

A Record Hail Loss in Illinois and Adjacent States

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ABSTRACT

Illinois and three adjacent states were hit by devastating hailstorms on April 13-14, 2006. Property losses totaled \$1.822 billion, an amount considerably more than any prior hailstorm event in the nation. The huge loss in April 2006 was largely due to several severe storms with frequent large hail hitting Chicago and several other metropolitan areas. A highly unstable air mass that developed on April 13 led to a large number of hailstorms in a relatively small region, and several supercell thunderstorms formed and produced large hailswaths across portions of Illinois, Indiana, Iowa, and Wisconsin during a 30-hour period. The excessive storm damages in Illinois caused losses amounting to \$648 million with major damages in Moline-Rock Island, Peoria, and several Chicago suburbs.

Keywords: hailstorms; property damages; record losses

INTRODUCTION

A series of very severe hailstorms struck Illinois and surrounding areas during a 30-hour period on April 13-14, 2006, resulting in property losses of \$1.822 billion, a new record high hail loss in the U.S. (Changnon,1999). The previous highest hail loss event occurred on April 10, 2001, when losses in a 3-state area (including Illinois) reached \$1.5 billion (Changnon and Burroughs, 2003). The April 2006 hail loss total was also the largest weather-caused loss in the U.S. during 2006 (PCS 2006). This paper examines the dimensions of the April 2006 storm event and the causes for the record losses.

An unstable air mass with upper air conditions conducive to the development of severe thunderstorms developed across the central Midwest on the afternoon of April 13. Supercell thunderstorms developed in eastern Iowa at 1700 LST (Local Standard Time), and moved eastward, eventually crossing southern Wisconsin, forming a 528-km path. Another group of damaging storms developed at 1815 LST in southeastern Iowa and moved across central Illinois, terminating at 0100 LST. on April 14. A third large complex of damaging storms began at 1845 LST on April 14 in east-central Illinois and moved across Indiana, terminating five hours later at the Indiana-Ohio border. The 30-hour stormy period included the production of 12 other smaller hailswaths (fig. 1), and these also caused severe damages.

An important aspect of most storms was the production of large hailstones. More than 390 locations reported hail and 286 had hailstones with diameters of 2.5 to 5 cm. Hailstones with diameters of 7.5 to 10 cm fell in 19 locales in Illinois. In contrast, the average Midwestern hailstone size is 0.65 cm (Changnon, 1977). At most locales reporting hail, the duration was 5 to 9 minutes, longer lasting than the regional point average of 2 minutes, and many locales had high winds with the hail, adding to the damage. The April storms also produced 28 tornadoes, but all were short-lived, small, and rated as weak, as F0 or F1 on the Fujita storm scale. One tornado struck Iowa City, and the total property losses from the tornadoes and high winds were \$27.8 million with no deaths.

STORM DIMENSIONS

Great atmospheric instability across the Midwest on April 13 led to the development of three large areas of hailstorms, and these storm areas lasted for 5 to 7 hours and each moved more than 320 km. Figure 1 shows these three large hailswath areas labeled as A, B, and C.

Hailswath A began at 1650 LST on the 13th in Iowa, and extended eastward 518 km, ending near midnight in the Milwaukee area. Considerable amounts of damaging hail fell in the Milwaukee metropolitan area.

Hailswath B began in Iowa at 1815 LST on April 13 and extended to the east-southeast for 488 km, ending at 0100 LST on the 14th in eastern Illinois. It had widths varying from 18 to 60 km, and during its 6.5-hour lifetime it contained 11 hailstorms. Storms in hailswath B created large property losses in Rock Island, Moline, Peoria, and numerous smaller Illinois communities.

Hailswath C began at 1845 LST on April 14 along the Illinois-Indiana boundary and its storms moved east-southeast for 322 km before ending at the Indiana-Ohio boundary at midnight.

It created major property damages in the Indianapolis metropolitan area.

These three long and wide hailswaths on April 13-14 exceeded average sizes of hailswaths. Historical data show that hailswaths typically have lengths ranging from 80 to 330 km with an average of 205 km, and widths typically range from 10 to 25 km (Changnon 1977).

Illinois experienced seven other smaller hailswaths, as shown in figure 1. Hailswath #2 brought damages to several northern suburbs of Chicago, and hailswaths #4 and #12 created major losses in the western suburbs, including Joliet and Aurora, and in portions of south Chicago. Hailswath #5 brought damages to Lincoln and Clinton, and hailswath #10 created hail losses in and around Gibson City and Watseka.

LOSSES

The insurance industry provided data on the types of property losses for each of the four states (Property Claims Service, 2006). The total number of claims of hail damage was 404,000, and the total losses were \$1.822 billion. The losses in each state and for the

types of property damaged are shown in table 1. This reveals that Indiana had the largest losses totaling \$684 billion. Illinois losses were \$648 million, ranking as second largest. Personal property (homes) suffered the greatest losses in all four states, totaling \$1.012 billion. Commercial properties had \$371 million in losses. Vehicle losses totaled \$269 million and were larger in Illinois than in other states.

Past studies have shown that insured property losses represent 90 percent of the total losses from a storm (Roth, 1996). Thus, the uninsured property losses for the April 13-14 storm event would be approximately \$180 million. If this value is added to the insured loss value, the hail loss total would be \$2.002 billion.

SUMMARY

Insured property losses in Illinois and three adjacent states due to hailstorms on April 13-14, 2006, were \$1.822 billion, an amount considerably more than the previous record of \$1.5 billion set by the hail event on April 10, 2001. The huge losses in April 2006 were largely due to several severe storms in a 30-hour period with frequent large hail that hit several major metropolitan areas in Illinois and adjacent states. A large number of hailstorms developed in a relatively small region, and several produced long hailswaths across large portions of Illinois, Indiana, and Wisconsin. The excessive storm damages in the Chicago, Milwaukee, and Indianapolis metropolitan areas caused much of the April 13-14 loss.

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Table 1. Insured property losses from hail on April 13-14, 2006, showing losses for various types of property and for each state. Amounts are in millions of 2006 dollars.

| Type of property | Indiana | Wisconsin | Iowa | Illinois | Total |
|------------------|---------|-----------|------|----------|-------|
| Personal | 374 | 300 | 37 | 301 | 1,012 |
| Commercial | 130 | 50 | 21 | 160 | 361 |
| Vehicles | 180 | 70 | 12 | 187 | 449 |
| Total | 684 | 420 | 70 | 648 | 1,822 |

Fig. 1. The hailswaths that occurred on April 13-14, 2006. The three very large hailswaths are labeled A, B, and C, and the smaller hailstreaks are numbered. Their order is based on their sequence of formation in time with #1 being the first and #12 the last.

