Flood of September 13–16, 2008, in Northeastern Illinois

Data Series 726

Cover. Snowplows attempting to push accumulated rainfall off the Tarmac at O'Hare International Airport, Chicago, Illinois, September 14, 2008. Photograph used with permission of David Lastrucci, ALPI U.S.A. Inc.

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By David J. Fazio and Jennifer B. Sharpe

Data Series 726

**U.S. Department of the Interior
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Conversion Factors, Datums, and Abbreviations

Multiply	By	To obtain
Length		
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Volume		
acre foot	1,233	cubic meter (m ³)
gallon (gal)	3.785	liter (L)
gallon (gal)	0.003785	cubic meter (m ³)
Flow rate		
gallon per minute (gal/min)	0.06309	liter per second (L/s)
inch per year (in/yr)	25.4	millimeter per year (mm/yr)

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

$$^{\circ}\text{F}=(1.8\times^{\circ}\text{C})+32$$

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

$$^{\circ}\text{C}=(^{\circ}\text{F}-32)/1.8$$

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Altitude, as used in this report, refers to distance above the vertical datum.

List of Abbreviations

AEP	annual exceedance probability
CSO	combined sewer overflow
FEMA	Federal Emergency Management Agency
FGCS	Federal Geodetic Control Subcommittee
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
IDNR–OWR	Illinois Department of Natural Resources–Office of Water Resources
IDOT	Illinois Department of Transportation
ISWS	Illinois State Water Survey
KML	Keyhole Markup Language
MWRDGC	Metropolitan Water Reclamation District of Greater Chicago
NEXRAD	Next Generation RADAR
NGS	National Geodetic Survey
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
PFDS	Precipitation Frequency Data Server
RADAR	Radio Detection and Ranging
TARP	Tunnel and Reservoir Plan
USGS	U.S. Geological Survey

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Flood of September 13–16, 2008, in Northeastern Illinois

By David J. Fazio and Jennifer B. Sharpe

Abstract

Major flooding occurred in northeastern Illinois during September 13–16, 2008, following extended storm activity. Rainfall recorded at select Illinois State Water Survey (ISWS), National Weather Service (NWS), and U.S. Geological Survey (USGS) rain gages in northeastern Illinois, ranged from 2.39 to 10.51 inches throughout a 51-hour period during September 12–14, 2008. The rainfall resulted in extensive **urban drainage**¹ and **riverine flooding**, causing the evacuation of thousands of residents, millions of dollars in damages, hundreds of road closings, and two water-related fatalities in the greater Chicago area. Nine counties in northeastern Illinois (16 counties throughout the State) were declared Federal disaster areas.

USGS **streamgages** recorded new record-peak **streamflows** at 13 locations as a result of the heavy rainfall. Four streamgages had a calculated **annual exceedance probability** (AEP) ranging from 0.2 to 1 percent, and one streamgage had a calculated AEP of less than 0.2 percent. During this **flood** event, USGS crews made 48 streamflow measurements at 45 streamgages. After the high-water had subsided, USGS crews set 230 high-water marks in over 40 communities along 131 miles of **streams**. The elevations for 117 high-water marks along approximately 100 miles of streams were measured by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) and the Illinois Department of Natural Resources–Office of Water Resources (IDNR–OWR). **Flood peak** water-surface profiles for select streams are plotted from the high-water mark data.

Introduction

During September 13 and 14, 2008, heavy rains caused severe flooding in several Midwestern States (fig. 1). The U.S. Geological Survey (USGS) Illinois Water Science Center responded to this flood event as part of its mission to provide

scientific, unbiased information about the Nation's rivers and streams. To meet critical needs for real-time streamflow data during the September 2008 flood event, USGS personnel were mobilized to the areas of flooding in order to make direct streamflow measurements and maintain the operational readiness of the streamgages (See Activities Log at <http://il.water.usgs.gov/flooddata/viewNews.cgi?date=20080913>). USGS personnel collected 48 streamflow measurements at 45 streamgages; 4 additional streamflow measurements were made at 3 ungaged locations, where flooding was particularly severe. After the floodwaters receded, high-water marks were set in 12 **drainage basins** in northeastern Illinois (fig. 2). Of these drainage basins, high-water marks were measured along the following select streams: Des Plaines River, North Branch Chicago River, West Branch DuPage River, East Branch DuPage River, DuPage River, Johnny Run, and Illinois River.

Purpose and Scope

This report summarizes the high-water mark data and presents flood-peak water-surface profiles of select stream reaches during the September 13–16, 2008, flood in northeastern Illinois. This report describes the meteorological conditions leading up to the flood, recorded rainfall, recorded flood-peak **gage heights**, and the flood-peak **discharges** with computed annual exceedance probabilities² (AEPs) at USGS streamgages. The impact and damages of the flood also are summarized.

²The annual exceedance probability (AEP) is the probability that a given event magnitude will be exceeded or equaled in any given year. For example, the AEP of the 50-year peak-flood streamflow is 0.02. In other words, there is a 2-percent chance that the 50-year peak flow will be exceeded or equaled in any given year. The reciprocal of the AEP is the recurrence interval. The recurrence interval (or return period) is the statistically computed average period of time within which a given event will be equal to or greater than a specified magnitude. This does not imply that an event of a specified magnitude will happen at regular intervals. For example, a 50-year rainfall is the rainfall that would be equal to or greater than the long-term average rainfall of once in 50 years. Two 50-year rainfalls could be experienced in 2 consecutive years (Hodgkins and others, 2007).

¹**Bolded** terms (or close variants thereof) are defined in the glossary near the end of the report.

Figure 1. Flood and high-flow conditions in the United States as measured by U.S. Geological Survey streamflow-gaging stations on September 14, 2008.

Figure 2. Locations of select streams, select U.S. Geological Survey streamgages, and high-water marks from the September 13–16, 2008, flood.

Storm and Flood of September 13–16, 2008, in Northeastern Illinois

Approximately 51 consecutive hours of rainfall (as measured at real-time gages during September 12–14) in northeastern Illinois caused new record flood-peak streamflows at USGS streamgages. Prior to this, Illinois had experienced the wettest January–July on record (Illinois State Water Survey, 2008a). While the August statewide precipitation was 1.4 in. below normal, combined with the above-normal precipitation of the preceding months, the statewide January–August precipitation total was 8.0 in. above normal (Illinois State Water Survey, 2008b).

On September 4th, **tropical depression** Gustav (an Atlantic storm) tracked northeasterly through central Illinois on a line between St. Louis, Mo. and Kankakee, Ill. As the storm progressed, it became **extratropical** as it merged with a **cold front** (Beven and Kimberlain, 2008). The slow, steady movement of this storm produced 1 to 4 in. of rain throughout most of Illinois (Illinois State Water Survey, 2008c). On September 8th, a narrow band of rainfall, greater than 1 in., further saturated northern DuPage and Cook Counties (National Oceanic and Atmospheric Administration, National Climatic Data Center NEXRAD Data Inventory, accessed May 9, 2011, at <http://www.ncdc.noaa.gov/nexradinv/>). On September 12th, Tropical Depression Lowell (a Pacific storm) merged with a **front** over the central United States (Berg, 2008). This storm moved across northern Illinois on Saturday, September 13th, generating the heaviest rainfall during the combined 3-day (September 12–14) rainfall event.

At the same time, Hurricane Ike (an Atlantic storm) was downgraded to a tropical depression as it passed through Arkansas into Missouri (Berg, 2009). On Sunday, September 14th, Tropical Depression Ike tracked into Illinois, south of Saint Louis, and merged with the trailing end of the storm that had been fueled by Tropical Depression Lowell (Berg, 2008). The combination of the two storms produced additional rain over large areas of northeastern Illinois, which were already saturated from the previous day of rainfall. Precipitation in La Salle, DeKalb, Kane, DuPage, and Cook Counties was particularly severe with the region's 3-day Next Generation RADAR (NEXRAD) rainfall total measuring from 1 in. to greater than 10 in. (fig. 3), and the 12-day cumulative precipitation at select USGS rain gages (where the rainfall was most severe) measured as much as 13.68 in. (fig. 4).

Data from USGS, DuPage County, Illinois State Water Survey (ISWS), and National Weather Service (NWS) rain gages corroborate the National Oceanic and Atmospheric Administration (NOAA) NEXRAD data. The measured storm-event totals (precipitation during September 12–September 14) at select rain gages had a range similar to the NEXRAD data. The select rain-gage totals ranged from 2.39 in. at Hebron,

Ill., to 10.51 in. at Elburn, Ill. (table 1). Based on the NOAA Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS), 16 of the 95 select rain gages had an AEP ranging from 1 to 0.5 percent, and 2 rain gages had an AEP ranging from 0.5 to 0.2 percent. The AEP was computed on the basis of the partial-duration series for a 72-hour duration rainfall.

USGS streamgages in northeastern Illinois (with more than 10 years of data) recorded new record flood-peak streamflows at 13 locations (table 2). An AEP ranging from 1 to 2 percent was calculated at four gages; an AEP ranging from 0.2 to 1 percent was calculated at three gages; and an AEP of less than 0.2 percent was calculated at one gage (Salt Creek at Rolling Meadows, USGS station 05530990) (Holmes and others, 2010).

Flood-Peak Water-Surface Profiles

High-water marks are evidence of the highest stage reached by a flood (Benson and Dalrymple, 1967). Two weeks after the September 2008 flood event, high-water marks were identified and flagged (appendix 1) in 43 communities, along 131 mi of 12 streams (table 3). The high-water mark evidence flagged for measurement consisted of the concentrated remains of buoyant material such as seeds, dried grass, polystyrene-foam particles, sticks and debris, or a “line” created as suspended sediment in the water coated submerged objects. Most of the high-water marks were flagged at bridge crossings and parks, as these provided the easiest access to the stream reach. High-water marks often were located on bridge structures, trees, fence posts, sign posts, utility poles, buildings, and electrical housings. High-water marks were flagged with either a blaze of paint or a floodmark disk and flagging. All high-water marks set were described on a field-data sheet (appendix 2) and most high-water marks were photographed (fig. 5). Copies of the field-data sheets, photographs, and a Keyhole Markup Language (KML) file of the high-water mark locations were delivered to Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) and Illinois Department of Natural Resources–Office of Water Resources (IDNR–OWR) for the elevations to be measured using a Global Navigation Satellite System (GNSS) or a digital level.

The elevation survey was conducted during summer 2009. Of the 239 high-water marks set, 121 were surveyed. Surveyed elevations were measured in relation to NAVD 88. The IDNR–OWR surveyed high-water marks set on the DuPage River, West Branch DuPage River, East Branch DuPage River, Johnny Run Creek, and Illinois River. The IDNR–OWR ran levels from National Geodetic Survey (NGS) 1st or 2nd vertical-order bench marks or IDNR–OWR bench marks. IDNR–OWR ran constant level lines the length of the flood area (or “main run”) while measuring to

established bench marks along the main run. The main run and all measurements to established bench marks was run as a closed-loop survey with errors not exceeding 0.005 inch per mile (L. Woodward, Illinois Department of Natural Resources—Office of Water Resources, written commun., 2011). The MWRDGC contracted with an engineering firm to survey high-water marks on the Des Plaines and North Branch Chicago Rivers. The engineering firm established horizontal and vertical ground control using GNSS technology, which met the specifications of the Federal Geodetic Control Subcommittee (FGCS) Second Order Class One and the accuracy standards in Federal Emergency Management Agency (FEMA) Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A—Guidance for Aerial Mapping and Surveying, 2003. High-water marks without satellite obstruction were directly measured by a GNSS. High-water marks with satellite obstruction were measured by setting two reference points with a GNSS and measuring to the high-water mark with a total station (J. Kratzer, Metropolitan Water Reclamation District Greater Chicago, written commun., 2011). The MWRDGC contracted with a second engineering firm to survey the high-water marks on the Little Calumet River. These high-water marks were measured to the same standards as the high-water marks measured on the Des Plaines and North Branch Chicago Rivers (M. Rembold, Camp Dresser & McKee, written commun., 2011).

Flood-peak water-surface profiles were produced by plotting high-water mark elevations by **river mile**. River mile was measured from the mouth of the river and was calculated by a Geographic Information System (GIS) program. The water surface between high-water marks was estimated by linear interpolation, creating an approximation of the actual water surface. High-water mark elevations are referenced to NAVD 88 (appendix 3). Of the 117 surveyed high-water marks, 1 has been annotated as unsuitable for use in the flood-peak water-surface profile.

Flood Damages and Impacts

Excessive rainfall on saturated soils and impervious land surfaces resulted in extensive urban drainage and riverine flooding. The flooding caused the evacuation of thousands of residents (Changnon, 2010); more than \$110 million in damages to residences, businesses, infrastructure and crops; five injuries; and 2 drowning fatalities (National Oceanic and Atmospheric Administration, 2008). In DuPage County, the Elmhurst Quarry Flood Control Facility diverted enough water from Salt Creek to fill the 8,300 acre-foot (2.7 billion gal) reservoir (fig. 6) (Illinois Environmental Protection Agency, 2009). In Cook County, the MWRDGC reported the Deep Tunnel, one portion of the Tunnel and Reservoir Plan (TARP), was filled to capacity—7,074 acre-foot (2.305 billion gal)—by 7:30 a.m. on Saturday, September

13th. The TARP is a combination of 109 mi of underground tunnels and two reservoirs designed to capture combined sewer overflow (CSO) and provide overbank flood relief; the TARP has a capacity of 17,660 acre-foot (5.755 billion gal). Prior to reaching the TARP's capacity, MWRDGC officials reversed the flow of the Chicago River by opening the gate at Wilmette, the T.J. O'Brien lock, and the lock at the Chicago River Controlling Works. The MWRDGC reported that approximately 34,370 acre-foot (11.2 billion gal) of storm water was released into Lake Michigan and 153,400 acre-foot (50 billion gal) into the Des Plaines River (E. Staudacher, Metropolitan Water Reclamation District of Greater Chicago, written commun., 2011).

The Illinois Department of Transportation (IDOT) closed 25 roads owing to flooding. IDOT reported another 101 intersections with excessive water, of which 11 were reported impassable. Other road closures included sections of three U.S. interstates; four U.S. highways; and seven Illinois state highways (Illinois Department of Natural Resources—Office of Water Resources, 2008). Floodwater closed two commuter rails and several freight rails for 2 to 3 days (Changnon, 2010). Flight delays at O'Hare International Airport and Midway Airport ranged from 6 to 8 hours (Changnon, 2010). Several feet of water at O'Hare Airport (fig. 7) caused closing of some taxiways and gate areas (National Oceanic and Atmospheric Administration, 2008). For the first time in 74 years, the Brookfield Zoo was closed because of flooded roads, viewing galleries, and exhibits. Lions, bears, and other large carnivores were restricted from their outdoor habitats as it was possible for the animals to swim across the moats inundated with floodwater (Chicago Tribune, 2008). Damage from overbank flooding was particularly severe in the Chicago communities of Morris (Grundy County); Warrenville (DuPage County); (fig. 7) and River Forest, Schiller Park, Des Plaines, and Albany Park (Cook County) (table 2).

On October 3, 2008, President George W. Bush signed Major Disaster Declaration FEMA-1800-DR for Cook, DeKalb, DuPage, Grundy, Kane, LaSalle, and Will Counties, Ill., which qualified these counties to receive public and (or) individual assistance through FEMA. On November 18, 2008, the list was updated to include two additional counties (outside the scope of this report) to receive public and (or) individual assistance, and Kendall County and six other counties (outside the scope of this report) to receive public assistance only (Federal Emergency Management Agency, 2008a). As of December 19, 2008, FEMA had approved more than \$69 Million in disaster assistance for residents of Illinois. In the 9 counties approved for individual disaster assistance, more than 26 thousand claims totaling \$54 Million were approved (Federal Emergency Management Agency, 2008b). The overwhelming majority of these claims were from Cook County (table 4).

Figure 3. Next Generation RADAR (NEXRAD) total storm precipitation during September 12–14, 2008, in northeastern Illinois.

Figure 4. Cumulative precipitation during September 3–14, 2008, for select rain gages in northeastern Illinois.

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Table 1. Rainfall data for a 3-day period at selected rain gages in northeastern Illinois, September 12–14, 2008.

[USGS, U.S. Geological Survey; AP, airport; GDN, garden; S, south; SE, south east; SSE, south south-east; SW, south west; HSE, house; WWTF, waste water treatment facility; W, west; WSW, west south-west; NE, north east; NW, north west; IS, island; L&D, lock and dam; RD, road; WFO, weather forecast office,]

County	Map reference number (fig. 3)	Agency station number	Agency station name	Reporting agency	Latitude (degrees, minutes, seconds)
Boone	R1	110583	Belvidere	NWS	42° 15' 18"
Cook	R2	5530990	Salt Creek at Rolling Meadows, IL	USGS	42°03'38"
	R3	116616	Park Forest	NWS	41° 29' 41"
	R4	114890	Lansing	NWS	41° 32' 31"
	R5	111549	Chicago Ohare AP	NWS	41° 59' 42"
	R6	G3	Des Plaines	ISWS	42°01'21.0"
	R7	413113087342201	Rain Gage near Chicago Heights, IL	USGS	41°31'13"
	R8	G22	Harvey	ISWS	41°35'08.4"
	R9	G2	Winnetka	ISWS	42°06'29.2"
	R10	G23	Lansing - Police Department	ISWS	41°35'16.0"
	R11	G24	Matteson - Police Department	ISWS	41°31'04.4"
	R12	G25	Chicago Heights - Big John's Farm Stand	ISWS	41°31'14.55"
	R13	415755087525300	O'Hare Airport at Chicago, IL	USGS	41°57'55"
	R14	G21	Tinley Park	ISWS	41°35'12.5"
	R15	G4	Village of Skokie	ISWS	42°01'36.2"
	R16	118324	Streamwood	NWS	42° 01' 32"
	R17	111497	Chicago Botanical GDN	NWS	42° 08' 26"
	R18	G1	Northbrook - Mission Brook Sanitary District	ISWS	42°06'38.85"
	R19	420052088034200	Schaumburg Public Works at Schaumburg, IL	USGS	42°00'52"
	R20	G5	Franklin Park	ISWS	41°55'55.3"
	R21	G20	Orland Park	ISWS	41°35'12.3"
	R22	G18	West 119th Street - Heat Corp. of America	ISWS	41°40'40.9"
	R23	G17	Alsip - Fire Department Station #2	ISWS	41°40'30.1"
	R24	G19	Avenue O	ISWS	41°40'21.5"
	R25	G16	Palos Park	ISWS	41°39'47.4"
	R26	G6	North Central Chicago, near Belmont	ISWS	41°56'17.0"
	R27	G14	South Water Purification Plant	ISWS	41°45'27.2"
	R28	114816	La Grange	NWS	41° 47' 43"
	R29	111577	Chicago Midway AP 3SW	NWS	41° 44' 14"
	R30	115110	Little Red School HSE	NWS	41° 42' 56"
	R31	G13	Greune Coal Company	ISWS	41°45'30.1"
	R32	110442	Barrington 3SW	NWS	42° 06' 55"
	R33	G15	Lemont - Saint Mary's Seminary	ISWS	41°40'45.9"
	R34	G8	Westchester - Forest Preserve	ISWS	41°50'41.1"
	R35	G12	Near Bedford Park - CP Hall	ISWS	41°45'30.7"
	R36	G10	West 26th Street	ISWS	41°50'42.5"
	R37	G9	Oak Park	ISWS	41°52'20"
	R38	G11	La Grange	ISWS	41°45'31.8"
	R39	G7	Broadway United Methodist Church	ISWS	41°56'35.1"

Table 1. Rainfall data for a 3-day period at selected rain gages in northeastern Illinois, September 12–14, 2008.—Continued

Longitude (degrees, minutes, seconds)	Total precipitation (inches)	72-hour duration rainfall (inches) for selected annual exceedance probabilities computed on the basis of the partial-duration series ^{1,2}								
		1.00	0.50	0.20	0.10	0.04	0.02	0.01	0.005	0.002
-88° 51' 52"	3.25	2.94	3.53	4.34	5.01	5.99	6.83	7.76	8.80	10.40
-88° 01' 00"	9.20	2.91	3.49	4.33	5.02	5.99	6.81	7.69	8.65	10.10
-87° 40' 49"	^a 8.74	3.05	3.68	4.59	5.35	6.44	7.34	8.32	9.37	10.90
-87° 32' 29"	^a 8.50	3.02	3.63	4.54	5.28	6.34	7.22	8.16	9.16	10.60
-87° 56' 01"	8.45	2.89	3.48	4.34	5.04	6.06	6.91	7.83	8.84	10.30
-87° 52' 39.9"	8.39	2.88	3.47	4.32	5.02	6.03	6.87	7.78	8.77	10.20
-87° 34' 22"	8.32	3.04	3.66	4.57	5.31	6.38	7.27	8.21	9.22	10.70
-87° 38' 00.9"	8.31	3.01	3.62	4.53	5.27	6.34	7.22	8.16	9.18	10.70
-87° 45' 06.5"	^b 8.19	2.81	3.38	4.20	4.87	5.82	6.60	7.43	8.31	9.60
-87° 32' 50.1"	8.19	2.99	3.60	4.50	5.23	6.29	7.16	8.09	9.09	10.50
-87° 43' 58.5"	8.12	3.04	3.66	4.58	5.34	6.44	7.37	8.38	9.48	11.10
-87° 34' 24.4"	^b 8.12	3.04	3.66	4.57	5.31	6.38	7.27	8.21	9.22	10.70
-87° 52' 53"	7.84	2.89	3.49	4.35	5.06	6.09	6.95	7.88	8.90	10.40
-87° 44' 54.7"	7.77	3.01	3.63	4.54	5.29	6.39	7.31	8.32	9.43	11.10
-87° 45' 21.2"	7.69	2.86	3.45	4.30	5.00	6.00	6.83	7.72	8.68	10.10
-88° 10' 42"	^c 7.67	2.99	3.59	4.43	5.12	6.11	6.94	7.85	8.85	10.30
-87° 47' 12"	^a 7.62	2.79	3.35	4.16	4.81	5.73	6.49	7.29	8.13	9.35
-87° 52' 05.4"	7.58	2.84	3.42	4.25	4.92	5.87	6.65	7.49	8.38	9.69
-88° 03' 42"	7.38	2.93	3.53	4.38	5.07	6.08	6.92	7.85	8.86	10.40
-87° 52' 41.3"	7.31	2.91	3.50	4.37	5.09	6.14	7.02	7.97	9.02	10.60
-87° 52' 33"	^b 7.28	3.00	3.61	4.52	5.29	6.44	7.44	8.57	9.85	11.80
-87° 39' 04.4"	^b 7.19	2.96	3.57	4.47	5.20	6.25	7.13	8.07	9.08	10.60
-87° 45' 00.0"	7.09	3.00	3.61	4.51	5.26	6.34	7.24	8.22	9.28	10.90
-87° 32' 22.7"	6.94	2.92	3.51	4.39	5.11	6.14	6.99	7.90	8.87	10.30
-87° 52' 13.5"	6.72	2.99	3.60	4.51	5.27	6.40	7.38	8.47	9.70	11.60
-87° 45' 39.4"	6.67	2.95	3.55	4.44	5.16	6.20	7.07	8.00	9.00	10.50
-87° 32' 37.9"	6.60	2.85	3.43	4.29	4.99	5.99	6.81	7.69	8.63	9.98
-87° 52' 15"	^d 6.59	2.98	3.59	4.49	5.24	6.35	7.30	8.35	9.52	11.30
-87° 46' 39"	6.58	3.01	3.62	4.53	5.27	6.35	7.24	8.23	9.30	10.90
-87° 52' 57"	^a 6.57	2.99	3.60	4.50	5.26	6.40	7.37	8.47	9.70	11.60
-87° 38' 29.9"	6.54	2.94	3.54	4.42	5.15	6.19	7.05	7.98	8.98	10.40
-88° 09' 50"	^c 6.39	2.96	3.55	4.36	5.02	5.92	6.67	7.45	8.28	9.47
-87° 57' 54.4"	6.39	2.97	3.58	4.48	5.25	6.44	7.49	8.70	10.10	12.30
-87° 52' 55.6"	5.79	2.96	3.56	4.45	5.20	6.29	7.23	8.27	9.42	11.20
-87° 46' 06.8"	5.78	3.01	3.62	4.53	5.27	6.35	7.25	8.23	9.29	10.90
-87° 38' 28.1"	5.70	2.93	3.54	4.42	5.15	6.20	7.08	8.02	9.04	10.60
-87° 46' 18"	5.68	2.97	3.58	4.47	5.21	6.27	7.15	8.11	9.14	10.70
-87° 53' 20.2"	5.54	2.98	3.59	4.49	5.25	6.38	7.36	8.45	9.67	11.60
-87° 38' 42.3"	5.21	2.94	3.54	4.43	5.16	6.20	7.07	8.01	9.02	10.50

Table 1. Rainfall data for a 3-day period at selected rain gages in northeastern Illinois, September 12–14, 2008.—Continued

County	Map reference number (fig. 3)	Agency station number	Agency station name	Reporting agency	Latitude (degrees, minutes, seconds)
DeKalb	R40	117833	Shabbona 3S	NWS	41° 43' 56"
	R41	112223	DeKalb	NWS	41° 56' 03"
	R42	113392	Genoa 2 SW	NWS	42° 04' 28"
DuPage	R43	415751087591000	Wood Dale WWTF at Wood Dale, IL	USGS	41°57'51"
	R44	415651088051900	Bloomington Lift Station at Bloomington, IL	USGS	41°56'51"
	R45	415801088095700	Bartlett WWTF near Bartlett, IL	USGS	41°58'01"
	R46	415518087583000	Addison WWTF at Addison, IL	USGS	41°55'18"
	R47	415423088081500	Carol Stream WWTF at Carol Stream, IL	USGS	41°54'23"
	R48	05531300	Salt Creek at Elmhurst, IL	USGS	41°53'10"
	R49	415300088054600	Wheaton Water Department at Wheaton, IL	USGS	41°53'00"
	R50	113490	Glen Ellyn 4S	NWS	41° 49' 36"
	R51	05540060	Kress Creek at West Chicago, IL	USGS	41°51'23"
	R52	415037088110600	Blackwell Forest Preserve near Warrenville, IL	USGS	41°50'37"
	R53	115097	Lisle-Morton Arboretum	NWS	41° 48' 46"
	R54	415356087575000	Elmhurst Quarry at Elmhurst, IL	USGS	41°53'56"
	R55	415037087581700	Oak Brook Well at Oak Brook, IL	USGS	41°50'37"
	R56	414843088042500	Morton Arboretum Near Lisle, IL	USGS	41°48'43"
	R57	414747087582700	Westmont Water Department at Westmont, IL	USGS	41°47'47"
	R56	414843088042500	Morton Arboretum Near Lisle, IL	USGS	41°48'43"
	R57	414747087582700	Westmont Water Department at Westmont, IL	USGS	41°47'47"
	R58	414655088102300	Naperville N Operations Center at Naperville, IL	USGS	41°46'55"
	R59	116281	Oak Brook 2W	NWS	41° 50' 32"
	R60	414430088035600	Woodridge WWTF at Woodridge, IL	USGS	41°44'30"
	R61	414411087575000	Marienbrook WWTF at Darien, IL	USGS	41°44'11"
	R62	05531410	Salt Creek at 22nd Street at Oakbrook, IL	USGS	41°50'51"
	R63	414613088091000	Naperville Municipal Building at Naperville, IL	USGS	41°46'13"
Grundy	R64	111420	Channahon Dresden IS	NWS	41° 23' 52"
	R65	115825	Morris 1 NW	NWS	41° 22' 15"
Kane	R66	112709	Elburn	NWS	41° 52' 27"
	R67	117586	St. Charles 7 NW	NWS	41° 57' 37"
	R68	05551200	Ferson Creek near St. Charles, IL	USGS	41°55'58"
	R69	05551330	Mill Creek near Batavia, IL	USGS	41°50'45"
	R70	112736	Elgin	NWS	42° 03' 46"
	R71	110338	Aurora	NWS	41° 46' 50"
	R72	05551675	Blackberry Creek near Montgomery, IL	USGS	41°44'27"
Kendall	R73	116855	Plano	NWS	41° 39' 07"
	R74	116065	Newark 2 SSE	NWS	41° 31' 57"

Table 1. Rainfall data for a 3-day period at selected rain gages in northeastern Illinois, September 12–14, 2008.—Continued

Longitude (degrees, minutes, seconds)	Total precipitation (inches)	72-hour duration rainfall (inches) for selected annual exceedance probabilities computed on the basis of the partial-duration series ^{1,2}								
		1.00	0.50	0.20	0.10	0.04	0.02	0.01	0.005	0.002
-88° 51' 55"	^a 8.11	2.98	3.57	4.42	5.16	6.33	7.41	8.69	10.20	12.70
-88° 46' 32"	^c 5.98	2.99	3.58	4.44	5.21	6.44	7.59	8.97	10.60	13.30
-88° 42' 27"	^c 4.63	2.99	3.59	4.43	5.14	6.23	7.21	8.34	9.66	11.80
-87° 59' 10"	8.73	2.92	3.51	4.37	5.08	6.12	6.99	7.95	9.01	10.60
-88° 05' 19"	8.47	2.97	3.58	4.45	5.17	6.25	7.18	8.23	9.40	11.20
-88° 09' 57"	8.37	2.92	3.51	4.37	5.08	6.12	6.99	7.95	9.01	10.60
-87° 58' 30"	8.08	2.93	3.53	4.40	5.12	6.19	7.11	8.11	9.24	11.00
-88° 08' 15"	7.89	3.00	3.61	4.49	5.25	6.39	7.40	8.55	9.87	12.00
-87° 57' 33"	7.09	2.95	3.55	4.43	5.17	6.27	7.22	8.28	9.47	11.30
-88° 05' 46"	7.03	3.00	3.61	4.50	5.26	6.43	7.47	8.67	10.10	12.30
-88° 03' 29"	^c 6.86	3.00	3.61	4.51	5.30	6.52	7.64	8.93	10.50	12.90
-88° 12' 14"	6.80	3.03	3.63	4.53	5.31	6.52	7.61	8.89	10.40	12.80
-88° 11' 06"	6.69	3.03	3.64	4.53	5.32	6.54	7.64	8.94	10.50	12.90
-88° 04' 22"	^a 6.59	3.01	3.61	4.52	5.31	6.55	7.68	9.01	10.60	13.10
-87° 57' 50"	6.57	2.94	3.54	4.42	5.15	6.24	7.18	8.22	9.38	11.20
-87° 58' 17"	6.19	2.97	3.57	4.47	5.22	6.37	7.36	8.50	9.78	11.80
-88° 04' 25"	6.08	3.01	3.61	4.52	5.31	6.55	7.68	9.01	10.60	13.10
-87° 58' 27"	6.06	2.98	3.59	4.49	5.26	6.44	7.48	8.67	10.00	12.20
-88° 04' 25"	6.08	3.01	3.61	4.52	5.31	6.55	7.68	9.01	10.60	13.10
-87° 58' 27"	6.06	2.98	3.59	4.49	5.26	6.44	7.48	8.67	10.00	12.20
-88° 10' 23"	5.99	3.03	3.63	4.53	5.33	6.57	7.71	9.05	10.60	13.20
-87° 58' 23"	^a 5.88	2.97	3.58	4.47	5.23	6.38	7.39	8.53	9.84	11.90
-88° 03' 56"	5.75	2.99	3.60	4.50	5.29	6.53	7.66	8.97	10.50	13.10
-87° 57' 50"	5.60	2.98	3.58	4.48	5.26	6.44	7.49	8.69	10.10	12.30
-87° 56' 12"	5.30	2.96	3.56	4.45	5.20	6.31	7.27	8.35	9.56	11.40
-88° 09' 10"	4.82	3.02	3.62	4.53	5.32	6.56	7.70	9.04	10.60	13.20
-88° 16' 55"	^d 6.89	2.99	3.58	4.41	5.13	6.27	7.31	8.52	9.95	12.20
-88° 26' 01"	^a 5.75	2.95	3.54	4.34	5.03	6.11	7.08	8.22	9.55	11.70
-88° 28' 22"	^d 10.51	3.04	3.65	4.53	5.30	6.52	7.64	8.96	10.50	13.10
-88° 25' 22"	^c 9.46	3.02	3.63	4.49	5.23	6.37	7.38	8.55	9.90	12.10
-88° 20' 27"	8.74	3.02	3.63	4.50	5.25	6.39	7.41	8.59	9.96	12.20
-88° 20' 57"	7.72	3.06	3.67	4.57	5.37	6.65	7.82	9.22	10.90	13.70
-88° 17' 10"	^c 7.08	3.01	3.61	4.45	5.12	6.07	6.86	7.71	8.63	10.00
-88° 18' 33"	^c 7.06	3.06	3.67	4.58	5.40	6.72	7.96	9.44	11.20	14.20
-88° 23' 00"	6.26	3.06	3.67	4.57	5.38	6.69	7.93	9.41	11.20	14.20
-88° 31' 45"	^c 6.63	3.00	3.60	4.46	5.24	6.49	7.66	9.07	10.80	13.60
-88° 33' 13"	^c 6.21	2.99	3.58	4.41	5.15	6.33	7.42	8.71	10.30	12.80

Table 1. Rainfall data for a 3-day period at selected rain gages in northeastern Illinois, September 12–14, 2008.—Continued

County	Map reference number (fig. 3)	Agency station number	Agency station name	Reporting agency	Latitude (degrees, minutes, seconds)
La Salle	R75	115562	Mendota 2 SE	NWS	41° 31' 46"
	R76	112510	Earlville 3 S	NWS	41° 33' 05"
	R77	116753	Peru	NWS	41° 21' 01"
	R78	115372	Marseilles Lock	NWS	41° 19' 43"
	R79	116526	Ottawa 5SW	NWS	41° 19' 42"
Lake	R80	5528000	Des Plaines River near Gurnee, IL	USGS	42°20'38"
	R81	115961	Mundelein 4WSW	NWS	42° 15' 19"
McHenry	R82	112048	Crystal Lake 4 NW	NWS	42° 15' 40"
	R83	115493	McHenry Stratton L&D	NWS	42° 18' 37"
	R84	119480	Woodstock 5 NW	NWS	42° 21' 46"
	R85	118192	Spring Grove	NWS	42° 28' 04"
	R86	5548280	Nippersink Creek near Spring Grove, IL	USGS	42°26'36"
	R87	113902	Harvard	NWS	42° 24' 53"
	R88	422834088255800	Rain Gage at Hebron, IL	USGS	42°28'34"
	R89	116725	Peotone	NWS	41° 19' 37"
Will	R90	115763	Monee Reservoir	NWS	41° 23' 36"
	R91	412657087372001	Rain Gage at Crete, IL	USGS	41°26'57"
	R92	114530	Joliet Brandon RD DAM	NWS	41° 30' 12"
	R93	117457	Romeoville WFO	NWS	41° 36' 16"
	R94	116849	Plainfield 3 NE	NWS	41° 38' 19"
	R95	414306088042100	Bolingbrook WWTF at Bolingbrook, IL	USGS	41°43'06"

¹The annual exceedance probability (AEP) is the probability that a given event will be exceeded or equaled in any given year. For example, the AEP of the 100-year rainfall is 0.01. In other words, there is a 1-percent chance that the rainfall would be exceeded or equaled in any given year.

²National Oceanic and Atmospheric Administration (2011).

^aDaily rainfall recorded at 8 a.m.

^bIncludes estimated data based on distance weighted linear interpolation (Westcott, 2008).

^cDaily rainfall recorded at 7 a.m.

^dDaily rainfall recorded at 6 a.m.

Table 1. Rainfall data for a 3-day period at selected rain gages in northeastern Illinois, September 12–14, 2008.—Continued

Longitude (degrees, minutes, seconds)	Total precipitation (inches)	72-hour duration rainfall (inches) for selected annual exceedance probabilities computed on the basis of the partial-duration series ^{1,2}								
		1.00	0.50	0.20	0.10	0.04	0.02	0.01	0.005	0.002
-89° 07' 36"	^c 6.39	3.02	3.62	4.45	5.14	6.16	7.04	8.01	9.10	10.80
-88° 54' 53"	^d 6.10	3.00	3.60	4.42	5.12	6.20	7.16	8.26	9.53	11.50
-89° 06' 26"	^c 5.46	3.02	3.62	4.45	5.13	6.10	6.90	7.76	8.69	10.00
-88° 45' 12"	^d 4.66	3.03	3.62	4.44	5.12	6.16	7.08	8.11	9.30	11.10
-88° 54' 38"	^a 4.08	3.01	3.61	4.42	5.10	6.12	7.01	8.01	9.14	10.90
-87° 56' 28"	5.38	2.72	3.26	3.99	4.55	5.32	5.91	6.51	7.11	7.91
-88° 04' 37"	^c 5.13	2.86	3.43	4.22	4.83	5.68	6.35	7.05	7.77	8.77
-88° 23' 43"	^c 5.99	2.97	3.56	4.37	5.01	5.90	6.62	7.38	8.18	9.33
-88° 15' 09"	^a 5.38	2.96	3.54	4.34	4.99	5.90	6.66	7.47	8.36	9.65
-88° 31' 53"	^c 3.75	2.97	3.56	4.36	4.98	5.83	6.52	7.22	7.96	8.99
-88° 14' 14"	^c 3.06	2.91	3.49	4.27	4.87	5.67	6.29	6.92	7.55	8.41
-88° 14' 51"	3.03	2.92	3.50	4.28	4.88	5.69	6.32	6.96	7.60	8.47
-88° 37' 51"	^c 2.45	2.94	3.53	4.32	4.93	5.78	6.46	7.17	7.91	8.94
-88° 25' 58"	2.39	2.95	3.54	4.33	4.93	5.75	6.39	7.04	7.70	8.59
-87° 47' 09"	^c 8.68	3.15	3.80	4.74	5.53	6.68	7.65	8.71	9.88	11.60
-87° 45' 54"	^a 8.59	3.12	3.76	4.70	5.48	6.62	7.59	8.64	9.81	11.60
-87° 37' 20"	7.44	3.07	3.70	4.62	5.37	6.46	7.36	8.32	9.34	10.90
-88° 06' 10"	^d 6.93	2.94	3.53	4.41	5.19	6.44	7.61	8.99	10.70	13.40
-88° 05' 09"	6.12	2.96	3.56	4.44	5.22	6.44	7.56	8.86	10.40	12.90
-88° 11' 17"	^c 6.11	2.99	3.58	4.47	5.25	6.49	7.63	8.98	10.60	13.20
-88° 04' 21"	5.92	2.99	3.59	4.49	5.28	6.52	7.64	8.94	10.50	13.00

Table 2. Flood-peak gage height, peak discharge, and annual exceedance probability of peak discharge (as published by Holmes and others, 2010) during the flood of September 2008 at selected U.S. Geological Survey streamgages in northeastern Illinois.[mi², square mile; ft, foot; ft³/s, cubic foot per second; AEP, annual exceedance probability; IL, Illinois; >, greater than]

Station number	Station name	Drainage area (mi ²)	Previous maximum streamflow				Annual peaks	Flood of September 2008			AEP (Holmes and others, 2010)
			Date	Stage (ft)	Discharge (ft ³ /s)	Rank		Date	Stage (ft)	Discharge (ft ³ /s)	
05439000	SOUTH BRANCH KISHWAUKEE RIVER AT DEKALB, IL	77.7	08/2007	13.60	3,020	5	37	9/14/2008	11.30	^a 2,030	
05529000	DES PLAINES RIVER NEAR DES PLAINES, IL	360	10/1986	10.88	4,900	14	69	9/14/2008	10.00	^a 3,010	10
05530990	SALT CREEK AT ROLLING MEADOWS, IL	30.5	08/1987	14.03	1,650	1	35	9/13/2008	12.99	^a 2,510	>2
05531300	SALT CREEK AT ELMHURST, IL	91.47	08/1972	7.27	2,230	2	45	9/14/2008	13.27	^a 1,940	
05531500	SALT CREEK AT WESTERN SPRINGS, IL	115	08/1987	10.54	3,540	2	63	9/14/2008	9.92	^a 2,890	
05532500	DES PLAINES RIVER AT RIVERSIDE, IL	630	08/1987	9.90	9,770	2	95	9/14/2008	9.87	^a 9,560	0.2-1
05536000	NORTH BRANCH CHICAGO RIVER AT NILES, IL	100	08/1987	11.35	2,590	1	58	9/13/2008	12.13	^a 3,340	2-1
05536105	NORTH BRANCH CHICAGO RIVER AT ALBANY AVENUE AT CHICAGO, IL	113	02/1997	6.81	2,360	1	18	9/14/2008	7.86	^a 3,580	
05536235	DEER CREEK NEAR CHICAGO HEIGHTS, IL	23.1	08/2007	12.37	1,320	1	61	9/15/2008	12.87	^{a,b} 1,320	
05536275	THORN CREEK AT THORNTON, IL	104	04/2006	15.10	5,540	1	62	9/14/2008	15.89	^a 5,860	1-2
05539900	WEST BRANCH DU PAGE RIVER NR WEST CHICAGO, IL	28.5	08/2007	10.35	1,040	1	48	9/13/2008	12.28	^a 1,840	2-1
05540060	KRESS CREEK AT WEST CHICAGO, IL	18.1	07/1996	9.24	1,980	1	50	9/14/2008	9.37	^a 2,100	1-2
05540095	WEST BRANCH DU PAGE RIVER NEAR WARRENVILLE, IL	90.4	07/1996	6.41	3,470	1	40	9/14/2008	8.03	^a 4,930	1-2
05540130	WEST BRANCH DU PAGE RIVER NEAR NAPERVILLE, IL	123	07/1996	14.31	6,620	2	20	9/14/2008	11.98	^a 4,160	4-10
05540160	EAST BRANCH DU PAGE RIVER NEAR DOWNERS GROVE, IL	26.6	08/1972	16.94	1,720	3	35	9/14/2008	17.26	^a 1,190	4-10
05540250	EAST BRANCH DU PAGE RIVER AT BOLINGBROOK, IL	75.8	07/1996	23.75	3,980	2	20	9/14/2008	24.01	^a 2,410	4-10
05540500	DU PAGE RIVER AT SHOREWOOD, IL	324	07/1996	14.03	17,300	4	68	9/15/2008	9.94	^a 9,440	4-10
05543500	ILLINOIS RIVER AT MARSEILLES, IL	8,259	01/1916	35.40	^a 40,000	2	112	9/16/2008	28.13	^c 104,000	
05550300	TYLER CREEK AT ELGIN, IL	38.9	08/2002	8.26	1,650	3	28	9/13/2008	8.53	^a 1,250	>10
05550500	POPLAR CREEK AT ELGIN, IL	35.2	02/1997	6.78	1,180	1	57	9/13/2008	7.69	^a 1,560	2-4
05551200	FERSON CREEK NEAR ST. CHARLES, IL	51.7	02/1997	8.77	2,580	1	48	9/13/2008	8.96	^a 2,980	1-2
05551330	MILL CREEK NEAR BATAVIA, IL	27.62	04/1999	7.52	1,080	1	11	9/13/2008	9.48	^a 4,510	
05551540	FOX RIVER AT MONTGOMERY, IL	1,732	08/2007	14.69	13,800	1	6	9/14/2008	15.12	^a 18,000	
05551675	BLACKBERRY CREEK NEAR MONTGOMERY, IL	54.97	04/1999	8.61	1,040	1	11	9/14/2008	10.69	^a 1,740	
05551700	BLACKBERRY CREEK NEAR YORKVILLE, IL	70.2	07/1996	13.16	5,510	2	48	9/15/2008	9.94	^a 2,130	>10

^aAll or part of the record affected by urbanization.^bDischarge affected to unknown degree by regulation or diversion.^cDischarge affected by regulation or diversion.^dDischarge owing to snowmelt, hurricane, ice-jam, or debris-dam breakup.

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Table 3. List of communities, by stream reach, and approximate number of miles where high-water marks were set for the September 13–16, 2008, flood in northeastern Illinois.

[~, approximately]

Stream	Stream miles	Community	County
Addison Creek	~6.5	Northlake	Cook
		Stone Park	Cook
		Bellwood	Cook
		Broadview	Cook
Des Plaines River	~28.0	Northbrook	Cook
		Prospect Heights	Cook
		Glenview	Cook
		Mount Prospect	Cook
		Des Plaines	Cook
		Park Ridge	Cook
		Rosemont	Cook
		Schiller Park	Cook
		Franklin Park	Cook
		River Grove	Cook
		Melrose Park	Cook
		River Forest	Cook
		Maywood	Cook
		Oak Park	Cook
		Forest Park	Cook
		Riverside	Cook
		Lyons	Cook
DuPage River	~27.0	Naperville	DuPage/Will
		Bolingbrook	Will
		Plainfield	Will
		Joliet	Will
		Shorewood	Will
		Minooka	Will
		Channahon	Will
East Branch DuPage River	~5.5	Woodridge	DuPage
		Naperville	DuPage/Will
		Bolingbrook	Will
Illinois River	~6.0	Morris	Grundy
Johnny Run	~4.0	Mazon	Grundy

Table 3. List of communities, by stream reach, and approximate number of miles where high-water marks were set for the September 13–16, 2008, flood in northeastern Illinois.—Continued

Stream	Stream miles	Community	County
Little Calumet River	~8.0	Harvey	Cook
		South Holland	Cook
		Thorton	Cook
		Calumet City	Cook
		Lansing	Cook
North Branch Chicago River	~8.5	Niles	Cook
		Old Edgebrook	Cook
		South Edgebrook	Cook
		Albany Park	Cook
Poplar Creek	~1.5	Elgin	Cook/Kane
Salt Creek	~3.0	Brookfield	Cook
		Lyons	Cook
South Branch Kishwaukee	~12.5	Genoa	DeKalb
		Sycamore	DeKalb
		DeKalb	DeKalb
West Branch DuPage River	~21.0	Roselle	DuPage
		Hanover Park	DuPage
		Carol Stream	DuPage
		West Chicago	DuPage
		Winfield	DuPage
		Warrenville	DuPage
		Naperville	DuPage/Will
Total stream miles	~131.5

Figure 5. Selected high-water marks in October 2008. *A*, Paint blaze on streetlight, Des Plaines River at Lake Street, River Forest, Illinois (Ill.). *B*, Floodmark disk and flagging on tree, Poplar Creek at Hammond Avenue, Elgin, Ill. *C*, Paint blaze on sign post, Des Plaines River at Robinson Avenue, Franklin Park, Ill. *D*, Paint blaze on bridge support, Des Plaines River at Golf Road, Des Plaines, Ill. *E*, Paint blaze and flagging on metal pole, North Branch Chicago River in an alley between North Springfield Avenue and North Avers Avenue, Albany Park, Ill. *F*, Paint blaze on guard rail, North Branch Chicago River at North Bernard Street, Albany Park, Ill.

Figure 6. Elmhurst Quarry Flood Control Facility, DuPage County, Illinois. *A*, full of water on September 16, 2008. *B*, dry on May 31, 2011.

Figure 7. Passenger jet taxiing to a terminal at O'Hare International Airport, Chicago, Illinois, September 14, 2008.

Table 4. Counties eligible for individual disaster assistance approved by the Federal Emergency Management Agency and ranked by dollar amount.

[Source: Federal Emergency Management Agency, 2008b]

Rank	County	Number of households	Dollar amount	Households (in percent)	Dollar amount (in percent)
1	Cook	23,595	\$47,022,881	89.3	86.5
2	DuPage	782	\$2,328,929	3.0	4.3
3	Will	596	\$1,161,786	2.3	2.1
4	Peoria ¹	634	\$1,036,988	2.4	1.9
5	Kane	325	\$948,509	1.2	1.7
6	La Salle	164	\$913,741	.6	1.7
7	DeKalb	153	\$473,075	.6	.9
8	Woodford ¹	97	\$244,233	.4	.4
9	Grundy	62	\$219,684	.2	.4
Total		26,408	\$54,349,826		

¹Outside of the study area.

Summary

Major flooding occurred in northeastern Illinois during September 13–16, 2008, following a combination of severe storms throughout the Midwest. The floods caused millions of dollars’ worth of damage to homes, businesses, and infrastructures and two water-related fatalities in the greater Chicago area. Rainfall totals ranged from 2.39 inches in Hebron, Illinois (Ill.), to 10.51 inches in Elburn, Ill., throughout a 51-hour period during September 12–14, 2008. U.S. Geological Survey streamgages recorded new record-peak streamflows at 13 locations as a result of the heavy rainfall. Four gages had a calculated annual exceedance probability (AEP) ranging from 0.2 to 1 percent, and one gage had a calculated AEP of less than 0.2 percent. High-water marks along select streams were depicted in flood-peak water-surface profiles. The combined length of the profiles exceeds 100 river miles.

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Glossary

The following definitions, except where noted, are from Langbein and Iseri (1960).

A

acre-foot A unit for measuring the volume of water equal to the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet or 325,851 gallons. The term is commonly used in measuring volumes of water used or stored.

annual exceedance probability The probability that a given event magnitude will be exceeded or equaled in any given year. For example, the annual exceedance probability of the 50-year peak-flood streamflow is 0.02. In other words, there is a 2-percent chance that the 50-year peak flow will be exceeded or equaled in any given year (Hodgkins and others, 2007). The reciprocal of the annual exceedance probability is the recurrence interval.

C

cold front The zone separating two air masses, with the cooler, denser air mass advancing and replacing the warmer air mass. Cold fronts often cause precipitation as water vapor in the rising warm air condenses and forms clouds. The cloud formation can result in heavy rain, thunderstorms, hail, or snow (Dictionary.com, 2011).

cubic feet per second A unit expressing discharge as a volume per unit of time. For example 1 cubic foot per second is equal to the discharge of a stream of 1 square foot in area passing a point with an average velocity of 1 foot per second.

D

discharge In hydrologic terms, the rate at which water passes a given point. Discharge is expressed in a volume per time with units of cubic feet per second. Discharge often is used interchangeably with streamflow (National Weather Service, 2009).

drainage basin A part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

E

extratropical A term used in advisories and tropical summaries to indicate that a cyclone has lost its “tropical” characteristics. The term implies both poleward displacement of the cyclone and the conversion of the cyclone’s primary energy source from the release of latent heat of condensation to baroclinic (the temperature contrast between warm and cold air masses) processes. It is important to note that cyclones can become extratropical and still retain winds of hurricane or tropical storm force (National Weather Service, 2009).

F

flood Any high flow, overflow, or inundation by water that causes or threatens damage (National Weather Service, 2009).

flood peak The highest value of the stage or discharge attained by a flood; thus, peak stage or peak discharge. Flood crest has nearly the same meaning, but because it connotes the top of the flood wave, it is properly used only in referring to stage—thus, crest stage, but not crest discharge.

front A boundary or transition zone between two air masses of different density, and thus (usually) of different temperature. A moving front is named according to the advancing air mass; for example, cold front if colder air is advancing (National Weather Service, 2009).

G

gage height The water-surface elevation referred to some arbitrary gage datum. Gage height often is used interchangeably with the more general term stage, although gage height is more appropriate when used with a reading on a streamgage.

R

river mile The curvilinear distance, in miles, measured upstream from the mouth along the meandering path of a stream channel in accordance with Bulletin No. 14 (October 1968) of the Water Resources Council and typically is used to denote location along a river.

riverine flood Excess flows over the banks of a natural channel such as a river, creek, stream, or ditch (Federal Emergency Management Agency, 2007).

S

stream A general term for a body of flowing water. In hydrology, the term generally is applied to the water flowing in a natural channel as distinct from a canal.

streamflow The discharge that occurs in a natural channel. Although the term discharge can be applied to the flow of a canal, the word streamflow uniquely describes the discharge in a surface-stream course.

streamgage A gaging station where a record of discharge of a stream is obtained. Within the U.S. Geological Survey, this term is used only for those gaging stations where a continuous record of gage height is obtained.

T

tropical depression A tropical cyclone in which the maximum 1-minute sustained surface wind is 33 knots (38 miles per hour) or less (National Weather Service, 2009).

U

urban drainage flood Excess flows over the banks of man-made ditches, retention ponds, and other facilities constructed to store runoff or carry it to a receiving stream or lake (Federal Emergency Management Agency, 2007).

Appendixes 1–3

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois

Appendix 2. Example High-Water Mark Documentation Field Sheet, Flood of September 2008, Northeastern Illinois

Appendix 3. Flood-Peak Water-Surface Profiles at Select Stream Reaches, Flood of September 2008, Northeastern Illinois

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.

[Vertical coordinate data are referenced to the North American Vertical Datum of 1988 (NAVD 88); horizontal coordinate data are referenced to the North American Datum of 1983; approximate quantitative indications of accuracy of high-water mark ratings: excellent, + 0.02 foot; good, + 0.05 foot; fair, + 0.10 foot; and poor, > 0.10 foot (Lumia and others, 1987); for the bank designation, "right" and "left" refer to an observation looking in the downstream direction of the watercourse; NR, not recovered; ft, feet; ° ' " , degrees, minutes, seconds; ~, approximately; R+R, railroad]

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
North Branch Chicago River							
Cook	Howard Street	Paint 3.0 ft up the downstream side of Howard St. bridge on the right bank	seed line/ debris line	excellent		42° 01' 08.4"	-87° 47' 45.6"
Cook	Howard Street	A flood mark disc 3.5 ft up a fence post 60 ft downstream of Howard St. on the right bank next to a parking lot	seed line/ debris line	fair		42° 01' 07.77"	-87° 47' 46.5"
Cook	Harts Road	A flood mark disc 2.0 ft up a tree 10 ft downstream of Harts Rd. and 14 posts off the left bank	mud line	good		42° 00' 34.3"	-87° 47' 47.1"
Cook	Harts Road	Paint 2.0 ft up the side of an equipment housing upstream of Harts Rd. bridge on the left bank 3 ft west of Riverside Rd.	mud line	excellent	612.46	42° 00' 36.7"	-87° 47' 45.8"
Cook	Harts Road	Paint 0.4 ft up a no parking sign 2 ft upstream of Harts Rd. on the left bank across Riverside Rd.	mud line	good		42° 00' 36.4"	-87° 47' 43.0"
Cook	Clayton Smith Woods Preserve	A flood mark disc 6.5 ft up a tree 560 ft downstream of the pedestrian path on the right bank near a pool	seed line/ debris line			41° 59' 55.7"	-87° 47' 00.32"
Cook	Clayton Smith Woods Preserve	A flood mark disc 2.5 ft up a tree 20 ft downstream of the pedestrian bridge on the left bank	seed line/ debris line	fair	608.75	40° 00' 00.5"	-87° 47' 03.7"
Cook	Clayton Smith Woods Preserve	Paint 7.0 ft up the downstream side of the pedestrian bridge on the right bank	seed line/ debris line	good		41° 59' 59.9"	-87° 47' 03.9"
Cook	Clayton Smith Woods Preserve	Paint 6.0 ft up the downstream side of the pedestrian bridge on the left bank	seed line/ debris line	good		42° 00' 00.9"	-87° 47' 03.9"
Cook	West Devon Avenue	A mark 1.0 ft up an abutment 4 ft downstream of W. Devon Ave. bridge on the left bank	seed line/ debris line	good		41° 54' 50.4"	-87° 46' 47.2"
Cook	West Devon Avenue	A flood mark disc 3.0 ft up a tree 15 ft downstream of W. Devon Ave. bridge on the left bank	seed line/ debris line	fair		41° 54' 50.1"	-87° 46' 47.0"
Cook	North Central Avenue	Paint 6.5 ft up a fence post 1,000 ft downstream of N. Central Ave. on the right bank near a pavillion	seed line/ debris line	good	603.42	41° 59' 19.77"	-87° 45' 45.91"
Cook	North Central Avenue	Paint 3.0 ft up the downstream side of N. Central Ave. bridge on the right bank	seed line/ debris line	fair	603.76	41° 59' 23.63"	-87° 45' 57.76"
Cook	Forest Glen Avenue	Paint 2.0 ft up the downstream side of Forest Glen Ave. bridge on the right bank	seed line/ debris line	excellent	602.05	41° 58' 54.4"	-87° 45' 05.4"
Cook	Cicero Avenue	Paint 2.0 ft up the Cicero Ave. bridge wingwall downstream of the bridge on the right bank	mud line	good		41° 58' 57.8"	-87° 44' 48.8"
Cook	Cicero Avenue	A flood mark disc 4.5 ft up a tree 20 ft downstream of Cicero Ave. bridge on the right bank	mud line	fair	600.94	41° 59' 00.3"	-87° 44' 53.0"
Cook	Foster Avenue/R+R Bridge	A flood mark disc on a tree 20 ft downstream of the R+R bridge on the right bank	seed line/ debris line	good	600.37	41° 58' 41.0"	-87° 44' 26.7"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Cook	Foster Avenue/ Kostner	Paint on a metal post on the right bank north of Foster (further east)	seed line	good	600.30	41° 58' 34.8"	-87° 44' 10.8"
Cook	Foster Avenue/ Kostner	Paint on a metal post on the right bank north of Kostner (further east)	seed line	good		41° 58' 34.9"	-87° 44' 15.8"
Cook	Foster Avenue/ Kostner	Paint on a metal post on the right bank north of Kostner (further west)	seed line	good	600.20	41° 58' 35.0"	-87° 44' 16.6"
Cook	Foster Avenue/ Pulaski	A flood mark disc 4.5 ft up a Chicago park district sign 110 ft upstream of Pulaski on the right bank across a foot path	seed line/ debris line	good		41° 58' 28.6"	-87° 43' 43.2"
Cook	Foster Avenue/ Pulaski	A flood mark disc 4.5 ft up a tree 80 ft downstream of Pulaski bridge on the left bank	mud line	fair	598.31	41° 58' 31.3"	-87° 43' 47.2"
Cook	Foster Avenue	Paint on the upstream side of Foster Ave. bridge on the left bank	seed line/ debris line	excellent		41° 58' 31.6"	-87° 43' 39.4"
Cook	Foster Avenue	A flood mark disc on a tree 10 ft upstream of Foster Ave. bridge on the left bank	seed line	good	598.04	41° 58' 31.5"	-87° 43' 39.4"
Cook	Foster Avenue/ Springfield	Paint on a metal post on the right bank across Foster Ave. and west of Springfield	seed line/ debris line	good	597.19	41° 58' 30.3"	-87° 43' 31.4"
Cook	Foster Avenue/ Springfield	Paint on a mail box on the right bank across Foster Ave. on a road inbetween Springfield and Ayers	mud line	fair		41° 58' 31.7"	-87° 43' 33.2"
Cook	Foster Avenue/Ayers	Paint 2.5 ft up the upstream side of Foster Ave. bridge on the right bank	seed line/ debris line	good	597.05	41° 58' 32.6"	-87° 43' 28.1"
Cook	Foster Avenue/Ayers	A flood mark disc 1.5 ft up a tree 150 ft downstream of Foster Ave. on the right bank across Ayers	mud line	fair	596.06	41° 58' 31.4"	-87° 43' 28.6"
Cook	West Foster Avenue/ Ridgeway	Paint on a metal post downstream of a pedestrian bridge off of W. Foster Ave. and 410 ft off of the left bank	debris line	fair	596.64	41° 58' 31.2"	-87° 43' 16.4"
Cook	West Foster Avenue/ Ridgeway	Paint on a metal post 145 ft downstream of a pedestrian bridge off of W. Foster Ave. on the left bank	debris line	fair		41° 58' 28.5"	-87° 43' 16.4"
Cook	West Foster Avenue/ Ridgeway	A flood mark disc on a tree 130 ft downstream of a pedestrian bridge off of W. Foster Ave. on the left bank	debris line	fair	595.50	41° 58' 28.7"	-87° 43' 18.0"
Cook	West Foster Avenue/ Ridgeway	A flood mark disc on a sycamore tree 348 ft upstream of a pedestrian bridge off of W. Foster Ave. on the right bank	debris line	fair		41° 58' 28.7"	-87° 43' 23.6"
Cook	West Foster Avenue/ Ridgeway	A flood mark disc on a power pole 160 ft upstream of a pedestrian bridge off of W. Foster Ave. on the left bank in an alley	seed line/ debris line	fair		41° 58' 27.2"	-87° 43' 21.7"
Cook	near Lawndale	Paint 2.5 ft up an abutment downstream of a bike bridge on the right bank	seed line/ debris line	good		41° 58' 26.0"	-87° 43' 12.2"
Cook	near Lawndale	Pencil and a flag 1.0 ft up a fence post 100 ft downstream of a bike bridge on the right bank near a road off Lawndale	debris line	excellent		41° 58' 25.0"	-87° 43' 12.7"
Cook	Bernard Street	Paint 2.0 ft up an I-beam 20 ft downstream of a pedestrian bridge on the right bank	seed line/ debris line	good	593.40	41° 58' 18.7"	-87° 42' 52.9"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Cook	Bernard Street	Paint 1.5 ft up an I-beam 25 ft downstream of a pedestrian bridge on the left bank near Bernard St.	seed line/ debris line	good		41° 58' 19.4"	-87° 42' 52.8"
Cook	Spaulding Avenue/ Kimball Avenue	Paint on a concrete retaining wall 35 ft upstream of Kimball Ave. bridge on the left bank	seed line/ debris line	fair	592.77	41° 58' 19.5"	-87° 42' 49.4"
Cook	Spaulding Avenue/ Kimball Avenue	A flood mark disc on a wood retaining wall 350 ft downstream of Kimball Ave. bridge on the left bank	debris line	excellent		41° 58' 12.5"	-87° 42' 44.0"
Cook	Spaulding Avenue/ Kimball Avenue	A flood mark disc on a tree 130 ft upstream of Spaulding Ave. bridge on the left bank	debris line	fair		41° 58' 24.2"	-87° 42' 41.6"
Cook	Spaulding Avenue/ Kimball Avenue	A flood mark disc on a tree 90 ft upstream of Spaulding Ave. bridge on the left bank	debris line	fair	591.70	41° 58' 24.5"	-87° 42' 41.3"
Cook	Kedzie	Paint 6.5 ft up a fence post 3 ft downstream of Kedzie bridge on the right bank	debris line	poor	589.68	41° 58' 28.6"	-87° 42' 30.8"
Cook	Albany	Paint on a stone retaining wall 70 ft downstream of a pedestrian bridge on the right bank	mud line	fair		41° 58' 26.8"	-87° 42' 21.1"
Cook	Foster Avenue/ Albany	Paint on a retaining wall 53 ft downstream of Albany bridge on the right bank	debris line	excellent		41° 58' 24.0"	-87° 42' 16.6"
Cook	Willow Road	Paint ~5.0 ft up the Willow Rd. exit ramp bridge wingwall upstream of the bridge on the right bank	seed line	excellent	637.05	42° 01' 09.7"	-88° 15' 39.1"
Cook	Milwaukee Avenue	Paint 6.5 ft up the Milwaukee Ave. bridge wingwall upstream of the bridge on the right bank	seed line	good	636.16	42° 06' 05.9"	-87° 53' 02.7"
Cook	North River Road	A flood mark disc 2.0 ft up a staff gage downstream of Milwaukee Ave. on the right bank and east of N. River Rd.	mud line	fair		42° 05' 58.7"	-87° 53' 23.8"
Cook	Milwaukee Avenue	Paint and a flag 6.0 ft up the end of a metal property fence on the left bank	mud line	fair		42° 05' 39.9"	-87° 53' 10.8"
Cook	Milwaukee Avenue	A flood mark disc 3.0–4.0 ft up a walnut tree on the left bank near a parking lot	seed line	good		42° 05' 41.9"	-87° 53' 09.0"
Cook	West Lake Avenue	Paint 4.0 ft up the upstream side of W. Lake Ave. bridge on the left bank	seed line	good	639.13	42° 05' 15.3"	-87° 53' 13.3"
Cook	North River Road	A nail 1.0 ft up a fence downstream of E. Kensington and on the right bank across N. River Rd. (further west)	mud line	fair		42° 04' 42.7"	-87° 53' 37.8"
Cook	North River Road	A nail 1.0 ft up a fence downstream of E. Kensington and on the right bank across N. River Rd. (further east)	mud line	fair		42° 04' 42.7"	-87° 53' 37.7"
Cook	North River Road	Paint on the downstream side of N. River Rd. on the left bank	seed line	fair	635.40	42° 04' 39.2"	-87° 53' 34.2"
Cook	East Central Road	Paint on the downstream side of E. Central Rd. on the right bank	seed line	good	634.60	42° 03' 56.9"	-87° 53' 14.4"
Cook	East Golf Road	Paint on the south side of the R+R bridge crossing E. Golf Rd. on the left bank	seed line/ debris line	good	a,6632.82	42° 03' 14.5"	-87° 52' 41.6"
Cook	East Golf Road	Paint on the downstream side of E. Golf Rd. bridge on the right bank	seed line/ debris line	excellent	633.55	42° 03' 15.5"	-87° 53' 15.8"
Cook	East Golf Road	A flood mark disc on a power pole downstream of the R+R bridge on the right bank	seed line/ debris line	good		42° 03' 8.4"	-87° 52' 56.0"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Cook	Big Bend Drive	A flood mark disc 3.5 ft up a tree on the right bank in a park east of Sherman	seed line/ debris line	fair	632.90	42° 02' 53.6"	-87° 52' 49.9"
Cook	Big Bend Drive	A mark on a brick light post in front of 1964 Big Bend Dr. on the right bank	mud line		632.65	42° 02' 55.8"	-87° 52' 29.9"
Cook	Big Bend Drive	Paint 2.0 ft up a concrete wall on the right bank inbetween Hawthorn and Big Bend Dr.	seed line/ debris line	excellent	632.45	42° 02' 53.0"	-87° 52' 41.2"
Cook	Rand Road	Paint on the downstream side of Rand Rd. bridge on the left bank	seed line/ debris line	good	632.54	42° 02' 39.9"	-87° 52' 41.7"
Cook	Rand Road	A flood mark disc on a tree 20 ft downstream of Rand Rd. bridge on the right bank	seed line/ debris line	poor		42° 02' 40.4"	-87° 52' 43.5"
Cook	Rand Road	Paint 3.5 ft up a levee wall 750 ft downstream of Rand Rd. bridge on the left bank	seed line/ debris line	good		42° 02' 32.8"	-87° 52' 40.7"
Cook	Miner Street	Paint 4.5 ft up the R+R bridge pier downstream of Miner St. on the left bank	seed line/ debris line	good	631.68	42° 02' 19.7"	-87° 52' 56.4"
Cook	Miner Street	Paint 2.0 ft up the downstream side of Miner St. bridge on the right bank	seed line/ debris line	excellent	631.66	42° 02' 21.6"	-87° 52' 58.8"
Cook	South Algonquin Road	Paint 2.0 ft up an abutment 15 ft downstream of S. Algonquin Rd. bridge on the left bank	seed line/ debris line	fair		42° 01' 53.7"	-87° 52' 40.0"
Cook	South Algonquin Road	A flood mark disc 3.0 ft up a power pole upstream of S. Algonquin Rd. on the left bank across a camp path		good	631.23	42° 01' 54.6"	-87° 52' 32.8"
Cook	Berry Lane	Paint 2.0 ft up an electrical box at 1500 Berry Ln. on the right bank	seed line/ debris line	fair	630.97	42° 01' 37.2"	-87° 52' 35.5"
Cook	East Oakton Street	Paint 2.0 ft up an abutment downstream of E. Oakton St. bridge on the left bank	seed line/ debris line	fair	630.96	42° 01' 29.9"	-87° 52' 28.1"
Cook	I-294	Paint 6.0 ft up an abutment downstream of I-294 bridge on the left bank	seed line/ debris line	fair		42° 01' 03.7"	-87° 51' 58.6"
Cook	Touhy Avenue	Paint 20.0 ft up an abutment on the downstream side of Touhy Ave. on the left bank	seed line/ debris line	excellent	629.88	42° 00' 36.8"	-87° 51' 38.4"
Cook	Devon Avenue	Paint 20.0 ft up an abutment 25 ft downstream of Devon Ave. bridge on the left bank	seed line/ debris line	good	629.42	41° 59' 44.7"	-87° 51' 32.1"
Cook	Higgins Road	Paint on the abutment on the downstream side of Higgins Rd. bridge on the left bank	seed line/ debris line	good		41° 59' 19.8"	-87° 51' 19.6"
Cook	Lawrence Avenue	Paint 3.0 ft up an abutment on the downstream side of Lawrence Ave. on the right bank	seed line/ debris line	excellent	627.33	41° 57' 57.7"	-87° 51' 19.44"
Cook	Lawrence Avenue	Paint 4.0 ft up an abutment on the downstream side of Lawrence Ave. on the left bank	seed line/ debris line	good	627.24	41° 57' 57.7"	-87° 51' 16.5"
Cook	Irving Park Road	Paint 1.5 ft up a guard rail on the downstream side of Irving Park Rd. on the right bank south of the canoe launch	seed line/ debris line	good	626.39	41° 57' 11.6"	-87° 51' 21.8"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Cook	Irving Park Road	A flood mark disc 5.0 ft up a tree downstream of Irving Park Rd. on the right bank next to River Rd.	seed line/ debris line	good		41° 57' 10.0"	-87° 51' 22.4"
Cook	Irving Park Road	Paint 2.0 ft up an abutment on the downstream side of Irving Park Rd. bridge on the right bank	seed line/ debris line	good		41° 57' 10.8"	-87° 51' 16.6"
Cook	River Road/Ivanhoe Street	A flood mark disc 2.5 ft up a tree downstream of Ivanhoe St. on the right bank	seed line/ debris line	good	626.65	41° 56' 47.13"	-87° 51' 18.1"
Cook	River Road/ Robinson Road	Paint 5.5 ft up a sign post on the right bank upstream of the outfall	seed line/ debris line	fair	626.80	41° 56' 36.5"	-87° 51' 15.0"
Cook	River Road/ Robinson Road	A flood mark disc 6.0 ft up a tree on the right bank downstream of the outfall	seed line/ debris line	good		41° 56' 35.7"	-87° 51' 14.6"
Cook	Belmont Avenue	Paint 20 ft up an abutment 30 ft downstream of Belmont Ave. bridge on the right bank	seed line/ debris line	fair	625.15	41° 56' 13.7"	-87° 50' 59.5"
Cook	Grand Avenue	A flood mark disc 3.0 ft up a tree 125 ft downstream of Grand Ave. bridge and 154 ft off of the right bank	mud line	good	624.95	41° 55' 46.1"	-87° 50' 40.1"
Cook	Thatcher Avenue/ 1st Avenue	Paint 2.0 ft up the downstream side of Thatcher Ave. bridge on the left bank	mud line	excellent	624.34	41° 55' 09.2"	-87° 50' 06.7"
Cook	First Avenue/North Avenue	A flood mark disc on a tree 31 ft downstream of the pedestrian bridge and 46 ft off the right bank (before the curve)	mud line	good		41° 54' 39.7"	-87° 50' 01.0"
Cook	Chicago Street	A flood mark disc 3.0 ft up a sign post downstream of Chicago St. and 150 ft off the left bank	debris line	good		41° 53' 37.9"	-87° 49' 40.4"
Cook	Lake Street	Paint 2.5 ft up a stop sign upstream of Lake St. and 30 ft off the left bank	debris line	good	622.78	41° 53' 17.4"	-87° 49' 49.5"
Cook	Lake Street	Paint 4.0 ft up a light post 2 ft downstream of Lake St. on the left bank and south of HWY-45	mud line	excellent		41° 53' 16.4"	-87° 49' 49.5"
Cook	Roosevelt Road	Paint on the downstream side of Roosevelt Rd. bridge 4 ft off the right bank	seed line	poor	621.54	41° 57' 52.2"	-87° 49' 39.9"
Cook	Cermac	A flood mark disc 2.0 ft up a tree 140 ft upstream of Cermac Rd. between the left bank and Shuthfts Grove parking	debris line	fair	617.51	41° 51' 00.4"	-87° 49' 25.0"
Cook	West 26th Street	Paint, a nail, and a flag on a tree 8 ft downstream of W. 26th St. bridge on the left bank	seed line	fair		41° 50' 33.0"	-87° 49' 43.0"
Cook	West 26th Street	Paint on the downstream side of W. 26th St. bridge on the left bank	seed line	good	616.42	41° 50' 33.4"	-87° 49' 42.8"
Cook	West 31st Street	Paint 5.0 ft up the upstream side of W. 31st St. bridge on the right bank	seed line	good	615.71	41° 50' 07.5"	-87° 49' 39.7"
Cook	Ridgewood Road	Paint 2.0 ft up a tree stump upstream of Ridgewood Rd. on the left bank across Groveland Ave.	mud line	good	614.58	41° 49' 44.1"	-87° 49' 30.6"
Cook	Ridgewood Road	Paint, a nail, and a flag 2.0 ft up a tree downstream of Ridgewood Rd. on the right bank across Park View	mud line	good		41° 49' 40.9"	-87° 49' 38.4"
Cook	Burling Road	A flood mark disc 1.5 ft up a tree 110 ft upstream of the Riverside Public Library on the left bank	seed line/ debris line	good		41° 49' 33.1"	-87° 49' 10.2"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Cook	State Street/154th Street	Paint 1.5 ft up an abutment on the downstream side of State St. bridge on the left bank	debris line	excellent		41° 36' 58.2"	-87° 37' 01.5"
Cook	State Street/154th Street	A flood mark disc 4.0 ft up a cottonwood tree 65 ft upstream of State St. bridge on the left bank	debris line	fair		41° 36' 58.0"	-87° 37' 00.2 "
Cook	159th Street	A flood mark disc 3.0 ft up a tree 1 ft downstream of 159th St. bridge on the right bank	seed line	excellent		41° 36' 03.8	-87° 34' 38.3"
Cook	159th Street	Paint 6.0 ft up an abutment on the downstream side of 159th St. bridge on the right bank	seed line	excellent		41° 36' 03.8"	-87° 34' 36.4"
Cook	159th Street	Paint 5.0 ft up the 159th St. bridge wingwall downstream of the bridge on the left bank	debris line	fair		41° 36' 03.8"	-87° 34' 41.0"
Cook	Route 6/83 (Torrence Avenue)	Paint 7.2 ft up the Torrence Ave. bridge wingwall downstream of the bridge on the right bank	seed line/debris line	good		41° 35' 41.0"	-87° 33' 31.6"
Cook	Burnam Avenue	Paint 5.5 ft up a retaining wall 70 ft downstream of Burnam Ave. bridge on the left bank	debris line	excellent/good		41° 35' 11.8"	-87° 32' 23.1"
Cook	Wentworth Avenue	A flood mark disc 7.0 ft up a tree 20.2 ft upstream of Wentworth Ave. bridge near the right bank	seed line	good		41° 35' 05.4"	-87° 31' 46.6"
Cook	Wentworth Avenue	Paint 4.8 ft up the Wentworth Ave. bridge wingwall 8 ft downstream of the bridge on the left bank	debris line	good		41° 35' 05.4"	-87° 31' 48.8"
Cook	State Street	Paint 4.0 ft up an abutment on the downstream side of State St. bridge on the right bank	mud line	good		41° 36' 10.1"	-87° 36' 57.6"
Addison Creek							
Cook	Rhodes Avenue	Paint 2.5 ft up the electric station fence 40 ft downstream from a walking path off of Rhodes Ave. on the right bank	seed line/mud line	good		41° 55' 42.9"	-87° 54' 37.1"
Cook	Fullerton Avenue	Paint on a concrete culvert 28 ft upstream from a foot path off of Fullerton Ave. on the right bank	mud line	fair		41° 55' 16.3"	-87° 54' 31.7"
Cook	Automatic Electric Drive	Paint on the Automatic Electric Dr. bridge wingwall downstream of the bridge on the right bank	seed line	poor		41° 54' 50.9"	-87° 54' 18.7"
Cook	North Prater Avenue	Paint on on the downstream side of N. Prater Ave. bridge on the left bank	seed line	good		41° 54' 30.8"	-87° 53' 57.8"
Cook	North Roy Avenue	A flood mark disc south of playground equipment 138 ft downstream of N. Roy Ave. bridge on the right bank	mud line	good		41° 54' 32.0"	-87° 53' 43.7"
Cook	North Roberta Avenue	A flood mark disc 0.5 ft up a tree 77 ft downstream of N. Roberta Ave. bridge on the right bank	mud line	good	639.56	41° 54' 32.2"	-87° 53' 35.4"
Cook	Morse Drive	Paint on concrete ground on the downstream side of Morse Dr. bridge on the left bank	mud line	poor		41° 54' 22.2"	-87° 53' 27.0"
Cook	East Hirsch Avenue	Paint up a 1.0 ft up a handrail 7 ft downstream of E. Hirsch Ave. bridge on the right bank	mud line			41° 54' 11.5"	-87° 53' 24.5"
Cook	Alley between 45th and 46th Avenue	Paint 3.0 ft up a man hole on the left bank	mud line	good		41° 54' 0.29"	-87° 53' 17.0"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Cook	North 40th Avenue	A flood mark disc 1.0 ft up a power pole 2 ft off the left bank next to an alley	mud line/ debris line	good		41° 53' 55.4"	-87° 52' 58.8"
Cook	North 40th Avenue	Paint 1.4 ft up a fence at the end of N. 40th Ave. on the right bank	debris line	good		41° 53' 53.8"	-87° 52' 56.3"
Cook	North 40th Avenue	A mud line 1.4 ft up the north side of 1511 N. 40th Ave. house on the off the right bank	mud line	good		41° 53' 53.4"	-87° 52' 55.7"
Cook	Eastern/ R+R bridge	A nail and flood mark disc on the downstream side of the Eastern R+R bridge on the right bank	mud line	good		41° 53' 28.4"	-87° 52' 17.4"
Cook	St. Charles Road	Paint 3.0 ft up on the downstream side of St. Charles Rd. bridge on the left bank	debris line	poor		41° 53' 12.6"	-87° 52' 13.8"
Cook	Harrison Street	Paint on the concrete 146 ft downstream of 30th Ave. bridge on the right bank	mud line	fair		41° 52' 17.8"	-87° 52' 11.8"
Cook	Wedgewood Road	Paint 4 ft 10" up the Wedgewood Rd. bridge pier downstream of the bridge on the left bank	mud line	fair		41° 52' 13.6"	-87° 52' 20.0"
Cook	Gladstone Street	Paint on the Gladstone St. bridge wingwall 5 ft downstream of the bridge on the left bank	mud line	fair		41° 52' 01.8"	-87° 52' 19.9"
Cook	Gardner Road	A nail and flood mark disc 4 ft 3" up a tree 23 ft upstream of Gardner Rd. bridge on the right bank		fair		41° 51' 40.4"	-87° 52' 03.7"
Cook	West 21st Avenue	Paint on concrete ground 8 ft downstream of W. 12st Ave. on the right bank		good		41° 51' 04.1"	-87° 51' 24.0"
Salt Creek							
Cook	31st Street	Paint on a 31st St. bridge wingwall 6 ft downstream of the bridge on the left bank	mud line	fair		41° 50' 05.9"	-87° 50' 33.5"
Cook	Monroe Avenue	Paint on a pier east of Monroe Ave. on the right bank				41° 49' 46.6"	-87° 50' 36.9"
Cook	Washington	Paint on a Washington bridge wingwall downstream of the bridge on the left bank	seed line	excellent		41° 49' 39.7"	-87° 50' 33.6"
Cook	Brookfield Avenue	A mark on the north side of Brookfield Ave. bridge on the west bank	seed line/ debris line	excellent		41° 49' 21.8"	-87° 50' 30.6"
Poplar Creek							
Cook	Varsity Drive	A nail on a fence 25 ft downstream of Varsity Dr. on the left bank	debris line	good		42° 01' 33.0"	-88° 15' 02.1"
Cook	Bluff City Boulevard	A flood mark disc ~4.0 ft up a tree 80 ft downstream of Bluff City Blvd. bridge on the left bank		good		42° 01' 08.6"	-88° 15' 38.6"
Cook	Bluff City Boulevard	Paint ~5.0 ft up the upstream side of Bluff City Blvd. on the right bank		fair		42° 01' 08.6"	-88° 15' 38.6"
Kane	Hammond Avenue	A nail in the flood plain 33 ft south of Hammond Ave. and north of Poplar Creek		good		42° 00' 55.2"	-88° 15' 59.9"
Kane	Hammond Avenue	A flood mark disc in the flood plain 53 ft south of Hammond Ave. and north of Poplar Creek near a green house ft fence		good		42° 00' 54.7"	-88° 16' 04.6"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
East Branch DuPage River							
DuPage	Veteran's Parkway	A nail, flood mark disc, and flag ~2.5 ft up a broken tree limb 200 ft upstream of Veteran's Pkwy bridge on the right bank	mud line	poor	635.18	41° 42' 41.4"	-88° 07' 38.7"
DuPage	Veteran's Parkway	A nail and flag ~3.0 ft up a dead tree 125 ft upstream of Veteran's Pkwy bridge on the right bank	mud line	poor		41° 42' 41.9"	-88° 07' 39.3"
DuPage	Royce Road/Whalon Lake	Paint, a nail, and a flood mark disc at a tree stump downstream of Whalon Lake on the right bank	mud line/debris line	fair	642.78	41° 42' 45.9"	-88° 05' 47.4"
DuPage	75th Street/Highway 33	Paint and a chiseled mark on the 75th St. bridge wingwall 10 ft upstream of the bridge on the right bank	debris line	good/fair		41° 44' 59.8"	-88° 04' 10.6"
DuPage	Arlington Drive	A flood mark disc and flag 4.0 ft up a tree 5 ft upstream of Arlington Dr. bridge on the left bank	seed line	poor	773.79	41° 58' 29.5"	-88° 08' 18.8"
DuPage	Arlington Drive	A flood mark disc and flag 5.0 ft up a tree downstream of Arlington Dr. bridge on the right bank	debris line	fair	772.91	41° 58' 29.4"	-88° 08' 20.0"
DuPage	Shick Road	A flood mark disc and flag 5.0 ft up a tree 80 ft upstream of Shick Rd. bridge on the right bank	debris line	fair	744.05	41° 57' 05.8"	-88° 10' 57.4"
DuPage	Shick Road	A flood mark disc and flag 4.0 ft up a tree 60 ft downstream of Shick Rd. bridge on the right bank	debris line	poor		41° 57' 04.2"	-88° 10' 57.9"
DuPage	Shick Road	A flood mark disc and flag 3.0 ft up a tree 40 ft downstream of Shick Rd. Bridge on the left bank	debris line	poor	743.23	41° 57' 04.4"	-88° 10' 57.1"
DuPage	Shick Road	A flood mark disc and flag 3.0 ft up a tree 50 ft downstream of Shick Rd. Bridge on the left bank	debris line	poor	743.12	41° 57' 04.3"	-88° 10' 57.1"
DuPage	Shick Road	A flag on bike bridge 30 ft downstream of Shick Rd. bridge	debris line	poor	742.94	41° 57' 04.4"	-88° 10' 57.9"
DuPage	Army Trail Road	A flood mark disc and flag 6.0 ft up a tree 60 ft upstream of Army Trail Rd. bridge on the left bank	debris line	poor	740.90	41° 56' 38.9"	-88° 10' 51.1"
DuPage	Army Trail Road	A flood mark disc and flag 5.0 ft up a tree 65 ft upstream of Army Trail Rd. bridge on the right bank	debris line	poor	740.45	41° 56' 39.1"	-88° 10' 51.8"
DuPage	Army Trail Road	A flood mark disc and flag 5.0 ft up a tree 60 ft upstream of Army Trail Rd. bridge on the right bank	debris line	poor	740.79	41° 56' 39.0"	-88° 10' 51.7"
DuPage	Army Trail Road	A flood mark disc and flag 7.0 ft up a tree 120 ft downstream of Army Trail Rd. on the left bank	debris line	poor	741.00	41° 56' 36.6"	-88° 10' 50.3"
DuPage	Army Trail Road	A flood mark disc and flag 7.0 ft up a tree 100 ft downstream of Army Trail Rd. on the left bank	debris line	poor	740.82	41° 56' 36.8"	-88° 10' 50.2"
DuPage	Geneva Road	A flood mark disc and flag 5.0 ft up a tree 25 ft upstream of Geneva Rd. bridge on the right bank	debris line	poor	720.44	41° 53' 13.6"	-88° 09' 34.9"
DuPage	Geneva Road	A flood mark disc and flag 4.0 ft up a tree cluster 20 ft upstream of Geneva Rd. bridge on the right bank	debris line	poor	720.21	41° 53' 13.5"	-88° 09' 35.0"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
DuPage	Beecher Road	Paint and a chiseled mark 1.0 ft up an abutment 3 ft upstream of Beecher Rd. bridge on the left bank	debris line	fair	713.29	41° 52' 09.8"	-88° 09' 46.1"
DuPage	Baynes Avenue	A flood mark disc 6.0 ft up under a tree branch 300 ft downstream of dam on the left bank	seed line	excellent/ good	711.17	41° 52' 16.3"	-88° 10' 39.8"
DuPage	Highway 38	A flood mark disc and flag on a tree 3 ft downstream of Highway 38 bridge on the left bank	debris line	fair	707.36	41° 51' 40.4"	-88° 11' 32.9"
DuPage	Highway 38	Wax pencil mark on an abutment on the downstream side of Highway 38 bridge on the left bank	seed line	poor		41° 51' 40.4"	-88° 11' 32.8"
DuPage	Highway 38	A flood mark disc and flag 4.0 ft up a tree 1 ft downstream of Highway 38 on the left bank	debris line	fair	707.87	41° 51' 40.4"	-88° 11' 33.0"
DuPage	Highway 38	A flood mark disc and flag 5.0 ft up a tree 5 ft upstream of Highway 38 bridge on the left bank	debris line	fair	707.72	41° 51' 41.1"	-89° 11' 32.5"
DuPage	Gary's Mill Road	Wax pencil mark on street beam on the downstream side of Gary fits Mill Rd. on the right bank	mud line	fair	NR	41° 51' 29.5"	-88° 11' 37.7"
DuPage	Gary's Mill Road	A flood mark disc ~ 5.0 ft up on small tree 15 ft downstream of Gary fits Mill Rd. bridge on the right bank	debris line	fair	707.23	41° 51' 29.3"	-88° 11' 37.5"
DuPage	Gary's Mill Road	A flood mark disc ~ 5.0 ft up on small tree 15 ft downstream of Gary fits Mill Rd. bridge on the right bank	debris line	fair	707.12	41° 51' 29.4"	-88° 11' 37.7"
DuPage	Gary's Mill Road	A flood mark disc ~ 5.0 ft up on small tree 15 ft downstream of Gary fits Mill Rd. bridge on the right bank	debris line	fair	707.40	41° 51' 29.5"	-88° 11' 37.9"
DuPage	Gary's Mill Road	A flood mark disc ~ 5.0 ft up on small tree 15 ft downstream of Gary fits Mill Rd. bridge on the right bank	debris line	fair	707.29	41° 51' 29.7"	-88° 11' 38.2"
DuPage	Mack Road	A flood mark disc on the gravel drive downstream of Mack Rd. and 85 ft off the left bank	debris line	fair	NR	41° 50' 32.4"	-88° 11' 53.5"
DuPage	Williams Road	A flood mark disc on the upstream side of Williams Rd. 30 ft off the right bank	beaten grass	poor	NR	41° 49' 46.4"	-88° 11' 25.5"
DuPage	Williams Road	A flood mark disc 2.7 ft up a tree upstream of Williams Rd. bridge 10 ft off the right bank	mud line	poor	698.49	41° 49' 46.6"	-88° 11' 25.5"
DuPage	Williams Road	A flag 30 ft downstream of Williams Rd. bridge 30 ft off the right bank	beaten grass	poor	NR	41° 49' 46.3"	-88° 11' 24.9"
DuPage	Batavia Road	Paint 5.0 ft up the Batavia Rd. bridge wingwall downstream of the bridge on the left bank	mud line/ debris line	good	697.58	41° 49' 42.5"	-88° 11' 05.9"
DuPage	Butterfield Road/ Illinois Route 56	A flag 2.0 ft up a tree 30 ft downstream of Butterfield Rd. pedestrian bridge on the right bank	debris line	fair	NR	41° 49' 29.5"	-88° 10' 44.1"
DuPage	Warrenville Road	Paint 3.0 ft the north side of a house 200 ft downstream of Warrenville Rd. east of River Rd.	paint		694.27	41° 49' 01.7"	-88° 10' 20.1"
DuPage	Diehl Street	A flag 2.0 ft up a fence 20 ft downstream of Diehl St. bridge on the left bank	mud line	fair	691.75	41° 48' 16.8"	-88° 10' 36.5"
DuPage	Diehl Street	A flag 3.0 ft up a fence 35 ft upstream of Diehl St. bridge on the left bank	mud line	fair	691.22	41° 48' 17.7"	-88° 10' 35.2"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
DuPage	Diehl Street	A flag 6.0 ft up a tree 5 ft downstream of Diehl St. bridge on the left bank		good	691.98	41° 48' 16.9"	-88° 10' 36.2"
DuPage	Diehl Street	A flood mark disc and flag 6.0 ft up a tree 20 ft downstream of Diehl St. bridge on the left bank	debris line	good	691.50	41° 48' 16.9"	-88° 10' 36.6"
DuPage	Reymond Drive at River Road	Paint on a spillway rock 20 ft downstream of the dam on the right bank	debris line	poor	681.96	41° 47' 04.1"	-88° 10' 43.0"
DuPage	Reymond Drive at River Road	A mark 7.0 ft or 8.0 ft up on a tree branch 400 ft downstream of the dam on the right bank	debris line	fair	NR	41° 47' 05.3	-88° 10' 36.7"
DuPage	Reymond Drive at River Road	Paint 5.0 ft up the fence coraer of dam flow on the upstream side of the dam	debris line	good	692.10	41° 47' 05.7"	-88° 10' 42.6"
DuPage	Ogden Avenue	Paint 0.55 ft up the upstream side of the bridge on the right bank	seed line	fair	681.32	41° 46' 54.9"	-88° 10' 32.2"
DuPage	Ogden Avenue	A flag on a tree 8 ft downstream of Ogden Rd. bridge on the right bank	debris line	good	NR	41° 46' 54.2"	-88° 10' 31.6"
DuPage	Jefferson Avenue	A flag 2.5 ft up the remains of a tree 40 ft downstream of Jefferson Ave. bridge on the right bank	mud line/debris line	poor	NR	41° 46' 21.5"	-88° 09' 57.4"
DuPage	Hillside Road	A flag 2.0 ft up a small tree 35 ft downstream of Hillside Rd. bridge on the left bank	debris line	good	664.95	41° 45' 56.4"	-88° 08' 50.5"
DuPage	Hillside Road	A flood mark disc and flag 2.0 ft up large tree 10 ft upstream of Hillside Rd. bridge on the right bank	debris line	fair	NR	41° 45' 57.3"	-88° 08' 51.7"
DuPage	Hobson Road	A flag 3.0 ft up a tree 25 ft upstream of hobson Rd. bridge on the left bank	debris line	good	656.42	41° 45' 02.8"	-88° 07' 47.4"
DuPage	Hobson Road	A flag 3.0 ft up a marker 20 ft upstream of Hobson Rd. bridge on the left bank	debris line	good		41° 45' 02.7"	-88° 07' 47.5"
DuPage	Hobson Road	A flag 3.0 ft up a marker 20 ft upstream of Hobson Rd. bridge on the left bank	debris line	good		41° 45' 02.7"	-88° 07' 47.5"
DuPage	Hobson Road	A flood mark disc 3.0 ft up a tree 20 ft upstream of Hobson Rd. bridge on the left bank	debris line	fair	656.42	41° 45' 02.7"	-88° 07' 47.5"
DuPage	Baily Road	A flood mark disc 3.0 ft up a tree 30 ft upstream of Baily Rd. bridge on the right bank	seed line	fair	652.75	41° 44' 26.2"	-88° 07' 37.6"
DuPage	Washington Street	A flood mark disc 2.8 ft up a tree 67 ft upstream of Washington St. bridge and 8 ft away from the right bank	debris line	good	641.91	41° 43' 14.8"	-88° 07' 55.4"
DuPage	Fairview Lane and West Kingston Lane	A flood mark disc 3.0 ft up a park sign 34 ft from W. Kingston Ln. as you face the pond	seed line	excellent	788.60	41° 58' 39.6"	-88° 12' 00.1"
Will	Naper-Plainfield Road	Paint 3.8 ft up a concrete wall on the west side of Plainfield Naperville Rd. on the right bank	mud line	good	623.65	41° 41' 26.9"	-88° 10' 00.0"
Will	119th Street	Paint 0.5 ft up the 119th St. (Ferguson Rd.) bridge structure downstream of the bridge and on the left bank	mud line/debris line	excellent	616.94	41° 39' 59.1"	-88° 10' 56.7"
Will	West 135th Street	A flood mark disc 4.0 ft up a tree 68m downstream of W. 135th St. on the left bank next to a boat launch.	debris line	excellent	610.82	41° 38' 12.3"	-88° 11' 27.1"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Will	North Division Street/Illinois Route 59	A flood mark disc on a tree north of a tributary and 28m west of Route 59 (North Division St.) bridge	mud line	excellent	603.30	41° 37' 04.9"	-88° 12' 10.8"
Will	Renwick Road	A flood mark disc 3.0 ft up an old power pole 12 ft upstream Renwick Rd. on the left bank	mud line	good	597.74	41° 35' 32.9"	-88° 13' 25.1"
Will	Caton Farm Road	A flood mark disc 3.3 ft up a tree 75 ft downstream of Caton Farm Rd. on the right bank	mud line	good	589.46	41° 33' 53.6"	-88° 11' 23.0"
Will	Cottage road/Illinois Route 59	A flood mark disc 3.3 ft up a pine tree 29m downstream of Route 59 (Cottage St.) bridge on the left bank	debris line	excellent	NR	41° 31' 09.6"	-88° 11' 56.9"
Will	Mound Road	Paint 0.3 ft up the Mound Rd. bridge support downstream of the bridge and on the left bank	mud line	excellent	558.85	41° 29' 32.8"	-88° 12' 52.9"
Will	West Seil Road	Paint 3.0 ft up a DNR sign 30 ft downstream of a bridge on the right bank	mud line	fair	563.54	41° 30' 26.6"	-88° 12' 31.2"
Will	Shepley Road	Paint 5.5 ft up the Shepley Rd. bridge wing wall upstream of the bridge on the left bank	mud line	fair	538.72	41° 28' 05.1"	-88° 12' 32.8"
Will	Rivers Edge Drive	A flood mark disc 4.0 ft up a tree on the right bank next to an empty lot off of Rivers Edge Rd.	mud line	good	525.14	41° 26' 56.8"	-88° 14' 39.2"
Will	Channahon Road/McEvilly Road	Paint 7 ft up the Channahon Rd. bridge wing wall downstream of the bridge and on the right bank	debris line	poor	524.86	41° 26' 53.7"	-88° 14' 27.0"
Will	Illinois Michigan Trail	Paint on a concrete wall 20 ft downstream of the I & M Trail dam on the right bank	seed line	good	520.72	41° 25' 18.2"	-88° 13' 43.0"
Will	Illinois Michigan Trail	Paint on a steel wall 300 ft downstream of the I & M Trail dam on the right bank	seed line	good	520.55	41° 25' 15.7"	-88° 13' 43.0"
Will	Blackberry Lane	A nail and flood mark disc 0.5 ft up a tree in between the road, the river, and a parking lot	mud line	good	509.58	41° 24' 44.0"	-88° 13' 31.7"
Will	Bridge Street	A nail and flood mark disc 2.0 ft up a tree upstream of Bridge St. bridge on the left bank	debris line	fair	513.81	41° 25' 14.1"	-88° 13' 38.2"
South Branch Kishwaukee River							
DeKalb	Gurler Road	A flood mark disc 3.5 ft up a tree 35 ft downstream of Gurler Rd. bridge on the left bank	debris line	poor		41° 53' 34.4"	-88° 47' 09.2"
DeKalb	Taylor Street	A flood mark disc 1.5 ft up a tree 150 ft downstream of Taylor St. bridge on the left bank	seed line			41° 55' 19.9"	-88° 45' 59.4"
DeKalb	Taylor Street	A flood mark disc 4.0 ft up a tree 1000 ft upstream of Taylor St. bridge across a bike path on the left bank	debris line			41° 55' 12.6"	-88° 46' 01.0"
DeKalb	Lucinda Avenue	A flood mark disc 1.5 ft up a large tree 150 ft downstream of Lucinda Ave. bridge on the right bank	debris line	fair		41° 56' 12.4"	-88° 45' 37.6"
DeKalb	1st Street	Paint 2.0 ft up the upstream side of 1st St. bridge on the left bank	debris line			41° 56' 22.3"	-88° 44' 59.9"
DeKalb	Hillcrest Street	Paint 3.0 ft up the Hillcrest St. bridge pier upstream of the bridge on the left bank	debris line	good		41° 56' 25.7"	-88° 44' 46.3"

Appendix 1. High-Water Mark Site Description and Elevation at Select Stream Reaches, Flood of September 2008, Northeastern Illinois.—Continued

County	Street reference	High-water mark description	High-water mark type	High-water mark rating	Elevation (ft above NAVD 88)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
DeKalb	Rich Road/ Cottonville Road	A flag 1.5 ft up a small tree 10 ft upstream of Rich Rd. bridge on the right bank	debris line			41° 58' 32.2"	-88° 43' 37.7"
DeKalb	Illinois Route 64	A flood mark disc 1.6 ft up a tree 2000 ft downstream of Route 64 bridge on the left bank along a gravel pull off	debris line	poor		41° 59' 52.6"	-88° 43' 32.5"
DeKalb	Illinois Route 72	Paint 5.0 ft up the Route 72 bridge pier upstream of the bridge on the right bank	debris line	good		42° 05' 52.0"	-88° 42' 18.5"
East Branch South Branch Kishwaukee River							
DeKalb	Illinois Route 23	A flood mark disc 5.5 ft up a tree 40 ft downstream of Route 23 bridge on the right bank	debris line	poor		41° 59' 43.0"	-88° 40' 59.7"
DeKalb	Illinois Route 64	A flood mark disc 4.23 ft up a golf catch fence off of Route 64	debris line			41° 59' 07.3"	-88° 40' 03.2"
Johnny Run							
Grundy	Dwight Road	Paint on the downstream left bank of the Dwight Rd. concrete bridge support	mud line	fair	590.96	41° 13' 18.5"	-88° 26' 15.6"
Grundy	Illinois Route 47	Paint on the downstream left bank of Route 47 bridge	seed line/ debris line	fair	NR	41° 14' 14.3"	-88° 25' 07.3"
Grundy	County Road 2000 South	Paint on the downstream left bank or north west wing wall of the County Rd. 2000 South bridge	mud line	good	568.83	41° 15' 22.2"	-88° 24' 08.2"
Grundy	Old Mazon Road	Paint on the upstream right bank of the Old Mazon Rd. concrete bridge support	mud line	good	571.67	41° 14' 58.8"	-88° 24' 00.1"
Grundy	County Road 3000 South	Paint on the downstream left bank of the County Rd. 3000 South bridge support	mud line	excellent	578.56	41° 14' 29.6"	-88° 24' 24.6"
Illinois River							
Grundy	Cemetery Road	A nail and flood mark disc 1.5 ft up a power pole on the right bank along Cemetery Rd. east of a drive	seed line/ mud line	fair	504.83	41° 22' 58.2"	-88° 21' 40.8"
Grundy	Cemetery Road	A nail, flood mark disc, and flag 3.0 ft up a power pole on the right bank along Cemetery Rd.	seed line/ debris line	excellent	504.55	41° 22' 21.9"	-88° 23' 02.1"
Grundy	William G. Stratton State Park	A flag ~7.0 ft up a tree in a parking lot on the right bank (further east)	debris line	good	NR	41° 21' 19.5"	-88° 25' 08.1"
Grundy	William G. Stratton State Park	A flag ~7.0 ft up a tree in a parking lot on the right bank (further west)	debris line	good	NR	41° 21' 19.5"	-88° 25' 08.1"
Grundy	Cemetery Road	A flood mark disc 3.0 ft up a power pole on the right bank across Cemetery Rd. upstream from a canal	mud line	fair	504.24	41° 21' 55.6"	-88° 24' 03.5"
Grundy	Old Stage Road	A flag 3.0 ft up a tree on the right bank south of a pedestrian bridge from Old Stage Rd. over a canal	mud line	good	NR	41° 21' 09.0"	-88° 27' 18.3"
Grundy	Calhoun Street - West River	A nail and flood mark disc ~6.0 ft up a tree on the right bank south of Calhoun St.	mud line	good/fair	503.02	41° 21' 19.6"	-88° 25' 46.3"
Nettle Creek (tributary to Illinois River)							
Grundy	Ottawa Street	Paint on the downstream side of Ottawa St. bridge on the right bank	mud line	excellent	503.05	41° 21' 26.8"	-88° 26' 24.6"

Appendix 2. Example High-Water Mark Documentation Field Sheet, Flood of September 2008, Northeastern Illinois

High-Water Mark Documentation U.S. Geological Survey Illinois Water Science Center

River/stream N. Branch Chicago River
 Site number NA Road name Foster / Ayers County Cook
 Party FA 710 Date 9/24/2008 Date of flood peak 9/13/2008
 Horizontal datum (circle): 1927 NAD | 1983 NAD Vertical datum (circle): 1929 NGVD | 1988 NAVD

SKETCH

HWM # 01 / NBCR-27 Quality (circle): excellent | good | fair | poor
 Photo # 919 GPS reading: lat 41° 56' 32.6" long 87° 43' 28.1" (good/poor)
 Location: 0 feet upstream | downstream | right bank | left bank | of bridge | dam
 HWM is: seed line | mud line | debris line | other found HWM on BRIDGE
 HWM marked with: paint | hub | rebar | nail | flood mark disk | chiseled mark | other (describe)
 Distance of HWM above ground (in feet) 2.5 HWM elevation

HWM # 02 / NBCR-28 Quality (circle): excellent | good | fair | poor
 Photo # 920, 921 GPS reading: lat 41° 56' 31.4" long 87° 43' 28.1" (good/poor)
 Location: 150 feet upstream | downstream | right bank | left bank | of bridge | dam Ayers Rd.
 HWM is: seed line | mud line | debris line | other found HWM on Tree
 HWM marked with: paint | hub | rebar | nail | flood mark disk | chiseled mark | other (describe)
 Distance of HWM above ground (in feet) 1.5 HWM elevation

HWM # _____ Quality (circle): excellent | good | fair | poor
 Photo # _____ GPS reading: lat _____° _____' _____" long _____° _____' _____" (good/poor)
 Location: _____ feet upstream | downstream | right bank | left bank | of bridge | dam
 HWM is: seed line | mud line | debris line | other found HWM on _____
 HWM marked with: paint | hub | rebar | nail | flood mark disk | chiseled mark | other (describe)
 Distance of HWM above ground (in feet) _____ HWM elevation

HWM # _____ Quality (circle): excellent | good | fair | poor
 Photo # _____ GPS reading: lat _____° _____' _____" long _____° _____' _____" (good/poor)
 Location: _____ feet upstream | downstream | right bank | left bank | of bridge | dam
 HWM is: seed line | mud line | debris line | other found HWM on _____
 HWM marked with: paint | hub | rebar | nail | flood mark disk | chiseled mark | other (describe)
 Distance of HWM above ground (in feet) _____ HWM elevation

Appendix 3. Flood-Peak Water-Surface Profiles at Select Stream Reaches, Flood of September 2008, Northeastern Illinois

Figure 3-1. Flood-peak water-surface profile, flood of September 2008, for Des Plaines River between Prospect Heights and Riverside.

Figure 3-2. Flood-peak water-surface profile, flood of September 2008, for West Branch DuPage River between Bloomingdale and Bolingbrook.

Figure 3–3. Flood-peak water-surface profile, flood of September 2008, for North Branch Chicago River near Park Ridge.

Figure 3–4. Flood-peak water-surface profile, flood of September 2008, for Johnny Run near Mazon.

Figure 3-5. Flood-peak water-surface profile, flood of September 2008, for Illinois River near Morris.

Figure 3-6. Flood-peak water-surface profile, flood of September 2008, for East Branch DuPage River near Bolingbrook.

Figure 3–7. Flood-peak water-surface profile, flood of September 2008, for DuPage River between Bolingbrook and Channahon.

Prepared by the Pembroke and Ohio Publishing Service
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