

STORM AND FLOOD OF AUGUST 13 TO 15, 1987, IN COOK AND DU PAGE COUNTIES, ILLINOIS

By George W. Curtis

Heavy rainfall on August 13 and 14, 1987, caused severe flooding of urban areas by streams in Cook and Du Page Counties, Ill. The storm was caused by the interaction of warm, moist air from the Southeast and Southwest with a cold-air mass from the Northwest. This interaction created a stationary weather pattern over northeastern Illinois that caused the heavy rain.

An all-time 24-hour rainfall record was established for the Chicago area when 9.35 inches of rain fell at O'Hare International Airport between 9:16 p.m. Thursday, August 13, and 2:45 p.m. Friday, August 14. This surpassed the previous record of 6.24 inches for a 24-hour period that was set on July 13, 1957. Record rainfall amounts also occurred in Chicago and in the suburbs within a 15-mile radius of the airport (R.R. Waldman, National Weather Service, written commun., 1987). An additional 2 to 3 inches of rain fell over the area during the following 2 days (fig. 20).



EXPLANATION

- 4 — Line of equal precipitation—
Interval 1 inch
- ▲ 2,370 Site of peak-flow measurement—
Number is discharge in
cubic feet per second
- Community
- ✕ O'Hare International Airport

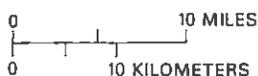


Figure 20. Precipitation and selected peak flows of the Des Plaines River and Salt Creek as a result of the storm of August 13 to 15, 1987, Cook and Du Page Counties, Ill. Precipitation, in inches, for the 48-hour period ending at 1 p.m. on August 15, 1987. (Source: Precipitation data provided by the National Weather Service and Wayne M. Wendland, Illinois State Climatologist; peak-flow data from U.S. Geological Survey files.)

The areas most acutely affected by flooding were communities along the Des Plaines River, which traverses the metropolitan area from north to south (fig. 20), and its tributary, Salt Creek. On August 14, flash flooding on the Des Plaines River occurred between 7 a.m. and about 11 a.m. The Des Plaines River crested near Des Plaines at midnight on August 14 and downstream at Riverside at noon on August 15 (R.R. Waldman, National Weather Service, written commun., 1987). General flooding continued after that time.

Suburban communities in the heavily urbanized Cook and Du Page Counties that were affected by the flooding include Arlington Heights, Bensenville, Buffalo Grove, Des Plaines, Elk Grove Village, Elmhurst, Mount Prospect, Rolling Meadows, Roselle, Schaumburg, and Wheeling. On August 14, access to O'Hare Airport was halted in the afternoon, and the first floor of the National Weather Service Forecast Office, which is located near the airport, was covered by 3 feet of water. The office lost electrical power and, after exhausting their emergency power, transferred their forecasting responsibilities to backup offices in Michigan, Wisconsin, and Illinois.



Figure 21. Flooded homes in Cook County, Ill., as a result of the storm of August 13 to 15, 1987. (Courtesy of *Chicago Tribune*.)

At least four deaths in the Chicago area and extensive damage were associated with the flooding (fig. 21). No deaths, however, were reported in the suburban residential areas located in the Des Plaines River basin (Federal Emergency Management Agency, 1987). Du Page County and parts of Cook County were declared major disaster areas by the President. Preliminary damage assessments indicate that about 8,900 buildings were affected by flooding or sewer backup in Cook County and about 7,500 buildings were affected in Du Page County. The total

number of homes affected was about 11,500, almost all of which were owner-occupied, single-family units. The Small Business Administration's estimate of damages to private property was \$53.0 million. The estimate damages to public property was \$9.4 million (Jane E. Norton, Federal Emergency Management Agency, oral commun., 1989).

The intense rainfall produced record maximum peak flows at 10 stream-gaging stations on the Des Plaines River and its tributaries, including Salt, Addison, and McDonald Creeks, and the West Fork of North Branch Chicago, the West Branch Du Page, the North Branch Chicago, and the Skokie Rivers. Recurrence intervals for peak flows at the 10 gages ranged from 100 years to 1.4 times greater than a 100-year flow. [See Curtis (1977), for computation techniques.]

The severe flooding in the lower reach of the Des Plaines River basin was caused partly by the large inflow from Salt Creek. The Des Plaines River near Des Plaines, (24 miles upstream from Salt Creek), peaked at 3,370 ft³/s (cubic feet per second), which is equivalent to a 10-year recurrence-interval discharge. The Des Plaines River at Riverside (0.9 mile downstream from Salt Creek) peaked at 9,750 ft³/s, which is equivalent to a discharge 1.2 times greater than a 100-year discharge.

Salt Creek gages at Rolling Meadows and Western Springs set new peaks of record on August 14 of 1,670 and 3,230 ft³/s, respectively, which are equivalent to discharges 1.4 times greater than a 100-year discharge. Additional heavy rains on August 16 caused the stream at Western Springs to rise again and peak at 3,540 ft³/s on August 17, thus breaking the peak of record set 3 days earlier.

In summary, the heavy rainfall and associated flooding in Cook and Du Page Counties in August 1987 caused extensive damage to this heavily urbanized area. Four people died, and more than 11,000 private residences and nearly 5,000 business establishments were affected by the flood; damages were in excess of \$62.4 million. The rainfall set 24-hour precipitation records, which caused peak flows on some of the streams to have recurrence intervals equal to or greater than 100 years.

REFERENCES CITED

- Curtis, G.W., 1977, Technique for estimating magnitude and frequency of floods in Illinois: U.S. Geological Survey Water-Resources Investigations 77-104, 70 p.
 Federal Emergency Management Agency, 1987, Interagency hazard mitigation report: Federal Emergency Management Agency FEMA-798-DR-Illinois, 44 p.

FOR ADDITIONAL INFORMATION

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