

# **June 29, 1998 Central Iowa Tornado/Derecho Event**

## **Narrative Taken from NWS Storm Data, June 1998 Edition**

*Information specific to the Des Moines and Polk County areas are highlighted.*

A complex weather situation was set up over the central U.S. as a mesoscale convective system passed to the south of Iowa during the overnight hours and early morning of the 29th. Initially the surface warm front was located to the south of this system. That was not actually the case aloft however. During the predawn hours the surface front surged north and by sunrise was located across northeast Nebraska across northern Iowa. The air mass was very unstable to the south of the front with dew point temperatures will in the 70s F.

The initial development of thunderstorms took place during the early part of the day over northeast Nebraska. The storms became severe quickly as they moved and developed eastward into Iowa. By mid-morning the storms had formed a nearly east to west line. Storm relative inflow into the line was around 40 knots. The storms produced a variety of severe weather across Iowa. They initially moved east across the northern and central counties but then began sinking southeast.

The dominant severe weather with the storms was extremely high winds. Damage was very widespread across the state. Winds in excess of 100 mph were reported with one unofficial wind speed measured at 126 mph in the town of Washington at 1405 CST. In one unusual story, high winds hit Mahaska County. Three miles south of New Sharon, a puppy was tied to its dog house which was picked up by the wind. The dog house and puppy were lifted over the top of a two car garage and a corn crib. Both were deposited in the farm yard. When found the dog house was upside down and the puppy, though scared, was fine.

There were several tornadoes during the event. One of the longer track well defined tornadoes was the initial tornado. It was on the ground for about 11 miles as it swept across Crawford County. Several residences, outbuildings, grain bins and trees were damaged along its path. Reports indicate that between 30 and 50 residences were damaged by this tornado.

There were several small tornadoes in central Iowa. They had short tracks and only touched down briefly. One cut a mile long path east of Marshalltown through a corn field and a grove of trees. Another in Dallas County was on the ground through mostly open country for two miles. High winds were a major problem with these storms. Many places reported winds over 80 mph with incredible tree damage and numerous buildings damaged or destroyed.

At least 38 counties were declared disaster areas by the Federal Government due to the severe damage and flooding. A final total will not be available before publication deadlines; however preliminary data have been included. In the Des Moines County Warning Area these included: Wright, Franklin, Butler, Bremer, Hamilton, Hardin, Grundy, Crawford, Carroll, Greene, Boone, Story, Marshall, Audubon, Guthrie, Dallas, Polk, Jasper, Cass, Adair, Madison, Warren, Marion, Adams and Taylor.

One of the hardest hit counties was Polk County. Damage appeared to be from straight line winds based on a storm survey that was done following the event. The damage occurred over the southwest semicircle of a large meso low in contact with the ground. Due to the rapid translational speed of 50 to 75 mph, winds were enhanced on the southwest semicircle of the meso low. Smaller scale winds could have been embedded within this circulation as well. There was little evidence of small scale convergent tornadic damage, however aerial surveys did make some suggestion and eye witness accounts of sightings were quite numerous in the metro Des Moines area. All trees and debris were laid down to the south or southeast.

The major damage swath was 3 to 7 miles wide northwest of Camp Dodge with a widening into a full blown derecho after that. The event was born a few miles northwest of Perry, between Rippey and Berkley in southwest Boone County. The mile wide damage path expanded to over 3 miles by the time it reached full intensity near highway 169 between Woodward and Perry. The path continued through Granger, Camp Dodge and Johnston. The path was nearly 7 miles wide near Granger. A second, smaller, meso low passed near Madrid downing power lines. This meso low matured near Jester Park Golf Course causing significant structural damage to houses. The two meso lows merged near the NWS Forecast Office in Johnston with two miles of power poles snapped off between Johnston and Granger.

Much of the damage along the most severe track was in the F1 intensity category with speeds in the 75 to 110 mph range. A few spots along the path, such as in the Granger and Camp Dodge area, sustained sufficient damage to justify F2 winds, 110 to 155 mph. It appears a tornado or family of tornadoes touched down southeast of Berkley and moved southeast into the Pleasant Hill area just east of Des Moines. The track was intermittent indicating either one tornado touching down occasionally or one or more weak tornadoes rotating around the meso circulation. The worst affected metro areas were the Granger area, Johnston and the northeast side of Des Moines proper. A duplex in Granger was flattened by the winds. There were several reports of roofs being ripped off of stores and houses in the metropolitan Des Moines area. Several small private planes were flipped at a small air field north of Des Moines. There were also several reports of semi-tractor trailer trucks being blown over on Interstate 35. Heavy construction equipment was overturned on Interstate 35/80 just north of Des Moines. Damage was extensive to the east side of Des Moines proper.

To make matters worse, following the passage of the main line of thunderstorms, a second line of severe thunderstorms developed and moved across the same areas already hit. The storms were smaller but did produce brief tornado touch downs and hail up to 2.5 inches in diameter. The second line of storms did eventually combine with the first and moved southeast across the rest of the state.

Damage was widespread across the state and it will be months before final numbers are in. Estimates from Polk County alone are near \$100 million in damage including cleanup. Totals were still being tallied at this writing; however a few include over \$11 million in damage from initial claims in Johnston and \$726,000 from West Des Moines just to city buildings and systems. West Des Moines was on the far west edge of the major damage however.

In addition to the property damage at least 125 people were injured during the storm. Most of the injuries were caused by flying debris and many were not serious. Fortunately there were no fatalities.

Heavy damage was reported by MidAmerican Energy. On a state wide report they indicated 200,000 homes were without electricity, affecting over 500,000 people, at one time during the storm. In the metropolitan Des Moines area 100,000 homes were without electricity at the height of the storm. That number was reduced to around 25,000 36 hours later. The worst damaged areas were without power for 5 to 6 days. Heavy damage was also reported by local telephone and cable systems. In Polk County the worst damage extended from the Camp Dodge area into the northeast parts of Des Moines. At least 462 homes in the metro Des Moines area sustained significant damage.

Statewide 80 homes were destroyed, 559 sustained severe damage, with 1416 others receiving moderate damage. In the Camp Dodge area 80 to 90 percent of the brick buildings were damaged with the roofs removed from many of them. Lightning from the storms struck the WSR-88D in the midst of the storm. The radar was taken out of service for more than 24 hours because of this.

In addition to the severe weather, flooding quickly became a problem. Iowa soil was nearly saturated as the weather pattern had been very wet for six weeks previous. Although rainfall was not extreme, one to three inches of rain fell over a several county area. This caused widespread urban flooding across north central into central Iowa, though damage from the flooding was not serious.

Crop damage was very difficult to determine and will not likely be clear until the fall harvest. Reports from some of the local extension agents say damage to the corn ranged up to 75% destroyed in areas with the highest wind, such as the swath that went through central Iowa in association with the tornado there. No doubt losses will be in the hundreds of thousands of dollars if not in the millions. Accounts of damage were of course too numerous to document here as the areal extent of the storms was very large. Countless reports of parts of crop fields being flattened were received. Semi-tractor trailer trucks were overturned by the high winds both in the Des Moines metro area as well as in Newton.

Trees were found on houses over a large part of the state. One news reporter wrote “there is not a power pole standing between Fort Dodge and Oskaloosa”. Though not figuratively true, this statement does point out the extensive damage that occurred with these storms.