharge, 190,000 cfs Apr. 20, 1952 (gage height, 17.91).

Remarks.—Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

Cooperation.—Gage height record at dam 5A furnished by Corps of Ergineers.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	14,400	154,000	11	112,000	87,600	21	257,000	93,200
2	21,300	144,000	12	121,000	91,100	22	250,000	89,600
3	27,200	135,000	13	131,000	93,700	23	238,000	84,300
4	35,600	124,000	14	150,000	94,800	24	227,000	79,600
5	53,200	115,000	15	178,000	94,200	25	216,000	75,700
6	66,800	107,000	16	210,000	92,500	26	205,000	74,300
7	77,300	99,800	17	215,000	89,200	27	195,000	73,300
8	87,600	94,900	18	238,000	89,200	28	184,000	71,800
9	98,400	91,800	19	263,000	91,200	29	173,000	69,900
10	104,000	88,700	20	264,000	93,200	30	164,000	69,500
						31	-------	69,900
Monthly mean discharge, in cubic feet per second							152,600	94,260
Runoff, in inches							2.88	1.84

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Mississippi River at Winona, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 14	0000	15.31	138,000	Apr. 17	1800	19.20	212,000	Apr. 20	1800	20.62	262,000
	1200	15.95	149,000		2400	19.47	219,000		2400	20.57	261,000
	2400	16.72	163,000								
				18	0600	19.82	229,000	21	1200	20.42	257,000
15	1200	17.62	178,000		1200	20.12	239,000		2400	20.30	254,000
	2400	18.41	194,000		1800	20.33	247,000				
					2400	20.48	254,000	22	1200	20.19	251,000
16	0600	18.85	204,000						2400	19.84	242,000
	1200	19.14	210,000	19	0600	20.60	260,000				
	1800	19.39	217,000		1200	20.67	264,000	23	1200	19.68	238,000
	2400	19.76	227,000		1800	20.70	265,000		2400	19.44	232,000
					2400	20.77	268,000				
17	0200	19.81	228,000					24	1200	19.20	227,000
	0600	19.24	213,000	20	0600	20.70	265,000		2400	18.92	221,000
	1200	19.10	210,000		1200	20.67	264,000				

GILMORE CREEK BASIN

(138) 5–3790. Gilmore Creek at Winona, Minn.

(Crest-stage station)

Location.—Lat 44°02'40", long 91°41'25", N½ sec.29, T.107 N., R.7 W., on left bank at west edge of Winona, 1,500 ft upstream from bridge on U.S. Highway 14, and 2¼ miles upstream from Lake Winona.

Drainage area.—8.95 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 380 cfs.

Maxima.—March–May 1965: Discharge, 436 cfs Apr. 7 (gage height, 4.65 ft, backwater from debris).

1939 to February 1965: Discharge, 5,360 cfs July 21, 1951 (gage height, 9.47 ft), from rating curve extended above 260 cfs on basis of slope-area measurement at 2,200 cfs and logarithmic plotting.

TREMPEALEAU RIVER BASIN

(139) 5–3794. Trempealeau River at Arcadia, Wis.

Location.—Lat 44°15'15", long 91°30'25", in SW¼ sec.32, T.21 N., R.9 W., near right bank on downstream side of bridge on State Highways 93 and 95 in Arcadia, half a mile downstream from Turton Creek.

Drainage area.—552 sq mi.

Gage-height record.—Wire-weight gage read twice daily. Graph drawn on basis of numerous wire-weight gage readings daily during rises. Datum of gage is 719.61 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 7,200 cfs and extended by logarithmic plotting. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 9,740 cfs at 2200 hours Apr. 6 (gage height, 7.15 ft); gage height, 8.04 ft 1600 hours Mar. 2 (backwater from ice).

1960 to February 1965: Discharge, 7,840 cfs Mar. 26, 1961 (gage height, 6.85 ft).

Mean discharge, in cubic feet per second, 1965, of Trempealeau River at Arcadia, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	700	270	384	11	1,000	2,850	299	21	280	513	247
2	2,000	500	375	12	780	2,860	285	22	270	484	238
3	3,000	800	372	13	660	1,860	272	23	260	477	238
4	2,000	1,800	378	14	560	1,240	264	24	250	474	234
5	1,600	4,000	375	15	470	888	252	25	240	536	234
6	1,400	7,400	494	16	430	724	272	26	240	968	339
7	1,800	8,010	399	17	390	662	272	27	240	830	436
8	2,300	6,470	351	18	350	696	321	28	240	675	412
9	1,900	3,990	327	19	310	635	304	29	230	510	321
10	1,250	3,030	316	20	290	560	272	30	230	436	285
								31	240	----	267
Monthly mean discharge, in cubic feet per second									836	1,839	317
Runoff, in inches									1.75	3.72	0.66

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	2.60	-----	Apr. 4	0200	5.10	-----	Apr. 8	1600	6.48	6,500
	0400	3.60	-----		0600	5.34	-----		2000	6.18	5,410
	0800	4.40	-----		1000	5.38	-----		2400	5.95	4,700
	1200	5.15	-----		1400	5.41	-----				
	1600	5.85	-----		1600	5.68	-----	Apr. 9	0600	5.70	4,040
	1800	6.35	-----		2000	5.82	-----		1800	5.62	3,850
	2000	6.70	-----		2400	5.81	-----		2400	5.50	3,580
	2400	6.85	-----								
				Apr. 5	0800	5.78	-----	Apr. 10	0600	5.35	3,290
Mar. 2	0400	6.75	-----		1600	5.93	-----		1200	5.18	3,010
	0800	6.70	-----		2400	6.03	4,940		1800	4.90	2,620
	1200	6.95	-----						2400	5.05	2,820
	1600	8.04	-----	Apr. 6	0400	6.14	5,280	Apr. 11	0600	4.96	2,700
	1700	6.90	-----		0800	6.52	6,670		1200	4.85	2,560
	2000	6.60	-----		1200	6.75	7,700		1800	5.15	2,960
	2400	6.40	-----		1600	6.83	8,090		2200	5.42	3,420
					2000	7.10	9,470		2400	5.32	3,240
Mar. 3	1200	5.90	-----		2200	7.15	9,740	Apr. 12	0600	5.10	2,890
	2400	5.50	-----		2400	7.12	9,580		1200	5.00	2,750
									1800	5.12	2,920
Apr. 3	0000	3.20	-----	Apr. 7	0400	6.95	8,700		2400	4.80	2,500
	0200	3.60	-----		1000	6.56	6,840				
	0600	3.99	-----		1600	6.75	7,700	Apr. 13	1200	3.95	1,760
	1200	3.80	-----		2200	6.93	8,600		2400	3.42	1,430
	1400	3.76	-----		2400	6.80	7,940				
	1800	4.13	-----					Apr. 14	1200	3.08	1,250
	2200	4.52	-----	Apr. 8	0600	6.65	7,240		2400	2.64	1,040
	2400	4.80	-----		1200	6.40	6,180				

(140) 5–3795. Trempealeau River at Dodge, Wis.

Location.—Lat 44°07'55", long 91°33'10", in sec.10, T.19 N., R.10 W., near left bank on downstream side of highway bridge in Dodge, 9 miles upstream from mouth.

Drainage area.—643 sq mi.

Gage-height record.—Wire-weight gage read twice daily. Graph drawn on basis of wire-weight gage readings and supplemented by crest gage readings during rises. Datum of gage is 663.42 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 15,000 cfs. Backwater from ice Mar. 1 to Apr. 6.

Maxima.—March to May 1965: Discharge, 12,100 cfs 2200 hours Apr. 7 (gage height, 9.40 ft).

1913–19, 1934 to February 1965: Discharge, 17,400 cfs Apr. 4, 1956 (gage height, 10.35 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	600	260	520	11	1,400	3,670	388	21	290	626	327
2	900	400	489	12	1,000	3,460	361	22	280	595	306
3	1,800	600	487	13	800	2,840	346	23	270	564	293
4	4,000	1,000	505	14	600	1,940	331	24	260	583	285
5	2,400	2,000	505	15	500	1,300	325	25	260	660	278
6	1,800	5,000	549	16	450	957	357	26	250	1,010	361
7	1,600	9,970	559	17	400	796	356	27	250	1,030	507
8	1,500	9,930	485	18	360	820	400	28	250	826	498
9	2,700	6,470	428	19	330	809	404	29	240	675	458
10	2,400	4,280	400	20	310	743	359	30	230	571	361
								31	240	------	323
Monthly mean discharge, in cubic feet per second									925	2,146	405
Runoff, in inches									1.66	3.72	0.73

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	1.80	------	Mar. 3	2400	8.15	------	Mar. 7	0600	5.30	-----
	0600	2.20	------						1600	5.80	-----
	1200	3.10	------	4	0600	8.10	------		2400	5.25	-----
	1800	4.10	------		1200	8.00	------				
	2400	4.32	------		1800	7.80	------	8	0600	5.10	-----
					2400	7.15	------		2400	6.00	-----
2	0600	4.28	------								
	1200	4.28	------	5	0600	6.85	------	9	1200	6.95	-----
	1800	4.40	------		1600	7.25	------		1600	7.20	-----
	2400	4.70	------		2000	7.20	------		1800	7.20	-----
					2400	6.80	------		2400	6.84	-----
3	0600	5.10	------								
	1200	6.00	------	6	0600	6.30	------	10	0600	6.30	-----
	1600	7.10	------		0800	6.25	------		1200	6.60	-----
	1800	7.70	------		1800	6.50	------		1600	6.80	-----
	2200	8.10	------		2400	5.70	------		2400	6.20	-----

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Trempealeau River at Dodge, Wis.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 11	0600	5.55	-----	Apr. 5	1800	7.42	-----	Apr. 9	2400	7.82	4,910
	1200	5.30	-----								
	1800	5.10	-----	6	2400	8.45	7,480	10	0600	7.70	4,570
	2400	4.95	-----						1200	7.60	4,330
				7	0600	8.80	9,100		1800	7.36	3,880
Apr. 3	0000	2.98	-----		1200	8.92	9,700		2400	7.28	3,750
	0600	3.03	-----		1800	9.20	11,100	11	1200	7.20	3,640
	1200	3.38	-----		2200	9.40	12,100		2400	7.20	3,640
	1800	3.95	-----		2400	9.38	12,000	12	1200	7.08	3,490
	2400	4.34	-----						2400	6.86	3,230
				8	0600	9.00	10,100				
4	0600	4.70	-----		1200	8.90	9,600	13	1200	6.50	2,850
	1200	4.95	-----		1800	8.92	9,700		2400	6.00	2,420
	1800	5.28	-----		2400	8.70	8,620				
	2400	5.73	-----								
				9	0600	8.42	7,350	14	1200	5.26	1,900
5	0600	6.31	-----		1200	8.18	6,290		2400	4.60	1,530
	1200	6.92	-----		1800	7.98	5,470				

BLACK RIVER BASIN

(141) 5–3809. Poplar River near Owen, Wis.

(Crest-stage station)

Location.—Lat 44°53'10", long 90°34'17", in NW¼ sec.25, T.28 N., R.2 W., at bridge on County Trunk N., 1.3 miles east of Longwood, and 4.2 miles south of Owen.

Drainage area.—159 sq mi.

Gage-height record.—Water-stage recorder graph.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 7,160 cfs.

Maxima.—March–May 1965: Discharge, 5,750 cfs 1500 hours Apr. 11 (gage height, 17.95 ft).
1958 to February 1965: Discharge, 8,250 cfs June 5, 1958 (gage height, 19.46 ft).

(142) 5–3810. Black River at Neillsville, Wis.

Location.—Lat 44°33'35", long 90°36'50", in sec.15, T.24 N., R.2 W., or right bank at downstream side of bridge on U.S. Highway 10 in Neillsville, 1 mile downstream from O'Neill Creek and 2.6 miles upstream from Cunningham Creek.

Drainage area.—756 sq mi.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals. Datum of gage is 962.77 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 40,000 cfs. Mean daily discharges computed from 24 punch-tape recordings per day. Backwater from ice Mar. 1–9, 11–22, Mar. 26 to Apr. 4.

Maxima.—March–May 1965: Discharge, 18,300 cfs 0400 hours Apr. 12 (gage height, 15.28 ft).
1905–09, 1913 to February 1965: Discharge, 48,800 cfs Sept. 10, 1938 (gage height, 23.8 ft).

Mean discharge, in cubic feet per second, 1965, of Black River at Neillsville, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	400	76	1,260	11	880	15,200	1,430	21	125	2,690	735
2	2,500	80	1,030	12	660	16,900	1,010	22	135	2,560	527
3	2,000	105	981	13	500	11,600	764	23	159	2,460	398
4	1,550	130	1,010	14	350	8,520	584	24	132	2,140	321
5	1,600	464	898	15	240	6,810	463	25	110	2,560	282
6	1,650	1,880	987	16	200	5,450	588	26	92	5,200	1,550
7	1,750	4,300	1,420	17	160	4,060	1,220	27	84	6,180	2,260
8	1,800	5,520	1,470	18	145	3,790	1,330	28	76	4,050	1,730
9	2,000	5,460	1,360	19	135	3,640	1,260	29	74	2,520	1,080
10	1,390	7,820	1,720	20	125	3,080	1,010	30	73	1,700	729
								31	74	-----	518
Monthly mean discharge, in cubic feet per second									683	4,565	1,030
Runoff, in inches									1.04	6.74	1.57

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 7	0000	7.81	3,280	Apr. 10	2400	12.18	11,000	Apr. 15	1200	9.99	6,740
	0400	7.91	3,400						1800	9.96	6,690
	1000	7.60	3,050	11	0600	13.74	14,400		2400	9.78	6,360
	1400	7.99	3,510		1000	13.99	15,100				
	1800	9.59	6,020		1400	13.90	14,800	16	0600	9.52	5,900
	2000	9.72	6,260		2000	14.81	17,100		1200	9.25	5,440
	2200	9.65	6,130		2400	15.23	18,200		1800	9.04	5,060
	2400	9.88	6,540						2400	8.81	4,720
				12	0400	15.28	18,300				
8	0200	11.32	9,240		1200	14.58	16,600	26	0000	8.70	4,540
	0400	10.20	7,120		1800	14.47	16,300		0200	8.81	4,720
	0600	9.62	6,080		2400	14.11	15,400		1000	8.30	3,930
	1400	8.71	4,560						1800	9.68	6,180
	2200	8.94	4,920	13	0600	13.14	13,000		2200	10.29	7,280
	2400	8.78	4,670		1200	12.09	10,800		2400	10.20	7,120
					1800	11.96	10,500				
9	0800	8.24	3,850		2400	11.62	9,840	27	0600	9.72	6,260
	1400	8.73	4,590						1600	9.70	6,220
	2000	11.04	8,700	14	0600	11.22	9,040		2400	9.28	5,490
	2200	10.51	7,690		1200	10.86	8,350				
	2400	10.54	7,750		1800	10.74	8,130	28	0600	8.77	4,650
					2400	10.44	7,560		1200	8.30	3,930
10	0400	10.64	7,940						1800	8.00	3,520
	1200	9.90	6,580	15	0600	10.12	6,980		2400	7.68	3,140
	1800	10.53	7,730								

(143) 5–3820. Black River near Galesville, Wis.

Location.—Lat 44°03'45", long 91°17'30", in sec.2, T.18 N., R.8 W., on left bank 30 ft downstream from bridge on U.S. Highway 53, 4.5 miles southeast of Galesville, and 5 miles downstream from Fleming Creek.

Drainage area.—2,120 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except Mar. 26, May 3–6 for which graph was reconstructed on basis of once-daily wire-weight gage readings and recorded range lines. Datum of gage is 658.43 ft above mean sea level, unadjusted.

Discharge record.—Stage-discharge relation defined by current meter measurements. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 33,000 cfs 1600 hours Apr. 13 (gage height, 13.60 ft).
1931 to February 1965: Discharge observed, 58,000 cfs Sept. 11, 1938 (gage height, 14.31 ft).

Remarks.—Flow regulated at Hatfield Dam powerplant where drainage area is 1,290 sq mi and storage capacity is 272 million cubic feet.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	700	1,900	6,540	11	4,700	14,500	3,930	21	1,900	7,140	3,320
2	1,600	2,200	4,580	12	3,900	22,200	3,770	22	1,750	5,950	2,840
3	2,000	2,600	3,800	13	3,400	31,800	3,000	23	1,650	5,360	2,320
4	3,000	3,200	3,470	14	3,000	26,300	2,560	24	1,550	5,330	2,050
5	4,500	3,600	3,910	15	2,600	20,000	2,350	25	1,450	5,330	2,050
6	4,600	3,860	3,760	16	2,300	15,400	2,260	26	1,350	5,580	3,190
7	4,700	5,110	3,470	17	2,000	12,500	2,210	27	1,250	6,670	3,400
8	4,800	6,860	3,650	18	1,800	10,200	2,270	28	1,200	9,690	5,230
9	5,100	10,300	3,850	19	2,000	8,370	3,120	29	1,150	12,000	6,080
10	6,000	14,200	3,850	20	2,050	7,650	3,640	30	1,100	9,640	5,420
								31	1,500	-----	3,500
Monthly mean discharge, in cubic feet per second									2,600	9,848	3,529
Runoff, in inches									1.41	5.18	1.92

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 9	0000	8.29	8,470	Apr. 12	1200	12.29	21,100	Apr. 15	1200	12.08	19,900
	1200	9.05	9,800		1800	12.87	25,700		1800	11.82	18,600
	2000	9.96	11,900		2400	13.23	29,300		2400	11.57	17,400
	2400	10.45	13,400								
				13	0600	13.44	31,400	16	0600	11.31	16,200
10	0600	10.81	14,400		1200	13.55	32,500		1200	11.08	15,300
	1200	10.86	14,600		1600	13.60	33,000		1800	10.80	14,400
	1800	10.75	14,200		2000	13.52	32,200		2400	10.61	13,800
	2400	10.63	13,900		2400	13.39	30,900				
								17	0600	10.40	13,200
11	0600	10.62	13,900	14	0600	13.12	28,200		1200	10.18	12,500
	1200	10.65	14,000		1200	12.91	26,100		1800	9.95	11,800
	1800	10.90	14,700		1800	12.69	24,100		2400	9.72	11,200
	2400	11.47	16,900		2400	12.53	22,800				
								26	2400	6.37	5,810
12	0600	11.84	18,700	15	0600	12.30	21,200				

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Black River near Galesville, Wis.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 27	1200	6.92	6,530	Apr. 28	2400	9.92	11,800	Apr. 29	2400	9.69	11,200
	2400	7.88	7,800								
				Apr. 29	0900	10.18	12,500	Apr. 30	1200	8.94	9,590
Apr. 28	1200	8.93	9,570		1800	9.95	11,800		2400	8.13	8,200
	1800	9.50	10,700								

LA CROSSE RIVER BASIN

(144) 5–3830. La Crosse River near West Salem, Wis.

Location.—Lat 43°54'05", long 91°07'05", is SE¼ sec.32, T.17 N., R.6 W., on left bank 30 ft upstream from highway bridge, 2 miles west of West Salem, and 6 miles downstream from Dutch Creek.

Drainage area.—398 sq mi.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals except Mar. 8–18, Mar. 28 to May 31 for which graph was reconstructed on basis of twice-daily or more chain-gage readings. Datum of gage is 668.0 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 3,500 cfs. Mean daily discharges computed from 24 punch-tape recordings per day except Mar. 8–18, 28–31. Backwater from ice Mar. 9–30.

Maxima.—March–May 1965: Discharge, 2,610 cfs 0130 hours Mar. 3 (gage height, 8.76 ft).

1913 to February 1965: Discharge observed, 8,200 cfs Aug. 6, 1935 (gage height, 12.2 ft).

Remarks.—Minor regulation by powerplant several miles upstream.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	905	576	308	11	280	1,130	300	21	130	353	298
2	2,080	970	300	12	230	1,900	280	22	150	294	302
3	2,440	960	288	13	210	1,220	274	23	180	298	310
4	1,140	1,190	302	14	200	813	266	24	250	306	302
5	1,450	1,060	304	15	190	511	264	25	290	362	298
6	2,200	1,290	306	16	190	310	206	26	290	576	452
7	1,920	1,360	314	17	190	374	310	27	290	571	718
8	810	1,440	308	18	180	397	385	28	280	369	837
9	600	1,790	308	19	190	392	329	29	270	452	528
10	350	1,590	300	20	160	438	318	30	260	318	320
								31	290	-----	322
Monthly mean discharge, in cubic feet per second									600	787	344
Runoff, in inches									1.74	2.21	1.00

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of La Crosse River near West Salem, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage neight	Discharge
Mar. 1	0000	3.06	427	Mar. 6	2400	8.37	2,310	Apr. 6	2400	6.95	1,550
	0800	3.31	484								
	1000	3.63	561	7	1200	8.16	2,180	7	1200	6.73	1,420
	1200	4.35	740		1800	6.46	1,390		2400	5.75	1,060
	1600	5.89	1,200		2400	6.06	1,250				
	1800	6.39	1,370					8	0400	5.66	1,040
	2000	6.47	1,400	31	2400	3.15	332		1000	6.29	1,260
	2200	6.89	1,570						1200	6.92	1,540
	2400	6.86	1,560	Apr. 1	0600	3.17	337		1800	7.47	1,840
					1200	3.67	475		2400	7.27	1,700
2	0800	6.73	1,500		1800	4.96	828				
	1000	7.58	1,890		2400	5.53	999	9	0600	6.91	1,530
	1400	8.53	2,420						1400	7.71	1,960
	2400	8.75	2,600	2	0800	5.76	1,070		2400	7.56	1,880
					1400	4.99	837				
3	0131	8.76	2,610		1800	5.42	966	10	0800	7.88	2,040
	1200	8.64	2,510		2400	5.28	924		1200	6.67	1,440
	2400	8.34	2,290						1800	6.19	1,260
				3	0800	4.95	825		2400	6.07	1,190
4	0400	7.88	2,040		1200	5.88	1,100				
	0800	7.59	1,900		2400	5.31	933	11	1200	5.84	1,120
	1000	5.26	1,010						1800	5.77	1,100
	1200	3.46	520	4	0600	5.11	873		2400	5.84	1,120
	1400	2.98	408		1200	6.37	1,290				
	1800	3.78	597		1600	6.70	1,410	12	0400	6.05	1,180
	2000	4.29	723		2400	6.63	1,380		0600	6.77	1,480
	2400	4.07	668						0800	7.89	2,040
				5	0800	6.32	1,270		1400	8.67	2,540
5	0400	4.20	700		1200	5.47	981		2000	7.70	1,950
	1000	5.57	1,100		1600	4.97	831		2400	7.57	1,880
	1400	6.72	1,500		2400	5.04	852				
	1600	8.38	2,320					13	0800	7.55	1,860
	2200	8.00	2,100	6	0800	5.37	951		1000	6.57	1,360
	2400	8.12	2,160		1000	6.32	1,270		1200	4.05	590
					1200	6.90	1,530		1800	4.88	804
6	1200	8.17	2,180		1800	7.01	1,580		2400	5.07	861

MISSISSIPPI RIVER MAIN STEM

(145) 5–3835. Mississippi River at La Crosse, Wis.

(Gaging station, discontinued 1955)

Location.—Lat 43°48'45", long 91°15'25", in sec.31, T.16 N., R.7 W., on left bank 1,300 ft upstream from highway bridge at La Crosse, 0.4 mile downstream from La Crosse River, and at mile 697.8 above Ohio River.

Drainage area.—62,800 sq mi, approximately.

Gage-height record.—Floodmark and gage reading on and near peak. Datum of gage is 626.32 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 278,000 cfs 0915–1410 hours Apr. 22 (gage height 17.96 ft, from floodmark).

1929 to March 1965: Discharge, 196,000 cfs Apr. 20, 1952 (gage height, 15.32 ft). Maximum-stage known, 16.5 ft June 19, 1880, present datum, from floodmark.

ROOT RIVER BASIN

(146) 5–3837. Mill Creek tributary near Chatfield, Minn.

(Crest-stage station)

Location.—Lat 43°53'57", long 92°14'16", in SW¼NW¼ sec.14, T.105 N., R.12 W., at culvert on county highway, 0.8 mile upstream from Mill Creek and 4.5 miles northwest of Chatfield.

Drainage area.—2.36 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by indirect measurements at 402 cfs and 702 cfs.

Maxima.—March–May 1965: Discharge, 506 cfs Apr. 6 (gage height, 14.20 ft, from floodmark); gage height, 15.1 ft Mar. 1 (Backwater from ice).
1959 to February 1965: Discharge, 703 cfs July 2, 1960 (gage height, 15.4€ ft, from high-water profile).

(147) 5–3838.5 Bear Creek near Grand Meadow, Minn.

(Crest-stage station)

Location.—Lat 43°43'25", long 92°35'20", in NE¼SE¼ sec.14, T.103 N., R.15 W., on left bank 42 ft upstream from bridge on county highway, 1½ miles northwest of Grand Meadow, and 4 miles upstream from North Fork Bear Creek.

Drainage area.—13.6 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 320 cfs and by indirect measurement at 3,730 cfs.

Maxima.—March–May 1965: Discharge, 885 cfs Apr. 6 (gage height, 18.2 ft, from floodmark).
1962 to February 1965: Discharge, 3,730 cfs March 28, 1962 (gage height, 21.18 ft, from high-water profile).

(148) South Branch Root River at Preston, Minn.

(Miscellaneous site)

Location.—Lat 43°40', long 92°05', in sec.6, T.102 N., R.10 W., on upstream side of bridge on County Highway 12.

Drainage area.—188 sq mi. (from Corps of Engineers).

Gage-height record.—Occasional readings made from reference point during flood. Datum of reference point is 944.86 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Discharge obtained on the following days by current-meter measurements.

Date	Discharge, in cfs
Mar. 3	182
Apr. 2	530
Apr. 3	441
Apr. 4	1,340

Maxima.—March–May 1965: Discharge unknown, elevation, 938.78 ft Mar. 1 (backwater from ice, from floodmark).
1940–41, 1961: Discharge unknown, elevation, 939.19 ft May 29, 1941, datum of gage 928.10 ft mean sea level, adjustment of 1912.

Cooperation.—Peak elevations furnished by Corps of Engineers.

(149) South Branch Root River at Lanesboro, Minn.

(Gaging station, discontinued 1942, miscellaneous site)

Location.—Lat 43°44', long 91°58', in sec.13, T.103 N., R.10 W., on downstream side of bridge in Lanesboro.

Drainage area.—297 sq mi.

Gage-height record.—Occasional gage-height readings on chain gage during flood. Datum of gage is 816.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by three current-meter measurements.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 1	Unknown	[a]14.30
Apr. 6	4,300	9.70
1940 to February 1965		
Mar. 26, 1950	21,000	19.2

[a]Backwater from ice

Cooperation.—Peak stages furnished by Corps of Engineers.

(150) 5–3840. Root River near Lanesboro, Minn.

Location.—Lat 43°44'58", long 91°58'43", in sec.1, T.103 N., R.10 W., on left bank half a mile upstream from highway bridge, $1\frac{1}{4}$ miles upstream from South Branch, and $2\frac{1}{2}$ miles northeast of Lanesboro.

Drainage area.—615 sq mi.

Gage-height record.—Water-stage recorder graph except 0900 hours Mar. 1 to 1740 hours Mar. 3 when graph was constructed on the basis of floodmark and adjacent record. Datum of gage is 791.84 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1–31, Apr. 5–7.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 1, 1900 hours	19,000	[a]17.83
Apr. 6, 2300 hours	------	[a]13.33
Apr. 9, 0200 hours	14,000	-----
1910–17, 1940 to February 1965:		
Mar. 29, 1962	22,100	16.11

[a]Backwater from ice.

Remarks.—Diurnal fluctuation at times during medium and low flow caused by power-plant above station.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	8,000	1,610	283	11	205	3,730	274	21	117	310	196
2	3,500	2,360	260	12	190	7,990	245	22	115	304	180
3	955	2,420	245	13	170	1,660	223	23	114	289	178
4	650	5,920	248	14	160	798	210	24	113	277	169
5	410	8,950	254	15	145	618	199	25	112	274	169
6	381	11,400	662	16	135	514	232	26	111	320	205
7	329	10,500	722	17	130	446	374	27	111	442	432
8	296	10,100	470	18	120	390	310	28	111	414	482
9	255	10,100	353	19	119	353	257	29	116	229	307
10	230	3,930	301	20	118	320	218	30	140	310	248
								31	200	------	218
Monthly mean discharge, in cubic feet per second									576	2,913	294
Runoff, in inches									1.08	5.28	0.55

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	2.02	-----	Mar. 1	0400	4.73	------	Mar. 1	1300	13.65	-----
	0600	1.85	-----		0500	6.64	------		1400	15.00	-----
	1200	1.86	-----		0600	6.50	------		1500	16.02	-----
	1800	3.22	-----		0700	5.79	------		1600	16.86	-----
	2400	4.41	-----		0800	7.02	------		1700	17.50	-----
					0900	8.35	------		1800	17.72	-----
Mar. 1	0100	4.50	-----		1000	9.58	------		1900	17.83	19,000
	0200	4.75	-----		1100	10.83	------		2000	17.82	-----
	0300	5.54	-----		1200	12.15	------		2100	17.70	-----

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Root River near Lanesboro, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	2200	17.38	------	Apr. 2	0200	6.41	2,890	Apr. 8	1400	10.81	8,700
	2300	17.04	------		0500	6.17	2,670		1800	12.15	11,700
	2400	16.65	------		1100	5.61	2,210		2400	13.03	13,900
					1600	5.15	1,841				
2	0200	15.98	------		2100	5.83	2,380	9	0200	13.07	14,000
	0400	14.79	------		2400	5.89	2,430		0600	12.70	13,100
	0600	13.56	------						1200	11.47	10,000
	0800	12.38	------	3	0600	5.60	2,200		1600	10.79	8,660
	1000	11.10	------		1200	5.35	2,000		1800	9.69	6,840
	1300	9.95	------		1500	5.15	1,840		2000	9.23	6,160
	1600	8.91	------		1700	5.14	1,830		2200	9.30	6,260
	1900	7.87	------		1900	6.01	2,530		2400	9.21	6,130
	2400	6.59	------		2000	6.95	3,400				
					2400	7.52	4,010	10	0300	8.60	5,320
3	0400	5.51	------						0600	7.20	3,650
	0600	5.03	------	4	0400	8.43	5,110		1200	6.79	3,240
	1200	4.53	------		0600	8.83	5,620		1400	6.77	3,220
	1800	4.25	------		0700	8.83	5,620		1600	6.67	3,120
	2400	3.99	------		1200	8.37	5,030		1900	7.16	3,610
					1300	8.36	5,020		2200	7.65	4,170
4	0600	3.75	------		1800	9.43	6,440		2400	7.70	4,230
	1200	3.58	------		2100	10.33	7,860				
	1800	3.41	------		2400	11.10	9,260	11	0200	7.74	4,280
	2400	3.32	------						0600	6.91	3,360
				5	0200	11.16	------		1200	6.37	2,850
29	2400	1.70	------		0400	11.01	------		1600	6.05	2,560
					0700	10.53	------		1800	6.78	3,230
30	0300	1.67	------		1100	9.90	------		2100	7.57	4,070
	0800	1.82	------		1500	10.59	------		2200	8.76	5,530
	1000	1.68	------		1800	11.27	------		2300	10.14	7,540
	1900	1.78	------		2200	11.98	------		2400	10.99	9,040
	2100	2.03	------		2400	12.27	------				
	2400	1.97	------					12	0100	11.39	9,860
				6	0400	12.56	------		0400	11.98	11,200
31	0600	1.93	------		0900	12.65	------		0500	12.00	11,300
	1200	1.93	------		1500	12.74	------		0800	11.70	10,600
	1600	1.90	------		2200	13.32	------		1000	11.02	9,100
	1900	2.15	------		2300	13.33	------		1300	10.47	8,100
	2200	3.04	------		2400	13.33	------		1500	10.47	8,100
	2400	3.39	776						1800	9.38	6,370
				7	0600	12.56	------		1900	8.41	5,080
Apr. 1	0300	4.06	1,100		0900	11.34	------		2000	7.54	4,040
	0700	4.48	1,360		1300	10.24	------		2200	6.59	3,050
	0900	4.49	1,360		1800	11.16	------		2400	6.20	2,700
	1300	4.26	1,220		2400	12.41	------				
	1700	4.95	1,680					13	0600	5.54	2,150
	2000	5.92	2,460	8	0400	11.60	10,300		1200	4.68	1,500
	2200	6.26	2,750		0600	10.61	8,340		1800	4.14	1,140
	2400	6.49	2,960		0900	9.77	6,960		2400	3.81	965

(151) Root River near Rushford, Minn.

(Miscellaneous site)

Location.—Lat 43°47'52", long 91°48'16", SW¼NW¼ sec.21, T.104 N., R.8 W., at bridge on U.S. Highway 16, 2.8 miles west of Rushford, Minn.

Drainage area.—1,019 sq mi.

Gage-height record.—Occasional readings made from chain gage during the flood. Datum of gage is 700.00 ft above mean sea level, adjustment of 1912. (Levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage-height (feet)
March–May 1965:		
Mar. 2	Unknown	[a]44.08
Apr. 7	15,500	41.10
1952 to February 1965:		
Mar. 31, 1952	34,600	(b)

[a]Backwater from ice
[b]Stage unknown, discharge determined at site 2.8 miles downstream.

Cooperation: Peak stages furnished by Corps of Engineers.

(152) 5–3845. Rush Creek near Rushford, Minn.

Location.—Lat 43°50'00", long 91°46'40", on line between secs.3 and 10, T.104 N., R.8 W., on downstream side near center of span of highway bridge, 1½ miles northwest of Rushford and 3 miles upstream from mouth.

Drainage area.—129 sq mi.

Gage-height record.—Graph drawn on the basis of once or twice-daily wire-weight gage readings and floodmark Mar. 1, 2 and twice-daily observer's and many engineers' wire-weight gage readings Mar. 31 to Apr. 11. Average of twice-daily wire-weight gage readings for remainder of period except Mar. 3 when one reading is available. Datum of gage is 735.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 20, 21, 24.

Maxima.—Given in following table.

	Discharge (cfs)	Gage-height (feet)
March–May 1965:		
Mar. 1, 2100 hours	3,130	8.75
Apr. 6, 0500 hours	5,490	9.06
1942 to February 1965:		
Mar. 26, 1950	[a]11,600	13.54

[a]From rating curve extended above 1,400 cfs on basis of contracted-opening measurements at gage heights 11.0 and 13.5 ft.

Mean discharge, in cubic feet per second, 1965, of Rush Creek near Rushford, Minn.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,600	1,020	37	11	46	242	37	21	37	40	36
2	699	404	37	12	42	217	36	22	34	39	36
3	76	268	38	13	46	108	36	23	34	39	36
4	68	1,330	38	14	44	51	36	24	36	40	36
5	59	1,640	39	15	44	48	37	25	32	44	37
6	65	3,770	37	16	44	44	37	26	34	42	42
7	87	1,700	36	17	44	44	37	27	37	41	38
8	58	1,950	36	18	42	44	37	28	36	40	37
9	54	815	39	19	42	42	37	29	40	39	36
10	49	212	38	20	40	41	35	30	44	38	36
								31	88	---	37
Monthly mean discharge, in cubic feet per second									119	480	37.0
Runoff, in inches									1.07	4.15	0.33

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	1.83	44	Apr. 2	0300	3.96	554	Apr. 7	0400	4.41	786
	0900	1.88	46		0600	3.57	421		0800	3.49	397
	1000	2.00	50		1200	2.95	254		1200	5.31	1,380
	1100	2.23	58		2100	3.47	391		1400	6.25	2,160
	1200	2.54	72		2400	3.43	385		1800	7.74	3,680
	1300	2.87	91						2000	6.82	2,680
	1500	3.39	126	3	0600	3.09	300		2400	5.76	1,740
	1800	4.01	200		1200	2.55	194				
	2400	4.96	367		1800	2.75	223	8	0400	4.33	738
					2400	3.17	313		0900	2.85	233
Mar. 1	0600	5.84	611						1200	4.40	780
	1200	6.94	1,320	4	0600	4.15	640		1400	6.25	2,160
	1800	8.42	2,800		1200	5.27	1,350		1600	7.50	3,400
	2100	8.75	3,130		1600	5.70	1,680		2000	8.20	4,260
	2400	8.15	2,530		2000	6.57	2,450		2400	6.95	2,800
					2400	5.99	1,930				
2	0600	6.23	1,030					9	0200	6.09	2,020
	1200	4.35	380	5	0400	5.10	1,230		0400	5.20	1,300
	1500	3.36	188		0800	4.25	692		0800	3.45	385
	1800	2.49	100		1200	3.87	520		1000	2.71	206
	2400	2.37	92		1400	4.45	810		1400	3.30	343
					1600	5.35	1,410		1800	4.51	846
30	2400	1.55	48		1800	6.31	2,220		2400	3.77	484
					2000	7.08	2,930				
31	1200	1.64	55		2400	8.23	4,310	10	0400	2.93	250
	1800	1.98	92						0800	2.06	107
	2100	2.45	162	6	0500	9.06	5,490		1800	2.81	225
	2400	3.11	292		0800	8.80	5,110		2400	2.58	182
					1000	8.43	4,590				
Apr. 1	0300	3.74	474		1400	7.55	3,460	11	0800	2.23	127
	0600	4.40	780		1800	6.78	2,640		1400	2.87	237
	1200	5.19	1,290		2000	6.30	2,210		1800	3.47	391
	1800	5.40	1,450		2400	5.36	1,420		2400	3.33	351
	2400	4.57	882								

(153) 5–3850. *Root River near Houston, Minn.*

Location.—Lat 43°46'05", long 91°35'11", in sec.32, T.104 N., R.6 W., on right bank 1 mile west of Houston and 2½ miles upstream from South Fork.

Drainage area.—1,270 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except 0600 hours Mar. 1 to 1100 hours Mar. 3 and 0100 hours May 27 to 2400 hours May 31. The graph was constructed on the basis of floodmark and twice or more daily readings made from reference point, 0600 hours Mar. 1 to 1100 hours Mar. 3. Datum of gage is 671.86 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1–31. Discharge May 27–31 estimated on basis of weather records and records for station Root River near Lanesboro.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 2, 1200 hours	31,000	[a]18.32
Apr. 7, 0200 hours	19,800	12.37
1909–17, 1929 to February 1965:		
Apr. 1, 1952	37,000	13.90
Mar. 27, 1961	Unknown	15.10

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	7,400	2,590	673	11	468	6,600	626	21	340	964	454
2	20,000	4,290	641	12	449	10,000	561	22	330	892	414
3	7,600	3,460	600	13	433	5,660	528	23	330	838	394
4	1,900	7,950	595	14	418	2,460	504	24	330	790	390
5	1,200	11,500	590	15	402	1,900	490	25	325	796	394
6	700	16,300	646	16	387	1,610	490	26	325	802	410
7	600	18,800	1,280	17	375	1,420	504	27	325	844	500
8	578	16,300	1,030	18	367	1,270	561	28	325	880	779
9	517	17,100	784	19	361	1,140	585	29	330	802	561
10	494	9,170	700	20	350	1,040	504	30	390	727	405
								31	500	------	472
Monthly mean discharge, in cubic feet per second									1,576	4,963	586
Runoff, in inches									1.43	4.36	0.53

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	4.48	------	Mar. 2	1200	18.32	31,000	Mar. 3	2400	13.41	-----
	0600	7.22	------		1500	18.17	------				
	1200	12.95	------		1800	17.90	------	4	0600	13.07	-----
	1800	15.08	------		2100	17.58	------		1200	12.74	-----
	2400	15.98	------		2400	17.20	------		1800	12.52	-----
									2400	12.15	-----
2	0300	16.56	------	3	0600	15.65	------				
	0600	17.16	------		1200	14.03	------	5	0600	11.73	-----
	0900	17.75	------		1800	13.71	------		1200	11.67	-----

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Root River near Houston, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 5	1800	11.88	------	Apr. 4	0400	8.06	6,110	Apr. 9	1000	11.87	17,400
	2400	11.58	------		0700	8.73	7,300		1300	11.95	17,700
					0900	9.02	7,850		1700	11.82	17,200
6	0900	10.67	------		1100	9.15	8,100		1900	11.65	16,400
	1100	10.79	------		1400	9.40	8,580		2200	11.65	16,400
	1400	10.74	------		1500	9.65	9,180		2400	11.43	15,500
	1900	10.94	------		1600	9.52	8,850				
	2400	10.52	------		2200	9.96	10,100	10	0600	10.20	10,800
					2400	10.13	10,600		1200	9.18	8,150
7	0900	9.53	------						1900	8.30	6,520
	1200	9.66	------	5	0100	10.24	10,900		2100	8.36	6,630
	1500	9.58	------		0600	10.27	11,000		2400	8.31	6,540
	1900	9.88	------		1000	10.39	11,400				
	2400	9.54	------		1400	10.39	11,400	11	0400	8.41	6,860
					1700	10.59	12,100		0600	8.51	6,900
30	2400	2.21	------		1900	10.51	11,800		1200	8.29	6,500
					2400	10.82	13,000		1800	7.83	5,730
31	0600	2.19	------						2400	9.07	7,940
	1200	2.28	------	6	0600	11.33	15,100				
	1800	2.57	------		0800	11.51	15,800	12	0200	9.42	8,620
	2400	2.86	856		1000	11.34	15,100		0500	9.25	8,280
Apr. 1	0600	4.08	1,650		1200	11.63	16,300		1200	9.93	9,980
	1200	5.51	2,740		1700	11.90	17,500		1800	10.45	11,600
	1800	6.18	3,420		2400	12.28	19,400		2100	10.53	11,900
	2400	6.84	4,230						2400	10.36	11,300
				7	0200	12.37	19,800				
2	0400	7.26	4,830		0400	12.33	19,600	13	0300	9.93	9,990
	0700	7.34	4,950		0500	12.19	18,900		0600	8.71	7,260
	1000	7.25	4,820		1100	12.19	18,900		0900	7.61	5,380
	1500	6.74	4,090		1400	12.05	18,200		1200	7.06	4,530
	2200	6.17	3,410		1900	12.15	18,700		1800	6.33	3,590
	2400	6.27	3,520		2400	12.10	18,500		2400	5.79	3,000
3	0300	6.53	3,830	8	0600	11.40	15,400	14	0600	5.40	2,640
	0600	6.51	3,800		1000	11.35	15,200		1200	5.12	2,420
	1500	6.00	3,220		1700	11.60	16,200		1800	4.90	2,240
	2000	5.88	3,090		2200	11.87	17,400		2400	4.74	2,120
	2400	6.30	3,550		2400	11.81	17,100				
4	0200	7.18	4,710	9	0600	11.90	17,500				

(154) 5–3855. South Fork Root River near Houston, Minn.

Location.—Lat 43°44', long 91°34, in NE¼SW¼ sec.9, T.103 N., R.6 W., on left bank 50 ft downstream from bridge on State Highway 76, half a mile upstream from Badger Creek and 1½ miles south of Houston.

Drainage area.—275 sq mi.

Gage-height record.—Water-stage recorder graph except 2230 hours Feb. 28 to 1550 hours Mar. 1, 2230 hours Mar. 2 to 1230 hours Mar. 3 and 0100 hours Apr. 17 to 2400 hours Apr. 19 when graph was constructed on the basis of adjacent record. Datum of gage is 680.41 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. No gage height record Apr. 17–19, discharge estimated on the basis of adjacent record and weather records. Backwater from ice Mar. 1–28, 30, 31.

Maxima.—Given in following table.

	Discharge (cfs)	Gage-height (feet)
March–May 1965:		
Mar. 2, 0400 hours	6,530	[e]13.64
Apr. 6, 0930 hours	4,170	11.86
1953 to February 1965:		
Mar. 29, 1962	8,420	13.35
Mar. 26, 1961	-----	[a]13.74

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,900	1,090	111	11	100	982	97	21	105	105	80
2	2,700	978	106	12	100	920	96	22	100	102	80
3	300	658	102	13	98	307	95	23	98	101	85
4	145	2,320	100	14	97	218	94	24	97	105	82
5	140	2,250	105	15	96	195	122	25	96	122	91
6	130	3,770	103	16	92	179	166	26	95	130	868
7	125	2,260	101	17	95	151	97	27	95	125	253
8	120	2,500	103	18	105	133	94	28	94	126	146
9	110	1,910	106	19	110	118	80	29	92	117	123
10	105	783	97	20	109	109	80	30	94	114	108
								31	146	------	111
Monthly mean discharge, in cubic feet per second									319	766	132
Runoff, in inches									1.34	3.11	0.55

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of South Fork Root River near Houston, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	3.81	-----	Mar. 8	0200	7.13	-----	Apr. 5	1200	9.33	1,490
	1400	3.91	-----		0400	6.53	-----		1500	8.28	1,240
	2000	4.98	-----		0800	5.91	-----		1800	9.46	1,530
	2100	5.73	-----		1200	5.56	-----		2100	10.60	2,110
	2200	7.66	-----		1800	5.15	-----		2400	11.44	3,290
	2300	8.80	-----		2400	4.30	-----				
	2400	9.95	-----					6	0600	11.80	4,030
				9	0600	3.76	-----		0930	11.86	4,170
Mar. 1	0200	10.70	-----		1200	3.43	-----		1800	11.60	3,600
	0400	11.75	-----		1800	3.12	-----		2400	11.52	3,440
	0800	12.34	-----		2400	2.94	-----				
	1200	12.65	-----					7	0600	11.20	2,860
	1800	13.04	-----	30	2400	2.38	-----		0800	10.54	2,060
	2400	13.55	-----						1000	9.53	1,550
2	0400	13.64	6,530	31	1400	2.02	-----		1200	8.54	1,300
	0800	13.30	-----		1800	2.30	-----		1300	8.12	1,210
	1000	12.68	-----		2100	3.04	-----		1500	8.62	1,310
	1200	12.02	-----		2400	4.16	449		1700	10.00	1,720
	1600	11.24	-----						2000	10.81	2,330
	2000	10.16	-----	Apr. 1	0400	5.25	645		2400	11.42	3,250
	2400	9.16	-----		0600	6.58	897				
					0800	7.65	1,110	8	0500	11.47	3,340
3	0400	8.50	-----		1200	8.25	1,230		0800	10.59	2,110
	0800	7.98	-----		1800	8.54	1,300		1000	9.27	1,480
	1200	7.57	-----		2400	9.14	1,440		1200	8.03	1,190
	1800	7.28	-----						1300	7.76	1,130
	2400	7.04	-----	2	0100	9.31	1,490		1500	9.05	1,420
					0500	8.80	1,360		1700	10.40	1,940
4	1200	6.48	-----		0800	7.78	1,130		1900	11.09	2,700
	2400	6.29	-----		1000	7.06	989		2200	11.71	3,830
					1200	6.41	865		2400	11.67	3,750
5	1200	6.34	-----		1800	5.32	658				
	1400	7.00	-----		2400	5.51	916	9	0200	11.62	3,640
	1800	8.00	-----						0500	11.67	3,750
	2000	8.41	-----	3	0300	5.36	665		0800	10.98	2,540
	2400	8.14	-----		0700	5.93	774		0900	10.15	1,780
					1200	5.02	604		1000	9.52	1,550
6	0400	7.36	-----		1800	4.26	467		1100	8.70	1,330
	0700	6.99	-----		2200	5.62	715		1200	7.94	1,170
	1000	6.73	-----		2400	7.87	1,150		1300	7.22	1,020
	1400	6.99	-----						1400	6.79	937
	1800	7.77	-----	4	0100	8.97	1,400		1700	6.38	859
	2200	8.44	-----		0200	9.71	1,610		2000	6.97	971
	2400	8.19	-----		0400	10.34	1,900		2400	7.14	1,000
					0600	10.77	2,290				
7	0400	7.47	-----		1000	11.20	2,860	10	0400	6.77	914
	0800	6.81	-----		1400	10.88	2,420		0800	6.12	810
	1400	6.43	-----		1900	10.54	2,060		1200	5.27	649
	1800	7.25	-----		2400	11.40	3,210		1600	4.86	575
	2000	7.97	-----						2000	5.66	722
	2200	8.54	-----	5	0200	11.45	3,300		2200	6.53	888
	2400	7.97	-----		0800	11.00	2,570		2400	7.38	1,050

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of South Fork Root River near Houston, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0200	7.62	1,100	Apr. 11	2100	9.14	1,440	Apr. 12	1200	6.15	816
	0600	6.95	968		2300	9.67	1,600		1400	5.63	717
	1200	5.99	785		2400	9.63	1,480		1800	4.66	539
	1600	5.17	631						2400	3.91	405
	1800	5.88	764	12	0600	8.96	1,390				
	1900	6.76	931		0800	8.12	1,200	13	1200	3.22	290
	2000	8.03	1,190		1000	7.06	989		2400	2.92	242

(155) 5–3860. Root River below South Fork near Houston, Minn.

(Gaging station, discontinued 1961)

Location.—Lat 43°46'13", long 91°32'03", in SE¼NE¼ sec.34, T.104 N., R.6 W., on right bank 600 ft downstream from South Fork and 1½ miles northeast of Houston.

Drainage area.—1,560 sq mi, approximately.

Gage-height record.—Peak stages only from chain gage readings. Datum of gage is 660.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Peak discharge obtained by summation of peaks for Root River and South Fork Root River near Houston.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (feet)
March–May 1965:		
Mar. 2	37,500	[a]18.50
Apr. 7	24,000	16.50
1938 to February 1965:		
Apr. 1, 1952	38,700	17.58

[a]Backwater from ice.

Cooperation.—Peak stages furnished by Corps of Engineers.

MORMON CREEK BASIN

(156) 5–3863. Mormon Creek near La Crosse, Wis.

(Crest-stage station)

Location.—Lat 43°46'00", long 91°08'27", in NE¼ sec.19, T.15 N., R.6 W., at bridge on country road 0.2 mile north of intersection with U.S. Highways 14 and 61, and 6.2 miles southeast from junction of U.S. Highways 14 and 61 and State Highway 33 in La Crosse.

Drainage area.—25.5 sq mi.

Gage-height record.—Crest stages only.

Maxima.—March–May 1965: Gage height, 11.0 ft April 2, 1965.
1961 to February 1965: Gage height, 11.57 ft Mar. 25, 1961.

BAD AXE RIVER BASIN

(157) 5–3871. North Fork Bad Axe River near Genoa, Wis.

(Crest-stage station)

Location.—Lat 43°33'10", long 91°08'58", in SW¼ sec.36, T.13 N., R.7 W., at bridge on State Highway 56, 4.1 miles southeast from Genoa, and 13.1 miles west of Viroqua.

Drainage area.—80.7 sq mi.

Gage-height record.—Water-stage recorder graph.

Maxima.—March–May 1965: Gage height, 15.91 ft Mar. 5.
1959 to February 1965: Gage height, 18.62 ft Aug. 29, 1959.

UPPER IOWA RIVER BASIN

(158) 5–3875. Upper Iowa River at Decorah, Iowa

Location.—Lat 43°18'20", long 91°48'05", in NE¼SW¼ sec.16, T.98 N., R.8 W., on right bank 1,200 ft upstream from bridge on State Highway 52, 1,500 ft downstream from Dry Run cutoff, and 3 miles upstream from Trout Run.

Drainage area.—511 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 850.00 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 20,000 cfs.

Maxima.—March–May 1965: Discharge, 9,800 cfs 0300 hours Mar. 2 (gage height, 9.89 ft).
1913 to February 1965: Discharge, 28,500 cfs May 29, 1941 (gage height, 15.19 ft), at site of former gaging station near Decorah, 4 miles downstream.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	5,700	2,140	243	11	182	3,010	206	21	118	260	163
2	8,350	2,420	226	12	166	3,440	189	22	106	238	151
3	1,770	2,460	214	13	163	2,360	176	23	121	234	151
4	648	4,490	200	14	151	832	170	24	111	226	142
5	462	5,460	196	15	148	620	163	25	127	275	190
6	402	7,910	192	16	136	501	200	26	104	355	2,090
7	402	7,470	617	17	136	432	170	27	98	420	522
8	320	6,430	456	18	94	366	238	28	89	372	390
9	243	5,240	285	19	118	315	203	29	86	300	315
10	203	2,880	230	20	121	285	176	30	98	265	275
								31	533	------	243
Monthly mean discharge, in cubic feet per second									694	2,067	303
Runoff, in inches									1.57	4.51	0.68
Runoff, in acre-feet									42,660	123,000	18,610

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Upper Iowa River at Decorah, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	2400	5.84	1,220	Mar. 1	1800	9.25	7,760	Mar. 2	2100	9.20	7,620
					1900	9.17	7,530		2300	9.29	7,880
Mar. 1	0200	5.82	1,220		2100	9.28	7,850		2400	8.95	6,900
	0400	6.10	1,490		2300	9.65	9,000				
	0530	6.60	2,100		2400	9.51	8,560	3	0200	7.50	3,590
	0700	7.00	2,720						0400	6.87	2,500
	0800	8.83	6,580	2	0300	9.89	9,800		0700	6.30	1,720
	0900	8.03	4,640		0900	9.48	8,470		1200	5.84	1,220
	1100	8.90	6,770		1300	9.25	7,760		1800	5.61	1,010
	1300	9.60	8,840		1800	9.32	7,970		2400	5.35	800
	1500	9.16	7,500								

MISSISSIPPI RIVER MAIN STEM

(159) Mississippi River at Lansing, Iowa

(Miscellaneous site)

Location.—NE¼ sec.29, T.99 N., R.3 W., at bridge on U.S. Highway 9 at Lansing.

Drainage area.—66,280 sq mi.

Discharge record.—Discharge obtained by current-meter measurement near peak.

Maximum.—March–May 1965: Discharge, 272,000 cfs Apr. 24, (gage height, 634.8 ft).

WEXFORD CREEK BASIN

(160) 5–3884. Wexford Creek near Harpers Ferry, Iowa

(Crest-stage station)

Location.—SE¼ sec.25, T.98 N., R.3 W., at bridge, 5 miles north of Harpers Ferry.

Drainage area.—11.9 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by step-backwater computations and current-meter measurement at 575 cfs.

Maxima.—March–May 1965: Discharge, peak stage did not reach bottom of gage.
1953 to February 1965: Discharge, 2,290 cfs July 2, 1962 (gage height, 7.03 ft).

PAINT CREEK BASIN

(161) 5–3885. Paint Creek at Waterville, Iowa

Location.—Lat 43°12'35", long 91°18'20", in NW¼NW¼ sec.22, T.97 N., R.4 W., on right bank 20 ft downstream from bridge on State Highway 373 and 0.5 mile northwest of Waterville.

Drainage area.—42.8 sq mi.

Gage-height record.—Water-stage recorder graph.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 3,000 cfs, extended to 9,100 cfs by logarithmic plotting and computed results of indirect measurement further downstream. Backwater from ice Mar. 1–3, 12–26, 30, 31.

Maxima.—March–May 1965: Discharge, 1,920 cfs 2130 hours Apr. 3; gage-height, 7.60 ft 1700 hours Mar. 1 (backwater from ice).
1951 to February 1965: Discharge, 9,100 cfs August 1951 (gage height, 17.35 ft). A stage higher than that of August 1951 may have occurred during the spring of 1949.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	900	534	4.9	11	7.6	78	3.4	21	2.7	4.7	3.8
2	50	88	4.5	12	4.0	31	3.4	22	2.6	4.5	3.6
3	15	342	4.0	13	3.1	12	3.4	23	2.5	4.2	3.6
4	6.0	393	3.9	14	6.0	8.9	3.4	24	2.5	4.9	3.5
5	118	337	4.0	15	8.0	8.1	3.6	25	2.5	7.4	9.6
6	77	314	4.0	16	5.0	6.4	18	26	2.5	9.6	420
7	145	150	3.8	17	4.0	6.0	4.5	27	2.6	6.4	18
8	79	186	3.6	18	3.3	5.6	14	28	2.7	7.4	11
9	33	40	3.9	19	3.0	5.1	5.6	29	2.8	5.8	8.1
10	15	31	3.5	20	2.8	4.9	4.2	30	35	5.2	7.4
								31	350	------	6.4
Monthly mean discharge, in cubic feet per second									61.1	88.0	19.3
Runoff, in inches									1.65	2.29	0.52
Runoff, in acre-feet									3,760	5,240	1,190

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	2.88	------	Mar. 1	0100	5.66	-----	Mar. 1	2200	5.50	-----
	0400	2.77	------		0300	5.88	-----		2300	5.00	-----
	0900	2.76	------		0400	5.90	-----		2400	4.61	-----
	1100	2.80	------		0430	5.97	-----				
	1230	2.88	------		0500	5.91	-----	Apr. 2	2400	3.94	97
	1300	3.32	------		0800	5.73	-----				
	1400	4.30	------		1000	5.70	-----	3	0330	3.75	65
	1430	4.68	------		1200	5.99	-----		0800	3.55	41
	1500	5.40	------		1230	6.12	-----		1030	3.55	41
	1530	6.63	------		1330	6.02	-----		1200	3.64	51
	1600	6.40	------		1500	6.36	-----		1330	3.65	52
	1800	6.88	------		1600	7.07	-----		1600	3.77	68
	2000	6.47	------		1700	7.60	-----		1700	3.92	93
	2200	6.00	------		1900	6.74	-----		1800	4.28	177
	2400	5.63	------		2100	6.00	-----		1830	4.55	270

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Paint Creek at Waterville, Iowa—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	1900	4.88	438	Apr. 4	0200	5.64	870	Apr. 4	1330	4.36	202
	1930	5.30	690		0300	5.20	630		1400	4.50	250
	2000	5.98	1,010		0400	4.87	432		1500	4.85	420
	2030	6.40	1,190		0500	4.63	305		1600	5.05	540
	2100	6.90	1,500		0600	4.43	226		1730	5.13	588
	2130	7.32	1,920		0730	4.25	169		2000	4.88	438
	2300	6.95	1,550		0900	4.12	136		2100	4.68	330
	2400	6.54	1,260		1100	4.04	118		2230	4.48	243
					1230	4.15	143		2400	4.28	177
4	0130	6.00	1,020								

(162) 5–3886. Paint Creek near Waterville, Iowa

(Crest-stage station)

Location.—Near center sec.36, T.97 N., R.4 W., at bridge 3 miles southeast of Waterville.

Drainage area.—56.0 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 1,500 cfs and by slope-area measurements at 3,040 cfs and 10,800 cfs.

Maxima.—March–May 1965: Discharge, about 2,190 cfs Apr. 3 (gage height, 10.35 ft, backwater from ice).
1953 to February 1965: Discharge, 4,870 cfs Mar. 27, 1960 (gage height, 13.81 ft)

Remarks.—Flood of Aug. 5, 1951 reached a stage of 17.00 ft (discharge, 10,800 cfs).

(163) 5–3887. Little Paint Creek tributary near Waterville, Iowa

(Crest-stage station)

Location.—SW$\frac{1}{4}$ sec.1, T.97 N., R.4 W., at culvert, 3$\frac{1}{2}$ miles northeast of Waterville.

Drainage area.—1.09 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 180 cfs and step-backwater computations.

Maxima.—March–May 1965: Discharge, peak stage did not reach bottom of gage.
1953 to February 1965: Discharge, 404 cfs June 28, 1959 (gage height, 4.34 ft).

MISSISSIPPI RIVER MAIN STEM

(164) 5–3895. Mississippi River at McGregor, Iowa

Location.—Lat 43°01'30", long 91°10'20", in SE¼SE¼ sec.22, T.95 N., R.3 W., on right bank in city park at north end of Main Street in McGregor, 2.6 miles upstream from Wisconsin River, 4.3 miles downstream from Yellow River, and at mile 633.4 from Ohio River. Auxiliary gage located at site 14.1 miles upstream in tailwater of Dam 9.

Drainage area.—67,500 sq mi, approximately.

Gage-height record.—Water-stage recorder graph, except Mar. 22–25. Datum of gage is 605.30 ft above mean sea level, adjustment of 1912, and auxiliary gage is 600.00 ft.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 276,000 cfs and is affected by backwater from Wisconsin River and Dam 10. Fall is used as a factor. Backwater from ice Mar. 1–31.

Maxima.—March–May 1965: Daily discharge, 276,000 cfs Apr. 24. Gage height, 25.38 ft 0400 hrs Apr. 24.

1936 to February 1965: Daily discharge, 197,500 cfs Apr. 22, 1952. Gage height, 20.89 ft Apr. 23, 1952.

Maximum stage known since at least 1828, that of Apr. 24, 1965.

Remarks.—Flow regulated by reservoirs and navigation dams.

Mean gage height, in feet, and discharge, in cubic feet per second, 1965

Day	March		April		May	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	7.47	24,700	8.11	23,100	22.08	203,000
2	8.82	41,000	8.49	33,200	21.42	191,000
3	10.08	56,900	8.85	39,500	20.70	181,000
4	11.29	63,300	9.30	46,800	19.91	169,000
5	12.53	59,800	9.74	54,600	18.94	159,000
6	13.35	59,300	10.39	64,600	18.08	150,000
7	13.48	56,200	11.24	74,400	17.38	139,000
8	13.40	52,500	12.22	87,000	16.76	129,000
9	13.15	47,700	13.48	109,000	16.10	123,000
10	12.81	43,000	14.94	121,000	15.38	117,000
11	12.35	39,000	16.03	132,000	14.70	110,000
12	11.70	35,400	16.78	140,000	14.17	106,000
13	11.01	33,600	17.25	146,000	13.82	101,000
14	10.49	31,400	17.72	153,000	13.62	98,800
15	9.88	23,500	18.33	165,000	13.55	99,000
16	9.18	23,000	19.02	173,000	13.58	101,000
17	8.75	19,100	19.88	185,000	13.55	99,000
18	8.87	18,100	20.80	196,000	13.50	100,000
19	8.70	18,700	21.92	211,000	13.42	97,200
20	8.51	19,100	23.27	238,000	13.37	96,100
21	8.27	16,200	24.31	256,000	13.45	95,900
22	7.95	16,300	24.98	268,000	13.62	95,500
23	7.94	16,700	25.32	275,000	13.78	96,000
24	7.94	16,700	25.36	276,000	13.82	94,900
25	7.94	16,600	25.21	270,000	13.70	96,300
26	7.98	16,400	24.88	264,000	13.58	95,500
27	8.05	16,500	24.39	255,000	13.42	96,100
28	8.08	17,200	23.89	242,000	13.18	93,400
29	8.11	18,000	23.27	231,000	12.83	89,000
30	8.02	16,100	22.71	216,000	12.67	87,100
31	7.84	17,100	----------	----------	12.60	84,300
Mean		30,620		164,800		115,900
Inches		0.52		2.72		1.98
Acre-feet		1,883,000		9,809,000		7,127,000

Annual maximum stages and mean daily discharges, for indicated years, of Mississippi River at McGregor, Iowa

Year	Date	Gage height (feet)	Discharge (cfs)	Year	Date	Gage height (feet)	Discharge (cfs)
1826	May	[a]26.0	--------	1948	Apr. 11	12.81	84,000
1880	June 22	[a]21.5	196,000	1949	Apr. 4, 13	11.42	73,100
1881	Oct. 21	[a]19.0	--------	1950	May 17	15.26	123,000
1888	May 13	[a]20.1	--------	1951	Apr. 22	20.83	185,700
1916	May 1	[a]18.3	--------	1952	Apr. 22	20.89	197,500
1920	Apr. 4, 5	[a]19.6	--------	1953	July 3	[d]12.90	86,200
1922	Apr. 19	[a]19.4	--------	1954	May 9	18.69	165,500
1937	May 6, 9	16.68	54,700	1955	Apr. 14	12.20	73,700
1938	May 27	[b]23.75	101,400	1956	Apr. 15, 16	14.88	105,000
1939	Apr. 6	15.76	96,900	1957	July 8	12.80	95,800
1940	Apr. 19	[c]10.50	52,100	1958	Apr. 14	8.98	55,800
1941	Apr. 20	14.66	102,800	1959	Apr. 3	12.32	72,300
1942	June 7	17.38	113,800	1960	June 4, 5	[e]16.08	83,100
1943	June 28	16.89	124,600	1961	Mar. 29, 30	15.47	114,000
1944	June 24	16.17	122,500	1962	Apr. 18–20	15.12	104,000
1945	Mar. 29	16.80	127,700	1963	Apr. 1	11.84	72,000
1946	Mar. 29	15.84	101,200	1964	May 19	11.56	75,600
1947	Apr. 21	13.70	85,500	1965	Apr. 24	25.38	276,000

[a]At Prairie du Chien, Wisconsin. Zero of gage at elevation 605.4 ft above mean sea level, adjustment of 1912.
[b]Occurred Sept. 18, 1938.
[c]Occurred June 17, 1940.
[d]Occurred Mar. 31, 1953.
[e]Occurred May 14, 15, 1960.

WISCONSIN RIVER BASIN

(165) 5–3901. Lac Vieux Desert near Land O'Lakes, Wis.

Location.—Lat 46°07'20", long 89°09'10", in SE¼NE¼ sec.17, T.42 N., R.11 E., head of Wisconsin River, 5 miles southeast of village of Land O'Lakes.

Drainage area.—28 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,679.53 ft above mean sea level, datum of 1929.

Maxima.—March to May 1965: Contents at end of week, 444 million cubic feet May 16 (gage height, 2 ft 0.5 in).
1938 to February 1965: Contents on last day of month, 556 million cubic feet Apr. 30, 1951 (gage height, 2 ft 6-3/4 in).

Remarks.—Reservoir operation began in 1908. Usable capacity 652 million cubic feet between gage heights -0 ft 2 in and 3 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	-0	2	0	Apr. 18	0	4	96
Mar. 7	-0	2	0	25	0	8	161
14	-0	2	0	May 2	1	1	246
21	-0	2	0	9	1	7.5	356
28	-0	2	0	16	2	.5	444
Apr. 4	0	.75	44	23	2	0	435
11	0	1.5	56	30	1	10.5	408

(166) 5–3901.5 Twin Lakes near Phelps, Wis.

Location.—Lat 46°01'20", long 89°10'10", in SW¼NE¼ sec.19, T.41 N., R.11 E., on Twin River, 5 miles southwest of Phelps.

Drainage area.—26 sq mi, approximately.

Gage-height record.—Staff gage. Altitude of gage is 1,640 ft (from river-profile map).

Maxima.—March to May 1965: Contents at end of week, 286 million cubic feet May 16, 30 (gage height, 2 ft 2 in).
1938 to February 1965: Contents on last day of month, 330 million cubic feet April 30, 1947 (gage height, 2 ft 5¼ in).

Remarks.—Reservoir operation began in 1908. Reservoir includes North and South Twin Lakes. Usable capacity Oct. 1 to May 31, 313 million cubic feet between gage heights 0 ft 4 in and 2 ft 4 in, and June 1 to Sept. 30, 261 million cubic feet between gage heights 0 ft 8 in and 2 ft 4 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Twin Lakes near Phelps, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	0	4	0	Apr. 18	0	8	52
Mar. 7	0	4	0	25	0	11	91
14	0	4	0	May 2	1	2.5	136
21	0	4	0	9	1	7	195
28	0	4	0	16	2	2	286
Apr. 4	0	5	13	23	2	1.5	280
11	0	7	39	30	2	2	286

(167) 5–3902. Buckatabon Lake near Conover, Wis.

Location.—Lat 46°01'15", long 89°18'35", in SE¼NE¼ sec.24, T.41 N., R.9 E., on Buckatabon Creek, 3.3 miles southwest of Conover.

Drainage area.—14 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,637.85 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 126 million cubic feet May 16 (gage height, 3 ft 7 in).
1938 to February 1965: Contents on last day of month, 128 million cubic feet Sept. 30, 1943 (gage height, 3 ft 7½ in).

Remarks.—Reservoir operation began in 1908. Reservoir includes Upper and Lower Buckatabon Lakes. Usable capacity 130 million cubic feet between gage heights 0 ft 6 in and 3 ft 8 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	0	6	0	Apr. 18	1	10	49
Mar. 7	0	6.5	2	25	2	4	70
14	0	6.5	2	May 2	2	8	84
21	0	6.5	2	9	3	2.5	108
28	0	6.5	2	16	3	7	126
Apr. 4	0	11.5	16	23	3	4.5	116
11	1	4	30	30	3	4.5	116

(168) 5–3902.5 Sevenmile Lake near Eagle River, Wis.

Location.—Lat 45°52'30", long 89°04'10", in SE¼NE¼ sec.11, T.39 N., R.11 E., on Sevenmile Creek, 9.1 miles southeast of village of Eagle River

Drainage area.—14 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,646.30 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 91 million cubic feet May 16 (gage height, 4 ft 9 in).
1938 to February 1965: Contents on last day of month, 89 million cubic feet June 30 and Aug. 31, 1953 and June 30 and July 31, 1961 (gage height, 4 ft 8 in).

Remarks.—Reservoir operation began in 1908. Usable capacity 93 million cubic feet between gage heights 0 ft 6 in and 4 ft 10 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Company.

Gage height, in feet and inches, and contents, in millions of cubic feet. 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	0	6	0	Apr. 18	2	4	37
Mar. 7	0	6	0	25	3	0	52
14	0	6	0	May 2	3	8	66
21	0	6	0	9	4	7	87
28	0	6	0	16	4	9	91
Apr. 4	1	2	12	23	4	7	87
11	1	6	20	30	4	7	87

(169) 5–3903. Lower Ninemile Lake near Eagle River, Wis.

Location.—Lat 45°53'35", long 89°07'15", in NE¼NW¼ sec.4, T.39 N., R.11 E., on Ninemile Creek, 6.6 miles southeast of village of Eagle River.

Drainage area.—25 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,638.27 ft above mean sea level (levels of Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 136 million cubic feet May 16 (gage height, 6 ft 5 in).
1938 to February 1965: Contents on last day of month, 130 million cubic feet July 31, 1961 (gage height, 6 ft 3 in).

Remarks.—Reservoir operation began in 1908. Usable capacity 121 million cubic feet between gage heights 1 ft 5 in and 6 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Lower Ninemile Lake near Eagle River Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	1	5	0	Apr. 18	4	10	80
Mar. 7	1	5	0	25	5	6	103
14	1	5	0	May 2	5	11	118
21	1	5	0	9	6	4	133
28	1	5	0	16	6	5	136
Apr. 4	3	1	32	23	6	3	130
11	3	9	48	30	6	3	130

(170) 5–3903.5 Burnt Rollways Reservoir near Eagle River, Wis.

Location.—Lat 45°53'40", long 89°08'30", in NE¼NW¼ sec.5, T.39 N., R.11 E., on Eagle River, 5.3 miles southeast of village of Eagle River.

Drainage area.—129 sq mi, approximately.

Gage-height record.—Staff gage. Altitude of gage is 1,620 ft (from river-profile map).

Maxima.—March to May 1965: Contents at end of week, 779 million cubic feet May 9, 16, 23, 30 (gage height, 1 ft 6 in).
1938 to February 1965: Contents on last day of month, 779 million cubic feet at times (gage height, 1 ft 6 in).

Remarks.—Reservoir operation began in 1908. Reservoir includes Whitefish, Big, Dog, Deer, Mud, Big Stone, Moccasin, Spirit, Medicine, Little Fork, Fourmile, Big Fork, Island, Round, Town Line, Range Line, Planting Ground, and Long Lakes. Usable capacity Nov. 1 to Apr. 30, 779 million cubic feet between gage heights -1 ft 3 in and 1 ft 6 in and May 1 to Oct. 31, 471 million cubic feet between gage heights 0 ft 0 in and 1 ft 6 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	-1	2	19	Apr. 18	0	1	333
Mar. 7	-1	1	39	25	0	11.5	604
14	-1	0	58	May 2	1	5.5	766
21	-0	11.5	68	9	1	6	779
28	-0	9.5	107	16	1	6	779
Apr. 4	-0	7.5	148	23	1	6	779
11	-0	5	200	30	1	6	779

(171) 5–3904. Long Lake near Phelps, Wis.

Location.—Lat 46°02'45", long 89°02'35", in NW¼SE¼ sec.7, T.41 N., R.12 E., on Deerskin River, 2.5 miles southeast of Phelps.

Drainage area.—35 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,695.14 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 371 million cubic feet May 16 (gage height 3 ft 9 in).
1938 to February 1965: Contents on last day of month, 332 million cubic feet June 30, 1953 (gage height, 3 ft 5 in).

Remarks.—Reservoir operations began in 1908. Usable capacity Oct. 1 to May 31, 400 million cubic feet between gage heights 0 ft 4 in and 4 ft 0 in and June 1 to Sept. 30, 332 million cubic feet between gage heights 1 ft 0 in and 4 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	0	4	0	Apr. 18	1	0.5	72
Mar. 7	0	4	0	25	2	3.5	206
14	0	4	0	May 2	2	9.5	261
21	0	4	0	9	3	4	323
28	0	4	0	16	3	9	371
Apr. 4	0	5	8	23	3	5	332
11	0	7	25	30	3	3	313

(172) 5–3906. Deerskin Lake near Eagle River, Wis.

Location.—Lat 45°59'05", long 89°09'40", in SE¼ sec. 31, T.41 N., R.11 E., on Deerskin Creek, 6.3 miles northeast of village of Eagle River.

Drainage area.—5 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,640.16 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 14 million cubic feet May 16 (gage height, 1 ft 5 in).
1938 to February 1965: Contents on last day of month, 22 million, cubic feet Oct. 31, 1938, May 31, and June 30, 1939, Apr. 30 and May 31, 1941, Sept. 30, 1959 (gage height, 2 ft 0 in).

Remarks.—The lake has been used as a reservoir since 1908. Usable capacity 22 million cubic feet between gage height 0 ft 4 in and 2 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Deerskin Lake near Eagle River, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	0	4	0	Apr. 18	0	8	4
Mar. 7	0	4	0	25	0	9	5
14	0	4	0	May 2	0	11	7
21	0	4	0	9	1	0	8
28	0	4	0	16	1	5	14
Apr. 4	0	4	0	23	1	3.5	12
11	0	7.5	4	30	1	3	11

(173) 5–3906.5 Sugar Camp Reservoir near Eagle River, Wis.

Location.—Lat 45°52'15", long 89°23'35", in NE¼ sec.17, T.39 N., R.9 E., on Sugar Camp Creek, 7.6 miles southwest of village of Eagle River.

Drainage area.—59 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,591.94 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 471 million cubic feet May 9 (gage height, 6 ft 6 in).
1938 to February 1965: Contents on last day of month, 471 million cubic feet Apr. 30, 1939, Sept. 30, Oct. 31, Nov. 30, Dec. 31, 1941, Sept. 30 and Nov. 30, 1942 (gage height 6 ft 6 in).

Remarks.—Reservoir operation began in 1908. Reservoir includes Chain, Echo, Stone, Sand, and Dam Lakes. Usable capacity Sept. 15 to May 31, 471 million cubic feet between gage height 1 ft 0 in and 6 ft 6 in and June 1 to Sept. 14, 180 million cubic feet between gage height 4 ft 0 in and 6 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	1	9	56	Apr. 18	3	5	193
Mar. 7	1	9	56	25	5	2	345
14	1	9	56	May 2	6	2	439
21	1	9	56	9	6	6	471
28	1	9	56	16	6	4	455
Apr. 4	1	9	56	23	6	1	431
11	2	4	102	30	6	0	423

(174) 5–3907. Little St. Germain Lake near Eagle River, Wis.

Location.—Lat 43°53'55", long 89°27'00", in SE¼ sec.35, T.40 N., R.8 E., on Little St. Germain Creek, 9.6 miles west of village of Eagle River.

Drainage area.—19 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,611.54 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 83 million cubic feet May 16 (gage height, 3 ft 1 in).
1938 to February 1965: Contents on last day of month, 83 million cubic feet Aug. 31, 1941 (gage height 3 ft 1 in).

Remarks.—The lake has been used as a reservoir since 1908. Usable capacity 79 million cubic feet between gage height 1 ft 2 in and 3 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	1	3	4	Apr. 18	1	10	29
Mar. 7	1	3.5	6	25	2	2	43
14	1	3	4	May 2	2	5.5	56
21	1	3	4	9	2	11.5	77
28	1	2.5	2	16	3	1	83
Apr. 4	1	4	7	23	2	11.5	77
11	1	7	18	30	2	11	75

(175) 5–3907.5 Big St. Germain Lake near Lake Tomahawk, Wis.

Location.—Lat 45°55'10", long 89°31'55", in SE¼ sec.30, T.40 N., R.8 E., on St. Germain River, 7.8 miles northeast of village of Lake Tomahawk.

Drainage area.—69 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,588.32 ft above mean sea level (levels by Public Service Commission of Wisconsin).

Maxima.—March to May 1965: Contents at end of week, 196 million cubic feet May 9 (gage height 3 ft 5 in).
1938 to February 1965: Contents on last day of month, 202 million cubic feet Dec. 31, 1946 (gage height, 3 ft 6 in).

Remarks.—The lake has been used as a reservoir since 1908. Reservoir includes Lake Content, and Big St. Germain and Fawn Lakes. Usable capacity, Sept. 15 to May 31, 202 million cubic feet between gage height 0 ft 6 in and 3 ft 6 in and June 1 to Sept. 14, 91 million cubic feet between gage height 1 ft 8 in and 3 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Big St. Germain Lake near Lake Tomahawk, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	0	6	0	Apr. 18	1	5	60
Mar. 7	0	7	5	25	2	0	100
14	0	6	0	May 2	2	9	151
21	0	6	0	9	3	5	196
28	0	6	0	16	3	3.5	188
Apr. 4	1	4	55	23	2	10	156
11	1	5	60	30	2	10	156

(176) 5–3908. Pickerel Lake near Lake Tomahawk, Wis.

Location.—Lat 45°52'20", long 89°31'45", in NE¼ sec.18 T.39 N., R.8 E., on St. Germain River 5 miles northeast of village of Lake Tomahawk.

Drainage area.—78 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,582.00 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 290 million cubic feet May 16 (gage height, 9 ft 0 in).
1938 to February 1965: Contents on last day of month, 306 million cubic feet Dec. 31, 1938, Apr. 30, 1947, Sept. 30, 1959 (gage height, 9 ft 4 in).

Remarks.—The dam was built in 1935. Usable capacity Sept. 15 to May 31, 338 million cubic feet between gage height 0 ft 0 in and 10 ft 0 in and June 1 to Sept. 14, 95 million cubic feet between gage height 8 ft 0 in and 10 ft 0 in (levels stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	5	4	141	Apr. 18	6	0	165
Mar. 7	4	6	111	25	7	1	207
14	2	6	52	May 2	7	6	222
21	0	11	16	9	8	7	270
28	0	9	13	16	9	0	290
Apr. 4	2	5	50	23	8	6	266
11	4	4	105	30	8	6	266

(177) 5–3909. Rainbow Lake near Lake Tomahawk, Wis.

Location.—Lat 45°50'00", long 89°32'40", in SW¼ sec.30, T.39 N., R.8 E., on Wisconsin River, 2.7 miles northeast of village of Lake Tomahawk.

Drainage area.—740 sq mi, approximately.

Gage-height record.—Float-tape gage. Datum of gage is 1,570.00 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 2,181 million cubic feet May 16 (gage height, 28 ft 0 in).
1936 to February 1965: Contents on last day of month, 2,197 million cubic feet Apr. 30, 1951 (gage height, 28 ft 1 in).

Remarks.—Dam was completed November 1935. Usable capacity was 1,639 million cubic feet between gage height 6 ft 0 in and 25 ft 0 in until August 1949 when it was increased to 2,181 million cubic feet between gage height 6 ft 0 in ard 28 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	17	4	633	Apr. 18	16	2	530
Mar. 7	16	1	523	25	21	5	1,097
14	14	6.5	404	May 2	25	7	1,737
21	11	6.5	213	9	27	9	2,133
28	10	9.5	177	16	28	0	2,181
Apr. 4	6	4	8	23	27	6.5	2,093
11	8	8	84	30	27	6	2,085

(178) 5–3911. Pelican Lake near Pelican Lake, Wis.

Location.—Lat 45°31'45", long 89°12'20", in S½ sec.11, T.35 N., R.10 E., on Pelican River, 2.8 miles northwest of village of Pelican Lake.

Drainage area.—22 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,589.98 ft mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 292 million cubic feet May 16 (gage height, 1 ft 11 in).
1938 to February 1965: Contents on last day of month, 331 million cubic feet June 30, 1939 (gage height, 2 ft 2 in).

Remarks.—Reservoir operation began in 1909. No usable capacity Apr. 1 to Oct. 31. Usable capacity Nov. 1 to Mar. 31, 305 million cubic feet between gage heights 0 ft 0 in and 2 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity table furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Pelican Lake near Pelican Lake, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	0	1	13	Apr. 18	0	10	127
Mar. 7	0	1	13	25	1	3	190
14	0	0	0	May 2	1	6.5	234
21	0	0	0	9	1	8	254
28	0	0	0	16	1	11	292
Apr. 4	0	1.5	19	23	1	9.5	273
11	0	5	63	30	1	8.5	260

(179) 5–3913. North Pelican Lakes near Rhinelander, Wis.

Location.—Lat 45°38'05", long 89°14'35", in SE¼ sec.4, T.36 N., R.10 E., on North Branch Pelican River, 8 miles east of city limits of Rhinelander.

Drainage area.—71 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,569.10 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 160 million cubic feet Apr. 25 (gage height, 0 ft 4.5 in).
1938 to February 1965: Contents on last day of month 177 million cubic feet Mar. 31, 1945 (gage height, 0 ft 7-3/4 in).

Remarks.—The lakes have been used as a reservoir since 1908. Reservoir includes: Moen, Second, Third, Fourth and Fifth Lakes. Usable capacity, June 1 to Sept. 15, 19 million cubic feet between gage heights -0 ft 4 in and 0 ft 0 in; Sept. 16 to May 31, 218 million cubic feet between gage heights 1 ft 4 in and -2 ft 6 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	-2	0	27	Apr. 18	-0	4	120
Mar. 7	-1	11	31	25	0	4.5	160
14	-1	11	31	May 2	0	2.5	151
21	-1	11	31	9	0	4	158
28	-1	11	31	16	0	3	153
Apr. 4	-1	10	36	23	0	1.5	146
11	-1	7.5	47	30	-0	1	134

(180) 5–3921. Minocqua Lake near Minocqua, Wis.

Location.—Lat 45°52'35", long 89°43'40", on line between secs.10 and 15, T.39 N., R.6 E., on Tomahawk River, 1 mile west of Minocqua.

Drainage area.—89 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1,584.56 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 484 million cubic feet May 30 (gage height, 0 ft 0 in).
1938 to February 1965: Contents on last day of month, 619 million cubic feet July 31, 1950, (gage height, 0 ft 5-5/8 in).

Remarks.—Reservoir operation began in 1910. Reservoir includes Little Tomahawk, Tomahawk, Mid, Minocqua, Baker and Kewasokogan Lakes. Usable capacity Oct. 1 to May 31, 628 million cubic feet between gage heights -1 ft 10 in and 0 ft 6 in, and June 1, to Sept. 30, 283 million cubic feet between gage heights -0 ft 6 in and 0 ft 6 in, (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	-1	10	0	Apr. 18	-1	3.5	136
Mar. 7	-1	10	0	25	-1	1	189
14	-1	10	0	May 2	-0	11	233
21	-1	10	0	9	-0	6	345
28	-1	10	0	16	-0	3.5	402
Apr. 4	-1	8	41	23	-0	1.5	448
11	-1	6	83	30	0	0	484

(181) 5–3922. Squirrel Lake near Minocqua, Wis.

Location.—Lat 45°50'35", long 89°54'15", in NE¼ sec.30, T.39 N., R.5 E., on Squirrel River, 9.4 miles west of Minocqua.

Drainage area.—17 sq mi., approximately.

Gage-height record.—Staff gage. Datum of gage is 1,560.93 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 175 million cubic feet May 16, 23, 30 (gage height, 3 ft 11 in.).
1938 to February 1965: Contents on last day of month, 193 million cubic feet Apr. 30, 1951 (gage height, 4 ft 1 -½ in).

Remarks.—Reservoir operation began in 1908. Usable capacity Oct. 1 to May 31, 182 million cubic feet between gage heights 1 ft 7 in and 4 ft 0 in; and June 1 to Sept. 30, 165 million cubic feet between gage heights 1 ft 10 in and 4 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Squirrel Lake near Minocqua, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	1	7	0	Apr. 18	2	9	83
Mar. 7	1	7	0	25	3	3	122
14	1	7	0	May 2	3	5	135
21	1	8	5	9	3	7	148
28	1	8	5	16	3	11	175
Apr. 4	1	9	11	23	3	11	175
11	2	2	41	30	3	11	175

(182) 5–3923. Willow Reservoir near Hazelhurst, Wis.

Location.—Lat 45°42'45", long 89°50'40", in NE¼ sec.10, T.37 N., R.5 E., on Tomahawk River, 8.8 miles southwest of Hazelhurst.

Drainage area.—327 sq mi, approximately.

Gage-height record.—Staff gage. Datum of gage is 1505.87 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 3,222 million cubic feet May 23 (gage height, 23 ft 3 in).
1938 to February 1965: Contents on last day of month, 3,316 million cubic feet June 30, 1954 (gage height, 23 ft 6-½ in).

Remarks.—Reservoir operation began in 1927. Usable capacity, 3,302 million cubic feet between gage heights 5 ft 0 in and 23 ft 6 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	6	3.5	48	Apr. 18	13	9	923
Mar. 7	7	4	116	25	18	0	1,814
14	8	2.5	188	May 2	20	2.5	2,356
21	8	11	256	9	21	8.5	2,760
28	8	9	240	16	23	2.5	3,209
Apr. 4	8	5.5	212	23	23	3	3,222
11	9	4	300	30	23	1.5	3,184

(183) 5–3925. Lake Nokomis at Bradley, Wis.

Location.—Lat 45°32'20", long 89°44'45", in NW¼ sec.9, T.35 N., R.6 E., on Tomahawk River, 0.4 mile east of Bradley.

Drainage area.—548 sq mi.

Gage-height record.—Staff gage. Datum of gage is 1,448.24 ft above mean sea level, datum of 1929.

Maxima.—March to May 1965: Contents at end of week, 1,792 million cubic feet May 16 (gage height, 14 ft 11 in).
1938 to February 1965: Contents on last day of month, 1,852 million cubic feet Sept. 30, 1959 (gage height, 15 ft 2-3/4 in).

Remarks.—Reservoir operation began in 1912. Usable capacity, 1,808 million cubic feet between gage heights 0 ft 0 in and 15 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	9	2	775	Apr. 18	8	6	671
Mar. 7	7	9.5	568	25	12	1	1,265
14	6	0	326	May 2	14	3	1,664
21	3	5	93	9	14	9	1,760
28	2	7.5	52	16	14	11	1,792
Apr. 4	2	5	44	23	14	10.5	1,784
11	3	11	127	30	14	6	1,712

(184) 5–3936. Spirit River Flowage near Tomahawk, Wis.

Location.—Lat 45°26'20", long 89°44'30", in SE¼ sec.9, T.34 N., R.6 E., on Spirit River, 2 miles south of Tomahawk.

Drainage area.—174 sq mi.

Gage-height record.—Staff gage. Datum of gage is 1,420.53 ft above mean sea level, datum of 1929.

Maxima.—March to May 1965: Contents at end of week, 752 million cubic feet May 2 (gage height, 16 ft 11.5 in).
1938 to February 1965: Contents on last day of month, 760 million cubic feet, June 30, 1953 (gage height, 17 ft ½ in).

Remarks.—Reservoir operation began in 1923. Usable capacity, 756 million cubic feet between gage heights, 0 ft 0 in and 17 ft 0 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Spirit River Flowage near Tomahawk, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	3	3	31	Apr. 18	16	5.5	707
Mar. 7	5	3	74	25	15	11	659
14	6	5.5	108	May 2	16	11.5	752
21	6	11	125	9	16	7.5	722
28	6	7.5	114	16	16	10	741
Apr. 4	0	0	0	23	16	6.5	714
11	3	11	43	30	16	6	711

(185) 5–3945. Prairie River near Merrill, Wis.

Location.—Lat 45°14'10", long 89°38'50", on line between secs.20 and 29, T.32 N., R.7 E., near center of span on downstream side of highway bridge, 1.5 miles upstream from Meadow Creek, 4.5 miles northeast of Merrill, and 8 miles upstream from mouth.

Drainage area.—181 sq mi.

Gage-height record.—Graph drawn on basis of once-daily chain-gage readings and flood mark. Altitude of gage is 1,300 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,600 cfs. Backwater from ice Mar. 1–4, Mar. 10 to Apr. 5.

Maxima.—March–May 1965: Discharge, 2,530 cfs 0600 hours Apr. 12 (gage height, 6.60 ft).

1914-31, 1939 to February 1965: Discharge, 5,800 cfs Aug. 31, 1941 (gage height, 9.45 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	72	72	570	11	96	1,500	398	21	78	960	324
2	76	72	528	12	91	2,020	350	22	76	877	264
3	81	74	513	13	90	1,260	312	23	76	754	226
4	83	76	461	14	90	1,140	264	24	76	728	166
5	86	78	412	15	91	1,140	312	25	76	695	170
6	98	82	454	16	90	1,060	600	26	75	720	252
7	147	95	520	17	86	1,000	833	27	74	877	247
8	126	183	574	18	82	998	768	28	73	970	247
9	119	611	574	19	80	928	478	29	72	800	211
10	106	1,110	454	20	78	897	370	30	72	634	196
								31	72	------	204
Monthly mean discharge, in cubic feet per second									86.7	747	395
Runoff, in inches									0.55	4.60	2.52

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Prairie River near Merrill, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 9	0000	2.60	272	Apr. 12	2400	5.16	1,440	May 15	2400	3.13	447
	0600	3.11	440								
	1200	3.59	622	13	0600	4.85	1,250	16	1200	3.57	614
	1800	3.96	776		1200	4.83	1,240		2400	3.84	724
	2400	4.29	939		1800	4.85	1,250				
					2400	4.76	1,200	17	1200	4.13	857
10	1200	4.65	1,130						1800	4.19	887
	2400	4.87	1,260	14	1200	4.62	1,120		2400	4.16	872
					2400	4.66	1,140				
11	1200	5.07	1,380					18	1200	3.98	785
	1800	5.40	1,590	15	1200	4.67	1,140		2400	3.61	630
	2400	6.12	2,130		2400	4.62	1,120				
								19	1200	3.13	447
12	0600	6.60	2,530	16	1200	4.50	1,050		1800	3.04	415
	1200	6.06	2,080		2400	4.43	1,010		2400	2.98	394
	1800	5.52	1,670								

(186) 5–3950. Wisconsin River at Merrill, Wis.

Location.—Lat 45°10'40", long 89°40'45", on line between secs.12 and 13, T.31 N., R.6 E., on left bank 300 ft downstream from highway bridge at east end of Merrill and 0.5 mile downstream from Prairie River.

Drainage area.—2,780 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at fifteen-minute intervals. Datum of gage is 1,228.85 ft above mean sea level, datum of 1929.

Discharge record.—Stage–discharge relation defined by current-meter measurements below 20,000 cfs. Mean daily discharges computed from 96 punch tape recordings per day. Backwater from ice Mar. 1 to Apr. 4.

Maxima.—March–May 1965: Discharge, 12,300 cfs 1300 hours May 18 (gage height, 9.79 ft).
1902 to February 1965: Discharge, 49,400 cfs Aug. 31, 1941 (gage height, 18.26 ft).

Remarks.—Flow regulated by 20 reservoirs and 9 powerplants above station.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,700	1,500	4,610	11	1,800	7,860	7,040	21	1,300	9,630	6,680
2	1,900	1,500	4,290	12	1,700	9,140	6,430	22	1,400	9,380	6,870
3	2,100	1,500	4,890	13	1,700	7,760	5,560	23	1,300	8,760	6,290
4	2,100	1,400	5,410	14	1,600	9,380	5,250	24	1,500	8,050	6,010
5	2,000	1,360	4,460	15	1,500	9,970	4,710	25	1,600	7,240	4,890
6	1,900	1,470	4,600	16	1,700	10,300	8,040	26	1,500	6,320	4,370
7	1,900	1,580	5,910	17	1,700	10,500	8,570	27	1,300	7,360	5,900
8	1,900	1,600	6,380	18	1,500	10,500	10,200	28	1,500	7,580	6,160
9	2,000	2,100	7,350	19	1,500	9,950	8,280	29	1,600	6,650	4,740
10	1,900	3,250	7,490	20	1,400	9,650	7,260	30	1,500	5,390	3,670
								31	1,400	-------	3,420
Monthly mean discharge, in cubic feet per second									1,658	6,288	5,991

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Wisconsin River at Merrill, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0000	7.06	5,750	Apr. 13	1800	7.96	7,550	Apr. 16	1200	9.13	10,300
	0200	7.46	6,550		2000	8.38	8,430		1600	9.06	10,100
	0600	8.36	8,380		2400	8.58	8,880		2000	9.22	10,600
	1200	8.00	7,630						2400	9.06	10,100
	1800	8.15	7,940	14	0200	8.76	9,310				
	2000	8.40	8,470		0600	8.85	9,530	17	0400	9.09	10,200
	2400	8.75	9,290		1200	8.61	8,950		1000	9.15	10,400
					1800	8.78	9,360		1200	9.22	10,600
12	0200	9.02	9,960		2200	9.00	9,900		1800	9.18	10,400
	0400	8.82	9,460		2400	9.22	10,600		2300	9.48	11,300
	1000	8.61	8,950						2400	9.46	11,300
	1200	8.78	9,360	15	0200	9.32	10,900				
	1600	8.72	9,220		0600	9.31	10,800	18	0600	9.45	11,200
	1800	8.56	8,840		1200	8.94	9,750		1000	9.31	10,800
	2400	8.51	8,720		1600	8.91	9,680		1400	8.85	9,530
					2000	8.70	9,170		1600	8.81	9,430
13	0200	8.38	8,430		2400	8.89	9,630		1800	8.89	9,630
	0600	7.80	7,230						2000	9.08	10,100
	1000	7.62	6,870	16	0200	9.07	10,100		2400	9.20	10,500
	1400	7.90	7,430		0600	9.22	10,600				

(187) 5–3961. Scotch Creek tributary near Edgar, Wis.

(Crest-stage station)

Location.—Lat 44°56'40", long 89°57'05", in SE¼ sec.31, T.29 N., R.5 E., at culvert on State Highway 29, 0.6 mile east of intersection with County Trunk H, and 1.5 miles northeast of Edgar.

Drainage area.—7.1 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 161 cfs and by culvert flow measurement at 1380 cfs.

Maxima.—March–May 1965: Discharge, 1,380 cfs Apr. 11 (gage height, 16.67 ft). 1962 to February 1965: Discharge, 460 cfs Sept. 13, 1962 (gage height, 14.07 ft).

(188) 5–3975. Eau Claire River at Kelly, Wis.

Location.—Lat 44°55'05", long 89°33'00", on line between secs. 9 and 10, T.28 N., R.8 E., on right bank 50 ft downstream from highway bridge, 0.7 mile northeast of Kelly, 1.3 miles upstream from Big Sandy Creek, 4.5 miles upstream from mouth, and 5 miles southeast of Wausau.

Drainage area.—326 sq mi.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals. Datum of gage is 1,177.88 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 6,400 cfs. Mean daily discharges computed from 24 punch-tape recordings per day. Backwater from ice Mar. 1 to Apr. 9.

Maxima.—March–May 1965: Discharge, 6,980 cfs 2000 hours Apr. 12 (gage height, 10.04 ft).

1914–26, 1939 to February 1965: Discharge, 8,300 cfs Aug. 21, 1926 (gage height, 8.4 ft from graph based on gage readings).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	58	73	717	11	280	3,150	576	21	96	1,160	432
2	120	71	652	12	210	6,420	474	22	92	1,130	357
3	200	70	628	13	170	5,410	380	23	90	1,060	310
4	180	70	706	14	150	4,040	315	24	86	949	263
5	180	80	621	15	146	3,340	376	25	81	861	252
6	300	100	535	16	134	2,520	2,030	26	78	1,040	414
7	260	120	497	17	128	1,960	1,610	27	76	1,370	503
8	310	250	483	18	130	1,780	1,320	28	74	1,300	386
9	330	600	538	19	108	1,490	899	29	73	1,100	311
10	320	1,980	615	20	102	1,310	582	30	73	844	261
								31	73	-------	228
Monthly mean discharge, in cubic feet per second									152	1,522	5.89
Runoff, in inches									0.54	5.21	2.08

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 8	0000	2.65	-------	Apr. 11	0600	5.04	2,070	Apr. 13	0400	9.32	6,190
	0800	2.95	-------		0800	6.09	2,980		0800	8.75	5,810
	1000	3.24	-------		1000	6.27	3,140		1200	8.50	5,340
	1600	2.93	-------		1600	5.99	2,890		1600	7.97	4,810
	2400	2.95	-------		1800	6.03	2,930		2400	7.96	4,800
					2200	7.41	4,250				
9	0800	2.94	-------		2400	8.07	4,910	14	0400	7.61	4,450
	1600	3.62	-------						1200	7.27	4,110
	2200	4.38	-------	12	0200	9.26	6,130		2400	6.50	3,350
	2400	5.31	2,380		0400	9.83	6,750				
					0600	9.70	6,610	15	0400	6.43	3,290
10	0400	5.85	2,760		1000	9.19	6,050		1200	6.60	3,440
	1000	5.03	2,060		1200	9.11	5,960		1600	6.60	3,440
	1600	4.03	1,340		1600	9.47	6,360		2400	6.22	3,100
	2400	5.18	2,180		2000	10.04	6,980				
					2200	9.88	6,810	16	0600	5.88	2,790
11	0200	5.95	2,860		2400	9.58	6,480		1200	5.54	2,490
	0400	6.26	3,130								

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Eau Claire River at Kelly, Wis.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 16	1800	5.32	2,300	Apr. 20	0600	4.15	1,410	May 17	0600	4.68	1,780
	2400	5.10	2,120		1600	3.86	1,240		1400	4.28	1,500
					2400	3.77	1,180		1800	4.16	1,420
17	0800	4.93	1,980						2400	4.09	1,370
	1600	4.82	1,900	May 15	2400	2.80	674				
	2400	4.80	1,930					18	0800	4.10	1,380
				16	0400	3.99	1,310		1600	4.00	1,320
18	1200	4.72	1,820		0600	4.49	1,640		2400	3.71	1,150
	2400	4.44	1,610		1000	5.16	2,170				
					1400	5.56	2,500	19	1200	3.25	904
19	0800	4.31	1,520		1800	5.53	2,480		1800	3.03	791
	1600	4.19	1,430		2400	5.15	2,160		2400	2.86	705
	2400	4.22	1,450								

(189) 5–3980. Wisconsin River at Rothschild, Wis.

Location.—Lat 44°53'10", long 89°37'50", in sec.26, T.28 N., R.7 E., on left bank at Rothschild, 0.5 mile downstream from Rothschild Dam, 2 miles downstream from Eau Claire River, 5 miles upstream from Black Creek, and 5.5 miles south of bridge on State Highway 29 in Wausau.

Drainage area.—4,000 sq mi. approximately.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals. Datum of gage is 1,135.86 ft above mean sea level, datum of 1929. Auxiliary digital recorder tape punched at sixty-minute intervals in Mosinee pond 8 miles downstream.

Discharge record.—Stage-discharge relation defined by current meter measurements. Fall used as a factor for discharges below 7,000 cfs. Mean daily discharges computed from 24 punch-tape recordings per day.

Maxima.—March–May 1965: Discharge, 49,200 cfs 1600 hours Apr. 12 (gage height 18.46 ft).

1944 to February 1965: Discharge, 47,000 cfs Sept. 27, 1959 (gage height 17.81 ft). Flood of Sept. 1, 1941, reached a stage of 22.3 ft, from tailwater data at Rothschild Dam (discharge, 75,000 cfs, from rating curve extended above 45,000 cfs by logarithmic plotting.)

Remarks.—Flow regulated by 20 reservoirs and 12 powerplants above station

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,010	1,720	7,380	11	2,940	21,700	9,190	21	1,350	14,400	7,480
2	2,640	1,880	6,980	12	2,240	44,300	7,480	22	1,930	14,600	7,700
3	4,030	1,610	6,860	13	1,980	30,200	6,930	23	2,030	12,700	7,150
4	4,020	1,800	7,680	14	1,790	24,200	6,270	24	1,750	11,700	6,750
5	3,640	1,780	6,840	15	1,950	23,800	6,200	25	2,000	10,400	6,370
6	3,830	1,930	6,500	16	1,930	20,400	12,600	26	2,010	10,300	6,280
7	3,830	3,410	7,150	17	2,000	17,900	14,900	27	1,540	15,800	7,510
8	3,670	5,170	7,670	18	1,910	18,400	13,300	28	1,330	13,900	7,470
9	4,110	6,210	9,170	19	2,000	16,600	11,700	29	1,950	10,600	6,190
10	3,510	7,730	10,000	20	1,600	15,400	9,150	30	1,980	8,210	5,170
								31	1,740	-------	4,140
Monthly mean discharge, in cubic feet per second									2,427	12,960	7,941

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Wisconsin River at Rothschild, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0000	6.64	7,730	Apr. 12	2000	18.05	47,200	Apr. 14	2000	12.41	23,100
	1000	6.64	7,730		2200	17.44	44,200		2400	12.64	23,900
	1100	13.13	25,700		2400	16.92	41,700				
	1200	13.69	27,800					15	0400	12.53	23,500
	1400	14.39	30,600	13	0200	16.49	39,700		0800	12.68	24,100
	1600	14.90	32,700		0400	15.93	37,200		1200	12.70	24,100
	1800	15.23	34,100		0600	15.20	34,000		1600	12.80	24,500
	2000	15.51	35,300		0800	14.75	32,000		2000	12.61	23,800
	2400	15.65	35,900		1000	14.17	29,700		2400	12.29	22,700
					1200	13.84	28,400				
12	0200	15.84	36,800		1600	13.03	25,300	16	0400	11.98	21,600
	0400	16.26	38,700		2000	13.20	25,900		0800	11.89	21,300
	0600	16.97	41,900		2400	12.76	24,300		1200	11.55	20,200
	0800	17.32	43,600						1400	12.31	22,800
	1000	17.59	44,900	14	0400	12.97	25,100		1600	11.70	20,700
	1200	18.20	47,900		0800	12.81	24,500		1800	11.31	19,400
	1400	18.44	49,100		1200	12.63	23,900		2000	10.92	18,100
	1600	18.46	49,200		1600	12.70	24,100		2400	10.98	18,300

(190) 5–3995. Big Eau Pleine River near Stratford, Wis.

Location.—Lat 44°49'15", long 90°04'35", on line between sec.13, T.27 N., R.3 E., and sec.18, T.27 N., R.4 E., on left bank 15 ft upstream from bridge on State Highway 97, 1 mile north of Stratford, and 1.4 miles downstream from small tributary.

Drainage area.—224 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 10–14, 21–29 when intake was frozen. Datum of gage is 1,154.24 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 24,000 cfs. Backwater from ice Mar. 1 to Apr. 9. Rate of change in stage used is a factor Apr. 10–15, 26, 27, May 16, 26.

Maxima.—March–May 1965: Discharge, 13,700 cfs 0500 hours Apr. 11 (gage height, 18.43)

1914–25, 1937 to February 1965: Discharge, 41,000 cfs Sept. 9, 1938 (gage height, 24.5 ft, from floodmarks).

Flood of June 5, 1914, reached a stage of 20.7 ft, from floodmarks (discharge, 40,000 cfs), former site and datum.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	40	17	195	11	115	11,100	176	21	28	604	115
2	150	18	182	12	94	6,160	118	22	26	598	85
3	350	18	220	13	80	2,090	90	23	24	488	67
4	250	19	258	14	70	1,710	72	24	22	384	55
5	200	20	173	15	58	1,690	74	25	21	511	55
6	280	50	267	16	50	984	1,520	26	20	2,320	977
7	180	400	292	17	44	818	716	27	19	2,200	886
8	260	1,400	183	18	39	1,140	477	28	18	660	318
9	240	2,300	260	19	34	836	358	29	18	346	173
10	160	5,670	328	20	31	651	180	30	17	228	115
								31	17	-------	84
Monthly mean discharge, in cubic feet per second									95.3	1,514	293
Runoff, in inches									0.49	7.54	1.51

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Big Eau Pleine River near Stratford, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 7	0000	5.75	------	Apr. 12	1800	11.82	4,070	Apr. 26	2200	12.06	4,460
	0600	6.56	------		2400	10.55	3,920		2400	11.95	4,260
	1200	7.35	------								
	1800	9.51	------	13	0600	8.94	1,830	27	0600	10.61	2,940
	2200	10.38	------		0900	8.20	1,510		1200	9.05	1,940
	2400	10.33	------		1200	8.06	1,500		----	------	------
					1600	8.82	2,090		1800	7.99	1,270
8	0500	10.73	------		2000	9.61	2,480		2400	7.10	1,060
	1200	10.28	------		2400	9.77	2,550				
	1400	9.90	------					May 15	2400	4.30	266
	2400	9.72	------	14	0600	9.15	2,010				
					1200	8.13	1,440	16	0300	5.80	610
9	0600	9.36	------		1600	7.78	1,350		0600	7.05	1,500
	1000	9.09	------		2000	7.70	1,340		0900	8.85	2,230
	1400	9.76	------		2400	8.18	1,740		1200	9.42	2,290
	1600	11.75	------						1500	9.03	1,940
	1700	12.96	------	15	0300	8.64	1,860		2400	7.41	1,020
	1900	13.35	------		0700	8.77	1,910				
	2100	14.59	------		1200	8.62	1,770	17	0600	6.65	903
	2400	13.97	6,300		1800	8.17	1,520		1200	6.07	696
					2400	7.83	1,360		1800	5.55	537
10	0600	12.33	4,540						2400	5.16	433
	1300	11.11	3,520	24	2400	4.79	338				
	1500	11.47	4,110					25	2400	3.23	60
	1800	13.25	6,140	25	0600	4.75	328				
	2100	15.10	8,600		1200	4.70	316	26	0600	3.90	152
	2400	17.04	11,500		1400	4.80	341		0900	4.54	278
					1600	5.25	456		1100	4.90	366
11	0200	17.97	13,100		1800	6.08	699		1300	7.10	1,500
	0500	18.43	13,700		2000	6.80	961		1500	8.34	1,870
	0800	17.80	12,200		2400	7.07	1,070		1900	8.85	1,950
	1200	16.80	10,500						2400	8.36	1,510
	1800	15.73	9,020	26	0300	7.21	1,120				
	2400	16.75	10,600		1000	7.16	1,100	27	0600	7.26	1,140
					1300	7.98	1,860		1200	6.42	818
12	0600	15.53	8,210		1500	9.42	2,600		1800	5.75	595
	1000	14.15	6,460		1700	10.80	3,600		2400	5.30	469
	1200	13.45	5,630		2000	11.84	4,390				

(191) 5–3996. Big Eau Pleine Reservoir near Knowlton, Wis.

Location.—Lat 44°43'50", long 89°45'35", in SW¼ sec.14, T.26 N., R.6 E., on Big Eau Pleine River, 4 miles south of Moon and 4.0 miles west of Knowlton.

Drainage area.—365 sq mi, approximately.

Gage-height record.—Float gage. Datum of gage is 1,115.00 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Maxima.—March to May 1965: Contents at end of week, 4,457 million cubic feet May 16 (gage height, 31 ft 6 in).
1938 to February 1965: Contents observed, 4,496 million cubic feet Oct. 25, 1959 (gage height, 31 ft 7½ in).

Remarks.—Reservoir operation began March 1937. Usable capacity, 4,457 million cubic feet between gage heights 0 ft 0 in and 31 ft 6 in (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Gage heights and capacity tables furnished by Wisconsin Valley Improvement Co.

Gage height, in feet and inches, and contents, in millions of cubic feet, 1965, of Big Eau Pleine Reservoir near Knowlton, Wis.

Date	Gage height		Contents	Date	Gage height		Contents
	Feet	Inches			Feet	Inches	
Feb. 28	3	9.5	103	Apr. 18	31	5.5	4,444
Mar. 7	15	2.5	982	25	31	5	4,431
14	19	2.5	1,530	May 2	31	5	4,431
21	19	6	1,575	9	31	5	4,431
28	19	0	1,497	16	31	6	4,457
Apr. 4	18	4.5	1,403	23	31	2	4,355
11	27	8.5	3,353	30	31	2	4,355

(192) 5–4002.95 Lake Dubay near Stevens Point, Wis.

Location.—Lat 44°39'50", long 89°39'05", in sec.10, T.25 N., R.7 E., 1½ miles downstream from Little Eau Pleine River and 10½ miles northwest of Stevens Point.

Drainage area.—4,890 sq mi, approximately.

Gage-height record.—Staff gage and recording headwater gage. Datum of gage is mean sea level (power company levels).

Maximum.—March–May 1965: Daily contents, 5,120 million cubic feet Apr. 13 (elevation, 1,117.52 ft).

Remarks.—Usable capacity, 2,117 million cubic feet between elevations 1,110 ft and 1,117 ft (limits stipulated by Public Service Commission of Wisconsin).

Cooperation.—Elevations and capacity table furnished by Wisconsin Valley Improvement Co.

Elevation, in feet, and contents, in millions of cubic feet, 1965

Day	March		April		May	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
1	1113.31	3,693	1110.13	2,838	1116.60	4,774
2	1113.51	3,753	1110.08	2,825	1116.88	4,878
3	1114.19	3,957	1110.08	2,825	1116.95	4,903
4	1115.11	4,242	1109.99	2,803	1116.56	4,759
5	1115.77	4,468	1110.08	2,825	1116.16	4,611
6	1116.09	4,585	1109.64	2,719	1115.45	4,355
7	1116.15	4,608	1110.00	2,805	1115.93	4,526
8	1116.14	4,604	1110.68	2,975	1116.58	4,767
9	1116.11	4,593	1112.04	3,330	1116.58	4,767
10	1115.99	4,548	1114.11	3,933	1116.50	4,737
11	1115.78	4,472	1116.23	4,637	1116.44	4,715
12	1115.73	4,454	1117.20	4,998	1116.40	4,700
13	1115.20	4,271	1117.52	5,120	1116.18	4,619
14	1114.65	4,098	1116.75	4,880	1116.51	4,741
15	1114.30	3,990	1116.87	4,854	1116.97	4,911
16	1114.20	3,960	1116.43	4,711	1116.88	4,878
17	1113.73	3,819	1115.12	4,245	1116.67	4,800
18	1113.11	3,633	1114.23	3,969	1116.25	4,644
19	1112.68	3,507	1116.23	4,637	1115.57	4,396
20	1112.47	3,448	1116.68	4,804	1115.60	4,407
21	1111.88	3,287	1116.65	4,792	1115.98	4,545
22	1111.52	3,191	1116.45	4,718	1116.58	4,767
23	1111.08	3,077	1116.26	4,648	1116.95	4,903
24	1110.75	2,992	1116.14	4,604	1116.70	4,811

Elevation, in feet, and contents, in millions of cubic feet, 1965, of Lake Dubay near Stevens Point, Wis.—Continued

Day	March		April		May	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
25	1110.29	2,877	1116.13	4,600	1116.73	4,822
26	1110.40	2,905	1116.15	4,607	1116.73	4,822
27	1110.24	2,865	1116.47	4,726	1116.69	4,807
28	1109.92	2,786	1116.45	4,718	1116.82	4,855
29	1110.12	2,835	1115.45	4,355	1116.53	4,748
30	1110.08	2,825	1115.50	4,372	1116.43	4,711
31	1110.14	2,840			1116.55	4,756

(193) 5-4008. Wisconsin River at Wisconsin Rapids, Wis.

Location.—Lat 44°22'05", long 89°51'30", in SW¼ sec.24, T.22 N., R.5 E., at Centralia powerplant of Nekoosa-Edwards Paper Co., 1.6 miles downstream from Chicago and Northwestern Railway bridge in Wisconsin Rapids.

Drainage area.—5,400 sq mi, approximately.

Gage-height record.—Headwater and tailwater recording gages and generation data read hourly and entered in daily log sheet by company employees. Elevation of powerplant pond is 980 ft and datum of powerplant gages is 887.83 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Discharge record.—Discharge computed hourly from powerplant records, using 0600 hours to 0600 hours basis for daily discharge. Powerplant rating checked by several recent high-water current-meter measurements, two near 47,000 cfs.

Maxima.—March–May 1965: Discharge, 64,000 cfs 2300 hours Apr. 13.
1914–50, 1957 to February 1965: Discharge, 70,400 cfs at site 7.0 miles downstream, Sept. 12, 1938 (gage height, 19.10 ft, datum then in use), from rating curve extended above 58,000 cfs.

Remarks.—Discharge computed from powerplant records on basis of load-discharge rating of hydroelectric units as developed by Geological Survey and taintor-gate rating and spillway ratings based on theoretical formulas and discharge measurements. Flow regulated by 21 reservoirs and many powerplants above station.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,740	2,970	6,860	11	5,640	24,700	12,200	21	2,340	21,600	10,100
2	3,480	2,520	11,000	12	4,950	45,900	10,900	22	2,940	20,000	8,000
3	3,750	2,250	9,420	13	4,910	53,100	8,220	23	2,910	19,100	8,800
4	5,010	2,230	12,800	14	4,260	43,600	5,250	24	3,020	17,000	8,500
5	5,480	3,390	12,300	15	4,320	35,400	7,480	25	2,640	16,900	8,720
6	6,040	4,170	9,000	16	3,920	35,500	17,200	26	2,620	16,600	12,000
7	6,810	5,700	7,610	17	4,020	31,900	19,800	27	2,990	21,900	10,500
8	7,250	7,750	8,420	18	3,390	24,800	21,500	28	2,290	23,700	12,200
9	7,200	8,940	12,400	19	3,180	19,300	19,000	29	2,100	19,000	11,600
10	6,720	11,000	13,600	20	3,270	21,600	13,000	30	2,670	11,600	7,270
								31	2,940	-------	4,880
Monthly mean discharge, in cubic feet per second									4,058	19,150	10,980

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Wisconsin River at Wisconsin Rapids, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0600	------	15,100	Apr. 12	2400	------	50,400	Apr. 14	0600	------	52,000
	1200	------	21,500						1200	------	46,300
	1800	------	22,700	13	0600	------	50,400		1800	------	44,000
	2400	------	30,200		1200	------	48,600		2400	------	39,300
					1800	------	52,900				
12	0600	------	34,000		2200	------	52,100	15	0600	------	38,000
	1200	------	42,400		2300	------	64,000				
	1800	------	48,700		2400	------	62,000				

(194) 5–4014. Petenwell Flowage near Necedah, Wis.

Location.—Lat 44°03'25", long 90°01'15", in SE¼ sec.4, T.18 N., R.4 E., on Wisconsin River, 0.7 mile upstream from bridge on State Highway 21, and 3.5 miles northeast of Necedah.

Drainage area.—5,860 sq mi, approximately.

Gage-height record.—Staff gage and recording headwater gage. Datum of gage is 790.2ft above mean sea level (levels by Wisconsin River Power Co.).

Maxima.—March–May 1965: Daily contents, 19,954 million cubic feet Apr. 17 (gage height, 136.08 ft).

1950 to February 1965: Contents on last day of month, 19,926 million cubic feet Oct. 31, 1954 (gage height, 136.05 ft).

Remarks.—Dam was completed in 1949. Reservoir operation began in April 1950. Limits of operation are stipulated by Public Service Commission of Wisconsin as follows: maximum gage height Mar. 16 to June 15, 136.00 ft (19,880 million cubic feet) and June 16 to Mar. 15, 135.00 ft (18,980 mcf); minimum gage height Apr. 16 to Dec. 31, 134.00 ft (18,090 mcf) and Jan. 1 to Apr. 15, 130.00 ft (14,690 mcf).

Cooperation.—Gage heights and capacity table furnished by Wisconsin Valley Improvement Co.

Gage height, in feet, and contents, in millions of cubic feet, 1965

Day	March		April		May	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
1	133.87	17,976	130.04	14,723	135.93	19,817
2	133.81	17,923	130.05	14,731	135.85	19,745
3	133.64	17,773	130.05	14,731	136.03	19,907
4	133.50	17,650	130.10	14,772	135.52	19,448
5	133.39	17,553	130.12	14,788	135.48	19,412
6	133.32	17,492	130.16	14,821	135.52	19,448
7	133.34	17,509	130.18	14,838	135.63	19,547
8	133.92	18,020	130.34	14,965	135.62	19,538
9	134.06	18,143	130.50	15,100	135.68	19,592
10	134.08	18,160	130.73	15,293	135.94	19,826
11	134.02	18,108	131.20	15,688	136.02	19,898
12	133.95	18,046	132.42	16,713	135.89	19,781
13	133.73	17,852	134.26	18,319	136.05	19,926
14	133.54	17,685	135.55	19,475	136.00	19,880
15	133.32	17,492	135.92	19,808	135.80	19,700
16	133.10	17,298	135.77	19,673	135.82	19,718
17	132.88	17,107	136.08	19,954	135.91	19,799
18	132.61	16,875	135.78	19,682	135.80	19,700

Gage height, in feet, and contents, in millions of cubic feet, 1965, of Petenwell Flowage near Necedah, Wis.—Continued

Day	March		April		May	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
19	132.28	16,595	135.75	19,655	135.95	19,835
20	132.10	16,444	135.70	19,610	135.88	19,772
21	131.92	16,293	135.95	19,835	135.69	19,601
22	131.74	16,142	136.03	19,907	135.73	19,637
23	131.44	15,890	136.04	19,916	135.72	19,628
24	131.15	15,646	135.95	19,835	135.76	19,664
25	130.87	15,411	135.80	19,700	135.85	19,745
26	130.66	15,234	135.69	19,601	136.00	19,880
27	130.46	15,067	135.60	19,520	135.76	19,664
28	130.30	14,936	135.66	19,574	135.51	19,439
29	130.11	14,780	135.87	19,763	135.69	19,601
30	130.00	14,690	135.85	19,745	135.87	19,763
31	129.97	14,665	----------	----------	135.79	19,691

(195) 5–4020. Yellow River at Babcock, Wis.

Location.—Lat 44°18'05", long 90°07'15", in NW¼ sec.14, T.21 N., R.3 E., on right bank at downstream side of highway bridge at Babcock, 1.9 miles upstream from Hemlock Creek.

Drainage area.—223 sq mi.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals except 0100 hours Mar. 3 to 1700 hours Mar. 10. Datum of gage is 954.75 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharges computed from 24 punch-tape recordings per day except 0100 hours Mar. 3 to 1700 hours Mar. 10. Backwater from ice Mar. 1 to Apr. 9.

Maxima.—March–May 1965: Discharge, 6,320 cfs 0800 hours Apr. 12 (gage height, 14.61 ft).
1944 to February 1965: Discharge, 11,600 cfs Apr. 2, 1952 (gage height, 17,38 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	16	26	275	11	230	4,140	134	21	36	371	188
2	60	27	214	12	160	5,830	114	22	33	320	137
3	150	30	185	13	110	3,180	99	23	31	307	108
4	300	45	234	14	80	1,410	81	24	29	319	91
5	400	60	242	15	75	832	68	25	28	323	80
6	450	100	225	16	66	657	118	26	27	807	185
7	500	400	189	17	58	538	398	27	26	1,740	1,100
8	450	1,200	158	18	52	499	364	28	25	1,390	691
9	400	1,800	161	19	46	533	368	29	25	709	417
10	320	2,640	159	20	40	469	277	30	25	408	242
								31	25	------	153
Monthly mean discharge, in cubic feet per second									138	1,037	240
Runoff, in inches									0.71	5.19	1.24

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Yellow River at Babcock, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	2.50	------	Apr.11	1200	12.38	3,700	Apr.26	1400	7.35	773
	1200	2.48	------		1400	13.04	4,300		1600	8.02	956
	1400	2.24	------		1600	13.61	4,890		1800	8.59	1,170
	1600	2.56	------		1800	14.04	5,460		2400	9.31	1,500
	1800	3.50	------		2400	14.43	6,040				
	2000	4.07	------					27	0600	9.58	1,640
	2400	4.84	------	12	0400	14.56	6,240		1200	9.90	1,820
					0600	14.60	6,300		1600	9.97	1,860
7	0400	5.31	------		0800	14.61	6,320		2000	9.90	1,820
	0800	5.90	------		1200	14.51	6,160		2400	9.77	1,740
	1200	6.65	------		1600	14.26	5,790				
	1600	7.50	------		2000	13.88	5,230	28	0600	9.50	1,600
	2000	8.45	------		2400	13.38	4,640		1200	9.15	1,420
	2400	9.13	------						1800	8.70	1,210
				13	0400	12.85	4,120		2400	8.16	998
8	0400	9.59	------		0800	12.33	3,660				
	0800	10.37	------		1200	11.79	3,170	29	0600	7.59	833
	1200	11.32	------		1800	11.00	2,550		1200	7.01	695
	1600	11.88	------		2400	10.25	2,030		1800	6.47	593
	1800	11.93	------						2400	5.96	521
	2400	11.79	------	14	0400	9.80	1,760				
					0800	9.41	1,560	May 26	2400	5.63	478
9	0800	11.35	------		1200	9.10	1,400				
	1000	11.48	------		1800	8.65	1,190	27	0200	6.41	584
	1400	11.77	------		2400	8.22	1,020		0600	7.98	944
	1800	11.65	------						1000	8.94	1,320
	2400	11.31	2,790	15	0600	7.86	908		1200	9.05	1,380
					1200	7.54	820		1600	8.92	1,310
10	0600	11.00	2,550		1800	7.25	750		2000	8.57	1,160
	1000	10.81	2,420		2400	7.10	715		2400	8.15	995
	1200	10.95	2,520								
	2000	11.28	2,760	25	2400	4.64	349	28	0400	7.70	863
	2400	11.32	2,800						0800	7.26	752
				26	0600	5.19	421		1200	6.85	662
11	0400	11.28	2,760		1000	6.03	530		1800	6.40	582
	0800	11.41	2,870		1200	6.68	629		2400	6.03	530

(196) 5–4032. Castle Rock Flowage near Mauston, Wis.

Location.—Lat 43°51'50", long 89°57'35", in sec.13, T.16 N., R.4 E., 4½ miles upstream from Duck Creek, 2 miles south of Germantown, and 7 miles northeast of Mauston.

Drainage area.—6,860 sq mi approximately.

Gage-height record.—Staff gage and recording headwater gage. Datum of gage is 790.2 ft above mean sea level (levels by Wisconsin River Power Co.).

Maxima.—March–May 1965: Daily contents, 7,786 million cubic feet Apr. 18 (gage height, 94.20 ft).

1950 to February 1965: Contents on last day of month, 7,786 million cubic feet June 30,1954 (gage height, 94.20 ft).

Remarks.—Dam was completed in 1950. Reservoir operation began in May 1950. Limits of operation are stipulated by Public Service Commission of Wisconsin as follows: Maximum gage height Mar. 16 to June 15, 94.00 ft. (7,630 million cubic feet) and June 16 to Mar. 15, 93.00 ft (6,880 mcf); minimum gage height May 1 to Jan. 31, 92.00 ft. (6,180 mcf) and Feb. 1 to Apr. 30, 87.00 ft (3,360 mcf).

Cooperation.—Gage heights and capacity table furnished by Wisconsin Valley Improvement Co.

Gage height, in feet, and contents, in millions of cubic feet, 1965, of Castle Rock Flowage near Mauston, Wis.

Day	March		April		May	
	Gage height	Contents	Gage height	Contents	Gage height	Contents
1	90.28	5,088	87.14	3,422	93.97	7,607
2	90.52	5,232	87.11	3,408	94.03	7,653
3	90.83	5,425	87.07	3,391	94.03	7,653
4	90.97	5,511	87.25	3,470	93.68	7,387
5	91.10	5,594	87.35	3,514	93.50	7,250
6	91.19	5,652	87.48	3,571	93.48	7,235
7	91.31	5,728	87.63	3,642	93.68	7,387
8	90.65	5,313	87.80	3,724	93.85	7,516
9	90.57	5,263	88.10	3,872	93.93	7,577
10	90.72	5,356	88.55	4,107	94.00	7,630
11	90.83	5,425	88.87	4,203	93.85	7,516
12	90.87	5,449	89.80	4,804	93.85	7,516
13	90.87	5,449	91.00	5,530	93.98	7,615
14	90.87	5,449	93.60	7,326	94.00	7,630
15	90.65	5,313	93.67	7,379	93.98	7,615
16	90.47	5,202	93.83	7,501	94.07	7,685
17	90.25	5,070	93.78	7,463	93.68	7,387
18	90.10	4,980	94.20	7,786	93.58	7,311
19	89.90	4,862	93.85	7,516	93.62	7,341
20	89.50	4,630	93.83	7,501	93.90	7,554
21	89.12	4,417	93.75	7,440	93.78	7,463
22	88.65	4,161	93.84	7,508	93.78	7,463
23	88.35	4,002	93.94	7,584	93.82	7,493
24	88.07	3,856	93.97	7,607	93.77	7,455
25	87.78	3,714	93.90	7,554	93.85	7,516
26	87.63	3,642	93.71	7,410	93.90	7,554
27	87.37	3,523	93.56	7,296	93.87	7,531
28	87.20	3,448	93.47	7,228	93.70	7,402
29	87.04	3,378	93.85	7,516	93.38	7,161
30	87.06	3,386	93.93	7,577	93.60	7,326
31	87.14	3,422	----------	----------	93.89	7,546

(197) 5–4035. Lemonweir River at New Lisbon, Wis.

Location.—Lat 43°52'50", long 90°09'40", in sec.8, T.16 N., R.3 E., near center span on downstream side of bridge on State Highway 80 in New Lisbon, 200 ft downstream from recreation dam and 1 mile upstream from Webster Creek.

Drainage area.—500 sq mi, approximately.

Gage-height record.—Wire-weight gage read twice daily. Graph drawn on basis of twice-daily wire-weight gage readings during rises. Datum of gage is 867.05 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 5,500 cfs. Backwater from ice Mar. 17 to Apr. 2.

Maxima.—March–May 1965: Discharge, 3,000 cfs 1200 hours Apr. 13 (gage height, 10.45 ft).
1944 to February 1965: Discharge, 6,880 cfs May 8, 1960 (gage height, 12.94 ft).

Mean discharge, in cubic feet per second, 1965, of Lemonweir River at New Lisbon, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	363	180	1,080	11	940	2,120	573	21	180	1,150	623
2	1,100	300	937	12	703	2,580	498	22	180	1,070	644
3	1,400	445	802	13	573	2,950	398	23	170	1,020	581
4	1,030	622	673	14	423	2,710	370	24	160	988	514
5	1,120	863	621	15	357	2,340	312	25	150	943	461
6	1,640	1,120	621	16	317	1,980	299	26	140	1,000	730
7	1,660	1,450	634	17	280	1,680	362	27	140	1,080	1,230
8	1,390	1,810	644	18	230	1,480	488	28	130	1,140	1,870
9	1,340	2,100	649	19	210	1,360	641	29	130	1,210	2,170
10	1,280	2,130	632	20	190	1,260	661	30	140	1,190	1,920
								31	150	-------	1,580
Monthly mean discharge, in cubic feet per second									588	1,409	781
Runoff, in inches									1.35	3.14	1.80

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	6.55	985	Apr. 10	0600	9.36	2,190	Apr. 14	1600	10.03	2,640
	0800	6.85	1,080		1200	9.27	2,130		2400	9.85	2,520
	1600	7.10	1,150		1800	9.19	2,080				
	2400	7.40	1,270		2400	9.17	2,070	15	0800	9.70	2,410
									1600	9.50	2,270
7	0800	7.71	1,390	11	1200	9.22	2,100		2400	9.30	2,150
	1600	8.00	1,510		1800	9.27	2,130				
	2400	8.32	1,640		2400	9.43	2,230	16	0800	9.13	2,050
									1600	8.90	1,920
8	0600	8.52	1,730	12	0600	9.65	2,380		2400	8.70	1,820
	1200	8.70	1,820		1200	9.95	2,580				
	1800	8.85	1,900		1800	10.21	2,790	17	0800	8.52	1,730
	2400	9.00	1,970		2400	10.33	2,890		1600	8.30	1,630
									2400	8.13	1,560
9	0600	9.14	2,050	13	0600	10.42	2,970	18	0800	7.99	1,510
	1200	9.23	2,110		1200	10.45	3,000		1600	7.86	1,450
	1800	9.30	2,150		1800	10.40	2,950		2400	7.79	1,430
	2400	9.36	2,190		2400	10.33	2,890				
								19	1200	7.63	1,360
10	0200	9.37	2,190	14	0800	10.20	2,780		2400	7.50	1,310

(198) 5–4040. Wisconsin River near Wisconsin Dells, Wis.

Location.—Lat 43°36'20", long 89°45'25", in extreme western part of sec.14, T.13 N., R.6 E., on right bank 0.5 mile downstream from Dell Creek and 3 miles downstream from Wisconsin Dells.

Drainage area.—7,830 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals. Altitude of gage is 810 ft (from topographic map).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharges computed from 24 punch-tape recordings per day.

Maxima.—March–May 1965: Discharge, 50,200 cfs 2000 hours Apr. 15 (gage height, 18.95 ft).
1934 to February 1965: Discharge, 72,200 cfs Sept. 14, 1938 (gage height, 23.83 ft).

Remarks.—Flow regulated by 23 reservoirs and many powerplants above station. In 1938, when the maximum of record occurred, there were 21 reservoirs above station, the two large reservoirs Petenwell and Castle Rock not yet in existence.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	5,200	4,460	16,800	11	9,370	10,400	14,100	21	8,940	23,600	18,300
2	5,400	4,430	12,600	12	9,820	11,800	15,100	22	8,650	22,600	14,200
3	6,000	3,930	13,300	13	9,760	19,800	11,500	23	8,530	22,900	10,700
4	7,400	3,670	20,700	14	9,830	29,800	11,100	24	8,500	23,200	10,500
5	9,100	4,080	18,100	15	9,860	46,300	10,200	25	8,590	23,800	10,300
6	9,440	5,220	14,100	16	9,740	46,600	10,300	26	7,770	24,100	11,000
7	8,820	6,720	10,900	17	9,660	40,500	18,700	27	7,240	22,700	17,300
8	7,680	7,460	10,000	18	9,410	37,200	21,000	28	7,120	22,900	18,100
9	8,200	8,360	10,400	19	9,340	33,600	22,000	29	5,940	22,200	14,600
10	8,740	8,940	11,000	20	9,220	25,600	20,700	30	4,310	23,800	11,200
								31	4,130	------	11,600
Monthly mean discharge, in cubic feet per second									8,120	19,690	14,210

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr.13	0000	10.16	13,900	Apr.15	1000	18.19	45,500	Apr.18	1200	16.85	38,200
	0200	10.64	15,300		1400	18.61	48,100		1800	16.50	36,600
	0800	11.44	17,800		1600	18.83	49,400		2400	16.57	36,900
	1400	12.10	19,900		2000	18.95	50,200				
	1800	12.98	23,000		2400	18.87	49,700	19	0800	16.29	35,600
	2400	13.67	25,400	16	0800	18.55	47,700		1000	15.89	33,900
					1200	18.36	46,500		1400	15.59	32,700
14	0400	14.05	26,800		1600	18.22	45,700		2400	14.87	29,900
	1000	14.38	28,000		2000	18.01	44,400				
	1200	14.73	29,400		2400	17.93	44,000	20	0600	14.47	28,400
	1800	15.35	31,800	17	0600	17.67	42,500		0800	14.09	27,000
	2000	15.40	32,000		1200	17.26	40,300		1000	13.75	25,700
	2200	16.14	35,000		1800	17.02	39,000		1200	13.61	25,200
	2400	16.63	37,200		2200	16.76	37,800		1400	13.23	23,800
15	0200	17.20	39,900		2400	16.81	38,000		1600	12.96	22,900
	0400	17.47	41,400	18	0600	16.67	37,300		2000	13.02	23,100
	0800	17.92	43,900						2400	13.38	24,400

(199) 5–4050. Baraboo River near Baraboo, Wis.

Location.—Lat 43°28'55", long 89°38'00", in NW¼ sec.35, T.12 N., R.7 E., on left bank 50 ft downstream from highway bridge, 0.3 mile downstream from Rowley Creek and 4 miles east of Baraboo.

Drainage area.—600 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 2–9 and crest-stage gage. Datum of gage is 788.21 ft above mean sea level datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 5,600 cfs. Backwater from ice Mar. 1–22.

Maxima.—March–May 1965: Discharge, about 4,500 cfs time unknown Mar. 6 (19.8 ft, backwater from ice).

1913–22, 1942 to February 1965: Discharge observed, 7,900 cfs Mar. 26, 1917 (gage height, 17.5 ft, estimated, at site 2.3 miles upstream at datum 7.6 ft higher).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	600	718	302	11	1,600	2,740	159	21	123	308	195
2	1,890	994	250	12	1,300	2,420	183	22	126	275	178
3	3,000	1,200	235	13	700	2,040	173	23	125	270	164
4	4,000	1,400	190	14	300	1,620	164	24	176	260	134
5	4,200	1,750	104	15	220	1,320	143	25	154	332	190
6	4,400	2,290	188	16	180	970	123	26	136	627	220
7	4,200	2,720	238	17	155	523	111	27	138	671	181
8	3,700	3,070	242	18	140	408	104	28	127	640	320
9	3,080	3,260	238	19	130	362	98	29	138	533	440
10	2,400	3,060	215	20	125	332	169	30	164	380	410
								31	355	-------	282
Monthly mean discharge, in cubic feet per second									1,228	1,250	205
Runoff, in inches									2.36	2.32	0.39

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	8.33	------	Apr. 3	0600	10.61	1,120	Apr. 8	1200	16.11	3,060
	0600	8.73	------		0900	10.81	1,180		2400	16.47	3,240
	1200	9.37	------		1600	10.96	1,210				
	1800	10.93	------		2400	11.32	1,310	9	0600	16.53	3,260
	2000	11.78	------						1200	16.54	3,270
	2400	13.40	------	4	0600	11.40	1,330		1800	16.53	3,260
					1200	11.40	1,330		2400	16.46	3,230
2	0600	14.00	------		1800	11.86	1,470				
	1200	14.35	------		2400	12.31	1,610	10	0600	16.33	3,160
	1800	14.70	------						1200	16.12	3,060
	2400	15.00	------	5	0600	12.41	1,640		1800	15.88	2,940
					1200	12.58	1,700		2400	15.80	2,900
31	2400	8.50	575		1800	13.03	1,850				
					2400	13.47	2,030	11	0600	15.66	2,830
Apr. 1	0600	8.65	614						1800	15.26	2,640
	1200	9.00	705	6	0600	13.63	2,110		2400	15.08	2,570
	1800	9.42	814		1200	13.88	2,210				
	2400	9.76	903		1800	14.64	2,520	12	1200	14.70	2,420
					2400	14.92	2,610		2400	14.31	2,260
2	0600	9.82	918								
	1200	9.84	923	7	0600	14.92	2,610	13	1200	13.76	2,040
	1800	10.49	1,090		1200	15.13	2,670		2400	13.05	1,800
	2100	10.72	1,150		1800	15.57	2,860				
	2400	10.75	1,160		2400	15.72	2,910				

(200) 5–4070. Wisconsin River at Muscoda, Wis.

Location.—Lat 43°12'00", long 90°26'25", in sec.1, T.8 N., R.1 W., on left bank at bridge on State Highway 80, 0.5 mile upstream from Eagle Mill Creek and 1 mile north of Muscoda.

Drainage area.—10,300 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at sixty-minute intervals. Datum of gage is 667.05 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharges computed from 24 punch-tape recordings per day. Backwater from ice Mar. 1 to Apr. 7.

Maxima.—March–May 1965: Discharge, 48,500 cfs 2300 hours Apr. 18 (gage height, 8.95 ft).
1902–03, 1913 to February 1965: Discharge, 80,800 cfs Sept. 16, 1938 (gage height, 11.48 ft).

Remarks.—Flow regulated by 23 reservoirs and many powerplants above station. In 1938, when the maximum of record occurred, there were 21 reservoirs above station, the two large reservoirs, Petenwell and Castle Rock not yet in existence.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	8,000	8,400	23,200	11	14,000	14,600	11,800	21	10,000	38,000	20,600
2	12,000	8,200	23,300	12	13,000	15,000	12,400	22	11,000	32,400	20,300
3	16,000	7,800	18,800	13	14,000	14,600	13,800	23	12,000	27,100	18,800
4	14,000	7,800	14,900	14	14,000	15,400	14,100	24	12,000	24,600	14,800
5	13,000	7,600	16,200	15	13,000	20,400	13,400	25	12,000	25,100	13,500
6	14,000	9,000	20,400	16	12,000	25,200	12,600	26	11,000	24,600	12,400
7	15,000	10,800	19,100	17	11,000	32,000	11,900	27	11,000	25,500	12,500
8	15,000	12,800	15,500	18	10,000	45,900	11,800	28	11,000	25,300	12,200
9	15,000	13,900	13,500	19	10,000	46,900	15,700	29	10,000	25,300	15,800
10	14,000	14,400	11,300	20	10,000	41,800	19,500	30	9,200	24,000	16,600
								31	8,800	-------	14,700
Monthly mean discharge, in cubic feet per second									12,100	21,480	15,660

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr.14	0000	3.85	14,300	Apr.17	1800	7.53	35,000	Apr.20	1800	8.20	41,000
	0600	3.84	14,300		2400	8.14	40,400		2400	8.16	40,600
	1200	4.06	15,100								
	2000	4.44	16,700	18	0600	8.53	44,300	21	0600	8.07	39,700
	2400	4.64	17,700		1200	8.77	46,700		1200	7.88	38,000
					1600	8.89	47,900		1800	7.71	36,500
15	0600	4.93	19,200		2000	8.91	48,100		2400	7.54	35,100
	1200	5.20	20,500		2300	8.95	48,500				
	1800	5.44	21,700		2400	8.94	48,400	22	0600	7.39	33,900
	2400	5.67	23,000						1200	7.20	32,600
				19	0600	8.92	48,200		1800	6.97	31,000
16	0600	5.86	24,200		1200	8.85	47,500		2400	6.73	29,400
	1200	6.03	25,200		1800	8.67	45,700				
	1800	6.19	26,100		2400	8.50	44,000	23	0600	6.52	28,100
	2400	6.37	27,200						1200	6.33	27,000
				20	0600	8.35	42,500		1800	6.19	26,100
17	0600	6.60	28,600		1200	8.25	41,500		2400	6.05	25,300
	1200	6.94	30,800								

(201) 5–4074. Morris Creek tributary near Norwalk, W

(Crest-stage station)

Location.—Lat 43°51'10", long 90°37'32", in NW¼ sec.21, T.16 N., R.2 W., at bridge on County Trunk T, 1.2 miles north of intersection with State Highway 71, and 2 miles north of Norwalk.

Drainage area.—4.67 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 617 cfs.

Maxima.—March–May 1965: Discharge, 490 cfs Apr. 2 (gage height, 11.80 ft).
1960 to February 1965: Discharge, 950 cfs Oct. 24, 1959 (gage height, 13.10 ft).

(202) 5–4080. Kickapoo River at La Farge, Wis.

Location.—Lat 43°34'30", long 90°38'35", on east-west quarter section line in W½ sec.29, T.13 N., R.2 W., on left bank 10 ft upstream from bridge on State Highway 82, in La Farge, 0.3 mile upstream from Otter Creek, and 1 mile downstream from powerplant.

Drainage area.—266 sq mi.

Gage-height record.—Digital recorder tape punched at fifteen-minute intervals. Datum of gage is 782.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 5,700 cfs. Mean daily discharges computed from 96 punch-tape recordings per day. Rate of change in stage used as factor Apr. 11, 12, May 26, 27. Backwater from ice Mar. 1 to Apr. 4.

Maxima.—March–May 1965: Discharge, about 3,600 cfs 1415 hours Mar. 2 (gage-height, 12.78 ft., backwater from ice).
1938 to February 1965: Discharge, 7,040 cfs Mar. 26, 1961 (gage height, 12.70 ft); gage height, 12.90 ft Mar. 8, 1950 (backwater from ice).

Remarks.—Considerable diurnal fluctuation during low-water periods caused by operation of powerplant, 1 mile upstream.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	900	500	129	11	250	2,260	103	21	100	120	126
2	2,500	560	133	12	210	1,970	104	22	96	154	338
3	1,800	700	124	13	180	332	93	23	92	159	149
4	400	1,400	116	14	160	238	91	24	88	171	134
5	1,000	1,690	157	15	150	336	86	25	84	229	141
6	2,200	2,330	153	16	140	239	227	26	80	322	973
7	700	1,890	129	17	130	206	152	27	78	214	576
8	1,000	1,620	128	18	120	223	188	28	80	177	239
9	660	2,350	138	19	110	188	183	29	88	141	178
10	340	652	116	20	104	170	117	30	130	137	157
								31	350	-------	145
Monthly mean discharge, in cubic feet per second									462	723	188
Runoff, in inches									2.00	3.03	0.81

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Kickapoo River at La Farge, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar.2	0000	10.06	------	Mar.8	1400	7.58	------	Apr.8	0400	8.86	1,870
	0200	10.25	------		1600	6.65	------		0800	9.29	2,040
	0600	10.95	------		1800	6.00	------		1000	8.82	1,860
	1000	11.87	------		2000	5.64	------		1200	6.93	1,240
	1400	12.77	------		2400	5.48	------		1400	5.50	827
	1415	12.78	3,600						1600	5.77	898
	2000	12.21	------	Apr.3	2400	4.84	------		1800	7.64	1,450
	2400	11.74	------						2000	8.68	1,810
				4	0200	6.87	------		2400	9.06	1,940
3	0600	11.28	------		0400	8.06	------				
	1200	10.76	------		0600	8.42	------	9	0400	9.76	2,250
	1800	9.95	------		1000	8.51	------		0800	10.69	2,880
	2000	9.47	------		1200	9.06	------		1200	11.15	3,410
	2200	8.48	------		1600	8.97	------		1600	10.63	2,830
	2400	7.35	------		1800	8.76	------		1800	9.91	2,330
					2400	8.63	1,790		2000	7.40	1,380
4	2400	5.22	------						2200	5.63	861
				5	0600	8.94	1,900		2400	5.10	729
5	0200	5.76	------		1000	9.02	1,930				
	0400	6.32	------		1200	8.18	1,630	10	2400	7.28	1,570
	0600	7.12	------		1400	7.05	1,280				
	1000	7.90	------		1600	7.17	1,310	11	0200	8.16	1,700
	1200	8.40	------		2000	8.24	1,650		0800	8.74	1,870
	1600	9.66	------		2400	8.68	1,810		1200	9.55	2,240
	2000	10.33	------						1600	10.49	2,840
	2400	11.24	------	6	0400	9.32	2,050		1800	10.71	2,900
					0800	10.23	2,520		2200	10.38	2,580
6	0600	11.79	------		1100	10.57	2,780		2400	10.31	2,550
	1000	11.86	------		1400	10.38	2,630				
	1200	11.77	------		1800	9.92	2,330	12	0400	10.23	2,520
	1600	10.93	------		2400	9.65	2,200		0800	10.48	2,730
	2000	9.94	------						1000	10.53	2,740
	2400	7.93	------	7	0400	9.91	2,330		1400	10.25	2,460
					0800	10.12	2,450		1600	9.52	1,880
7	2400	6.51	------		1200	9.55	2,140		1800	6.99	882
					1400	7.73	1,480		2000	5.23	608
8	0400	7.33	------		1600	6.76	1,190		2200	4.41	517
	0800	8.01	------		1800	6.80	1,200		2400	3.99	458
	1000	8.28	------		2000	7.48	1,400				
	1200	8.27	------		2400	8.30	1,680				

(203) 5–4105. Kickapoo River at Steuben, Wis.

Location.—Lat 43°11'25", long 90°52'30", in NW¼ sec.8, T.8 N., R.4 W., on right bank 0.8 mile upstream from Duffy Creek, 1 mile northwest of Steuben and 14 miles upstream from mouth.

Drainage area.—690 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 657.82 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice March 1–8, 17, 18, 20–26.

Maxima.—March–May 1965: Discharge, 6,500 cfs 0700 hours Mar. 4 (gage height 11.18 ft, backwater from ice).
1933 to February 1965: Discharge, 10,800 cfs Mar. 28, 1961 (gage height, 12.33 ft).

Mean discharge, in cubic feet per second, 1965, of Kickapoo River at Steuben, Wis.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	800	1,250	466	11	1,020	2,700	423	21	300	507	410
2	2,000	1,510	447	12	505	2,540	393	22	300	488	378
3	5,000	1,710	429	13	452	3,180	370	23	290	458	470
4	5,500	2,040	420	14	402	2,660	364	24	280	486	471
5	3,900	2,470	430	15	386	2,030	354	25	270	557	417
6	3,700	2,740	631	16	339	1,090	366	26	270	683	773
7	3,200	2,820	539	17	340	786	444	27	270	721	873
8	3,600	2,820	476	18	310	643	483	28	263	634	1,020
9	2,670	2,800	459	19	295	592	450	29	272	544	922
10	2,140	2,700	446	20	300	537	468	30	304	493	609
								31	660	-------	499
Monthly mean discharge, in cubic feet per second									1,301	1,506	506
Runoff, in inches									2.17	2.44	0.85

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 2	0000	8.71	------	Mar. 7	0600	9.74	-------	Mar. 31	2400	7.72	1,100
	1200	9.12	------		1200	9.55	-------				
	1800	9.44	------		1800	9.44	-------	Apr. 1	1200	8.20	1,260
	2400	10.02	------		2400	9.57	-------		2400	8.59	1,390
3	0600	10.88	------	8	0600	10.04	-------	2	2400	8.83	1,630
	1200	10.92	------		1200	9.71	-------				
	1800	10.66	------		2400	9.35	-------	13	0000	9.20	2,570
	2400	10.97	------						0600	9.37	3,000
				9	1200	9.23	2,640		1200	9.63	3,640
4	0600	11.17	------		2400	9.16	2,470		1800	9.51	3,340
	0700	11.18	6,500						2400	9.35	2,940
	1200	10.96	------	10	1200	9.07	2,250				
	1800	10.52	------		2400	8.72	1,610	14	1200	9.23	2,640
	2400	10.10	------						2400	9.14	2,420
				11	1200	7.07	959				
5	0600	9.80	------		1800	5.99	735	15	1200	9.00	2,080
	1200	9.65	------		2400	5.11	582		1800	8.88	1,840
	1800	9.94	------						2400	8.54	1,460
	2400	9.93	------	30	2400	4.38	435				
								16	1200	7.30	1,080
6	1200	9.92	------	31	0600	4.84	513		2400	5.70	721
	1800	9.53	------		1200	5.19	570				
	2400	9.50	------		1800	6.43	788				

(204) Wisconsin River at Bridgeport, Wis.

(Miscellaneous site)

Location.—SW¼ sec.11, T.6 N., R.6 W., at bridge on U.S. Highway 18 at Bridgeport.

Drainage area.—11,700 sq mi.

Discharge record.—Discharge obtained on the following days by current-meter measurements.

Date	Discharge, in cfs
Apr. 15	20,100
Apr. 19	44,600
Apr. 24	32,500
May 1	26,300

TURKEY RIVER BASIN

(205) 5–4116. Turkey River at Spillville, Iowa

Location.—Lat 43°12'30", long 91°57'00", in SW¼NE¼ sec.19, T.97 N., R.9 W., on right bank 60 ft downstream from county highway bridge, at north edge of Spillville, 150 ft downstream from old mill dam, and 3,000 ft upstream from Wonder Creek.

Drainage area.—177 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 3–10, Apr. 14–20, May 27–31. Datum of gage is 1,034.77 ft above mean sea level, datum of 1928.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,410 cfs, extended to 3,500 cfs by logarithmic plotting. Backwater from ice Mar. 1 to Apr. 4.

Maxima.—March–May 1965: Discharge, about 3,900 cfs Mar. ·; gage height, 16.11 ft 0800 hrs Mar. 1 (backwater from ice).
1956 to February 1965: Discharge, 7,380 cfs Mar. 29, 1962 (gage height, 15.32 ft). Flood in June 1947 reached a stage of 18.4 ft, from floodmark (discharge about 10,000 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,150	1,480	92	11	45	699	57	21	20	83	40
2	1,690	1,700	77	12	40	927	54	22	18	80	40
3	450	1,380	73	13	36	261	53	23	16	77	41
4	190	1,700	68	14	33	210	51	24	15	79	40
5	118	2,420	68	15	32	174	52	25	14	110	59
6	92	2,440	67	16	32	148	65	26	14	202	967
7	91	1,460	68	17	32	128	59	27	13	173	400
8	76	1,260	69	18	30	112	54	28	13	144	200
9	60	1,330	64	19	25	100	47	29	13	120	142
10	50	445	61	20	22	90	43	30	13	104	122
								31	60	-------	106
Monthly mean discharge, in cubic feet per second									178	655	110
Runoff, in inches									1.16	4.13	0.71
Runoff, in acre-feet									10,920	38,950	6,740

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	14.20	-------	Apr. 7	2400	7.51	1,090	Apr. 9	0200	10.02	2,010
	0600	14.75	-------	8	0400	6.62	790		0600	8.58	1,440
	0700	15.29	-------		0600	6.42	737		1200	8.96	1,580
	0800	16.11	-------		1000	6.84	866		1600	7.81	1,170
	0900	12.90	-------		1600	7.66	1,130		1700	7.01	914
	1000	12.76	-------		1800	8.27	1,340		1800	6.42	737
	1100	12.62	-------		2000	10.03	2,080		2000	6.28	688
	1600	14.14	-------		2300	11.68	2,810		2400	5.85	572
	1800	14.29	-------		2400	11.58	2,750				
	2400	13.06	-------								

(206) 5–4116.5. Crane Creek tributary near Saratoga, Iowa

(Crest-stage station)

Location.—Near SE corner of sec.21, T.99 N., R.13 W., at bridge on State Highway 9, 1 mile east of Saratoga.

Drainage area.—4.06 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 355 cfs and by contracted-opening measurement at 1,830 cfs.

Maxima.—March–May 1965: Discharge, about 800 cfs Apr. 8 (gage height, 5.70 ft, backwater from ice).
1953 to February 1965: Discharge, 1,830 cfs Aug. 31, 1962 (gage height, 6.32 ft).

(207) 5–4117. Crane Creek near Lourdes, Iowa

(Crest-stage station)

Location.—NW¼ sec.6, T.97 N., R.12 W., at bridge on State Highway 272, 1 mile southwest of Lourdes.

Drainage area.—75.8 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 3,340 cfs and by contracted-opening measurement at 11,900 cfs.

Maxima.—March–May 1965: Discharge, about 1,000 cfs Mar. 1 (gage height, 12.6 ft, backwater from ice).
1953 to February 1965: Discharge, 11,900 cfs Aug. 31, 1962 (gage height, 15.70 ft).

(206) 5–4125. Turkey River at Garber, Iowa

Location.—Lat 42°44'20", long 91°15'45", in NE¼SW¼ sec.36, T.92 N., R.4 W., on left bank 10 ft downstream from highway bridge at Garber, 800 ft upstream from Wayman Creek, 2,000 ft downstream from Elk Creek, and 1 mile downstream from Volga River.

Drainage area.—1,545 sq mi.

Gage-height record.—Water-stage recorder graph except Feb. 27–Mar. 5, for which graph was reconstructed on basis of twice daily wire-weight gage readings. Datum of gage is 634.46 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 25,000 cfs. Backwater from ice Mar. 1–9, 19–28.

Maxima.—March–May 1965: Discharge, 13,800 cfs 1800 hours Apr. 1; gage height observed, 22.10 ft 0800–0900 hours Mar. 1.
1913–16, 1919–27, 1929–30, 1932 to February 1965: Discharge, 32,300 cfs Feb. 23, 1922 (gage height, 28.06 ft, from floodmark).
Maximum stage known since about 1890, that of Feb. 23, 1922.

Mean discharge, in cubic feet per second, 1965, of Turkey River at Garber, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	10,000	12,600	660	11	875	4,080	407	21	290	730	327
2	7,000	8,460	602	12	695	3,780	384	22	270	630	327
3	5,000	6,240	556	13	805	3,910	362	23	260	597	341
4	3,500	8,020	522	14	925	2,720	344	24	250	602	317
5	4,200	9,820	496	15	1,020	1,540	334	25	240	700	310
6	3,600	10,000	475	16	800	1,220	358	26	230	850	3,760
7	3,200	9,390	458	17	670	1,070	334	27	230	1,000	3,830
8	3,800	6,960	458	18	348	935	358	28	225	1,020	2,250
9	1,500	6,230	450	19	330	830	410	29	221	850	1,310
10	1,140	5,830	434	20	310	755	366	30	448	750	996
								31	4,130	-------	855
Monthly mean discharge, in cubic feet per second									1,823	3,761	755
Runoff, in inches									1.36	2.72	0.56
Runoff, in acre-feet									112,100	223,800	46,400

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	9.16	-------	Mar. 2	0300	19.75	-------	Mar. 31	2000	15.31	8,590
	0300	10.30	-------		0730	19.44	-------		2400	16.93	10,700
	0500	11.50	-------		1530	19.36	-------				
	0730	11.72	-------		2400	19.27	-------	Apr. 1	0600	18.00	12,200
	1200	11.61	-------						1200	18.39	12,700
	1600	11.50	-------	3	0830	19.17	-------		1800	19.15	13,800
	1700	15.84	-------		1300	19.10	-------		1900	19.14	13,700
	1800	16.60	-------		1500	18.95	-------		2100	18.87	13,400
	2000	18.00	-------		1700	17.97	-------		2400	17.78	11,900
	2400	20.50	-------		1800	17.25	-------				
					2000	15.40	-------	2	0300	16.54	10,200
Mar. 1	0300	21.60	-------		2200	14.06	-------		0600	15.54	8,880
	0600	22.07	-------		2400	13.26	-------		0900	15.04	8,250
	0800	22.10	-------						1200	14.77	7,920
	0900	22.10	-------	31	0000	7.82	1,410		1500	14.55	7,660
	1230	22.00	-------		0600	8.57	1,910		1800	14.49	7,590
	1530	22.02	-------		0900	9.26	2,430		2200	14.46	7,550
	1800	21.90	-------		1100	9.36	2,510		2400	14.29	7,350
	2100	21.25	-------		1400	9.46	2,590				
	2400	20.50	-------		1800	13.00	5,910				

GRANT RIVER BASIN

(209) 5–4135. Grant River at Burton, Wis.

Location.—Lat 42°43'10", long 90°49'10", in sec.23, T.3 N., R.4 W., on right bank at downstream side of highway bridge at Burton, 6 miles northwest of Potosi and 9.5 miles upstream from mouth.

Drainage area.—267 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 606.89 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 17,500 cfs and by slope-area measurements at 25,000 cfs. Backwater from ice Feb. 26 to Mar. 9, Mar. 14 to Apr. 1, and backwater from Mississippi River Apr. 15 to May 3.

Maxima.—March–May 1965: Discharge, about 7,000 cfs 0800 hours Mar. 1 (gage height, 22.05 ft, backwater from ice); gage height, 22.71 ft 0200 hours Mar. 6, backwater from ice.

1934 to February 1965: Discharge, 25,000 cfs July 16, 1950 (gage height 24.82 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	5,000	3,000	100	11	305	239	74	21	66	76	57
2	1,700	607	92	12	229	177	74	22	64	80	80
3	900	258	92	13	136	134	70	23	62	94	78
4	200	721	107	14	115	126	69	24	62	130	70
5	1,000	541	96	15	110	120	70	25	62	175	69
6	2,000	596	98	16	97	115	84	26	62	160	106
7	1,700	246	89	17	85	105	81	27	66	150	167
8	1,200	203	87	18	80	95	69	28	70	130	93
9	800	195	88	19	75	90	63	29	75	120	81
10	453	140	81	20	70	80	58	30	120	110	80
								31	1,700	-------	76
Monthly mean discharge, in cubic feet per second									602	300	83.8
Runoff, in inches									2.60	1.26	0.36

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Grant River at Burton, Wis.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 27	0000	9.49		Mar. 5	1600	19.70		Mar. 31	2000	18.00	
	0600	9.52			2000	21.84			2400	20.03	
	1200	9.43			2400	22.70					
	1800	9.87						Apr. 1	0300	20.34	
	2400	11.22		6	0200	22.71			0600	19.40	
					0600	22.10			0800	17.55	
28	0600	14.24			1200	19.78			1000	15.65	
	1000	14.90			1800	18.00			1200	14.62	
	1200	15.55			2000	16.97			1400	14.44	
	1600	17.50			2200	16.12			1800	15.07	
	1800	19.30			2400	15.42			2200	15.86	
	2000	20.40							2400	15.72	1,410
	2400	21.45		7	0600	14.32					
					1200	14.11		2	0600	12.04	871
Mar. 1	0600	22.02			1600	15.22			1200	9.10	459
	0800	22.05	7,000		1800	17.07			1600	7.98	316
	1200	21.47			2200	19.48			2000	7.47	266
	1800	21.39			2400	20.54			2400	7.19	241
	2400	21.65									
				8	0200	20.94		3	0200	7.18	240
2	0200	21.70			0600	20.41			1000	7.70	287
	1400	20.13			1000	18.79			1800	6.96	222
	2400	21.49			1200	17.80			2400	7.87	304
					1400	16.50					
3	0300	21.53			2100	14.55		4	0300	8.87	427
	1200	19.50			2400	14.80			0800	12.72	966
	1800	17.27							1000	13.61	1,100
	2000	16.10		9	0600	15.43			1800	10.60	669
	2400	14.45			1200	13.84			2400	9.60	529
					1800	11.70					
4	0600	13.00			2400	10.15		5	0400	9.62	532
	1200	12.21							1200	8.94	437
	1800	11.74		30	2400	9.57			1800	9.68	540
	2400	11.57							2400	11.62	812
				31	0200	12.00					
5	0300	11.55			0400	13.58		6	0600	10.61	670
	0600	11.90			0500	13.86			1200	10.40	641
	0900	13.90			1000	12.14			2400	8.26	348
	1200	16.65			1400	10.81					
	1400	18.25			1800	13.70					

PLATTE RIVER BASIN

(210) 5–4140. Platte River near Rockville, Wis.

Location.—Lat 42°43'55", long 90°38'25", in SW¼ sec.17, T.3 N., R.2 W., on right bank just downstream from highway bridge, 0.8 mile upstream from Blakely Branch, 2.2 miles east of Rockville, 4.5 miles northeast of Potosi, and 15.2 miles upstream from mouth.

Drainage area.—139 sq mi.

Gage-height record.—Water-stage recorder graph except parts of Feb. 28 to Mar. 2 for which graph was reconstructed on basis of available recorder record, floodmark and numerous float-tape gage readings. Datum of gage is 642.95 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 7000 cfs, and by slope-area measurement at 43,500 cfs. Backwater from ice Feb. 27 to Mar. 2, Mar. 19–28.

Maxima.—February–May 1965: Discharge, about 3000 cfs 2200 hours Feb. 28 (gage height, 10.86 ft, backwater from ice).
1934 to January 1965: Discharge, 43,500 cfs July 16, 1950 (gage height 17.26 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,600	1,080	60	11	61	191	47	21	46	54	40
2	960	336	57	12	52	125	45	22	45	52	47
3	387	240	54	13	55	84	44	23	43	51	47
4	82	467	52	14	54	75	42	24	43	56	43
5	828	474	132	15	69	76	44	25	42	92	42
6	468	748	72	16	56	69	50	26	42	110	47
7	549	207	59	17	66	66	47	27	43	81	77
8	413	177	62	18	52	63	45	28	46	85	55
9	224	139	55	19	47	64	42	29	50	72	48
10	72	92	50	20	45	57	40	30	115	65	46
								31	968	-------	45
Monthly mean discharge, in cubic feet per second									246	185	52.8
Runoff, in inches									2.04	1.48	0.44

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	4.80	-------	Mar. 1	1800	9.9	-------	Mar. 3	2400	3.94	118
	0600	4.87	-------		2400	10.4	-------				
	1100	5.15	-------					4	0600	3.73	89
	1200	5.11	-------	2	0400	10.6	-------		1200	3.61	76
	1400	5.24	-------		0900	10.3	-------		1800	3.53	69
	1500	5.60	-------		1200	8.9	-------		2400	3.54	70
	1600	8.0	-------		1500	7.9	-------				
	1800	10.0	-------		1800	7.2	-------	5	0300	3.66	81
	2000	10.7	-------		2100	8.3	-------		0600	4.16	157
	2200	10.86	3,000		2400	7.40	1,200		0900	5.05	364
	2400	10.8	-------						1200	6.56	821
				3	0600	5.40	462		1800	8.3	1,660
Mar. 1	0600	10.0	-------		1200	4.64	261		2000	8.4	1,730
	1200	9.8	-------		1800	4.21	167		2400	7.43	1,220

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Platte River near Rockville, Wis.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 6	0600	5.68	544	Mar. 30	1200	3.35	56	Apr. 3	1200	4.22	169
	1200	4.89	322		1500	3.45	64		1800	4.07	141
	1600	4.64	261		1800	3.90	111		2100	4.30	185
	2000	4.72	280		2200	5.05	364		2400	4.77	292
	2400	4.68	270		2300	5.00	351				
					2400	5.08	373	4	0500	5.75	565
7	0300	4.65	263						1600	5.12	383
	1300	4.07	141	31	0300	5.43	471		2400	5.80	580
	1600	5.40	462		1300	4.70	275	5	0900	4.72	280
	1800	7.15	1,080		1600	6.60	835		1500	5.28	427
	2100	8.1	1,550		1800	8.40	1,730		2000	6.09	667
	2400	7.20	1,100		2200	9.30	2,810		2200	5.93	619
					2400	8.80	2,110		2400	6.37	755
8	0300	5.66	538								
	0600	4.97	343	Apr. 1	0600	6.25	715	6	0300	7.62	1,310
	1300	4.23	171		1000	5.83	589		0500	7.57	1,290
	1800	5.10	378		1500	7.20	1,100		0700	7.59	1,300
	2300	5.90	610		1900	7.86	1,430		1200	5.68	544
	2400	5.82	586		2400	6.54	814		1800	5.13	386
									2100	5.09	375
9	0600	4.76	290	2	0600	5.13	386		2400	5.09	374
	1200	4.18	161		1200	4.52	233				
	1800	3.87	107		1800	4.30	185	7	0600	4.57	244
	2400	3.73	89		2400	4.67	268		1200	4.22	169
									1800	4.12	150
30	0000	3.32	54	3	0300	5.22	411		2400	4.17	158

LITTLE MAQUOKETA RIVER BASIN

(211) 5–4145. Little Maquoketa River near Durango, Iowa.

Location.—Lat 42°33'25", long 90°44'45", in NW¼NE¼ sec.5, T.89 N., R.2 E., on left bank 10 ft upstream from highway bridge, 1½ miles east of Durango, 5 miles northwest of Dubuque, and 7.5 miles upstream from mouth.

Drainage area.—130 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 612.03 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 6,300 cfs, extended to 25,000 cfs by logarithmic plotting and results of three slope-area measurements. Backwater from ice Mar. 9–11, 18–29.

Maxima.—March-May 1965: Discharge, 8,860 cfs 1830 hours Feb. 28 (gage height, 16.41 ft).

1925 to February 1965: Discharge, about 29,000 cfs June 15, 1925 (gage height, 22.1 ft).

Mean discharge, in cubic feet per second, 1965, of Little Maquoketa River near Durango, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,100	1,220	54	11	56	354	29	21	23	43	20
2	996	283	48	12	47	127	28	22	22	40	21
3	339	326	42	13	91	81	25	23	21	37	39
4	68	566	39	14	139	70	24	24	20	53	28
5	358	811	43	15	122	73	25	25	20	186	23
6	261	734	41	16	94	62	37	26	19	134	45
7	271	177	36	17	62	68	31	27	19	89	113
8	260	170	32	18	33	58	27	28	21	95	46
9	100	113	35	19	28	50	24	29	25	74	36
10	68	102	33	20	25	46	22	30	425	63	34
								31	1,530	------	30
Monthly mean discharge, in cubic feet per second									215	210	35.8
Runoff, in inches									1.91	1.80	0.32
Runoff, in acre-feet									13,220	12,510	2,200

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 27	0000	2.93	24	Feb. 28	1930	14.65	6,490	Mar. 31	1230	4.54	292
	1400	2.92	23		2000	13.05	4,800		1400	4.98	397
	1600	2.98	28		2030	11.60	3,560		1500	7.00	1,050
	1700	3.12	42		2100	10.80	3,000		1600	8.10	1,520
	1800	3.97	170		2200	9.58	2,270		1700	10.20	2,650
	1930	4.69	322		2300	8.60	1,740		1900	12.34	4,180
	2200	4.11	197		2400	7.85	1,390		2000	12.52	4,340
	2300	5.65	579						2100	12.35	4,180
	2330	7.00	1,040	Mar. 30	0000	3.14	47		2200	11.10	3,220
	2400	8.50	1,690		0200	3.41	82		2400	8.70	1,800
					0500	3.48	92				
28	0030	9.41	2,160		1000	3.40	81	Apr. 1	0000	6.83	982
	0200	8.23	1,560		1500	3.69	124		0600	6.40	827
	0600	7.00	1,040		1600	3.97	173		1000	6.90	1,010
	1100	6.18	748		1700	4.80	353		1400	7.23	1,140
	1400	7.00	1,040		1800	5.70	601		1700	8.59	1,740
	1500	8.55	1,720		1900	6.60	895		1800	8.72	1,810
	1600	10.30	2,700		2000	7.95	1,450		1900	8.72	1,810
	1630	11.50	3,490		2130	8.35	1,630		2000	8.45	1,680
	1700	13.80	4,950		2400	7.76	1,360		2300	6.78	962
	1800	15.85	8,010						2400	6.27	784
	1830	16.41	8,860	31	0500	5.67	592				
	1900	15.95	8,150		1000	4.67	322				

MISSISSIPPI RIVER MAIN STEM

(212) Mississippi River at Dubuque, Iowa
(Miscellaneous site)

Location.—Lat 42°29', long 90°38', on right bank at the foot of Fourth Street in Dubuque, adjacent to and on the downstream side of the right abutment of the Illinois Central Railroad Bridge and at mile 579.9 above the Ohio River.

Drainage area.—81,600 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 584.95 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements and analysis of gate operation procedure at Dam 12. Relation only applicable for standard gate operation procedures and discharges above 100,000 cfs.

Maxima.—April–May 1965: Discharge, 304,000 cfs 0030 hrs Apr. 26 (gage height, 26.71 ft).
1865 to February 1965: Gage height, 22.7 ft Apr. 22, 1951 and Apr. 25, 1952.

Remarks.—Current-meter measurements for 1944-65 and annual maximum gage heights prior to 1965 furnished by Corps of Engineers. Gage-height record furnished by U.S. Weather Bureau.

Mean gage height, in feet, and discharge, in cubic feet per second, 1965

Day	April		May		Day	April		May	
	Gage height	Discharge	Gage height	Discharge		Gage height	Discharge	Gage height	Discharge
1	-------	----------	24.59	266,000	16	19.29	178,000	14.67	111,000
2	-------	----------	23.96	254,000	17	20.04	190,000	14.57	110,000
3	-------	----------	23.34	244,000	18	20.84	202,000	14.55	110,000
4	-------	----------	22.66	232,000	19	21.78	217,000	14.47	109,000
5	-------	----------	21.90	219,000	20	22.88	236,000	14.43	108,000
6	-------	----------	21.06	206,000	21	24.12	257,000	14.40	108,000
7	-------	----------	20.17	192,000	22	25.18	276,000	14.48	109,000
8	-------	----------	19.37	180,000	23	25.95	290,000	14.61	110,000
9	-------	----------	18.61	168,000	24	26.42	299,000	14.82	113,000
10	14.70	111,000	17.87	157,000	25	26.67	304,000	14.97	115,000
11	15.97	129,000	17.07	145,000	26	26.64	303,000	14.91	114,000
12	16.70	140,000	16.25	133,000	27	26.40	299,000	15.00	115,000
13	17.46	151,000	15.42	121,000	28	26.08	293,000	14.60	110,000
14	18.12	161,000	14.97	115,000	29	25.64	285,000	14.26	106,000
15	18.72	170,000	14.73	112,000	30	25.12	275,000	------	----------

Annual maximum gage heights for indicated years

Year	Date	Gage height (feet)	Year	Date	Gage height (feet)
1866	May	20.17	1881	Oct. 24, 25	20.2
1869	----------	15.02	1882	Apr. 20	15.7
1870	Apr. 20	21.83	1883	Apr. 27–29	15.7
1874	May 13–17	10.4	1884	Oct. 16	13.6
1875	Apr. 26	15.5	1885	May 6, 7	11.5
1876	May 27–29	15.4	1886	Apr. 29	14.4
1877	July 18–19	7.7	1887	Apr. 25–27	14.0
1878	Aug. 1	5.4	1888	May 12, 13	21.4
1879	May 30	9.7	1889	Apr. 1–3, May 30	6.4
1880	June 23, 24	21.7			

Annual maximum gage height for indicated years of Mississippi River at Dubuque, Iowa—Continued

Year	Date	Gage height (feet)	Year	Date	Gage height (feet)
1890	June 26	13.2	1928	Apr. 7, 8	14.0
1891	Apr. 30, May 1, 2	12.9	1929	Apr. 17	17.0
1892	June 24	17.6	1930	June 26, 27	11.0
1893	May 11–14	15.7	1931	Dec. 3–4	7.6
1894	May 29	15.5	1932	Apr. 20, 21	13.1
1895	June 24–26	6.3	1933	Apr. 11	11.9
1896	May 29	13.9	1934	Apr. 17	12.0
1897	Apr. 15	17.9	1935	Apr. 3–5	16.2
1898	June 21–23	9.4	1936	Apr. 5	16.8
1899	June 22–44	14.8	1937	Mar. 8	12.2
1900	Oct. 17	14.6	1938	Sept. 21	20.6
1901	Apr. 20	11.0	1939	Apr. 6	17.5
1902	May 24	12.6	1940	June 18	11.4
1903	Sept. 27	17.4	1941	Apr. 23	16.4
1904	June 8, 9	11.7	1942	June 12	19.3
1905	June 18–19	17.4	1943	June 29	18.9
1906	Apr. 21–25	16.6	1944	June 27	19.0
1907	Apr. 9, 10	16.1	1945	Mar. 29, 30	18.9
1908	July 19	14.9	1946	Mar. 27	17.8
1909	Apr. 20	13.2	1947	June 14	15.5
1910	Apr. 2, 3	9.1	1948	Mar. 31, Apr. 1	14.2
1911	Oct. 19	14.6	1949	Apr. 4–11, 15	12.4
1912	Apr. 4	12.2	1950	May 20	16.7
1913	Mar. 25	12.6	1951	Apr. 22	22.7
1914	July 12	14.4	1952	Apr. 25	22.7
1915	Apr. 21, 22	12.1	1953	Apr. 1, 2, 4	14.0
1916	May 3	19.8	1954	May 12	20.2
1917	Apr. 18, 19	15.5	1955	Apr. 14, 15	13.3
1918	June 11, 12	13.6	1956	Apr. 19	16.0
1919	Apr. 22, 23	16.6	1957	July 13	13.7
1920	Apr. 7	21.0	1958	Apr. 16, 17	10.0
1921	May 10	10.7	1959	Apr. 2	14.3
1922	Apr. 21	21.0	1960	May 17	17.5
1923	May 3, 4	12.4	1961	Mar. 31	16.7
1924	May 8	11.7	1962	Apr. 19	16.3
1925	June 25	11.1	1963	Apr. 2–4	12.5
1926	Oct. 5	11.3	1964	May 18–21	12.20
1927	Mar. 28	15.6	1965	Apr. 26	26.71

GALENA RIVER BASIN

(213) 5–4150. Galena River at Buncombe, Wis.

Location.—Lat 42°30'50", long 90°22'40", near center of sec.33, T.1 N., R.1 E., on left bank at Buncombe, 0.6 mile upstream from Coon Branch, 1.5 miles upstream from Scrabble Branch, 2 miles upstream from Wisconsin-Illinois State line, and 3.5 miles southeast of Hazel Green.

Drainage area.—128 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 682.77 ft above mean sea level, adjustment of 1912 (Corps of Engineers Bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 8,000 cfs and by slope-area measurement at 12,400 cfs and extended above for 1937 peak by logarithmic plotting. Backwater from ice Mar. 19–27.

Maxima.—March–May 1965: Discharge, 3,800 cfs 2000 hours Mar. 31 (gage height, 11.82 ft).
1939 to February 1965: Discharge, 12,400 cfs Feb. 20, 1953 (gage height, 15.68 ft). Flood in February 1937 reached a stage of about 17.1 ft, from information by local resident (discharge, 18,000 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	890	919	37	11	43	98	25	21	24	31	19
2	910	210	35	12	36	65	24	22	23	30	20
3	359	118	34	13	35	48	23	23	22	29	28
4	65	140	33	14	39	43	23	24	22	35	26
5	178	330	40	15	42	47	23	25	22	64	22
6	265	279	34	16	40	43	24	26	22	75	31
7	192	98	32	17	47	47	24	27	23	53	114
8	310	66	31	18	30	42	22	28	25	53	37
9	163	64	28	19	26	38	20	29	29	45	26
10	54	54	26	20	25	31	18	30	137	41	25
								31	1,370	-------	23
Monthly mean discharge, in cubic feet per second									176	108	29.9
Runoff, in inches									1.58	0.94	0.27

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	3.54	110	Mar. 1	1200	5.40	587	Mar. 3	0800	4.89	422
	0400	3.62	123		1600	5.75	710		1200	4.21	238
	1800	3.44	96		2000	6.88	1,150		2400	3.49	94
	1200	3.24	68		2200	7.35	1,350				
	1400	4.30	260		2400	7.28	1,320	29	2400	2.99	39
	1600	6.00	803								
	1800	6.60	1,040	2	0400	6.49	1,000	30	0600	2.78	28
	2000	9.20	2,260		0800	6.43	972		1200	2.92	39
	2100	10.20	2,770		1200	6.80	1,120		1400	3.04	49
	2200	9.60	2,460		1600	5.80	728		1600	4.00	192
	2400	7.80	1,560		2000	5.57	646		2000	4.46	300
					2400	5.63	667		2400	5.08	482
Mar. 1	0400	5.95	784								
	0800	5.47	611	3	0400	5.95	784	31	0200	5.28	547

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965 of Galena River at Buncombe, Wis—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 31	0800	4.60	338	Mar. 31	2300	9.70	2,510	Apr. 1	2000	6.60	1,040
	1200	4.49	307		2400	8.20	1,760		2400	5.22	527
	1400	5.90	765								
	1600	8.10	1,710	Apr. 1	0200	6.65	1,060	2	0600	4.10	214
	1700	10.10	2,660		0400	5.85	746		1200	3.70	136
	1800	11.30	3,380		0800	5.44	601		1800	3.50	104
	2000	11.82	3,800		1200	6.06	826		2200	4.13	221
	2200	10.90	3,160		1800	7.27	1,310		2400	3.96	184

MAQUOKETA RIVER BASIN

(214) 5–4170. Maquoketa River near Manchester, Iowa

Location.—Lat 42°27'25", long 91°25'55", in NW¼NE¼ sec.9, T.88 N., R.5 W., on left bank 2 miles southeast of Manchester and 4.7 miles downstream from Honey and Prairie Creeks.

Drainage area.—305 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage 895.06 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 9,700 cfs and extended to 20,000 cfs by velocity-area studies. Backwater from ice Mar. 1, 6–8, 19–27.

Maxima.—March–May 1965: Discharge, 5,150 cfs 0330 hours Apr. 1; gage height, 12.77 ft 0430 hours Mar. 1 (backwater from ice).

1933 to February 1965: Discharge, 20,000 cfs June 13, 1947 (gage height, 21.36 ft, from floodmarks).

Maximum flood known at Manchester June 15, 1925, stage unknown, discharge 25,400 cfs.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,500	4,530	112	11	220	311	98	21	80	123	61
2	2,430	1,420	116	12	130	280	94	22	75	84	43
3	529	447	132	13	186	200	94	23	72	108	90
4	218	565	110	14	293	207	86	24	70	93	164
5	456	821	110	15	316	155	61	25	67	204	127
6	900	1,160	109	16	267	169	61	26	66	311	576
7	1,000	542	106	17	153	142	101	27	66	255	756
8	1,100	340	91	18	103	147	95	28	65	232	380
9	600	302	77	19	92	155	87	29	67	221	206
10	251	251	128	20	84	139	82	30	119	157	194
								31	1,550	-------	196
Monthly mean discharge, in cubic feet per second									488	469	153
Runoff, in inches									1.84	1.72	0.58
Runoff, in acre-feet									30,000	27,910	9,410

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Maquoketa River nr. Manchester, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	11.26	------	Mar. 31	0000	5.77	306	Apr. 1	1900	10.45	3,900
	0200	11.93	------		0600	5.87	355		2400	9.36	2,900
	0330	11.31	------		0900	5.89	365				
	0400	11.80	------		1200	6.10	480	2	0600	8.13	1,910
	0430	12.77	------		1400	6.60	780		1000	7.55	1,450
	0600	11.18	------		1500	7.10	1,130		1400	7.01	1,070
	0730	10.68	------		1600	8.00	1,810		1700	6.72	864
	1100	10.44	------		1800	9.51	3,040		2000	6.50	720
	1300	10.38	------		2000	10.41	3,860		2200	6.39	654
	1600	10.68	------		2400	11.35	4,840		2400	6.31	606
	2000	10.66	------								
	2400	10.43	3,880	Apr. 1	0200	11.61	5,120	3	1000	6.00	420
					0330	11.64	5,150		1600	5.91	375
2	0400	10.02	3,500		0500	11.62	5,130		2000	5.92	380
	0800	9.48	3,010		0800	11.50	5,000		2400	6.08	468
	1200	8.83	2,470		1200	11.39	4,880				
	2000	7.33	1,290		1400	11.25	4,720				
	2400	6.85	955		1600	11.00	4,450				

(215) 5–4177. Bear Creek near Monmouth, Iowa

Location.—Lat 42°02'30", long 90°53'00", in NE¼SE¼ sec.31, T.84 N., R.1 E., on right bank 15 ft downstream from highway bridge, 1.6 miles upstream from Rat Run, 2.8 miles south of Monmouth, and 8.2 miles upstream from mouth.

Drainage area.—61.3 sq mi.

Gage-height record.—Water-stage recorder graph, except Apr. 13 to May 17. Once-daily wire-weight gage readings used for this period. Datum of gage is 728.80 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 6,000 cfs. Backwater from ice Mar. 1–7, 10, 11, 16–31.

Maxima.—March–May 1965: Discharge, 846 cfs 2130 hours May 25; gage height, 8.86 ft 2000 hours Mar. 29 (backwater from ice).
1957 to February 1965: Discharge, 2,440 cfs Jan. 12, 1960 (gage height, 11.56 ft). Flood in June 1944 reached a stage of about 21.5 ft, from floodmark (discharge not determined).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	100	210	20	11	23	55	13	21	20	13	7.9
2	85	100	18	12	29	35	12	22	15	13	7.9
3	70	65	16	13	45	22	12	23	13	13	15
4	25	128	16	14	81	20	12	24	12	26	13
5	22	275	16	15	96	22	12	25	11	48	131
6	60	268	15	16	110	16	19	26	11	38	94
7	80	88	14	17	90	16	14	27	11	30	192
8	146	51	14	18	60	14	10	28	14	30	37
9	128	37	14	19	40	13	9.3	29	170	24	30
10	33	26	14	20	25	13	8.6	30	350	21	27
								31	270	------	24
Monthly mean discharge, in cubic feet per second									724	57.7	27.7
Runoff, in inches									1.36	1.05	0.52
Runoff, in acre-feet									4,450	3,430	1,700

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Bear Creek near Monmouth, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 29	0000	5.31	------	Apr. 5	0000	5.86	88	May 25	1830	5.40	21
	1100	5.39	------		0700	5.79	75		1900	5.38	20
	1200	5.44	------		0800	6.23	164		1930	6.15	148
	1400	5.69	------		0900	6.31	182		2000	7.40	516
	1600	6.37	------		1100	6.92	351		2030	8.02	752
	1800	7.06	------		1300	6.84	327		2100	8.20	832
	1900	7.64	------		1500	7.19	439		2130	8.23	846
	2000	8.86	------		1930	7.22	450		2200	8.11	792
	2100	7.69	------		2100	7.00	375		2400	7.05	394
	2300	7.90	------		2200	6.99	372				
	2400	7.87	------		2400	7.04	387	26	0100	6.52	239
									0230	6.05	128
30	0400	7.01	------	6	0100	7.06	394		0600	5.67	57
	1200	6.11	------		0300	7.07	397		1200	5.56	41
	1500	6.47	------		0700	7.12	414		1800	5.65	54
	1900	7.29	------		0900	7.13	418		2130	5.90	98
	2100	8.09	------		1000	7.12	414		2400	6.75	303
	2130	8.42	------		1100	6.79	312				
	2300	8.06	------		1200	6.55	244	27	0230	7.48	548
	2400	8.08	------		1400	6.29	178		0300	7.50	554
					1600	6.12	140		0330	7.47	544
31	0600	6.71	------		1700	6.08	132		0600	6.55	250
	0930	6.12	------		1900	6.05	126		0900	6.17	155
	1230	6.05	------		2400	5.99	114		1400	5.88	96
	1700	6.53	------						2400	5.65	55
	1930	6.67	------	May 24	2400	5.24	11				
	2130	7.02	------								
	2400	7.10	------	25	1630	5.21	10				

(216) 5–4185. Maquoketa River near Maquoketa, Iowa

Location.—Lat 42°05'05", long 90°37'55", in SW¼NE¼ sec.17, T.84 N., R.3 E., on right bank 500 ft upstream from bridge on State Highway 62, 1,200 ft upstream from Prairie Creek, 2.0 miles northeast of Maquoketa, and 2.2 miles downstream from North Fork, and 28 miles upstream from mouth.

Drainage area.—1,553 sq mi.

Gage-height record.—Water-stage recorder graph, except May 12–24, where graph was reconstructed with the use of wire-weight readings and recorder record. Datum of gage is 636.52 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 45,000 cfs. Backwater from ice Mar. 1–4, 18–29.

Maxima.—March–May 1965: Discharge, 9,880 cfs 1100 hrs Apr. 1 (gage height, 12.45 ft). 1913 to February 1965: Discharge, 48,000 cfs June 27, 1944 (gage height, 24.70 ft).

Mean discharge, in cubic feet per second, 1965, of Maquoketa River near Maquoketa, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,000	9,020	782	11	1,630	2,070	531	21	480	695	452
2	4,500	8,180	742	12	774	1,690	459	22	460	659	420
3	5,000	3,960	671	13	1,090	1,340	512	23	440	627	452
4	2,500	3,450	508	14	1,340	1,120	476	24	430	691	575
5	1,510	4,490	575	15	1,590	1,010	473	25	420	760	572
6	2,390	6,320	607	16	1,870	958	547	26	410	954	922
7	3,280	3,720	583	17	1,660	864	487	27	400	976	1,900
8	4,240	1,940	567	18	900	814	473	28	400	1,010	1,850
9	4,710	1,720	567	19	550	707	494	29	1,000	990	1,220
10	2,380	1,400	559	20	520	627	417	30	4,220	882	1,070
								31	7,130	------	962
Monthly mean discharge, in cubic feet per second									2,007	2,118	691
Runoff, in inches									1.49	1.52	0.51
Runoff, in acre-feet									123,400	126,000	42,500

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 1	0000	10.79	7,870	Apr. 2	1600	11.12	8,240	Apr. 3	1100	5.51	2,910
	0400	11.73	8,980		2400	10.16	7,180		1200	5.91	3,190
	0800	12.19	9,550						1500	5.61	2,980
	1100	12.45	9,880	3	0200	9.62	6,580		1800	5.51	2,910
	2400	10.97	8,070		0400	8.86	5,760		2000	5.35	2,800
					0800	7.44	4,400		2200	5.51	2,910
2	0100	11.56	8,770		0900	6.48	3,630		2400	5.90	3,180
	0900	11.18	8,320		1000	5.18	2,680				

APPLE RIVER BASIN

(217) 5–4190. Apple River near Hanover, Ill.

Location.—Lat 42°15'05", long 90°17'10", in NE¼NW¼ sec.16, T.26 N., R.2 E., on right bank 0.3 mile southwest of Hanover and 12 miles upstream from mouth.

Drainage area.—244 sq mi.

Gage-height record.—Digital recorder tape punched at 15-minute intervals. Prior to Apr. 7, 1965, water-stage recorder graph. Datum of gage is 591.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge for period of backwater from Mississippi River, Apr. 17 to May 10, estimated on basis of two discharge measurements and records for nearby stations. Mean daily discharge computed from 96 punch-tape recordings per day begirning Apr. 7, 1965.

Maxima.—April–May 1965: Discharge, 4,240 cfs 0400 hours Apr. 1 (gage height, 14.22 ft).

1934 to March 1965: Discharge, 12,000 cfs Jan. 5, 1946; gage height, 26.12 ft Jan. 5, 1946 (ice jam).

Mean discharge, in cubic feet per second, 1965, of Apple River near Hanover, Ill

Day	April	May	Day	April	May	Day	April	May
1	2,650	80	11	585	66	21	85	47
2	817	78	12	432	58	22	80	50
3	330	76	13	170	56	23	75	59
4	521	76	14	138	53	24	80	59
5	919	90	15	150	52	25	140	53
6	1,100	100	16	143	59	26	150	55
7	240	80	17	120	60	27	120	77
8	174	90	18	110	60	28	100	71
9	167	85	19	100	59	29	90	55
10	130	80	20	90	52	30	85	52
						31	--------	50
Monthly mean discharge, in cubic feet per second							336	65.7
Runoff, in inches							1.54	0.31

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 29	0000	1.70	36	Mar. 31	0200	5.84	1,140	Apr. 1	1400	6.60	1,300
	1400	1.71	38		0300	5.82	1,130		2100	10.69	2,680
	1500	1.81	52		1200	3.45	658		2200	10.84	2,740
	1600	2.65	330		1300	3.38	640		2400	10.56	2,620
	1700	2.43	228		1400	3.46	660				
	1900	2.67	340		1700	6.42	1,260	2	0600	6.15	1,200
	2400	2.47	244		2000	10.50	2,600		1200	2.90	458
30	0900	2.05	102		2400	13.23	3,790		1400	2.63	320
	1200	2.08	110						1800	2.44	232
	1600	2.87	444	Apr. 1	0300	14.17	4,220		2000	2.37	204
	1800	4.50	870		0400	14.22	4,240		2300	2.40	216
	2000	5.62	1,090		0800	10.85	2,740		2400	2.47	244
	2400	5.70	1,110		1300	6.67	1,320				

PLUM RIVER BASIN

(218) 5–4200. Plum River below Carroll Creek, near Savanna, Ill.

Location.—Lat 42°06'50", long 90°05'35", in NW¼SW¼ sec.31, T.25 N., R.4 E., on left bank 0.7 mile upstream from Camp Creek, 2.6 miles downstream from Carroll Creek, 3.5 miles northeast of Savanna, and 13 miles upstream from mouth.

Drainage area.—231 sq mi.

Gage-height record.—Digital recorder tape punched at 15-minute intervals. Prior to May 11, 1965, water-stage recorder graph. Datum of gage is 580.00 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge for period of backwater from Mississippi River Apr. 18 to May 10 estimated on basis of two discharge measurements and records for nearby stations. Mean daily discharge computed from 96 punch-tape recordings per day beginning May 11, 1965.

Maxima.—April–May 1965: Discharge, 1,740 cfs 1330 hours Apr. 1 (gage height, 22.11 ft).
1940 to March 1965: Discharge, 11,600 cfs Jan. 6, 1946 (gage height, 28.74 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	1,670	85	11	278	84	21	80	42
2	1,010	82	12	235	69	22	75	42
3	317	80	13	160	63	23	70	75
4	491	80	14	137	58	24	90	65
5	722	100	15	162	55	25	150	55
6	1,150	110	16	168	56	26	160	49
7	326	90	17	142	56	27	130	54
8	234	100	18	120	52	28	110	54
9	255	95	19	100	47	29	100	46
10	165	90	20	90	44	30	90	43
						31	--------	43
Monthly mean discharge, in cubic feet per second							300	66.6
Runoff, in inches							1.45	0.33

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 29	0000	9.60	46	Mar. 30	2200	20.52	1,280	Apr. 1	1800	21.87	1,660
	1300	9.60	46		2400	20.67	1,320		2400	21.32	1,500
	1500	9.74	52								
	1700	10.65	94	31	0300	20.71	1,330	2	1100	20.24	1,210
	1900	11.94	173		1000	20.42	1,260		1400	19.00	950
	2200	15.12	442		1200	20.34	1,240		1800	16.82	628
	2400	15.93	523		1500	20.65	1,310		2200	15.00	430
					2000	22.02	1,710		2400	14.40	376
30	0300	16.00	530		2300	22.07	1,730				
	0700	16.70	614		2400	22.02	1,710	3	0400	13.53	298
	1000	16.71	615						0900	13.86	318
	1400	16.28	564	Apr. 1	0600	21.82	1,650		1100	13.86	318
	1700	17.70	748		1200	22.09	1,740		1800	13.08	260
	1900	19.90	1,130		1330	22.11	1,740		2400	14.96	426

MISSISSIPPI RIVER MAIN STEM

(219) 5–4205. Mississippi River at Clinton, Iowa

Location.—Lat 41°46'50", long 90°15'07", in NW¼ sec.34, T.81 N., R.6 E., on right bank at foot of Eighth Avenue in Camanche, 5.0 miles upstream from Wapsipinicon River, 6.4 miles downstream from Clinton, 10.6 miles downstream from Dam 13, and at mile 511.8 upstream from Ohio River.

Drainage area.—85,600 sq mi, approximately, at Fulton-Lyons Bridge (formerly U.S. Highway 30) where discharge measurements are made.

Gage-height record.—Water-stage recorder graph. Datum of gage is 562.68 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 307,000 cfs. Backwater from ice Mar. 1–6, 9–27.

Maxima.—March–May 1965: Daily discharge, 307,000 cfs Apr. 28; gage height, 24.65 ft 0600 hrs Apr. 28.

1873 to February 1965: Daily discharge, 250,000 cfs June 25, 1880; gage height, 14.5 ft June 25, 1880, at site 14.8 miles downstream at Le Claire, at datum 0.07 ft lower.

Maximum stage known since at least 1828 that of Apr. 28, 1965.

Cooperation.—Two discharge measurements furnished by Corps of Engineers.

Mean gage height, in feet, and discharge, in cubic feet per second, 1965

Day	March		April		May	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	9.30	28,000	11.22	60,800	23.90	284,000
2	9.93	40,000	11.95	71,600	23.53	275,000
3	10.36	50,000	11.99	72,900	23.10	264,000
4	11.04	56,000	11.68	69,300	22.66	252,000
5	11.18	60,000	11.93	74,300	22.13	240,000
6	10.96	58,000	13.00	88,800	21.57	228,000
7	10.97	62,800	13.33	91,700	20.93	216,000
8	11.65	73,200	13.41	91,900	20.31	205,000
9	12.68	82,000	13.51	93,400	19.63	192,000
10	12.96	84,000	13.83	95,900	18.92	180,000
11	12.66	75,000	14.67	112,000	18.21	170,000
12	12.07	70,000	15.22	125,000	17.52	157,000
13	11.87	66,000	15.81	134,000	16.83	147,000
14	11.67	62,000	16.59	143,000	16.12	135,000
15	11.26	56,000	17.13	155,000	15.54	126,000
16	11.11	51,000	17.61	162,000	15.20	121,000
17	10.69	47,000	17.97	169,000	14.92	117,000
18	10.85	43,000	18.37	176,000	14.61	112,000
19	10.30	30,500	18.89	186,000	14.47	111,000
20	10.44	33,000	19.47	195,000	14.42	110,000
21	10.70	36,000	20.18	209,000	14.41	110,000
22	10.58	34,000	21.10	226,000	14.45	110,000
23	10.32	32,000	22.03	245,000	14.47	111,000
24	10.15	31,000	22.82	263,000	14.51	112,000
25	10.12	30,000	23.63	280,000	14.59	113,000
26	10.16	31,000	24.24	300,000	14.75	116,000
27	10.14	32,000	24.55	305,000	14.94	118,000
28	9.98	32,900	24.63	307,000	14.96	118,000
29	9.76	34,400	24.49	300,000	14.90	116,000
30	10.01	40,800	24.26	294,000	14.63	112,000
31	10.47	48,200	----------	----------	14.30	107,000
Mean		48,700		169,900		157,600
Inches		0.66		2.21		2.12
Acre-feet		2,995,000		10,110,000		9,689,000

WAPSIPINICON RIVER BASIN

(220) 5—4205.6 Wapsipinicon River near Elma, Iowa

Location.—Lat 43°14'35", long 92°31'50", in NW¼NW¼ sec.8, T.97 N., R.14 W., on right bank 10 ft downstream from county highway bridge, 0.2 mile downstream from unnamed creek, and 4.9 miles west of Elma.

Drainage area.—95.2 sq mi.

Gage-height record.—Water-stage recorder graph except March 3, 4, 9, 10, 21–25, May 8–20. Datum of gage is 1,131.46 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 4,190 cfs, extended to 5,500 cfs by logarithmic plotting. Backwater from ice Mar. 1 to Apr. 7.

Maxima.—March–May 1965: Discharge, 2,430 cfs 1600 hours Apr. 8 (gage height, 13.19 ft; gage height, 14.08 ft 1800 hours Mar. 1, backwater from ice.
1958 to February 1965: Discharge, about 5,700 cfs Mar. 29, 1962 (gage height, 14.84 ft, backwater from ice).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	600	370	24	11	19	857	21	21	9.2	23	16
2	560	410	22	12	18	1,220	19	22	8.4	23	15
3	300	540	20	13	17	385	18	23	7.8	27	15
4	130	920	18	14	16	100	17	24	7.2	31	15
5	68	1,700	18	15	15	82	20	25	7.0	73	17
6	43	1,980	108	16	15	62	32	26	6.8	105	49
7	34	1,760	164	17	14	50	37	27	6.6	67	41
8	28	1,640	74	18	12	42	30	28	6.4	41	29
9	24	1,480	34	19	11	36	22	29	6.6	32	23
10	21	686	26	20	10	30	18	30	8.0	27	20
								31	150	-------	18
Monthly mean discharge, in cubic feet per second									70.3	493	32.3
Runoff, in inches									0.85	5.77	0.39
Runoff, in acre-feet									4,320	29,360	1,980

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Wapsipinicon River near Elma, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	6.55	-----	Apr. 8	1300	12.84	1,800	Apr. 11	1700	12.23	1,230
	1100	6.63	-----		1400	13.02	2,120		1900	12.54	1,460
	1400	7.42	-----		1600	13.19	2,430		2400	12.18	1,200
	1600	8.90	-----		2100	12.87	1,850				
	1800	9.97	-----		2400	12.64	1,550	12	0400	12.00	1,100
	2400	11.63	-----						0600	11.89	1,040
				9	0400	12.63	1,540		1000	12.07	1,140
Mar. 1	0600	12.92	-----		0800	12.78	1,710		1400	12.45	1,380
	1800	14.08	-----		1000	12.89	1,880		1600	12.58	1,460
	2400	13.87	-----		1200	12.70	1,610		2200	12.19	1,200
					1600	12.57	1,480		2400	11.92	1,060
2	0600	13.54	-----		1800	12.33	1,290				
	1200	13.18	-----		2200	12.00	1,100	13	0200	11.57	910
	2400	12.65	-----		2400	11.76	984		0400	11.05	752
									0500	10.69	678
Apr. 6	0000	13.43	-----	10	0400	11.27	811		0600	10.28	596
	0400	13.36	-----		0800	10.74	688		0700	9.83	514
	1300	13.66	-----		1400	10.24	588		0800	9.32	438
	1600	13.63	-----		1800	10.27	594		0900	8.83	369
	2400	13.31	-----		2400	10.46	632		1000	8.48	328
									1100	7.93	269
7	2400	12.39	1,330	11	1200	10.37	614		1300	7.33	219
					1300	10.38	616		1600	6.71	166
8	0600	12.19	1,200		1500	10.93	726		2000	6.32	136
	1100	12.43	1,360		1600	11.29	817		2400	6.07	122
	1200	12.64	1,550								

(221) 5–4206. Little Wapsipinicon River tributary near Riceville, Iowa

(Crest-stage station)

Location.—Near south quarter-corner of sec.27, T.99 N., R.14 W., at culvert 3.5 miles east of Riceville and 0.4 mile south of State Highway 9.

Drainage area.—0.90 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 117 cfs and by flow-through-culvert measurement of 703 cfs.

Maxima.—March–May 1965: Discharge, about 230 cfs Apr. 8 (gage height, 4.55 ft, backwater from ice).
1953 to February 1965: Discharge, 703 cfs Aug. 31, 1962 (gage height, 5.03 ft).

(222) 5–4206.2 Little Wapsipinicon River near Acme, Iowa

(Crest-stage station)

Location.—Sec.10, T.98 N., R.14 W., at bridge on County Road D, 1 mile north of Acme.

Drainage area.—7.76 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 861 cfs and by contracted-opening measurement at 2,380 cfs.

Maxima.—March–May 1965: Discharge, about 210 cfs Mar. 1 (gage height, 6.8 ft, backwater from ice).
1953 to February 1965: Discharge, 2,380 cfs Aug. 31, 1962 (gage height, 9.02 ft).

(223) 5–4206.4 Little Wapsipinicon River at Elma, Iowa

(Crest-stage station)

Location.—NW¼ sec.12, T.97 N., R.14 W., at bridge, on County Road A near west city limits of Elma.

Drainage area.—37.3 sq mi.

Gage-height record.—Crest stages and occasional low-flow stages.

Discharge record.—Stage-discharge relation defined by current-meter measurements and contracted opening measurement at 5,740 cfs.

Maxima.—March–May 1965: Discharge, about 450 cfs Mar. 1 (gage height, 8.4 ft, backwater from ice).
1953 to February 1965: Discharge, 5,740 cfs Aug. 31, 1962 (gage height, 12.53 ft).

(224) 5–4210. Wapsipinicon River at Independence, Iowa

Location.—Lat 42°27'50", long 91°53'40", in SE¼ sec.4, T.88 N., R9 W., on right bank at Sixth Street in Independence, 1,800 ft downstream from dam at abandoned hydroelectric plant, 4-3/4 miles downstream from Otter Creek, and 10¼ miles upstream from Pine Creek.

Drainage area.—1,048 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 882.85 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 20,600 cfs. Backwater from ice Mar. 20–30.

Maxima.—March–May 1965: Discharge, 8,880 cfs 1400 hours Apr. 7 (gage height, 12.19 ft).
1933 to February 1965: Discharge, 21,500 cfs June 14, 1947 (gage height, 18.74 ft).

Maximum stage since at least 1901, that of June 14, 1947.

Mean discharge, in cubic feet per second, 1965, of Wapsipinicon River at Independence, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,380	4,400	735	11	1,430	5,230	382	21	200	744	290
2	3,790	6,170	609	12	1,050	5,420	339	22	180	654	304
3	2,780	3,840	532	13	789	4,170	290	23	170	574	412
4	1,670	3,750	467	14	753	3,310	266	24	160	558	360
5	3,920	5,160	435	15	807	3,370	272	25	150	672	325
6	5,010	7,200	405	16	780	3,160	278	26	145	870	829
7	4,240	8,540	360	17	600	2,380	236	27	140	910	1,190
8	4,300	8,420	375	18	375	1,840	260	28	135	900	1,090
9	3,030	7,390	360	19	284	1,220	311	29	130	920	1,140
10	1,910	5,990	360	20	230	870	318	30	150	861	1,300
								31	723	------	1,570
Monthly mean discharge, in cubic feet per second									1,368	3,316	529
Runoff, in inches									1.51	3.53	0.58
Runoff, in acre-feet									84,120	197,300	32,530

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 4	0000	7.54	3,140	Apr. 6	2100	11.83	8,360	Apr. 8	0600	12.05	8,680
	0600	7.68	3,330		2400	11.90	8,460		1200	11.86	8,400
	1200	8.00	3,740						2400	11.59	8,030
	1800	8.31	4,120	7	0300	11.87	8,420				
	2400	8.59	4,460		0800	11.70	8,180	9	0600	11.41	7,770
					1100	11.72	8,210		1200	11.14	7,400
5	1200	9.24	5,200		1200	11.76	8,260		1800	10.86	7,040
	1800	9.45	5,420		1300	12.14	8,810		2400	10.56	6,680
	2400	9.94	5,950		1400	12.19	8,880				
					1700	12.12	8,780	10	1200	9.93	5,940
6	0600	10.48	6,580		1900	12.15	8,820		2400	9.44	5,410
	1200	10.82	6,990		2400	12.09	8,740				
	1800	11.53	7,940								

(225) 5–4220. Wapsipinicon River near De Witt, Iowa

Location.—Lat 41°45'55", long 90°32'00", in SW¼NE¼ sec.6, T.80 N., R.4 E., on left bank 15 ft downstream from bridge on U.S. Highway 61, 3 miles south of De Witt, 6.2 miles upstream from Brophy Creek, and 18.2 miles upstream from mouth.

Drainage area.—2,330 sq mi (includes that of Silver Creek).

Gage-height record.—Water-stage recorder graph except Mar. 20–24. Datum of gage is 598.81 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 25,000 cfs. Backwater from ice Mar. 1–19.

Maxima.—March–May 1965: Discharge, 10,200 cfs 2230 hours Apr. 14 (gage height, 11.05 ft).

1934 to February 1965: Discharge, 26,000 cfs June 27, 1944 (gage height, 12.07 ft).

Cooperation.—Two discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965, of Wapsipinicon River near De Witt, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,400	4,170	2,010	11	5,000	8,400	1,210	21	1,400	3,430	705
2	1,500	3,470	1,850	12	5,600	9,200	1,110	22	1,300	2,680	680
3	1,600	3,590	1,740	13	6,400	9,800	1,040	23	1,250	2,210	814
4	2,000	4,430	1,590	14	6,800	9,980	979	24	1,200	2,270	962
5	2,400	5,470	1,560	15	6,000	9,700	946	25	1,160	2,870	858
6	2,700	7,480	1,400	16	4,800	8,690	891	26	1,080	2,700	918
7	3,100	8,750	1,320	17	5,200	7,640	918	27	1,050	2,410	1,280
8	3,500	8,900	1,290	18	3,500	6,420	852	28	1,020	2,600	1,760
9	4,000	8,650	1,480	19	1,900	4,990	798	29	1,700	2,550	1,890
10	4,500	8,160	1,340	20	1,600	4,320	750	30	4,480	2,230	2,050
								31	4,480	------	1,910
Monthly mean discharge, in cubic feet per second									3,020	5,605	1,255
Runoff, in inches									1.49	2.67	0.62
Runoff, in acre-feet									185,700	333,500	77,160

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 12	0000	10.80	8,850	Apr. 13	2400	11.00	9,900	Apr. 15	1200	10.97	9,720
	1200	10.87	9,200						2400	10.88	9,250
	2400	10.94	9,550	14	1200	11.00	9,900				
					2230	11.05	10,200	16	1200	10.77	8,700
13	1200	11.00	9,900		2400	11.04	10,100		2400	10.63	8,120

MISSISSIPPI RIVER MAIN STEM

(226) Mississippi River at Davenport, Iowa

(Miscellaneous site)

Location.—Lat 41°31'10", long 90°33'55", in center wall of Lock 15 about 15 ft upstream from pivot pier of Government bridge at Davenport, 500 ft upstream from Dam 15, and at mile 482.9 upstream from Ohio River.

Drainage area.—88,500 sq mi, approximately.

Gage-height record.—Peak stages only from water-stage recorder and staff gage readings. Datum of gage is 542.50 ft above mean sea level, adjustment of 1912, and prior to Sept. 2, 1864, at datum 0.6 ft higher. Prior to Sept. 6, 1872, several staff gages at old bridge site 2,300 ft upstream, and Sept. 7, 1872, to Feb. 8, 1933, staff gage at site 15 ft downstream on pier of Government bridge.

Maxima.—March–May 1965: Gage height, 22.48 ft Apr. 28.
1860 to February 1965: Gage height, 19.4 ft June 27, 1892.

Remarks.—Stage records furnished by Corps of Engineers.

Annual maximum gage heights, for indicated years, of Mississippi River at Davenport, Iowa

Year	Date	Gage height (feet)	Year	Date	Gage height (feet)
1860	June 21	12.6	1890	July 1	11.9
1861	Apr. 27–29	14.2	1891	May 3–5	10.3
1862	May 4–7	15.2	1892	June 27	19.4
1863	May 1–5	8.0	1893	Mar. 13	15.1
1864	Feb. 27	7.7	1894	May 31	12.3
1865	Mar. 4	11.1	1895	Mar. 4	8.9
1866	May 4	15.7	1896	May 28–30	12.0
1867	June 27, 28	14.3	1897	Apr. 17	15.1
1868	Mar. 10	*22.0	1898	Feb. 14	9.9
1869	Oct. 9–10	12.9	1899	June 25, 26	11.85
1870	Apr. 25	16.8	1900	Mar. 13	13.1
1871	May 14–16	12.8	1901	Mar. 16	9.6
1872	May 28	9.1	1902	May 29	10.5
1873	May 8	12.9	1903	Oct. 1	13.65
1874	Mar. 9	15.6	1904	Mar. 22	13.2
1875	Apr. 29	12.9	1905	June 21	14.3
1876	Apr. 16	13.8	1906	Apr. 22–26	13.9
1877	Apr. 4, 5	9.9	1907	Apr. 13	13.6
1878	July 17	7.1	1908	July 21	12.25
1879	June 1	7.8	1909	Dec. 25	13.7
1880	June 26	18.4	1910	Jan. 1	11.9
1881	Oct. 27	17.7	1911	Oct. 22, 23	11.2
1882	Apr. 23	14.1	1912	Mar. 30	12.7
1883	May 2	13.3	1913	Mar. 28, 29	12.8
1884	Mar. 28, 29	11.9	1914	July 14, 15	10.65
1885	May 8	10.1	1915	June 3–5, 7	9.5
1886	May 1–3	12.5	1916	May 5	15.9
1887	Feb. 12	12.9	1917	Apr. 21	12.35
1888	May 16	18.6	1918	June 14	10.35
1889	Mar. 12	7.8	1919	Apr. 25	13.7

*Ice gorge-raised 5 ft in one day.

ROCK RIVER BASIN

(227) 5–4465. Rock River near Joslin, Ill.

Location.—Lat 41°33'35", long 90°10'55", in NE¼ sec.18, T.18 N., R.3 E., on right bank at downstream side of bridge on State Highway 92, 1.8 miles east of Joslin, 12 miles downstream from Rock Creek, and 27 miles upstream from mouth.

Drainage area.—9,520 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at 15-minute intervals, except May 24, 28–31. Datum of gage is 564.06 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-water measurements. Discharge for periods of no gage-height record computed from records for nearby stations. Mean daily discharge computed from 96 punch-tape recordings per day.

Maxima.—April–May 1965: Discharge, 21,700 cfs 0945 hours Apr. 8 (gage height, 13.12 ft).

1939 to March 1965: Discharge, 46,200 cfs Mar. 22, 1948 (gage height, 14.46 ft); gage height, 16.23 ft Mar. 3, 1948 (backwater from ice).

Stage known since 1892, that of Mar. 3, 1948.

Mean discharge, in cubic feet per second, 1965, of Rock River near Joslin, Ill

Day	April	May	Day	April	May	Day	April	May
1	12,300	10,200	11	18,300	9,140	21	11,100	3,730
2	16,900	9,240	12	17,600	8,790	22	10,300	3,690
3	19,800	8,570	13	17,200	8,000	23	9,720	3,320
4	19,800	8,010	14	16,600	6,970	24	9,580	3,200
5	19,400	7,700	15	16,300	5,800	25	10,100	3,460
6	19,800	8,100	16	15,900	5,430	26	10,700	3,740
7	21,200	9,420	17	15,300	4,890	27	11,200	3,790
8	21,500	9,660	18	14,200	3,380	28	11,600	3,700
9	20,600	10,300	19	12,900	3,520	29	11,500	3,400
10	19,200	9,640	20	12,000	4,090	30	10,700	3,200
						31	--------	3,400
Monthly mean discharge, in cubic feet per second							15,110	6,112
Runoff, in inches							1.77	0.74

(228) 5–4475. Green River near Geneseo, Ill.

Location.—Lat 41°29'20", long 90°09'30", in NE¼SW¼ sec.4, T.17 N., R.3 E., on right bank at upstream side of bridge on State Highway 82, 1.4 miles upstream from Geneseo Creek and 2.4 miles north of Geneseo.

Drainage area.—958 sq mi.

Gage-height record.—Digital recorder tape punched at 15-minute intervals. Prior to Apr. 28, 1965, water-stage recorder graph. Datum of gage is 580.66 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharge computed from 96 punch-tape recordings per day beginning Apr. 28, 1965.

Maxima.—April–May 1965: Discharge, 3,980 cfs 2200 hours Apr. 25 (gage height, 10.57 ft).

1936 to March 1965: Discharge, 8,900 cfs Oct. 11, 1954 (gage height, 14.69 ft); gage height, 16.65 ft Jan. 24, 1965 (ice jam).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	1,280	1,320	11	1,850	1,220	21	876	493
2	1,190	1,160	12	1,660	1,040	22	812	482
3	1,020	1,000	13	1,300	900	23	764	451
4	924	911	14	1,150	780	24	2,230	434
5	1,120	960	15	1,750	688	25	3,380	430
6	2,900	1,160	16	1,890	644	26	3,150	448
7	3,190	1,350	17	1,560	622	27	2,280	476
8	2,410	1,660	18	1,260	584	28	2,080	454
9	2,110	1,960	19	1,080	549	29	1,930	427
10	1,840	1,540	20	956	514	30	1,590	412
						31	--------	391
Monthly mean discharge, in cubic feet per second							1,718	821
Runoff, in inches							2.00	0.99

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Green River near Geneseo, Ill.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	4.25	780	Apr. 25	2200	10.57	3,980	Apr. 29	2400	6.66	1,740
	0200	4.27	788		2400	10.54	3,960				
	0400	4.38	832					30	1200	6.24	1,580
	0500	4.71	964	26	0200	10.45	3,880		2400	5.95	1,460
	0800	6.70	1,760		0900	9.73	3,280				
	1100	8.90	2,720		1400	9.22	2,910	May 1	1200	5.59	1,320
	1200	9.18	2,890		1900	8.86	2,700		2400	5.43	1,250
	1900	9.41	3,050		2400	8.60	2,550				
	2100	9.42	3,050					2	1200	5.17	1,150
	2400	9.31	2,980	27	1200	7.92	2,250		2400	5.02	1,090
					2400	7.42	2,050				
25	0400	8.96	2,760					3	1200	4.76	984
	0600	8.97	2,760	28	1200	7.44	2,060		2400	4.68	952
	0900	9.23	2,920		2400	7.53	2,090				
	1300	10.11	3,590					4	1200	4.56	904
	1600	10.38	3,810	29	1200	7.15	1,940		2400	4.54	896
	1900	10.54	3,960								

(229) Rock River at Moline, Ill.

(Miscellaneous site)

Location.—SE¼ sec.16, T.17 N., R.1 W., at bridge on U.S. Highway 150 at Moline.

Drainage area.—10,630 sq mi.

Discharge record.—Discharge obtained on the following days by current-meter measurements. Stage-discharge relation affected by backwater from Mississippi River.

Date	Gage height (ft)	Discharge (cfs)
Apr. 25	11.16	13,600
26	11.84	14,400
27	12.24	14,400
28	12.53	14,400
29	12.57	15,600
30	12.39	13,600
May 1	12.07	12,400
2	11.69	11,600
3	11.12	10,200
4	10.58	9,550
5	10.09	9,350
6	9.60	8,870
7	9.34	10,800
10	9.54	12,300

Cooperation.—Data furnished by Corps of Engineers.

(230) 5—4480. Mill Creek at Milan, Ill.

Location.—Lat 41°26'35", long 90°33'15", in SW¼SE¼ sec.24, T.17 N., R.2 W., on left bank at upstream side of Knoxville Road Bridge, 1 mile southeast of Milar.

Drainage area.—62.5 sq mi.

Gage-height record.—Digital recorder tape punched at 15-minute intervals. Prior to Apr. 27, 1965, water-stage recorder graph except Apr. 9—25, for which graph was drawn on basis of once-daily wire-weight gage readings. Peak on Apr. 24 was determined from high-water mark. Datum of gage is 566.23 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharge computed from 96 punch-tape recordings per day beginning Apr. 27, 1965.

Maxima.—April—May 1965: Discharge, 9,060 cfs 0900 hours Apr. 24 (gage height, 11.53 ft, from high-water mark).
1939 to March 1965: Discharge, 8,980 cfs Oct. 10, 1954 (gage height, 9.39 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	14	99	11	220	40	21	51	24
2	11	81	12	102	37	22	45	24
3	9.0	67	13	43	34	23	41	23
4	15	65	14	74	32	24	4,470	21
5	253	66	15	566	30	25	977	22
6	1,170	56	16	250	30	26	316	29
7	89	55	17	96	29	27	210	29
8	112	97	18	79	27	28	227	20
9	112	58	19	64	25	29	153	19
10	91	45	20	57	23	30	121	22
						31	--------	20
Monthly mean discharge, in cubic feet per second							335	40.3
Runoff, in inches							5.97	0.74

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	1.52	22	Apr. 26	1200	2.94	290	Apr. 30	1200	2.26	124
	0200	4.00	620		2400	2.70	230		2400	2.17	107
	0300	5.50	1,300								
	0600	10.00	6,000	27	1200	2.56	195	May 1	1200	2.14	101
	0900	11.53	9,060		2400	2.65	218		2400	2.05	86
	1000	11.10	8,200								
	1200	10.00	6,000	28	1200	2.67	222	2	1200	2.03	82
	2400	6.94	2,210		2400	2.48	175		2400	1.96	71
25	0700	5.08	1,090	29	1200	2.40	155	3	1200	1.94	68
	1200	4.43	792		2400	2.29	130		2400	1.90	62
	1800	3.88	578								
	2400	3.49	452								

IOWA RIVER BASIN

(231) 5–4486. East Branch Iowa River above Hayfield, Iowa

(Crest-stage station)

Location.—Near south quarter corner sec.4, T.96 N., R.24 W., at bridge $1\frac{1}{2}$ miles southeast of Hayfield.

Drainage area.—2.23 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 141 cfs and extended above by logarithmic plotting.

Maxima.—March–May 1965: Discharge, about 250 cfs Apr. 6 (gage height, 7.31 ft, backwater from ice).
1953 to February 1965: Discharge, 209 cfs June 18, 1954 (gage height, 7.15 ft).

(232) 5–4487. East Branch Iowa River near Hayfield, Iowa

(Crest-stage station)

Location.—$NW\frac{1}{4}$ sec.35, T.97 N., R.24 W., at bridge, 2 miles east of Hayfield.

Drainage area.—7.94 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 436 cfs and extended above by logarithmic plotting.

Maxima.—March–May 1965: Discharge, about 370 cfs Apr. 6 (gage height, 13.67 ft, backwater from ice).
1952 to February 1965: Discharge, 457 cfs June 18, 1954 (gage height, 13.01 ft).

(233) 5–4488. East Branch Iowa River near Garner, Iowa

(Crest-stage station)

Location.—Near center of sec.25, T.96 N., R.24 W., at bridge on U.S. Highway 18, 1.2 miles west of Garner.

Drainage area.—45.1 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, about 1,000 cfs Apr. 6 (gage height, 12.89 ft, backwater from ice).
1952 to February 1965: Discharge, 1,120 cfs Mar. 26, 1961 (gage height, 12.81 ft).

(234) 5—4489. East Branch Iowa River tributary near Garner, Iowa

(Crest-stage station)

Location.—Near center sec.27, T.96 N., R.24 W., at culvert on U.S. Highway 18, 2.1 miles west of Garner.

Drainage area.—5.98 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, about 170 cfs Apr. 6 (gage height, 9.15 ft, backwater from ice).
1952 to February 1965: Discharge, 206 cfs June 17, 1954 (gage height, 6.71 ft).

(235) 5—4490. East Branch Iowa River near Klemme, Iowa

Location.—Lat 43°00'30", long 93°37'35", in NE¼NW¼ sec.36, T.95 N., R.24 W., on left bank 15 ft downstream from county highway bridge, 1.0 mile west of Klemme, and 15.4 miles upstream from confluence with West Branch Iowa River.

Drainage area.—133 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 2–14, 18–28. Datum of gage is 1,179.02 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1955, wire-weight gage at site 0.6 mile upstream at datum 1.11 ft higher.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,740 cfs, extended to 4,090 cfs by logarithmic plotting. Backwater from ice Mar. 1 to Apr. 7.

Maxima.—March–May 1965: Discharge, 4,090 cfs 2200 hours Apr. 8 (gage height, 9.94 ft); gage height, 10.67 ft 1030 hours Apr. 6 (backwater from ice).
1948 to February 1965: Discharge, 5,960 cfs June 19, 1954 (gage height, 11.2 ft, from floodmark at site 0.6 mile upstream at datum 1.11ft higher).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	108	190	125	11	47	1,000	67	21	15	200	86
2	240	475	114	12	42	1,060	61	22	13	180	79
3	90	500	104	13	37	763	57	23	11	164	132
4	76	550	92	14	33	635	66	24	10	154	254
5	72	1,220	94	15	30	514	100	25	9.6	174	231
6	68	2,400	139	16	27	419	209	26	9.2	241	453
7	65	2,500	135	17	26	341	181	27	9.2	208	500
8	60	3,170	114	18	24	299	136	28	9.0	175	313
9	56	2,340	94	19	20	257	106	29	9.0	157	227
10	52	1,190	77	20	17	228	89	30	18	141	230
								31	80	------	201
Monthly mean discharge, in cubic feet per second									44.6	728	157
Runoff, in inches									0.39	6.11	1.36
Runoff, in acre-feet									2,740	43,330	9,650

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of East Branch Iowa River near Klemme, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	10.03	------	Apr. 8	1200	9.59	3,040	Apr. 9	0600	9.70	3,420
	0500	10.08	------		1600	9.62	3,140		0800	9.53	2,830
	1030	10.67	------		1800	9.74	3,560		1000	9.35	2,320
	1800	10.55	------		2200	9.94	4,090		1200	9.15	2,000
	2400	10.19	------		2400	9.92	4,020		1400	8.91	1,690
									1800	8.73	1,450
7	2400	9.45	2,570	9	0400	9.78	3,530		2400	8.61	1,320

(236) 5–4495. Iowa River near Rowan, Iowa

Location.—Lat 42°45'35", long 93°37'15", in NW¼NE¼ sec.25, T.92 N., R.24 W., on left bank, 10 ft downstream from county highway bridge, 3.8 miles northwest of Rowan, 9.4 miles downstream from confluence of East and West Branches, and at mile 316.4.

Drainage area.—429 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 2–14, 21–30. Graph was reconstructed on basis of daily wire-weight gage readings Mar. 6, 21, 26, 28. Datum of gage is 1,143.35 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 8,300 cfs. Backwater from ice Mar. 1 to Apr. 7.

Maxima.—March–May 1965: Discharge, about 6,700 cfs Apr. 7; gage height, 14.62 ft 1800 hours Apr. 6 (backwater from ice).
1940 to February 1965: Discharge, 8,460 cfs June 21, 1954 (gage height, 14.88 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	510	800	485	11	200	4,300	258	21	64	914	200
2	1,000	1,700	434	12	180	4,430	236	22	52	745	202
3	380	1,900	387	13	158	3,880	210	23	48	641	202
4	310	2,500	346	14	140	3,170	200	24	43	578	268
5	290	4,200	312	15	130	2,700	206	25	40	622	431
6	270	5,800	373	16	118	2,320	299	26	37	764	749
7	250	6,000	418	17	110	1,970	390	27	35	828	992
8	240	5,790	404	18	102	1,620	353	28	35	722	1,020
9	220	5,480	346	19	95	1,320	282	29	37	595	892
10	210	5,230	294	20	82	1,100	217	30	54	539	736
								31	300	------	663
Monthly mean discharge, in cubic feet per second									185	2,439	413
Runoff, in inches									0.50	6.34	1.11
Runoff, in acre-feet									11,390	145,100	25,400

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Iowa River near Rowan, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	13.93	------	Apr. 7	2400	13.27	6,210	Apr. 10	1400	12.57	5,230
	0200	14.12	------						1800	12.40	4,990
	1200	14.53	------	8	0800	13.08	5,940		2400	12.15	4,640
	1400	14.58	------		1800	12.77	5,510				
	1800	14.62	------		2200	12.79	5,540	11	1200	11.80	4,130
	2400	14.55	------		2400	12.75	5,480		2400	11.82	4,310
7	0600	14.34	------	9	2400	12.76	5,490	12	0800	12.10	4,570
	1200	14.18	------						1400	12.04	4,490
	1400	13.80	------	10	0800	12.76	5,490		2400	11.88	4,250
	1800	13.43	------								

(237) 5–4515. Iowa River at Marshalltown, Iowa

Location.—Lat 42°04'05", long 92°54'05", in NW¼SW¼ sec.24, T.84 N., R.18 W., on right bank in city park in Marshalltown, 300 ft upstream from Burnett Creek, 0.2 mile downstream from bridge on State Highway 14, 2.0 miles upstream from Linn Creek, and at mile 222.6.

Drainage area.—1,564 sq mi, including that of Burnett Creek.

Gage-height record.—Water-stage recorder graph. Datum of gage 853.10 ft above mean sea level, datum 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 21,000 cfs and extended to 42,000 cfs from velocity-area study. Backwater from ice Mar. 1–30.

Maxima.—March–May 1965: Discharge, 17,400 cfs 1600 hours Apr. 6 (gage height 17.63 ft).

1902–3, 1914–27, 1932 to February 1965: Discharge, 42,000 cfs June 4, 1918 (gage height, 17.74 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,000	9,520	1,550	11	1,500	10,600	820	21	480	2,680	584
2	8,200	9,340	1,370	12	1,200	8,800	748	22	400	2,330	571
3	5,600	7,080	1,200	13	1,050	8,020	680	23	330	2,000	694
4	3,700	7,640	1,190	14	900	7,400	610	24	310	1,890	694
5	2,600	11,400	1,060	15	840	7,070	571	25	300	2,000	788
6	1,900	16,900	959	16	840	6,540	554	26	300	2,150	2,470
7	2,000	14,800	874	17	880	5,840	530	27	300	2,060	4,660
8	2,100	13,400	951	18	800	5,060	571	28	300	1,960	4,110
9	1,900	13,300	974	19	700	4,270	640	29	320	1,840	3,430
10	1,700	12,900	986	20	580	3,360	640	30	1,100	1,720	2,970
								31	4,000	------	2,660
Monthly mean discharge, in cubic feet per second									1,649	6,796	1,326
Runoff, in inches									1.22	4.85	0.98
Runoff, in acre-feet									101,400	404,400	81,540

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Iowa River at Marshalltown, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	15.27	7,960	Apr. 5	2200	17.38	15,900	Apr. 6	2400	17.49	16,500
	0300	15.33	8,090		2400	17.48	16,500				
	0600	15.58	8,740					7	0600	17.36	15,800
	1300	16.35	11,300	6	1200	17.57	17,000		1800	16.97	13,800
	1600	16.55	12,100		1600	17.63	17,400		2400	16.87	13,400
	2000	17.23	15,200								

(238) 5–4517. Timber Creek near Marshalltown, Iowa

Location.—Lat 42°00'25", long 92°51'30", in SE¼SW¼ sec.8, T.83 N., R.17 W., on left bank 20 ft downstream from bridge on U.S. Highway 30, 2.7 miles upstream from mouth and 3.0 miles southeast of Marshalltown.

Drainage area.—118 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 1–5, 17, 18, 30, 31. Daily wire-weight gage readings available for this period. Datum of gage is 849.44 ft above sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 3,100 cfs. Backwater from ice and debris Mar. 1 to Apr. 16.

Maxima.—March–May 1965: Discharge, 3,130 cfs 1100 hours Apr. 24; gage-height, 15.07 ft 0200 hours Apr. 1 (backwater from ice).
1949 to February 1965: Discharge, 4,940 cfs June 18, 1950 (gage height 15.77 ft). Flood in June 1947 reached a stage of 16.8 ft (discharge not determined).

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,100	1,300	110	11	19	150	49	21	39	45	32
2	400	500	96	12	18	105	49	22	31	42	105
3	200	370	84	13	25	92	45	23	26	40	124
4	100	500	77	14	45	84	43	24	23	1,360	66
5	50	1,100	75	15	100	76	44	25	21	649	68
6	30	600	70	16	400	70	43	26	20	310	524
7	25	200	63	17	1,000	65	40	27	19	221	188
8	22	160	64	18	500	57	37	28	30	191	127
9	21	140	65	19	66	51	33	29	230	149	119
10	20	130	52	20	46	48	33	30	900	127	117
								31	1,500	------	106
Monthly mean discharge, in cubic feet per second									227	298	886
Runoff, in inches									2.21	2.82	0.87
Runoff, in acre-feet									13,940	17,720	5,450

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Timber Creek near Marshalltown, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 31	0000	13.40	------	Apr. 1	1530	12.27	------	Apr. 24	1200	13.80	2,690
	0900	13.88	------		1700	12.45	------		1500	12.55	1,820
	1100	13.91	------		2100	12.39	------		1700	9.70	925
	1500	13.69	------		2400	12.08	------		1900	7.80	590
	1800	14.05	------						2200	6.89	463
	2000	14.76	------	24	0000	3.10	56		2400	7.09	490
	2200	14.90	------		0200	6.00	347				
	2400	14.93	------		0300	9.30	845	25	1200	8.55	708
					0500	10.81	1,190		1700	9.38	853
Apr. 1	0200	15.07	------		0700	11.56	1,410		2100	7.92	596
	0600	14.16	------		0900	13.72	2,630		2400	7.00	461
	1200	13.08	------		1100	14.31	3,130				

(239) 5–4519. Richland Creek near Haven, Iowa

Location.—Lat 41°53'55", long 92°28'35", in SE¼NE¼ sec.21, T.82 N., R.14 W., on right bank 5 ft upstream from highway bridge, 0.5 mile north of Haven, and 3.0 miles upstream from mouth.

Drainage area.—56.1 sq mi.

Gage-height record.—Water-stage recorder graph, except April 26–28, May 27–30. Daily wire-weight gage readings were available for those periods. Datum of gage is 798.69 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,200 cfs and extended to 3,560 cfs on basis of logarithmic plotting. Backwater from ice Mar. 2–16, 19–23, 28, 29.

Maxima.—March–May 1965: Discharge, 2,090 cfs 1200 hours Apr. 24 (gage height, 9.98 ft).
1949 to February 1965: Discharge, 3,650 cfs Mar. 30, 1960 (gage height, 12.39 ft). Flood in June 1918 reached a stage of 14.3 ft (discharge not determined).

Cooperation.—Two discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	764	588	58	11	7.0	41	26	21	11	12	17
2	150	86	50	12	11	27	24	22	9.4	10	21
3	40	66	44	13	35	21	22	23	8.0	10	25
4	20	84	61	14	60	20	22	24	7.3	956	19
5	23	776	52	15	120	19	24	25	7.3	413	19
6	13	268	40	16	180	16	24	26	7.3	144	270
7	10	33	34	17	611	15	21	27	13	101	46
8	9.0	63	34	18	170	14	19	28	54	90	34
9	8.3	34	33	19	25	13	17	29	170	78	29
10	7.5	29	27	20	15	12	17	30	610	66	28
								31	871	------	121
Monthly mean discharge, in cubic feet per second									131	137	41.2
Runoff, in inches									2.68	2.72	0.85
Runoff, in acre-feet									8,030	8,140	2,530

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Richland Creek near Haven, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	1.70	91	Apr. 24	1400	8.90	1,720	Apr. 25	0300	3.20	324
	0030	2.30	173		1500	7.15	1,140		0900	3.08	304
	0100	4.00	460		1600	4.90	604		1000	3.25	332
	0130	5.80	768		1700	3.64	399		1300	4.17	487
	0200	6.78	1,030		1900	2.99	288		1500	4.64	562
	0230	6.92	1,080		2100	2.95	282		1600	4.60	556
	0400	6.73	1,020		2300	3.44	365		1800	4.00	460
	0600	6.95	1,080		2400	3.40	358		2100	3.06	300
	0800	7.18	1,150						2400	2.72	242
	0900	7.68	1,300	25	0100	3.50	375				
	1000	8.70	1,640		0200	3.89	441	26	0300	2.28	170
	1100	9.60	1,960		0300	4.23	497		1200	1.98	125
	1200	9.98	2,090		0400	4.28	505		2400	1.77	99
	1300	9.82	2,040		0500	4.06	470				

(240) 5–4520. Salt Creek near Elberon, Iowa

Location.—Lat 41°57'45", long 92°18'55", in NW¼NW¼ sec.36, T.83 N., R.13 W., near center of span on downstream side of bridge on U.S. Highway 30, 1.2 miles northwest of Irving, 2.5 miles south of Elberon, and 9.0 miles upstream from mouth.

Drainage area.—201 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 3–5, 19–21. Daily wire-weight readings were available. Datum of gage is 781.58 ft above mean sea level (Iowa Highway Commission bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 17,000 cfs and extended by logarithmic plotting to 35,000 cfs. Backwater from ice Mar. 1–31.

Maxima.—March–May 1965: Discharge, 4,680 cfs 0300 hours Apr. 1 (gage height, 15.75 ft).
1945 to February 1965: Discharge, 35,000 cfs June 13, 1947 (gage height, 17.6 ft). Flood of June 16, 1944, reached a stage of 19.9 ft, from floodmark (discharge, 30,000 cfs, estimated).

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,100	3,420	114	11	34	246	72	21	62	75	38
2	1,000	1,280	101	12	34	183	67	22	50	69	55
3	400	482	79	13	41	147	61	23	43	65	117
4	180	762	196	14	90	135	59	24	37	171	82
5	90	2,320	212	15	240	129	60	25	35	329	75
6	56	2,450	140	16	600	112	65	26	33	281	1,380
7	48	343	113	17	700	103	56	27	31	201	822
8	42	322	104	18	240	94	50	28	52	178	262
9	39	253	97	19	150	86	42	29	210	151	219
10	36	197	79	20	85	81	40	30	900	131	210
								31	2,250	------	680
Monthly mean discharge, in cubic feet per second									320	493	185
Runoff, in inches									1.83	2.74	1.06
Runoff, in acre-feet									19,650	29,350	11,400

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Salt Creek near Elberon, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 29	0000	6.13	------	Mar. 30	1500	12.42	------	Apr. 1	1800	14.13	2,660
	0200	6.17	------		1600	13.20	------		2400	13.83	2,310
	1200	5.93	------		1800	13.74	------				
	1400	6.06	------		2000	13.86	------	2	0600	13.77	2,250
	1600	6.80	------		2200	13.83	------		0800	13.64	2,100
	1700	7.90	------		2400	13.91	------		1000	12.83	1,470
	1800	9.40	------						1100	12.20	1,150
	1900	10.55	------	31	0700	14.62	------		1200	11.43	928
	2100	11.37	------		1400	14.15	------		1300	10.80	776
	2400	11.12	------		2000	14.35	------		1400	10.25	665
					2400	15.06	3,780		1600	9.55	548
30	0400	10.90	------						1800	9.20	492
	0800	11.05	------	Apr. 1	0300	15.75	4,680		2300	9.02	463
	1300	11.09	------		1200	14.73	3,380		2400	9.03	465
	1400	11.48	------								

(241) 5–4522. Walnut Creek near Hartwick, Iowa

Location.—Lat 41°50'10", long 92°23'20", in SE¼SW¼ sec.8, T.81 N., R.13 W., on left bank 5 ft upstream from highway bridge, 1.2 miles downstream from North Walnut Creek, 4.0 miles northwest of Hartwick, and 6.5 miles upstream from mouth.

Drainage area.—70.9 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 18–21, Apr. 7–23, May 2–15, 27–31. Datum of gage 786.59 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,600 cfs and extended to 4,930 cfs on basis of contracted-opening and flow-over-embankment measurement of peak flow.

Maxima.—March–May 1965: Discharge, 2,700 cfs 1930 hours Mar. 30 (gage height, 14.59 ft).

1949 to February 1965: Discharge, 4,930 cfs Sept. 3, 1958 (gage height, 15.67 ft). Flood in June 1947, reached a stage 17.7 ft (discharge not determined).

Cooperation.—Two discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	320	423	73	11	11	65	36	21	20	14	17
2	100	105	66	12	17	47	34	22	16	13	17
3	75	109	64	13	24	35	31	23	13	12	21
4	50	104	59	14	45	30	31	24	11	798	19
5	33	977	58	15	86	26	31	25	10	478	19
6	20	246	53	16	170	23	25	26	9.6	199	115
7	16	53	48	17	800	21	26	27	16	159	40
8	14	89	42	18	140	18	22	28	43	131	38
9	13	58	43	19	50	17	18	29	150	99	36
10	12	46	39	20	27	15	18	30	845	86	36
								31	916	------	32
Monthly mean discharge, in cubic feet per second									131	150	38.9
Runoff, in inches									2.14	2.36	0.63
Runoff, in acre-feet									8,080	8,920	2,390

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Walnut Creek near Hartwick, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 30	0000	6.25	250	Mar. 31	0500	6.95	318	Apr. 1	0100	11.10	925
	0800	6.25	250		0700	6.10	237		0200	10.00	700
	1230	6.05	232		1030	5.52	189		0400	8.40	478
	1400	6.45	268		1200	5.75	207		0600	7.74	401
	1500	8.50	490		1300	6.40	264		1000	6.78	301
	1600	11.30	975		1400	8.70	516		1200	6.54	277
	1700	12.70	1,360		1500	11.50	1,020		1230	6.54	277
	1800	14.00	1,900		1700	13.70	1,730		1400	6.75	298
	1930	14.59	2,700		1800	14.12	2,020		1500	7.03	326
	2100	14.38	2,370		1900	14.22	2,150		1700	7.78	406
	2200	14.12	2,020		2000	14.19	2,110		1800	7.98	428
	2400	12.95	1,440		2100	13.98	1,890		1900	8.02	432
					2200	13.60	1,690		2000	7.83	411
Mar. 31	0100	11.30	975		2300	13.11	1,490		2200	7.12	335
	0200	9.75	662		2400	12.28	1,260		2400	6.10	237
	0300	8.50	490								

(242) 5–4530. Big Bear Creek at Ladora, Iowa

Location.—Lat 41°45'00", long 92°11'00", in SW¼SW¼ sec.7, T.80 N., R.11 W., on left bank 10 ft downstream from highway bridge, a quarter of a mile south of Ladora, and 2½ miles upstream from Little Bear Creek.

Drainage area.—189 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 754.94 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 8,000 cfs. Backwater from ice Mar. 1–30.

Maxima.—March–May 1965: Discharge, 3,580 cfs 0100 hours Apr. 1 (gage height, 11.34 ft); gage height, 11.77 ft 2200 hours Mar. 30 (backwater from ice).
1945 to February 1965: Discharge, 10,500 cfs Mar. 30, 1960 (gage height, 14.60 ft).

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,100	1,590	180	11	56	240	73	21	60	48	45
2	600	421	153	12	95	137	72	22	50	44	44
3	370	250	133	13	150	104	66	23	40	43	82
4	150	324	123	14	240	94	65	24	33	1,110	58
5	100	1,730	127	15	430	84	72	25	30	1,240	54
6	84	1,160	112	16	580	72	68	26	29	594	110
7	72	214	99	17	1,600	67	57	27	60	361	100
8	66	226	96	18	300	61	54	28	400	310	64
9	62	204	100	19	150	55	48	29	640	248	63
10	58	183	81	20	90	53	45	30	1,650	210	67
								31	2,210	------	126
Monthly mean discharge, in cubic feet per second									373	383	85.1
Runoff, in inches									2.27	2.26	0.52
Runoff, in acre-feet									22,920	22,760	5,230

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Big Bear Creek at Ladora, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 30	0000	7.27	------	Apr. 1	1300	5.58	884	Apr. 5	0200	3.02	269
	0600	6.63	------		1400	5.64	902		0500	3.02	269
	1200	4.18	------		1600	5.42	836		0600	3.08	279
	1400	5.35	------		1900	5.81	953		0700	4.10	485
	1600	7.60	------		2200	5.80	950		0800	5.40	830
	1700	9.10	------		2400	5.62	896		0900	5.80	950
	1800	10.27	------	2	0400	4.88	680		1000	7.60	1,630
	2200	11.77	------		0700	4.24	520		1200	9.23	2,380
	2400	11.50	------		1000	3.70	395		1430	9.80	2,670
Mar. 31	0400	10.00	2,780		1400	3.12	287		1530	9.65	2,600
	0500	8.85	2,200		1800	2.87	243		1600	9.68	2,610
	0600	8.00	1,790		2200	2.73	221		1900	9.73	2,640
	0700	6.95	1,370		2400	2.71	218		2100	10.20	2,900
	1000	5.20	770	3	0600	2.86	242		2300	10.42	3,030
	1200	4.60	610		0900	2.86	242		2400	10.44	3,040
	1400	5.95	995		1700	2.72	219	6	0200	10.45	3,050
	1500	6.90	1,350		1800	2.73	221		0400	9.80	2,670
	1600	8.50	2,020		2000	2.90	248		0500	9.20	2,370
	1700	9.70	2,620		2200	3.48	351		0600	7.90	1,730
	1900	10.65	3,170		2400	3.83	421		0800	6.70	1,240
	2400	11.30	3,560						0900	6.27	1,060
Apr. 1	0100	11.34	3,580	4	0200	3.93	442		1000	5.62	848
	0200	11.32	3,570		0600	3.69	393		1100	5.43	785
	0500	10.15	2,870		1200	3.17	296		1400	4.38	505
	0600	8.60	2,070		1600	2.98	262		1700	3.84	383
	0700	7.75	1,690		1900	2.94	255		2000	3.47	318
	0800	6.90	1,350		2200	2.94	255		2400	3.26	276
	1100	5.92	986		2400	2.98	262				

(243) 5–4531. Iowa River at Marengo, Iowa

Location.—Lat 41°48'35", long 92°04'20", in NW¼SE¼ sec.24, T.81 N., R.11 W., on right bank at downstream side of abandoned county highway bridge, 0.7 mile downstream from Bear Creek, 0.8 mile north of Marengo, and 4.9 miles upstream from Hilton Creek, and at mile 139.4.

Drainage area.—2,794 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 3, 4, 18. Datum of gage is 720.52 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 31,000 cfs. Backwater from ice Mar. 1–31.

Maxima.—March–May 1965: Discharge, 19,900 cfs 1000 hours Apr. 7 (gage height, 17.84 ft).
1956 to February 1965: Discharge, 30,800 cfs Mar. 31, 1960 (gage height, 19.21 ft).

Cooperation.—Six discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965, of Iowa River at Marengo, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,300	12,200	3,100	11	2,500	15,800	1,650	21	3,000	6,460	1,040
2	5,000	13,100	2,810	12	2,100	15,200	1,580	22	2,500	5,830	1,040
3	4,800	12,200	2,480	13	2,500	14,100	1,420	23	2,200	4,680	1,360
4	4,500	14,100	2,280	14	2,100	12,000	1,360	24	1,900	6,770	1,460
5	4,200	15,000	2,460	15	2,300	10,700	1,320	25	1,800	7,540	1,370
6	4,000	17,500	2,350	16	3,000	9,910	1,280	26	1,700	7,030	1,870
7	4,300	19,300	1,990	17	5,000	9,170	1,200	27	1,600	6,240	3,680
8	4,700	19,300	1,840	18	6,200	8,430	1,120	28	2,300	5,430	3,970
9	5,000	18,700	1,770	19	5,000	7,720	1,040	29	3,500	4,200	3,920
10	3,500	16,400	1,690	20	3,600	7,080	1,020	30	6,000	3,490	4,010
								31	10,000	------	4,140
Monthly mean discharge, in cubic feet per second									3,681	10,850	2,052
Runoff, in inches									1.52	4.33	0.85
Runoff, in acre-feet									226,300	645,800	126,200

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	15.75	11,200	Apr. 4	1200	16.57	14,200	Apr. 6	0400	17.68	19,000
	0300	15.68	11,000		1800	16.54	14,100		1500	17.17	16,200
	0600	15.72	11,200		2400	16.48	13,800		2400	17.53	18,100
	1200	15.93	11,800								
	1800	16.30	13,300	5	1000	16.56	13,500	7	1000	17.84	19,900
	2400	16.48	14,000		2400	17.60	18,800		2400	17.67	18,900
4	0600	16.60	14,300								

(244) 5–4535.1 Coralville Reservoir near Coralville, Iowa

Location.—Lat 41°43'20", long 91°31'30", in SW¼NE¼ sec.22, T.80 N., R.6 W., at outlet works at left end of Coralville Dam, 4.0 miles northeast of Coralville and at mile 83.3.

Drainage area.—3,115 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is at mean sea level, datum of 1929 (levels by Corps of Engineers).

Maxima.—March–May 1965: Contents, 403,600 acre-ft 1200 hours May 5 (elevation, 708.50 ft).
1958 to February 1965: Contents, 368,000 acre-ft Apr. 8, 1960 (elevation, 706.77 ft).

Remarks.—Reservoir is formed by earth-fill rock-faced dam; completed in 1957. Storage began in September 1958. Capacity, 489,000 acre-ft between elevations 650 (sill of outlet conduit) and 712 ft (crest of spillway). No dead storage. Figures given herein represent total contents based on a flat pool condition. Water is stored for flood control and conservation. Records are furnished by Corps of Engineers.

Elevation, in feet, and contents, in acre-feet, 1965, of Coralville Reservoir near Coralville, Iowa

Date	Time	Elevation	Contents	Date	Time	Elevation	Contents
Jan. 31	2400	673.92	27,600	Apr. 30	2400	707.33	379,400
Feb. 28	2400	671.12	19,500	May 5	1200	708.50	403,600
Mar. 31	2400	669.08	15,300	May 31	2400	699.58	237,300

(245) 5—4540. Rapid Creek near Iowa City, Iowa

Location.—Lat 41°42'00", long 91°29'05", in NE¼NE¼ sec.36, T.80 N., R.6 W., on left bank 80 ft upstream from bridge on State Highway 1 (formerly 261), 3 miles northeast of Iowa City, and 4.0 miles upstream from mouth.

Drainage area.—24.6 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 673.72 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,500 cfs and extended to 6,1000 cfs on basis of contracted opening measurement of peak flow. Backwater from ice Mar. 18—27.

Maxima.—March—May 1965: Discharge, 6,100 cfs 0800 hours May 23 (gage height, 14.10 ft).
1937 to February 1965: Discharge, 5,200 cfs July 14, 1962 (gage height, 13.64 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	20	14	14	11	23	43	14	21	4.0	5.7	6.4
2	5.3	7.3	13	12	29	17	11	22	2.0	4.8	5.7
3	3.8	6.2	11	13	120	12	9.6	23	1.0	7.0	1,170
4	3.0	7.9	26	14	127	12	8.6	24	.7	191	64
5	11	225	20	15	152	15	34	25	.7	107	43
6	40	143	16	16	61	11	34	26	.7	47	126
7	67	16	13	17	120	9.8	14	27	4.0	32	101
8	117	29	11	18	10	7.9	10	28	51	30	38
9	28	16	37	19	5.0	6.6	8.4	29	112	23	33
10	20	23	17	20	4.5	6.2	7.5	30	41	19	30
								31	22	5	32
Monthly mean discharge, in cubic feet per second									38.9	36.5	63.8
Runoff, in inches									1.82	1.65	2.99
Runoff, in acre-feet									2,390	2,170	3,920

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Rapid Creek near Iowa City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	3.52	7.0	Apr. 6	0300	8.52	500	May 23	0500	11.15	1,410
	0500	3.51	6.8		0330	7.23	393		0600	11.88	2,130
	0700	3.89	17.5		0400	6.25	278		0700	13.50	4,900
	0800	5.03	104		0500	5.33	140		0800	14.10	6,100
	0900	6.24	276		0800	4.65	64.5		0900	13.36	4,620
	1100	7.32	401		1300	4.33	39.1		1000	12.29	2,680
	1300	7.35	403		2400	4.03	22.9		1100	11.59	1,820
	1500	5.89	224						1200	10.75	1,110
	1900	5.05	106	May 22	2400	3.43	5.3		1300	9.30	605
	2000	5.87	220						1400	7.77	433
	2030	7.03	373	23	0100	3.53	7.3		1500	6.75	342
	2100	8.87	543		0200	4.00	21.6		1600	5.85	218
	2200	9.67	688		0300	6.00	240		1900	5.26	131
	2400	9.80	725		0400	8.18	466		2400	4.95	94.5
6	0200	9.48	641								

(246) 5–4543. Clear Creek near Coralville, Iowa

Location.—Lat 41°40'35", long 91°35'55", in NW¼SW¼ sec.6, T.79 N., R.6 W., on left bank about 50 ft upstream from highway bridge, 1.2 miles west of Coralville, and 2.2 miles upstream from mouth.

Drainage area.—98.1 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 19–24, Apr. 1–4, 9, 10, 12–23, Apr. 29 to May 5, May 29–31. Datum of gage is 648.43 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 5,600 cfs. Backwater from ice Mar. 1–15, 18–28.

Maxima.—March–May 1965: Discharge, 4,060 cfs 2400 hours Apr. 24 (gage height, 12.50 ft).
1952 to February 1965: Discharge, 5,390 cfs May 29, 1962 (gage height, 13.31 ft).

Cooperation.—Two discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	280	95	115	11	85	237	60	21	42	30	30
2	200	85	110	12	60	125	54	22	36	27	28
3	80	80	105	13	110	95	48	23	31	25	500
4	55	75	131	14	150	75	45	24	27	1,520	109
5	38	616	120	15	240	60	77	25	25	1,990	83
6	100	1,180	89	16	396	54	96	26	24	483	158
7	150	153	76	17	552	46	51	27	27	229	419
8	210	181	67	18	200	40	44	28	150	193	113
9	160	125	152	19	74	37	36	29	415	140	92
10	110	120	74	20	54	33	32	30	309	120	85
								31	173	------	82
Monthly mean discharge, in cubic feet per second									147	276	106
Runoff, in inches									1.73	3.13	1.24
Runoff, in acre-feet									9,050	16,400	6,510

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Clear Creek near Coralville, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	3.15	64	Apr. 25	0100	12.45	3,960	Apr. 26	0300	8.39	812
	0200	4.27	147		0300	12.12	3,280		0500	7.48	630
	0400	5.15	249		0800	11.40	2,040		0700	6.82	518
	0600	5.87	358		0900	11.31	1,900		0900	6.40	444
	0800	7.65	669		1000	11.26	1,840		1000	6.29	426
	1000	9.10	968		1300	10.99	1,510		1200	6.14	400
	1200	10.30	1,240		2000	10.36	1,260		1500	5.84	351
	1400	11.12	1,600		2100	10.28	1,240		1900	5.55	309
	1800	11.57	2,260		2200	10.15	1,200		2400	5.35	281
	2200	12.37	3,790		2400	9.68	1,090				
	2400	12.50	4,060								

(247) 5—4545. Iowa River at Iowa City, Iowa

Location.—Lat 41°39'25", long 91°32'25", in SE¼SE¼ sec.9, T.79 N., R.6 W., on right bank 25 ft downstream from Hydraulics Laboratory of State University of Iowa in Iowa City, 175 ft downstream from University Dam, 0.9 mile upstream from Ralston Creek, 3.6 miles downstream from Clear Creek, and at mile 74.2.

Drainage area.—3,271 sq mi.

Gage-height record.—Water-stage recorder graph Mar. 1 to Apr. 21 and digital recorder tape punched at 15 minute intervals Apr. 22 to May 31. Datum of gage is 39.00 ft above Iowa City datum, and 627.27 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 11,100 cfs 0430 hours Apr. 24 (gage height, 11.74 ft.)

1903 to February 1965: Discharge, 42,500 cfs June 8, 1918 (gage height, 19.6 ft., from graph based on gage readings, at site 2,600 ft downstream at datum 0.2 ft higher).

Flood of July 17, 1881, reached a stage of 21.1 ft, from flood marks of site 2,600 ft downstream at datum 0.2 ft higher, (discharge, 51,000 cfs). Maximum stage known since at least 1850, about 3 ft higher than that of July 17, 1881, occurred in June 1851 (discharge, 70,000 cfs estimated).

Remarks: Flow regulated by Coralville Reservoir (capacity, 489,000 acre-ft) since Sept. 17, 1958.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,540	4,860	281	11	4,210	3,660	5,830	21	3,380	9,820	5,880
2	3,680	5,260	258	12	5,240	1,350	5,800	22	3,710	9,810	5,970
3	4,150	6,730	235	13	5,690	1,260	5,830	23	3,430	9,760	6,640
4	4,180	8,380	289	14	5,630	3,820	5,900	24	2,050	6,080	4,270
5	3,460	9,360	1,380	15	5,460	9,470	5,990	25	1,360	2,850	6,060
6	2,540	9,400	4,060	16	5,390	9,880	6,050	26	1,260	857	6,200
7	1,470	7,630	5,830	17	5,550	9,900	5,860	27	1,140	462	6,710
8	1,750	8,310	5,860	18	4,560	9,900	5,810	28	1,360	412	6,090
9	1,540	9,230	6,070	19	3,230	9,890	5,760	29	2,300	349	6,040
10	2,150	8,890	5,890	20	3,300	9,830	5,800	30	4,620	305	6,040
								31	4,700	------	6,000
Monthly mean discharge, in cubic feet per second									3,388	6,257	4,990
Runoff, in acre-feet									208,300	372,300	306,800

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Iowa River at Iowa City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	10.64	9,860	Apr. 24	0900	7.31	6,200	Apr. 24	2000	4.10	3,320
	0430	11.74	11,100		1200	5.12	4,170		2400	4.62	3,740
	0700	9.70	8,770		1800	4.10	3,320				

(248) 5–4550. Ralston Creek at Iowa City, Iowa

Location.—Lat 41°39'50", long 91°30'45", in SE¼NW¼ sec.11, T.79 N., R.6 W., on left bank 10 ft upstream from bridge on Rochester Avenue (formerly State Highway 1), near east edge of Iowa City, and 2.2 miles upstream from mouth.

Drainage area.—3.01 sq mi.

Gage-height record.—Water-stage recorder graph except Apr. 9–12. Datum of gage is 662.53 ft above mean sea level, datum of 1929 (State University of Iowa bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1–29.

Maxima.—March–May 1965: Discharge, 198 cfs 0330 hours Apr. 24 (gage height, 4.25 ft).
1924 to February 1965: Discharge, 1,690 cfs July 18, 1956 (gage height, 9.06 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1.9	1.5	1.7	11	2.0	3.0	1.4	21	0.20	0.67	0.67
2	.70	.76	1.3	12	2.0	1.5	1.1	22	.16	.59	.64
3	.28	.79	1.1	13	2.0	1.2	.96	23	.13	.70	12
4	.20	.99	5.6	14	2.0	2.4	.85	24	.10	52	2.4
5	3.7	20	3.1	15	2.6	3.1	8.0	25	.09	14	1.7
6	6.0	5.1	1.9	16	3.0	1.6	2.8	26	.10	5.6	14
7	5.0	1.8	1.5	17	4.4	1.3	1.5	27	.34	4.5	5.6
8	6.0	4.8	1.3	18	1.5	1.0	1.1	28	3.0	3.7	3.3
9	2.5	1.9	6.5	19	.39	.89	.82	29	6.9	2.7	3.2
10	3.0	2.2	1.9	20	.30	.76	.73	30	4.9	2.1	2.5
								31	3.1	------	4.6
Monthly mean discharge, in cubic feet per second									2.21	4.77	3.09
Runoff, in inches									0.85	1.77	1.18
Runoff, in acre-feet									136	284	190

Gage height, in feet, and discharge, in cubic feet per second, at indicated time 1965, of Ralston Creek at Iowa City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 23	0000	1.90	0.5	Apr. 24	0100	3.10	35.0	Apr. 24	1200	3.05	29.5
	0900	1.94	.6		0200	3.56	94.8		1330	3.63	104
	1600	1.91	.6		0300	4.15	182		1500	3.33	64.9
	1700	2.13	1.3		0330	4.25	198		1800	2.94	19.5
	1900	1.91	.6		0500	3.57	96.1		2100	2.83	12.9
	2200	1.91	.6		0800	3.00	24.0		2400	2.90	16.5
	2300	2.18	1.5		1100	2.87	14.9				
	2400	2.36	2.5								

(249) 5–4550.1 South Branch Ralston Creek at Iowa City, Iowa

Location.—Lat 41°38'50", long 91°30'30", in SW¼NE¼ sec.14, T.79 N., R.6 W., on right bank 60 ft downstream from Muscatine Avenue bridge in Iowa City and 1.3 miles upstream from confluence with Ralston Creek.

Drainage area.—3.20 sq mi, approximately.

Gage-height record.—Water-stage recorder graph, except Mar. 1–15. Several outside staff gage readings used for this period. Datum of gage is 678.03 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 220 cfs and by culvert computation at 780 cfs. Backwater from ice Mar. 1, 13, 16–25, 28–30.

Maxima.—March–May 1965: Discharge, 652 cfs 0330 hours Apr. 24 (gage height, 6.57 ft).
1963 to February 1965: Discharge, 126 cfs June 22, 1964 (gage height, 3.47 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1.0	1.6	2.3	11	2.0	7.4	2.0	21	0.4	1.1	1.0
2	.5	.9	1.8	12	2.0	3.4	1.6	22	.3	.9	.8
3	.3	.8	1.8	13	2.0	2.4	1.5	23	.3	.9	25
4	.2	.9	13	14	2.0	3.2	1.3	24	.2	122	3.0
5	4.0	41	6.7	15	2.0	6.7	10	25	.2	24	2.1
6	6.0	8.4	3.9	16	2.3	3.0	2.3	26	.4	9.9	30
7	5.0	2.4	3.0	17	4.0	2.4	1.6	27	.6	7.5	7.9
8	6.0	8.1	2.5	18	2.0	1.6	1.3	28	2.0	5.8	5.0
9	3.0	2.6	8.6	19	1.0	1.5	1.1	29	7.0	3.9	4.6
10	2.5	10	2.5	20	.6	1.3	1.1	30	5.0	3.0	3.3
								31	2.0	------	3.6
Monthly mean discharge, in cubic feet per second									2.15	9.62	5.04
Runoff, in inches									0.78	3.35	1.82
Runoff, in acre-feet									132	572	310

Gage height, in feet, and discharge, in cubic feet per second, at indicated time 1965, of South Branch Ralston Creek at Iowa City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	1.65	1.4	Apr. 24	1000	2.39	30	Apr. 25	0300	2.24	23
	0030	1.67	1.6		1200	2.66	46		0400	2.35	28
	0100	3.78	150		1300	3.73	144		0500	2.50	36
	0130	5.35	390		1400	4.13	190		0600	2.60	42
	0200	5.00	326		1500	3.26	95		0800	2.45	34
	0300	6.23	568		1600	2.73	51		0900	2.34	28
	0330	6.57	652		1800	2.35	28		1200	2.30	26
	0400	6.15	550		2000	2.19	21		1400	2.19	21
	0500	4.40	226		2200	2.15	19		2000	2.06	15
	0600	3.21	90		2400	2.36	29		2400	2.04	14
	0700	2.83	58								

(250) 5–4555. English River at Kalona, Iowa

Location.—Lat 41°28'10", long 91°43'00", in SE¼SE¼ sec.13, T.77 N., R. 8 W., on right bank 30 ft upstream from bridge on State Highway 1, 1 mile south of Kalona, 4.5 miles downstream from Smith Creek, and 14.5 miles upstream from mouth.

Drainage area.—573 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 633.45 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 17,700 cfs. Backwater from ice Mar. 1, 4–14, 21–27.

Maxima.—March–May 1965: Discharge, 9,300 cfs 1230 hours Apr. 25 (gage height, 17.65 ft)
1939 to February 1965: Discharge, 18,500 cfs Mar. 31, 1960 (gage height, 19.89 ft). Maximum stage known, 19.9 ft in June 1930 from floodmarks (discharge 18,500 cfs).

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	980	2,650	552	11	220	834	183	21	300	136	100
2	1,450	1,230	450	12	210	730	158	22	200	124	95
3	708	418	365	13	330	353	149	23	160	212	456
4	450	333	313	14	540	279	136	24	140	6,200	436
5	300	1,030	294	15	1,140	391	156	25	125	8,700	201
6	200	4,020	296	16	2,230	296	322	26	110	6,710	192
7	310	2,900	256	17	4,480	237	254	27	100	3,200	846
8	450	752	225	18	5,370	201	158	28	446	1,270	363
9	280	708	256	19	2,670	169	129	29	1,880	914	217
10	240	462	223	20	702	145	112	30	2,070	690	199
								31	2,470	------	397
Monthly mean discharge, in cubic feet per second									1,008	1,543	274
Runoff, in inches									2.03	3.00	0.55
Runoff, in acre-feet									62,010	91,820	16,840

Gage height, in feet, and discharge, in cubic feet per second, at indicated time 1965, of English River at Kalona, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 23	0000	2.94	119	Apr. 24	2000	16.52	7,330	Apr. 26	2400	14.29	4,990
	2100	2.89	110		2200	16.55	7,380				
	2200	2.92	115		2400	16.66	7,540	27	0600	12.85	4,030
	2230	4.50	465						1000	11.75	3,450
	2300	6.75	1,120	25	0800	17.46	8,920		1400	10.62	2,830
	2330	9.00	2,000		1030	17.62	9,240		2000	9.14	2,060
	2400	11.00	3,030		1230	17.65	9,300		2400	8.24	1,680
					1430	17.63	9,260				
24	0100	12.60	3,890		1730	17.50	9,000	28	0600	7.41	1,340
	0400	13.76	4,600		2400	17.03	8,170		1000	7.15	1,240
	0900	15.32	5,920						1600	6.92	1,170
	1500	16.52	7,330	26	1600	15.67	6,310		2400	6.62	1,080
	1700	16.58	7,420								

(251) 5–4557. Iowa River near Lone Tree, Iowa

Location.—Lat 41°25'35", long 91°28'20", in NW¼NE¼ sec.6, T.76 N., R.5 W., on left bank 10 ft downstream from county highway bridge, 5 miles southwest of Lone Tree, and 6 miles downstream from English River and at mile 47.2.

Drainage area.—4,293 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 588.16 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 31,200 cfs. Backwater from ice Mar. 7–9, 26, 27.

Maxima.—March–May 1965: Discharge, 21,700 cfs 2400 hours Apr. 24 (gage height, 16.92 ft).
1956 to February 1965: Discharge, 28,100 cfs Apr. 1, 1960 (gage height, 17.90 ft).
Flood of May 25, 1944, reached a stage of 19.94 ft, from information by Corps of Engineers.

Remarks.—Flow regulated by Coralville Reservoir (capacity 489,000 acre-ft) since Sept. 17, 1958.

Cooperation.—Three discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,820	8,070	1,920	11	4,240	9,320	6,160	21	4,420	10,000	6,260
2	5,640	7,710	1,600	12	5,320	4,280	6,100	22	4,280	9,950	6,310
3	5,830	6,830	1,340	13	6,530	2,930	6,040	23	4,590	9,960	7,340
4	4,050	7,710	1,140	14	7,730	2,810	6,130	24	3,300	17,700	6,710
5	3,840	8,810	1,260	15	8,080	7,790	6,180	25	2,310	20,600	6,300
6	3,960	12,100	3,350	16	8,950	9,370	6,670	26	1,600	17,300	6,840
7	1,800	15,000	5,650	17	10,400	9,980	6,580	27	1,300	10,500	8,530
8	2,100	12,500	6,100	18	11,600	10,100	6,360	28	2,170	4,330	7,970
9	1,850	9,950	6,540	19	9,920	10,100	6,230	29	4,580	2,970	6,890
10	2,500	10,000	6,400	20	5,810	10,100	6,220	30	7,560	2,370	6,790
								31	7,680	------	6,700
Monthly mean discharge, in cubic feet per second									5,057	9,371	5,633
Runoff, in inches									1.36	2.44	1.51
Runoff, in acre-feet									310,900	557,600	346,300

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Iowa River near Lone Tree, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	13.54	11,300	Apr. 25	1800	16.53	19,900	Apr. 27	2400	10.30	6,660
	0400	14.99	14,600		2400	16.40	19,400				
	0600	15.27	15,400					28	0300	9.70	5,760
	0900	15.54	16,200	26	0600	16.20	18,600		0600	9.05	4,940
	1600	16.58	19,900		1200	15.93	17,500		0900	8.48	4,310
	1800	16.75	20,800		1800	15.50	16,100		1200	8.12	3,940
	2200	16.90	21,600		2400	14.96	14,500		1500	7.89	3,710
	2400	16.92	21,700						1800	7.75	3,570
				27	1200	13.13	10,600		2100	7.64	3,460
25	0600	16.88	21,500		1800	11.46	8,100		2400	7.54	3,360
	1200	16.70	20,600								

(252) 5–4570. Cedar River near Austin, Minn.

Location.—Lat 43°38'10", long 92°58'20", in NE¼SE¼ sec.15, T.102 N., R.18 W., on left bank 200 ft upstream from abandoned powerhouse, 500 ft downstream from highway bridge, 1.1 miles downstream from Turtle Creek, and 1.1 miles south of Austin.

Drainage area.—425 sq mi.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1, 2, 17–19.

Maxima.—Given in the following table.

	Discharge (cfs)	Gage height (ft)
March–May 1965:		
Mar. 1, 2130 hours	9,400	[a]18.87
Apr. 6, 1730 hours	8,410	16.21
1909–14, 1944 to February 1965:		
Mar. 29, 1962	9,530	-----
Mar. 26, 1950	-----	17.81

[a]Backwater from ice.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,620	203	229	11	132	3,770	162	21	57	419	126
2	3,480	561	212	12	114	3,460	151	22	60	370	119
3	796	782	209	13	104	2,340	140	23	60	342	119
4	452	2,730	215	14	97	1,780	134	24	62	335	126
5	323	6,410	220	15	95	1,400	148	25	60	356	162
6	264	7,920	276	16	91	1,080	164	26	60	475	489
7	223	5,760	258	17	85	841	181	27	60	482	405
8	195	6,080	232	18	72	681	170	28	58	356	255
9	164	5,470	201	19	60	573	151	29	63	288	198
10	148	4,280	176	20	57	475	134	30	72	252	164
								31	91	------	142
Monthly mean discharge, in cubic feet per second									396	2,009	196
Runoff, in acre-feet									1.07	5.27	0.53

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Cedar River near Austin, Minn.

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Feb. 28	0000	2.27	56	Mar. 4	1800	3.55	422	Apr. 7	0900	12.14	5,180
	1200	2.23	51		2400	3.41	374		1200	11.60	4,800
	1500	2.38	74						1800	12.20	5,220
	1800	2.58	117	5	0600	3.28	328		2400	13.00	5,820
	2100	2.75	164		1200	3.21	304				
	2300	3.38	369		1800	3.28	328	8	0300	13.14	5,930
	2400	3.92	583		2400	3.16	288		0600	13.13	5,920
									1200	13.21	5,980
Mar. 1	0100	4.80	-----	31	2400	2.66	145		1800	13.48	6,180
	0200	6.00	-----						2300	13.93	6,520
	0300	6.80	-----	Apr. 1	1200	2.69	153		2400	13.91	6,510
	0500	7.85	-----		1600	2.87	204				
	0600	9.00	-----		2000	3.12	276	9	0600	12.88	5,740
	0700	10.22	-----		2400	3.59	436		0900	12.53	5,470
	0900	11.43	-----						1100	12.57	5,500
	1100	13.00	-----	2	1200	3.60	440		1900	11.99	5,070
	1300	15.25	-----		1600	3.91	549		2100	11.68	4,850
	1500	16.88	-----		1800	4.23	677		2400	11.61	4,800
	1800	18.10	-----		2000	4.42	753				
	2130	18.87	9,400		2100	4.44	761	10	0600	11.11	4,450
	2200	18.87	-----		2400	4.41	749		1200	10.81	4,240
	2400	18.42	-----						2400	10.37	3,930
				3	1200	4.02	593				
2	0200	17.88	-----		2000	4.99	986	11	1200	10.05	3,710
	0400	17.00	-----		2400	5.62	1,270		1500	9.84	3,570
	0800	14.70	-----						1800	10.12	3,760
	1200	11.38	-----	4	0600	6.83	1,860		2200	10.21	3,820
	1600	8.34	-----		1200	7.60	2,250		2400	10.18	3,800
	2000	6.82	-----		1500	8.40	2,690				
	2400	5.85	-----		1800	9.85	3,580	12	0800	10.06	3,720
					2000	10.84	4,260		1200	9.83	3,560
3	0200	5.46	1,200		2200	11.63	4,820		1800	9.26	3,210
	0400	5.18	1,070		2400	12.32	5,320		2400	8.61	2,820
	0600	4.82	913								
	0800	4.61	829	5	1200	14.01	6,590	13	1200	7.64	2,270
	1000	4.41	749		1500	13.92	6,520		2400	7.08	1,990
	1200	4.27	693		2400	14.35	6,860				
	1400	4.21	669					14	1200	6.61	1,760
	1600	4.18	657	6	0600	15.21	7,560		2400	6.28	1,590
	1800	4.14	641		1200	16.04	8,260				
	2000	4.06	609		1730	16.21	8,410	15	1200	5.88	1,390
	2200	3.95	565		1800	16.21	8,410		2400	5.55	1,240
	2400	3.88	538		2400	15.72	7,990				
								16	1200	5.18	1,070
4	0600	3.74	489	7	0400	14.47	6,960		2400	4.91	950
	1200	3.60	440		0600	13.52	6,220				

(253) 5–4577. Cedar River at Charles City, Iowa

Location.—Lat 43°03'45", long 92°40'25", in SE¼NE¼, sec.12, T.95 N., P.16 W., on right bank 500 ft downstream from bridge on U.S. Highway 18 (St. Mary's Street) in Charles City, 13 miles upstream from Little Cedar River, and at mile 253.1 above mouth of Iowa River (U.S. Geological Survey river profile).

Drainage area.—1,054 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 11–15. Datum of gage is 973.02 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 29,200 cfs. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 21,000 cfs 0100 hours Apr. 7 (gage height, 19.14 ft); gage height, 21.64 ft 0730 hours Mar. 2.
1964 to February 1965: Discharge, about 1,500 cfs Feb. 28, 1965.
Flood of Mar. 27, 1961 reached a stage of 21.6 ft from floodmarks (29,200 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,000	1,800	599	11	560	8,830	469	21	218	937	370
2	14,000	3,500	547	12	480	11,400	424	22	206	833	346
3	9,400	3,000	502	13	430	6,970	400	23	196	748	334
4	5,200	6,200	456	14	380	3,910	370	24	188	710	334
5	3,100	12,000	492	15	370	2,860	388	25	182	762	365
6	2,100	19,800	813	16	370	2,270	400	26	178	836	577
7	1,500	19,600	936	17	350	1,820	512	27	170	955	975
8	1,060	16,500	833	18	300	1,450	528	28	168	944	1,010
9	840	15,200	651	19	260	1,220	450	29	164	807	687
10	670	10,300	540	20	236	1,070	400	30	168	677	547
								31	500	------	462
Monthly mean discharge, in cubic feet per second									1,514	5,264	539
Runoff, in inches									1.66	5.57	0.59
Runoff, in acre-feet									93,110	313,200	33,160

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Cedar River at Charles City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 2	0000	20.85	-----	Apr. 6	1600	18.98	20,700	Apr.10	2400	11.63	8,860
	0600	21.60	-----		2400	19.13	21,000				
	0730	21.64	-----					11	0600	11.14	8,270
	1200	21.50	-----	7	0100	19.14	21,000		1300	10.62	7,640
	1800	21.04	-----		1000	18.88	20,400		1500	11.92	9,200
	2400	20.50	-----		1800	17.99	18,600		1700	12.57	10,000
					2400	17.29	17,300		1800	12.56	10,000
Apr. 3	0000	9.65	-----						2200	12.27	9,650
	0800	8.91	-----	8	0600	16.63	16,200		2400	12.46	9,900
	1800	8.86	-----		1200	16.21	15,500				
	2400	9.64	-----		1800	17.05	16,900	12	0600	14.11	12,200
					2000	17.13	17,000		0900	14.50	12,800
4	1200	12.30	-----		2400	17.03	16,900		0930	14.51	12,800
	1500	13.55	-----						1000	14.50	12,800
	1530	12.45	-----	9	0600	16.87	16,600		1200	14.35	12,500
	1600	12.85	-----		1200	16.24	15,500		1800	13.20	10,900
	2400	14.23	-----		1800	15.41	14,200		2400	12.08	9,400
					2400	14.30	12,400				
5	1200	15.79	-----					13	0600	10.92	8,000
	2000	16.63	-----	10	0600	13.43	11,200		1200	9.91	6,820
	2400	17.36	17,400		1200	12.62	10,100		1800	9.02	5,840
					1800	12.04	9,350		2400	8.19	5,010
6	0600	18.25	19,100								

(254) 5–4580. Little Cedar River near Ionia, Iowa

Location.—Lat 43°02'00", long 92°30'10", in SW¼NE¼ sec.21, T.95 N., R.14 W., on left bank 12 ft downstream from county highway bridge, 2.5 miles west of Ionia, and 7.0 miles upstream from mouth.

Drainage area.—306 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 3, 4. Datum of gage is 973.35 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 10,200 cfs. Backwater from ice Mar. 1, 31.

Maxima.—March–May 1965: Discharge, 6,250 cfs 2200 hours Apr. 6 (gage height, 12.11 ft).
1954 to February 1965: Discharge, 10,800 cfs Mar. 27, 1961 (gage height, 15.58 ft). Flood of June 22, 1954, reached a stage of 11.37 ft (discharge, 4,600 cfs).

Mean discharge, in cubic feet per second, 1965, of Little Cedar River near Ionia, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,000	1,270	112	11	97	2,190	97	21	41	129	76
2	4,870	1,400	102	12	88	3,210	84	22	37	117	70
3	1,300	1,540	95	13	79	2,660	79	23	35	113	65
4	440	2,020	88	14	70	581	74	24	33	112	63
5	281	3,870	84	15	70	364	78	25	32	163	153
6	213	5,530	115	16	69	272	146	26	29	239	442
7	160	5,500	287	17	42	210	159	27	29	207	210
8	152	4,270	180	18	40	178	123	28	29	170	175
9	122	4,250	142	19	46	163	104	29	29	151	149
10	105	2,840	112	20	45	151	88	30	32	121	121
								31	300	-------	112
Monthly mean discharge, in cubic feet per second									352	1,466	129
Runoff, in inches									1.33	5.35	0.48
Runoff, in acre-feet									21,650	87,250	7,400

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	7.02	1,670	Apr. 7	0600	11.57	5,650	Apr.11	1200	7.00	1,660
	0600	6.98	1,650		1800	11.34	5,390		1400	7.15	1,750
	2000	6.57	1,370		2400	10.69	4,690		1800	8.28	2,580
	2400	6.79	1,530	8	1200	9.42	3,530		2000	9.22	3,360
4	0200	7.07	1,700		1400	9.58	3,670		2200	9.79	3,860
	1400	7.35	1,880		1800	10.42	4,430		2400	9.67	3,750
	2000	8.26	2,570		2100	11.18	5,220				
	2400	8.43	2,700		2400	10.89	4,900	12	0600	8.70	2,920
									1600	8.90	3,080
5	0400	8.64	2,870	9	0600	10.30	4,320		2400	9.59	3,680
	1000	9.74	3,820		1800	10.05	4,100				
	1600	10.46	4,460		2400	9.74	3,820	13	0200	9.58	3,670
	2400	10.77	4,770						0800	9.10	3,260
				10	0600	9.13	3,280		1400	8.44	2,710
6	1600	11.66	5,750		1600	8.26	2,570		1800	7.53	2,000
	2000	12.03	6,160		2400	7.30	1,850		2000	6.70	1,480
	2200	12.11	6,250						2400	5.81	928
	2400	12.06	6,190	11	0600	6.82	1,550				

(255) 5–4585. Cedar River at Janesville, Iowa

Location.—Lat 42°39'00", long 92°27'50", in NE¼SW¼ sec.35, T.91 N., R.14 W., on left bank 300 ft downstream from county highway bridge at Janesville 3.3 miles upstream from West Fork Cedar River, and at mile 207.7 above the mouth of Iowa River (U.S. Geological Survey river profiles).

Drainage area.—1,661 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 3 for which graph was reconstructed from wire-weight gage readings. Datum of gage is 868.26 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 36,200 cfs. Backwater from ice Mar. 1–8, Mar. 18 to Apr. 5.

Maxima.—March–May 1965: Discharge, 29,200 cfs 2400 hours Apr. 7 (gage height, 14.33 ft); gage height, 16.33 ft 1700 hours Mar. 3 (backwater from ice).

1904–06, 1914–27, 1932–42, 1945 to February 1965: Discharge, 37,000 cfs Mar. 28, 1961 (gage height, 16.33 ft).

Flood of Mar. 17, 1945, reached a stage of 16.2 ft, from floodmark at site 300 ft upstream (discharge, 34,300 cfs Mar. 16, 1929, reached a stage of about 16 ft from information by City of Waterloo (discharge not determined).

Mean discharge, in cubic feet per second, 1965, of Cedar River at Janesville, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	840	5,200	1,040	11	1,490	14,700	835	21	520	1,520	556
2	2,800	5,000	890	12	1,220	11,000	754	22	490	1,340	548
3	13,000	4,700	890	13	1,030	13,400	684	23	460	1,210	525
4	11,000	6,000	808	14	880	10,700	660	24	470	1,120	564
5	8,200	8,800	772	15	910	5,930	620	25	440	1,150	510
6	6,000	17,700	745	16	781	4,170	612	26	410	1,330	878
7	4,200	25,400	910	17	696	3,320	620	27	310	1,310	1,290
8	3,000	27,400	1,150	18	530	2,660	803	28	234	1,320	1,130
9	2,340	22,100	1,120	19	560	2,200	688	29	310	1,290	1,270
10	1,800	20,400	1,000	20	560	1,750	503	30	480	1,150	1,100
								31	1,300	------	980
Monthly mean discharge, in cubic feet per second									2,170	7,509	821
Runoff, in inches									1.51	5.04	0.57
Runoff, in acre-feet									133,400	446,800	50,490

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 3	0000	12.32	------	Apr. 7	2400	14.33	29,200	Apr. 11	1800	10.32	12,800
	0400	13.55	------						2400	9.80	11,500
	1200	15.27	------	8	0600	14.25	28,800				
	1600	16.20	------		1600	13.92	26,800	12	0600	9.33	10,600
	1700	16.33	------		2400	13.35	24,300		1000	9.25	10,300
	2000	15.77	------						1400	9.37	10,600
	2400	14.78	------	9	0600	12.93	22,400		2400	10.14	12,400
					1200	12.71	21,400				
Apr. 5	0000	10.33	13,000		2400	12.80	21,800	13	1200	10.63	13,800
	0600	11.08	15,400						1600	10.63	13,900
	1200	11.81	17,900	10	0600	12.72	21,400		2400	10.48	13,400
	2400	12.84	22,000		1200	12.55	20,700				
					1800	12.30	19,600	14	0600	10.03	12,300
7	0600	13.21	23,600		2400	11.88	18,200		1200	9.42	10,700
	1200	13.34	24,200						1800	8.66	9,130
	1800	14.10	28,000	11	0900	11.11	15,500		2400	7.86	7,690

(256) 5–4589. West Fork Cedar River at Finchford, Iowa

Location.—Lat 42°37'50", long 92°32'25", in SW¼SE¼ sec.6, T.90 N., R.14 W., on left bank 100 ft downstream from county highway bridge in Finchford, and 3.2 miles upstream from Shell Rock River.

Drainage area.—846 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 867.06 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current meter measurements below 22,600 cfs, extended to 31,900 by logarithmic plotting and one indirect measurement of peak flow. Backwater from ice Mar. 1 to Apr. 4.

Maxima.—March–May 1965: Discharge, 16,700 cfs 0930 hours Apr. 7 (gage height, 15.91 ft).

1945 to February 1965: Discharge, 31,900 cfs June 27, 1951 (gage height, 17.28 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965, of West Fork Cedar River at Finchford, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	700	900	942	11	370	5,440	446	21	160	1,220	273
2	1,700	2,750	830	12	330	4,220	400	22	150	1,080	268
3	3,010	3,010	740	13	310	3,680	370	23	142	946	283
4	3,500	7,400	666	14	300	3,910	351	24	140	856	341
5	1,720	9,400	606	15	286	3,180	337	25	138	866	432
6	1,060	13,800	568	16	280	2,560	324	26	134	1,030	1,050
7	760	16,300	539	17	250	2,130	322	27	132	1,300	1,810
8	560	13,700	539	18	212	1,840	322	28	130	1,490	2,500
9	480	9,170	536	19	192	1,680	314	29	130	1,290	2,650
10	415	7,410	500	20	174	1,440	296	30	132	1,090	2,070
								31	150	------	1,660
Monthly mean discharge, in cubic feet per second									585	4,170	751
Runoff, in inches									0.80	5.50	1.02
Runoff, in acre-feet									35,990	248,100	46,190

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	13.81	10,200	Apr. 6	1600	15.30	14,900	Apr. 7	2400	15.52	16,000
	0800	13.80	8,800		2400	15.47	15,800				
	2400	14.33	10,600					8	0800	15.29	14,900
				7	0930	15.91	16,700		1400	15.00	13,600
6	0800	14.93	13,200		1800	15.61	16,400		2400	14.31	10,500

(257) 5–4590. Shell Rock River near Northwood, Iowa

Location.—Lat 43°24'50", long 93°13'10", in NW¼NW¼ sec.9, T.99 N., R.20 W., on right bank 50 ft downstream from county highway bridge, 2 miles south of Northwood, and 4.1 miles upstream from Elk Creek.

Drainage area.—300 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 2–28, Apr. 4. Datum of gage is 1,176.48 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,430 cfs, extended to 3,200 by logarithmic plotting. Backwater from ice Mar. 1 to Apr. 10.

Maxima.—March–May 1965: Discharge, 3,400 cfs 2000 hours Apr. 8 (gage height, 12.07 ft, backwater from ice).

1945 to February 1965: Discharge, about 3,000 cfs Mar. 26, 1961 (gage height, 11.68 ft, backwater from ice).

Mean discharge, in cubic feet per second, 1965, of Shell Rock River near Northwood, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	640	148	546	11	262	2,960	257	21	82	1,260	170
2	520	158	488	12	240	3,100	220	22	72	1,140	170
3	450	178	431	13	210	2,820	198	23	64	1,040	166
4	420	465	388	14	180	2,600	185	24	56	958	159
5	390	1,300	416	15	170	2,400	183	25	54	907	157
6	380	2,000	431	16	160	2,190	218	26	52	890	251
7	360	2,800	394	17	150	1,990	233	27	52	818	293
8	340	3,200	361	18	140	1,750	205	28	50	742	283
9	310	3,100	319	19	120	1,570	200	29	51	674	259
10	290	3,000	278	20	100	1,410	187	30	58	609	231
								31	90	------	214
Monthly mean discharge, in cubic feet per second									210	1,600	274
Runoff, in inches									0.81	5.97	1.05
Runoff, in acre-feet									12,920	95,560	16,840

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	10.00	-----	Apr. 8	2400	11.90	------	Apr. 11	2400	10.90	3,170
	1200	10.64	-----								
	2400	11.26	-----	9	1600	11.64	------	12	0600	10.92	3,190
					2000	11.37	------		1200	10.84	3,120
7	0600	11.25	-----		2400	11.21	------		2400	10.62	2,950
	1000	11.04	-----	10	1200	10.86	------				
	2400	11.80	-----		2400	10.63	2,950	13	1200	10.42	2,800
									2400	10.28	2,710
8	1200	11.85	-----	11	1400	10.52	2,870				
	2000	12.07	3,400								

(258) 5–4595. Winnebago River at Mason City, Iowa

Location.—Lat 43°10'00", long 93°11'40", in NE¼NW¼ sec.3, T.96 N., R.20 W., on right bank 650 ft upstream from Thirteenth Street Bridge in Mason City, and 1.0 mile upstream from Willow Creek.

Drainage area.—526 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,069.59 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 10,600 cfs.

Maxima.—March–May 1965: Discharge, 9,700 cfs 2130 hours Apr. 11 (gage height, 14.27 ft).
1932 to February 1965: Discharge, 10,800 cfs Mar. 30, 1933 (gage height, 15.7 ft).

Mean discharge, in cubic feet per second, 1965, of Winnebago River at Mason City, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,920	504	882	11	218	6,220	801	21	54	1,240	440
2	1,210	992	796	12	182	5,880	662	22	53	1,120	435
3	465	1,240	729	13	152	3,640	518	23	49	1,020	535
4	440	2,560	644	14	124	2,820	468	24	49	1,000	796
5	420	4,840	1,760	15	114	2,410	477	25	49	1,110	763
6	390	7,920	1,830	16	106	2,090	792	26	53	1,300	1,360
7	360	7,340	1,570	17	92	1,890	756	27	53	1,160	1,470
8	320	7,750	1,510	18	80	1,720	634	28	54	1,110	1,230
9	290	6,690	1,260	19	66	1,550	508	29	57	1,020	1,030
10	254	5,900	1,000	20	56	1,390	435	30	63	960	976
								31	90	-------	860
Monthly mean discharge, in cubic feet per second									319	2,880	901
Runoff, in inches									0.70	6.11	1.97
Runoff, in acre-feet									19,600	171,300	55,390

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	4.96	1,230	Apr. 6	2400	13.52	8,810	Apr.10	0600	11.04	6,120
	1400	4.71	1,080						1200	10.79	5,900
	1800	5.01	1,260	7	0900	11.30	6,400		2400	10.23	5,350
	2400	5.72	1,710		1200	11.29	6,390				
					1600	11.65	6,750	11	1200	9.68	4,810
4	1200	6.43	2,190		2000	12.85	8,050		1400	9.75	4,870
	1800	7.48	2,920		2400	13.09	8,290		1600	10.75	5,860
	2000	8.35	3,680						1800	12.40	7,550
	2200	8.90	4,120	8	1000	12.01	7,160		2000	13.97	9,300
	2400	8.95	4,160		1200	12.07	7,220		2130	14.27	9,700
					2000	13.03	8,230		2400	13.73	9,040
5	1600	9.68	4,810		2400	12.88	8,080				
	2400	11.21	6,320					12	0600	11.75	6,850
				9	1100	11.14	6,210		1200	10.35	5,460
6	1000	12.86	8,060		1400	10.90	6,000		1800	9.45	4,600
	1200	12.95	8,150		2200	11.51	6,610		2400	8.97	4,180
	1500	12.82	8,020		2400	11.47	6,570				
	2100	13.70	9,000								

(259) 5–4620. Shell Rock River at Shell Rock, Iowa

Location.—Lat 42°42'50", long 92°34'55", in NW¼NE¼ sec.11, T.91 N., R.15 W., on right bank 400 ft upstream from bridge on State Highway 3 in Shell Rock, and 11 miles upstream from mouth.

Drainage area.—1,746 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 835.34 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 32,900 cfs. Backwater from ice Mar. 1–3, Apr. 1.

Maxima.—March–May 1965: Discharge, 24,400 cfs 1000 hours Apr. 7 (gage height, 15.09 ft).

1953 to February 1965: Discharge, 33,500 cfs Mar. 28, 1961 (gage height, 16.26 ft). Flood in 1856 reached a stage of 17.7 ft at bridge 400 ft downstream, from information furnished by Corps of Engineers (discharge, about 45,000 cfs).

Mean discharge, in cubic feet per second, 1965, of Shell Rock River at Shell Rock, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,950	6,000	2,200	11	835	13,100	1,650	21	390	3,490	1,160
2	13,900	8,850	1,990	12	817	13,500	1,530	22	395	3,190	1,130
3	8,000	6,380	1,870	13	790	16,000	1,380	23	372	2,880	1,080
4	2,900	6,620	1,630	14	782	9,930	1,250	24	337	2,780	1,200
5	1,410	12,200	1,530	15	726	7,880	1,240	25	321	2,880	1,490
6	1,210	19,100	2,640	16	662	6,820	1,250	26	317	3,140	2,880
7	1,240	23,400	2,860	17	897	6,050	1,470	27	309	3,230	2,780
8	1,080	19,400	2,520	18	705	5,210	1,470	28	305	2,820	2,680
9	1,010	20,800	2,380	19	504	4,540	1,280	29	309	2,640	2,340
10	926	17,100	1,970	20	396	3,870	1,240	30	329	2,400	2,140
								31	941	------	2,060
Monthly mean discharge, in cubic feet per second									1,550	8,540	1,816
Runoff, in inches									1.02	5.46	1.20
Runoff, in acre-feet									95,340	508,200	111,700

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 4	1200	11.04	6,050	Apr. 7	1400	15.04	24,000	Apr. 12	0800	12.72	12,000
	1800	11.37	7,140		2400	14.85	22,600		1200	12.89	12,400
	2400	11.91	8,990						1600	13.14	13,700
				8	1200	14.20	18,600		2400	14.05	17,800
5	0600	12.35	10,600		1800	14.05	17,800				
	1200	12.70	11,900		2400	14.15	18,400	13	0400	14.18	18,500
	1800	13.17	13,800						0800	14.07	18,000
	2400	13.76	16,400	9	1200	14.66	21,400		1200	13.79	16,500
					1800	14.76	22,000		1800	13.21	14,000
6	0600	14.10	18,100		2400	14.63	21,200		2400	12.68	12,000
	1800	14.45	20,000								
	2400	14.73	21,800	10	1200	13.82	16,700	14	0600	12.25	10,600
					2400	13.19	13,900		1200	11.96	9,710
7	0600	14.94	23,300						2400	11.59	8,570
	1000	15.09	24,400	11	2400	12.80	12,300				

(260) 5–4630. Beaver Creek at New Hartford, Iowa

Location.—Lat 42°34'20", long 92°36'55", in SE¼SE¼ sec.28, T.90 N., R.15 W., on downstream side of center bridge pier on county highway bridge, a quarter of a mile north of New Hartford, and 8 miles upstream from mouth.

Drainage area.—347 sq mi.

Gage-height record.—Water-stage recorder graph except for Mar. 10–16, 21–30. Graph was reconstructed on basis of once-daily wire weight gage readings Mar. 14–16, 21–30. Datum of gage is 881.30 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 10,600 cfs. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 9,610 cfs 1100 hours Apr. 6 (gage height, 11.80 ft).

1945 to February 1965: Discharge, 18,000 cfs June 13, 1947 (gage height, 13.5 ft, from graph based on gage readings), from rating curve extended above 7,300 cfs by logarithmic plotting.

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965, of Beaver Creek at New Hartford, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	600	600	195	11	104	935	93	21	46	202	62
2	2,000	4,100	173	12	94	811	87	22	43	186	66
3	1,000	3,500	152	13	88	531	82	23	41	174	86
4	670	3,200	137	14	84	422	79	24	39	172	172
5	370	6,000	129	15	80	396	78	25	37	236	189
6	272	8,520	124	16	78	357	78	26	36	391	1,190
7	200	4,600	117	17	72	308	75	27	36	359	3,980
8	166	2,810	112	18	64	271	71	28	35	304	1,680
9	132	2,000	111	19	57	240	65	29	35	259	797
10	114	1,080	101	20	51	219	62	30	35	220	704
								31	76	------	596
Monthly mean discharge, in cubic feet per second									218	1,447	376
Runoff, in inches									0.72	4.65	1.25
Runoff, in acre-feet									13,400	86,090	23,090

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 2	0000	9.73	------	Apr. 4	1800	9.92	------	Apr. 7	1800	9.62	3,600
	0200	10.14	------		2400	10.17	------		2400	9.43	3,300
	0400	10.58	------								
	0600	11.22	------	5	0800	10.83	------	8	1800	8.90	2,520
	0800	11.66	------		1800	11.25	------		2400	8.87	2,480
	1200	11.79	------		2400	11.38	7,740				
	1800	11.42	------					9	1200	8.53	2,050
	2400	10.92	------	6	1100	11.80	9,610		1800	8.27	1,760
					1600	11.62	9,000		2400	7.84	1,410
3	0800	10.30	------		2400	11.03	6,610				
	1600	9.88	------					10	0600	7.50	1,190
	2400	9.73	------	7	0600	10.51	5,330		1200	7.13	1,040
					1000	10.32	4,910		1800	6.83	942
4	1200	9.79	------		1200	10.10	4,450		2400	6.78	922

(261) 5–4635. Blackhawk Creek at Hudson, Iowa

Location.—Lat 42°24'30", long 92°27'45", in SW¼NE¼, sec.27, T.88 N., R.14 W., on left bank 35 ft downstream from bridge on State Highway 58, and 0.2 mile northwest of Chicago Great Western Railway tracks in the west edge of Hudson.

Drainage area.—303 sq mi.

Gage-height record.—Water-stage recorder except Mar. 3, Apr. 6–19, May 5–22, for which graph was reconstructed on basis of daily wire-weight gage readings. Datum of gage is 865.03 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 7,720 cfs. Backwater from ice Mar. 1–5, Mar. 16 to April 1.

Maxima.—March–May 1965: Discharge, 7,500 cfs 0900 hours Apr. 6 (gage height, 16.35 ft).

1952 to February 1965: Discharge, about 9,000 cfs Mar. 31, 1960 (gage height, 16.93 ft, backwater from ice).

Mean discharge, in cubic feet per second, 1965, of Blackhawk Creek at Hudson, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,080	4,000	160	11	123	458	61	21	45	82	33
2	1,700	3,090	141	12	111	366	58	22	40	84	38
3	1,140	1,700	122	13	99	241	53	23	34	79	140
4	700	2,080	110	14	101	194	51	24	32	87	283
5	415	3,650	105	15	147	182	49	25	30	185	222
6	297	5,880	96	16	154	171	47	26	29	345	309
7	222	2,040	88	17	154	139	45	27	28	290	461
8	190	654	83	18	118	135	42	28	27	244	297
9	156	549	78	19	86	121	39	29	27	215	233
10	142	330	69	20	60	99	35	30	40	184	227
								31	250	------	222
Monthly mean discharge, in cubic feet per second									251	929	129
Runoff, in inches									0.95	3.42	0.49
Runoff, in acre-feet									15,430	55,310	7,930

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 1	0000	13.41	------	Apr. 3	0800	13.00	1,590	Apr. 6	1200	16.28	7,150
	0100	14.00	------		1700	12.67	1,470		1600	15.94	5,360
	0200	14.72	------		2400	12.77	1,500		1900	15.65	4,250
	0300	15.24	------						2200	15.35	3,450
	0400	15.20	3,120	4	0500	12.87	1,540		2400	15.14	3,040
	0500	15.37	3,490		1000	13.37	1,780				
	0700	15.68	4,340		1300	14.27	2,290	7	0200	14.92	2,820
	1100	16.00	5,600		1800	14.72	2,640		0800	14.32	2,320
	1200	16.01	5,640		2400	14.63	2,560		1400	13.73	1,960
	1300	15.98	5,520						1900	12.98	1,580
	1800	15.70	4,400	5	0400	14.65	2,580		2000	12.36	1,380
	2400	15.57	4,010		0800	14.94	2,840		2200	11.48	1,100
2	0600	15.33	3,320		1200	15.22	3,160		2400	10.84	935
	1000	15.14	3,040		1500	15.49	3,780				
	1400	15.15	3,050		1900	15.79	4,760	8	0300	10.14	758
	1800	14.96	2,860		2400	16.04	6,000		0600	9.74	670
	2100	14.63	2,560						1200	9.42	611
	2400	14.24	2,270	6	0600	16.29	7,200		1800	9.31	591
					0900	16.35	7,500		2400	9.36	600
3	0400	14.18	2,240								

(262) 5–4640. Cedar River at Waterloo, Iowa

Location.—Lat 42°29'40", long 92°20'00", in NW¼NW¼ sec.25, T.89 N., R.13 W., on left bank at foot of East Seventh Street, 0.3 mile upstream from Eleventh Avenue Bridge in Waterloo, 1 mile downstream from Blackhawk Creek, and at mile 187.9 above the mouth of Iowa River (U.S. Geological Survey river profile).

Drainage area.—5,146 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 824.09 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 76,400 cfs. Backwater from ice Mar. 1.

Maxima.—March–May 1965: Discharge, 69,500 cfs 0800 hours Apr. 8 (gage height, 21.67 ft)

1940 to February 1965: Discharge, 76,700 cfs Mar. 29, 1961 (gage height, 21.86 ft). Flood of Mar. 16, 1929, reached a stage of about 20 ft, determined by Corps of Engineers, from information by city of Waterloo (discharge, 65,000 cfs). Flood of Apr. 2, 1933, reached a stage about 0.5 ft lower than Mar. 16, 1929, from information by city of Waterloo (discharge, 61,000 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	5,000	11,200	5,030	11	3,090	47,200	3,750	21	1,350	7,500	2,260
2	12,300	19,800	4,520	12	2,680	35,200	3,420	22	1,240	6,730	2,480
3	24,200	21,300	4,360	13	2,480	34,100	2,890	23	1,180	6,060	2,370
4	30,700	21,800	4,060	14	2,370	34,900	2,730	24	1,110	5,670	2,730
5	21,800	29,800	3,720	15	2,370	23,600	2,630	25	1,150	5,610	3,030
6	11,800	51,700	3,650	16	2,530	16,500	2,560	26	1,090	6,090	4,110
7	7,490	65,800	4,580	17	2,190	13,500	2,730	27	1,020	6,600	7,760
8	5,320	68,000	4,810	18	1,380	11,600	2,860	28	960	6,570	9,070
9	4,140	60,200	4,580	19	1,400	10,100	2,930	29	990	6,150	7,840
10	3,470	55,400	4,390	20	1,440	8,740	2,510	30	1,340	5,480	6,850
								31	2,780	--------	5,960
Monthly mean discharge, in cubic feet per second									5,237	23,430	4,102
Runoff, in inches									1.17	5.08	0.92
Runoff, in acre-feet									322,000	1,394,000	252,200

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Cedar River at Waterloo, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 31	0000	5.72	1,840	Apr. 4	0600	11.65	20,000	Apr. 10	2400	18.94	53,500
	0600	5.59	1,580		2400	13.07	25,100				
	1000	5.65	1,700					11	0600	18.50	50,900
	1400	5.92	2,280	5	1200	14.08	28,900		1200	17.87	47,400
	1600	6.20	2,960		1800	14.79	31,900		2400	16.55	40,200
	1800	6.51	3,810		2400	16.01	37,600				
	2000	6.85	4,840					12	1800	14.92	32,400
	2400	7.13	5,740	6	0800	18.06	48,600		2400	14.64	31,200
					1800	19.84	58,300				
Apr. 1	0600	7.89	8,170		2400	20.55	62,400	13	0300	14.63	31,100
	1200	8.36	9,670						2400	16.11	38,000
	1800	10.05	14,800	7	0600	20.92	64,800				
	2000	10.66	16,700		2400	21.48	68,300	14	0100	16.13	38,200
	2400	11.04	17,900						0600	16.01	37,600
				8	0800	21.67	69,500		1200	15.59	35,500
2	1200	11.47	19,400		1200	21.59	68,800		1800	14.97	32,700
	1600	11.73	20,300		2400	21.01	65,400		2400	14.25	29,600
	2400	12.38	22,600								
				9	1200	20.10	59,800	15	1200	12.50	23,000
3	0200	12.46	22,900		1800	19.73	57,500		2400	11.32	18,900
	0400	12.44	22,800		2400	19.53	56,500				
	1200	12.00	21,200					16	0600	10.88	17,400
	2400	11.51	19,500	10	1200	19.37	55,700		1800	10.24	15,400
					2000	19.17	54,600		2400	10.00	14,600
4	0200	11.51	19,500								

(263) 5–4641.33 Half Mile Creek near Gladbrook, Iowa

Location.—Lat 42°12'40", long 92°36'40", in SW¼SW¼ sec.33, T.86 N., R.15 W., on right bank 10 ft downstream from county highway bridge, 3/4 mile upstream from mouth, and 7 miles northeast of Gladbrook.

Drainage area.—1.33 sq mi.

Gage-height record.—Digital recorder tape punched at 5 minute intervals except Mar. 1–9. Datum of gage is 948.16 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 96.0 cfs. Discharge for period of no gage-height record estimated on basis of weather records and records for nearby stations.

Maxima.—March–May 1965: Discharge, 43.2 cfs 1825 hours Apr. 1 (gage height, 5.22 ft).

1962 to February 1965: Discharge, 126 cfs July 18, 1963 (gage height, 6.84 ft).

Mean discharge, in cubic feet per second, 1965, of Half Mile Creek near Gladbrook, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	29.0	40.8	0.34	11	0.12	2.50	0.18	21	0.12	0.18	0.10
2	16.0	21.2	.30	12	.34	1.10	.16	22	.13	.17	.37
3	9.00	11.4	.28	13	.52	.60	.15	23	.11	.18	.31
4	4.50	16.0	.29	14	1.05	.40	.15	24	.09	.60	.26
5	2.30	23.0	.35	15	1.61	.26	.20	25	.08	2.10	.27
6	1.00	27.6	.32	16	2.07	.22	.17	26	.08	.97	4.36
7	.40	11.4	.27	17	1.07	.22	.14	27	.08	.73	.85
8	.20	15.3	.27	18	.45	.20	.12	28	.08	.60	.62
9	.12	11.4	.22	19	.15	.18	.11	29	.13	.47	.71
10	.10	6.95	.19	20	.12	.18	.10	30	8.15	.40	.66
								31	29.2	------	.56
Monthly mean discharge, in cubic feet per second									3.50	6.58	0.432
Runoff, in inches									3.03	5.52	0.37
Runoff, in acre-feet									215	391	27

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 30	0000	3.45	0.30	Mar. 31	1200	4.72	23.3	Apr. 2	1600	4.52	16.3
	0200	4.15	3.85		1400	4.81	26.8		1800	4.50	15.6
	0400	4.21	4.95		1800	5.10	38.4		2200	4.48	15.0
	0800	4.10	3.00		2400	5.17	41.2		2400	4.46	14.3
	1000	3.92	1.52								
	1200	3.78	.95	Apr. 1	0600	5.19	42.0	3	0200	4.44	13.6
	1400	3.86	1.24		1000	5.13	39.6		0600	4.37	11.4
	1600	4.51	13.9		1200	5.12	39.2		1000	4.30	9.12
	2000	4.62	17.7		1825	5.22	43.2		1200	4.27	8.16
	2400	4.67	19.4		2400	5.03	35.6		1400	4.28	8.48
									1800	4.39	12.0
31	0200	4.69	22.2	2	0800	4.72	23.3		2000	4.43	13.3
	0600	4.71	23.0		1200	4.60	19.1		2400	4.45	13.9

(264) 5–4641.37 Four Mile Creek near Traer, Iowa

Location.—Lat 42°12'05", long 92°33'45", near center of sec.2, T.85 N., R.15 W., on left bank 10 ft downstream from county highway bridge, 2 miles upstream from mouth, and 5 miles west of Traer.

Drainage area.—19.51 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 2–10, Apr. 1, Apr. 7 to May 4. Datum of gage is 905.87 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 600 cfs. Backwater from ice Mar. 2 to Apr. 4.

Maxima.—March–May 1965: Discharge, 600 cfs 1600 hours Mar. 1 (gage height, 11.91 ft); gage height, 12.30 ft 1930 hours Mar. 31 (backwater from ice).
1962 to February 1965: Discharge, 287 cfs July 18, 1963 (gage height, 11.24 ft).

Mean discharge, in cubic feet per second, 1965, of Four Mile Creek near Traer, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	472	280	4.8	11	0.7	14	2.8	21	0.9	3.1	1.7
2	250	150	4.5	12	1.1	7.0	2.6	22	.7	3.1	3.6
3	140	180	4.1	13	3.0	5.6	2.5	23	.6	3.4	5.2
4	66	230	4.5	14	8.0	5.4	2.4	24	.5	6.0	4.4
5	40	473	5.5	15	22	5.6	2.7	25	.5	16	5.1
6	14	179	4.8	16	24	4.5	2.4	26	.4	15	40
7	5.0	20	4.1	17	10	4.0	2.2	27	.5	11	16
8	1.7	32	3.9	18	6.0	3.5	1.9	28	.7	8.0	10
9	1.0	11	3.4	19	2.7	3.5	1.8	29	1.5	6.6	9.6
10	.8	13	2.9	20	1.5	3.2	1.7	30	50	5.4	9.6
								31	200	------	8.4
Monthly mean discharge, in cubic feet per second									42.8	56.7	5.78
Runoff, in inches									2.53	3.24	0.34
Runoff, in acre-feet									2,630	3,330	355

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	11.47	416	Mar.30	1100	9.18	------	Mar.31	1300	11.10	-----
	0400	11.16	343		1200	9.14	------		1400	11.63	-----
	0700	10.99	318		1300	9.48	------		1500	11.70	-----
	0800	11.00	319		1500	10.00	------		1700	12.00	-----
	0900	11.54	439		1600	10.94	------		1800	12.21	-----
	1000	11.78	536		1700	11.54	------		1900	12.29	-----
	1200	11.86	575		1800	11.65	------		1930	12.30	-----
	1400	11.88	585		1900	11.66	------		2000	12.25	-----
	1600	11.91	600		2200	11.61	------		2400	12.17	-----
	1800	11.85	570		2400	11.55	------				
	2000	11.76	527					Apr. 1	0400	12.05	-----
	2400	11.52	432	31	0400	11.23	------		0800	11.89	-----
					0700	11.00	------		1200	11.63	-----
29	2400	8.26	-----		0800	10.99	------		1400	11.60	-----
					1100	10.70	------		2000	11.74	-----
30	0400	8.72	-----		1200	10.70	------		2400	11.72	-----
	0800	9.00	-----								

(265) 5–4645. Cedar River at Cedar Rapids, Iowa

Location.—Lat 41°58'20", long 91°40'05", in SE¼NW¼ sec.28, T.83 N., R.7 W., on right bank 500 ft upstream from Eighth Avenue Bridge in Cedar Rapids, 2.7 miles upstream from Prairie Creek, and at mile 112.7 above mouth of Iowa River.

Drainage area.—6,510 sq mi.

Gage-height record.—Water-stage recorder graph, except Apr. 12, 13 and May 26. Datum of gage is 700.47 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 72,000 cfs. Backwater from ice Mar. 2–6, 19–31.

Maxima.—March–May 1965: Discharge, 66,800 cfs 1730 hours Apr. 10 (gage height, 18.51 ft).

1902 to February 1965: Discharge, 73,000 cfs Mar. 31, 1961; gage height, 20.0 ft Mar. 18, 1929.

Flood in June 1851 reached a stage of about 20 ft (discharge, 65,000 cfs. estimated).

Mean discharge, in cubic feet per second, 1965, of Cedar River at Cedar Rapids, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,440	9,240	7,080	11	7,480	62,100	4,890	21	1,700	10,900	3,130
2	7,000	11,600	6,280	12	5,620	55,000	4,500	22	1,900	9,520	3,060
3	7,500	14,300	5,380	13	5,620	45,000	4,050	23	1,800	8,400	3,100
4	8,000	20,000	5,240	14	5,040	36,400	3,680	24	1,700	7,880	3,180
5	10,000	23,300	5,070	15	5,730	32,400	3,580	25	1,900	7,880	3,180
6	24,000	28,500	4,650	16	6,200	33,000	3,360	26	2,100	7,600	4,000
7	27,200	35,100	4,350	17	6,080	25,600	3,230	27	2,200	7,440	5,340
8	19,800	49,100	4,710	18	5,180	18,300	3,160	28	2,000	7,680	6,800
9	14,800	61,200	5,280	19	1,700	14,600	3,260	29	2,200	7,800	8,440
10	10,500	66,100	5,070	20	1,500	12,500	3,330	30	4,000	7,600	9,040
								31	6,700	--------	8,560
Monthly mean discharge, in cubic feet per second									6,825	24,530	4,774
Runoff, in inches									1.21	4.20	0.85
Runoff, in acre-feet									419,700	1,460,000	293,500

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	9.67	25,600	Apr. 7	2400	13.22	41,100	Apr. 9	1200	17.53	61,500
	0600	10.10	27,400						1800	17.93	63,600
	1200	10.43	28,800	8	0600	14.22	45,600		2400	18.14	64,800
	1800	10.63	29,700		1200	15.00	49,100				
	2400	10.88	30,800		1800	15.88	53,100	10	0600	18.33	65,800
					2400	16.57	56,400		1200	18.44	66,400
7	0600	11.30	32,600						1730	18.51	66,800
	1200	11.68	34,300	9	0600	17.08	59,000		2400	18.33	65,800
	1800	12.38	37,400								

(266) Cedar River near Rochester, Iowa

(Miscellaneous site)

Location.—SE¼ sec.13, T.79 N., R.3 W., at Interstate Highway I-80 bridge, 1.5 miles south of Rochester.

Drainage area.—7,245 sq mi.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 67,200 cfs Apr. 11 (elevation 651.86 ft above mean sea level).

1961 to March 1965: Discharge 71,700 cfs Apr. 1, 1961 (elevation, 652.08 ft above mean sea level).

(267) 5-4650. Cedar River near Conesville, Iowa

Location.—Lat 41°24'30", long 91°17'15", in SW¼SW¼ sec.2, T.76 N., R.4 W., on right bank 10 ft downstream from highway bridge, 3.4 miles northeast of Conesville, 5.2 miles downstream from Wapsinonoc Creek, 10.7 miles upstream from mouth, and at mile 39.8 upstream from mouth of Iowa River. (U.S. Geological Survey river profile).

Drainage area.—7,785 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 3–5, 21–28. Wire-weight gage readings were available. Datum of gage is 581.95 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 70,000 cfs. Backwater from ice Mar. 1–7, 14–29.

Maxima.—March–May 1965: Discharge, 68,100 cfs 2100 hours Apr. 12 (gage height, 16.85 ft).

1939 to February 1965: Discharge, 70,800 cfs Apr. 2, 1961 (gage height, 16.62 ft). Flood in March 1929 reached a stage of 15.8 ft, from information by local residents to Corps of Engineers.

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,300	9,840	10,000	11	18,700	58,900	6,820	21	2,600	18,000	4,180
2	4,000	11,200	9,200	12	11,100	66,700	6,460	22	2,550	15,400	4,150
3	4,200	12,500	8,320	13	8,080	65,400	6,100	23	2,600	13,200	5,430
4	4,500	13,700	7,610	14	8,790	57,200	5,590	24	2,800	17,600	6,370
5	4,700	16,400	7,450	15	8,500	48,700	5,160	25	2,900	16,500	4,700
6	8,400	22,200	7,050	16	9,400	39,300	4,940	26	2,800	13,500	4,480
7	13,600	28,900	6,620	17	11,200	34,500	4,750	27	2,700	12,000	6,350
8	26,100	30,800	6,310	18	11,200	32,800	4,430	28	2,700	11,400	7,310
9	34,000	35,200	6,940	19	5,600	27,600	4,250	29	3,500	10,900	7,510
10	27,000	46,400	7,240	20	3,300	21,700	4,170	30	7,600	10,500	8,700
								31	8,080	-------	9,920
Monthly mean discharge, in cubic feet per second									8,597	27,300	6,404
Runoff, in inches									1.27	3.91	0.95
Runoff, in acre-feet									528,600	1,624,000	393,700

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0000	14.87	39,400	Apr. 11	1600	16.24	58,100	Apr. 12	2400	16.84	67,900
	1200	15.38	45,900		2400	16.58	63,500				
	2400	15.98	54,200					13	0600	16.78	66,900
				12	0600	16.72	65,800		1200	16.73	66,000
11	0900	16.36	60,000		1200	16.80	67,200		1800	16.62	64,100
	1000	16.38	60,300		1800	16.84	67,900		2400	16.47	61,700
	1400	16.24	58,100		2100	16.85	68,100				

(268) 5–4655. Iowa River at Wapello, Iowa

Location.—Lat 41°10'40", long 91°10'55", in NW¼SE¼ sec.27, T.74 N., R.3 W., on right bank 30 ft downstream from bridge on State Highway 99 at east edge of Wapello, 13.0 miles downstream from Cedar River, and at mile 16.0 (revised).

Drainage area.—12,499 sq mi.

Gage-height record.—Water-stage recorder graph, except May 6–9, for which graph was reconstructed on basis of daily wire-weight gage readings. Datum of gage is 548.98 ft above mean sea level, adjustment of 1912.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 70,000 cfs. Backwater from ice March 1–31. Backwater from Mississippi River April 29 to May 9.

Maxima.—March–May 1965: Discharge, 70,800 cfs 0900 hours Apr. 13 (gage height, 17.25 ft).
1914 to February 1965: Discharge, 94,000 cfs June 18, 1947 (gage height, 16.14 ft); gage height, 17.02 ft Apr. 5, 1960, before levee broke downstream from gage.

Remarks.—High flows regulated by Coralville Flood Control Reservoir (capacity 489,000 acre-ft) since Sept. 17, 1958.

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	5,600	16,900	11,300	11	27,000	63,700	13,200	21	8,000	32,700	9,840
2	5,400	19,000	10,400	12	18,000	68,200	12,600	22	6,500	27,700	9,910
3	8,000	19,000	9,400	13	15,000	70,300	12,100	23	5,800	24,200	10,100
4	11,000	20,200	8,530	14	14,000	67,300	11,600	24	5,200	24,800	14,100
5	14,000	22,600	8,150	15	14,000	63,400	11,200	25	4,800	35,000	10,400
6	13,000	28,200	8,790	16	15,000	58,300	10,900	26	4,500	37,200	10,700
7	12,000	36,000	10,500	17	19,000	50,500	11,100	27	4,300	30,900	11,800
8	11,000	45,100	11,100	18	20,000	46,600	10,500	28	4,100	21,400	15,200
9	17,000	47,400	13,800	19	15,000	44,800	10,100	29	6,000	15,000	14,000
10	33,000	51,100	14,000	20	10,000	39,000	9,860	30	11,000	12,700	14,200
								31	15,000	--------	15,400
Monthly mean discharge, in cubic feet per second									12,010	37,970	11,440
Runoff, in inches									1.11	3.39	1.06
Runoff, in acre-feet									738,200	2,260,000	703,700

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 11	0000	15.18	56,700	Apr. 12	1500	16.95	68,600	Apr. 14	1200	16.77	67,400
	0600	15.72	60,100		1800	17.05	69,400		1800	16.57	65,900
	1200	16.26	63,800		2400	17.16	70,100		2400	16.46	65,200
	1800	16.87	68,100								
	2100	17.00	69,000	13	0900	17.25	70,800	15	0600	16.28	64,000
	2400	16.87	68,100		1800	17.17	70,200		1200	16.18	63,300
					2400	17.08	69,600		1800	16.09	62,600
12	0600	16.65	66,600						2400	15.96	61,900
	0900	16.68	66,800	14	0600	16.95	68,600				

EDWARDS RIVER BASIN

(269) 5–4665. Edwards River near New Boston, Ill.

Location.—Lat 41°11'15", long 90°58'05", at quarter corner between secs.21 and 28, T.14 N., R.5 W., on left bank at downstream side of bridge on State Highway 17, 1.5 miles northeast of New Boston and 5 miles upstream from mouth.

Drainage area.—434 sq mi.

Gage-height record.—Digital recorder tape punched at 15-minute intervals. Prior to Apr. 7, 1965, water-stage recorder graph. No gage-height record Apr. 1, 2, May 9, 13–31. Datum of gage is 529.92 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge for periods of no gage-height record computed from records for nearby stations. Mean daily discharge computed from 96 punch-tape recordings per day beginning Apr. 7, 1965.

Maxima.—April–May 1965: Discharge, 6,450 cfs 1030 hours Apr. 26 (gage height, 20.51 ft).
1934 to March 1965: Discharge, 7,280 cfs Apr. 26, 1950, May 12, 1951; gage height, 21.46 ft Oct. 13, 1954.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	600	941	11	709	528	21	357	130
2	450	821	12	804	398	22	348	250
3	345	724	13	542	300	23	347	210
4	323	674	14	432	260	24	407	180
5	302	681	15	483	230	25	607	150
6	342	566	16	582	210	26	5,930	250
7	767	511	17	644	190	27	4,430	400
8	2,740	781	18	625	170	28	2,860	300
9	1,320	1,200	19	472	150	29	1,620	200
10	783	758	20	380	140	30	1,170	160
						31	--------	140
Monthly mean discharge, in cubic feet per second							1,057	407
Runoff, in inches							2.72	1.08

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	13.57	348	Apr. 27	0800	20.13	4,720	Apr. 30	1200	17.18	1,160
	0800	13.81	382		2400	19.82	3,660		2400	16.75	1,020
	1600	14.16	434								
	2400	14.38	467	28	1200	19.51	2,920	May 1	1200	16.47	941
					2000	19.10	2,300		2400	16.21	868
25	2000	14.58	497		2400	18.78	2,020				
	2200	14.93	566					2	1200	16.03	822
	2400	20.11	4,640	29	0600	18.42	1,760		2400	15.83	772
					1200	18.12	1,580				
26	0600	20.46	6,200		1800	17.89	1,460	3	2400	15.43	672
	1030	20.51	6,450		2400	17.69	1,370				
	1600	20.44	6,100								
	2400	20.31	5,450								

POPE CREEK BASIN

(270) 5–4670. Pope Creek near Keithsburg, Ill.

Location.—Lat 41°07'45", long 90°55'10", in SE¼ sec.11, T.13 N., R.5 W., near center of span on downstream side of highway bridge, 2 miles northeast of Keithsburg and 3.3 miles upstream from mouth.

Drainage area.—171 sq mi.

Gage-height record.—Graph based on twice-daily readings of wire-weight gage, except May 10, 11. Datum of gage is 524.07 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge for period of backwater from Mississippi River Apr. 26 to May 7, estimated on basis of one discharge measurement and records for nearby stations. Discharge for period of no gage-height record estimated on basis of records for nearby stations.

Maxima.—April–May 1965: Discharge, 2,290 cfs 1300 hours Apr. 25 (gage height, 25.28 ft).
1934 to March 1965: Discharge, 4,230 cfs Mar. 12, 1939 (gage height, 26.24 ft); gage height observed, 28.0 ft Feb. 21, 1937 (backwater from ice).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	108	190	11	426	150	21	102	54
2	73	160	12	285	135	22	94	49
3	57	140	13	181	120	23	92	65
4	53	120	14	148	106	24	1,070	48
5	105	140	15	420	97	25	1,980	47
6	1,110	120	16	317	90	26	1,000	57
7	848	105	17	225	81	27	550	68
8	352	338	18	172	73	28	400	73
9	338	249	19	134	64	29	300	50
10	232	180	20	114	57	30	240	41
						31	--------	41
Monthly mean discharge, in cubic feet per second							384	107
Runoff, in inches							2.51	0.72

HENDERSON CREEK BASIN

(271) 5–4690. Henderson Creek near Oquawka, Ill.

Location.—Lat 41°00'05", long 90°51'15", in NE¼SW¼ sec.28, T.12 N., R.4 W., on left bank at downstream side of bridge on State Highway 94, 1 mile south of Bald Bluff, 6.5 miles northeast of Oquawka, and 22 miles upstream from mouth.

Drainage area.—428 sq mi.

Gage-height record.—Digital recorder tape punched at 15-minute intervals. Prior to Apr. 27, 1965, water-stage recorder graph. Datum of gage is 541.67 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Mean daily discharge computed from 96 punched-tape recordings per day beginning Apr. 27, 1965.

Maxima.—April–May 1965: Discharge, 4,280 cfs 0500 hours Apr. 26 (gage height, 24.84 ft).
1934 to March 1965: Discharge, 16,500 cfs Apr. 25, 1950 (gage height, 28.17 ft).

Mean discharge, in cubic feet per second, 1965, of Henderson Creek near Oquawka, Ill.

Day	April	May	Day	April	May	Day	April	May
1	364	635	11	1,660	569	21	378	191
2	288	536	12	1,510	474	22	330	356
3	221	460	13	798	409	23	308	317
4	215	637	14	620	361	24	962	206
5	526	1,950	15	984	322	25	2,970	222
6	2,500	1,180	16	966	296	26	3,760	540
7	2,140	620	17	721	267	27	2,030	582
8	1,130	832	18	581	241	28	1,180	324
9	1,540	1,610	19	481	223	29	915	226
10	990	933	20	420	202	30	747	212
						31	--------	199
Monthly mean discharge, in cubic feet per second							1,074	520
Runoff, in inches							2.80	1.40

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 24	0000	15.83	302	Apr. 26	0300	24.83	4,260	Apr. 29	0800	19.74	953
	0400	15.85	305		0500	24.84	4,280		1600	19.30	874
	0600	16.10	340		0800	24.79	4,180		2400	18.99	818
	0900	16.82	449		1200	24.65	3,900				
	1000	17.18	507		2000	24.25	3,130	30	0800	18.70	766
	1400	20.98	1,200		2400	24.10	2,870		1600	18.46	724
	1500	21.53	1,330						2400	18.25	688
	1600	21.89	1,440	27	0800	23.89	2,580				
	1700	22.15	1,520		1200	23.20	1,960	May 1	1200	17.93	634
	2000	22.67	1,730		1800	22.54	1,680		2400	17.64	585
	2400	22.97	1,850		2400	21.81	1,410				
								2	1200	17.36	537
25	0200	23.07	1,900	28	0600	21.18	1,240		2400	17.10	494
	0800	23.73	2,390		1200	20.80	1,160				
	1800	24.56	3,720		1800	20.53	1,110	3	1200	16.89	460
	2000	24.67	3,940		2400	20.18	1,040		2400	16.70	430
	2200	24.75	4,100								
	2400	24.80	4,200								

MISSISSIPPI RIVER MAIN STEM

(272) Mississippi River at Burlington, Iowa

(Miscellaneous site)

Location.—Lat 40°48'10", long 91°05'30", on pivot pier of Chicago Burlington and Quincy Railroad bridge at Burlington, and at mile 403.1 upstream from Ohio River.

Drainage area.—114,000 sq mi, approximately.

Gage-height record.—Peak stages only from staff gage readings. Datum of gage is 511.45 ft above mean sea level, adjustment of 1912.

Maxima.—March–May 1965: Gage height, 21.0 ft Apr. 30, May 1.
1851 to February 1965: Gage height, 18.9 ft in June 1851.

Remarks.—Stage records furnished by Corps of Engineers.

Annual maximum gage heights, for indicated years, of Mississippi River at Burlington, Iowa

Year	Date	Gage height (feet)	Year	Date	Gage height (feet)
1851	June	18.9	1919	May 8	13.79
1869	Oct. 12, 13	11.8	1920	Apr. 11	14.79
1870	Apr. 26–28	15.0	1921	May 13	9.42
1871	May 21	12.1	1922	Apr. 24, 25	15.42
1872	June 7, 8	9.6	1923	Apr. 10	11.18
1873	June 18–20	11.2	1924	Aug. 25	12.16
1874	Mar. 27	7.7	1925	June 23	9.4
1879	July 15	7.07	1926	Oct. 6–9	11.53
1880	June 28	15.8	1927	Apr. 3	12.88
1881	Oct. 31	16.53	1928	Dec. 28	14.09
1882	Apr. 25	13.3	1929	Mar. 23	15.82
1883	May 5	11.8	1930	June 18	11.8
1884	Mar. 30, 31	13.8	1931	Dec. 3	9.5
1885	May 10	9.78	1932	Mar. 9	11.4
1886	May 7	12.0	1933	Apr. 10	12.4
1887	Feb. 14	9.78	1934	Dec. 12	11.5
1888	May 18, 19	17.55	1935	Apr. 11	11.7
1889	May 24, 25	6.00	1936	Apr. 10	12.6
1890	June 30	11.62	1937	Mar. 10–12	13.8
1891	May 5, 6	9.70	1938	Sept. 25, 26	15.0
1892	June 8–30	17.5	1939	Apr. 11, 12	13.1
1893	May 16	12.47	1940	Apr. 19, 20	9.3
1894	June 3, 4	10.4	1941	Apr. 27, 28	13.0
1895	Mar. 2, 3	5.3	1942	June 16, 17	15.5
1896	June 3	10.25	1943	Apr. 18, 19	14.1
1897	Apr. 27–29	13.2	1944	May 27	17.1
1898	Mar. 15	6.8	1945	Apr. 1, 2	15.4
1899	June 28–30	10.3	1946	Jan. 11	17.1
1900	Oct. 23, 24	9.0	1947	June 20, 21	17.0
1901	Mar. 24	9.4	1948	Mar. 23	16.4
1902	July 21	10.8	1949	Mar. 12	12.2
1903	June 5, 6	14.9	1950	Apr. 26	13.8
1904	Mar. 29	10.8	1951	Apr. 29	18.1
1905	June 25	12.2	1952	Apr. 28	17.85
1906	Apr. 24–26	12.3	1953	Apr. 3–6	12.3
1907	Apr. 15, 16	11.4	1954	May 16–18	14.8
1908	June 9	11.25	1955	Apr. 27	13.2
1909	May 5, 6	11.7	1956	Apr. 21	12.2
1910	Mar. 22	8.35	1957	July 15	11.1
1911	Feb. 20	10.2	1958	June 13	9.8
1912	Apr. 5, 6	13.35	1959	Apr. 5, 6	14.5
1913	Mar. 29, 30	11.7	1960	Apr. 4	18.7
1914	June 23	9.32	1961	Apr. 5	16.3
1915	June 7, 8	10.4	1962	Apr. 7	16.7
1916	May 9	14.2	1963	Mar. 22	12.1
1917	June 17	11.62	1964	May 21–23	10.4
1918	June 12	12.95	1965	Apr. 30, May 1	21.0

SKUNK RIVER BASIN

(273) 5–4700. South Skunk River near Ames, Iowa

Location.—Lat 42°04'05", long 93°37'05", in NW¼SW¼ sec.23, T.84 N., R.24 W., on left bank 2.5 miles north of Ames, 3.5 miles downstream from Keigley Branch, 5.2 miles upstream from Squaw Creek, and at mile 228.1.

Drainage area.—315 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 1 to Apr. 5. Graph reconstructed from daily wire-weight gage readings Mar. 30, Apr. 1. Datum of gage is 893.61 ft above sea level, datum of 1929 (Iowa Highway Commission bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 8,630 cfs. Discharge Apr. 2–5 estimated on basis of weather records and records from nearby stations. Backwater from ice Mar. 1–31, Apr. 7–9.

Maxima.—March–May 1965: Discharge, 5,260 cfs 0530 hours Apr. 6 (gage height, 9.43 ft).
1920–27, 1932 to February 1965: Discharge, 8,630 cfs June 10, 1954; gage height, 13.90 ft May 20, 1944.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	500	3,090	152	11	51	1,390	77	21	74	150	35
2	1,200	2,600	130	12	54	1,040	68	22	58	125	60
3	400	2,100	111	13	65	773	60	23	47	115	284
4	180	2,400	100	14	90	630	55	24	37	182	216
5	120	3,400	91	15	140	540	53	25	34	309	214
6	100	5,150	83	16	210	412	50	26	32	469	1,860
7	82	3,400	77	17	500	323	49	27	30	345	2,270
8	72	2,500	96	18	200	257	46	28	28	276	1,060
9	63	2,000	118	19	124	209	39	29	26	219	681
10	57	1,480	91	20	92	177	34	30	110	180	596
								31	200	------	468
Monthly mean discharge, in cubic feet per second									193	1,208	301
Runoff, in inches									0.71	4.28	1.10
Runoff, in acre-feet									11,850	71,880	18,490

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	9.17	5,020	Apr. 6	1800	9.35	5,190	Apr. 7	0600	8.00	3,940
	0200	9.34	5,180		2000	9.28	5,120		1200	7.12	3,190
	0530	9.43	5,260		2400	8.88	4,740		2400	6.68	-----
	1200	9.34	5,180								

(274) 5–4710. South Skunk River below Squaw Creek near Ames Iowa

Location.—Lat 42°00'30", long 93°35'40", in NE¼NW¼ sec.13, T.83 N., R.24 W., on right bank 15 ft downstream from county highway bridge, a quarter of a mile downstream from Squaw Creek, a quarter of a mile upstream from bridge on U.S. Highway 30, 2 miles southeast of Ames, and at mile 222.6.

Drainage area.—556 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 3, 28, 29. Datum of gage is 867.10 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 8,460 cfs, extended to 9,260 cfs by logarithmic plotting. Backwater from ice Mar. 1, 4–15, 19–30.

Maxima.—March–May 1965: Discharge, 7,340 cfs 0400 hours Apr. 6 (gage height, 12.59 ft).
1952 to February 1965: Discharge, 9,260 cfs Mar. 30, 1960 (gage height, 13.20 ft)
Flood of May 19, 1944, reached a stage of 13 ft, from floodmarks (discharge, about 10,000 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	5,000	5,910	338	11	114	2,170	121	21	160	236	49
2	2,690	4,480	276	12	120	1,610	110	22	138	201	82
3	800	3,540	231	13	150	1,180	98	23	120	196	328
4	280	4,530	201	14	200	939	87	24	110	477	306
5	240	6,080	192	15	370	815	83	25	100	891	295
6	210	7,020	173	16	610	651	72	26	94	1,050	3,120
7	180	5,450	158	17	1,010	518	70	27	92	758	3,420
8	160	4,330	161	18	476	406	62	28	90	592	1,640
9	146	3,260	182	19	240	335	50	29	90	470	1,120
10	128	2,340	149	20	190	276	44	30	500	393	970
								31	2,460	------	790
Monthly mean discharge, in cubic feet per second									557	2,037	483
Runoff, in inches									1.16	4.09	1.00
Runoff, in acre-feet									34,250	121,200	29,710

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 31	0000	5.00	1,540	Apr. 2	1600	8.40	3,750	Apr. 6	0400	12.59	7,340
	0600	4.12	1,100		2400	7.81	3,320		1200	12.37	7,030
	0800	3.86	982						2400	12.05	6,620
	1200	4.37	1,210	3	0800	7.18	2,880				
	1400	5.11	1,600		1200	7.60	3,170	7	0400	11.65	6,280
	1500	5.85	2,010		1800	8.89	4,120		1400	10.13	5,080
	1700	7.55	3,140		2400	9.51	4,610		2400	9.43	4,540
	1800	8.50	3,820								
	1900	9.65	4,740	4	0400	9.63	4,720	8	0400	9.08	4,260
	2400	11.27	6,080		1400	9.00	4,200		0600	9.24	4,390
Apr. 1	0600	11.81	6,340		2000	9.67	4,750		1200	9.37	4,500
	0700	11.82	6,350		2400	9.49	4,590		1800	9.07	4,260
	1800	10.88	5,390						2400	8.69	3,970
	2400	11.06	5,860	5	0200	9.43	4,540				
					0800	10.94	5,840	9	1200	7.80	3,310
	0400	10.76	5,660		1200	11.61	6,340		2400	6.58	2,470
	0800	9.91	4,970		2400	12.50	7,200				

(275) 5–4712. Indian Creek near Mingo, Iowa

Location.—Lat 41°48'20", long 93°18'25", in NW¼NW¼ sec.28, T.81 N., R.21 W., on right bank 30 ft downstream from bridge on State Highway 117, 0.7 mile downstream from Wolf Creek, 2.2 miles upstream from Byers Branch, and 3-3/4 miles northwest of Mingo.

Drainage area.—276 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 2–10, 18, 19, May 8–25, 29–31. Daily wire-weight readings are available for most of these periods.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 5,100 cfs. Backwater from ice Mar. 1–9, 17–27.

Maxima.—March–May 1965: Discharge, 4,610 cfs 0230 hours Apr. 6 (gage height, 14.32 ft).
1958 to February 1965: Discharge, 5,860 cfs May 7, 1960 (gage height, 15.07 ft). Flood of May 20, 1944, reached a stage of 21.4 ft, from information by local residents (discharge not determined).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,400	3,380	197	11	59	580	100	21	110	86	58
2	500	2,260	178	12	53	416	92	22	90	74	87
3	130	1,000	146	13	71	320	87	23	80	95	132
4	120	1,360	134	14	146	285	77	24	70	789	214
5	140	3,030	132	15	383	234	74	25	65	851	240
6	125	4,080	121	16	551	189	71	26	60	712	407
7	130	1,160	115	17	2,330	163	68	27	70	454	503
8	100	990	118	18	500	133	63	28	194	352	287
9	110	752	115	19	200	110	58	29	330	283	222
10	92	562	104	20	150	99	57	30	793	232	216
								31	1,850	------	216
Monthly mean discharge, in cubic feet per second									354	834	151
Runoff, in inches									1.48	3.37	0.63
Runoff, in acre-feet									21,760	49,650	9,300

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Indian Creek near Mingo, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 31	0000	11.33	1,690	Apr. 2	1000	12.70	2,520	Apr. 5	0400	9.89	1,170
	0700	10.58	1,410		1200	12.00	2,020		0500	10.75	1,470
	0830	10.33	1,330		1400	11.30	1,680		0600	12.00	2,020
	1130	10.37	1,340		1800	10.30	1,320		0700	12.50	2,360
	1230	10.44	1,360		2200	9.51	1,050		1200	13.37	3,240
	1300	10.51	1,380		2400	9.18	954		1500	13.77	3,780
	1400	11.05	1,580						1900	14.13	4,310
	1500	11.60	1,820	3	0200	8.95	885		2200	14.22	4,450
	1600	12.00	2,020		0600	8.65	795		2400	14.24	4,480
	1700	12.30	2,210		0930	8.51	758				
	2200	12.98	2,780		1100	8.54	765	6	0230	14.32	4,610
	2400	13.12	2,940		1200	8.72	816		0700	14.30	4,580
					1500	9.50	1,050		1600	13.97	4,060
Apr. 1	0600	13.31	3,170		1700	9.90	1,180		2000	13.58	3,510
	1200	13.41	3,290		2400	10.67	1,440		2400	12.60	2,440
	1500	13.54	3,460	4	0100	10.71	1,460				
	1800	13.68	3,650		0600	10.53	1,390	7	0100	12.05	2,050
	2100	13.80	3,870		1000	10.56	1,400		0400	10.80	1,490
	2400	13.78	3,790		1600	10.24	1,290		0600	10.29	1,310
					1900	10.25	1,300		1000	9.65	1,100
2	0130	13.74	3,740		2100	10.42	1,360		1400	9.20	960
	0400	13.58	3,510		2400	10.12	1,250		2100	8.66	798
	0700	13.27	3,120						2400	8.48	750
	0900	12.95	2,750	5	0300	9.80	1,140				

(276) 5–4715. South Skunk River near Oskaloosa, Iowa

Location.—Lat 41°21'15", long 92°39'30", in NW¼SW¼ sec.25, T.76 N., R.16 W., or right bank 300 ft upstream from bridge on U.S. Highway 63 and 4 miles north of Oskaloosa, and 147.3 miles upstream from mouth.

Drainage area.—1,635 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 19–27, Apr. 1–5. Daily wire-weight gage readings used Mar. 20 and Apr. 1–5. Datum of gage is 685.50 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 18,000 cfs and on basis of velocity-area study at 37,000 cfs. Backwater from ice Mar. 1 to Apr. 2.

Maxima.—March–May 1965: Discharge, 11,200 cfs 0500 hours Apr. 9 (gage height, 19.87 ft).

1945 to February 1965: Discharge, 20,000 cfs June 15, 1947 (gage height, 21.26 ft from floodmarks).

Flood in May 1944 reached a stage of 25.8 ft, from floodmarks (discharge, 37,000 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,000	2,700	1,570	11	570	9,360	730	21	3,500	1,110	372
2	1,600	3,500	1,340	12	550	7,690	674	22	2,700	998	362
3	2,300	6,180	1,170	13	580	5,520	626	23	2,000	910	502
4	2,600	7,390	1,100	14	700	4,000	582	24	1,500	2,050	498
5	2,100	8,560	1,130	15	1,000	3,230	562	25	1,100	4,700	618
6	1,600	10,300	958	16	2,200	2,620	562	26	900	4,470	958
7	1,200	11,100	882	17	4,000	2,180	502	27	800	3,520	2,710
8	1,000	11,100	826	18	5,000	1,840	466	28	1,300	2,820	3,620
9	800	11,100	902	19	4,800	1,540	426	29	2,000	2,230	2,500
10	650	10,400	806	20	4,100	1,290	398	30	2,500	1,860	1,960
								31	2,000	------	1,720
Monthly mean discharge, in cubic feet per second									1,892	4,876	1,033
Runoff, in inches									1.33	3.33	0.73
Runoff, in acre-feet									116,300	290,100	63,530

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	17.52	7,530	Apr. 6	2400	19.74	11,000	Apr. 8	2400	19.85	11,200
	0600	17.73	7,820	7	0600	19.83	11,200				
	1200	18.18	8,470		1200	19.80	11,100	9	0500	19.87	11,200
	1800	18.73	9,320		1800	19.78	11,100		1200	19.82	11,100
	2400	19.00	9,750		2400	19.68	10,900		2400	19.62	10,800
6	1200	19.35	10,300	8	1200	19.79	11,100				

(277) 5–4725. North Skunk River near Sigourney, Iowa

Location.—Lat 41°18'05", long 92°12'10", in NE¼SE¼ sec.14, T.75 N., R.12 W., on right bank 20 ft downstream from bridge on State Highway 149, 2½ miles south of Sigourney, and 16.2 miles upstream from mouth.

Drainage area.—730 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 19 to Apr. 4. Datum of gage is 651.53 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 19,500 cfs and by indirect measurement at 27,500 cfs. Backwater from ice Mar. 1–31.

Maxima.—March–May 1965: Discharge, 4,620 cfs 1430, hours April 8; (gage height, 17.55 ft); gage height, 18.14 ft 2000 hours Mar. 17, (backwater from ice).
1945 to February 1965: Discharge, 27,500 cfs Mar. 31, 1960 (gage height, 25.33 ft). Flood in May 1944 reached a stage of 22.8 ft, from floodmark (discharge, 14,500 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	800	1,100	781	11	270	1,650	327	21	1,500	222	156
2	1,200	900	652	12	250	1,370	273	22	1,200	202	146
3	1,300	900	544	13	300	752	248	23	900	188	142
4	800	1,200	470	14	500	561	231	24	700	557	301
5	500	1,950	448	15	1,000	664	234	25	550	2,640	271
6	400	3,230	512	16	2,300	460	342	26	460	3,100	234
7	450	2,940	440	17	3,000	382	257	27	410	4,080	455
8	500	4,290	384	18	2,700	320	219	28	370	3,400	838
9	400	2,650	353	19	2,300	279	192	29	700	1,460	410
10	330	1,100	372	20	1,800	245	170	30	1,500	975	322
								31	1,300	------	311
Monthly mean discharge, in cubic feet per second									990	1,459	356
Runoff, in inches									1.56	2.23	0.56
Runoff, in acre-feet									60,870	86,810	21,890

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 16	0000	12.97	------	Mar. 17	2000	18.14	------	Apr. 8	0000	16.86	4,110
	0600	13.25	------		2400	18.04	------		1200	17.48	4,560
	0700	13.26	------						1430	17.55	4,620
	1200	13.11	------	18	0300	17.90	------		1800	17.48	4,560
	1600	14.05	------		0900	17.07	------		2400	17.13	4,300
	1800	14.70	------		1500	16.29	------				
	2000	15.11	------		2400	15.98	------	9	0000	16.22	3,710
	2400	15.43	------						1200	13.55	2,490
				Apr. 7	0000	14.05	2,670		1800	10.70	1,560
17	0300	16.13	------		0300	14.05	2,670		2400	10.01	1,350
	0500	16.59	------		0600	14.15	2,710				
	0700	16.50	------		1200	14.51	2,870	10	1200	9.01	1,070
	1000	17.05	------		1800	14.98	3,080		2000	8.49	932
	1300	17.80	------		2400	15.86	3,520		2400	8.70	983
	1600	18.05	------								

(278) 5–4735. Big Creek near Mount Pleasant, Iowa

Location.—Lat 41°00'50", long 91°34'45", in NW¼NW¼ sec.29, T.72 N., R.6 W., on left bank 12 ft downstream from highway bridge, 100 ft downstream from Lynn Creek, 0.7 mile downstream from Brandywine Creek, and 3.4 miles northwest of Mount Pleasant.

Drainage area.—106 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 630.53 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 4,100 cfs and by contracted-opening measurement at 6,160 cfs. Backwater from ice Mar. 1, 5–12, 15, 16, 18–28.

Maxima.—March–May 1965: Discharge, 2,580 cfs 1330 hours Mar. 17 (gage height, 12.07 ft).

1955 to February 1965: Discharge, 4,460 cfs Mar. 29, 1960 (gage height, 15.30 ft). Flood of Aug. 3, 1948, reached a stage of about 27 ft, from floodmarks by local residents (discharge not determined).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	50	60	67	11	9.2	469	35	21	35	59	11
2	30	46	53	12	7.0	220	27	22	20	46	13
3	15	43	43	13	35	130	24	23	17	45	10
4	9.0	54	36	14	109	156	20	24	15	117	9.0
5	7.4	328	38	15	250	598	20	25	14	595	9.5
6	7.0	802	36	16	450	292	18	26	12	326	13
7	7.0	249	30	17	1,900	187	16	27	11	196	13
8	8.0	484	31	18	450	122	14	28	55	165	10
9	9.0	398	138	19	92	88	12	29	454	122	8.0
10	8.8	244	50	20	50	71	11	30	274	91	8.0
								31	89	------	7.5
Monthly mean discharge, in cubic feet per second									145	227	26.8
Runoff, in inches									1.58	2.39	0.29
Runoff, in acre-feet									8,920	13,490	1,650

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 17	0000	7.02	895	Mar. 17	2400	8.82	1,410	Mar. 18	1500	4.92	-----
	0200	8.06	1,350						1700	4.85	-----
	1330	12.07	2,580	18	0400	6.95	878		2000	4.11	-----
	2000	10.06	1,820		1100	4.88	428		2400	3.45	-----

(279) 5–4740. Skunk River at Augusta, Iowa

Location.—Lat 40°45'10", long 91°16'30", in NE¼NE¼ sec.26, T.69 N., R.4 W., on left bank 300 ft upstream from bridge on State Highway 394 at Augusta, 2 miles upstream from Long Creek, at mile 12.5.

Drainage area.—4,303 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 19–20, for which graph was reconstructed on basis of daily wire-weight gage readings. Datum of gage is 521.24 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 50,000 cfs. Backwater from ice Mar. 1–18, 22–26. Backwater from Mississippi River Apr. 14–30, May 1–14.

Maxima.—March–May 1965: Discharge, 20,300 cfs 0230 hours Mar. 18 (gage height, 16.99 ft).
1913, 1914 to February 1965: Discharge, 51,000 cfs Apr. 3, 1960 (gage height, 25.00 ft).
Flood of June 1, 1903, reached a stage of about 21 ft (discharge, about 45,000 cfs).

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,000	6,140	8,000	11	1,700	18,200	3,500	21	9,250	3,200	1,080
2	5,000	5,990	7,000	12	1,600	19,100	3,100	22	7,400	2,800	979
3	7,000	5,900	5,900	13	1,500	17,300	2,800	23	6,000	2,800	907
4	6,500	6,380	5,200	14	2,200	13,200	2,500	24	4,500	3,000	840
5	6,000	8,010	4,800	15	3,500	10,000	2,170	25	3,500	6,000	808
6	3,500	14,800	4,500	16	5,000	7,100	1,820	26	2,800	9,500	970
7	3,000	15,800	4,300	17	16,000	6,100	1,560	27	2,410	9,100	1,130
8	2,500	17,100	4,000	18	19,000	5,000	1,520	28	2,000	8,200	1,660
9	2,200	17,700	3,900	19	17,400	4,200	1,360	29	3,820	8,500	3,350
10	2,000	16,800	3,800	20	14,000	3,700	1,180	30	8,890	8,900	4,570
								31	7,190	------	4,210
Monthly mean discharge, in cubic feet per second									5,818	9,351	3,013
Runoff, in inches									1.56	2.42	0.81
Runoff, in acre-feet									357,700	556,400	185,300

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 17	0000	11.58	------	Mar. 19	2400	14.73	16,100	Apr. 11	1200	16.00	18,400
	0400	13.63	------						1800	16.14	18,700
	1000	15.70	------	20	0600	14.33	15,500		2400	16.22	18,800
	1300	16.41	------		1200	13.49	14,100				
	1700	16.70	------		1800	12.55	12,700	12	0600	16.36	19,100
	2000	16.87	------		2400	11.59	11,300		1400	16.45	19,300
	2400	16.95	------	21	0600	10.65	10,000		1800	16.41	19,200
18	0230	16.99	20,300		1200	9.87	8,920		2400	16.22	18,800
	1200	16.87	20,100		1800	9.46	8,360				
	2400	16.22	18,800		2400	9.27	8,110	13	0600	15.84	18,100
									1200	15.39	17,300
19	0600	15.82	18,100	Apr. 10	2400	15.18	16,900		1800	14.88	16,400
	1200	15.44	17,400						2400	14.60	15,900
	1800	15.08	16,700	Apr. 11	0600	15.70	17,900				

MISSISSIPPI RIVER MAIN STEM

(280) 5–4745. Mississippi River at Keokuk, Iowa

Location.—Lat 40°23'35", long 91°22'25", in SE¼SW¼ sec.30, T.65 N., R.4 W., near right bank in tailwater at downstream end of new lock below dam and powerplant of Union Electric Co. at Keokuk, 2.8 miles upstream from Des Moines River and at mile 364.2 upstream from Ohio River.

Drainage area.—119,000 sq mi, approximately.

Gage-height record.—Water-stage recorder. Datum of gage is 477.41 ft above mean sea level, datum of 1929 (levels by Corps of Engineers); 477.83 ft above mean sea level, adjustment of 1912; 477.34 ft above mean gulf level; and 484.65 ft above Memphis datum. Jan. 1, 1878, to May 1913, staff gage at Galland (formerly Nashville), 8 miles upstream; zero of gage was set to low-water mark of 1864, or 497.94 ft above mean sea level, adjustment of 1912.

Discharge record.—Records furnished by Union Electric Company except for period of Apr. 21 to May 11 which were computed by the U.S. Geological Survey on basis of backwater rating of the tailwater gage. Furnished records computed from records of turbine operation at power plant and openings of spillway gages in dam.

Maxima.—April–May 1965: Daily discharge, 327,000 cfs May 1; gage height, 22.14 ft, May 1.

1878 to February 1965: Daily discharge, 314,000 cfs May 18, 1888 (gage height, 12.0 ft, site and datum then in use; 19.6 ft present site and datum).

Flood of June 6, 1851, reached a stage of 21.0 ft, present site and datum; estimated as 13.5 ft at Galland (discharge, 360,000 cfs).

Remarks.—Discharge records furnished by Union Electric Company except for period Apr. 21 to May 11. Annual peak stages furnished by Corps of Engineers.

Mean gage height, in feet, and discharge, in cubic feet per second, 1965, of Mississippi River at Keokuk, Iowa

Day	March		April		May	
	Gage height	Discharge	Gage height	Discharge	Gage height	Discharge
1	----------	48,900	----------	82,700	22.09	327,000
2	----------	60,600	----------	97,600	21.75	318,000
3	----------	64,400	----------	111,600	21.41	310,000
4	----------	77,300	----------	122,200	20.97	298,000
5	----------	77,300	----------	133,200	20.48	286,000
6	----------	108,800	----------	146,200	20.02	279,000
7	----------	116,600	----------	157,600	19.51	269,000
8	----------	115,000	----------	173,600	19.03	260,000
9	----------	117,700	----------	184,500	18.62	253,000
10	----------	123,300	----------	191,000	18.20	246,000
11	----------	136,300	18.07	191,500	17.77	238,000
12	----------	138,800	19.02	200,000	17.07	223,400
13	----------	126,900	19.57	213,900	16.32	211,600
14	----------	116,100	20.05	223,100	15.49	198,200
15	----------	116,000	20.59	235,700	14.67	185,400
16	----------	121,700	20.82	244,700	----------	174,400
17	----------	130,100	20.60	250,500	----------	161,900
18	----------	134,000	20.06	247,200	----------	151,500
19	----------	110,800	19.31	239,300	----------	142,400
20	----------	76,200	18.80	234,400	----------	134,600
21	----------	60,500	18.67	234,000	----------	129,900
22	----------	62,300	18.60	238,000	----------	128,100
23	----------	62,600	18.62	239,000	----------	126,200
24	----------	54,200	18.79	246,000	----------	125,400
25	----------	48,200	19.71	267,000	----------	129,000
26	----------	46,500	21.10	292,000	----------	126,900
27	----------	44,600	21.64	305,000	----------	128,100
28	----------	50,000	21.43	300,000	----------	130,000
29	----------	56,200	21.34	302,000	----------	133,200
30	----------	75,000	21.97	321,000	----------	135,800
31	----------	81,700	----------	----------	----------	136,000
Mean		89,000		214,200		196,600
Inches		0.86		2.01		1.91
Acre-feet		5,472,000		12,740,000		12,090,000

Annual maximum stages and mean daily discharges, for indicated years of Mississippi River at Keokuk, Iowa

Year	Date	Gage height (feet)	Discharge (cfs)	Year	Date	Gage height (feet)	Discharge (cfs)
1851	June 6	21.0	360,000	1916	May 9	------	213,000
1868	May 8	14.6	----------	1917	June 17	------	163,000
1869	July 16	14.7	----------	1918	June 12	16.7	192,000
1870	Apr. 27	16.4	----------	1919	May 8	17.15	205,000
1871	May	12.2	----------	1920	Apr. 10–11	------	230,000
1872	June 7	12.1	----------	1921	May 12–13	------	108,000
1873	June 14–15	12.5	----------	1922	Apr. 24, 25	17.45	240,000
1874	Mar. 12	8.8	----------	1923	Apr. 9, 10	12.0	148,000
1875	July 9	12.9	----------	1924	Aug. 24, 25	------	160,000
1876	Apr. 17	16.5	----------	1925	June 23	10.3	112,000
1877	Apr. 9–10	11.6	----------	1926	Sept. 28	------	146,000
1878	June 11	------	150,000	1927	Apr. 3	------	175,000
1879	June 2, 3	8.45	110,000	1928	Apr. 12	------	150,000
1880	June 29	17.5	271,000	1929	Mar. 23	19.3	247,000
1881	Apr. 23, 24	------	241,000	1930	June 18	13.9	163,000
1882	Oct. 31, 1881	18.9	293,000	1931	July 4	------	52,500
1883	May 18	15.4	201,000	1932	Apr. 24, 25	10.2	106,000
1884	Apr. 1	16.7	236,000	1933	Apr. 9	14.5	160,000
1885	Oct. 9, 10,1884	------	170,000	1934	Apr. 22	------	83,500
1886	May 6	15.95	212,000	1935	Apr. 11, 12	------	138,000
1887	May 4	------	156,000	1936	Apr. 9, 10	12.3	148,000
1888	May 18	19.6	314,000	1937	Mar. 10	16.1	190,000
1889	Apr. 20	------	84,200	1938	Sept. 26	16.4	193,800
	June 8, 18			1939	Oct. 1, 1938	------	159,100
1890	July 1	12.6	178,000	1940	Apr. 19	6.4	81,700
1891	May 3	------	141,000	1941	Apr. 27	12.3	154,400
1892	June 29	19.25	306,000	1942	June 16	15.80	200,900
1893	May 15–17	14.85	203,000	1943	Apr. 18	------	174,000
1894	June 4	11.3	158,000	1944	May 27, 28	20.85	256,000
1895	Mar. 11	------	59,200	1945	Mar. 26	16.80	203,300
1896	June 3	11.9	161,000	1946	Jan. 11	16.95	223,300
1897	Apr. 28, 29	18.4	230,000	1947	June 21	20.2	245,700
1898	Mar. 20	------	108,000	1948	Mar. 23	18.9	233,600
1899	June 29	------	159,000	1949	Mar. 12	13.3	150,700
1900	Apr. 5, 6	------	124,000	1950	Apr. 25, 26	------	175,900
1901	Mar. 24–26	11.3	150,000	1951	Apr. 29	------	265,100
1902	July 21, 22	15.5	181,000	1952	Apr. 27	------	253,800
1903	June 6	19.6	270,000	1953	Apr. 1, 2	12.5	137,200
1904	Oct. 7, 1903	------	186,000	1954	May 17	------	181,400
1905	June 10	18.5	212,000	1955	Apr. 25	12.7	156,600
1906	Apr. 26–28	14.0	192,000	1956	Apr. 22	10.2	131,500
1907	Apr. 17–18	------	178,000	1957	July 15	8.70	106,000
1908	June 9	------	178,000	1958	June 13	8.29	99,000
1909	May 5–7	13.9	181,000	1959	Apr. 5	14.17	182,000
1910	Mar. 20–23	10.1	124,000	1960	Apr. 4	21.83	289,500
1911	Feb. 21	12.3	156,000	1961	Apr. 5	17.11	208,400
1912	Apr. 6, 7	17.7	220,000	1962	Apr. 7	18.58	224,100
1913	Mar. 29	13.5	169,000	1963	Mar. 22	10.76	128,700
1914	June 24	11.2	122,000	1964	May 21	7.96	96,400
1915	Feb. 28	------	142,000	1965	May 1	22.14	327,000

Note.—Annual peak stages referenced to tailwater gage, datum 477.83 feet, adjustment of 1912.

DES MOINES RIVER BASIN

(281) West Fork Des Moines River below Talcott Dam near Dundee, Minn.

(Miscellaneous site)

Location.—Lat 43°53'10", long 95°26'11", near center of sec.20, T.105 N., R.38 W., at outlet of Talcott Lake, 3¼ miles northeast of Dundee.

Gage-height record.—Peak from graph based on twice-daily tailwater staff gage readings, Apr. 6–8. Datum of gage is 1,395.29 ft above mean sea level, adjustment of 1929 (levels by Minnesota Conservation Department Division of Waters).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 4,700 cfs 0600 hours Apr. 7 (gage height, 11.51 ft).
1963 to March 1965: Discharge, 1,000 cfs Aug. 4, 1963 (gage height, 8.22 ft).

Cooperation.—Gage heights furnished by Minnesota Conservation Department, Division of Waters.

(282) 5–4758. West Fork Des Moines River tributary near Jackson, Minn.

(Crest-stage station)

Location.—Lat 43°41'40", long 95°01'30", in NW¼SE¼, sec.27, T.103 N., R.35 W., at culvert on county road three-quarters of a mile upstream from mouth, and 5½ miles north of Jackson.

Drainage area.—1.42 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 6 cfs and by indirect measurement at 49 cfs.

Maxima.—April–May 1965: Discharge, 38 cfs Apr. 5 (gage height, 17.86 ft, backwater from ice).
1960 to March 1965: Discharge, 69 cfs Mar. 28, 1962 (gage height, 16.34 ft, backwater from ice).

(283) 5–4759. West Fork Des Moines River tributary near Lakefield, Minn.

(Crest-stage station)

Location.—Lat 43°40'30", long 95°03'20", in SE¼SE¼ sec.32, T.103 N., R.35 W., at culvert on County Highway 19, 1½ miles upstream from mouth, and 5-3/4 miles east of Lakefield.

Drainage area.—4.52 sq mi.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 47 cfs and by indirect measurement at 119 cfs.

Maxima.—April–May 1965: Discharge, 112 cfs Apr. 5 (gage height, 10.46 ft, backwater from ice); gage height, 10.65 ft April 1 (backwater from ice).
1960 to March 1965: Discharge, 119 cfs June 9, 1963 (gage height, 7.00 ft); gage height, 8.86 ft Mar. 28, 1962 (backwater from ice).

(284) 5–4760. West Fork Des Moines River at Jackson, Minn.

Location.—Lat 43°37'10", long 94°59'10", in SE¼SW¼ sec.24, T.102 N., R.35 W., on right bank in Jackson, 200 ft downstream from dam at powerplant.

Drainage area.—1,220 sq mi, approximately.

Gage-height record.—Water-stage recorder graph except 0100 hours Apr. 6 to May 31. Graph was constructed on the basis of six or more daily gage readings, on powerplant gage above dam, 0100 hours Apr. 6 to Apr. 27 and average of twice-daily gage readings on the outside staff gage Apr. 28 to May 31. Datum of gage is 1,287.75 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-measurements. Backwater from ice Apr. 1–9. Discharge for the period Apr. 6–14 was obtained from powerplant gage stage-discharge relation.

Maxima.—April–May 1965: Discharge, 9,530 cfs 2200 hours Apr. 9 (gage height, 18.38 ft, from powerplant gage); gage height, 18.62 ft 1500 hours Apr. 6, from floodmark (backwater from ice).

1909–13, 1930 to March 1965: Discharge, 8,360 cfs June 8, 1953 (gage height, 17.43 ft, from floodmark), from rating curve extended above 3,500 cfs on basis of contracted-opening measurement of peak flow.

Remarks.—Some regulation by Yankton, Long, Shetek, and Heron Lakes above station.

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	77	1,590	11	8,330	1,500	21	2,760	1,780
2	124	1,440	12	7,110	1,480	22	2,320	1,730
3	295	1,440	13	5,980	1,510	23	2,220	1,660
4	645	1,390	14	5,360	1,550	24	2,150	1,590
5	1,530	1,290	15	4,750	1,620	25	2,150	1,780
6	5,300	1,170	16	4,310	1,640	26	2,160	1,850
7	5,600	1,170	17	3,860	1,590	27	2,140	1,810
8	5,100	1,270	18	3,550	1,590	28	2,040	1,730
9	8,000	1,500	19	3,300	1,590	29	1,770	1,730
10	9,100	1,840	20	3,070	1,640	30	1,750	1,690
						31	--------	1,690
Monthly mean discharge, in cubic feet per second							3,561	1,576
Runoff, in inches							3.26	1.49

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 31	0000	4.27	-----	Apr. 2	0600	8.83	------	Apr. 3	2200	10.45	-----
	1200	4.37	-----		1200	8.28	------		2300	11.22	-----
	1300	4.30	-----		1600	8.09	------		2400	10.97	-----
	2100	6.79	-----		2400	8.21	------				
	2400	7.10	-----					4	0100	10.87	-----
				3	0900	8.10	------		0500	10.61	-----
Apr. 1	0500	7.20	-----		1200	8.10	------		0600	10.93	-----
	1200	7.08	-----		1500	9.83	------		1200	10.77	-----
	1500	7.89	-----		1700	11.09	------		1800	11.34	-----
	1800	8.87	-----		1800	10.98	------		2400	11.56	-----
	2100	9.17	-----		1900	10.99	------				
	2400	9.15	-----		2100	10.55	------	5	0100	11.59	-----

Gage height and discharge at indicated time, 1965, of West Fork Des Moines River at Jackson, Minn.—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	1200	11.61	-----	Apr. 7	1800	18.46	------	Apr. 9	1800	18.29	-----
	1700	11.79	-----		2100	18.38	------		2200	18.38	9,530
	1800	13.15	-----		2400	18.21	------		2400	18.29	-----
	2100	13.74	-----								
	2400	14.72	-----	8	0300	18.17	------	10	0600	18.21	9,070
					0600	18.04	------		0800	18.25	9,170
6	0600	17.41	-----		0800	17.96	------		1200	18.29	9,270
	0900	18.07	-----		1200	17.71	------		1300	18.26	9,200
	1200	18.52	-----		1400	17.71	------		1800	18.18	8,990
	1500	18.96	-----		1700	17.46	------		2400	18.12	8,830
	1800	18.54	-----		1800	17.62	------				
	2100	18.64	-----		2000	17.88	------	11	2400	17.72	7,828
	2400	18.46	-----		2100	17.71	------				
					2400	17.79	------	12	2400	17.12	6,390
7	0300	18.64	-----								
	0700	18.67	-----	9	0600	18.04	------	13	2400	16.78	5,580
	0800	18.59	-----		1000	18.04	------				
	1200	18.67	-----		1300	17.79	------	14	2400	16.58	5,140
	1500	18.55	-----		1500	18.04	------				

Note.—Gage-heights Apr. 6–14 are from gage at power plant above dam.

(285) 5–4761. Story Brook near Petersburg, Minn.

(Crest-stage station)

Location.—Lat 43°32'20", long 94°59'40", in SW¼NW¼ sec.24, T.101 N., R.35 W., at bridge on U.S. Highway 71, 3 miles upstream from mouth, and 4 miles west of Petersburg.

Gage-height record.—Crest stages only.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 252 cfs and by indirect measurement at 2,110 cfs.

Maxima.—April–May 1965: Discharge, 1,200 cfs Apr. 6 (gage height, 12.75 ft, backwater from ice); gage height, 18.58 ft Apr. 4 (backwater from ice).
1960 to March 1965: Discharge, 2,110 cfs July 4, 1962 (gage height, 12.77 ft); gage height, 14.17 ft Mar. 28, 1962 (backwater from ice).

(286) 5–4765. West Fork Des Moines River at Estherville, Iowa

Location.—Lat 43°24'00", long 94°50'40", in SW¼SE¼ sec.10, T.99 N., R.34 W., on right bank in city park, 1,200 ft downstream from bridge on State Highway 9 at Estherville, 2.5 miles upstream from Brown Creek and at mile 404.4 upstream from mouth of Des Moines River (U.S. Geological Survey river profile).

Drainage area.—1,372 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,247.55 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 10,600 cfs. Backwater from ice Mar. 17–25, Apr. 4–8.

Maxima.—March–May 1965: Discharge, 10,200 cfs 1900 hours Apr. 10 (gage height, 15.61 ft).
1951 to February 1965: Discharge, 10,800 cfs June 8, 1953 (gage height, 15.53 ft).

Mean discharge, in cubic feet per second, 1965, of West Fork Des Moines River at Estherville, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	108	490	1,810	11	36	9,490	2,090	21	31	3,100	1,960
2	56	1,120	1,670	12	35	8,300	1,790	22	35	2,760	2,110
3	50	1,340	1,540	13	35	7,000	1,620	23	38	2,490	1,940
4	49	1,660	1,490	14	39	6,060	1,670	24	38	2,360	1,800
5	48	3,000	1,660	15	42	5,530	1,880	25	36	2,340	1,980
6	45	5,700	1,400	16	46	4,980	2,070	26	35	2,390	2,180
7	44	7,200	1,390	17	48	4,380	1,930	27	33	2,410	2,160
8	43	7,600	1,790	18	33	3,960	1,800	28	31	2,320	2,010
9	40	7,860	1,760	19	23	3,680	1,730	29	30	2,140	1,880
10	37	9,660	1,900	20	27	3,380	1,730	30	33	1,940	1,860
								31	93	------	1,850
Monthly mean discharge, in cubic feet per second									42.5	4,221	1,821
Runoff, in inches									0.04	3.43	1.53
Runoff, in acre-feet									2,610	251,200	112,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 9	0000	13.84	7,440	Apr. 10	1800	15.55	10,100	Apr. 11	2400	14.79	8,910
	1000	13.85	7,450		1900	15.61	10,200				
	2000	14.55	8,500		2400	15.56	10,100	12	0600	14.62	8,620
	2400	14.67	8,710						1200	14.41	8,270
				11	0600	15.38	9,870		1800	14.21	8,030
10	0400	14.87	8,960		1800	14.95	9,100		2400	13.95	7,610
	0800	15.22	9,590								

(287) West Fork Des Moines River at Emmetsburg, Iowa

(Miscellaneous site)

Location.—NW¼ sec.26, T.96 N., R.33 W., at bridge on county road about 1 mile west of Emmetsburg.

Drainage area.—1,672 sq mi.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 9,780 cfs and extended above by logarithmic plotting.

Maximum.—March–May 1965: Discharge, 12,000 cfs Apr. 11 (elevation, 1,206.83 ft above mean sea level).

(288) West Fork Des Moines River near Ottosen, Iowa

(Miscellaneous site)

Location.—SE¼ sec.1, T.93 N., R.31 W., at county line on State Highway 44, 3 miles west of Ottosen.

Drainage area.—2,018 sq mi.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 13,200 cfs and extended above by logarithmic plotting.

Maxima.—March–May 1965: Discharge, 14,000 cfs Apr. 12 (elevation, 1,136.68 ft above mean sea level).

(289) 5–4767.5 West Fork Des Moines River at Humboldt, Iowa

Location.—Lat 42°43'10", long 94°13'10", in SE¼SW¼ sec.1, T.91 N., R.29 W., on First Avenue bridge in city of Humboldt, about 700 feet below dam, 3.9 miles upstream from confluence with East Fork Des Moines River, and at mile 334.3 upstream from mouth of Des Moines River(U.S. Geological Survey river profile).

Drainage area.—2,256 sq mi.

Gage-height record.—Graph constructed from daily wire-weight gage readings. Datum of gage is 1,053.54 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 14,400 cfs. Backwater from ice Mar. 19–26.

Maxima.—March–May 1965: Discharge, 14,400 cfs 1400 hours Apr. 8 (gage height, 13.90 ft).

October 1964 to February 1965: Discharge, 1,360 cfs Oct. 1, 1964 (gage height, 5.11 ft).

Flood of June 23, 1947, reached a stage of 12.2 ft (discharge, 11,000 cfs) at present site and datum.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	948	1,520	3,610	11	217	12,700	3,100	21	270	6,370	2,740
2	885	2,150	3,340	12	217	12,200	3,010	22	242	5,740	2,660
3	579	2,920	3,040	13	245	13,400	2,850	23	224	5,210	2,680
4	462	4,600	2,830	14	290	12,800	2,730	24	212	4,910	2,860
5	335	7,330	2,600	15	432	11,700	2,610	25	208	4,670	3,140
6	276	9,340	2,510	16	596	10,500	2,790	26	206	4,460	3,440
7	233	12,500	2,540	17	634	9,260	3,160	27	205	4,410	3,360
8	241	14,300	2,560	18	484	8,420	3,280	28	205	4,160	3,560
9	245	14,000	2,560	19	400	7,650	3,170	29	213	3,920	3,530
10	229	13,700	2,860	20	310	6,980	2,950	30	240	3,780	3,360
								31	478	------	3,170
Monthly mean discharge, in cubic feet per second									354	7,853	2,987
Runoff, in inches									0.18	3.88	1.53
Runoff, in acre-feet									21,740	467,300	183,700

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 30	0000	3.33	217	Apr. 2	2400	6.35	2,470	Apr. 6	2400	11.85	10,800
	1200	3.37	233								
	2400	3.47	276	3	1200	6.73	2,850	7	0600	12.52	12,000
					2400	7.33	3,490		1000	12.59	12,100
31	1000	3.60	335						2400	13.64	14,000
	1400	3.87	478	4	1200	8.24	4,570				
	1800	4.09	609		2400	9.06	5,760	8	1200	13.88	14,400
	2200	4.40	820						1400	13.90	14,400
	2400	4.56	932	5	1200	9.90	7,200		1800	13.89	14,400
					1600	10.15	7,650		2400	13.76	14,200
Apr. 1	0400	4.99	1,260		1800	11.10	9,360				
	0600	5.12	1,370		2000	10.60	8,460	9	0800	13.60	13,900
	1200	5.38	1,570		2400	10.55	8,370		2400	13.65	14,000
	1800	5.56	1,730								
	2400	5.71	1,870	6	0400	10.59	8,440	10	0800	13.62	13,900
					1200	10.96	9,110		1200	13.55	13,800
2	1200	6.00	2,130		1800	11.52	10,100		2400	13.23	13,200

(290) 5–4780. East Fork Des Moines River near Burt, Iowa

Location.—Lat 43°12'35", long 94°10'40", in NW¼NE¼ sec.20, T.97 N., R.28 W., on right bank 30 ft downstream from highway bridge, 0.8 mile upstream from Buffalo Creek, 2.5 miles northeast of Burt, 5.3 miles downstream from Mud Creek, and at mile 389.7 upstream from mouth of Des Moines River (U.S. Geological Survey river profile).

Drainage area.—462 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 1–15, 18–30. Datum of gage is 1,114.42 ft (revised) above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 3,180 cfs, extended to 5,000 cfs by logarithmic plotting and velocity-area study. Backwater from ice Mar. 1 to Apr. 9.

Maxima.—March–May 1965: Discharge, 5,000 cfs 2100 hours Apr. 6 (gage height, 14.21 ft, backwater from ice).
1951 to February 1965: Discharge, 3,870 cfs June 21, 1954 (gage height, 12.67 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	52	400	1,000	11	42	3,110	1,110	21	34	1,550	682
2	60	470	960	12	43	2,920	1,020	22	32	1,450	650
3	50	660	888	13	44	2,680	920	23	30	1,340	625
4	47	1,100	828	14	46	2,480	844	24	29	1,270	610
5	44	2,000	858	15	47	2,340	814	25	27	1,250	625
6	42	3,900	1,110	16	48	2,190	883	26	26	1,310	744
7	40	3,600	1,180	17	47	2,090	876	27	26	1,260	884
8	40	3,900	1,230	18	45	1,980	837	28	25	1,230	848
9	40	4,500	1,120	19	42	1,820	828	29	25	1,170	807
10	41	3,490	1,040	20	37	1,700	762	30	27	1,090	741
								31	100	------	688
Monthly mean discharge, in cubic feet per second									41.2	2,008	871
Runoff, in inches									0.10	4.85	2.17
Runoff, in acre-feet									2,530	119,500	53,580

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
April 4	0000	11.80	------	Apr. 6	1600	14.13	------	Apr. 9	0800	13.46	-----
	0800	11.83	------		2100	14.21	5,000		1200	13.42	-----
	1200	11.87	------		2400	14.19	------		1800	13.23	-----
	1800	12.04	------						2400	12.85	3,700
	2200	12.19	------	7	1000	13.80	------				
	2400	12.32	------		2400	13.64	------	10	1200	12.74	3,500
5	0200	12.45	------						2400	12.54	3,280
	0600	12.97	------	8	1800	13.96	------				
	1800	13.33	------		2000	13.95	------	11	1200	12.40	3,100
	2400	13.53	------		2400	13.84	------		2400	12.23	2,960
6	1200	13.90	------								

(291) East Fork Des Moines River at Algona, Iowa

(Miscellaneous site)

Location.—NW¼ sec.2, T.95 N., R.29 W., at bridge on U.S. Highway 169 at north edge of Algona.

Drainage area.—882 sq mi.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 10,700 cfs and extended above by logarithmic plotting.

Maximum.—March–May 1965: Discharge, 11,400 cfs, Apr. 9 (elevation, 1,118.78 ft above mean sea level).

(292) 5–4790. East Fork Des Moines River at Dakota City, Iowa

Location.—Lat 42°43'25", long 94°11'30", in NW¼SE¼ sec.6, T.91 N., R.28 W., on right bank 50 ft upstream from old mill dam, in city park at east edge of Dakota City, 500 ft upstream from county highway bridge, 0.6 mile downstream from bridge on State Highway 3, 3.4 miles (revised) upstream from confluence with West Fort Des Moines River, and at mile 333.8 upstream from mouth of Des Moines River (U.S. Geological Survey river profile).

Drainage area.—1,308 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 2, 3. Datum of gage is 1,038.71 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 17,300 cfs. Backwater from ice Mar. 1 to Apr. 6.

Maxima.—March–May 1965: Discharge, 15,700 cfs 0500 hours Apr. 9 (gage height, 23.13 ft).
1940 to February 1965: Discharge, 18,800 cfs June 21, 1954 (gage height, 16.95 ft, from floodmark, at site 8 miles upstream near Hardy at different datum).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,420	1,020	2,420	11	420	10,600	1,770	21	320	3,380	1,720
2	1,300	1,520	2,250	12	400	8,520	1,760	22	270	3,090	1,630
3	1,120	3,000	2,070	13	390	7,460	1,690	23	240	2,850	1,550
4	960	4,700	1,910	14	380	6,660	1,650	24	220	2,650	1,470
5	840	7,000	1,780	15	390	6,000	1,720	25	190	2,560	2,120
6	740	10,800	1,680	16	440	5,410	1,890	26	172	2,570	2,120
7	630	14,400	1,570	17	770	4,930	1,960	27	158	2,580	2,250
8	560	15,400	1,540	18	610	4,450	1,880	28	142	2,550	1,990
9	490	15,400	1,600	19	500	4,050	1,810	29	136	2,560	1,900
10	450	13,200	1,710	20	390	3,700	1,780	30	130	2,540	1,970
								31	170	------	1,970
Monthly mean discharge, in cubic feet per second									495	5,852	1,822
Runoff, in inches									0.44	4.99	1.61
Runoff, in acre-feet									30,440	348,200	112,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of East Fork Des Moines River at Dakota City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 7	0000	21.85	13,600	Apr. 9	1200	23.03	15,600	Apr. 11	2400	19.08	9,410
	0400	22.08	13,900		2400	22.42	14,500				
	0800	21.80	13,500					12	0800	18.55	8,720
	1200	22.38	14,400	10	0800	21.88	13,600		1600	18.18	8,230
	2000	22.88	15,300		1600	21.35	12,800		2400	17.85	7,820
	2400	22.98	15,500		2400	20.81	11,900				
8	1200	22.88	15,300					13	0800	17.63	7,560
	2400	23.07	15,600	11	0800	20.21	11,000		1600	17.46	7,370
					1600	19.65	10,200		2400	17.21	7,090
9	0500	23.13	15,700								

(293) 5–4800. Lizard Creek near Clare, Iowa

Location.—Lat 42°32'40", long 94°20'45", in NE¼NE¼ sec.11, T.89 N., R.30 W., on right bank 20 ft downstream from county highway bridge, 3 miles south of Clare, 8 miles northwest of Fort Dodge, and 8.9 miles upstream from South Lizard Creek.

Drainage area.—257 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 3–7, 18, 19. Datum of gage is 1,079.30 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 5,270 cfs, extended to 10,000 cfs by logarithmic plotting. Backwater from ice Mar. 1 to Apr. 6.

Maxima.—March–May 1965: Discharge, 4,670 cfs 1530 hours Apr. 7; gage height, 11.61 ft 1300 hours Apr. 4 (backwater from ice).
1940 to February 1965: Discharge, 10,000 cfs June 23, 1947 (gage height, 16.0 ft, from floodmark).

Cooperation.—One discharge measurement furnished by the Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	700	74	143	11	38	985	123	21	34	223	128
2	370	210	128	12	42	845	104	22	27	199	138
3	130	480	106	13	90	696	91	23	24	173	151
4	60	1,100	93	14	210	588	84	24	22	154	196
5	47	1,800	89	15	510	488	93	25	21	161	284
6	41	2,500	84	16	680	390	363	26	20	238	814
7	37	3,680	78	17	640	330	321	27	20	264	578
8	36	2,450	80	18	250	280	244	28	19	223	388
9	36	1,800	154	19	120	241	182	29	19	190	305
10	36	1,130	151	20	62	214	138	30	20	165	277
								31	29	------	253
Monthly mean discharge, in cubic feet per second									142	742	205
Runoff, in inches									0.64	3.22	0.92
Runoff, in acre-feet									8,710	44,170	12,620

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Lizard Creek near Clare, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 3	0000	11.02	------	Apr. 5	1700	9.31	------	Apr. 7	1200	10.55	4,180
	0800	10.68	------		2000	8.27	------		1530	11.10	4,670
	1200	10.85	------		2400	8.41	2,440		2400	9.23	3,060
	1400	11.10	------					8	0400	8.68	2,630
	1600	11.24	------	6	1200	8.39	2,420		1800	8.11	2,230
	2400	11.36	------		1400	8.98	2,860		2400	8.07	2,200
					1600	8.81	2,730				
4	1300	11.61	------		2400	9.10	2,960	9	0600	7.91	2,090
	1400	7.28	------						1800	7.06	1,550
	1500	8.45	------						2400	6.62	1,280
	2400	9.28	------	7	0600	9.26	3,090				
5	1200	9.20	------								

(294) 5–4805. Des Moines River at Fort Dodge, Iowa

Location.—Lat 42°30'25", long 94°12'00", in NW¼SW¼ sec.19, T.89 N., R.28 W., on right bank 400 ft upstream from Soldier Creek, 1,800 ft downstream from Illinois Central Railroad bridge in Fort Dodge, 2,000 ft downstream from Lizard Creek, and at mile 314.6.

Drainage area.—4,190 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 969.38 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 35,600 cfs. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 35,600 cfs 0630 hours Apr. 8 (gage height, 17.79 ft).
1905–06, 1913–27, 1946 to February 1965: Discharge, 35,400 cfs June 21,1954; gage height, 19.62 ft, from floodmark, June 23, 1947.

Cooperation.—One discharge measurement furnished by the Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,420	3,300	6,770	11	860	26,200	5,380	21	890	11,300	4,980
2	2,780	7,000	6,260	12	850	22,800	5,350	22	740	10,400	4,870
3	2,220	9,600	5,750	13	900	21,900	5,020	23	500	9,620	4,800
4	1,920	12,000	5,290	14	1,160	20,900	4,800	24	505	8,860	4,960
5	1,700	17,000	5,020	15	1,900	19,000	4,810	25	500	8,560	5,920
6	1,500	23,500	4,890	16	2,400	17,200	5,320	26	500	8,470	9,920
7	1,360	30,600	4,650	17	2,220	15,500	5,830	27	470	8,220	8,420
8	1,210	35,100	4,560	18	1,820	14,200	5,840	28	460	7,760	7,340
9	1,080	34,000	4,560	19	1,340	13,100	5,600	29	455	7,460	6,740
10	920	30,900	5,000	20	1,090	12,200	5,310	30	510	7,180	6,470
								31	1,300	------	6,130
Monthly mean discharge, in cubic feet per second									1,274	15,790	5,695
Runoff, in inches									0.35	4.21	1.57
Runoff, in acre-feet									78,310	939,800	350,200

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Des Moines River at Fort Dodge, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	12.51	20,600	Apr. 7	2000	17.16	33,800	Apr. 8	1600	17.70	35,300
	0600	12.82	21,400		2400	17.35	34,300		1700	17.60	35,000
	1000	13.38	22,900						2400	17.58	35,000
	2400	14.83	27,000	8	0400	17.55	34,900				
					0600	17.67	35,200	9	1200	17.29	34,100
7	1300	15.96	30,300		0630	17.79	35,600		2400	16.90	33,000
	1800	16.97	33,200								

(295) 5–4810. Boone River near Webster City, Iowa

Location.—Lat 42°26'00", long 93°48'15", in NW¼SE¼ sec.18, T.88 N., R.25 W., on right bank 10 ft upstream from bridge on State Highway 60, 2 miles south of Webster City, and 4.5 miles downstream from White Fox Creek.

Drainage area.—844 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 1–15, 19–25. Graph was reconstructed from daily wire-weight gage readings Mar. 3, 15. Datum of gage is 989.57 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 19,600 cfs, extended to 21,500 cfs by logarithmic plotting. Backwater from ice Mar. 1, 18–25.

Maxima.—March–May 1965: Discharge 15,200 cfs 2200 hours Apr. 6 (gage height, 15.91 ft).
1896 to February 1965: Discharge, 21,500 cfs June 10, 1918 (gage height, 19.1 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,500	2,630	780	11	250	7,190	510	21	164	933	478
2	3,100	3,110	680	12	220	5,780	438	22	140	803	510
3	2,320	3,230	596	13	200	4,630	383	23	120	725	568
4	1,600	4,940	528	14	200	3,760	362	24	100	655	609
5	1,160	8,220	478	15	209	3,050	362	25	90	752	956
6	840	13,800	609	16	204	2,520	644	26	80	1,460	3,920
7	650	14,400	1,050	17	190	2,100	1,060	27	74	1,660	3,930
8	520	13,600	965	18	400	1,770	890	28	74	1,400	3,120
9	400	11,400	768	19	270	1,410	690	29	74	1,120	2,340
10	306	10,100	609	20	200	1,160	551	30	91	905	2,000
								31	669	------	1,680
Monthly mean discharge, in cubic feet per second									626	4,307	1,067
Runoff, in inches									0.86	5.69	1.46
Runoff, in acre-feet									38,510	256,300	65,580

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Boone River near Webster City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 30	0000	1.93	75.9	Apr. 1	1300	6.20	2,540	Apr. 5	0400	10.37	6,580
	1400	1.93	75.9		1700	6.87	3,130		1600	12.02	8,830
	1800	2.10	114		2200	7.36	3,540		2400	13.37	10,900
	2200	2.14	124		2400	7.39	3,570				
	2400	2.24	148					6	0600	14.64	13,000
31	1100	2.33	170	2	0700	6.86	3,120		1200	15.35	14,200
	1200	2.47	206		2400	6.61	2,900		1800	15.83	15,100
	1300	2.71	278	3	0800	6.49	2,790		2200	15.91	15,200
	1400	3.06	398		1200	6.76	3,030		2400	15.89	15,200
	1500	3.43	550		2400	8.07	4,150				
	1600	3.84	755	4	0600	8.07	4,150	7	1000	15.20	14,000
	1700	4.45	1,160		1000	8.22	4,280		1200	15.15	13,900
	1800	4.82	1,430		1200	8.40	4,440		2400	15.60	14,700
	2200	5.32	1,820		2000	10.12	6,260				
	2400	5.34	1,830		2400	10.17	6,320	8	1200	14.95	13,500
Apr. 1	1000	5.94	2,330						2400	14.37	12,500

(296) 5–4815. Des Moines River near Boone, Iowa

Location.—Lat 42°04'40", long 93°55'55", in NE¼NE¼ sec.24, T.84 N., R.27 W., on left bank 30 ft upstream from Boone Water Department dam, 2 miles northwest of Boone, 2.2 miles upstream from Bluff Creek, and at mile 258.8.

Drainage area.—5,511 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 2–4, 9, 10, 19, Apr. 7–12, for which graph was reconstructed from daily (during March) and hourly (during April) outside staff gage readings. Datum of gage is 872.16 ft (revised) above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 57,400 cfs. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 51,600 cfs 0400 hours Apr. 9 (gage height, 22.89 ft).

1920 to February 1965: Discharge, 57,400 cfs June 22, 1954 (gage height, 25.35 ft, from graph based on hourly gage readings).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,600	4,110	7,950	11	1,580	43,400	5,720	21	1,640	12,800	5,720
2	6,000	11,000	7,430	12	1,420	36,800	5,890	22	1,300	11,600	5,620
3	7,500	13,000	6,870	13	1,320	31,500	5,720	23	1,100	10,500	5,680
4	6,000	19,000	6,320	14	1,280	28,500	5,380	24	960	9,810	5,620
5	4,300	21,000	5,820	15	1,760	26,200	5,210	25	840	9,420	5,820
6	3,300	34,900	5,640	16	2,600	23,000	5,330	26	740	9,600	9,620
7	2,700	42,400	5,700	17	3,000	20,300	6,200	27	660	9,860	15,000
8	2,300	49,300	5,920	18	2,800	18,000	6,730	28	620	9,540	13,100
9	1,940	50,800	5,620	19	2,480	16,000	6,510	29	660	8,890	10,500
10	1,720	47,900	5,470	20	2,100	14,400	6,130	30	760	8,400	9,270
								31	1,600	-------	8,560
Monthly mean discharge, in cubic feet per second									2,212	21,730	6,970
Runoff, in inches									0.46	4.40	1.46
Runoff, in acre-feet									136,000	1,293,000	428,600

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Des Moines River near Boone, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	15.82	28,600	Apr. 8	0800	22.13	48,700	Apr. 9	2400	22.37	49,600
	0600	16.89	31,600		1600	22.62	50,600	10	0800	22.07	48,500
	1200	18.14	35,200		2000	22.79	51,200		1400	21.83	47,600
	1800	19.14	38,500		2400	22.87	51,500		2400	21.45	46,200
	2400	19.57	39,900								
				9	0400	22.89	51,600	11	0800	20.97	44,400
7	1000	19.95	41,100		0800	22.84	51,400		1600	20.42	42,600
	1800	20.89	44,200		1600	22.66	50,700		2400	19.67	40,200
	2400	21.45	46,200								

(297) 5–4816.50 Des Moines River near Saylorville, Iowa

Location.—Lat 41°41'50", long 93°40'05", near center of sec.5,T.79 N., R.24 W., near center of span on downstream side of highway bridge, 2.0 miles west of Saylorville, 2.0 miles downstream from Rock Creek, 2.2 miles upstream from Beaver Creek, and at mile 211.4.

Drainage area.—5,841 sq mi.

Gage-height record.—Wire-weight gage read once daily. Datum of gage is 787.54 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 44,600 cfs. Backwater from ice Mar. 1 to Apr. 3.

Maxima.—March–May 1965: Discharge, 47,400 cfs 1700 hours Apr. 10 (gage height, 24.02 ft).
1893 to February 1965: Discharge, 60,000 cfs June 24, 1954 (gage height, 24.5 ft).

Cooperation.—Three discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,500	3,310	10,000	11	1,920	46,100	5,990	21	2,100	17,300	7,920
2	5,150	5,200	9,330	12	1,830	42,200	6,250	22	1,500	15,500	6,030
3	6,700	10,000	8,560	13	1,890	36,900	6,370	23	1,200	14,400	6,160
4	7,400	15,200	7,790	14	2,200	32,600	6,060	24	1,000	14,000	6,040
5	5,450	19,400	7,130	15	2,740	30,000	5,750	25	900	13,000	6,030
6	4,200	28,600	6,520	16	3,800	28,200	5,580	26	800	12,600	7,580
7	3,520	35,600	6,410	17	5,200	25,600	5,820	27	740	12,100	11,000
8	3,070	45,300	6,640	18	4,580	22,900	6,820	28	740	12,200	15,700
9	2,590	45,600	6,590	19	3,600	21,000	7,200	29	900	11,700	17,700
10	2,200	47,100	6,110	20	2,700	19,100	6,880	30	1,680	10,700	12,900
								31	2,470	--------	10,800
Monthly mean discharge, in cubic feet per second									2,815	23,110	7,925
Runoff, in inches									0.56	4.41	1.56
Runoff, in acre-feet									173,100	1,375,000	487,300

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Des Moines River near Saylorville, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	19.54	24,500	Apr. 8	1400	23.93	46,800	Apr. 10	2400	24.00	47,300
	1200	20.71	29,100		2400	23.78	45,800				
	2400	21.32	31,800					11	1200	23.86	46,300
				9	0700	23.65	44,900		2400	23.60	44,500
7	1200	21.93	34,600		2400	23.88	46,500				
	2400	23.12	41,200					12	1200	23.27	42,300
				10	1700	24.02	47,400		2400	22.88	39,700
8	1000	23.87	46,400								

(298) 5—4821.7 Big Cedar Creek near Varina, Iowa

Location.—Lat 42°41'21", long 94°47'55", in NE¼NE¼ sec.24, T.91 N., R.34 W., on left bank 5 ft downstream from county highway bridge, 3.1 miles upstream from Drainage Ditch 74, and 3.3 miles northeast of Varina.

Drainage area.—80.0 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 1–12, 18–29. Datum of gage is 1,225.12 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 2,070 cfs. Backwater from ice Mar. 1 to Apr. 8.

Maxima.—March–May 1965: Discharge, 1,060 cfs 1200 hours Apr. 8 (gage height, 10.17 ft); gage height 15.05 ft 2200 hours Apr. 6 (backwater from ice).
1959 to February 1965: Discharge, 2,080 cfs Aug. 31, 1962 (gage height, 13.68 ft); gage height, 14.49 ft Mar. 29, 1962 (ice jam).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	56	47	42	11	34	389	59	21	37	72	63
2	62	110	38	12	38	337	48	22	31	59	101
3	50	250	32	13	60	291	41	23	27	50	196
4	38	490	28	14	130	255	37	24	25	43	151
5	34	730	28	15	150	213	119	25	22	61	178
6	32	910	26	16	160	170	234	26	21	108	224
7	30	860	24	17	110	143	153	27	20	86	179
8	30	940	178	18	84	118	105	28	20	70	121
9	30	606	130	19	66	99	78	29	20	58	103
10	32	432	83	20	50	86	64	30	22	49	102
								31	26	------	91
Monthly mean discharge, in cubic feet per second									49.9	271	98.6
Runoff, in inches									0.72	3.78	1.42
Runoff, in acre-feet									3,070	16,130	6,060

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Big Cedar Creek near Varina, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0000	14.44	------	Apr. 7	1400	13.38	------	Apr. 8	0800	10.08	1,040
	1600	14.51	------		1700	14.56	------		1200	10.17	1,060
	1800	14.47	------		1900	12.22	------		2400	9.04	799
	2200	15.05	------		2200	10.75	------				
	2400	14.78	------		2400	10.55	------	9	1200	8.02	584
									2400	7.33	459
7	1200	14.11	------	8	0400	9.81	------				

(299) 5–4823. North Raccoon River near Sac City, Iowa

Location.—Lat 42°20'20", long 94°59'10", in NE¼NW¼ sec.24, T.87 N., R.36 W., on right bank 15 ft downstream from county highway bridge, 0.2 mile upstream from Indian Creek, and 4.5 miles south of Sac City.

Drainage area.—713 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 2, 4–10, 13–30. Graph was reconstructed from daily wire-weight gage readings Mar. 5, 18, 19, 22. 24, 25, 27, 30. Datum of gage is 1,144.60 ft above mean sea level, datum of 1929 (levels by Iowa Natural Resources Council).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 10,600 cfs. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 6,960 cfs 2400 hours Apr. 6 (gage height, 15.59 ft).
1958 to February 1965: Discharge, 10,800 cfs Sept. 1, 1962 (gage height, 18.12 ft). Flood of June 21, 1954, reached a stage of 15.61 ft, from floodmark (discharge, 7,000 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,000	1,200	279	11	120	3,130	384	21	268	461	363
2	600	3,100	244	12	144	2,460	313	22	226	413	386
3	390	2,900	220	13	190	1,870	270	23	192	370	524
4	200	3,400	199	14	280	1,500	241	24	168	325	735
5	150	4,800	183	15	370	1,260	362	25	138	325	857
6	132	6,630	177	16	490	1,020	1,030	26	130	418	1,470
7	120	6,190	165	17	620	860	917	27	130	510	1,370
8	112	5,610	460	18	880	710	665	28	138	425	958
9	108	4,670	766	19	580	597	483	29	152	363	717
10	106	3,730	524	20	320	518	391	30	252	319	644
								31	540	------	583
Monthly mean discharge, in cubic feet per second									298	2,003	545
Runoff, in inches									0.48	3.13	0.88
Runoff, in acre-feet									18,340	119,200	33,480

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of North Raccoon River near Sac City, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	14.37	------	Apr. 6	1800	15.47	6,790	Apr. 8	1200	14.64	5,660
	0200	13.90	------		2400	15.59	6,960		1600	14.46	5,440
	0400	13.89	------						2400	14.31	5,260
	1200	14.13	------	7	1600	14.71	5,740				
	1800	14.69	------		2200	14.87	5,950	9	2200	13.19	4,180
	2400	14.86	5,940		2400	14.86	5,940		2400	13.11	4,100
6	1000	15.47	6,790								

(300) 5–4825. North Raccoon River near Jefferson, Iowa

Location.—Lat 41°59'20", long 94°22'30", in SW¼NW¼ sec.20, T.83 N., R.30 W., on right bank 50 ft downstream from bridge on State Highway 17, 2 miles south of Jefferson, and 4.2 miles upstream from Hardin Creek.

Drainage area.—1,619 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 1 to Apr. 1, for which graph was reconstructed on basis of daily wire-weight gage readings. Datum of gage is 967.09 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 28,400 cfs. Backwater from ice Mar. 1 to Apr. 5.

Maxima.—March–May 1965: Discharge, 9,890 cfs 2330 hours Apr. 5 (gage height, 15.29 ft); gage height, 15.59 ft 2200 hours Apr. 4 (backwater from ice).
1940 to February 1965: Discharge, 29,100 cfs June 23, 1947 (gage height, 22.3 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	800	3,700	826	11	260	7,300	922	21	650	1,050	761
2	3,500	3,100	728	12	310	5,850	741	22	540	935	746
3	1,600	2,800	646	13	460	4,460	618	23	460	836	1,300
4	720	5,200	588	14	700	3,290	550	24	370	839	1,440
5	360	7,400	530	15	1,100	2,590	581	25	310	1,010	1,590
6	305	9,030	519	16	1,800	2,130	822	26	305	1,220	3,890
7	280	8,380	511	17	3,000	1,790	1,310	27	305	1,230	8,400
8	270	9,240	511	18	2,300	1,560	1,400	28	310	1,240	7,300
9	258	9,320	550	19	900	1,340	1,130	29	340	1,100	4,110
10	250	8,520	1,010	20	760	1,200	897	30	580	945	2,800
								31	1,300	------	2,270
Monthly mean discharge, in cubic feet per second									819	3,620	1,613
Runoff, in inches									0.58	2.49	1.15
Runoff, in acre-feet									50,390	215,400	99,170

Gage height, in feet, and discharge, in cubic feet per second, at indicated time 1965, of North Raccoon River near Jefferson, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 4	0000	13.45	------	Apr. 8	2000	15.12	9,600	May 26	1800	12.02	5,170
	1900	14.03	------		2400	15.15	9,660		2400	12.97	6,360
	2000	15.10	------								
	2200	15.59	------	9	0600	15.11	9,590	27	1000	14.47	8,550
	2400	15.56	------		2400	14.65	8,840		1200	14.56	8,700
									1400	14.79	9,060
5	0600	15.12	------	10	1200	14.50	8,600		1600	14.89	9,220
	1200	14.75	------		2000	14.31	8,300		1900	14.94	9,300
	2330	15.29	9,890		2100	14.15	8,040		2100	14.91	9,260
	2400	15.28	9,880		2400	14.08	7,930		2400	14.80	9,080
6	0600	15.08	9,540	May 25	2400	7.41	1,720	28	0600	14.37	8,390
	1200	14.83	9,130						1200	13.65	7,310
	1800	14.37	8,390	26	0200	7.45	1,750		2400	12.14	5,320
	2400	14.28	8,250		0400	7.66	1,840				
					0600	8.56	2,320	29	1000	11.02	4,170
7	0400	14.23	8,170		0800	9.66	3,040		1400	10.64	3,830
	2400	14.54	8,660		1000	10.46	3,670		1800	10.31	3,550
					1200	10.95	4,100		2400	9.92	3,240
8	1200	14.93	9,290								

(301) 5–4830. East Fork Hardin Creek near Churdan, Iowa

Location.—Lat 42°06'25", long 94°22'10", in SE¼SW¼ sec.5, T.84 N., R.30 W., on left bank 35 ft upstream from county highway bridge, 4.4 miles upstream from mouth, and 6.5 miles southeast of Churdan.

Drainage area.—24.0 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 1,050.90 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 200 cfs, extended to 413 cfs by logarithmic plotting. Backwater from ice Mar. 1 to Apr. 4.

Maxima.—March–May 1965: Discharge, about 300 cfs Mar. 31; gage height, 8.28 ft 1430 hours Mar. 31 (backwater from ice).
1952 to February 1965: Discharge, 413 cfs May 5, 1960 (gage height, 8.92 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	25	150	11	11	27	70	5.5	21	19	5.8	4.5
2	14	80	9.5	12	76	42	5.5	22	16	5.8	5.0
3	8.8	100	8.7	13	58	26	5.0	23	15	5.3	6.5
4	6.8	126	7.6	14	50	19	5.0	24	13	25	7.6
5	5.8	179	8.0	15	44	15	5.2	25	12	59	8.5
6	5.8	156	7.3	16	39	13	5.0	26	11	53	29
7	7.0	136	6.0	17	36	10	4.5	27	11	29	17
8	9.0	134	7.3	18	32	8.0	4.5	28	12	22	11
9	12	113	7.0	19	27	8.0	4.0	29	15	17	8.7
10	18	97	6.0	20	21	7.0	4.2	30	22	13	8.0
								31	160	------	7.3
Monthly mean discharge, in cubic feet per second									26.7	57.5	7.74
Runoff in inches									1.28	2.67	0.37
Runoff, in acre-feet									1,640	3,420	476

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of East Fork Hardin Creek near Churdan, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 31	0000	6.27	------	Apr. 4	2400	4.62	120	Apr. 5	0700	6.13	214
	0700	6.06	------						1200	5.75	188
	1100	6.37	------	5	0200	4.91	138		2200	5.45	170
	1430	8.28	------		0600	6.05	208		2400	5.47	171
	2400	6.73	------								

(302) 5–4836. Middle Raccoon River at Panora, Iowa

Location.—Lat 41°41'15", long 94°22'15", in NE¼NW¼ sec.5, T.79 N., R.30 W., on left bank 15 ft downstream from county highway bridge, 0.2 mile southwest of Panora, and 1.5 miles upstream from Andy's Branch.

Drainage area.—440 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 3. Datum of gage is 991.20 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 4,440 cfs, extended to 9,150 cfs by logarithmic plotting. Backwater from ice Mar. 1–3, 13–16, 19–23.

Maxima.—March–May 1965: Discharge, 6,890 cfs 0330 hours Mar. 17; gage height, 11.54 ft 0530 hours Mar. 2 (backwater from ice).
1953 to February 1965: Discharge, about 14,000 cfs June 10, 1953 (gage height, 14.3 ft).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,800	3,190	201	11	304	733	122	21	280	162	106
2	3,800	3,190	174	12	631	502	117	22	200	155	137
3	1,990	1,510	155	13	1,300	383	114	23	134	142	152
4	1,000	1,860	145	14	1,420	325	106	24	119	156	264
5	525	3,250	135	15	1,540	320	109	25	116	282	236
6	366	2,400	125	16	1,610	285	154	26	111	404	959
7	315	1,220	122	17	3,630	245	145	27	105	417	2,540
8	315	1,050	119	18	984	214	122	28	183	325	1,280
9	281	881	180	19	380	185	112	29	355	275	644
10	256	752	145	20	320	166	106	30	743	231	584
								31	1,950	------	473
Monthly mean discharge, in cubic feet per second									938	840	325
Runoff, in inches									2.46	2.13	0.85
Runoff, in acre-feet									57,650	50,000	20,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Middle Raccoon River at Panora, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 1	0000	7.60	------	Mar. 18	0800	6.07	1,090	Apr. 6	2400	6.67	1,580
	0400	8.75	------		1400	5.51	662				
	0600	9.24	------		1800	5.33	536	May 25	2400	4.89	280
	1200	9.69	------		2400	5.27	496				
	2400	11.12	------					26	0600	5.05	362
				Apr. 3	2400	6.41	1,360		1000	5.09	384
2	0530	11.54	------						1200	5.21	456
	0600	10.24	------	4	0600	6.62	1,540		1300	5.66	775
	0700	9.61	------		1400	7.12	2,020		1400	6.12	1,130
	1100	9.80	------		1800	7.34	2,240		1600	6.58	1,500
	1300	10.18	------		2400	7.22	2,120		2000	6.95	1,850
	2000	9.72	------						2400	7.18	2,080
	2400	8.61	------	5	0200	7.14	2,040				
17	0000	8.34	3,360		0400	7.48	2,380	27	1600	7.81	2,740
	0100	9.14	4,400		0500	8.23	3,230		2200	7.90	2,840
	0330	10.87	6,890		0800	9.35	4,690		2400	7.80	2,730
	0700	9.11	4,350		1200	8.25	3,250				
	0900	8.42	3,450		1600	8.32	3,330	28	0200	7.36	2,260
	1300	8.01	2,960		2000	8.20	3,190		0600	6.57	1,490
	1800	7.77	2,700		2400	8.19	3,180		1000	6.17	1,170
	2400	7.30	2,200						1600	5.86	925
				6	0600	7.99	2,940		2400	5.64	760
	0400	6.66	1,570		1200	7.43	2,330				

(303) 5–4840. South Raccoon River at Redfield, Iowa

Location.—Lat 41°34'45", long 94°11'00", in SW¼SW¼ sec.3, T.78 N., R.29 W., on left bank 10 ft upstream from county highway bridge at Redfield, 0.8 mile downstream from bridge on State Highway 90, 1 mile downstream from Middle Raccoon River, and 15.6 miles upstream from mouth.

Drainage area.—988 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 3–13, 18–31, Apr. 10–15, 18–24, where graph was reconstructed from daily wire-weight gage readings except Mar. 5, 6. Datum of gage is 896.43 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 35,000 cfs. Backwater from ice Mar. 25–27.

Maxima.—March–May 1965: Discharge, 15,800 cfs 1300 hours Mar. 17 (gage height, 19.60 ft).

1940 to February 1965: Discharge, 35,000 cfs July 2, 1958 (gage height, 29.04 ft, from floodmark).

Mean discharge, in cubic feet per second, 1965, of South Raccoon River at Redfield, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	9,520	7,250	470	11	507	1,610	284	21	840	394	216
2	7,310	4,300	416	12	1,130	1,160	268	22	676	376	322
3	3,640	2,780	372	13	2,460	865	256	23	426	356	431
4	1,360	3,210	352	14	3,010	695	244	24	348	370	458
5	780	8,340	340	15	3,600	745	240	25	332	831	546
6	640	5,130	320	16	3,770	695	290	26	322	1,140	1,950
7	508	2,520	300	17	12,500	605	304	27	440	951	2,660
8	500	2,300	304	18	2,800	538	256	28	891	760	1,960
9	493	2,010	392	19	1,120	474	236	29	1,470	632	1,060
10	441	1,820	333	20	955	434	213	30	2,390	542	935
								31	5,030	------	860
Monthly mean discharge, in cubic feet per second									2,265	1,794	567
Runoff, in inches									2.64	2.03	0.66
Runoff, in acre-feet									139,300	106,800	34,890

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 14	0000	8.04	2,860	Mar. 18	0600	9.93	4,260	Apr. 8	0400	6.61	1,880
	1000	8.01	2,840		0700	8.50	3,180		1400	7.57	2,530
	1800	8.37	3,090		0800	7.63	2,570		2000	7.73	2,640
	2400	9.00	3,560		1000	6.50	1,810		2400	7.40	2,410
					1200	5.98	1,490				
15	0400	9.33	3,810		2400	5.59	1,270	May 25	2400	4.09	510
	1400	8.68	3,320								
	2400	9.46	3,900	Apr. 4	2400	8.24	3,000	26	0200	4.48	690
									0300	4.93	915
16	0400	9.77	4,140	5	0200	8.21	2,980		0400	5.34	1,130
	1200	8.99	3,550		0400	8.84	3,440		0800	6.08	1,550
	1600	8.45	3,150		0500	9.87	4,220		1000	6.28	1,670
	1800	10.19	4,470		0600	11.23	5,300		1100	7.23	2,290
	2000	9.02	3,580		0800	13.19	7,130		1300	8.33	3,060
	2200	8.43	3,130		1000	14.76	8,890		1400	8.37	3,090
	2300	9.12	3,650		1600	16.98	11,800		1900	7.07	2,180
	2400	11.00	5,120		1700	16.99	11,800		2400	7.45	2,440
					2200	16.38	11,000				
17	0100	13.13	7,070		2400	14.80	8,940	27	1200	7.63	2,570
	0300	14.94	9,110						2200	8.24	3,000
	0500	17.16	12,000	6	0200	13.07	7,010		2400	8.28	3,030
	1300	19.60	15,800		0600	11.74	5,750				
	1600	19.02	14,900		1200	10.84	4,990	28	0200	8.29	3,030
	2000	17.45	12,500		1800	9.69	4,080		0400	8.24	3,000
	2200	16.75	11,500		2400	8.74	3,360		0600	7.54	2,510
	2400	14.35	8,400						1000	6.64	1,900
				7	0800	7.80	2,690		1600	5.90	1,440
18	0200	12.50	6,440		1600	7.12	2,210		2400	5.45	1,190
	0400	11.32	5,380		2400	6.72	1,950				

(304) 5–4845. Raccoon River at Van Meter, Iowa

Location.—Lat 41°32'00", long 93°57'10", in SW¼SW¼ sec.22, T.78 N., R.27 W., on right bank 100 ft downstream from highway bridge, 0.3 mile northeast of Van Meter, 1.2 miles downstream from confluence of North and South Raccoon River, and 30 miles upstream from mouth.

Drainage area.—3,441 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 6–9, 19–27, May 16 when wire-weight gage readings were available. Datum of gage is 841.16 ft, above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 40,000 cfs. Backwater from ice Mar. 1–31.

Maxima.—March–May 1965: Discharge, 22,300 cfs 0300 hours Apr. 6 (gage height, 18.35 ft).

1915 to February 1965: Discharge, 41,200 cfs June 13, 1947; gage height, 21.77 ft July 3, 1958.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	8,000	13,100	2,190	11	1,000	14,200	1,420	21	3,300	2,090	1,350
2	10,000	11,700	1,930	12	1,300	12,300	1,490	22	2,300	1,870	1,310
3	8,300	11,400	1,720	13	2,800	9,940	1,320	23	1,600	1,710	1,440
4	5,800	11,700	1,570	14	5,000	7,660	1,200	24	1,300	1,700	1,680
5	3,800	16,700	1,450	15	6,400	5,720	1,110	25	1,100	2,350	2,170
6	2,500	19,600	1,360	16	7,600	4,660	1,050	26	980	3,580	3,830
7	1,700	16,700	1,270	17	16,000	3,850	1,300	27	900	3,830	6,520
8	1,400	16,100	1,240	18	11,000	3,240	1,500	28	960	3,410	8,600
9	1,150	14,600	1,250	19	7,000	2,780	1,750	29	2,000	3,000	9,460
10	1,000	14,000	1,270	20	4,800	2,400	1,560	30	3,000	2,580	9,160
								31	8,000	------	5,210
Monthly mean discharge, in cubic feet per second									4,258	7,949	2,570
Runoff, in inches									1.43	2.58	0.86
Runoff, in acre-feet									261,800	473,000	158,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Raccoon River at Van Meter, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 17	0000	11.28	------	Apr. 4	0500	12.50	12,000	Apr. 7	1500	15.22	16,400
	0200	13.25	------		1300	12.27	11,700		2400	15.15	16,200
	0500	15.15	------		2100	11.90	11,200				
	0900	16.64	------		2400	12.14	11,500	May 28	0000	9.84	8,360
	1400	17.58	------						0400	10.14	8,810
	1800	18.06	------	5	0400	12.68	12,300		0800	10.28	9,020
	2000	18.17	------		0600	13.16	13,100		1400	9.95	8,520
	2100	18.20	------		1000	14.82	15,700		1800	9.81	8,320
	2200	18.19	------		1300	16.04	17,700		2400	9.88	8,420
	2400	18.08	------		1600	16.93	19,200				
					2400	18.12	21,700	29	0600	10.19	8,880
18	0300	17.73	------						1200	10.57	9,460
	0600	16.45	------	6	0300	18.35	22,300		1800	10.94	10,000
	0900	14.30	------		0400	18.34	22,200		2400	11.17	10,400
	1300	11.86	------		0600	18.12	21,700				
	1800	10.85	------		1100	16.99	19,300	30	0300	11.20	10,400
	2400	10.25	------		1400	16.55	18,500		0600	11.15	10,300
					1700	16.29	18,100		0900	11.01	10,100
Apr. 3	0000	12.13	11,500		2000	16.12	17,800		1200	10.73	9,700
	0800	11.74	10,900		2400	15.89	17,400		1800	9.69	8,150
	2200	12.38	11,900						2400	8.42	7,770
	2400	12.35	11,800	7	0930	15.41	16,700				

(305) 5–4855. Des Moines River below Raccoon River, at Des Moires, Iowa

Location.—Lat 41°34'30", long 93°35'40", in NE¼SE¼ sec.10, T.78 N., R.24 W., on right bank 10 ft downstream from South East 14th Street bridge, 0.8 mile downstream from Raccoon River and Scott Street Dam, and at mile 200.7.

Drainage area.—9,879 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 762.52 ft above sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 65,000 cfs. Backwater from ice Mar. 14–18, 24–27.

Maxima.—March–May 1965: Discharge, 65,500 cfs 0400 hours Apr. 11 (gage height, 29.78 ft).

1940 to February 1965: Discharge, 77,000 cfs June 26, 1947 (gage height, 20.8 ft in gage well, 21.6 ft from outside flood mark, at site above Scott Street dam, 0.8 mile upstream at datum 11.16 ft higher).

Maximum stage known since at least 1893, that of June 26, 1947.

Cooperation.—Three discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965, of Des Moines River below Raccoon River at Des Moines

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	7,740	17,600	12,000	11	3,210	65,000	7,270	21	7,800	17,900	7,760
2	13,700	22,200	11,100	12	3,170	61,600	7,720	22	5,740	16,300	7,460
3	16,000	22,800	10,300	13	3,860	52,800	7,700	23	4,370	15,000	7,370
4	15,700	24,600	9,430	14	5,000	43,400	7,350	24	3,300	14,500	7,460
5	12,900	29,000	8,700	15	7,000	37,000	6,930	25	2,900	14,500	7,930
6	8,970	43,800	8,040	16	9,000	33,000	6,690	26	2,600	15,200	10,300
7	6,100	52,400	7,700	17	18,000	29,500	6,900	27	2,500	15,200	14,600
8	4,840	57,600	7,880	18	21,000	26,100	7,850	28	2,870	14,900	19,300
9	4,070	62,800	7,800	19	14,500	22,800	8,660	29	3,650	14,000	21,600
10	3,600	65,000	7,410	20	10,200	20,000	8,360	30	4,940	13,000	21,300
								31	8,760	--------	16,200
Monthly mean discharge, in cubic feet per second									7,675	31,320	9,905
Runoff, in inches									0.90	3.54	1.16
Runoff, in acre-feet									471,900	1,863,000	609,100

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	22.22	25,300	Apr. 7	2400	28.20	54,400	Apr. 11	1800	29.65	64,600
	0600	22.50	26,200						2400	29.58	64,100
	1200	23.09	28,300	8	0600	28.46	56,200				
	1800	23.98	31,400		1800	28.85	59,000	12	0600	29.46	63,200
	2400	24.89	35,100		2400	29.08	60,600		1200	29.28	62,000
									1800	29.02	60,100
6	0600	25.83	39,200	9	1200	29.43	63,000		2400	28.70	57,900
	0900	26.30	41,600		2400	29.65	64,600				
	1200	26.78	44,500					13	1200	27.96	52,700
	1800	27.37	48,600	10	1200	29.73	65,100		2400	27.24	47,700
	2400	27.67	50,700		2400	29.77	65,400				
								14	1200	26.58	43,300
7	0600	27.80	51,600	11	0400	29.78	65,500		2400	25.88	39,500
	1800	28.02	53,100		1200	29.73	65,100				

(306) 5–4860. North River near Norwalk, Iowa

Location.—Lat 41°27'25", long 93°39'10", in NW¼SW¼ sec.20, T.77 N., R.24 W., on left bank 10 ft downstream from highway bridge, 1-3/4 miles southeast of Norwalk, 8 miles northwest of Indianola, 8.7 miles upstream from Middle Creek, and 9 miles south of Des Moines.

Drainage area.—349 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 1–10, 22–25. Daily wire-weight readings available for period. Datum of gage is 788.45 above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 9,100 cfs and extended to 32,000 cfs on basis of area-velocity studies. Backwater from ice Mar. 1–30.

Maxima.—March–May 1965: Discharge, about 8,000 cfs Mar. 18 (gage height, 22.86 ft, backwater from ice).
1940 to February 1965: Discharge, 32,000 cfs June 13, 1947 (gage height, 25.3 ft, from floodmark).

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965, of North River near Norwalk, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	600	1,870	134	11	82	456	78	21	1,500	130	44
2	1,200	1,990	117	12	80	445	68	22	800	120	49
3	1,500	1,400	105	13	78	305	62	23	450	110	62
4	800	1,080	97	14	90	252	59	24	250	104	85
5	350	1,260	95	15	600	282	57	25	130	192	90
6	200	2,730	94	16	1,000	254	58	26	120	341	223
7	150	3,140	92	17	2,500	216	59	27	120	305	641
8	110	1,140	101	18	6,400	188	54	28	250	232	279
9	90	836	136	19	6,600	162	49	29	600	187	140
10	86	552	94	20	3,000	144	46	30	1,000	156	138
								31	1,540	------	222
Monthly mean discharge, in cubic feet per second									1,041	686	117
Runoff, in inches									3.44	2.19	0.39
Runoff, in acre-feet									64,020	40,600	7,200

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 14	0000	10.34	------	Mar. 18	2400	22.79	------	Apr. 6	0800	19.94	2,050
	0600	10.64	------						1400	20.39	2,540
	1200	11.12	------	19	0600	22.69	------		1800	20.87	3,510
	1800	11.95	------		1200	22.55	------		2200	21.17	4,250
	2400	13.00	------		1800	22.33	------		2400	21.20	4,330
					2400	21.99	------				
15	0600	14.10	------					7	0300	21.13	4,150
	1200	15.82	------	20	0600	21.67	------		0600	20.99	3,800
	1800	17.60	------		1200	21.48	------		1200	20.68	3,080
	2400	18.60	------		1800	21.21	------		2000	20.22	2,300
					2400	20.84	------		2400	19.91	2,030
16	0600	19.05	------								
	0900	19.17	------	Apr. 4	2400	17.23	1,080	8	0200	19.60	1,820
	1200	19.19	------						0400	19.02	1,550
	2200	19.55	------	5	0630	15.80	850		0600	18.37	1,330
	2400	19.73	------		0900	16.29	926		0900	17.45	1,120
					1100	16.52	963		1200	16.54	966
17	0600	20.57	------		1200	17.12	1,060		1400	16.12	899
	1200	20.92	------		1300	17.30	1,090		1600	15.85	858
	1800	21.21	------		1400	18.60	1,370		1800	15.72	838
	2400	21.65	------		1600	19.25	1,600		2000	15.70	835
					2000	19.48	1,700		2400	15.77	846
18	1600	22.85	------		2400	19.63	1,820				
	1800	22.86	------								

(307) 5–4864.9 Middle River near Indianola, Iowa

Location.—Lat 41°25'25", long 93°35'05", in SW¼SE¼ sec. 35, T.77 N., R.24 W., on right bank 10 ft downstream from county highway bridge, 0.5 mile upstream from Cavitt Creek, and 4.5 miles northwest of Indianola.

Drainage area.—503 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 776.15 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from ice Mar. 1–16, 21–30.

Maxima.—March–May 1965: Discharge, 9,700 cfs 1930 hours Mar. 17; gage height, 21.00 ft 0630 hours Apr. 6.
1940 to February 1965: Discharge, 34,000 cfs June 13, 1947 (gage height, 28.27 ft, from floodmark).

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	930	2,340	239	11	145	953	161	21	350	234	101
2	1,180	1,390	215	12	150	696	144	22	250	217	104
3	800	822	203	13	160	493	136	23	200	203	137
4	300	1,110	185	14	310	414	130	24	190	206	171
5	200	4,360	189	15	820	427	124	25	170	509	176
6	180	7,640	192	16	2,400	395	122	26	160	660	195
7	170	1,690	181	17	8,500	367	121	27	210	463	586
8	165	1,840	215	18	6,620	310	114	28	350	412	326
9	160	2,710	318	19	3,350	276	108	29	600	319	198
10	150	1,070	190	20	791	251	102	30	1,100	290	339
								31	1,770	------	234
Monthly mean discharge, in cubic feet per second									1,059	1,102	192
Runoff, in inches									2.43	2.44	0.44
Runoff, in acre-feet									65,120	65,590	11,810

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 17	0000	13.96	3,890	Mar. 18	1200	17.10	6,160	Apr. 5	0900	9.65	1,230
	0100	15.22	4,770		1800	16.00	5,280		0930	10.73	1,710
	0200	16.78	5,940		2400	15.70	5,080		1000	11.50	2,060
	0300	18.19	7,210						1030	12.45	2,530
	0600	19.23	8,270	19	0600	15.31	4,760		1100	13.77	3,260
	0700	19.19	8,230		0900	14.87	4,450		1130	14.83	3,870
	0800	19.84	8,940		1200	13.68	3,660		1200	15.47	4,280
	0900	19.57	8,640		1500	11.57	2,400		1300	16.73	5,130
	1400	20.07	9,210		1800	10.62	1,880		1400	17.89	6,030
	1600	20.16	9,330		2400	9.36	1,240		1600	19.18	7,200
	1930	20.45	9,700						1800	19.80	7,820
	2400	20.03	9,160	Apr. 4	2400	8.93	935		2400	20.47	8,540
18	0600	19.12	8,100	5	0500	8.95	942	6	0300	20.72	8,810
	0900	17.81	6,800		0700	9.07	990		0630	21.00	9,120

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Middle River near Indianola, Iowa—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 6	0900	20.90	9,010	Apr. 7	2400	9.05	980	Apr. 9	0300	15.55	4,320
	1200	20.33	8,380						0500	15.93	4,570
	1600	19.01	7,030	8	0430	8.88	913		0700	15.54	4,320
	2000	17.78	5,940		0600	8.92	931		0800	14.92	3,930
	2200	16.80	5,180		1000	9.97	1,370		0900	13.75	3,240
	2300	16.07	4,670		1400	10.97	1,820		1100	12.23	2,420
	2400	14.83	3,870		1700	11.85	2,230		1400	10.98	1,830
7	0200	12.92	2,790		1900	13.00	2,830		1700	10.49	1,610
	0500	11.43	2,030		2200	14.02	3,390		2400	9.83	1,310
	1200	10.12	1,440		2400	14.67	3,770				

(308) 5–4874.70 South River near Ackworth, Iowa

Location.—Lat 41°20'15", long 93°29'05", in SE¼SE¼ sec.34, T.76 N., R.23 W., on right bank 15 ft downstream from county highway bridge, 2 miles southwest of Ackworth and 0.6 mile downstream from Otter Creek. Prior to Oct. 1, 1961, at site 3.8 miles downstream.

Drainage area.—460 sq mi. Prior to October 1, 1961, 474 sq mi.

Gage-height record.—Water-stage recorder graph, except May 11–28, 30, when daily wire weight gage readings were available. Datum of gage is 769.97 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 30,000 cfs. Backwater from ice Mar. 1–29.

Maxima.—March–May 1965: Discharge, 12,100 cfs 1030 hours Mar. 17 (gage height, 25.47 ft).

1940 to February 1965: Discharge, 34,000 cfs June 5, 1947 (gage height, 24.60 ft, at site 3.8 miles down stream at datum 8.01 ft lower).

Flood in June 1930 reached a stage of 24.5 ft, from information by local residents (discharge, about 30,000 cfs), at site 3.8 miles down stream.

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	250	1,640	195	11	45	2,030	199	21	150	96	63
2	100	542	156	12	35	668	156	22	100	84	73
3	150	460	120	13	40	350	125	23	70	79	96
4	120	671	250	14	150	288	106	24	64	321	88
5	90	2,810	262	15	700	312	153	25	58	3,350	82
6	80	3,680	203	16	1,700	249	300	26	90	1,320	239
7	70	863	135	17	10,000	189	143	27	170	624	195
8	62	3,400	1,560	18	3,000	149	96	28	900	719	99
9	56	2,700	1,550	19	400	127	75	29	1,400	372	72
10	50	1,000	365	20	200	106	66	30	1,580	251	237
								31	2,010	------	181
Monthly mean discharge, in cubic feet per second									771	982	246
Runoff, in inches									1.93	2.38	0.62
Runoff, in acre-feet									47,390	58,410	15,150

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of South River near Ackworth, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 16	0000	11.10	------	Mar. 18	0200	20.35	------	Apr. 6	1800	12.10	2,500
	0100	11.25	------		0400	17.55	------		2400	9.80	1,440
	0230	11.76	------		0600	15.35	------				
	1000	10.94	------		0800	13.70	------	7	0600	8.73	1,010
	1400	10.85	------		1000	12.63	------		1200	8.12	806
	1500	10.87	------		1400	11.37	------		1800	7.57	641
	1800	12.00	------		1800	10.98	------		2400	7.26	548
	2100	13.30	------		2100	10.65	------	8	0500	7.13	512
	2400	15.05	------		2400	9.83	------		0800	9.00	1,120
									1000	12.00	2,450
17	0200	18.80	------	Apr. 4	2400	7.22	536		1200	14.15	3,540
	0400	21.90	------						1400	16.10	4,720
	0600	22.65	------	5	0300	7.19	528		1600	17.65	5,800
	0700	24.70	------		0800	7.37	581		1700	18.30	6,260
	0900	25.33	12,000		0900	10.65	1,780		1930	18.57	6,450
	1030	25.47	12,100		1000	13.00	2,950		2200	17.65	5,800
	1300	25.30	12,000		1300	14.52	3,760		2400	16.80	5,210
	1400	25.06	11,800		1900	16.01	4,660				
	1500	25.10	11,800		2400	16.52	5,010	9	0600	14.38	3,680
	1600	24.98	------						1000	13.22	3,060
	1900	24.77	------	6	0600	16.62	5,080		1400	11.42	2,160
	2100	24.38	------		1000	15.55	4,380		1800	9.68	1,390
	2400	22.40	------		1400	13.87	3,380		2400	8.57	954

(309) 5–4879.8 White Breast Creek near Dallas, Iowa

Location.—Lat 41°14'45", long 93°15'50", in NE¼NW¼ sec.3, T.74 N., R.21 W., on left bank 15 ft downstream from county highway bridge, ½ mile downstream from Kirk Branch, and 2¼ miles northwest of Dallas.

Drainage area.—342 sq mi.

Gage-height record.—Water-stage recorder graph, except April 29 to May 1. Once-daily tape gage readings available for this period. Datum of gage is 759.12 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 6,400 cfs. Backwater from ice Mar. 1–16, 19–30.

Maxima.—March–May 1965: Discharge, 6,640 cfs 1100 hours Mar. 17 (gage height, 22.49).

1962 to February 1965: Discharge, 12,000 cfs (estimated) June 11, 1962 (gage height, 28.87 ft, from flood mark).

Flood of June 6, 1947, may have been slightly higher than the flood of June 11, 1962.

Cooperation.—One discharge measurement furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965, of White Breast Creek near Dallas, Iowa

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	450	985	142	11	66	2,070	163	21	200	112	38
2	350	492	127	12	60	866	112	22	150	98	38
3	270	439	107	13	70	316	86	23	130	91	40
4	220	638	370	14	150	270	71	24	110	177	39
5	180	2,680	156	15	500	548	100	25	90	2,390	41
6	150	3,130	119	16	1,100	383	116	26	80	1,590	114
7	120	1,780	94	17	5,540	244	119	27	140	521	130
8	100	2,150	131	18	2,380	184	69	28	300	481	78
9	85	2,010	899	19	700	148	47	29	700	280	45
10	75	1,130	738	20	350	126	41	30	850	200	40
								31	1,040	------	120
Monthly mean discharge, in cubic feet per second									539	884	146
Runoff, in inches									1.82	2.88	0.49
Runoff, in acre-feet									33,140	52,620	8,990

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 15	0000	7.91	------	Mar. 18	2100	13.46	2,080	Apr. 6	0800	16.42	3,360
	0400	8.00	------		2400	13.52	2,110		1200	15.82	3,060
	1000	8.23	------						1700	14.67	2,570
	1100	8.47	------	19	0300	13.57	2,130		2100	14.19	2,380
	1300	8.39	------		1000	13.42	2,070		2400	14.09	2,340
	1500	8.49	------		1600	13.32	------				
	1700	9.30	------		2000	13.37	------	7	0800	13.96	2,280
	1900	10.23	------		2400	12.80	------		1000	13.89	2,260
	2000	10.56	------						1200	13.64	2,160
	2200	10.78	------	20	0500	10.55	------		1400	12.82	1,830
	2400	10.84	------		0800	8.95	------		1700	11.09	1,300
					1000	8.37	------		2100	9.72	886
16	0300	10.97	------		1200	8.00	------		2400	8.88	670
	0600	10.94	------		1400	7.67	------				
	1030	10.83	------		1700	7.47	------	8	0000	8.55	588
	1300	11.07	------		2000	7.42	------		0400	8.49	572
	1400	10.86	------		2200	7.41	------		0500	8.48	570
	1700	12.84	------		2400	7.31	------		0600	8.62	605
	2000	13.79	2,220						0700	9.01	702
	2200	14.14	2,360	Apr. 4	2400	8.60	600		0730	10.00	970
	2400	15.60	2,950						0800	11.30	1,360
				5	0400	8.39	548		0900	12.60	1,750
17	0130	18.00	4,150		0500	8.37	542		1000	13.70	2,180
	0300	20.65	5,540		0600	8.42	555		1100	14.68	2,570
	0400	21.39	5,980		0700	9.74	892		1300	15.45	2,880
	0600	21.84	6,250		0800	11.24	1,340		1700	16.38	3,340
	1000	22.44	6,610		1000	13.62	2,150		1800	16.43	3,360
	1100	22.49	6,640		1200	15.72	3,010		2000	16.42	3,360
	1200	22.41	6,600		1400	17.22	3,760		2030	16.16	3,230
	1400	21.91	6,300		1530	17.41	3,860		2400	15.48	2,890
	1700	20.65	5,540		1730	17.37	3,840				
	2400	17.38	3,840		1900	19.12	4,710	9	0300	15.03	2,710
					2000	19.43	4,860		0800	13.71	2,180
18	0500	15.12	2,750		2100	19.41	4,860		1300	13.00	1,900
	0900	13.78	2,210		2300	19.21	4,760		1800	12.35	1,680
	1100	13.37	2,050		2400	18.92	4,610		2400	10.65	1,160
	1300	13.22	1,990								
	1630	13.20	1,980	6	0500	17.05	3,680	10	0400	9.53	832

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Whitebreast Creek near Dallas, Iowa—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0600	9.16	740	Apr. 11	0130	16.18	3,240	Apr. 12	0300	11.60	1,450
	1000	9.37	792		0200	16.13	3,220		0600	10.76	1,200
	1730	9.00	700		0300	15.25	2,800		0900	9.83	919
	1900	10.10	1,000		0600	13.65	2,160		1200	9.13	732
	2000	12.50	1,720		0800	13.20	1,980		1500	8.66	615
	2100	13.90	2,260		1000	13.00	1,900		1800	8.29	523
	2300	15.65	2,980		1800	12.64	1,760		2100	8.00	465
	2400	16.06	3,180		2400	12.19	1,630		2400	7.77	419

(310) 5–4885. Des Moines River near Tracy, Iowa

Location.—Lat 41°16'55", long 92°51'30", in NW¼SE¼ sec.19, T.75 N., R.17 W., on right bank 250 ft upstream from abandoned Bellefountaine Bridge, 0.5 mile downstream from bridge on State Highway 92, 0.8 mile east of Tracy, 3.1 miles upstream from Cedar Creek, and 6.4 miles downstream from English Creek, and at mile 130.3.

Drainage area.—12,479 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 1–5, 17–23, 24. Daily outside readings available for these periods. Datum of gage is 670.91 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 155,000 cfs. Backwater from ice Mar. 1–15.

Maxima.—March–May 1965: Discharge, 77,300 cfs 1930 hours Apr. 11 (gage height, 23.17 ft).

1920 to February 1965: Discharge 155,000 cfs June 14, 1947 (gage height, 23.5 ft). Maximum stage known since 1881, that of June 14, 1947. Flood of May 31, 1903, reached a stage of about 25 ft (discharge, about 130,000 cfs).

Cooperation.—Three discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,000	17,800	15,000	11	5,000	76,300	9,020	21	20,000	24,600	8,800
2	6,000	22,900	13,700	12	4,500	75,600	8,440	22	13,100	20,700	8,320
3	8,400	25,100	12,600	13	4,300	69,700	8,620	23	9,420	18,200	8,180
4	11,000	26,600	11,500	14	5,000	62,400	8,560	24	6,920	17,200	8,060
5	15,000	29,500	11,400	15	7,600	54,200	8,200	25	5,570	21,600	8,120
6	16,000	39,400	10,200	16	16,700	47,000	8,000	26	4,840	26,500	8,800
7	13,000	48,600	9,440	17	28,300	41,400	7,760	27	4,470	20,800	11,300
8	11,000	55,900	9,000	18	38,400	37,300	7,660	28	5,660	18,900	15,000
9	8,000	66,800	10,700	19	38,200	33,300	8,380	29	8,340	18,000	18,100
10	5,400	75,300	10,900	20	33,900	28,900	9,020	30	9,400	16,300	19,900
								31	12,300	--------	20,800
Monthly mean discharge, in cubic feet per second									12,250	37,890	10,760
Runoff, in inches									1.13	3.39	0.99
Runoff, in acre-feet									753,200	2,255,000	661,400

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Des Moines River at Tracy, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 1	0000	11.17	14,400	Apr. 5	1100	15.74	28,400	Apr. 9	1000	22.28	67,200
	0300	11.22	14,500		1300	15.88	28,900		1800	22.69	71,700
	1300	12.70	18,400		1800	16.41	30,900		2100	22.65	71,200
	2000	13.35	20,300		2400	17.09	33,700		2400	22.87	73,700
	2400	13.65	21,300								
				6	0300	17.65	36,200	10	0400	23.02	75,500
2	0400	13.86	22,000		2200	19.06	43,200		0800	23.07	76,100
	1200	14.18	23,000		2400	19.22	44,100		1800	22.98	75,100
	2400	14.54	24,200						2400	22.98	75,100
				7	1200	20.02	48,900				
3	0400	14.65	24,600		2400	20.54	52,600	11	0600	23.01	75,400
	1200	14.83	25,200						1600	23.16	77,200
	1800	14.91	25,500	8	0500	20.88	55,000		1930	23.17	77,300
	2400	14.98	25,700		0800	21.00	55,800		2400	23.15	77,100
					1200	21.01	55,900				
4	1200	15.22	26,600		1900	21.11	56,700	12	1300	23.05	75,900
	1800	15.35	27,000		2100	21.20	57,400		2400	22.81	73,000
	2400	15.45	27,400		2400	21.39	58,900				
								13	1200	22.51	69,700
5	0600	15.59	27,900	9	0800	21.83	62,800		2400	22.20	66,400

(311) 5–4890. Cedar Creek near Bussey, Iowa

Location.—Lat 41°13'10", long 92°54'25", on south line in SW¼SW¼ sec.11, T.74 N., R.18 W., on left bank at downstream side of bridge on State Highway 156, 1.6 miles northwest of Bussey, and 8.9 miles upstream from mouth.

Drainage area.—374 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 20–23. Datum of gage is 682.15 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 28,000 cfs. Backwater from ice Mar. 1–16, 19–28.

Maxima.—March–May 1965: Discharge, 6,500 cfs 0100 hours Mar. 18 (gage height, 20.51 ft).

1947 to February 1965: Discharge, 29,300 cfs May 9, 1950; gage height, 28.06 ft July 2, 1958.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	500	803	220	11	47	3,360	75	21	300	161	34
2	350	410	176	12	46	1,250	68	22	200	138	34
3	110	380	138	13	50	845	63	23	150	126	33
4	70	605	140	14	90	662	55	24	110	150	34
5	64	2,090	151	15	350	1,220	72	25	95	3,420	34
6	58	4,690	135	16	900	640	161	26	85	3,100	45
7	55	908	112	17	4,710	400	95	27	100	622	85
8	52	2,060	102	18	3,890	290	58	28	550	550	64
9	50	2,800	144	19	600	220	43	29	1,170	360	32
10	49	1,260	106	20	450	187	36	30	668	275	29
								31	887	------	29
Monthly mean discharge, in cubic feet per second									542	1,133	84.0
Runoff, in inches									1.67	3.38	0.26
Runoff, in acre-feet									33,330	67,400	5,160

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965, of Cedar Creek near Bussey, Iowa

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Mar. 17	0000	12.45	2,110	Apr. 6	1600	19.47	5,330	Apr. 10	2200	11.66	1,830
	0100	13.25	2,400		1800	18.71	4,730		2400	12.96	2,280
	0200	14.70	2,980		1900	17.66	4,180	11	0300	14.76	3,000
	0300	15.65	3,360		2100	15.26	3,200		0600	16.49	3,700
	0600	17.00	3,900		2400	11.89	1,910		0900	17.02	3,910
	0800	17.72	4,210						1100	17.18	3,970
	1500	19.18	5,080	7	0300	9.93	1,260		1200	17.19	3,980
	1900	20.10	5,970		0600	9.09	1,020		1400	16.94	3,880
	2200	20.40	6,350		0900	8.60	882		1600	16.34	3,640
	2400	20.50	6,490		1200	8.37	795		1800	15.47	3,290
					1600	7.94	710		2200	14.43	2,870
18	0100	20.51	6,500		2000	7.72	655		2400	12.20	2,020
	0200	20.49	6,480		2400	7.52	605	12	0300	10.97	1,590
	0400	20.37	6,310						0600	10.27	1,360
	0600	20.05	5,910	8	0400	7.43	582		0900	9.85	1,240
	0900	19.25	5,140		0500	7.45	588		1200	9.61	1,160
	1200	18.16	4,430		0700	7.83	682		1800	9.23	1,060
	1400	16.80	3,820		1000	8.76	925		2400	8.94	974
	1600	13.75	2,600		1200	10.50	1,430				
	1700	12.20	2,020		1400	13.18	2,370	24	2400	6.12	255
	1800	11.00	1,600		1500	14.34	2,840				
	2000	9.10	1,020		1700	15.83	3,430	25	0200	7.01	478
	2200	8.20	777		1900	16.80	3,820		0400	8.52	860
	2400	7.75	662		2200	17.66	4,180		0600	16.34	1,720
					2400	17.95	4,320		0800	14.32	2,830
Apr. 4	2400	6.78	420						1000	16.00	3,500
				9	0200	18.13	4,420		1200	17.10	3,940
5	0500	6.75	412		0300	18.14	4,420		1500	18.19	4,450
	0700	7.00	475		0400	18.08	4,390		1800	18.93	4,880
	0900	7.84	685		0600	17.66	4,180		2100	19.59	5,450
	1100	9.10	1,020		0900	16.57	3,730		2400	20.06	5,920
	1200	10.60	1,460		1100	15.24	3,200	26	0130	20.11	5,980
	1300	12.60	2,160		1200	14.39	2,860		0300	20.01	5,860
	1500	14.82	3,030		1400	12.66	2,180		0500	19.53	5,390
	1800	17.12	3,950		1700	10.69	1,490		0700	18.80	4,790
	2100	17.89	4,300		2000	9.84	1,230		1000	16.83	3,830
	2400	18.38	4,540		2400	9.39	1,100		1200	14.18	2,770
									1400	11.63	1,820
6	0600	19.14	5,050	10	0200	9.33	1,080		1700	9.57	1,150
	1200	19.79	5,640		0700	9.33	1,080		2000	8.75	922
	1300	19.81	5,660		1000	9.36	1,090		2400	8.24	787
	1400	19.77	5,620		1600	9.27	1,070				

(312) 5–4895. Des Moines River at Ottumwa, Iowa

Location.—Lat 41°00'40", long 92°24'40", in SE¼NE¼ sec.25, T.72 N., R.14 W., on right bank 15 ft downstream from Wabash Railroad Bridge at Ottumwa, 6.5 miles upstream from Village Creek, 9.5 miles downstream from South Avery Creek, and at mile 94.1.

Drainage area.—13,374 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 622.00 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 130,000 cfs. Backwater from ice. Mar. 3, 10–13.

Maxima.—March–May 1965: Discharge, 78,600 cfs 0800 hours Apr. 11 (gage height, 18.33 ft).

1917 to February 1965: Discharge, 135,000 cfs June 7, 1947 (gage height, 20.2 ft, at site 1,100 ft downstream at Vine Street Bridge at datum 0.77 ft higher).

Flood of June 7, 1947 is the highest stage known since 1850. Flood of May 31, 1903, reached a stage of 19.4 ft, former site and datum at Vine Street Bridge or about 22 ft at Market Street Bridge, from information by Corps of Engineers and U.S. Weather Bureau (discharge estimated as 140,000).

Cooperation.—Three discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	3,620	16,600	16,000	11	5,400	77,600	9,670	21	26,700	25,600	9,100
2	5,820	22,000	14,500	12	5,000	77,300	8,650	22	17,100	22,100	8,710
3	7,200	25,500	13,300	13	4,650	74,000	8,200	23	12,400	19,300	8,350
4	9,790	26,000	12,200	14	5,350	67,400	7,570	24	8,530	18,500	8,290
5	12,400	28,400	12,300	15	6,950	60,200	7,990	25	6,490	24,500	8,260
6	14,900	36,100	11,200	16	12,200	51,600	7,930	26	5,680	29,200	8,890
7	16,200	41,000	9,910	17	34,600	44,200	8,050	27	4,700	24,500	10,600
8	13,500	47,900	9,250	18	31,800	38,600	7,600	28	6,100	20,300	14,300
9	9,350	53,900	9,790	19	35,100	33,800	7,960	29	10,200	19,300	18,100
10	6,000	67,500	11,600	20	34,400	30,000	8,950	30	11,200	17,600	20,400
								31	12,100	--------	21,400
Monthly mean discharge, in cubic feet per second									12,760	38,020	10,940
Runoff, in inches									1.10	3.17	0.94
Runoff, in acre-feet									784,300	2,262,000	672,400

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0000	16.81	59,900	Apr. 11	1200	18.27	77,800	Apr. 13	1200	17.97	74,500
	0800	17.31	65,200		2400	18.21	77,100		2400	17.70	70,500
	1800	17.72	70,700								
	2400	18.14	76,300	12	1200	18.27	77,800	14	2400	17.20	64,200
11	0800	18.33	78,600		2400	18.14	76,300				

(313) 5–4905. Des Moines River at Keosauqua, Iowa

Location.—Lat 40°43'45", long 91°57'45", in SE¼SW¼ sec.36, T.69 N., R.10 W., on right bank 10 ft upstream from bridge on State Highway 1 at Keosauqua, 4.0 miles downstream from Chequest Creek, and at mile 51.3 (revised).

Drainage area.—14,038 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 557.36 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 125,000 cfs. Backwater from ice Mar. 1–18.

Maxima.—March–May: Discharge, 79,800 cfs 0400 hours Apr. 12 (gage height, 19.36 ft). 1903–06, 1910 to February 1965: Discharge, 146,000 cfs June 1, 1903 (gage height, 27.85 ft, from floodmark).
Flood of June 1, 1851, reached a stage of 24 ft (discharge not determined).

Cooperation.—Two discharge measurements furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,700	15,000	16,100	11	7,000	74,600	10,700	21	33,300	27,900	8,880
2	5,000	20,700	14,500	12	5,500	79,200	8,740	22	19,100	23,400	8,990
3	7,500	24,700	13,300	13	5,000	77,400	8,180	23	14,100	19,900	8,260
4	9,500	26,700	12,200	14	6,000	73,800	8,350	24	9,950	18,200	8,120
5	12,000	30,200	11,600	15	8,000	72,500	8,380	25	7,120	24,000	8,070
6	15,000	43,400	11,500	16	12,000	63,000	8,100	26	6,050	31,100	8,290
7	17,000	43,400	10,100	17	35,000	53,400	8,010	27	5,320	28,100	9,720
8	15,000	53,300	9,270	18	36,000	44,800	7,790	28	5,070	20,800	12,300
9	11,000	59,900	9,080	19	38,200	38,100	7,560	29	9,240	19,400	16,400
10	9,000	61,800	10,800	20	38,200	32,800	8,240	30	11,200	17,900	19,100
								31	11,400	--------	20,500
Monthly mean discharge, in cubic feet per second									13,760	40,650	10,680
Runoff, in inches									1.13	3.23	0.88
Runoff, in acre-feet									845,900	2,419,000	656,800

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0000	15.39	58,100	Apr. 11	2400	19.30	79,400	Apr. 14	1200	18.27	73,600
	0600	15.62	59,300	12	0400	19.36	79,800		2000	18.01	72,200
	1200	15.99	61,200		1200	19.30	79,400		2400	18.22	73,300
	1800	16.43	63,700		2400	19.13	78,400				
	2400	17.20	67,800					15	0400	18.49	74,800
11	0600	17.99	72,000	13	1200	19.00	77,700		1200	18.21	73,300
	1200	18.52	75,000		2400	18.70	76,000		2400	17.35	68,600
	1800	19.00	77,700								

(314) 5–4910. Sugar Creek near Keokuk, Iowa

Location.—Lat 40°26'45", long 91°28'55", in SE¼NW¼ sec.7, T.65 N., R.5 W., on left bank 10 ft downstream from highway bridge, 4.1 miles upstream from mouth, and 6 miles northwest of Keokuk.

Drainage area.—105 sq mi.

Gage-height record.—Water-stage recorder graph, except Mar. 18, 19, 21 to Apr. 4, Apr. 22, 23, 26–28, when no wire weight gage readings were available. Mar. 20, Apr. 5, 6, 24, 25 when wire weight readings were used. Datum of gage is 510.20 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 3,800 cfs and extended on basis of logarithmic plotting. Backwater from ice Mar. 1–6, 9–14, 20.

Maxima.—March–May 1965: Discharge, 4,580 cfs 0130 hours Apr. 6 (gage height, 12.65 ft, from floodmark).
1905 to February 1965: Discharge, 33,000 cfs June 9, 1905 (gage height, 20.6 ft, from floodmark), estimated on basis of area-velocity study.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	65	60	28	11	13	816	26	21	45	28	5.0
2	50	50	23	12	12	309	22	22	38	20	4.7
3	45	60	20	13	17	96	16	23	32	16	4.3
4	42	160	18	14	60	125	12	24	28	41	4.0
5	50	1,850	18	15	173	611	21	25	25	680	4.3
6	40	2,080	18	16	364	219	45	26	23	300	13
7	19	355	17	17	2,080	86	17	27	100	80	16
8	16	531	278	18	450	56	10	28	400	50	6.1
9	15	717	217	19	95	44	7.6	29	250	41	4.3
10	14	411	45	20	55	34	6.1	30	120	34	3.4
								31	80	------	2.8
Monthly mean discharge, in cubic feet per second									155	332	30.1
Runoff, in inches									1.71	3.53	0.33
Runoff, in acre-feet									9,550	19,760	1,850

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	6.00	546	Apr. 6	0300	12.50	4,450	Apr. 7	0600	5.57	498
	0600	7.70	970		0800	11.07	2,510		1200	4.42	279
	1200	9.35	1,560		1200	8.97	1,400		1800	3.85	182
	1800	11.00	2,380		1500	7.49	967		2400	3.58	143
	2400	12.58	4,400		2400	6.69	746				
6	0130	12.65	4,580								

FOX RIVER BASIN

(315) 5–4943. Fox River at Bloomfield, Iowa

Location.—Lat 40°46'10", long 92°25'10", in SW¼SE¼ sec.13, T.69 N., R.14 W., on left bank 15 ft downstream from highway bridge, 1¼ miles north of Bloomfield, and 8.6 miles downstream from North Fox Creek.

Drainage area.—87.7 sq mi.

Gage-height record.—Water-stage recorder graph, except May 8, 9. Datum of gage is 755.57 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 5,400 cfs and by slope-area measurement at 8,600 cfs. Backwater from ice Mar. 1–15, 17–27.

Maxima.—March–May 1965: Discharge, 5,060 cfs 1200 hours Apr. 8 (gage height, 19.67 ft).

1957 to February 1965: Discharge, 8,600 cfs May 6, 1960 (gage height, 24.02 ft).

Floods of June 9, 1905, and June 18, 1946, were highest known (stage and discharge unknown).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	90	83	22	11	8.2	1,480	17	21	34	20	3.8
2	50	60	17	12	8.0	129	15	22	30	15	8.6
3	28	96	14	13	12	59	10	23	27	14	10
4	15	130	14	14	150	241	7.2	24	25	12	7.2
5	11	543	15	15	350	846	7.7	25	24	441	3.1
6	10	490	15	16	761	126	7.7	26	23	140	91
7	9.6	142	12	17	2,570	60	5.9	27	60	64	152
8	9.2	2,360	46	18	150	36	5.6	28	317	58	32
9	8.8	251	112	19	90	28	5.2	29	236	40	17
10	8.4	739	27	20	45	24	4.2	30	100	31	14
								31	88	-------	10
Monthly mean discharge, in cubic feet per second									173	292	23.5
Runoff, in inches									2.27	3.71	0.31
Runoff, in acre-feet									10,610	17,370	1,440

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 8	0000	4.31	102	Apr. 8	2000	13.14	1,800	Apr. 10	0300	4.60	137
	0400	4.27	97		2100	11.24	1,250		0600	4.51	124
	0530	4.31	102		2300	8.99	768		0700	4.50	123
	0600	5.89	290		2400	8.09	615		0800	4.53	127
	0630	9.49	859						0900	4.57	133
	0700	13.19	1,820	Apr. 9	0100	7.46	513		1100	6.24	334
	0730	14.64	2,340		0300	6.66	398		1200	8.09	615
	0800	15.99	2,920		0500	6.15	328		1300	10.11	988
	0830	16.99	3,410		0700	5.77	273		1400	10.39	1,050
	0900	18.04	4,040		1000	5.37	274		1500	10.34	1,030
	1000	18.97	4,600		1500	5.01	180		1800	9.76	907
	1200	19.67	5,060		1630	4.96	180		1830	9.54	870
	1400	19.19	4,730		1700	4.96	180		1930	9.55	872
	1800	16.81	3,310		2000	4.82	161		2000	9.69	903
	1900	15.16	2,540		2400	4.66	138		2100	12.39	1,580

Gage height, in feet, and discharge, in cubic feet per second, at indicated time 1965, of Fox River at Bloomfield, Iowa—Continued

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr.10	2200	14.26	2,170	Apr. 11	0630	16.55	3,180	Apr. 11	2400	5.37	224
	2400	15.74	2,800		0700	16.41	3,100				
					0800	15.54	2,710	Apr. 12	0400	4.94	178
11	0130	16.03	2,930		0900	13.90	2,060		0430	4.96	180
	0200	16.05	2,940		1030	11.04	1,200		0900	4.60	137
	0230	16.13	2,970		1200	9.66	896		1400	4.34	104
	0330	16.07	2,950		1500	7.43	508		2000	4.17	87
	0500	16.38	3,090		1800	6.39	356		2400	4.07	74
	0530	16.56	3,180		2200	5.62	259				

(316) 5–4950. Fox River at Wayland, Mo.

Location.—Lat 40°23'45", long 91°35'50", in NW¼ sec.31, T.65 N., R.6 W., on left bank 90 ft downstream from bridge on U.S. Highway 136, three-quarters of a mile west of Wayland, and 5 miles downstream from Brush Creek.

Drainage area.—400 sq mi, approximately.

Gage-height record.—Digital recorder tape punched at 15 minute intervals. Datum of gage is 501.52 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 5,370 cfs 0345 hours Apr. 6 (gage height, 15.97 ft).

1922 to February 1965: Discharge, 25,000 cfs June 29, 1933 (gage height, 21.53 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	139	310	136	11	126	2,660	101	21	266	145	29
2	383	256	109	12	109	2,620	71	22	212	134	27
3	178	208	92	13	121	910	57	23	167	147	28
4	82	304	80	14	379	430	49	24	118	122	25
5	49	2,200	75	15	889	1,790	112	25	119	1,080	26
6	99	4,780	90	16	1,720	1,830	93	26	114	2,410	40
7	98	1,880	81	17	4,240	610	48	27	103	727	48
8	81	891	80	18	4,630	345	40	28	126	333	49
9	114	2,420	114	19	2,260	224	35	29	781	231	116
10	136	2,730	98	20	456	169	32	30	876	174	60
								31	408	-------	38
Monthly mean discharge, in cubic feet per second									632	1,102	67.1
Runoff, in inches									1.82	3.07	0.19
Runoff, in acre-feet									38,830	65,590	4,120

BEAR CREEK BASIN

(317) 5–4955. Bear Creek near Marcelline, Ill.

Location.—Lat 40°08'34", long 91°20'14", between secs.20 and 21, T.2 N., R.8 W., on right bank at downstream side of highway bridge, 0.9 mile downstream from Grindstone Creek, 2¼ miles northeast of Marcelline, and 12 mile upstream from mouth.

Drainage area.—348 sq mi.

Gage-height record.—Water-stage recorder graph. Datum of gage is 504.52 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements below 15,200 cfs and extended above by logarithmic plotting.

Maxima.—April–May 1965: Discharge, 11,400 cfs 1615 hours Apr. 6 (gage height, 19.46 ft).
1944 to March 1965: Discharge, 21,200 cfs July 22, 1951 (gage height, 26.07 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	359	48	11	1,140	23	21	92	20
2	275	42	12	560	21	22	80	15
3	177	38	13	219	19	23	72	12
4	218	36	14	181	18	24	63	11
5	1,660	35	15	1,080	64	25	223	9.3
6	8,620	34	16	521	473	26	145	14
7	1,890	30	17	237	199	27	89	23
8	390	29	18	166	52	28	73	23
9	244	29	19	130	31	29	63	16
10	497	28	20	106	24	30	55	12
						31	--------	9.3
Monthly mean discharge, in cubic feet per second							354	46.4
Runoff, in inches							2.10	0.15

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 5	0000	5.16	271	Apr. 5	2200	14.10	5,500	Apr. 7	0200	12.00	3,820
	0300	5.14	267		2400	14.55	5,900		0600	10.00	2,420
	0600	5.10	258						1200	8.35	1,460
	0800	5.10	258	6	0200	15.10	6,400		1800	7.30	967
	1000	5.35	312		1000	17.55	8,880		2400	6.33	586
	1100	5.80	424		1615	19.46	11,400				
	1200	6.60	687		2100	18.00	9,420	8	0400	5.95	466
	1300	7.50	1,050		2200	16.15	7,390		1500	5.46	337
	1600	8.80	1,710		2300	15.00	6,310		2400	5.26	293
	1800	9.40	2,060		2400	14.10	5,500				
	2000	12.50	4,220								

WYACONDA RIVER BASIN

(318) 5–4960. Wyaconda River above Canton, Mo.

Location.—Lat 40°08'30", long 91°33'55", in SE¼ sec.28, T.62 N., R.6 W., on left bank on downstream side of bridge on State Highway 16, 1 mile upstream from Sugar Creek and 2 miles west of Canton.

Drainage area.—393 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 19–22, Apr. 18–24 for which graph was constructed on basis of once-daily readings of wire-weight gage. Datum of gage is 515.41 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 4,850 cfs 1200 hours Apr. 7 (gage height, 20.5 ft).
1932 to February 1965: Discharge 17,700 cfs June 30, 1933 (gage height, 30.00 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	370	355	121	11	179	2,340	67	21	288	123	22
2	400	280	91	12	186	2,430	43	22	206	106	20
3	206	213	74	13	220	850	36	23	172	143	20
4	161	400	64	14	628	340	31	24	111	110	18
5	179	1,580	58	15	1,250	1,400	37	25	110	901	18
6	128	3,830	62	16	1,800	1,700	99	26	118	2,180	22
7	146	4,550	63	17	3,000	630	66	27	100	1,100	29
8	133	1,890	53	18	3,630	310	38	28	123	362	31
9	186	1,800	51	19	3,930	206	28	29	868	213	42
10	206	1,320	65	20	941	156	23	30	1,170	154	31
								31	490	------	25
Monthly mean discharge, in cubic feet per second									698	1,066	46.7
Runoff, in inches									2.05	3.03	0.14
Runoff, in acre-feet									42,910	63,420	2,870

FABIUS RIVER BASIN

(319) 5–4970. North Fabius River at Monticello, Mo.

Location.—Lat 40°06'30", long 91°42'55", in SW¼SE¼ sec.6, T.61 N., R.7 W., near center of span on downstream side of bridge on State Highway 16, 1 mile south of Monticello, and 19 miles upstream from Middle Fabius River.

Drainage area.—452 sq mi.

Gage-height record.—Graph based on once or twice-daily wire-weight, gage readings. Datum of gage is 540.73 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 6,640 cfs 0910 hours Mar. 18 (gage height, 21.30 ft).
1874 to February 1965: Discharge, 17,400 cfs June 30, 1933 (gage height, 30.8 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965, of North Fabius River at Monticello, Mo.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	356	376	156	11	228	4,160	81	21	431	131	32
2	315	345	122	12	216	2,420	74	22	335	521	27
3	102	670	110	13	239	570	54	23	325	521	23
4	71	620	94	14	720	510	39	24	266	521	26
5	71	2,280	81	15	1,440	2,480	38	25	221	820	27
6	94	5,070	79	16	2,640	1,620	64	26	212	1,930	30
7	114	3,510	79	17	4,820	370	53	27	212	670	31
8	137	1,230	67	18	5,770	325	35	28	292	431	28
9	170	1,920	62	19	1,640	248	34	29	1,050	257	28
10	248	1,110	86	20	745	186	32	30	960	228	27
								31	475	-------	26
Monthly mean discharge, in cubic feet per second									804	1,202	56.3
Runoff, in inches									2.05	2.97	0.14
Runoff, in acre-feet									49,420	71,520	3,460

(320) 5–4980. Middle Fabius River near Monticello, Mo.

Location.—Lat 40°05'40", long 91°44'10", in SE¼ sec.12, T.61 N., R.8 W., near center of span on upstream side of bridge on State Highway 16, 2½ miles southwest of Monticello, 8 miles downstream from Radish Branch, and 17 miles upstream from mouth.

Drainage area.—393 sq mi.

Gage-height record.—Graph based on once or twice-daily wire-weight gage readings and crest-stage gage. Datum of gage is 540.46 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 4,300 cfs 1400 hours Mar. 17 (gage height, 16.02 ft).

1945 to February 1965: Discharge, 16,200 cfs June 7, 1947 (gage height, 26.28 ft). A flood of unknown date reached a stage of 26.6 ft, from floodmark (discharge, 16,800 cfs).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	363	315	116	11	295	2,070	41	21	950	108	23
2	418	241	93	12	265	2,070	39	22	237	94	20
3	245	368	83	13	295	1,680	36	23	195	116	20
4	118	442	72	14	620	368	34	24	129	364	18
5	69	1,200	63	15	1,250	770	34	25	102	920	18
6	108	3,900	60	16	2,110	1,220	46	26	131	1,430	22
7	87	3,200	58	17	4,000	800	68	27	125	1,910	22
8	135	3,350	55	18	3,300	285	55	28	131	432	24
9	201	755	55	19	3,000	190	46	29	554	172	26
10	305	950	48	20	2,310	147	29	30	980	120	28
								31	455	-------	27
Monthly mean discharge, in cubic feet per second									758	1,000	44.5
Runoff, in inches									2.22	2.84	0.13
Runoff, in acre-feet									46,580	59,480	2,740

(321) 5–5000. South Fabius River near Taylor, Mo.

Location.—Lat 39°53'50", long 91°34'50", in SW¼NW¼ sec.21, T.59 N., R.6 W., on right bank at downstream side of highway bridge, 4⅕ miles southwest of Taylor, 5 miles downstream from Grassy Creek, and 5.3 miles upstream from confluence with North Fabius River.

Drainage area.—620 sq mi; 630 sq mi at site used prior to May 14, 1936.

Gage-height record.—Water-stage recorder graph except Mar. 19–21, May 14–16, May 22–30 for which graph was constructed from once-daily wire-weight gage readings. Datum of gage is 482.91 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 7,940 cfs 0300 hours Apr. 6 (gage height, 12.49 ft).

1934 to February 1965: Discharge, 19,700 cfs June 8, 1947 (gage height, 19.5 ft), from rating curve extended above 11,000 cfs.

Flood in 1928 reached a stage of 18.49 ft, from floodmark.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,230	655	130	11	458	2,230	49	21	1,060	210	48
2	1,050	478	116	12	530	2,230	44	22	402	170	36
3	780	613	98	13	705	1,200	40	23	357	154	26
4	374	1,460	88	14	1,350	610	35	24	273	140	21
5	248	3,520	81	15	2,230	1,200	31	25	205	142	20
6	238	6,440	72	16	2,790	1,380	31	26	188	136	20
7	232	5,140	67	17	5,740	780	51	27	205	471	20
8	297	4,150	62	18	5,440	430	58	28	366	466	20
9	510	1,150	58	19	5,140	300	83	29	1,110	208	21
10	442	927	54	20	3,430	235	60	30	1,600	160	64
								31	1,140	-------	55
Monthly mean discharge, in cubic feet per second									1,294	1,246	53.5
Runoff, in inches									2.41	2.24	0.10
Runoff, in acre-feet									79,580	74,150	3,290

NORTH RIVER BASIN

(322) 5–5010. North River at Palmyra, Mo.

Location.—Lat 39°49'05", long 91°31'15", in SE¼SW¼ sec.13, T.58 N., R.6 W., on right bank 100 ft upstream from city waterworks dam, 1,000 ft upstream from bridge on U.S. Highways 24 and 61, half a mile north of Palmyra, and 7 miles upstream from mouth.

Drainage area.—373 sq mi.

Gage-height record.—Digital-recorder tape punched at 15 minute intervals. Datum of gage is 464.81 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Backwater from Mississippi River Apr. 10 to May 13.

Maxima.—March–May 1965: Discharge, 9,620 cfs 0915 hours Apr. 6 (gage height, 20.89 ft).

1934 to February 1965: Discharge, 27,400 cfs Apr. 11, 1944; gage height, 24.42 ft May 28, 1955.

A flood of unknown date reached a stage of about 28.0 ft, from floodmarks, at site 1,000 ft downstream, present datum.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	1,220	270	72	11	298	1,200	29	21	214	140	19
2	698	209	62	12	387	550	27	22	182	130	17
3	329	657	54	13	601	380	25	23	174	120	15
4	217	984	50	14	1,010	370	23	24	140	115	15
5	170	2,070	46	15	1,060	270	21	25	118	110	14
6	150	6,770	42	16	1,090	240	25	26	108	115	16
7	137	2,090	39	17	5,180	560	26	27	108	300	16
8	208	592	36	18	2,490	250	21	28	312	170	14
9	428	332	33	19	727	180	18	29	785	110	13
10	307	380	31	20	290	160	21	30	619	92	12
								31	387	------	11
Monthly mean discharge, in cubic feet per second									650	664	27.8
Runoff, in inches									2.01	1.99	0.09
Runoff, in acre-feet									39,960	39,500	1,710

BEAR CREEK BASIN

(323) 5–5020. Bear Creek at Hannibal, Mo.

Location.—Lat 39°40'43", long 91°24'33", in SE¼NW¼ sec.1, T.56 N., R.5 W., on right bank 400 ft downstream from upstream bridge on dual U.S. Highway 61 at Hannibal, 4-3/4 miles upstream from mouth.

Drainage area.—31.0 sq mi.

Gage-height record.—Digital-recorder tape punched at 15 minute intervals. Datum of gage is 508.91 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 1,020 cfs 1900 hours Apr. 5 (gage height, 5.79 ft).

1938–42, 1947 to February 1965: Discharge, 6,500 cfs Aug. 3, 1957 (gage height, 14.05 ft).

Remarks.—High flow regulated by Bear Creek Reservoir since Aug. 7, 1961.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	242	13	0.6	11	31	5.8	0.4	21	12	1.1	38
2	37	11	.6	12	55	2.4	.4	22	11	1.0	113
3	14	60	.5	13	64	2.0	.4	23	11	1.0	174
4	11	37	.5	14	90	12	.4	24	9.0	1.5	166
5	10	119	.5	15	54	3.8	.4	25	8.8	3.8	149
6	9.4	541	.4	16	22	2.1	.4	26	8.3	1.1	48
7	13	298	.4	17	528	1.7	.4	27	14	1.0	3.6
8	44	5.2	.4	18	333	1.5	.4	28	52	1.0	2.6
9	61	92	.4	19	18	1.2	.4	29	57	.8	2.4
10	26	15	.4	20	13	1.2	.4	30	24	.8	2.4
								31	16	------	2.2
Monthly mean discharge, in cubic feet per second									61.2	41.3	22.9
Runoff, in inches									2.28	1.49	0.85
Runoff, in acre-feet									3,770	2,460	1,410

SALT RIVER BASIN

(324) 5–5080. Salt River near New London, Mo.

Location.—Lat 39°36'44", long 91°24'30" in NE¼NW¼ sec.36, T.56 N., R.5 W., on left bank 180 ft upstream from upstream bridge on dual U.S. Highway 61, 2 miles north of New London, and 8 miles upstream from Spencer Creek.

Drainage area.—2,480 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage 477.03 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 26,000 cfs 1500 hours Apr. 7 (gage height, 21.53 ft).
1922 to February 1965: Discharge, 64,700 cfs Aug. 2, 1958 (gage height, 29.92 ft).
Flood of July 14, 1858 reached a stage of about 27.6 ft, present site and datum, based on comparison of June 1928 flood crest of stone marker 1 mile downstream from gage.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	4,810	2,110	416	11	2,510	5,110	180	21	5,300	660	205
2	7,210	1,480	371	12	2,920	11,600	172	22	1,480	554	169
3	4,640	2,220	332	13	4,330	6,620	162	23	1,060	490	144
4	2,430	12,200	302	14	6,510	2,350	148	24	865	470	131
5	1,410	11,700	277	15	8,560	2,040	138	25	716	617	108
6	995	20,500	261	16	8,300	2,750	127	26	571	1,030	121
7	898	25,400	244	17	15,900	3,280	121	27	516	1,240	118
8	898	18,700	221	18	23,400	1,970	138	28	716	1,130	105
9	1,240	9,880	209	19	21,100	1,160	144	29	2,270	648	90
10	1,970	2,590	190	20	11,600	832	144	30	4,130	485	88
								31	3,460	-------	85
Monthly mean discharge, in cubic feet per second									4,926	5,061	183
Runoff, in inches									2.29	2.28	0.08
Runoff, in acre-feet									302,900	301,100	11,230

THE SNY BASIN

(325) 5–5130. Bay Creek at Nebo, Ill.

Location.—Lat 39°26'35", long 90°47'45", in NW¼ sec.19, T.7 S., R.3 W., on left bank 400 ft downstream from highway bridge, 500 ft upstream from Spring Creek, a quarter of a mile west of Nebo, and 1.6 miles upstream from Chicago and Alton Railroad bridge. Records include flow of Spring Creek.

Drainage area.—162 sq mi, including that of Spring Creek.

Gage-height record.—Digital recorder tape punched at 15-minute intervals. Prior to April 28, 1965, water-stage recorder graph. Datum of gage is 462.56 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements below 9,000 cfs and extended above by logarithmic plotting.

Maxima.—April–May 1965: Discharge, 2,140 cfs 0900 hours Apr. 11 (gage height, 9.49 ft).
1939 to March 1965: Discharge, 23,500 cfs Aug. 16, 1946 (gage height, 19.31 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	53	43	11	1,110	25	21	61	18
2	46	39	12	202	22	22	53	17
3	46	36	13	112	20	23	49	17
4	51	33	14	119	22	24	86	16
5	291	32	15	381	21	25	175	16
6	562	32	16	145	20	26	94	22
7	134	31	17	102	19	27	62	32
8	94	46	18	84	20	28	56	26
9	75	39	19	72	20	29	51	18
10	289	29	20	64	19	30	47	15
						31		14
Monthly mean discharge, in cubic feet per second							159	25.1
Runoff, in inches							1.09	0.18

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1965

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Apr. 10	0000	1.67	67	Apr. 11	0300	4.35	539	Apr. 11	2200	4.29	526
	1200	1.67	67		0500	5.89	947		2400	3.68	392
	1400	4.28	524		0600	7.87	1,540				
	1500	5.90	950		0700	9.35	2,080	12	0600	2.85	230
	1800	3.62	378		0900	9.49	2,140		1200	2.48	171
	2000	3.08	270		1200	7.60	1,460		2400	2.17	127
	2300	5.07	718		2000	5.07	718				
	2400	4.96	690								

CUIVRE RIVER BASIN

(326) 5–5145. Cuivre River near Troy, Mo.

Location.—Lat 39°00'59", long 90°59'00", in SE¼ sec.14, T.49 N., R.1 W., on downstream side of center pier of bridge on U.S. Highway 61, 1½ miles downstream from confluence of North and West Forks and 2 miles north of Troy.

Drainage area.—903 sq mi.

Gage-height record.—Water-stage recorder graph except Mar. 25–26, Apr. 22–24, Apr. 29 to May 31 for which graph was constructed from once-daily wire-weight gage readings. Datum of gage is 450.27 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 11,200 cfs 1400 hours Apr. 6 (gage height, 20.54 ft).

1888 to February 1965: Discharge, 120,000 cfs Oct. 5, 1941 (gage height, 33.4 ft, from floodmarks).

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	2,200	282	164	11	635	3,080	75	21	210	232	23
2	2,350	200	143	12	575	4,270	68	22	160	182	22
3	1,250	271	125	13	695	1,250	64	23	148	150	24
4	470	2,850	113	14	575	515	56	24	135	132	22
5	298	1,490	100	15	398	4,670	42	25	125	1,370	22
6	222	8,440	177	16	282	2,250	38	26	118	970	30
7	200	3,550	105	17	1,320	930	33	27	118	470	28
8	272	1,370	90	18	3,260	590	31	28	470	320	34
9	1,290	575	87	19	970	398	29	29	1,290	240	32
10	1,010	385	82	20	360	300	26	30	890	182	26
								31	470	------	16
Monthly mean discharge, in cubic feet per second									734	1,397	62.2
Runoff, in inches									0.94	1.73	0.08
Runoff, in acre-feet									45,160	83,140	3,820

ILLINOIS RIVER BASIN

(327) 5–5855. Illinois River at Meredosia, Ill.

Location.—Lat 39°49'36", long 90°33'53", in SE¼NE¼ sec.21, T.16 N., R.13 W., on left bank 0.3 mile downstream from bridge on State Highway 104 in Meredosia, 4½ miles upstream from McKee Creek and at mile 71.1.

Drainage area.—25,300 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 418.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-fall-discharge relation defined by current-meter measurements.

Maxima.—April–May 1965: Discharge, 55,000 cfs 0500 hours April 18; gage height, 17.65 ft 1000 hours to 1700 hours Apr. 19.

1938 to March 1965: Discharge, 123,000 cfs May 26–28, 1943; gage height, 28.61 ft May 26, 1943.

Mean discharge, in cubic feet per second, 1965, of Illinois River at Meredosia, Ill.

Day	April	May	Day	April	May	Day	April	May
1	31,900	49,600	11	46,500	45,600	21	52,400	34,100
2	32,100	49,800	12	49,500	45,000	22	51,800	32,800
3	31,800	49,700	13	50,500	44,300	23	51,200	31,200
4	31,100	49,600	14	51,000	43,100	24	49,500	29,800
5	31,400	49,200	15	52,000	40,900	25	47,700	28,300
6	34,000	47,700	16	53,200	39,900	26	46,600	27,900
7	38,600	46,500	17	53,200	38,800	27	46,700	27,200
8	41,300	46,000	18	54,400	38,100	28	48,000	26,300
9	43,000	45,600	19	54,000	36,200	29	48,800	24,600
10	44,400	45,800	20	53,200	34,900	30	48,800	21,900
						31	----	17,900
Monthly mean discharge, in cubic feet per second							45,600	38,300
Runoff, in inches							2.01	1.75

(328) 5–5870. Macoupin Creek near Kane, Ill.

Location.—Lat 39°14'00", long 90°23'45", in SE¼ sec.11, T.9 N., R.12 W., near center of span on downstream side of bridge on U.S. Highway 67 (alternate), 1.4 miles downstream from Link Branch, and 3½ miles northwest of Kane.

Drainage area.—875 sq mi.

Gage-height record.—Graph based on twice-daily readings of wire-weight gage, except Apr. 24, May 6, 10, 26. Datum of gage is 426.77 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge for periods of no gage-height record estimated on basis of records for nearby stations.

Maxima.—April–May 1965: Discharge, 2,120 cfs 2000 hours Apr. 11 (gage height, 12.30 ft).

1921–33, 1940 to March 1965: Discharge, 40,000 cfs May 18, 1943 (gage height, 28.5 ft).

Mean discharge, in cubic feet per second, 1965

Day	April	May	Day	April	May	Day	April	May
1	56	178	11	1,470	57	21	141	41
2	49	146	12	1,500	50	22	127	25
3	45	120	13	788	44	23	113	19
4	47	101	14	441	44	24	120	17
5	77	92	15	506	34	25	932	16
6	735	88	16	790	30	26	1,740	150
7	688	83	17	466	27	27	712	390
8	287	80	18	292	31	28	353	194
9	194	74	19	222	68	29	263	128
10	127	65	20	177	66	30	209	60
						31	--------	37
Monthly mean discharge, in cubic feet per second							456	82.4
Runoff, in inches							0.58	0.11

MISSISSIPPI RIVER MAIN STEM

(329) 5–5875. Mississippi River at Alton, Ill.

Location.—Lat 38°53'06", long 90°10'51", in sec.14, T.5 N., R.10 W., near left bank in downstream end of intermediate lock wall of lock and dam 26 at Alton, 300 f. downstream from Missouri and Illinois Bridge and Belt Railroad bridge, 7.7 miles upstream from Missouri River, and at mile 202.7 above Ohio River.

Drainage area.—171,500 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is at mean sea level, datum of 1929 (levels by Corps of Engineers).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Fall used as a factor.

Maxima.—March–May 1965: Discharge, 380,000 cfs 0700 hours to 2300 hours May 3; gage height, 420.75 ft 1500 hours to 1800 hours Apr. 16.
1927 to February 1965: Discharge, 437,000 cfs May 24, 1943 (gage height, 429.91 ft), includes 90,000 cfs floodwater overflow from Missouri River.
Flood in June 1844 reached a stage of 432.10 ft (discharge unknown).

Remarks.—Natural flow of stream affected by many reservoirs and navigation dams in upper Mississippi River basin.

Cooperation.—Alton gage-height record furnished by Corps of Engineers.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	62,400	155,000	369,000	11	165,000	287,000	356,000	21	233,000	367,000	225,000
2	98,800	150,000	377,000	12	167,000	297,000	344,000	22	207,000	358,000	209,000
3	118,000	154,000	380,000	13	176,000	313,000	337,000	23	149,000	350,000	197,000
4	115,000	172,000	378,000	14	180,000	330,000	328,000	24	126,000	345,000	188,000
5	119,000	188,000	374,000	15	176,000	343,000	318,000	25	111,000	345,000	184,000
6	122,000	208,000	374,000	16	170,000	351,000	307,000	26	93,200	342,000	179,000
7	133,000	219,000	373,000	17	181,000	363,000	297,000	27	81,700	339,000	177,000
8	164,000	240,000	373,000	18	199,000	369,000	281,000	28	91,700	339,000	166,000
9	164,000	261,000	368,000	19	212,000	377,000	265,000	29	102,000	348,000	171,000
10	163,000	278,000	363,000	20	223,000	375,000	243,000	30	113,000	357,000	172,000
								31	146,000	------	172,000
Monthly mean discharge, in cubic feet per second									147,200	297,300	285,300
Runoff, in inches									0.99	1.93	1.92
Runoff, in acre-feet									*9,048	*17,690	*17,540

*In thousands

MISSOURI RIVER MAIN STEM

(330) 6–9345. Missouri River at Hermann, Mo.

Location.—Lat 38°42'36", long 91°26'21", in SW¼ sec.25, T.46 N., R.5 W., on downstream side of third pier from right abutment of bridge on State Highway 19 at Hermann. River mile, 97.9.

Drainage area.—528,200 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 481.56 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 258,000 cfs 1400 hours Apr. 8 (gage height, 23.50 ft).

1897 to February 1965: Discharge, 676,000 cfs June 6, 7, 1903; gage height, 33.33 ft July 19, 1951.

Flood of June 1844 reached a gage height of 35.5 ft (discharge about 892,000 cfs, computed by Corps of Engineers).

Remarks.—Flow partly regulated by many reservoirs above station.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	42,800	68,200	65,200	11	80,500	226,000	57,900	21	186,000	85,500	51,300
2	48,500	69,600	59,000	12	92,300	224,000	64,800	22	148,000	77,500	54,900
3	114,000	74,100	53,800	13	88,500	202,000	57,500	23	124,000	72,800	51,600
4	160,000	140,000	51,600	14	84,500	176,000	56,400	24	101,000	66,500	51,000
5	123,000	178,000	51,600	15	82,000	180,000	63,100	25	80,000	63,100	62,300
6	96,700	223,000	53,400	16	95,000	154,000	59,400	26	66,100	58,300	92,300
7	79,000	246,000	54,900	17	117,000	141,000	51,600	27	59,000	62,300	77,500
8	65,200	256,000	52,400	18	170,000	128,000	49,600	28	53,400	84,000	76,500
9	59,000	254,000	49,200	19	208,000	110,000	47,200	29	52,000	87,000	99,400
10	67,400	237,000	47,500	20	217,000	98,400	46,500	30	57,400	75,500	114,000
								31	64,800	------	94,500
Monthly mean discharge, in cubic feet per second									99,440	137,300	61,870
Runoff, in inches									0.22	0.29	0.14
Runoff, in acre-feet									*6,115	*8,168	*3,804

*In thousands

LOUTRE RIVER BASIN

(331) 6–9355. Loutre River at Mineola, Mo.

Location.—Lat 38°53'20", long 91°34'30", in SE¼NW¼ sec.34, T.48 N., R.6 W., at downstream side of left pier of bridge in Mineola, 0.2 mile upstream from Sallee Branch, 1¼ mile downstream from Interstate Highway 70.

Drainage area.—202 sq mi.

Gage-height record.—Water-stage recorder graph except for Mar. 3, 6–9, days of no gage-height record and Mar. 1, 2, 10–12, from graph based on gage readings recorded range of stage and partial recorder record.

Discharge record.—Stage-discharge relation defined by current-meter measurements. Rate of change in stage used as a factor for stages above 8 ft.

Maxima.—March–May 1965: Discharge, 5,580 cfs 0400 hours Apr. 6 (gage height, 15.27 ft).

1947 to February 1965: Discharge, 12,900 cfs June 30, 1957 (gage height, 20.88 ft). Flood of June 1928 reached a stage of about, 28.9 ft, from information by local resident.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	498	72	38	11	151	997	12	21	62	65	3.7
2	253	55	33	12	212	280	11	22	54	55	3.2
3	120	1,090	28	13	182	125	9.6	23	70	50	2.9
4	59	682	26	14	114	334	8.2	24	71	45	2.7
5	50	685	23	15	78	1,720	7.4	25	53	197	2.5
6	45	2,210	22	16	51	386	6.4	26	46	167	5.6
7	40	372	20	17	1,480	199	5.4	27	96	87	5.4
8	50	202	17	18	386	130	8.7	28	470	66	4.2
9	100	130	16	19	132	97	5.2	29	456	54	5.0
10	280	107	14	20	81	76	4.2	30	163	46	4.0
								31	97	-------	3.2
Monthly mean discharge, in cubic feet per second									194	359	11.5
Runoff, in inches									1.10	1.98	0.07
Runoff, in acre-feet									11,900	21,380	709

COLDWATER CREEK BASIN

(332) 6–9365. Coldwater Creek near St. Louis, Mo.

Location.—Lat 38°48'50", long 90°13'50", in sec.16, T.47 N., R.7 E., on right wingwall on downstream side of bridge on U.S. Highway 67, 1.7 miles upstream from mouth, 3.5 miles south of West Alton, and 6.0 miles north of St. Louis city limits.

Drainage area.—43.6 sq mi.

Gage-height record.—Digital recorder tape punched at 15 minute intervals. Datum of gage is 442.63 ft above mean sea level, datum of 1929 (Missouri Highway Department bench mark).

Discharge record.—Stage-discharge relation defined by current-meter measurements. Discharge on Apr. 12, 13, obtained from adjoining good record and weather records.

Maxima.—March–May 1965: Discharge, 1,210 cfs 0015 hours Apr. 6 (gage height, 6.94 ft).

1959–61, 1962 to February 1965: Discharge, 6,170 cfs June 29, 1960 (gage height, 17.13 ft).

Mean discharge, in cubic feet per second, 1965, of Coldwater Creek near St. Louis, Mo.

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	73	32	33	11	34	44	30	21	25	34	24
2	156	31	26	12	33	39	29	22	28	33	24
3	44	96	23	13	31	35	28	23	51	33	22
4	49	39	39	14	30	54	28	24	31	32	33
5	53	288	37	15	29	102	27	25	29	160	24
6	46	258	50	16	29	46	24	26	37	38	82
7	48	65	34	17	57	39	27	27	34	35	40
8	50	54	31	18	30	33	61	28	30	39	23
9	42	47	32	19	28	34	24	29	31	32	21
10	36	56	30	20	28	35	24	30	32	31	17
								31	32	-------	18
Monthly mean discharge, in cubic feet per second									41.5	63.1	31.1
Runoff, in inches									1.10	1.62	0.82
Runoff, in acre-feet									2,550	3,760	1,910

MISSISSIPPI RIVER MAIN STEM

(333) 7–0100. Mississippi River at St. Louis, Mo.

Location.—Lat 38°37'44", long 90°10'47", on downstream side of west pier of Eads Bridge at St. Louis, 15 miles downstream from Missouri River, 19.2 miles upstream from Meramec River, and at mile 180.0 above Ohio River.

Drainage area.—701,000 sq mi, approximately.

Gage-height record.—Water-stage recorder graph. Datum of gage is 379.94 ft above mean sea level, datum of 1929.

Discharge record.—Stage-discharge relation defined by current-meter measurements.

Maxima.—March–May 1965: Discharge, 525,000 cfs 1430 hours Apr. 16 (gage height, 28.83 ft).

1861 to February 1965: Daily discharge, 1,019,000 cfs June 10, 11, 1903; gage height, 40.28 ft July 22, 1951.

Flood in April 1785 may have reached a stage of 42.0 ft.

Flood in June 1844 reached a stage of 41.32 ft, from floodmarks (discharge, 1,300,000 cfs), computed by Corps of Engineers.

Remarks.—Natural flow of stream affected by many reservoirs and navigation dams in upper Mississippi River basin and by many reservoirs and diversions for irrigation in Missouri River basin.

Mean discharge, in cubic feet per second, 1965

Day	March	April	May	Day	March	April	May	Day	March	April	May
1	102,000	218,000	431,000	11	234,000	513,000	400,000	21	440,000	459,000	279,000
2	131,000	221,000	429,000	12	246,000	516,000	396,000	22	408,000	440,000	265,000
3	164,000	218,000	427,000	13	265,000	520,000	394,000	23	324,000	425,000	255,000
4	225,000	248,000	423,000	14	270,000	516,000	384,000	24	263,000	414,000	245,000
5	275,000	324,000	416,000	15	263,000	516,000	370,000	25	216,000	412,000	237,000
6	254,000	394,000	414,000	16	260,000	523,000	362,000	26	178,000	404,000	237,000
7	231,000	444,000	414,000	17	279,000	511,000	351,000	27	152,000	398,000	263,000
8	243,000	479,000	416,000	18	324,000	500,000	335,000	28	147,000	398,000	254,000
9	240,000	500,000	414,000	19	388,000	488,000	317,000	29	154,000	414,000	243,000
10	230,000	509,000	408,000	20	425,000	474,000	299,000	30	159,000	429,000	265,000
								31	192,000	-------	286,000
Monthly mean discharge, in cubic feet per second									247,800	427,500	342,900
Runoff, in inches									0.41	0.68	0.56
Runoff, in acre-feet									*15,240	*25,440	*21,080

*In thousands

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