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Prepared in cooperation with the Illinois Department of Natural Resources,
Office of Water Resources

Floods of July 18–20, 1996, in Northern Illinois

Open-File Report 97–425

U.S. Department of Interior
U.S. Geological Survey

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By Robert R. Holmes, Jr., and Amanda L. Kupka

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ILLINOIS DEPARTMENT OF NATURAL RESOURCES,
OFFICE OF WATER RESOURCES

Urbana, Illinois
1997

U.S. DEPARTMENT OF THE INTERIOR
BRUCE BABBITT, Secretary

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Federal Center
Denver, CO 80225

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PLATE

[Plate is in pocket]

FIGURES

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CONVERSION FACTORS

Multiply	By	To obtain
Length		
inch (in.)	2.54	centimeter
foot (ft)	0.3048	meter
square mile (mi^2)	2.590	square kilometer
Flow rate		
cubic foot per second (ft^3/s)	0.02832	cubic meter per second

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

Floods of July 18–20, 1996, in Northern Illinois

by Robert R. Holmes, Jr., *and* Amanda L. Kupka

ABSTRACT

Record flooding occurred on many streams in northern Illinois during July 18–20, 1996. Over 16 inches of rain fell at some locations during and just prior to this period. Peak of record discharges were recorded at 19 U.S. Geological Survey (USGS) streamflow-gaging stations. The USGS, in cooperation with the Illinois Department of Natural Resources, Office of Water Resources (IDNROWR), has compiled the available hydrologic data from the July 1996 flood in northern Illinois, and the data are presented in this report.

INTRODUCTION

Record rainfall amounts over 16 in. were reported for the 24-hour period ending at 7:00 a.m. on July 18, 1996, in northern Illinois. These amounts resulted from several subsequent thunderstorms tracking along the same west to east stalled low-pressure front. This rainfall produced record flooding in highly urbanized northern Illinois (fig. 1) from July 18 through July 20, 1996. This flooding caused hundreds of millions of dollars worth of damage and two deaths (Chicago Tribune, July 21 and July 26, 1996). Numerous houses were inundated (fig. 2), and roadway infrastructure in the area was damaged as many roads and bridges were washed out. Three dams in the region experienced complete failure, whereas numerous other dams were overtopped experiencing varying degrees of damage. Illinois Governor Jim Edgar declared 15 northern Illinois counties State disaster areas, followed by a Federal disaster declaration of 11 Illinois counties by President Bill Clinton.

Because of the extreme nature of this flood, documenting and archiving the data collected during this flood are valuable for future engineering, environmental, and hydrologic studies. Various Federal and State agencies collected hydrologic data in the flood area. The U.S. Geological Survey (USGS), in cooperation with the Illinois Department of Natural Resources, Office of Water Resources (IDNROWR), has compiled the available data from the July 18–20, 1996, flood in northern Illinois. The purpose of this report is to document and present these data.

FLOOD OF JULY 18–20, 1996

Meteorological Setting

Beginning midmorning on July 17, 1996, a slow moving low-pressure system stalled over northern Illinois (fig. 1). Because abundant moisture from the Gulf of Mexico was available in the upper atmosphere, convective heating by the sun caused atmospheric instability over the area. Over the next 24 hours, winds at the 10,000–20,000 feet level running parallel to the front along a west to east track was the mechanism for channeling each developing thunderstorm along the same track, roughly from Rockford to Joliet, Ill. This effect has been referred to as the “train echo.” This weather system caused appreciable rainfall along the storm track. Chagnon (1997) gives a more detailed discussion of the meteorological setting for this flood event.

Storm Rainfall

Rainfall amounts were heaviest in Du Page, Kane, Kendall, and Will Counties: the National Weather Service (NWS) rain gage in Aurora officially recording 16.91 in. This amount is a new State of Illinois record for 24-hour rainfall, surpassing the former record of 16.64 in. officially recorded in East St. Louis in southwestern Illinois in 1957. Based on Bulletin 70 (Huff and Angel, 1989), recurrence intervals of greater than 100 years were estimated for long-term NWS rain gages at De Kalb (8.09 in.) and Aurora (16.91 in.). The observations of point rainfall from 117 locations were recorded by NWS, USGS, Illinois State Water Survey (ISWS), and other local agency rain gages in the flood area listed in table 1. Point-rainfall observations and isohyets of rainfall, modified from Chagnon (1997), are shown in figure 1. The isohyets of rainfall were drawn based on weather radar data and from observations of point rainfall recorded at rain gages. The larger amounts of rain fell along a line from Rockford to Joliet, coinciding with the stalled low-pressure front.

The time distribution of rainfall was nonuniform during the period because rain fell during scattered thunderstorms. The time distribution of rainfall measured at two USGS continuous tipping-bucket rain gages, Du Page County Airport near St. Charles, Ill. (415457088150600, map reference number R87), and Sawmill Creek near Lemont, Ill. (05533400, map reference number R102), are shown in figure 3. The digital time-series rainfall data (in 5-, 15-, or 60-minute increments) for all USGS and ISWS rain gages in the study area are given in appendix 1. The rainfall data presented in this report are the recorded values from the rain gage and have had no corrections applied for intense rainfall.

Flooding

Large amounts of rain fell in some of the most heavily urbanized areas in Illinois. Urbanization tends to worsen flooding during rainstorms because the amount of pervious surfaces to absorb rainfall is decreased. The USGS operates over 65 continuous-recording streamflow-gaging stations in northern Illinois (fig. 4) to address flooding problems in this area. The runoff from this rainfall produced record flood discharges at 19 USGS streamflow-gaging stations (table 2), with near record discharges at several more stations. IDNROWR operated 6 continuous-recording stage gages and 60 crest-stage gages in the flood area. The crest-stage gages record only the peak stage (elevation) of the stream. The digital-time series (in 15-minute increments) of discharge and(or) stage for all USGS and IDNROWR gages are listed in appendix 1. Peak stage data for the IDNROWR crest-stage gages in the flood area are listed in table 3.

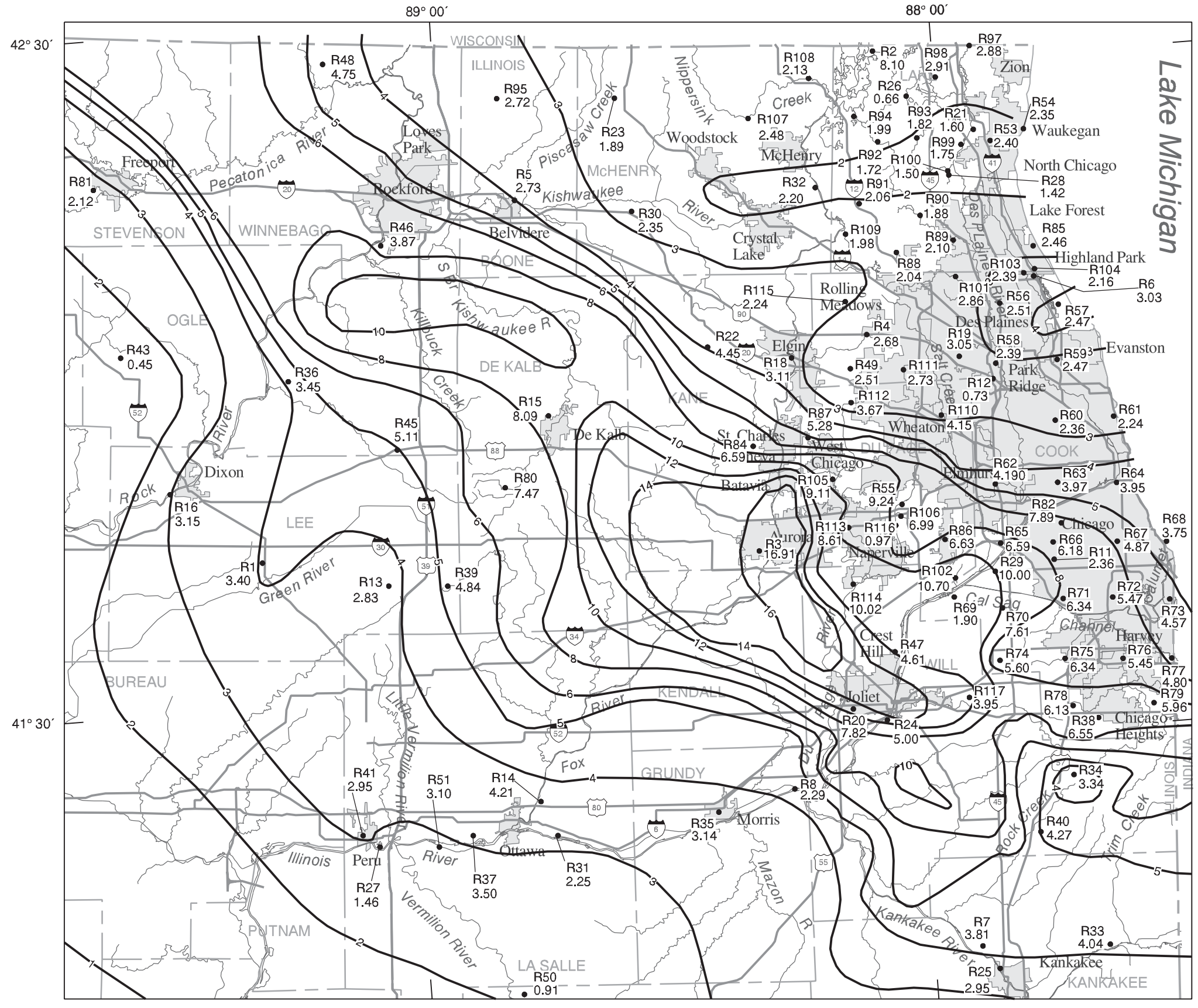
Using methods outlined in Bulletin 17B (Hydrology Subcommittee of Interagency Advisory Committee on Water Data, 1982), a Log Pearson Type III distribution was fit to the annual peak data set for each USGS continuous streamflow-gaging station to obtain the flood-frequency estimates. Where applicable, using the weighting scheme recommended in Curtis (1987, p. 4), the station frequency estimates were weighted with the regional flood-frequency estimates of Curtis (1987) to produce the flood-frequency estimates for each station. Eleven stations had peak discharges that were greater than the 100-year flood discharge, which is defined as the discharge with a 1-percent chance of occurrence in any one year. The frequency estimate for each station, peak discharge, and stage are listed in table 2.

The discharge peaks for the streams and rivers in the flood area occurred anywhere from a few hours to a day after the rainfall, depending on the size of the stream. Discharge hydrographs for five selected streamflow-gaging stations in the flood area are shown in figure 5.

Most of the available hydrologic data collected in the flood area are shown on plate 1. The data include rain-gage locations, point-rainfall observations and isohyets, USGS streamflow-gaging station locations, and flood-frequency information.

SUMMARY

Record flooding occurred on many streams in northern Illinois during July 18–20, 1996. This flooding was caused by record rainfall from several subsequent thunderstorms tracking along the same west to east stalled low-pressure front. A new State of Illinois 24-hour record rainfall of 16.91 in. was recorded at Aurora. The National Weather Service rain gages at Aurora and De Kalb had frequency estimates greater than the 100-year recurrence interval. Peaks of record were recorded at 19 U.S. Geological Survey streamflow-gaging stations. Peak discharges in excess



Base from U.S. Geological Survey
1:100,000 and 1:2,000,000 Digital Data
Albers Equal-Area Conic projection
Standard parallels 33° and 45°, central meridian –89°

Isohyets from Chagnon,S.A., 1997,
Illinois State Water Survey

Figure 1. Point-rainfall observations and Illinois State Water Survey rainfall isohyets in the northern Illinois flood area.

Figure 2. Aerial views of flooding in Kane County, Ill. (courtesy of Paul Shuch, Kane County Development Department).

Figure 2. Aerial views of flooding in Kane County, Ill. (courtesy of Paul Shuch, Kane County Development Department)—Continued.

Table 1. Rainfall data for a 24-hour period at selected rain gages in northern Illinois, July 17–18, 1996

[NWS, National Weather Service; -- not available; >, greater than; N/A, not applicable; <, less than; ISWS, Illinois State Water Survey; USGS, U.S. Geological Survey; MISC, miscellaneous; IDNROWR, Illinois Department of Natural Resources, Office of Water Resources]

Map reference number (see fig. 1 and pl.1)	Station number	Station name	Data-collection agency	Latitude	Longitude	24-Hour rainfall total (from 7:00 a.m., July 17, 1996, to 7:00 a.m., July 18, 1996) (inches)	Recurrence interval frequency[1] (years)
R1	110146	Amboy	NWS	41°44′	89°20′	3.40	--
R2	110203	Antioch	NWS	42°29′	88°07′	8.10	--
R3	110338	Aurora	NWS	41°45′	88°21′	16.91	>100
R4	110442	Barrington 3 Southwest	NWS	42°04′	88°08′	2.68	--
R5	110583	Belvidere 1 North	NWS	42°16′	88°50′	2.73	--
R6	N/A	Botanic Gardens Glencoe	NWS	42°09′	87°48′	3.03	--
R7	110803	Bourbonnais 3 Northwest	NWS	41°10′	87°55′	3.81	--
R8	111420	Channahon Dresdon Island	NWS	41°24′	88°17′	2.29	--
R9	111447	Chatsworth	NWS	40°45′	88°17′	.19	--
R10	111455	Chebanse	NWS	41°00′	87°54′	1.61	--
R11	111577	Chicago Midway	NWS	41°44′	87°46′	2.36	<2
R12	111549	Chicago O'Hare	NWS	42°00′	87°53′	.73	--
R13	111835	Compton 1 Northwest	NWS	41°42′	89°05′	2.83	--
R14	112178	Dayton	NWS	41°23′	88°47′	4.21	--
R15	112223	DeKalb	NWS	41°57′	88°46′	8.09	>100
R16	112348	Dixon 1 Northwest	NWS	41°50′	89°31′	3.15	>2
R17	112500	Dwight	NWS	41°05′	88°25′	1.97	--
R18	112736	Elgin	NWS	42°02′	88°17′	3.11	--
R19	112763	Elk Grove Village Firehouse	NWS	42°02′	87°57′	3.05	--
R20	112830	Elwood 8 Northwest (Joliet Junior College)	NWS	41°31′	88°10′	7.82	--
R21	113738	Gurnee Public Works	NWS	42°22′	87°55′	1.60	--
R22	113782	Hampshire 8 Southeast	NWS	42°03′	88°27′	4.45	--
R23	N/A	Harvard	NWS	42°25′	88°38′	1.89	--
R24	114530	Joliet Brandon Road Dam	NWS	41°30′	88°06′	5.00	>10
R25	114603	Kankakee Metro Wastewater	NWS	41°08′	87°53′	2.95	<2
R26	114837	Lake Villa 2 Northeast	NWS	42°25′	88°03′	.66	-
R27	114923	La Salle 1 South	NWS	41°19′	89°06′	1.46	--
R28	115059	Libertyville	NWS	42°18′	87°58′	1.42	--
R29	115110	Little Red School (Willow Springs)	NWS	41°43′	87°53′	10.00	--
R30	115326	Marengo	NWS	42°15′	88°36′	2.35	<2
R31	115372	Marseilles Lock	NWS	41°20′	88°45′	2.25	--
R32	115493	McHenry W.G. Stratton Lock & Dam	NWS	42°17′	88°14′	2.20	--
R33	115758	Momence	NWS	41°10′	87°40′	4.04	--
R34	115763	Monee Reservoir	NWS	41°25′	87°44′	3.34	--
R35	115825	Morris 1 Northwest	NWS	41°22′	88°26′	3.14	--
R36	116490	Oregon 2 East	NWS	42°00′	89°17′	3.45	--

Table 1. Rainfall data for a 24-hour period at selected rain gages in northern Illinois, July 17–18, 1996—Continued

Map reference number (see fig. 1 and pl.1)	Station number	Station name	Data-collection agency	Latitude	Longitude	24-Hour rainfall total (from 7:00 a.m., July 17, 1996, to 7:00 a.m., July 18, 1996) (inches)	Recurrence interval frequency[1] (years)
R37	116526	Ottawa 4 Southwest	NWS	41°20′	88°55′	3.50	>2
R38	116616	Park Forest	NWS	41°30′	87°41′	6.55	--
R39	116661	Paw Paw 1 East	NWS	41°42′	88°58′	4.84	--
R40	116725	Peotone	NWS	41°20′	87°48′	4.27	--
R41	116753	Peru	NWS	41°20′	89°08′	2.95	--
R42	116819	Piper City	NWS	40°42′	88°11′	.63	--
R43	116897	Polo 5 Northwest	NWS	42°02′	89°37′	.45	--
R44	116910	Pontiac	NWS	40°53′	88°38′	1.20	--
R45	117354	Rochelle	NWS	41°54′	89°04′	5.11	--
R46	117376	Rockford Airport	NWS	42°12′	89°06′	3.87	>2
R47	117457	Romeoville	NWS	41°36′	88°05′	4.61	--
R48	117916	Shirland	NWS	42°28′	89°13′	4.75	--
R49	118324	Streamwood	NWS	42°01′	88°10′	2.51	--
R50	118353	Streator 3 Southeast	NWS	41°06′	88°49′	.91	--
R51	118756	Utica Starved Rock Dam	NWS	41°19′	88°59′	3.10	--
R52	119021	Watseka 2 Northwest	NWS	40°47′	87°46′	1.04	--
R53	119029	Waukegan	NWS	42°21′	87°53′	2.40	>2
R54	119030	Waukegan Number 2	NWS	42°22′	87°49′	2.35	--
R55	119221	Wheaton 3 Southeast	NWS	41°49′	88°04′	9.24	--
R56	G1	Cook County Rain Gage Network Site 1	ISWS	42°06′39″	87°52′06″	2.51	--
R57	G2	Cook County Rain Gage Network Site 2	ISWS	42°06′29″	87°45′06″	2.47	--
R58	G3	Cook County Rain Gage Network Site 3	ISWS	42°01′21″	87°52′39″	2.39	--
R59	G4	Cook County Rain Gage Network Site 4	ISWS	42°01′37″	87°45′20″	2.47	--
R60	G6	Cook County Rain Gage Network Site 5	ISWS	41°56′16″	87°45′39″	2.36	--
R61	G7	Cook County Rain Gage Network Site 6	ISWS	41°56′33″	87°38′42″	2.24	--
R62	G8	Cook County Rain Gage Network Site 7	ISWS	41°50′42″	87°52′53″	4.19	--
R63	G9	Cook County Rain Gage Network Site 8	ISWS	41°50′47″	87°45′28″	3.97	--
R64	G10	Cook County Rain Gage Network Site 9	ISWS	41°50′42″	87°38′27″	3.95	--
R65	G11	Cook County Rain Gage Network Site 10	ISWS	41°45′29″	87°52′20″	6.57	--
R66	G12	Cook County Rain Gage Network Site 11	ISWS	41°45′32″	87°46′06″	6.18	--
R67	G13	Cook County Rain Gage Network Site 12	ISWS	41°45′31″	87°38′29″	4.87	--
R68	G14	Cook County Rain Gage Network Site 13	ISWS	41°45′27″	87°32′38″	3.75	--
R69	G15	Cook County Rain Gage Network Site 14	ISWS	41°40′47″	87°57′55″	10.90	--
R70	G16	Cook County Rain Gage Network Site 15	ISWS	41°39′46″	87°52′13″	7.61	--
R71	G17	Cook County Rain Gage Network Site 16	ISWS	41°40′32″	87°45′00″	6.34	--
R72	G18	Cook County Rain Gage Network Site 17	ISWS	41°40′36″	87°39′07″	5.47	--
R73	G19	Cook County Rain Gage Network Site 18	ISWS	41°40′21″	87°32′22″	4.57	--
R74	G20	Cook County Rain Gage Network Site 19	ISWS	41°35′09″	87°52′35″	5.60	--

Table 1. Rainfall data for a 24-hour period at selected rain gages in northern Illinois, July 17–18, 1996—Continued

Map reference number (see fig. 1 and pl.1)	Station number	Station name	Data-collection agency	Latitude	Longitude	24-Hour rainfall total (from 7:00 a.m., July 17, 1996, to 7:00 a.m., July 18, 1996) (inches)	Recurrence interval frequency[1] (years)
R75	G21	Cook County Rain Gage Network Site 20	ISWS	41°35′15″	87°44′52″	6.34	--
R76	G22	Cook County Rain Gage Network Site 21	ISWS	41°35′11″	87°38′00″	5.45	--
R77	G23	Cook County Rain Gage Network Site 22	ISWS	41°35′09″	87°32′14″	4.80	--
R78	G24	Cook County Rain Gage Network Site 23	ISWS	41°31′05″	87°44′00″	6.13	--
R79	G25	Cook County Rain Gage Network Site 24	ISWS	41°31′14″	87°34′25″	5.96	--
R80	N/A	De Kalb	ISWS	41°50′40″	88°51′10″	7.47	--
R81	N/A	Freeport	ISWS	42°16′47″	89°40′24″	2.12	--
R82	N/A	Midway Chicago	ISWS	41°47′12″	87°45′06″	7.89	--
R83	N/A	Stelle	ISWS	40°57′02″	88°09′26″	1.22	--
R84	N/A	St. Charles	ISWS	41°54′14″	88°21′39″	6.59	--
R85	40874126	Southwest Fork of South Branch Ravine 10 at Highland Park, Ill.	USGS	42°11′40″	87°48′01″	2.46	--
R86	414552087585600	Clarendon Hills Cemetery at Darien, Ill.	USGS	41°45′52″	87°58′56″	6.63	--
R87	415457088150600	Du Page County Airport near St. Charles, Ill.	USGS	41°54′57″	88°15′06″	5.28	--
R88	421113088042200	Lake Zurich Wastewater Treatment Facility at Lake Zurich, Ill.	USGS	42°11′13″	88°04′22″	2.04	--
R89	421215087573400	Vernon Hills Rain Gage at Prairie View, Ill.	USGS	42°12′15″	87°57′34″	2.10	--
R90	421428088012900	Diamond Lake Wastewater Treatment Facility at Diamond Lake, Ill.	USGS	42°14′28″	88°01′29″	1.88	--
R91	421533088084600	Wauconda Wastewater Treatment Facility at Wauconda, Ill.	USGS	42°15′33″	88°08′46″	2.06	--
R92	422100088062800	Round Lake Rain Gage at Round Lake, Ill.	USGS	42°21′00″	88°06′28″	1.72	--
R93	422118088014700	Grayslake Wastewater Treatment Facility at Grayslake, Ill.	USGS	42°21′18″	88°01′47″	1.82	--
R94	422315088091800	Fox Lake Rain Gage at Fox Lake, Ill.	USGS	42°23′15″	88°09′18″	1.99	--
R95	422459087520700	Waukegan Airport at Waukegan, Ill.	USGS	42°24′59″	88°52′07″	2.72	--
R96 (not shown)	423526087551800	Kenosha Airport at Kenosha, Wis.	USGS	42°35′26″	87°55′18″	1.28	--
R97	05527800	Des Plaines River at Russell, Ill.	USGS	42°29′22″	87°55′32″	2.88	--
R98	05527940	Tempel Farms Ditch near OId Mill Creek, Ill.	USGS	42°26′39″	87°59′30″	2.91	--
R99	05528000	Des Plaines River near Gurnee, Ill.	USGS	42°20′39″	87°56′18″	1.75	--
R100	05528030	Bull Creek near Libertyville, Ill.	USGS	42°18′22″	87°58′07″	1.50	--
R101	05528500	Buffalo Creek near Wheeling, Ill.	USGS	42°09′05″	87°57′25″	2.86	--
R102	05533400	Sawmill Creek near Lemont, Ill.	USGS	41°42′28″	87°57′45″	10.70	--
R103	05534500	North Branch Chicago River at Deerfield, Ill.	USGS	42°09′10″	87°49′07″	2.39	--
R104	05535070	Skokie River near Highland Park, Ill.	USGS	42°09′34″	87°47′52″	2.16	--
R105	05540060	Kress Creek at West Chicago, Ill.	USGS	41°51′23″	88°12′15″	9.11	--
R106	05540195	St. Joseph Creek at State Highway 34 at Lisle, Ill.	USGS	41°48′06″	88°04′08″	6.99	--
R107	05548105	Nippersink Creek above Wonder Lake, Ill.	USGS	42°23′07″	88°22′09″	2.48	--
R108	05548280	Nippersink Creek near Spring Grove, Ill.	USGS	42°26′37″	88°14′51″	2.13	--
R109	05549850	Flint Creek near Fox River Grove, Ill.	USGS	42°12′40″	88°10′23″	1.98	--
R110	N/A	Addison North Wastewater Treatment Facility	MISC	41°56′50″	87°59′13″	4.15	--
R111	N/A	Schaumburg Public Works	MISC	42°00′52″	88°03′40″	2.73	--

Table 1. Rainfall data for a 24-hour period at selected rain gages in northern Illinois, July 17–18, 1996—Continued

Map reference number (see fig. 1 and pl.1)	Station number	Station name	Data-collection agency	Latitude	Longitude	24-Hour rainfall total (from 7:00 a.m., July 17, 1996, to 7:00 a.m., July 18, 1996) (inches)	Recurrence interval frequency[1] (years)
R112	N/A	Bartlett Wastewater Treatment Facility	MISC	41°58′01″	88°09′57″	3.67	--
R113	N/A	Naperville Northwest Wastewater Pump Station	MISC	41°47′00″	88°10′22″	8.61	--
R114	N/A	Naperville Southwest Wastewater Pump Station	MISC	41°42′00″	88°09′53″	10.02	--
R115	N/A	West Branch Du Page River at Naperville, Ill.	IDNROWR	41°66′55″	88°10′32″	2.24	--
R116	N/A	East Branch Du Page River at Lisle, Ill.	IDNROWR	41°47′09″	88°04′46″	7.65	--
R117	N/A	Marley Creek near New Lenox, Ill.	IDNROWR	41°31′55″	87°56′15″	3.95	--

[1]Frequency estimate from Huff and Angel, 1989.

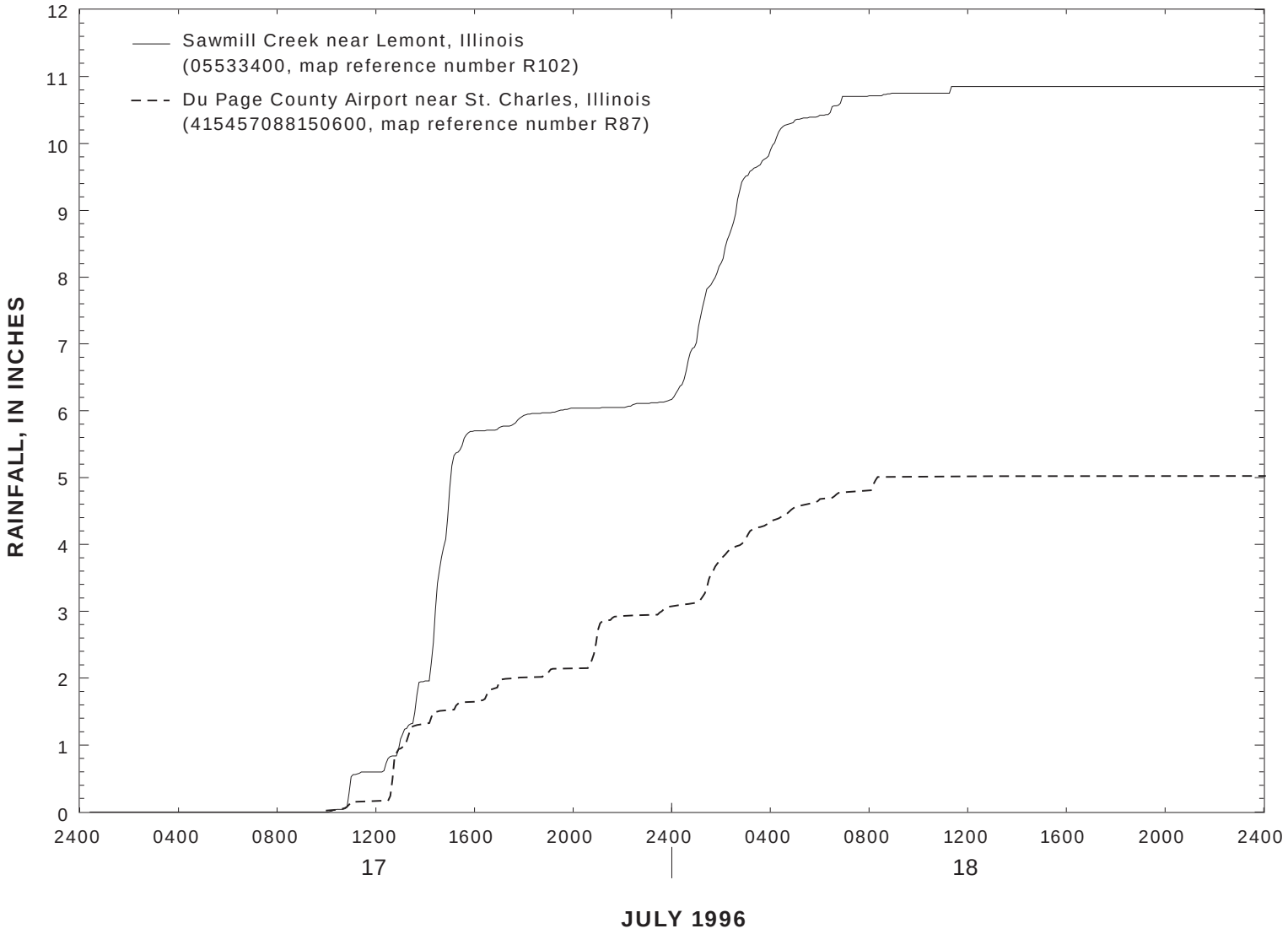
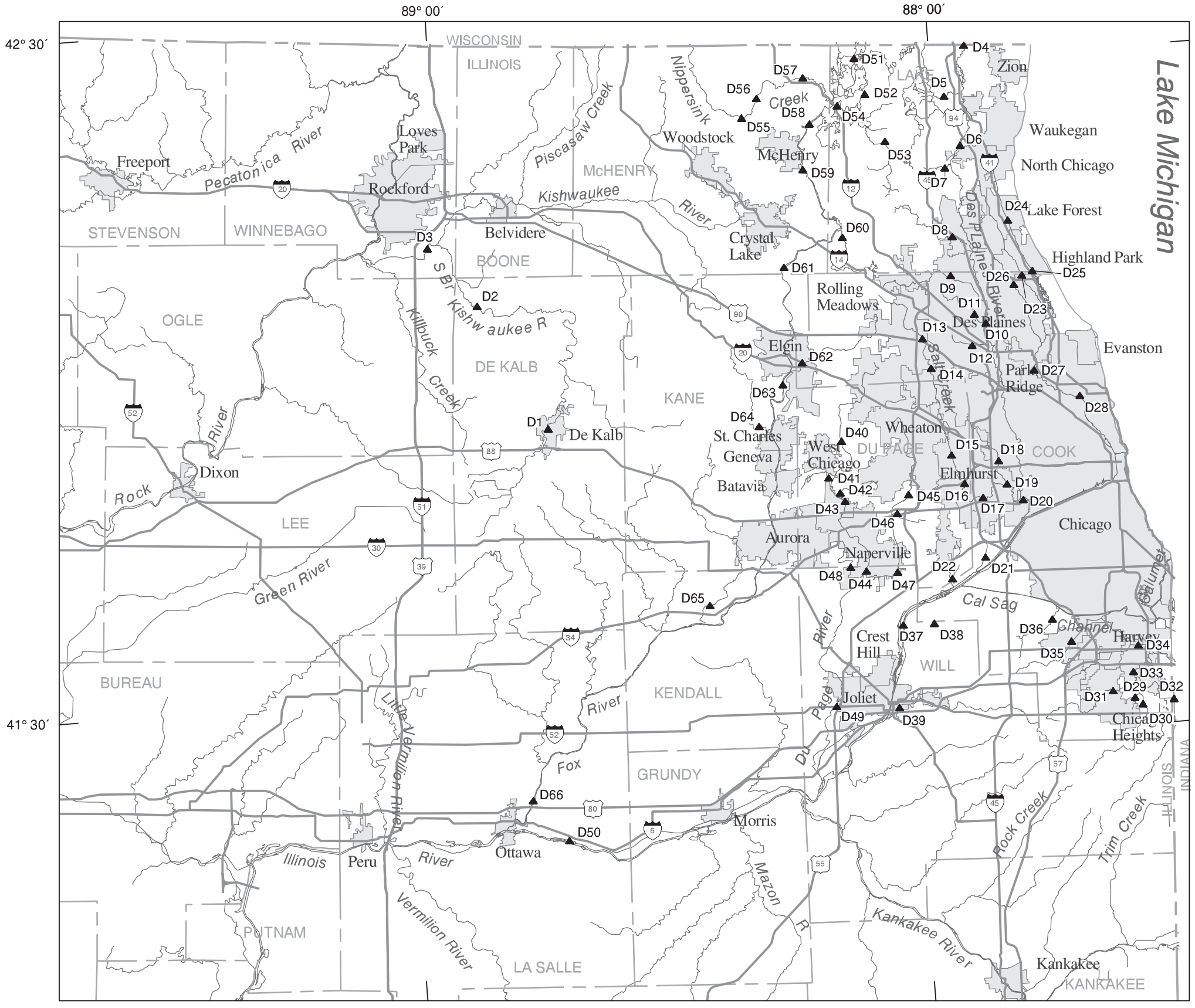


Figure 3. Cumulative rainfall amounts from midnight July 17, 1996, at selected U.S. Geological Survey rain gages in the northern Illinois flood area.



Base from U.S. Geological Survey
1:100,000 and 1:2,000,000 Digital Data
Albers Equal–Area Conic projection
Standard parallels 33° and 45°, central meridian –89°

Figure 4. U.S. Geological Survey streamflow-gaging stations in the northern Illinois flood area.

Table 2. Peak-flow data at selected U.S. Geological Survey streamflow-gaging stations in the northern Illinois flood area

[mi^2, square miles; ft, feet; ft^3/s, cubic feet per second; Q, discharge; >, greater than; <, less than; G.H., gage height; --, not available]

Map reference number (see fig. 4 and pl. 1)	Station number	Station name	Drainage area (mi^2)	Period of record	Type of record	Previous maximum flood			Maximum for July 1996 flood			
						Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)	Recurrence interval (years)
D1	05439000	South Branch Kishwaukee River at De Kalb, Ill.	77.7	1979–current	Q	07/02/83	15.80	3,500	07/18/96	12.97	2,280	>[1]25
D2	05439500	South Branch Kishwaukee River near Fairdale, Ill.	387	1939–current	Q	03/19/79	10.45	--	07/18/96	13.37	25,400	>[1]100
						02/20/94	10.31	8,790				
D3	05440000	Kishwaukee River near Perryville, Ill.	1,099	1939–current	Q	02/21/94	20.71	17,100	07/18/96	23.54	24,200	>[1]50
D4	05527800	Des Plaines River at Russell, Ill.	123	1961–current	Q	03/21/79	9.69	2,120	07/18/96–07/19/96	5.19	272	<[1]2
						03/06/76	10.75	1,940				
						09/27/86	10.75	1,600				
D5	05527950	Mill Creek at Old Mill Creek, Ill.	61	1989–current	Q	06/30/93	12.06	1,090	07/18/96	11.94	1,020	>[2]5
D6	05528000	Des Plaines River near Gurnee, Ill.	232	1945–current	Q	09/27/86	11.95	3,530	07/19/96	4.93	558	<[1]2
D7	05528030	Bull Creek near Libertyville, Ill.	6.30	1989–current	Q	06/30/93	4.75	105	07/18/96	1.39	13.8	<[2]2
D8	05528230	Indian Creek at Prairie View, Ill.	36.0	1989–current	Q	02/19/94	5.94	500	07/18/96	3.75	139	<[2]2
						02/20/94	5.72	815				
D9	05528500	Buffalo Creek near Wheeling, Ill.	19.6	1952–current	Q	07/22/82	7.94	887	07/17/96	4.09	160	[2]<2
D10	05529000	Des Plaines River near Des Plaines, Ill.	360	1940–current	Q	10/01/86	10.88	4900	07/18/96	1.95	857	[1]<2
D11	05529500	Mc Donald Creek near Mount Prospect, Ill.	7.93	1952–current	Q	08/14/87	8.08	806	07/18/96	3.51	91.6	[2]<2
D12	05530000	Weller Creek at Des Plaines, Ill.	13.2	1950–current	Q	06/10/67	15.09	1,590	07/17/96	4.41	188	[2]<2
D13	05530990	Salt Creek at Rolling Meadows, Ill.	30.5	1973–current	Q	08/14/87	14.03	1,650	07/18/96	5.42	360	[2]<2
D14	05531044	Salt Creek near Elk Grove Village, Ill.	51.9	1992–current	G.H.	06/24/94	14.04	--	07/18/96	12.38	--	[3]--
D15	05531300	Salt Creek at Elmhurst, Ill.	91.2	1989–current	Q	08/21/90	13.37	1,530	07/18/96	10.91	934	[2]>2
D16	05531410	Salt Creek at 22nd Street at Oak Brook, Ill.	103	1994–current	G.H.	06/02/95	54.11	--	07/18/96	53.47	--	[3]--
D17	05531500	Salt Creek at Western Springs, Ill.	115	1945–current	Q	08/17/87	10.54	3,540	07/18/96	8.03	1,600	[2]>2
D18	05532000	Addison Creek at Bellwood, Ill.	17.9	1951–current	Q	08/14/87	12.84	1,120	07/17/96	6.52	400	[2]<2
D19	05532300	Salt Creek at Brookfield, Ill.	146	1989–current	G.H.	05/10/90	10.19	--	07/18/96	8.13	--	[3]--
D20	05532500	Des Plaines River at Riverside, Ill.	630	1943–current	Q	08/15/87	9.90	9,770	07/18/96	6.33	3,690	[2]<2
D21	05533000	Flag Creek near Willow Springs, Ill.	16.5	1951–current	Q	09/14/61	13.71	2,680	07/18/96	10.37	2,300	[2]>25
D22	05533400	Sawmill Creek near Lemont, Ill.	13.0	1985–current	Q	05/09/90	15.46	1,730	07/18/96	17.54	3,070	[2]>100
						06/07/93	15.60	565				
D23	05534500	North Branch Chicago River at Deerfield, Ill.	19.7	1952–current	Q	08/14/87	11.52	933	07/18/96	7.52	159	[2]<2
D24	05535000	Skokie River at Lake Forest, Ill.	13	1951–current	Q	09/26/86	8.27	492	07/18/96	3.41	103	[2]<2
						07/22/82	8.35	288				
D25	05535070	Skokie River near Highland Park, Ill.	21.1	1967–current	Q	08/14/87	9.09	895	07/18/96	7.27	365	[2]<2

Table 2. Peak-flow data at selected U.S. Geological Survey streamflow-gaging stations in the northern Illinois flood area—Continued

Map reference number (see fig. 4 and pl. 1)	Station number	Station name	Drainage area (mi^2)	Period of record	Type of record	Previous maximum flood			Maximum for July 1996 flood			
						Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)	Recurrence interval (years)
D26	05535500	West Fork of the North Branch Chicago River at Northbrook, Ill.	11.5	1952–current	Q	08/14/87	10.10	1,190	07/18/96	5.00	313	[2]< 2
D27	05536000	North Branch Chicago River at Niles, Ill.	100	1950–current	Q	08/14/87	11.35	2,590	07/19/96	6.44	766	[2]<2
D28	05536105	North Branch Chicago River at Albany Avenue at Chicago, Ill.	113	1989–current	Q	05/10/90	6.34	1,890	07/18/96	4.87	900	[4]--
D29	05536215	Thorn Creek at Glenwood, Ill.	24.7	1949–current		08/17/68	11.26	2,600	07/18/96	--	2,700	[2]>25
D30	05536235	Deer Creek near Chicago Heights, Ill.	23.1	1948–current	Q	11/28/90	11.79	709	07/18/96	11.41	824	[2]>5
						07/13/57	11.75	1,380				
D31	05536255	Butterfield Creek at Flossmoor, Ill.	23.5	1948–current	Q	05/22/82	11.97	2,160	07/18/96	12.59	2,220	[2]>25
D32	05536265	Lansing Ditch near Lansing, Ill.	8.84	1948–current	Q	10/11/54	10.18	--	07/18/96	9.52	208	[2]>2
						05/10/48	9.24	461				
D33	05536275	Thorn Creek at Thornton, Ill.	104	1948–current	Q	06/14/81	17.06	3,630	07/18/96	16.24	4,470	[2]>25
						07/13/57	16.00	4,700				
D34	05536290	Little Calumet River at South Holland, Ill.	208	1947–current	Q	11/28/90	20.50	709	07/19/96	20.01	3,870	[2]>5
						07/14/57	20.11	4,440				
D35	05536340	Midlothian Creek at Oak Forest, Ill.	12.6	1950–current	Q	07/13/57	9.00	--	07/18/96	6.15	473	[2]>10
						04/22/73	7.67	627				
D36	05536500	Tinley Creek near Palos Park, Ill.	11.2	1951–current	Q	10/10/54	10.30	1,930	07/18/96	10.25	2,010	[2]>50
D37	05536995	Chicago Sanitary and Ship Canal at Romeoville, Ill.	739	1984–current	Q	11/28/90	--	19,279	07/17/96	25.31	19,948	[5]--
						03/18/91	26.27	3,952				
						11/20/91		5,083				
D38	05537500	Long Run near Lemont, Ill.	20.9	1951–current	Q	10/10/54	9.91	3,160	07/18/96	11.10	5,310	[1]>100
D39	05539000	Hickory Creek at Joliet, Ill.	107	1944–current	Q	06/13/81	14.90	17,300	07/18/96	10.00	8,710	[2]>25
D40	05539900	West Branch Du Page River near West Chicago, Ill.	28.5	1961–current	Q	12/03/82	10.44	984	07/18/96	8.75	583	[2]>2
						08/14/87	10.63	605				
D41	05540060	Kress Creek at West Chicago, Ill.	18.1	1985–current	Q	08/14/87	7.37	573	07/18/96	9.24	1,980	[2]>100
D42	05540091	Spring Brook at Forest Preserve near Warrenville, Ill.	6.83	1991–current	Q	06/24/94	11.24	297	07/18/96	12.60	393	[4]--
D43	05540095	West Branch Du Page River near Warrenville, Ill.	90.4	1968–current	Q	08/15/87	5.85	3,050	07/18/96	6.41	3,470	[2]>100
D44	05540130	West Branch Du Page River near Naperville, Ill.	123	1988–current	Q	02/19/94	9.92	--	07/18/96	14.31	6,620	[2]>100
						05/25/91	9.58	3,420				
D45	05540160	East Branch Du Page River near Downers Grove, Ill.	26.6	1989–current	Q	05/10/90	15.55	881	07/18/96	16.13	936	[2]>5
D46	05540195	St. Joseph Creek at Route 34 at Lisle, Ill.	11.1	1988–current	Q	05/09/90	11.30	938	07/18/96	12.89	1,280	[2]>100

Table 2. Peak-flow data at selected U.S. Geological Survey streamflow-gaging stations in the northern Illinois flood area—Continued

Map reference number (see fig. 4 and pl. 1)	Station number	Station name	Drainage area (mi^2)	Period of record	Type of record	Previous maximum flood			Maximum for July 1996 flood			
						Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)	Recurrence interval (years)
D47	05540250	East Branch Du Page River at Bolingbrook, Ill.	75.8	1988–current	Q	05/10/90	22.67	1,990	07/18/96	23.75	3,980	[2]>100
D48	05540275	Spring Brook at 87th Street near Naperville, Ill.	9.90	1987–current	Q	05/09/90	7.68	694	07/18/96	10.77	1,750	[2]>25
D49	05540500	Du Page River at Shorewood, Ill.	324	1940–current	Q	10/11/54	11.06	12,000	07/18/96	14.03	17,300	[2]>100
D50	05543500	Illinois River at Marseilles, Ill.	8,259	1919–current	Q	12/04/82	16.78	94,100	07/19/96	14.53	79,300	[2]>25
D51	05547000	Channel Lake near Antioch, Ill.		1939–current	G.H.	04/06/60	8.29	--	07/18/96	4.72		[3]--
D52	05547500	Fox Lake near Lake Villa, Ill.		1939–current	G.H.	04/06/60	8.18	--	07/19/96–07/20/96	4.67		[3]--
D53	05547755	Squaw Creek at Round Lake, Ill.	17.2	1989–current	Q	07/18/93	6.42	312	07/18/96	2.39	39.6	[2]<2
D54	05548000	Nippersink Lake at Fox Lake, Ill.		1939–current	G.H.	04/05/60	8.12	--	07/19/96	4.69		[3]--
D55	05548105	Nippersink Creek above Wonder Lake, Ill.	84.5	1994–current	Q	06/11/67	13.95	--	07/18/96	6.1	205	[4]--
D56	05548110	Nippersink Creek below Wonder Lake, Ill.	97.3	1994–current	Q	06/11/67	8.76	--	07/18/96	3.32	163	[4]--
D57	05548280	Nippersink Creek near Spring Grove, Ill.	192	1966–current	Q	09/26/86	14.26	2,910	07/18/96–07/19/96	5.66	304	[2]<2
D58	05548500	Fox River at Johnsburg, Ill.	1,205	1939–current	G.H.	04/06/60	7.55	--	07/19/96	4.70		[3]--
D59	05549500	Fox River near McHenry, Ill.	1,250	1941–current	G.H.	04/05/60	6.36	--	07/19/96	4.64		[3]--
D60	05549850	Flint Creek near Fox River Grove, Ill.	37	1989–current	Q	02/20/94	5.32	552	07/18/96	2.98	72.5	[2]<2
D61	05550000	Fox River at Algonquin, Ill.	1,403	1915–current	Q	04/01/16	4.50	--	07/20/96	2.15	1,760	[2]<2
						04/06/60	--	6,610				
						04/02/79						
D62	05550500	Poplar Creek at Elgin, Ill.	35.2	1951–current	Q	04/22/73	5.45	896	07/18/96	2.29	140	[2]<2
						08/05/89	5.79	641				
D63	05551000	Fox River at South Elgin, Ill.	1,556	1989–current	Q	07/18/93	14.45	6,990	07/20/96	13.15	2,130	[4]--
D64	05551200	Ferson Creek near St. Charles, Ill.	51.7	1960–current	Q	02/20/71	7.64	1,970	07/18/96	7.79	1,990	[1]>10
						02/08/65	9.66	250				
D65	05551700	Blackberry Creek near Yorkville, Ill.	70.2	1960–current	Q	07/03/83	9.91	2,060	07/18/96	13.16	5,510	[1]>100
D66	05552500	Fox River at Dayton, Ill.	2,642	1914–current	Q	01/25/60	36.47	--	07/19/96	24.47	55,400	[2]>100
						10/11/54	24.63	47,100				

[1]Frequency established based on weighted estimate of flood-frequency statistics (Curtis, 1987, p. 4).

[2]Frequency established based on station data only on flood-frequency statistics.

[3]Gage-height gage only.

[4]Insufficient length of record to conduct frequency analysis (Hydrology Subcommittee of Interagency Advisory Committee on Water Data, 1982).

[5]Regulated flow.

Table 3. High water marks from Illinois Department of Natural Resources crest-stage gages in the northern Illinois flood area

[--, not available; >, greater than]

Stream	Location	Elevation of high water mark (feet above sea level)
Aux Sable	Site number 17- Upstream side of Delbos Road bridge just upstream from Illinois and Michigan Canal	507.38
Aux Sable	Site number 18- Upstream side of Chicago, Rock Island, and Pacific Railroad bridge	519.22
Fiddyment	Site number 1- Upstream side face of Hamilton left bank at intersection of Morgan-top bolt in second rail post	600.79
Fiddyment	Site number 2- Mark on warning sign at Oakstreet bridge 0.9 feet above ground	624.78
Fiddyment	Site number 3- Yellow nail on power light pole at left upstream corner at MacGregor Road	640.92
Fiddyment	Site number 4- Upstream side face of Ferrel Road right bank at intersection of McKenzie Avenue fence corner post 0.6 feet up from ground	653.76
Flagg	Site number 1- West end of 48th Street on Tollway Frontage Road	636.75
Flagg	Site number 2-Northeast corner of Birch Street and Lions Township just downstream from 55th Street	634.31
Flagg	Site number 3- Top of storm sewer along east side of I-294 end of Keokuk Road just downstream from Plainfield Road	633.43
Flagg	Site number 4- Manhole cover upstream from tollway bridge on Cochise Drive in Indian Head Park	632.17
Flagg	Site number 5- Downstream concrete parapet on Wolf Road immediately downstream I-294 tollway	631.44
Flagg	Site number 6- Concrete parapet downstream side of 91st Street bridge	682.00
Ford Heights	Site number 1- Red nail in second power pole south from north end of Kennedy Lane	632.56
Ford Heights	Site number 2- Red nail in first power pole north of Diplomat north of Kennedy Lane	632.08
Ford Heights	Site number 3- Red nail in power pole at Congress and Kennedy Lane	633.46
Hammel Creek	Site number 3- On 6-inch diameter ash tree directly south of Shorewood Sewage Treatment Plant	586.4
Hammel Creek	Site number 4- On the left upstream wingwall of box culvert under Brookshore Drive Road	591.2
Hammel Creek	Site number 5- On multi-trunk Willow tree at the rear of Mrs. Schmarz' property	592.6
Hammel Creek	Site number 7- On the left upstream wingwall of pipe culvert just below the south retention pond on box culvert under Raven Road	603.1
Hammel Creek	Site number 8- On the left upstream wingwall of pipe culvert just below the south retention pond	605.3

Table 3. High water marks from Illinois Department of Natural Resources crest-stage gages in the northern Illinois flood area—Continued

Stream	Location	Elevation of high water mark (feet above sea level)
Hammel Creek	Site number 9- On the right downstream wingwall of box culvert adjacent to U.S. Route 52 at the southwest corner of Shorewood	614.2
Hammel Creek	Site number 12- On the left downstream wingwall of pipe culvert under Greenfield Road	607.3
Hickory Creek	Site number 4- Just upstream from the confluence of Hickory and Spring Creeks—20 feet below the wall on the left bank	539.01
Hickory Creek	Site number 6- Sidewalk/entry at southeast corner of Jackson and Garnsey	548.88
Hickory Creek	Site number 7- Henderson north of Jackson- house number 411 with chain link fence on the west side of Henderson, 1 foot above ground	549.77
Hickory Creek	Site number 8- Draper/Walnut and EJ&ERR- 2 inches above bottom of highest “mini-arch” opening in parapet wall on Draper Avenue bridge	566.52
Justice	Site number 1- Red nail on power light pole northwest corner of 73rd Place and 86th Avenue	597.70
Justice	Site number 2- 1.4 feet below the fire hydrant top at house number 7441 Cork Avenue driveway	597.69
Justice	Site number 3- Mark below right downstream wingwall of Route 171 culvert	579.03
Justice	Site number 4- Oval pipe under Illinois and Michigan Railroad for 41st Street bridge	587.51
Kyte River	Site number 1- At the southern end of Rochelle Sewage Disposal and Treatment Plant on the right bank attached to the iron post driven in bank	771.42
Kyte River	Site number 2- On the right upstream wingwall of the bridge at the entrance to the sewage-disposal plant	773.36
Kyte River	Site number 3- At the left upstream corner of Lakeview Drive bridge attached to the iron post driven in the bank	775.23
Kyte River	Site number 4- On the left upstream wingwall of Route 51 bridge on the south side of Rochelle	776.07
Kyte River	Site number 5- On the right upstream pier from Main Street bridge	779.07
Kyte River	Site number 6- On a post at the right upstream corner of Second Street bridge	779.9
Kyte River	Site number 7- At the First Avenue bridge; upstream gage on the right wingwall	780.05
Kyte River	Site number 8- At the Burlington and Northern Railroad bridge—upstream gage on the right pier	781.89
Kyte River	Site number 9- At the Northwestern Railroad bridge on the right downstream headwall	782.33
Kyte River	Site number 10- At the Avenue bridge on a pipe driven in the right upstream bank	783.49

Table 3. High water marks from Illinois Department of Natural Resources crest-stage gages in the northern Illinois flood area—Continued

Stream	Location	Elevation of high water mark (feet above sea level)
Kyte River	Site number 11- At the School Avenue bridge on the left upstream wingwall	--
Kyte River	Site number 12- On the left upstream wingwall of the Route 38 bridge	785.99
Kyte River	Site number 13- On the left upstream wingwall of the Route 51 bridge on the north edge of Rochelle	--
Kyte River	Site number 14- In the suburb of Hillcrest just north of Rochelle on an abandoned headwall at the west end of Scott Street	793.94
Lansing Ditch	Site number 1- On North Creek at Torrence Avenue on the right downstream wingwall	609.35
Lansing Ditch	Site number 2- On North Creek at Oakwood Avenue in Lansing on the left upstream wingwall	609.81
Lansing Ditch	Site number 3- Burnham Avenue near 189th Street in Lansing on the right upstream headwall	610.42
Lansing Ditch	Site number 4- At the corner of Glenwood-Lansing Road and Wentworth Avenue at Lansing Airport on the steel post on the right bank of the main channel	613.85
Lansing Ditch	Site number 5- At 201st Street and Torrence Avenue on the left downstream wingwall	613.27
Lansing Ditch	Site number 6- Lynwood site in the North 1/2 Section 7, Township 35 North Range 15 East, on the right upstream headwall	616.58
Lansing Ditch	Site number 7- In the trailer park just downstream from Route 30 at the bridge crossing on the left downstream headwall	622.53
Lansing Ditch	Site number 8- In structure 143, Dr. Mary Woodland Reservoir on the left upstream face of the control structure	623.95
Lansing Ditch	Site number 9- At Sauk Trail Road on the left upstream wingwall	632.63
Lansing Ditch	Site number 10- Lansing Ditch crossing at 223rd Street in Sauk Village on the steel post on the right downstream side of the culvert pipe	645.10
Long Run	Site number 1- Upstream face of 17600 West right bank at ground level at the first post on the steel guardrail 2.1 feet down from the top of the post	596.35
Long Run	Site number 2- Upstream face of 17600 West (1st street upstream from the oil tanks) right bank yellow nail in the second wood guardrail post from the driveway on the steel guardrail 1.6 feet down from the top of the post	595.82
Long Run	Site number 3- Upstream face of Smith Road -yellow nail in the 47-inch twin trunk cottonwood tree right upstream side of the bank.	630.19
Long Run	Site number 4- Downstream face of Archer Avenue 1.4 feet down from the top of the tenth guardrail post (west) south of 135th Street	645.67

Table 3. High water marks from Illinois Department of Natural Resources crest-stage gages in the northern Illinois flood area—Continued

Stream	Location	Elevation of high water mark (feet above sea level)
Natalie-Midlothian Creeks	Site number 1- Union Ditch Walk bridge to the structure 6 feet from the top of "Steadfast Bridges" on the east side of the bridge	698.19
Natalie-Midlothian Creeks	Site number 2- Top right upstream core apron at 167th Street and the culvert at structure number 32	692.91
Natalie-Midlothian Creeks	Site number 3- Structure 32 inlet to Amil Gate chiseled mark on the left east wingwall face 4.4 feet down from the top handrail at the fourth post from the quonset hut	692.19
Natalie-Midlothian Creeks	Site number 4- Upstream side face of Gaynell right bank wingwall top of the fourth 6 x 8 timber down	690.58
Natalie-Midlothian Creeks	Site number 5- Upstream side face of Gentry left bank- chiseled yellow nail in the left upstream wingwall 2.1 feet down from the top	682.56
Natalie-Midlothian Creeks	Site number 6- Upstream face of 155th bridge near Kilpatrick 0.2 foot down from Low Chord	633.80
Natalie-Midlothian Creeks	Site number 7- Upstream side face of Kenton culvert 1.6 feet down from the top of the headwall	630.75
Navajo Creek	Site number 1- On the right upstream headwall of Route 83 culvert	593.06
Navajo Creek	Site number 2- Old U.S. Geological Survey gage on the right downstream headwall of 127th Street culvert	620.4
Navajo Creek	Site number 3- On the left downstream headwall of Harlem Avenue culvert	622.14
Navajo Creek	Site number 4- At the intersection of Seneca Road and Kiowa Lane on the street sign	621.4
Navajo Creek	Site number 5- On the left upstream headwall of 76th Avenue culvert	634.4
Sawmill	Site number 2- Northeast corner of the culvert on the tributary at Cass Street (Bailey Road) just north of 91st Street -2 inches above the bottom guardrail	668.99
Sawmill	Site number 3- Low spot in White Deer Drive north of twin culverts	682.99
Sawmill	Site number 4- Carriage Greens Country Club dam just upstream from I-55 -overtopped the lower portions of the crest of the dam in several locations in addition to flow through the emergency spillway ("V" at the east end of the dam) at the left abutment	700.50
Sawmill	Site number 5- Top of Carriage Greens Country Club dam west of the spillway	704.50
Sawmill	Site number 6- Top of Carriage Greens Country Club dam a few feet to the west of site number 5	705.0
Sawmill	Site number 7-Top of Carriage Greens Country Club dam a few feet to the west of site number 6	705.4
Sawmill	Site number 8-Top of Carriage Greens Country Club dam a few feet to the west of site number 7	705.8

Table 3. High water marks from Illinois Department of Natural Resources crest-stage gages in the northern Illinois flood area—Continued

Stream	Location	Elevation of high water mark (feet above sea level)
Sawmill	Site number 9-Top of Carriage Greens Country Club dam a few feet to the west of site number 8	706.5
Shorewood	Site number 1- Bottom of the gas meter at number 301 Route 59	575.00
Shorewood	Site number 2- Red nail in the base of a 17-feet elm at the downstream side. Northwest corner of north parking lot of the Grace Baptist Church	576.36
Shorewood	Site number 3- Concrete base of the yield street sign at Picnic and West Shore	573.60
Silver Creek	Site number 1- 5th Avenue on the left upstream wingwall	619.20
Silver Creek	Site number 2- 9th Avenue on the left upstream wingwall	--
Silver Creek	Site number 3- 15th Avenue on the left upstream wingwall	--
Silver Creek	Site number 4- 17th Avenue on the left upstream wingwall	--
Silver Creek	Site number 5- 19th Avenue on the left upstream wingwall	625.44
Silver Creek	Site number 6- Behind Alberto Culver Factory on the railroad bridge left upstream headwall	629.0
Silver Creek	Site number 7- Armitage Avenue on the left upstream wingwall	630.81
Silver Creek	Site number 8- Fullerton Avenue on the left upstream wingwall	632.45
Silver Creek	Site number 9- Northeast corner of K-Mart parking lot on the right upstream wingwall	637.00
Silver Creek	Site number 10- Mannheim Road on the right upstream headwall	639.23
Silver Creek	Site number 11- Grand Avenue on the left upstream wingwall	640.41
Silver Creek	Site number 12- Belmont Avenue on the left upstream wingwall	642.81
Silver Creek	Tri-State Tollway on the left upstream headwall	643.80
Stony Creek	Site number 1- 80th Avenue (Roberts Road) on the left downstream wingwall	588.4
Stony Creek	Site number 2- Harlem Avenue (Route 43) on the left downstream pier	590.3
Stony Creek	Site number 3- Virginia Avenue (103rd Road) on the left downstream wingwall	590.9
Stony Creek	Site number 4- Downstream from Ridgeland Avenue and 120 feet downstream from a railroad bridge on a 24-inch diameter sycamore tree on the left bank	590.8
Stony Creek	Site number 5- Upstream of Ridgeland Avenue and 80 feet downstream from a railroad on the right bank	592.2

Table 3. High water marks from Illinois Department of Natural Resources crest-stage gages in the northern Illinois flood area—Continued

Stream	Location	Elevation of high water mark (feet above sea level)
Stony Creek	Site number 6- Central Avenue on the right downstream headwall	>592.4
Stony Creek	Site number 7- In the Wolfe State Wildlife Refuge and south of the intersection of Lavergne Avenue and 109th Street on the left downstream wingwall	--
Stony Creek	Site number 8- 115th Street on the left downstream wingwall	589.33
Stony Creek	Site number 9- Kostner Avenue on the left downstream wingwall	588.1
Stony Creek	Site number 10- On the right upstream head wall at intersection of Edison Avenue and East Shore Drive	599.52

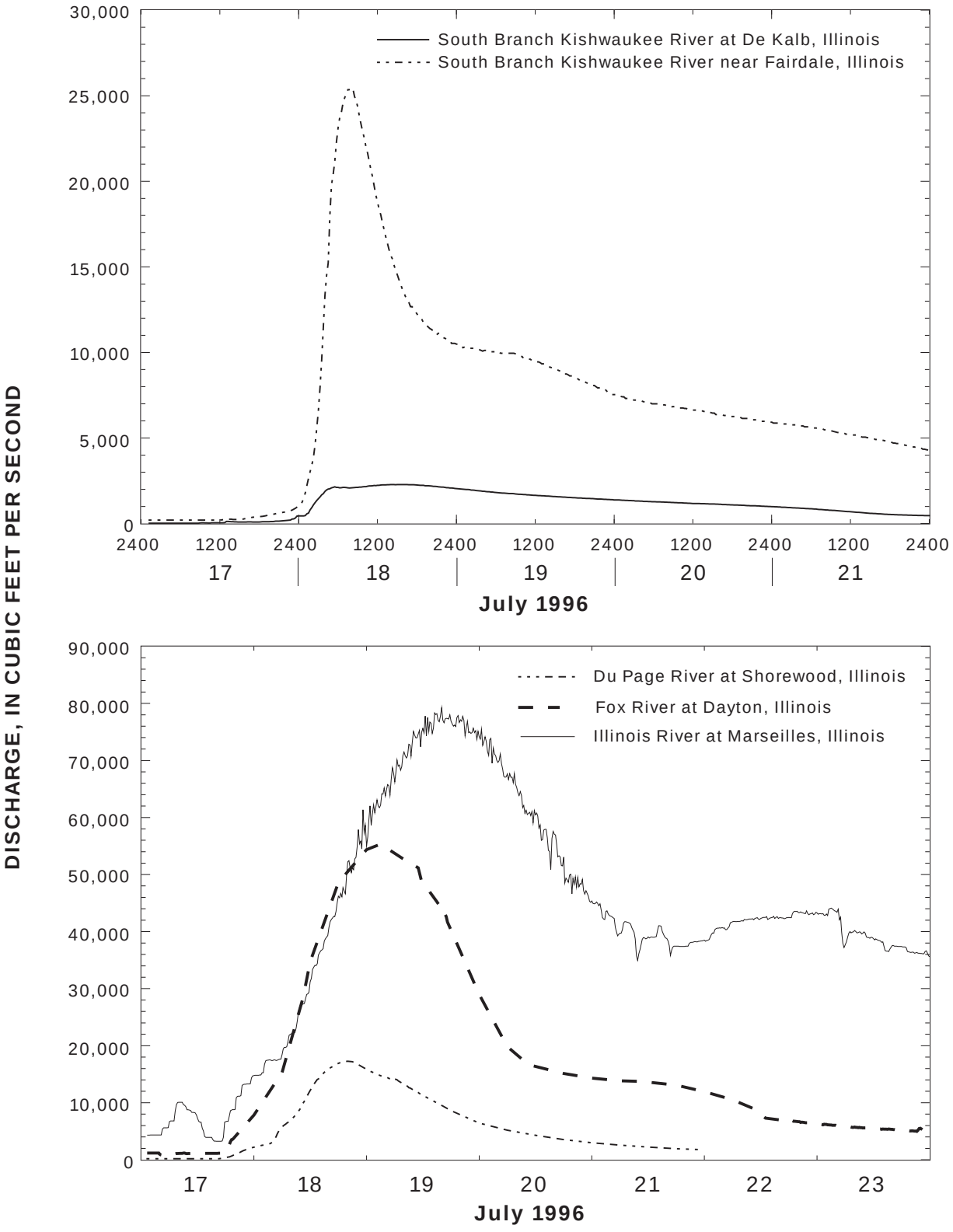


Figure 5. Flood discharge hydrographs for selected U.S. Geological Survey streamflow-gaging stations in the northern Illinois flood area.

of the estimated 100-year flood frequency were estimated at 11 continuous streamflow-gaging stations.

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