Floods of December 1982 to May 1983 in the Central and Southern Mississippi River and the Gulf of Mexico Basins

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Floods of December 1982 to May 1983 in the Central and Southern Mississippi River and the Gulf of Mexico Basins

By Roy B. Stone *and* R.H. Bingham

Abstract

Widespread flooding occurred in December 1982 and in spring 1983 in the central and southern Mississippi River basin. The first series of storms, December 2–7, caused severe flooding along many streams in Illinois, Missouri, and Arkansas. Much of the three-State area experienced recordbreaking 24-hour rainfall amounts that caused some streams to exceed previously known flood heights and discharges; in many cases the recurrence interval of peak discharges exceeded 100 years. The second series of storms, December 24–29, caused severe flooding in Louisiana and moderate flooding in Mississippi. Peak discharges on some streams exceeded the 100-year recurrence interval. Damages exceeded $200 million and 25 persons died as a result of the December storms. Western Tennessee was on the fringes of both storms and received only minor flooding.

During April 4–8, 1983, as much as 17 inches of rain fell in parts of southern Mississippi and southeastern Louisiana. In some areas, 24-hour amounts exceeded 5 inches, causing peak discharges to exceed the recurrence interval of 100 years at 20 streamflow gaging stations.

In May 1983 heavy and intense rains caused major flooding in the Big Black River and Pearl River basins in Mississippi.

INTRODUCTION

Four major floods occurred in the central and southern Mississippi River basin from December 1982 to May 1983. Two of the floods were in December 1982, one during the first week and the second during the last week. The third flood occurred in April 1983 and the fourth in May 1983. The flooding in late December extended into January 1983 and caused major problems along many streams in Illinois, Missouri, Arkansas, Mississippi, and Louisiana. The flood of April 1983 was smaller in areal extent but caused major problems along streams in Mississippi and Louisiana and minor problems along streams in western Tennessee. In May 1983 major floods occurred only in the Big Black River and Pearl River basins in Mississippi. Figure 1 shows the general area affected by the floods.

Damages from the December floods probably exceeded at least $200 million, according to reports by U.S. Army Corps of Engineers' Little Rock, Memphis, and Vicksburg Districts. Louisiana, Mississippi, and Arkansas suffered the most severe damage; several lives were lost. Many counties in the three States were declared disaster areas. Damage estimates are not available for the April and May 1983 floods.

Purpose and Scope

The purpose of this report is to document four outstanding floods by summarizing conditions that preceded the floods, showing the distribution and amounts of rainfall, describing the magnitude and frequency of flood discharges at selected sites in the area, and describing the effects of the December 1982 floods on reservoirs. The data provide a technical basis on which to make flood-plain management decisions.

Acknowledgments

Discharge and other streamflow data in this report were obtained through cooperative programs between the U.S. Geological Survey and State agencies of Arkansas, Illinois, Mississippi, Missouri, Louisiana, and Tennessee; county and municipal agencies in those States; and Federal agencies. The U.S. Army Corps of Engineers' Little Rock, Memphis, and Vicksburg Districts provided rainfall data, reservoir flood heights and contents, and estimates of flood damage. The National Weather Service provided rainfall data.

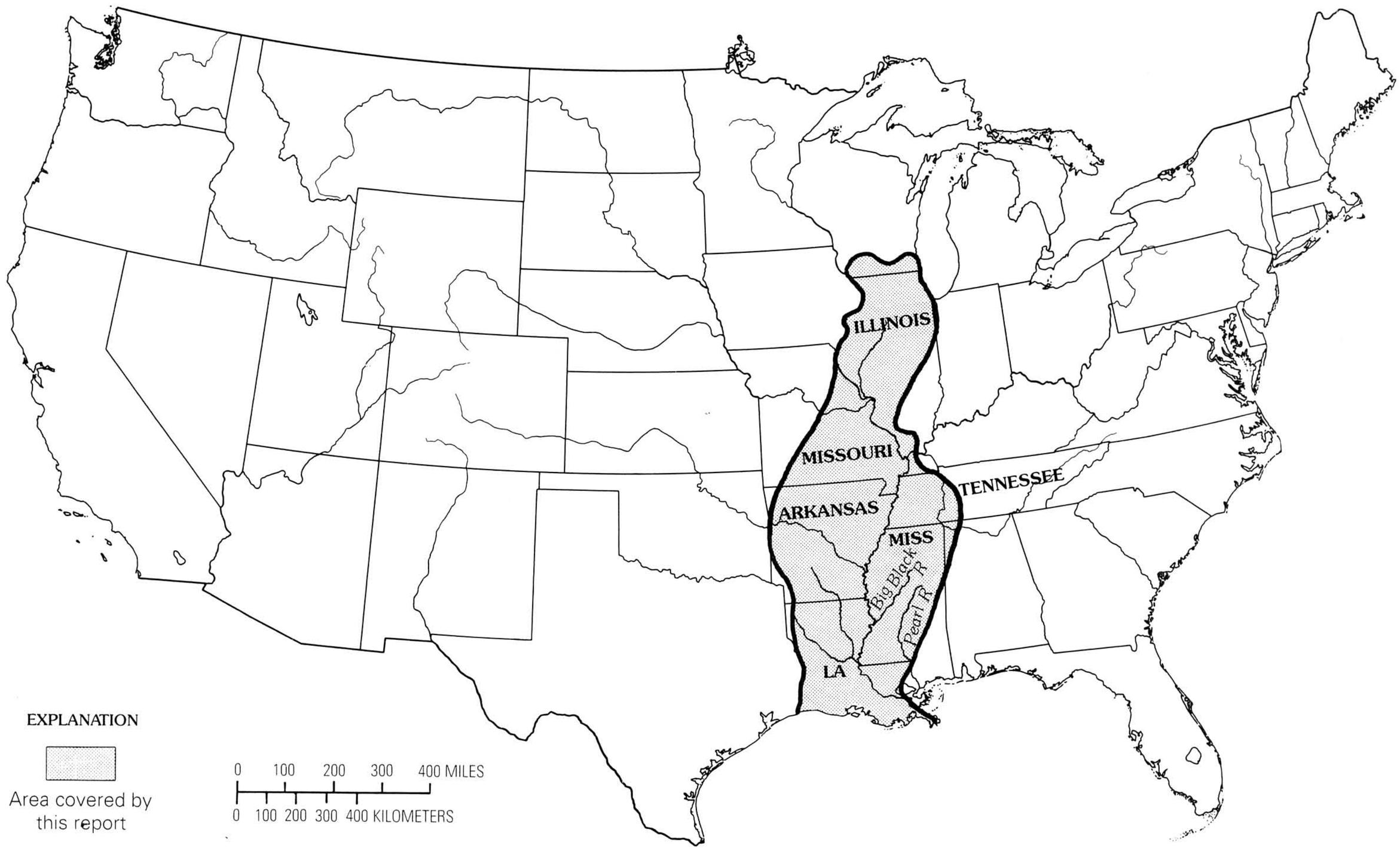


Figure 1. Area affected by the floods of December 1982 to May 1983 in the central and southern Mississippi River and Gulf of Mexico basins.

Other Federal and State agencies, municipalities, universities, corporations, and individuals collected and provided information about the floods. Credit for their assistance is given in the text.

FLOODS OF DECEMBER 1982

Heavy and intense rainfall in December 1982 caused severe flooding along many streams in Illinois, Missouri, Arkansas, Mississippi, and Louisiana (fig. 1). The storms occurred during two separate periods, December 2–7 and December 24–29. Flooding from the second storm extended into January on major streams. Rainfall data for the storms were collected by the U.S. Army Corps of Engineers and the National Weather Service.

Several localities in the study area experienced recordbreaking 24-hour rainfall amounts (National Weather Service, December 1982) during the first week in December. Above-normal rainfall had also occurred during November 1982, mostly near the end of the month. The National Weather Service reported that December 1982 was a recordbreaking month for rainfall at almost every rain gage in Mississippi. The combination of large rains and saturated soils produced severely damaging floods in December on almost every stream in the five-State area.

Meteorology

The excessive rains in late fall and early winter 1982 were associated with a recurring pattern of slow-moving low-pressure areas. The two main storms, December 2–7 and December 24–29, were related to deep low pressure over the southwestern United States. The resulting flow around the systems fed warm, moist air over the lower Mississippi River basin and created atmospheric disturbances over the Gulf of Mexico and southeastern Texas that supported development of heavy rainfall. To add to the problem, high pressure centers over the Middle Atlantic States prevented the storms from moving in the usual pattern. Moisture from the Gulf of Mexico was drawn into the basin by a counter-clockwise flow of air around the lows and clockwise flow around the highs. Subsequent slow movement of the systems toward the northeast produced tornadoes, severe thunderstorms, and intense rainfall for extended periods.

On December 1, 1982, an intense low-pressure center moved out of the Rocky Mountains and into the Great Plains. The low-pressure center and the cold front that accompanied it pushed a large band of storms into the Mississippi River Valley, where heavy rains began on December 2. A second low formed simultaneously over

eastern Texas and reinforced the flow of warm, moist air into the Lower Mississippi Valley. The two low-pressure areas produced heavy rainfall during December 2–7.

The pattern of warm, moist air flow continued during the month with general rains, some of them locally heavy in mid-December, and very heavy rains December 24 to December 28. Figure 2 shows the pattern of rainfall during December 3–6, and figure 3 shows the pattern of rainfall during December 25–27.

Precipitation

Total precipitation amounts for December 1982 at many sites in the Mississippi River basin were the largest recorded for any December in this century. Total amounts commonly exceeded 10 inches throughout the central and southern parts of the basin and locally exceeded 20 inches. Largest amounts generally occurred in Illinois, Missouri, and Arkansas during December 2–7. Largest amounts occurred in Mississippi and Louisiana during December 24–29. Total amounts of precipitation for both periods in western Tennessee were generally less than 10 inches and produced only minor flooding on some streams. Table 1 (at end of report) gives cumulative amounts of rainfall for separate periods in each State affected by the December 1982 floods.

The following State-by-State summaries of record-breaking rainfall amounts are taken from information published by the National Weather Service (December 1982 and January 1983) and the U.S. Army Corps of Engineers (1983, May 1983, and August 1983). All sites mentioned in the summaries are not necessarily listed in table 1.

Illinois

In most parts of Illinois, December 1982 was the wettest December in this century. Only parts of east-central and northwestern Illinois failed to receive recordbreaking amounts. During December 2–6, rainfall amounts of 5 to 7 inches fell throughout the State, causing record or near-record flooding. The heaviest amounts of rain fell during December 2–3, when 6.12 inches at Springfield set a new 24-hour record. Figure 4 shows a graph of the duration and intensity of rainfall at the National Weather Service station at Springfield for December 2–3. A total of 6.95 inches of rain fell at the station during December 2–5. This was the only period when heavy rainfall caused significant flooding in Illinois during December 1982. A total of 1.45 inches fell at Springfield from December 24 through 27.

Missouri

In Missouri, all sections except the northwest experienced heavy and intense rainfall in December 1982. During December 2–5, rainfall averaged 5 to 7 inches across eastern and southern Missouri, and amounts of 10 to 15 inches were reported locally. The heaviest rainfall amounts were reported from stations in Oregon, Carter, Wayne, and Reynolds Counties. The amounts in those counties ranged consistently from 10 to 14 inches. The counties of Lincoln and Warren in east-central Missouri averaged 9 to 10 inches. Table 2 (at end of report) gives precipitation totals and recurrence intervals at six sites for the December 2–5 storm in Missouri (Waite and Alexander, 1987). The storm of December 23–27 produced only moderate flooding in extreme southeastern Missouri, where the heaviest and most intense rainfall occurred. During the entire month, rainfall averaged 2.5 inches above normal at Kansas City, 5 to 6 inches above normal at Columbia and St. Louis, and 6.5 inches above normal at Springfield.

Arkansas

Throughout Arkansas excessive rainfall caused extreme flooding on many streams. Rainfall exceeded 8 inches in a band from Foreman and Ashdown northeastward through Clarksville and Morrilton in the 24-hour period ending at 6 a.m., December 3. Maximum 24-hour totals were 11.9 inches at Mountain View, 11.4 inches at Shirley, 12.36 inches at Mammoth Spring, 10.75 inches at Melbourne, 10.0 inches at Oden, and 10.95 inches at Ouachita. The heaviest rainfall in Arkansas occurred December 2–3 and continued in varying amounts for about 4 days. Another storm occurred December 25–27; however, the 3-day total rainfall was generally less than 10 inches, most of which fell in southeastern Arkansas (fig. 3).

Mississippi

For Mississippi, December 1982 was a record month for rainfall at almost every rain gage in the State. More than 20 inches of rain fell during the month in a large area of the central delta and parts of the north-central and northeastern Mississippi hills. The two largest rains occurred December 3–4 and 24–27. The graph in figure 5 shows the duration and intensity of rainfall at the National Weather Service station at Jackson, Miss., for December 3–4. A total of 7.94 inches fell at the station during December 1–4; similar amounts fell in most of the State. For example, a total of 9.2 inches fell at Kosciusko during the same period. The graph in figure 6 shows the duration and intensity of rainfall at Jackson for December 24–27. Rainfall totaled 6.02 inches at Jackson and 6.00 inches at Kosciusko. Figure 7 shows cumulative rainfall for December at Tupelo, Miss. The graph is based on daily totals of rainfall at the station.

Louisiana

In Louisiana the statewide average rainfall for December 1982 was 15 inches—the highest since record-

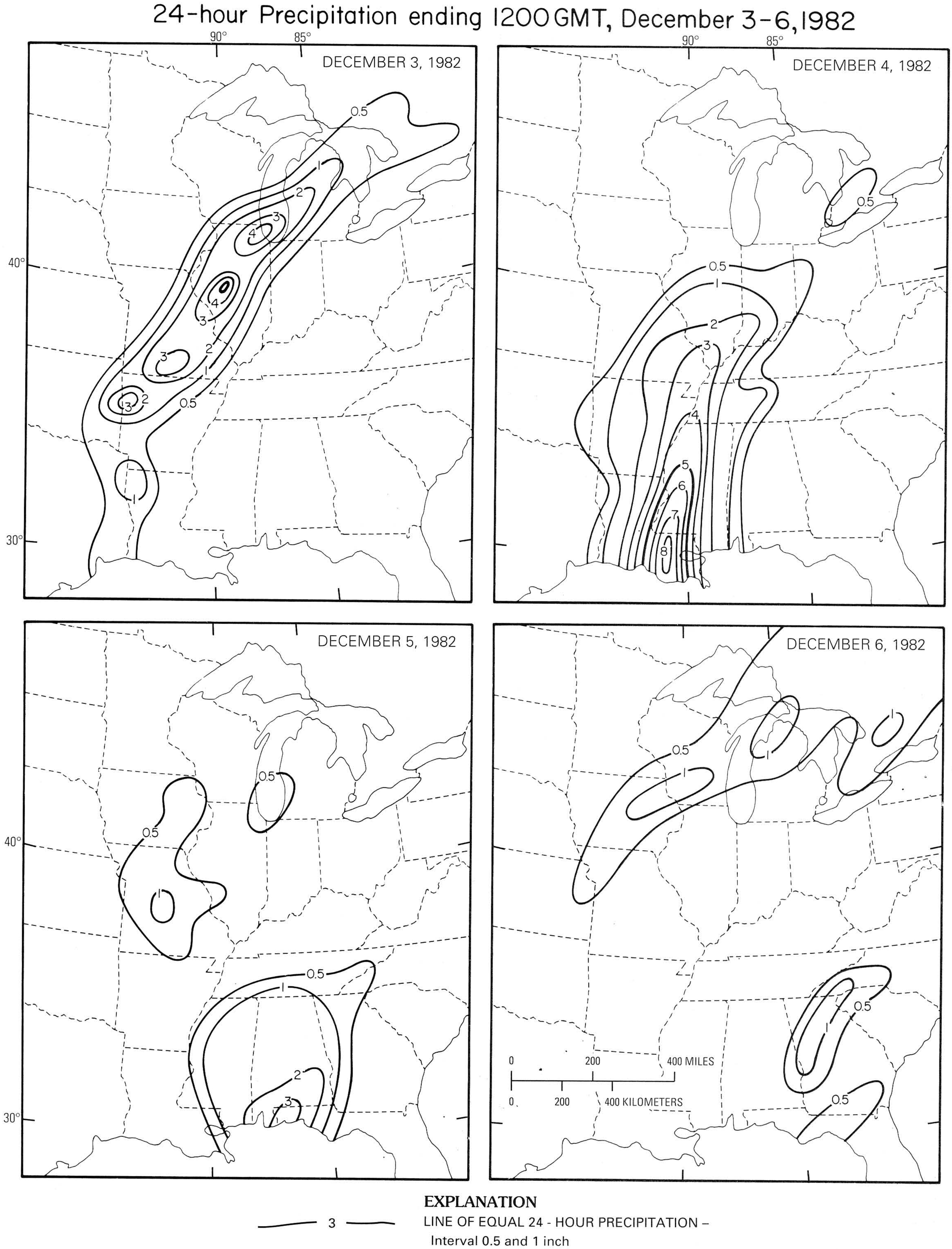


Figure 2. General distribution of heavy rains in the Mississippi River and Gulf of Mexico basins December 3–6, 1982 (from National Weather Service, December 1982).

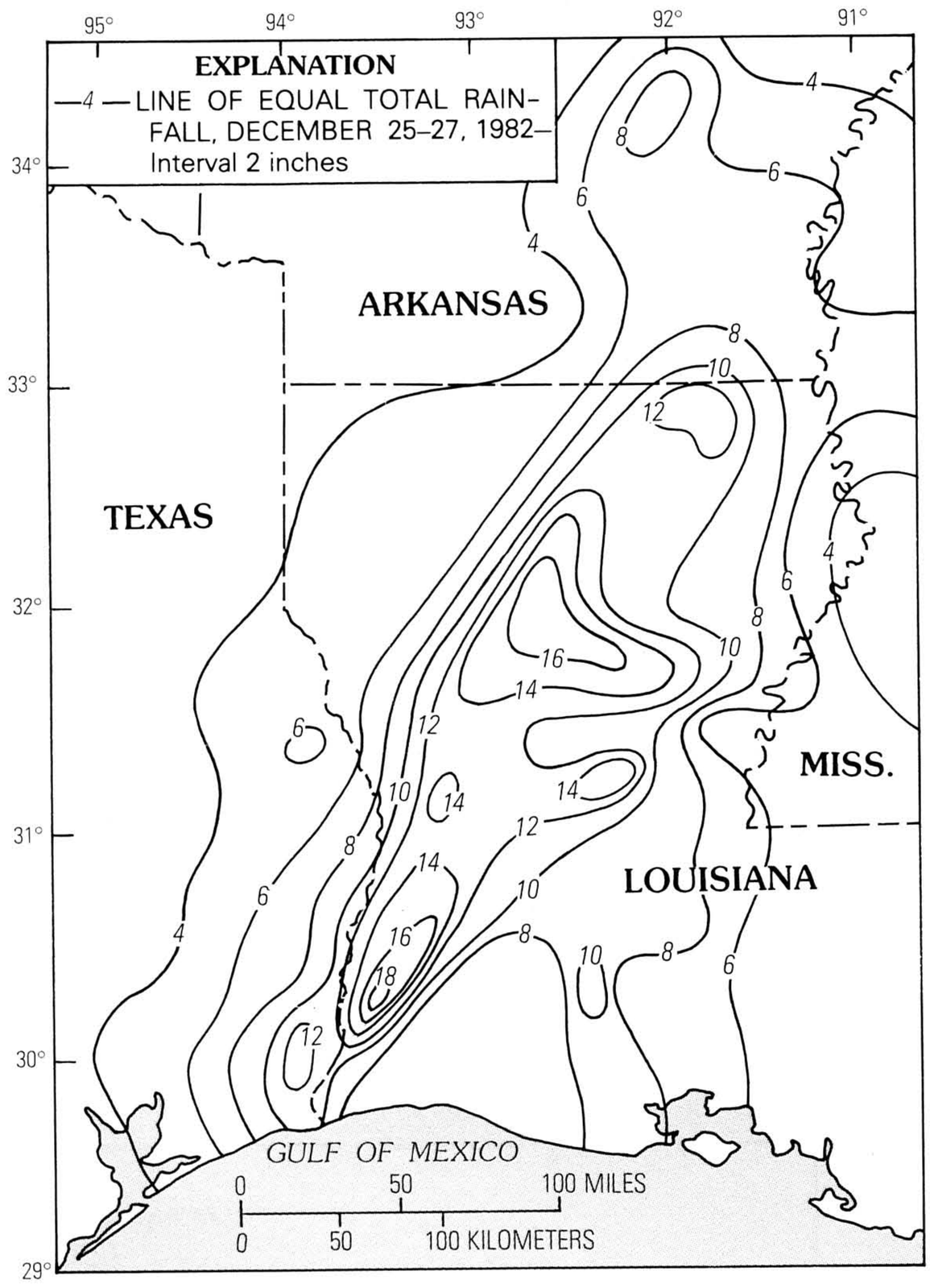


Figure 3. General distribution of heavy rains in the lower Mississippi River and Gulf of Mexico basins December 25–27, 1982 (from National Weather Service, December 1982).

keeping began in 1888. The largest recorded amount of rain in December 1982 was 25.45 inches at Belah Fire Tower near Jena. At DeRidder, 23.18 inches were recorded.

Very heavy rains occurred over almost the entire southern half of the State on December 4–5. Twenty-four-hour rainfall amounts ranged from 6 inches in the southwestern parishes to about 9 inches in parts of southeastern Louisiana. However, the largest rainfall to strike Louisiana in more than 100 years began on December 25 and continued into the early morning hours on the 28th (National Weather Service, December 1982). Rainfall averaged 15 inches over a 100-mile-wide band extending from Lake Charles in southwestern Louisiana to Monroe in the northeast. Several locations recorded total amounts of about 18 inches, 13 inches of which fell on December 26. December was the second consecutive month of excessive rainfall in Louisiana. The graph in figure 8 shows cumulative rainfall at DeRidder during October, November, and December 1982.

Storm Runoff

Runoff from the December 1982 storms resulted in recordbreaking floods on many streams in Illinois, Missouri, Arkansas, Mississippi, and Louisiana. The rates of flow in streams throughout the area were already high at the end of November because of above-normal rainfall. In addition, the high moisture saturation levels of the soils created conditions favorable for high rates of runoff in December. Consequently, the successive storms with heavy

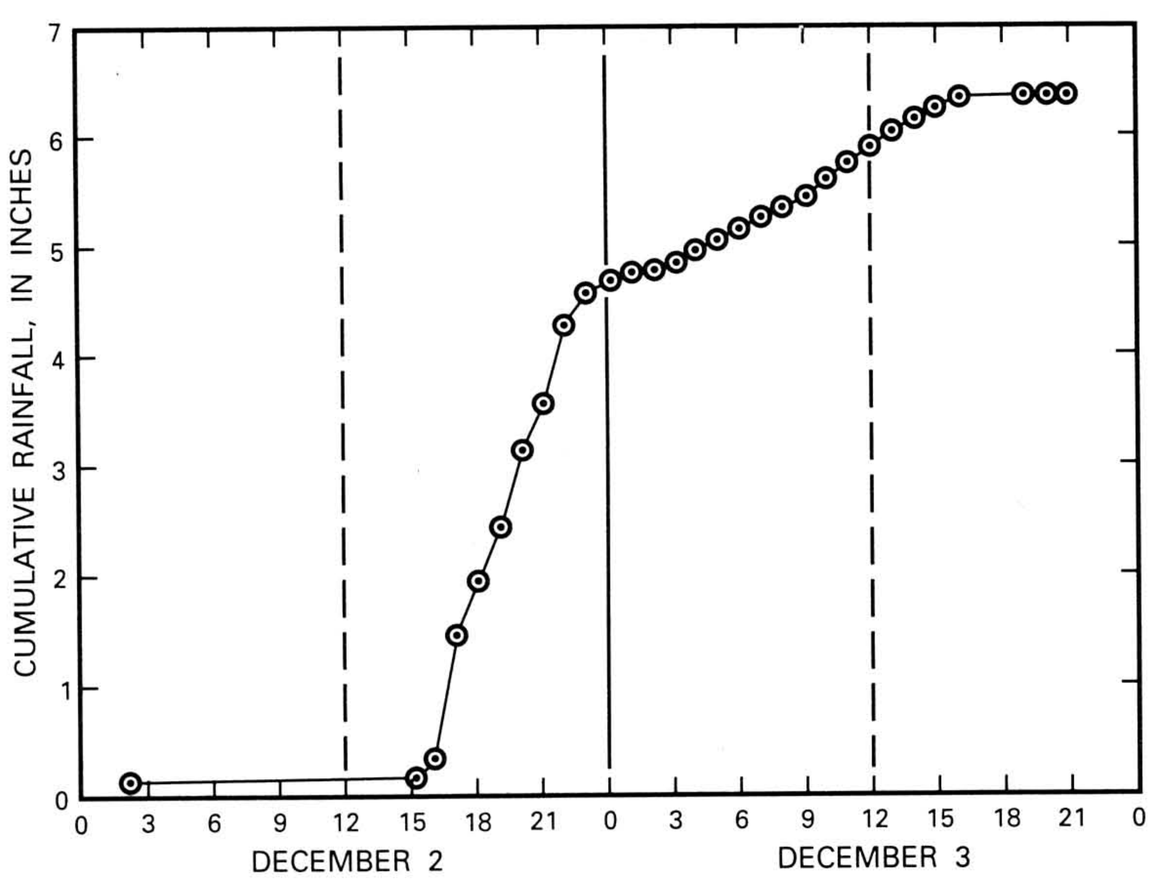


Figure 4. Mass curve of rainfall at the National Weather Service station at Springfield, Ill., December 2–3, 1982.

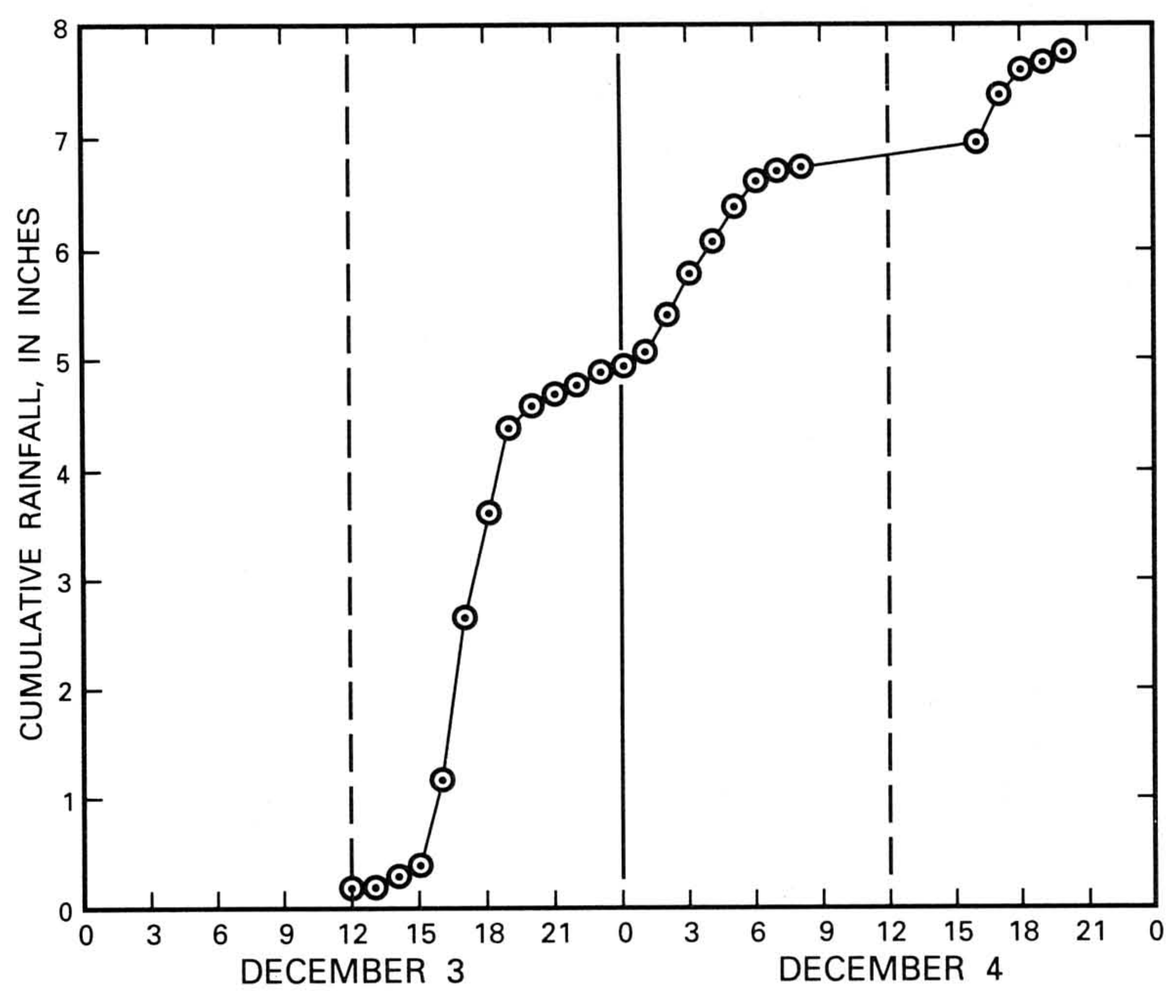


Figure 5. Mass curve of rainfall at the National Weather Service station at Jackson, Miss., December 3–4, 1982.

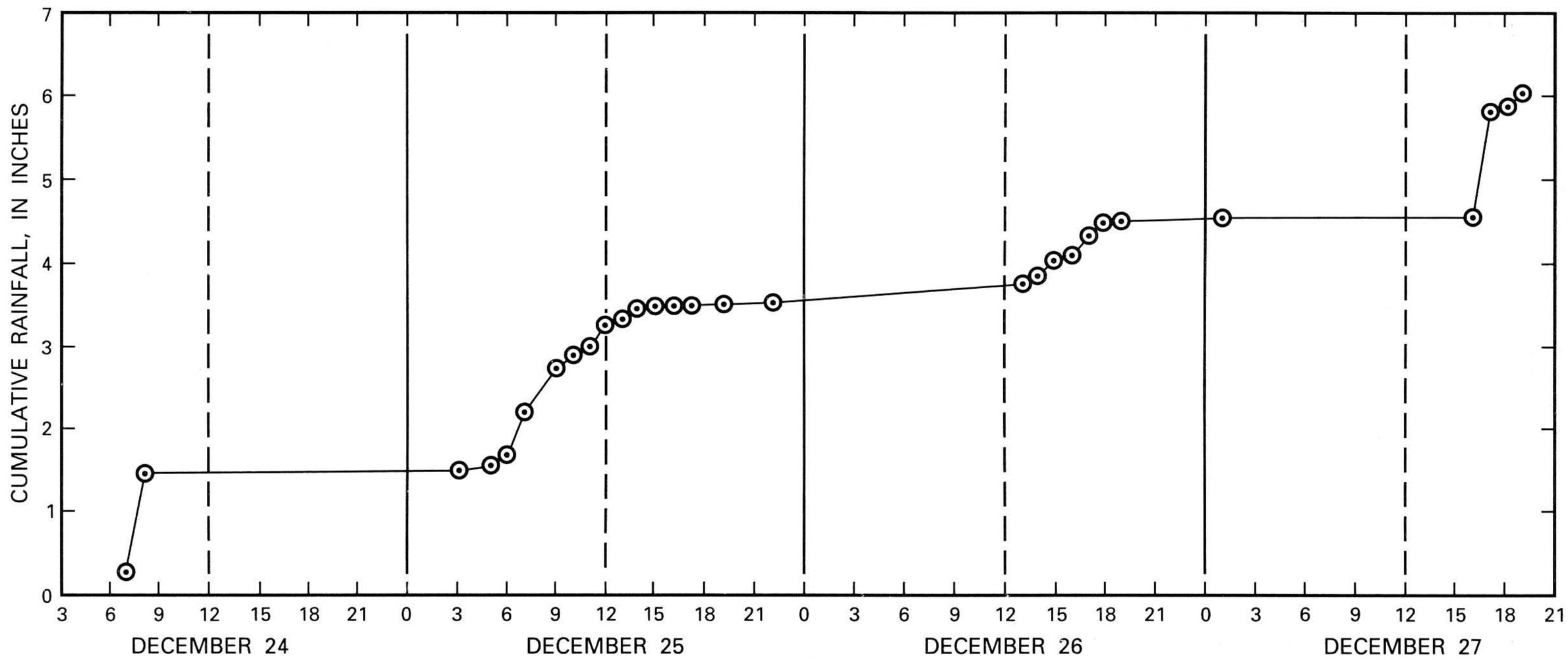


Figure 6. Mass curve of rainfall at the National Weather Service station at Jackson, Miss., December 24–27, 1982.

and intense rainfall in December produced widespread recordbreaking floods, which exceeded the 100-year flood on many streams.

Storm runoff and stage data at 491 streamflow gaging sites are given in table 3 (at end of report). The first column in table 3 is an index number assigned to each site shown on plate 1. The index (site) numbers are used for reference in illustrations, tables, and discussions only in this report. Column 2 gives the permanent number for each streamflow gaging site. The permanent number is based on the downstream order as used in annual water-resources data reports. The numbers are listed in a downstream direction along the mainstream, and stations on tributaries are listed between stations on the mainstream in the order in which those tributaries enter the mainstream. Gaged sites on tributaries to tributaries are listed in a similar manner.

On plate 1, each gaging station has been assigned a permanent number conforming to the downstream order. The complete eight-digit number for each station (such as 02429900) includes the two-digit part number (02) and the six-digit downstream order number (429900). The part number refers to an area where the part boundaries coincide with certain natural drainage divides. For this report, stations and data are listed for some areas of the following parts: Part 2, South Atlantic Slope and Eastern Gulf of Mexico basins; Part 3, Ohio River basin; Part 5, Hudson Bay and Upper Mississippi River basins; Part 6, Missouri River basin; Part 7, Lower Mississippi River basin; and Part 8, Western Gulf of Mexico basin.

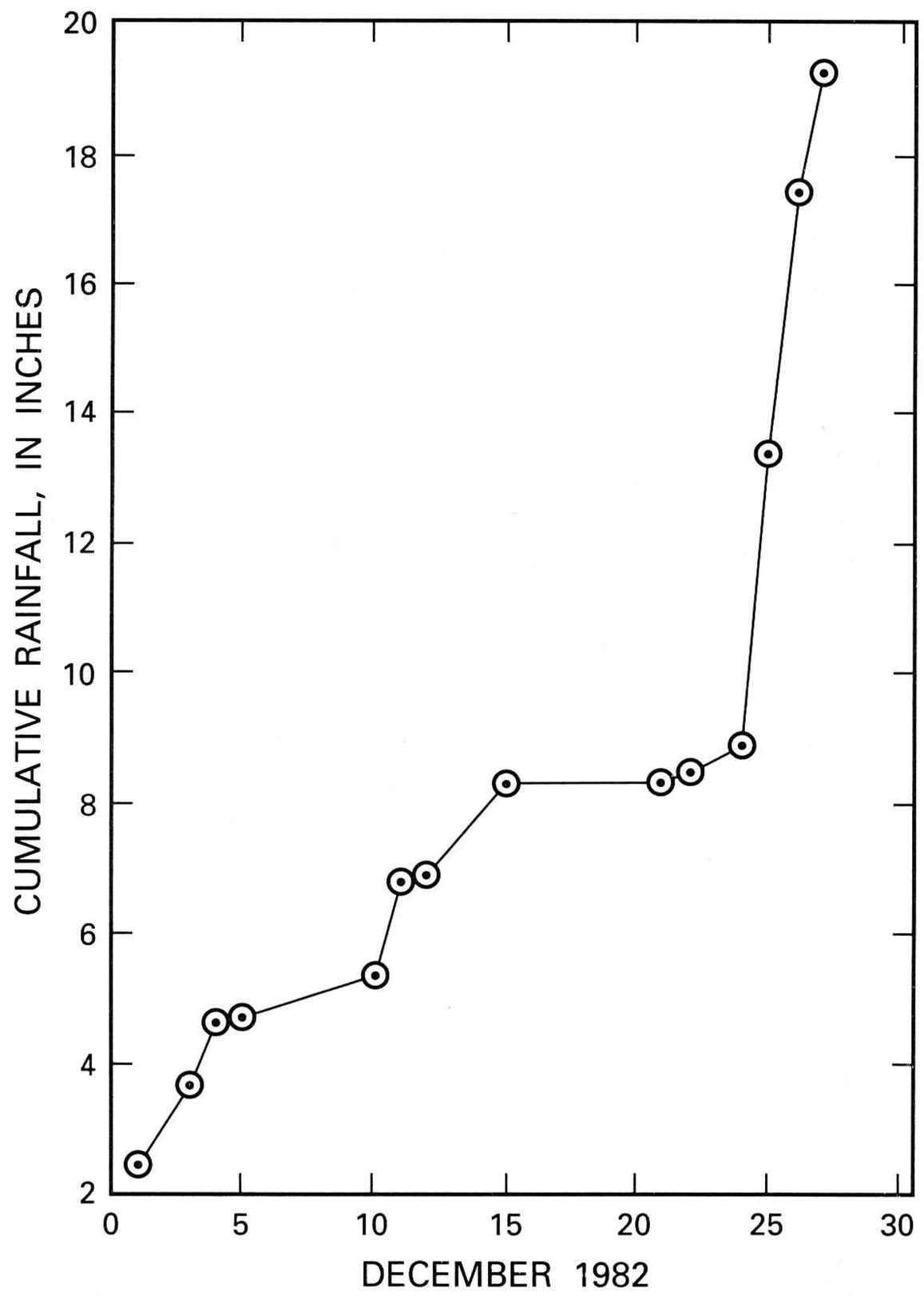


Figure 7. Cumulative daily rainfall at the National Weather Service station at Tupelo, Miss., December 1982.

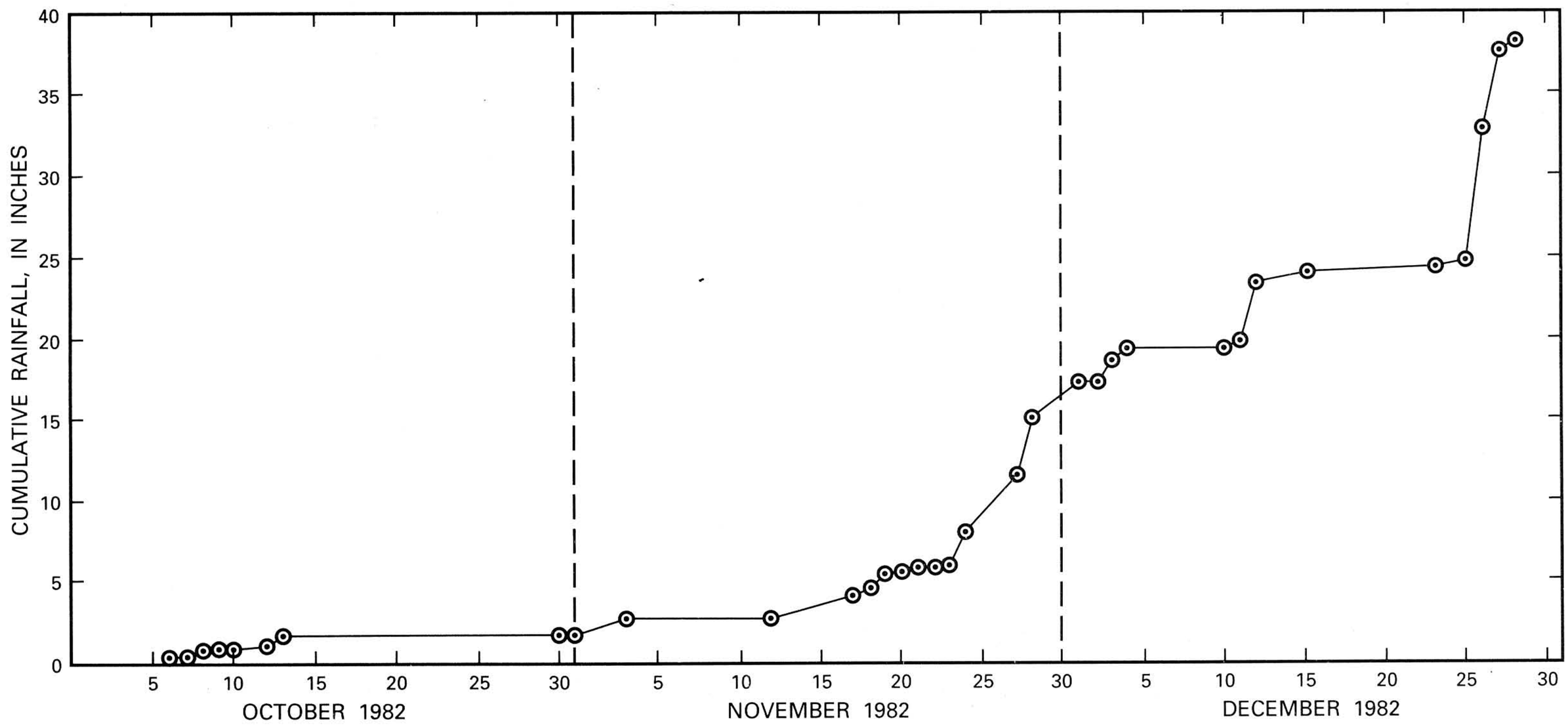


Figure 8. Cumulative rainfall at the National Weather Service station at DeRidder, La., during October, November, and December 1982.

Flood Frequency

The recurrence interval is the average interval of time, in years, between occurrences of floods that exceed a specified magnitude. For example, a flood of 100-year recurrence interval has a 1-in-100 chance, on the average, of occurring in any given year. However, the fact that a major flood occurs in any year does not affect the probability of a flood as large or larger occurring in the same year or during the next year.

Another measure of a flood's severity is its probability of being exceeded by another flood. Probability is expressed as a decimal number less than 1.0 that shows the chance of a flood being exceeded in any given year. Probability can be converted to percent chance by multiplying the decimal number by 100. The recurrence interval, or average number of years over a long period of time between floods of a given magnitude, is the reciprocal of the probability. The relations between probability, percent, and recurrence interval are as follows:

Relative measures of flood severity

Probability	Percent	Recurrence interval
0.1	10	10
0.04	4	25
0.02	2	50
0.01	1	100
0.005	0.5	200

For example, there is a 2-percent chance that a flood having a probability of 0.02 will be equaled or exceeded in a given year. A flood of this magnitude would occur on an average of once in 50 years. Probabilities of floods at gaged sites are computed from either a mathematical or a graphical distribution of known floods at the site during a specific time period.

Probabilities of recurrence intervals discussed in this report were obtained from a combination of regional relations and log-Pearson Type III analyses of annual peak streamflow at gaging stations (U.S. Water Resources Council, 1981).

Streamflow records from several gages can be used to derive regional relations for estimating flood magnitudes. The regional relations smooth out variations due to sampling errors and could produce better estimates of flood magnitude-frequency relations than does a short record at a single gaged site.

Discharge of December 1982 Floods

Discharges of the flood peaks, their relation to past recorded flood events, and their recurrence intervals are given in table 3. Peak discharges are listed for 282 gaged sites for the December 2–7 storms. Discharges at 63 of those sites were the greatest recorded since the stations were established, and discharges at 42 sites equaled or exceeded the 100-year flood. Peak discharges are listed for 180 gaged sites for the December 24–29 storms. Discharges at 46 of

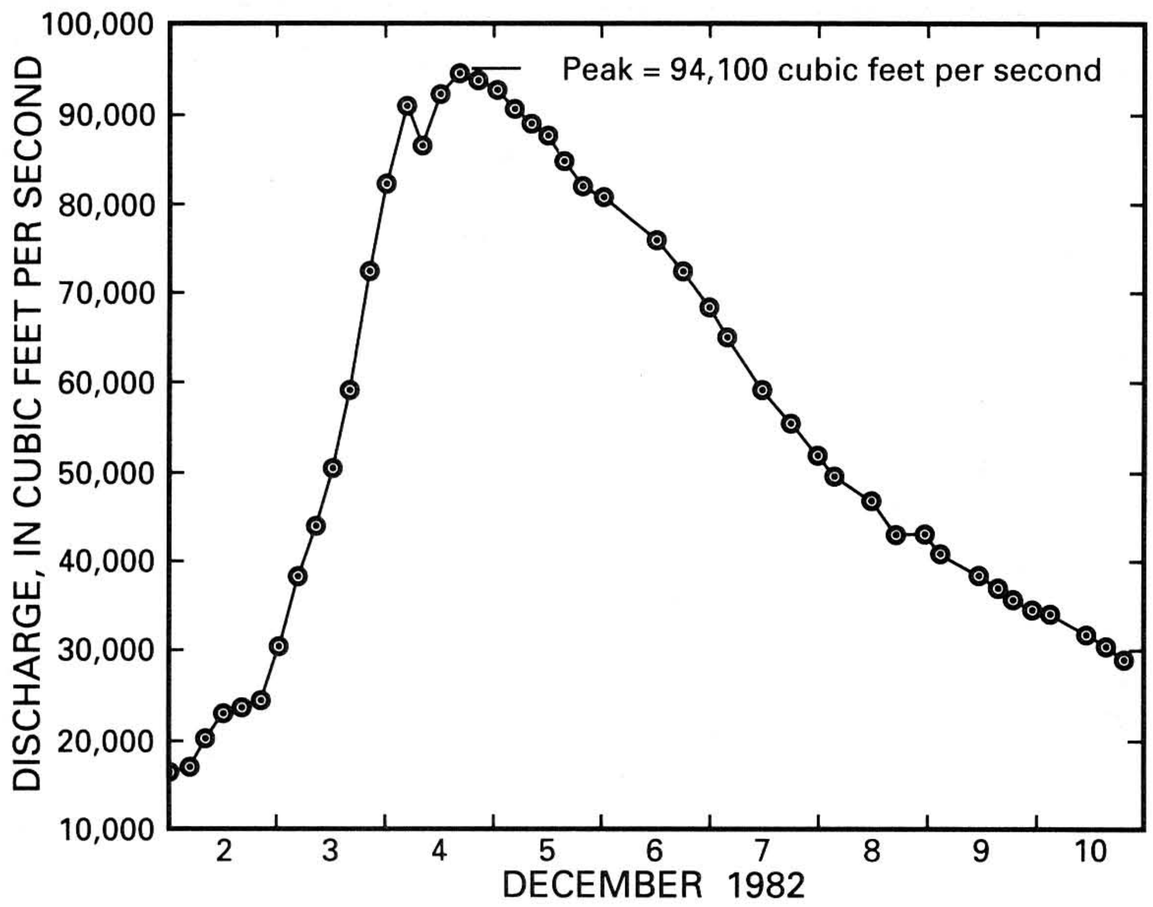


Figure 9. Discharge hydrograph for Illinois River at Marseilles, Ill., during December 2–10, 1982 (site number 165, plate 1 and table 3).

those sites were the greatest recorded, and discharges at 5 sites equaled or exceeded the 100-year flood. Many of the outstanding peaks during December were on the large streams (drainage areas more than 2,000 mi^2) because of the generally wide distribution and long duration of the rainfall. The Gasconade River at Jerome, Mo. (site 208), exceeded the 100-year flood on December 5. Some of the outstanding flood peaks are described in this section. Table 3 contains additional information on flood peaks. Flood-crest elevations can be determined from table 3 by adding the gage height of the flood to the datum of the gage for stations where the datum has been determined. Datum of the gage above National Geodetic Vertical Datum (NGVD) of 1929 is the elevation of the "zero" reading of the gage.

Illinois was affected more severely by the early December storm than by the storm of December 24–28. The Illinois River at Marseilles (site 165), an upstream station (drainage area 8,259 mi^2), for instance, exceeded the previous maximum stage by about 1.6 ft for the period since 1919. The peak discharge in 1957 was about 93,600 ft^3/s.The December 4 flood peak of 94,100 ft^3/s has an estimated recurrence interval of 45 years. The graph in figure 9 shows the approximate discharge of the Illinois River at Marseilles for December 2–10, 1982. Figure 10 shows the approximate discharge of the Illinois River at Marseilles December 24–28; the December 26 flood peak was about 46,000 ft^3/s.

Missouri, like Illinois, was affected most by the early December storms. New peaks of record were established on many streams. The Gasconade River exceeded previous maximum flood peaks by 2.4 and 4.2 ft, respectively, at

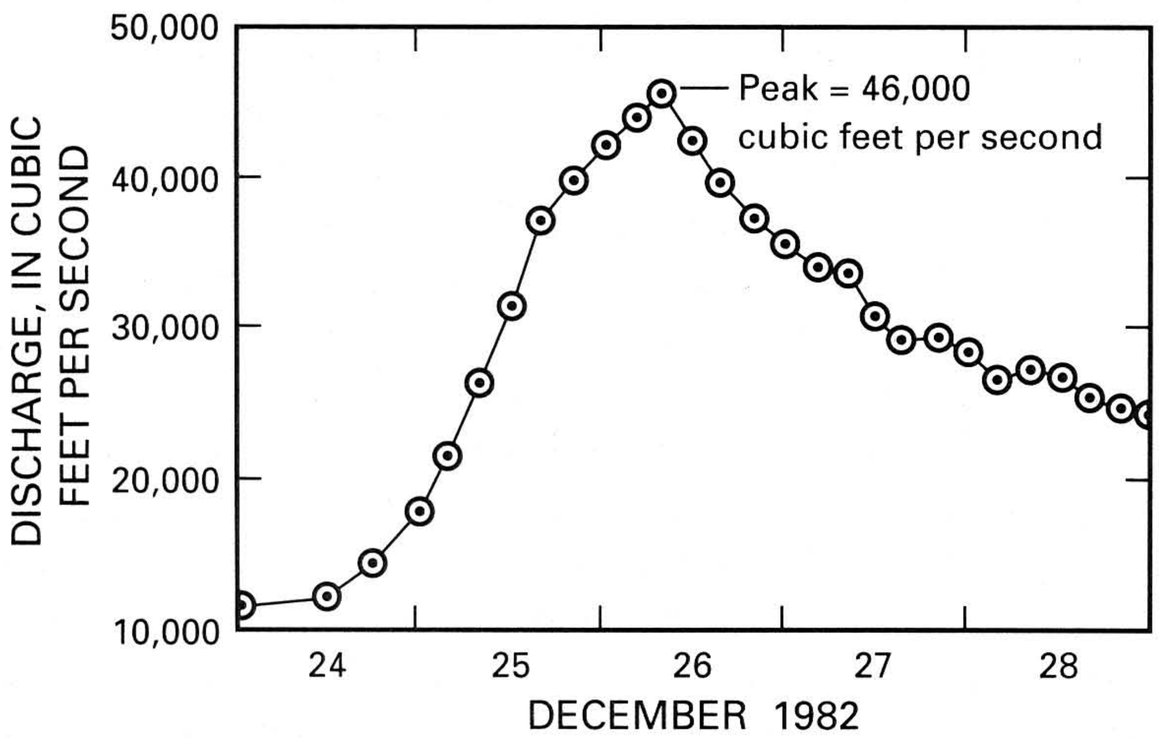


Figure 10. Discharge hydrograph for Illinois River at Marseilles, Ill., during December 24–28, 1982 (site number 165, plate 1).

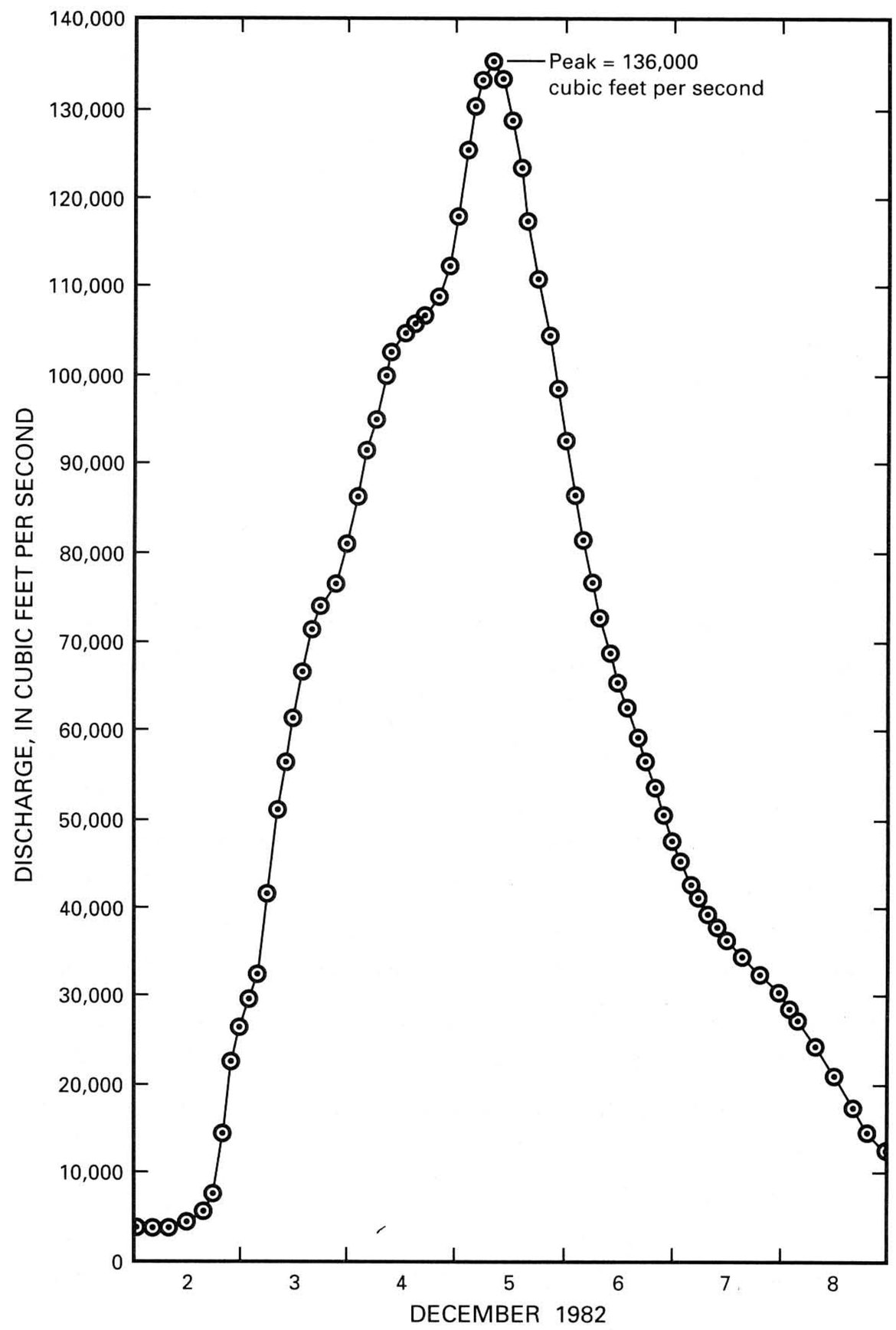


Figure 11. Discharge hydrograph for Gasconade River at Jerome, Mo., during December 2–8, 1982 (site number 208, plate 1 and table 3).

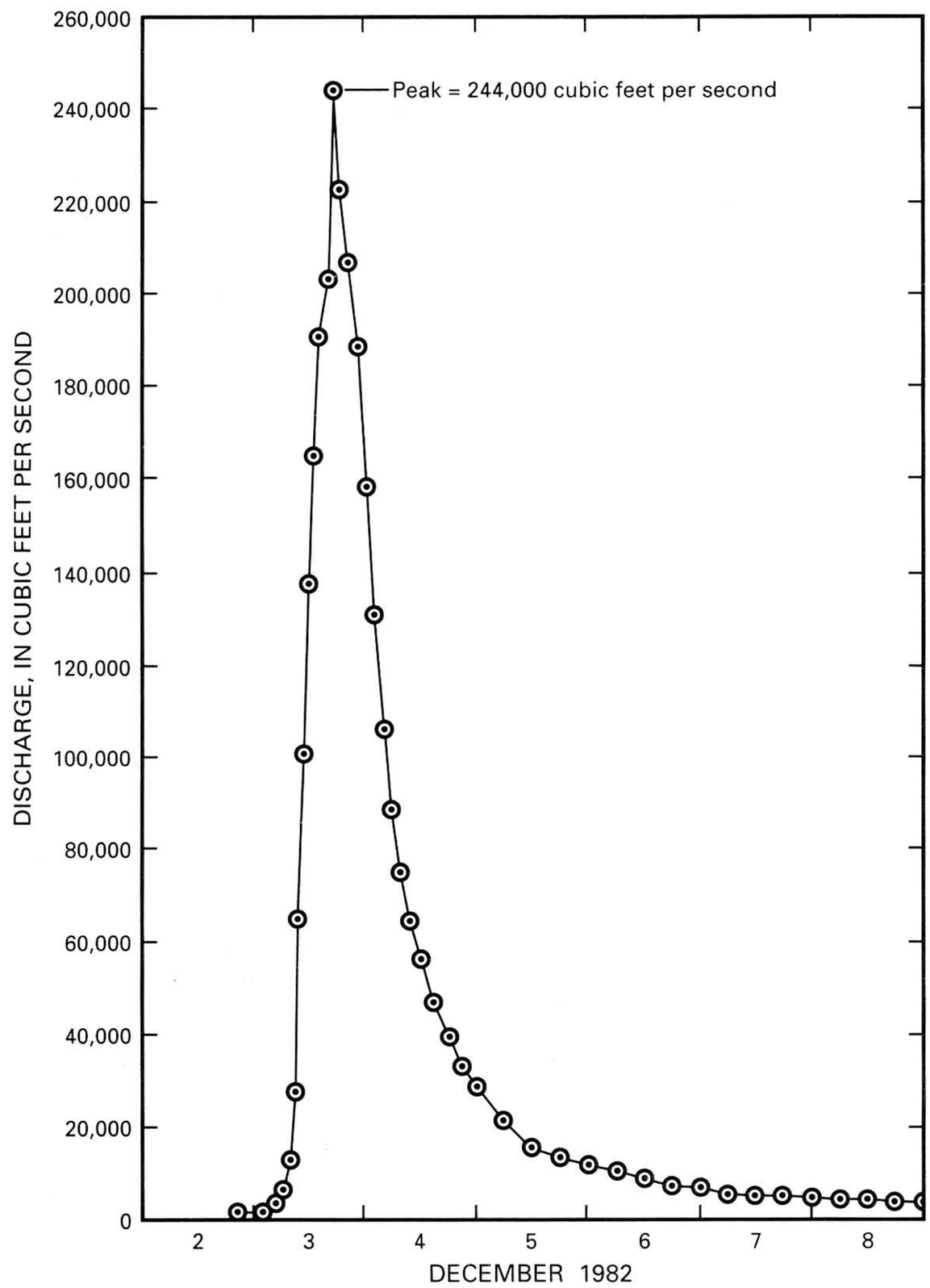


Figure 12. Discharge hydrograph for Spring River at Imboden, Ark., during December 2–8, 1982 (site number 273, plate 1 and table 3).

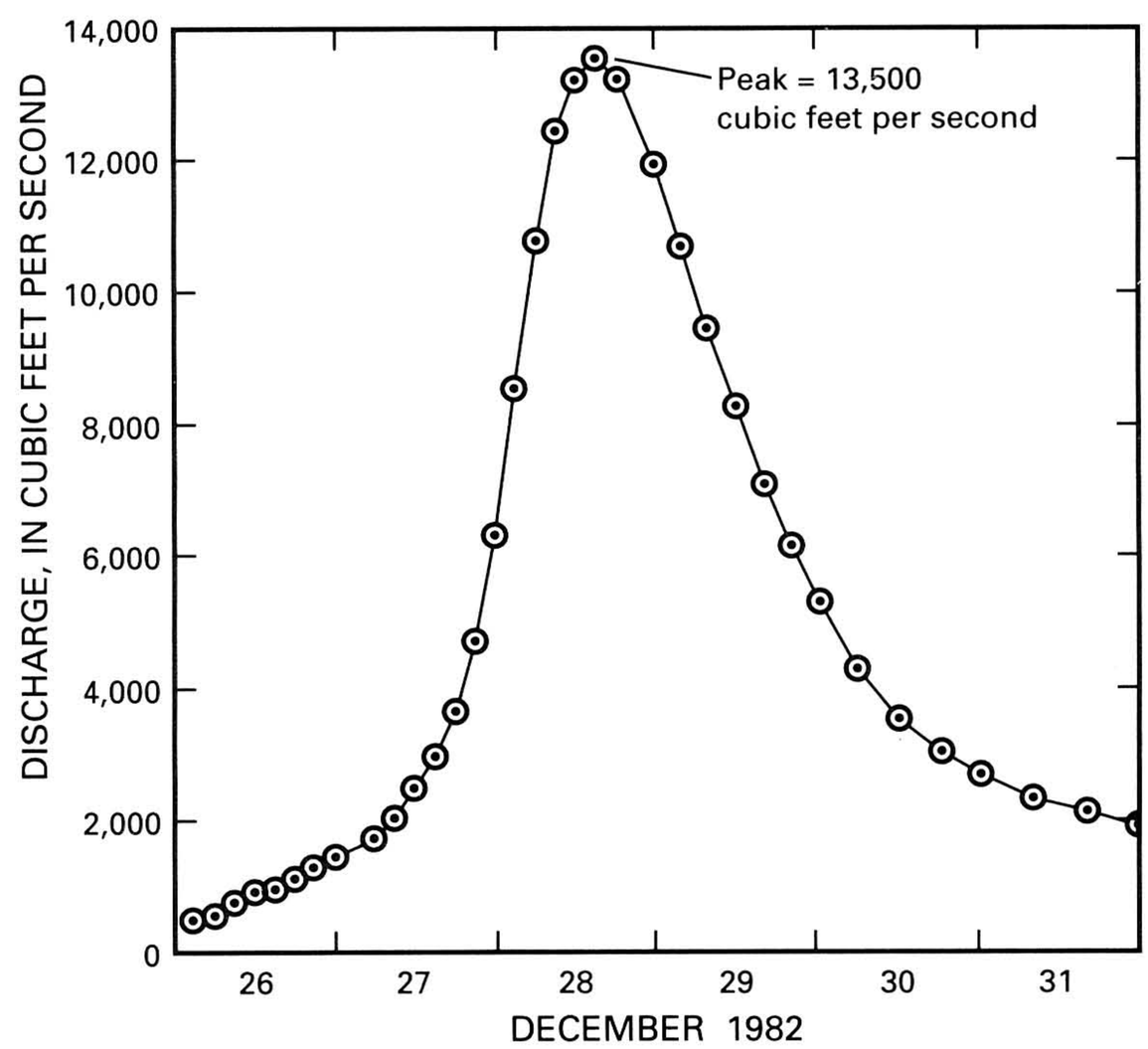


Figure 13. Discharge hydrograph for Smackover Creek near Smackover, Ark., during December 26–31, 1982 (site number 367, plate 1 and table 3).

Jerome (since 1897) and near Rich Fountain (since 1922). The stations are represented by site numbers 208 and 209 on plate 1 and in table 3. The peak discharges of 136,000 ft^3/s at Jerome and 134,000 ft^3/s near Rich Fountain both exceeded the peak discharge of the 100-year flood. The graph in figure 11 shows the approximate discharge of the Gasconade River at Jerome for December 2–8, 1982. The late December storms produced minor flooding in most of Missouri; only the extreme southeastern part of the State experienced significant flooding. On December 26, Little River ditch 1 near Morehouse, Mo. (site 244), exceeded the 100-year flood discharge and established a new maximum for the period since 1945.

Arkansas had severe flooding caused by the early December storms. Record peaks were exceeded at many locations across the State. On the Spring River at Imboden (site 273), the maximum peak stage since 1915 was exceeded by about 6 ft. The December 3 peak discharge of 244,000 ft^3/s was almost twice the previous maximum of 125,000 ft^3/s in August 1915 and was larger than the 100-year flood. Figure 12 shows the approximate discharge of the Spring River at Imboden for December 2–8, 1982. The southeastern part of Arkansas received additional flooding from the late December storms. However, most of the State experienced floods of generally less than 10-year recurrence intervals. The December 28 peak discharge of 13,500 ft^3/s on Smackover Creek near Smackover, Ark. (site 367), was only about one-fourth of the maximum discharge recorded on June 8, 1974. The December 28 discharge is estimated to be a 6-year flood. The graph in figure 13 shows the approximate discharge of Smackover Creek near Smackover for December 26–31, 1982.

In Louisiana the early December storms caused only minor flooding, but the late December storms caused severe flooding on many streams. Some gaging stations recorded flood peaks that exceeded the 100-year flood. On the Dugdemona River near Jonesboro, La. (site 405), the December 28 peak stage exceeded the previous maximum since 1939 by about 1.3 ft. On Little River near Rochelle (site 410), the December 29 peak exceeded the previous maximum since 1958 by about 5.7 ft. The discharge of 41,500 ft^3/s on Dugdemona River was about 1.5 times as large as the previous maximum, whereas the discharge of 108,000 ft^3/s on Little River was nearly twice as large as the previous maximum. The Dugdemona River flood had a recurrence interval of more than 100 years, and the Little River flood had a recurrence interval of about 90 years. The graphs in figures 14 and 15 show the approximate discharges of Dugdemona River and Little River. Figure 16 shows the approximate discharge of Bear Head Creek near

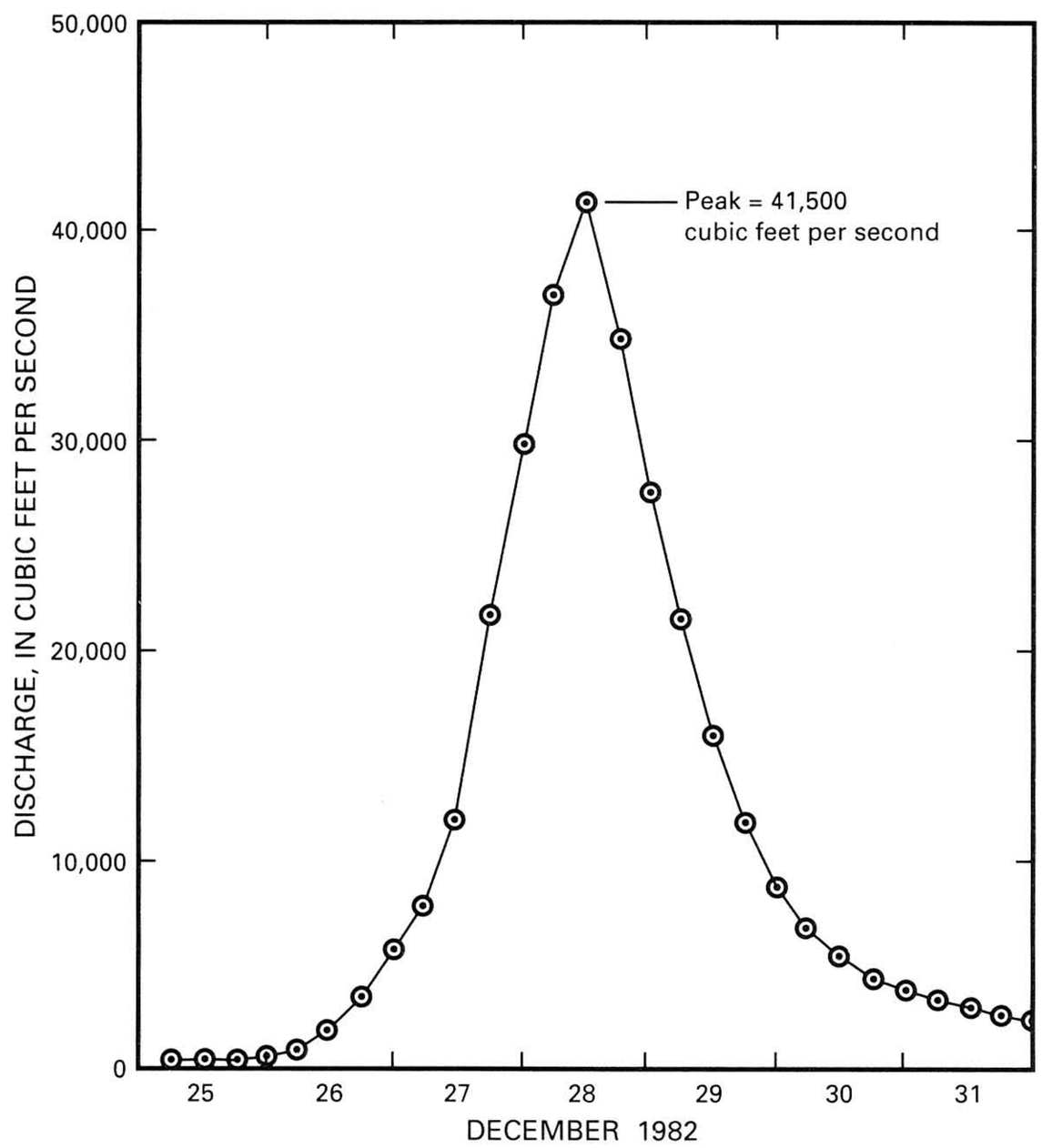


Figure 14. Hydrograph of discharge for Dugdemona River near Jonesboro, La., during December 25–31, 1982 (site number 405, plate 1 and table 3).

Starks, La. (site 483). The peak discharge of 19,100 ft^3/s exceeded the 100-year recurrence interval and was the greatest since 1954.

In Mississippi, large flood peaks occurred mostly in the northern part of the State. The early December storms produced floods with recurrence intervals of about 2 years at most sites. An exception is Skuna River at Bruce, Miss. (site 322), where the December 4 peak discharge of 18,900 ft^3/s had a recurrence interval of approximately 7 years. The late December storms caused larger floods in most parts of the State. The December 26 peak discharge of 39,300 ft^3/s on the Skuna River at Bruce had a recurrence interval of approximately 30 years. The Yalobusha River at Calhoun City (site 321) exceeded the previous maximum flood stage since 1949 by about 1.2 ft. The December 26 peak discharge of 70,100 ft^3/s exceeded that of the 100-year flood. Recurrence intervals of the flood discharges generally ranged from 2 to 20 years at other sites in Mississippi.

Tennessee experienced some flooding in the western part of the State. During early and late December, flood discharges at most gaged sites had recurrence intervals of about 2 years. The largest flood occurred on the Hatchie River at Bolivar (site 236), where the December 30 peak discharge of 45,800 ft^3/s had a recurrence interval of about 20 years. None of the previous maximum floods were exceeded during December 1982 in Tennessee.

The main stem of the Mississippi River had fairly high peaks from Illinois downstream to its mouth. However, none of the previous maximum floods were exceeded. The largest flood on the Mississippi River during December 1982 occurred at Alton, Ill. (site 196), where the peak discharge of 422,000 ft^3/s had a recurrence interval of about 15 years. Recurrence intervals of the December floods at other sites on the Mississippi River ranged from less than 2 years at Tarbert Landing and Vicksburg, Miss. (sites 344 and 327, respectively), to about 5 years at St. Louis, Mo. (site 210). The peak discharges in the downstream reaches exceeded 1 million ft^3/s, with a peak on January 9 of 1.4 million ft^3/s at Vicksburg, Miss.

Crippen and Bue (1977) developed a family of four curves that provide a guide for estimating maximum flood flows in the study area. The curves are based on the largest known floods through 1974 and on the particular climate, topography, and geology involved. Curves A and B, shown in figure 17, are upper and lower limits enveloping the four regional curves. The curves in figure 17 indicate that floods in December 1982 were generally about one-half the potential maximum flood in large basins and about one-third in small basins. Exceptions are five gaging stations (sites 273, 279, 283, 294, and 305) in Arkansas in the White and Arkansas River basins that nearly equal the potential maximum discharge for curve B. The December peak discharge on Middle Fork Little Red River near Shirley, Ark. (site 283) exceeds curve B by about 70 percent, but it is below curve A.

Flood-Crest Elevations at Ungaged Sites

Information given in table 3 was collected at streamflow gaging stations located in the large area affected by the floods. In addition, elevations of flood crests were determined at numerous ungaged sites along some of the major streams in Illinois, Missouri, Arkansas, and Louisiana.

Records of flood-crest elevations for the early December 1982 event on the Des Plaines, Illinois, Meramec, Bourbeuse, Buffalo, White, and Arkansas Rivers are given in table 4 (at end of report). Flood-crest elevations for the late December 1982 event for two tributaries in the Mississippi River Delta are given in table 5 (at end of report).

Information given in table 4 can be used to develop water-surface profiles for the early December flood along some streams in Illinois, Missouri, and Arkansas. Figure 18 shows the flood profile for the Illinois River. Abrupt changes in the profile at some road and railroad crossings are differences in upstream and downstream water-surface elevations caused by bridge and culvert constrictions. Flooding by the early December storm was minor to moderate in Louisiana, Mississippi, and Tennessee; consequently, water-surface profiles in those States were not surveyed. During late December, however, major

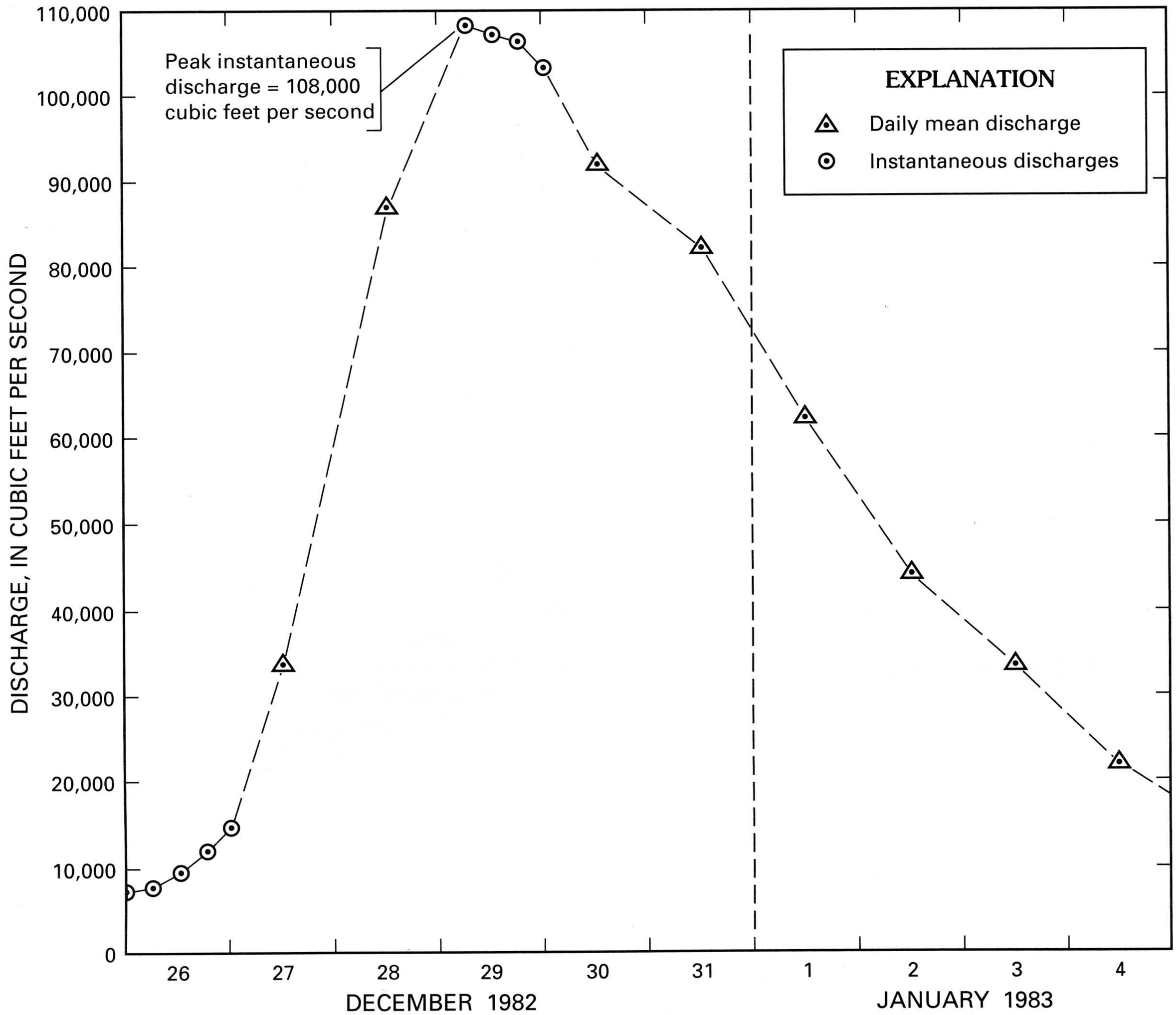


Figure 15. Discharge hydrograph for Little River near Rochelle, La., during December 26, 1982, to January 4, 1983 (site number 410, plate 1 and table 3).

floods occurred along some streams in Louisiana. Figure 19 shows the water-surface profile for the late December flood on Dugdemona River in Louisiana, which is based on data from table 5.

Flood-crest elevations at many ungaged points along streams were obtained by leveling to floodmarks identified during or immediately after the floods. Flood-crest elevations provide a means to determine the extent of overflows and are useful in land-use management of flood plain lands.

Both the U.S. Geological Survey and the U.S. Army Corps of Engineers (Little Rock, Memphis, and Vicksburg Districts) participated in flagging the floodmarks. Most of the elevations were determined by the Corps of Engineers.

Ungaged points are referred to in distance in river miles upstream from the mouth of the stream. River miles were determined by the U.S. Army Corps of Engineers unless otherwise noted. Flood-crest elevations are water-surface elevations in feet above NGVD of 1929.

Table 3. Summary of peak stages and discharges at 491 streamflow gaging sites in the study area—Continued

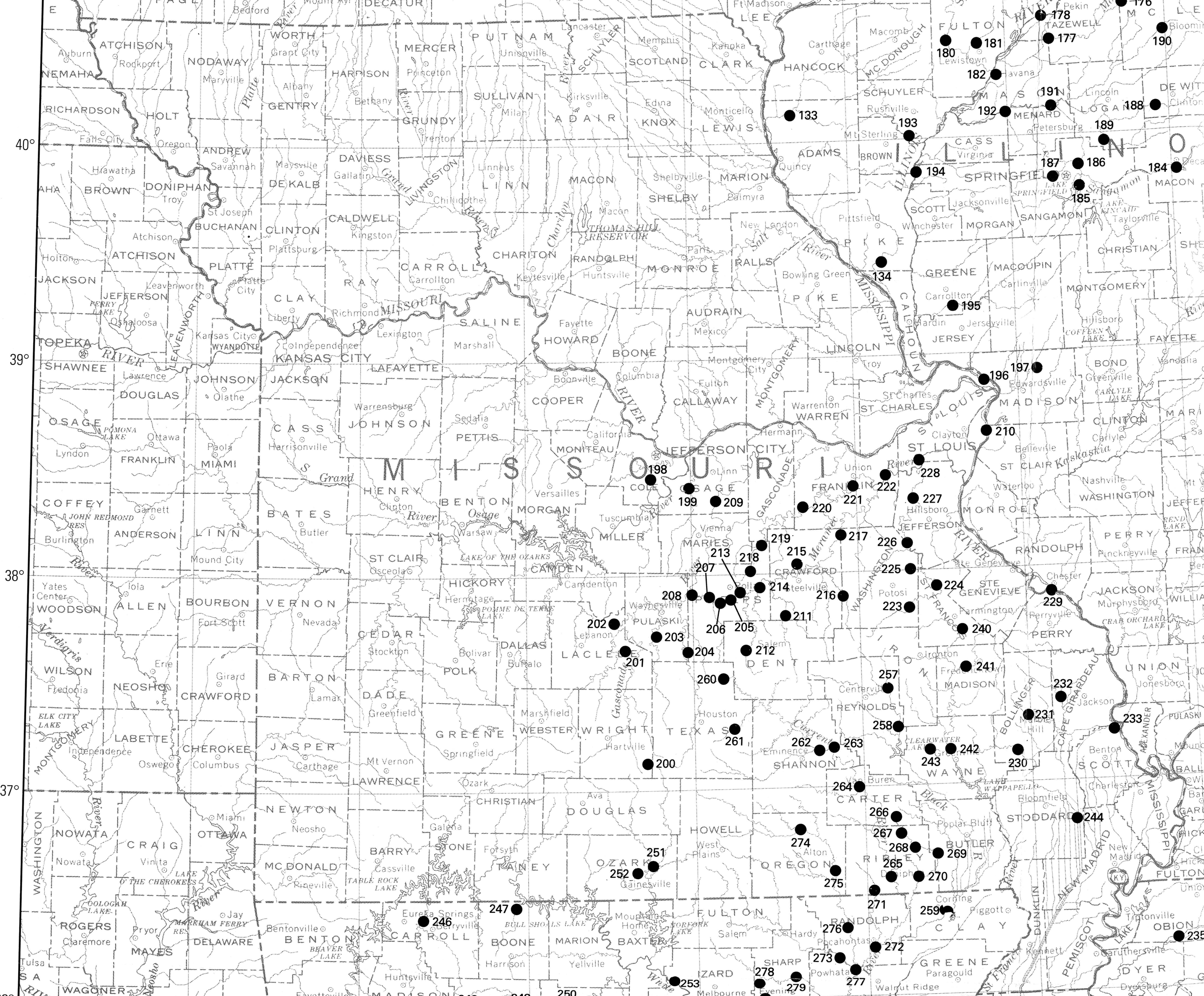
Site no.	Permanent station number	Stream name and location	Drainage area (mi^2)	Datum of gage above NGVD of 1929 (feet)	Period of record	Flood data: Previous flood of record: Date	Previous flood of record: Gage height (feet)	Previous flood of record: Discharge (ft^3/s)	Flood of December 1982, January 1983, April 1983, or May 1983: Date	Gage height (feet)	Discharge (ft^3/s)	Recurrence interval (years)
		ILLINOIS RIVER BASIN—Continued										
184	05573540	Sangamon River at Route 48 at Decatur, Ill.	938	583.43	1982–	——	——	——	Dec. 4	16.40	4,500	——
185	05576000	South Fork Sangamon River near Rochester, Ill.	867	511.30	1949–	July 1, 1957 Apr. 14, 1979	28.36 31.92	18,100 ——	Dec. 4	27.50	8,940	4
186	05576500	Sangamon River at Riverton, Ill.	2,618	508.38	1908–12, 1915–	May 19, 1943	31.52	68,700	Dec. 4	23.82	29,600	9
187	05577500	Spring Creek at Springfield, Ill.	107	524.65	1948–	Mar. 30, 1960	12.70	6,750	Dec. 3	14.44	8,080	3
188	05578500	Salt Creek near Rowell, Ill.	335	610.00	1942–	May 16, 1968	29.21	24,500	Dec. 3	20.71	4,310	3
189	05579500	Lake Fork near Cornland, Ill.	214	555.06	1948–	Apr. 12, 1979	23.11	8,930	Dec. 4	22.43	7,270	14
190	05580950	Sugar Creek near Bloomington, Ill.	34.4	725.11	1974–	Mar. 3, 1979	11.04	3,680	Dec. 3	14.02	6,600	100
191	05582000	Salt Creek near Greenview, Ill.	1,804	479.00	1941–	May 19, 1943	20.50	41,200	Dec. 4	20.21	37,500	35
192	05583000	Sangamon River near Oakford, Ill.	5,093	452.88	1909–11, 1911–12, 1914–19, 1921–22, 1928–33, 1939–	May 20, 1943	25.63	123,000	Dec. 5	23.65	68,700	40
193	05585000	LaMoine River at Ripley, Ill.	1,293	431.1	1921–	Sept. 27, 1970	28.42	24,100	Dec. 5	27.27	21,000	20
194	05585500	Illinois River at Meredosia, Ill.	26,028	418.0	1938–	May 26, 1943	28.61	123,000	Dec. 12	26.40	112,000	20
195	05587000	Macoupin Creek near Kane, Ill.	868	426.77	1921–33, 1940–	May 18, 1943	28.5	40,000	Dec. 4	26.3	26,700	15
		MISSISSIPPI RIVER MAIN STEM										
196	05587500	Mississippi River at Alton, Ill.	171,500	.00	1927–	Apr. 28, 1973	423.155	[y]535,000	Dec. 5	428.68	422,000	15
		CAHOKIA CREEK BASIN										
197	05587900	Cahokia Creek at Edwardsville, Ill.	212	425.62	1969–	Apr. 12, 1979	24.74	8,200	Dec. 4 Dec. 25	19.52 19.76	5,210 5,330	2 3
		MOREAU RIVER BASIN										
198	06910500	Moreau River near Jefferson City, Mo.	561	546.33	1904, 1942, 1948–75	1904 June 8, 1937 Oct. 14, 1969	38.67 19.17 28.60	—— —— 24,400	Dec. 3	29.83	30,000	85
		OSAGE RIVER BASIN										
199	06927000	Maries River at Westphalia, Mo.	257	542.74	1937, 1948–81	Oct. 12, 1969	20.83	26,100	Dec. 3	21.96	39,000	>100
		GASCONADE RIVER BASIN										
200	06927600	Wheeler Branch near Mountain Grove, Mo.	1.34	——	1955–	June 16, 1958	6.32	940	Dec. 2	5.41	680	5
201	06927800	Osage Fork at Drynob, Mo.	404	927.85	1903, 1914, 1943, 1962–81	1903 Apr. 12, 1979	31 17.96	—— 21,300	Dec. 3	19.37	38,800	>100
202	06928000	Gasconade River near Hazelgreen, Mo.	1,250	844.75	1916, 1929–71, 1973–	January 1916	30.6	90,000	Dec. 3	34.46	90,000	35
203	——	Roubidoux Creek at Waynesville, Mo.	278	——	——	——	——	——	Dec. 3	——	[v]27,700	60
204	06930000	Big Piney River near Big Piney, Mo.	560	800.99	1922–81	Dec. 27, 1942	20.7	32,700	Dec. 3	24.54	[w]81,200	>100
205	06931000	Beaver Creek near Rolla, Mo.	13.7	805.31	1949–58, 1960–79	July 28, 1979	9.50	12,000	Dec. 3	6.84	5,900	15
206	06931500	Little Beaver Creek near Rolla, Mo.	6.41	——	1945, 1948–79	July 17,1958	8.57	7,420	Dec. 3	7.64	5,130	25

See footnotes at end of table.

Table 3. Summary of peak stages and discharges at 491 streamflow gaging sites in the study area—Continued

Site no.	Permanent station number	Stream name and location	Drainage area (mi^2)	Datum of gage above NGVD of 1929 (feet)	Period of record	Flood data: Previous flood of record: Date	Previous flood of record: Gage height (feet)	Previous flood of record: Discharge (ft^3/s)	Flood of December 1982, January 1983, April 1983, or May 1983: Date	Gage height (feet)	Discharge (ft^3/s)	Recurrence interval (years)
					GASCONADE RIVER BASIN—Continued							
207	06932000	Little Piney Creek at Newburg, Mo.	200	693.40	1915 1929–	Aug. 20, 1915 Aug. 14, 1946	16.70 16.2	—— 32,500	Dec. 3	16.70	29,300	40
208	06933500	Gasconade River at Jerome, Mo.	2,840	657.64	1897 1903–06 1915 1923–	Jan. 6, 1897	28.96	120,000	Dec. 5	31.34	136,000	>100
209	06934000	Gasconade River near Rich Fountain, Mo.	3,180	553.70	1922–65	Apr. 16,1945	29.13	96,400	Dec. 6	33.30	134,000	>100
					MISSISSIPPI RIVER MAIN STEM							
210	07010000	Mississippi River at St. Louis, Mo.	697,000	——	1844 1961–	June 27, 1844 Apr. 28, 1973	41.32 43.23	1,300,000 852,000	Dec. 7	39.27	739,000	5
					MERAMEC RIVER BASIN							
211	07010350	Meramec River at Cook Station, Mo.	199	864.51	1966–81	Feb. 10, 1966	17.74	34,900	Dec. 3	15.29	16,500	5
212	07011200	Love Creek near Salem, Mo.	.89	——	1955–81	Apr. 11, 1979	7.13	365	Dec. 3	5.19	160	5
213	07011600	Love Branch at Rolla, Mo.	1.72	1040.00	1978–	Apr. 11, 1979	4.37	1,700	Dec. 2	4.17	1,320	——
214	07012050	Dry Fork near St. James, Mo.	370	——	1944–50	December 1942 Aug. 15, 1946	24.5 21.7	—— 28,000	Dec. 3	20.5	22,000	5
215	07013000	Meramec River near Steelville, Mo.	781	681.68	1915 1923–	Aug. 20, 1915	26.52	60,000	Dec. 4	25.59	49,300	45
216	07014200	Courtois Creek at Berryman, Mo.	173	733.21	1944–47	June 8, 1945	12.89	24,300	——	12.39	22,000	——
217	07014500	Meramec River near Sullivan, Mo.	1,475	581.82	1915, 1922–33 1943–	August 1915	33.48	90,000	Dec. 4	32.22	67,700	90
218	07015000	Bourbeuse River near St. James, Mo.	21.3	899.46	1945 1947–81	June 8, 1945 Apr. 11, 1979	14.0 11.17	8,390 8,390	——	10.84	7,100	15
219	07015720	Bourbeuse River near Highgate, Mo.	135	804.10	1957 1965–	June 1957 Apr. 11, 1979	23 22.1	—— 	Dec. 3	23.65	49,300	>100
220	07016000	Bourbeuse River near Spring Bluff, Mo.	608	626.34	1915 1944–81	August 1915 June 30, 1957	35.66 34.71	—— 50,700	Dec. 5	41.26	87,000	>100
221	07016500	Bourbeuse River at Union, Mo.	808	488.58	1915 1921–	Aug. 22, 1915	28.5	50,000	Dec. 5	33.80	73,300	>100
222	07017000	Meramec River at Robertsville, Mo.	2,673	448.24	1915 1940–51	August 1915	36.1	125,000	Dec. 5	37.6	140,000	>100
223	07017200	Big River at Irondale, Mo.	175	753.28	1965–	Nov. 1, 1972	27.92	43,200	Dec. 3	17.29	17,900	<5
224	07017500	Dry Branch near Bonne Terre, Mo.	3.35	——	1956–81	June 30, 1957	5.55	1,520	Dec. 3	3.82	720	<5
225	07017700	Fountain Farm Branch near Potosi, Mo.	2.16	——	1957–81	June 30, 1957	18.36	1,890	Dec. 3	13.78	660	<5
226	07018000	Big River near Desoto, Mo.	718	538.79	1915 1949–	August 1915	29.4	70,500	Dec. 4	22.35	37,400	10
227	07018500	Big River at Byrnesville, Mo.	917	433.69	1915 1922–	Aug. 21, 1915	30.2	80,000	Dec. 5	25.18	36,600	25
228	07019000	Meramec River near Eureka, Mo.	3,788	404.18	1903–06, 1915 1922–	Aug. 22, 1915	42.2	175,000	Dec. 6	42.89	145,000	>100
					MISSISSIPPI RIVER MAIN STEM							
229	07020500	Mississippi River at Chester, Ill.	708,600	——	1844 1928–	June 30, 1844 Apr. 30, 1973	39.8 43.32	1,350,000 886,000	Dec. 9	41.6	825,000	5
					HEADWATER DIVERSION CHANNEL BASIN							
230	07021000	Castor River at Zalma, Mo.	423	350.38	1915, 1920–	Mar. 11, 1935 Mar. 28, 1977	28.22 27.05	—— 40,800	Dec. 4	29.91	97,100	>100
231	——	Crooked Creek at Lutesville, Mo.	75.2	——	——	——	——	——	——	——	[v]40,900	>100
232	——	Whitewater River near Burfordville, Mo.	238	——	——	——	——	——	——	——	[v]60,300	>100

See footnotes at end of table.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