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40th Anniversary of Northern Illinois' Worst Tornado Disaster

by Jim Allsopp, Warning Coordination Meteorologist

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Introduction

On Friday afternoon April 21, 1967 the Chicago area suffered its worst tornado outbreak. At least 10 tornadoes raked northeast Illinois, three of which were violent, F4 tornadoes. In the wake of the twisters, 58 were dead, more than 1000 were injured, and there was nearly half a billion in damage (2006 dollars).

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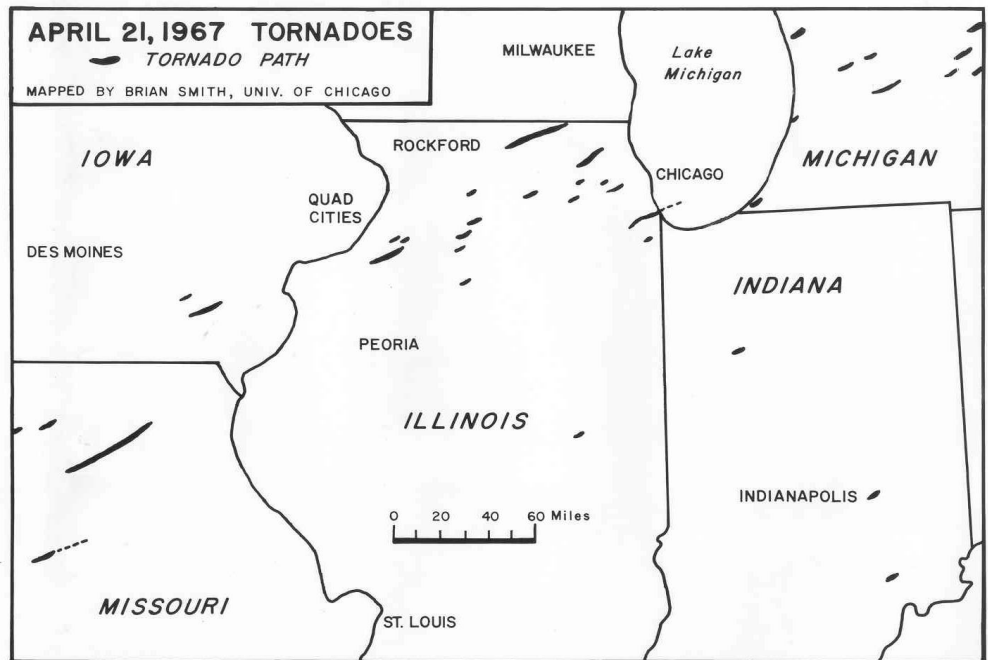
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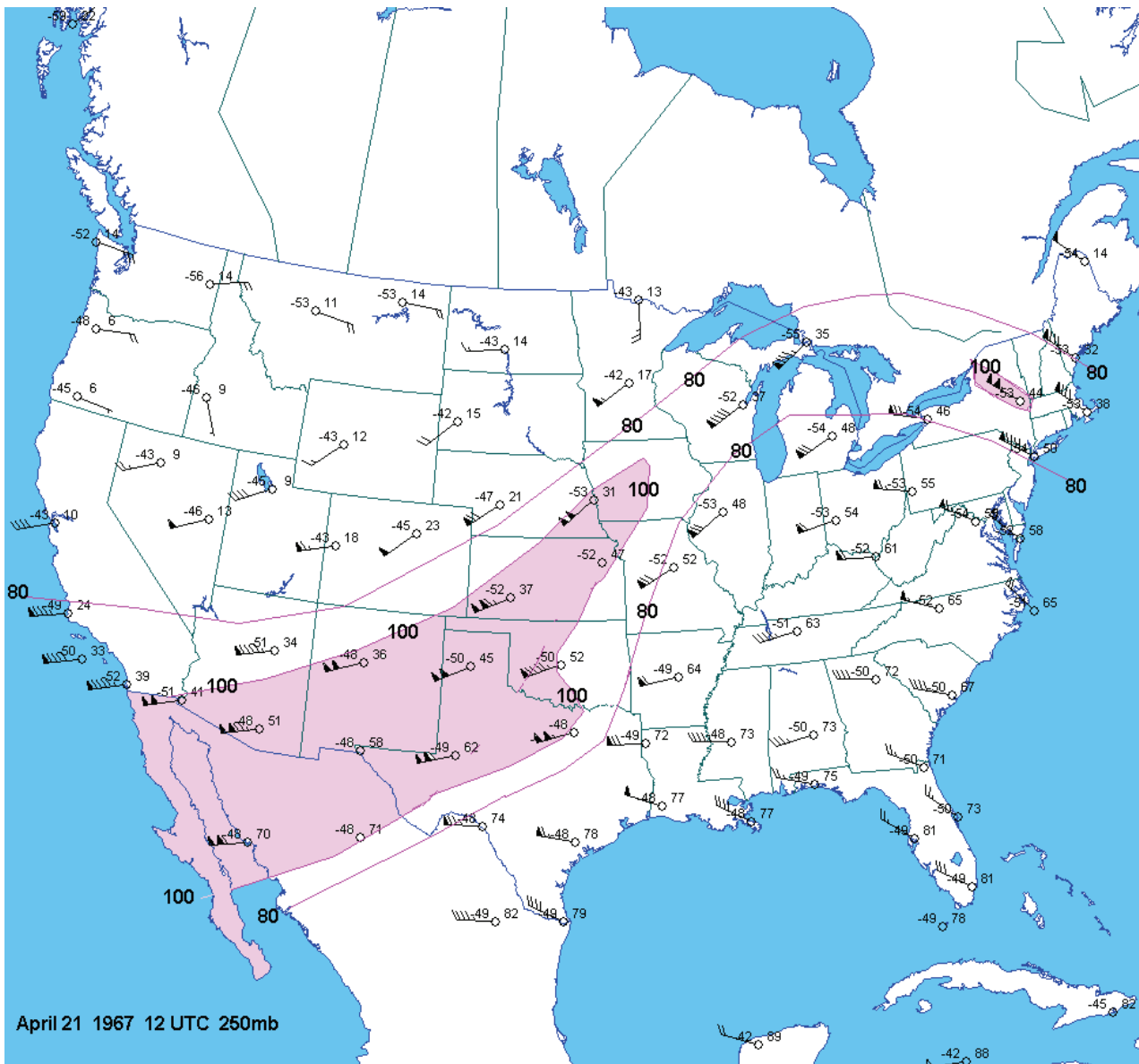
Synopsis

The winter of 1966-1967 had been a harsh one. In fact, it was a record setting winter. The record 23 inch snowstorm of January 26 and 27 led to Chicago's snowiest winter, with a total of 68.4 inches. (The current record was set in 1978-1979). There was continuous snow cover on the ground from January 26 until March 9, a 42 day stretch! But the weather pattern had changed by late March and April. Spring had arrived. Chicago saw five straight days in the 70s the previous weekend - April 13 through 17. Rockford even hit 80 degrees during the mid-April warm spell. People in northeast Illinois were looking forward to another mild spring weekend Friday April 21.

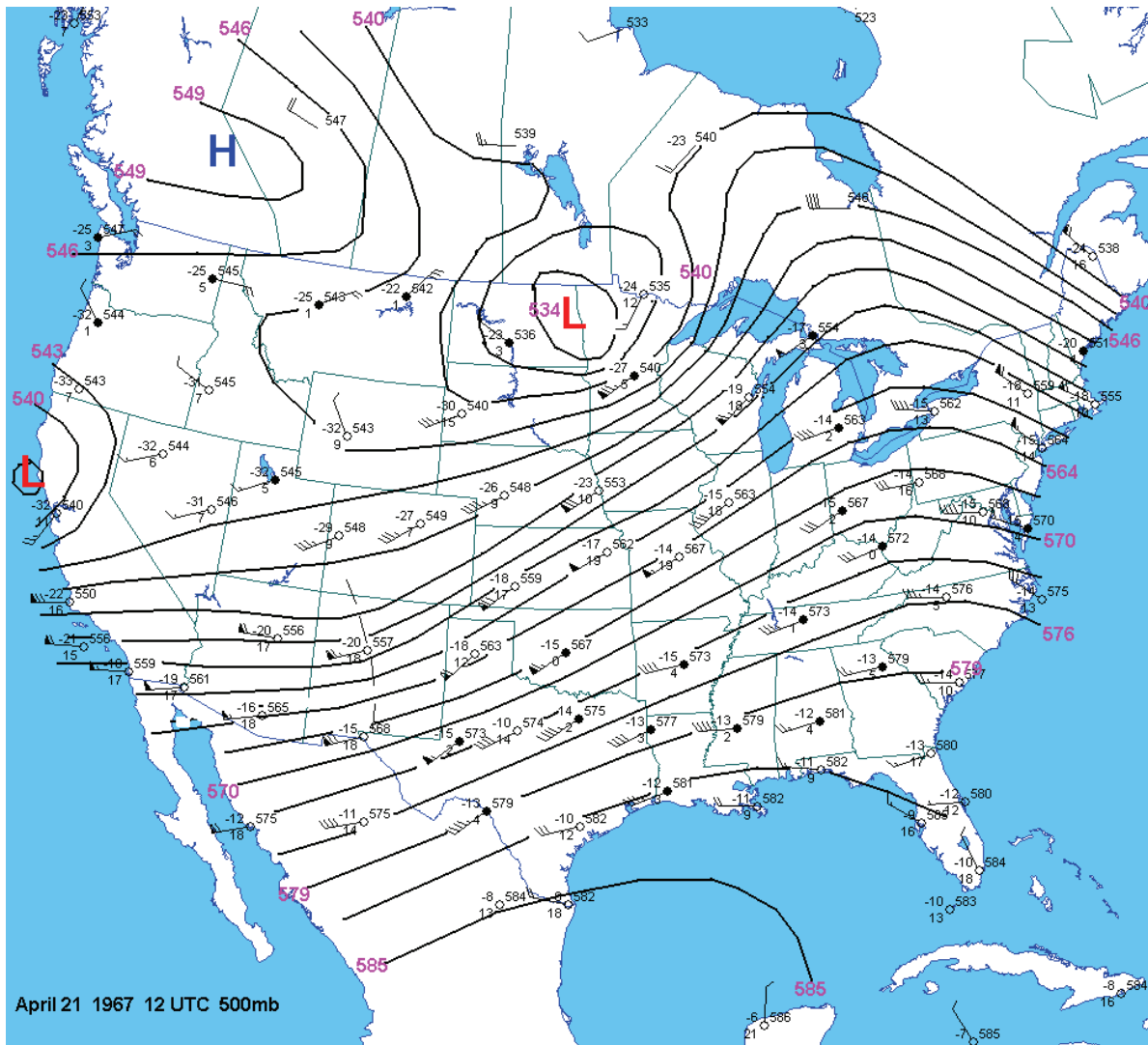
Friday morning, April 21 a strong west-southwest upper level jet stream was in place from the southwest U.S. to the Great Lakes. At 500 millibars (about 18,000 feet) a short wave trough was moving rapidly northeast from the southwestern U.S. In response to the short wave, at the sur-

face a wave of low pressure developed over the central Plains and moved northeast along a nearly stationary front which was draped across the Midwest. As the wave of low pressure approached northern Illinois, the stationary boundary surged north of Chicago as a warm front, bringing mild and humid air to the area. Temperatures climbed into the low to mid 70s across north and central Illinois on strong south winds and dew point temperatures reached the lower 60s. As the wave of low pressure approached during the warmth of the afternoon, surface winds backed slightly to the south-southeast, especially near Lake Michigan as a weak lake breeze formed. This likely increased the low level wind shear – the change of wind speed and direction with height - an important factor in producing rotating supercell thunderstorms and tornadoes. By late afternoon the mid level short wave was approaching and the upper level jet maximum of 120 knots (250 millibars or around 34, 000 feet) moved into the upper Great Lakes, which put northeast Illinois in the right-rear region of the jet – a favorable location for vertical development of thunderstorms.

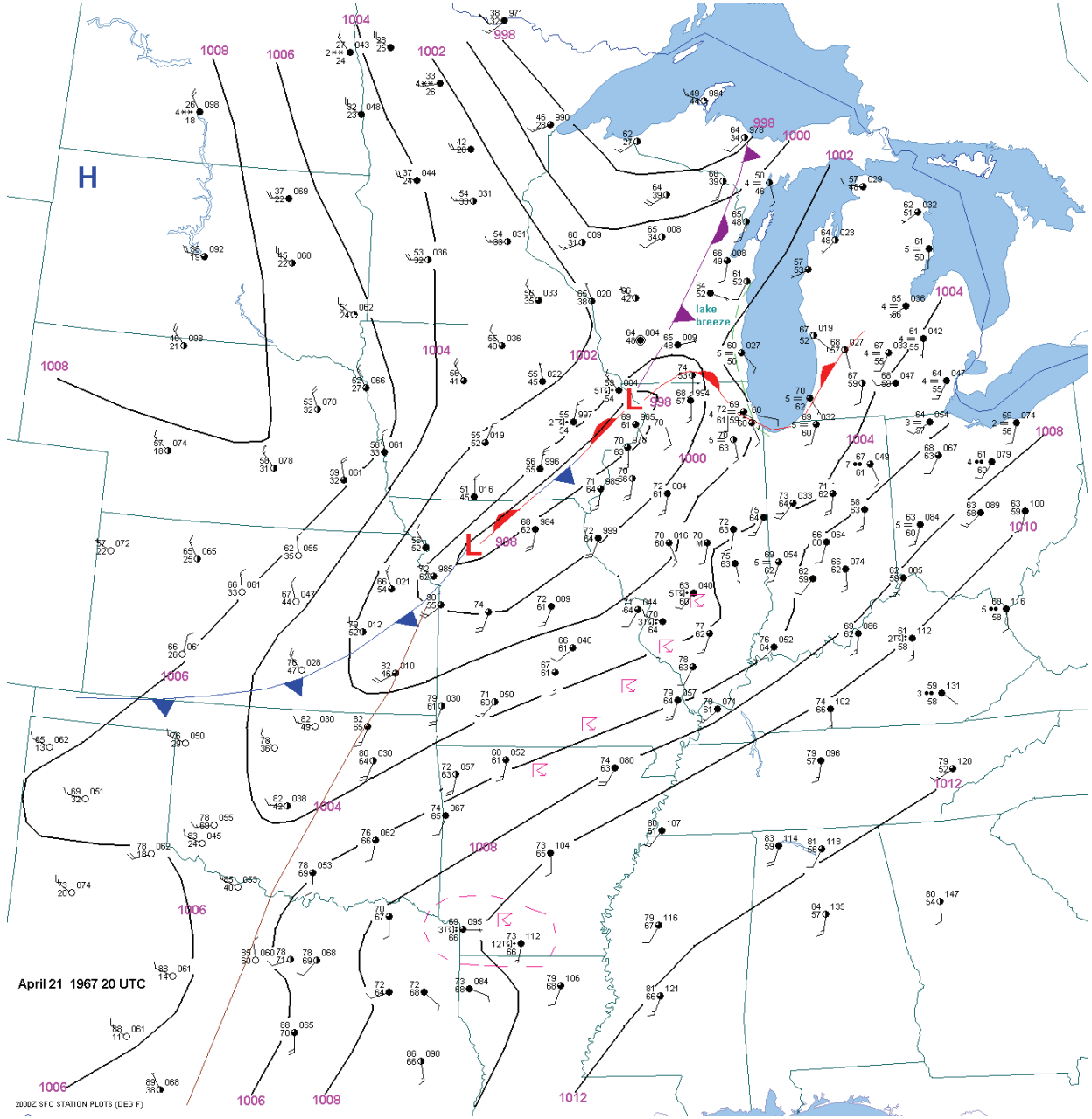
This fatal combination of factors led to explosive development of rotating supercells along a pre-existing line of storms that was moving across northern Illinois that afternoon. This line had already produced wind damage and tornadoes across Missouri, Iowa and northwest and north central Illinois. It would continue producing tornadoes across lower Michigan into the evening. But by far the most devastating tornadoes occurred in northeast Illinois and the Chicago area during the mid and late afternoon.



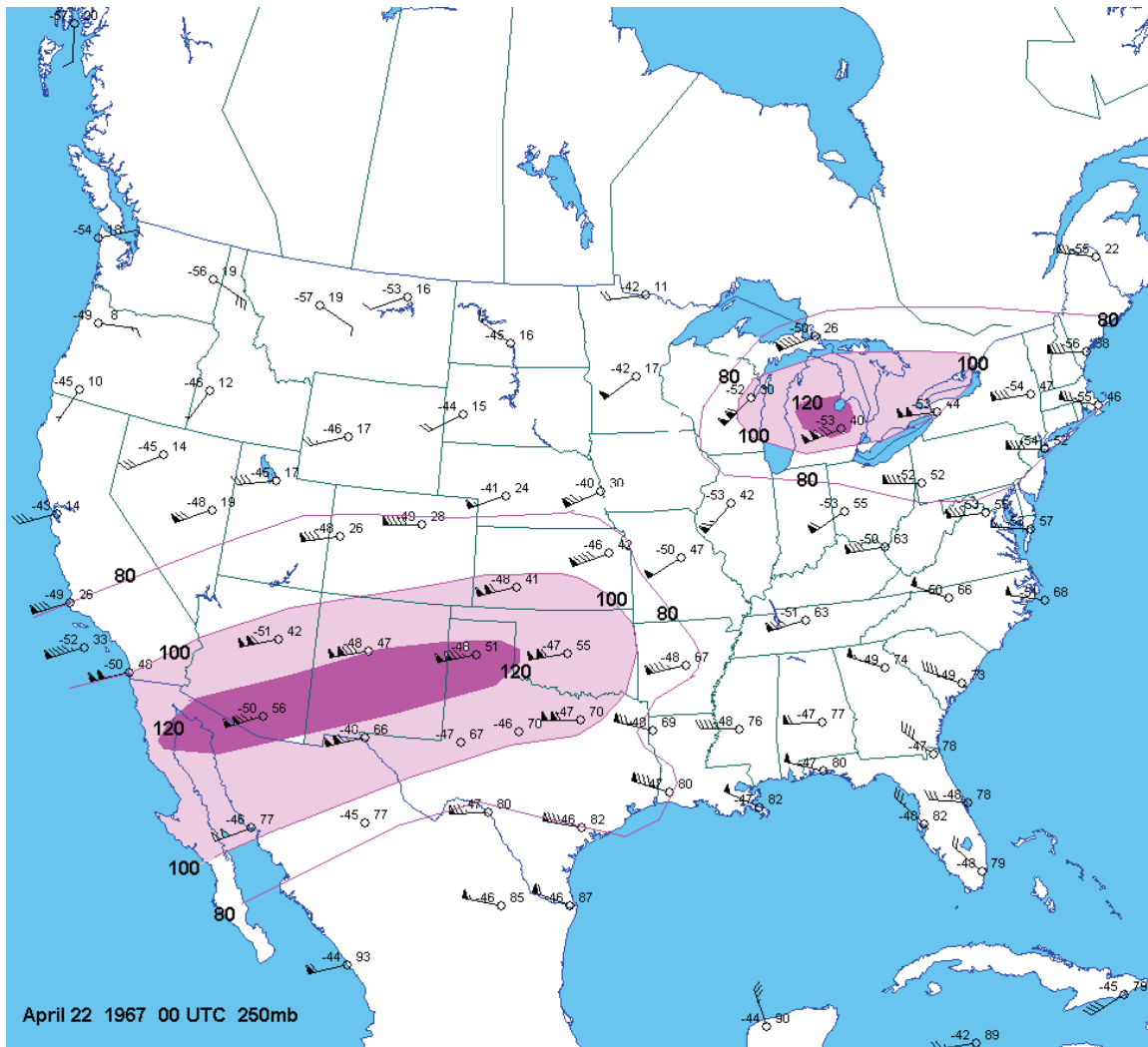
250 mb map at 12Z (700 AM CDT)



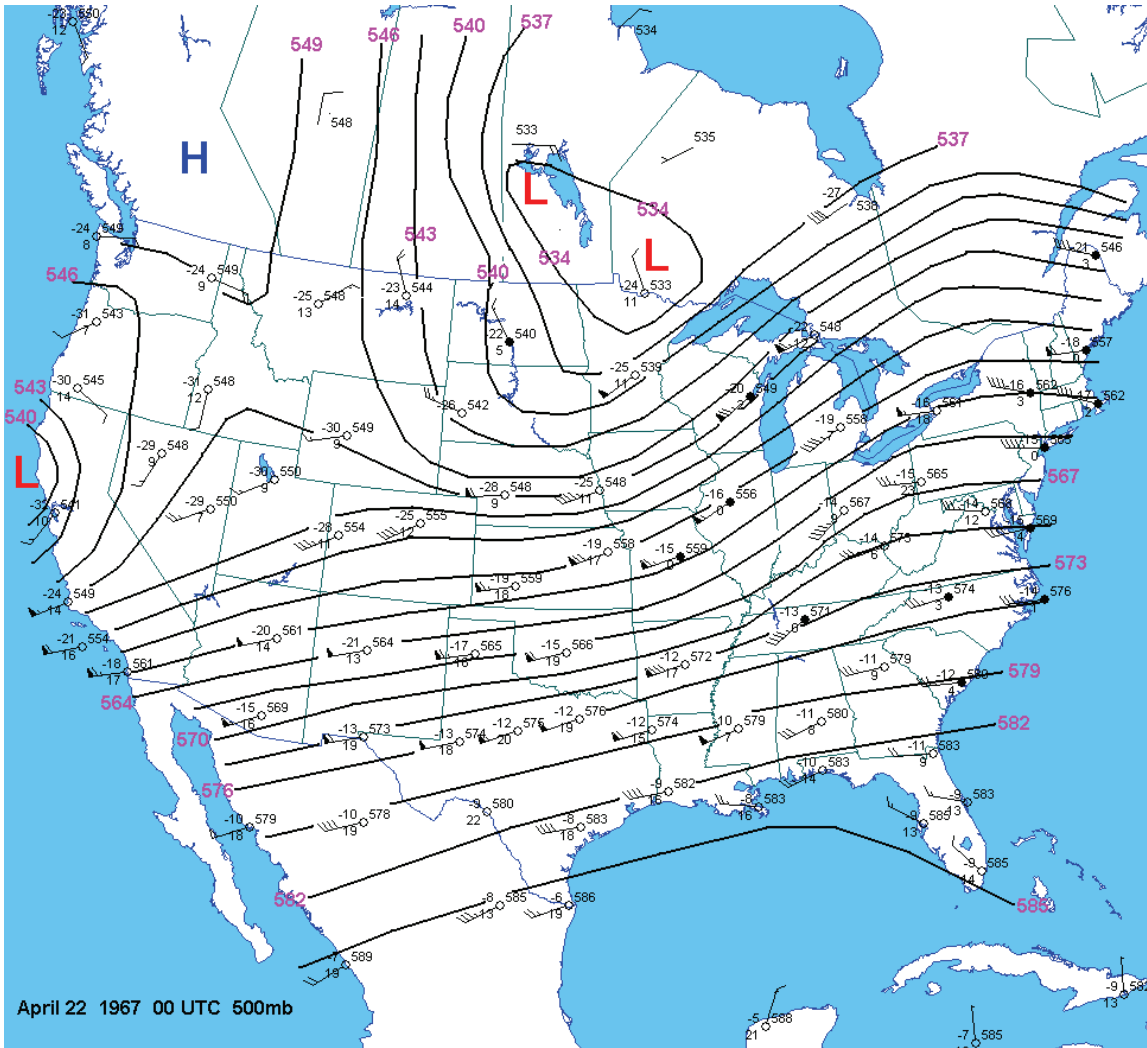
500 mb map at 12Z (700 AM CDT)



Surface map at 20Z (300 PM CDT)



250 mb map at 00Z (700 PM CDT)



500 mb map at 00Z (700 PM CDT)

In the wake of the storms, much colder air poured into the area on northwest winds. Two days later northern Illinois had a very rare late April snow! A total of 3.8 inches fell at Rockford and 3.1 inches fell at Chicago (Midway) on April 23. This is the latest 3 inch snow on record for both locations.

Detailed Summaries of the Three Big Tornadoes

The Belvidere Tornado

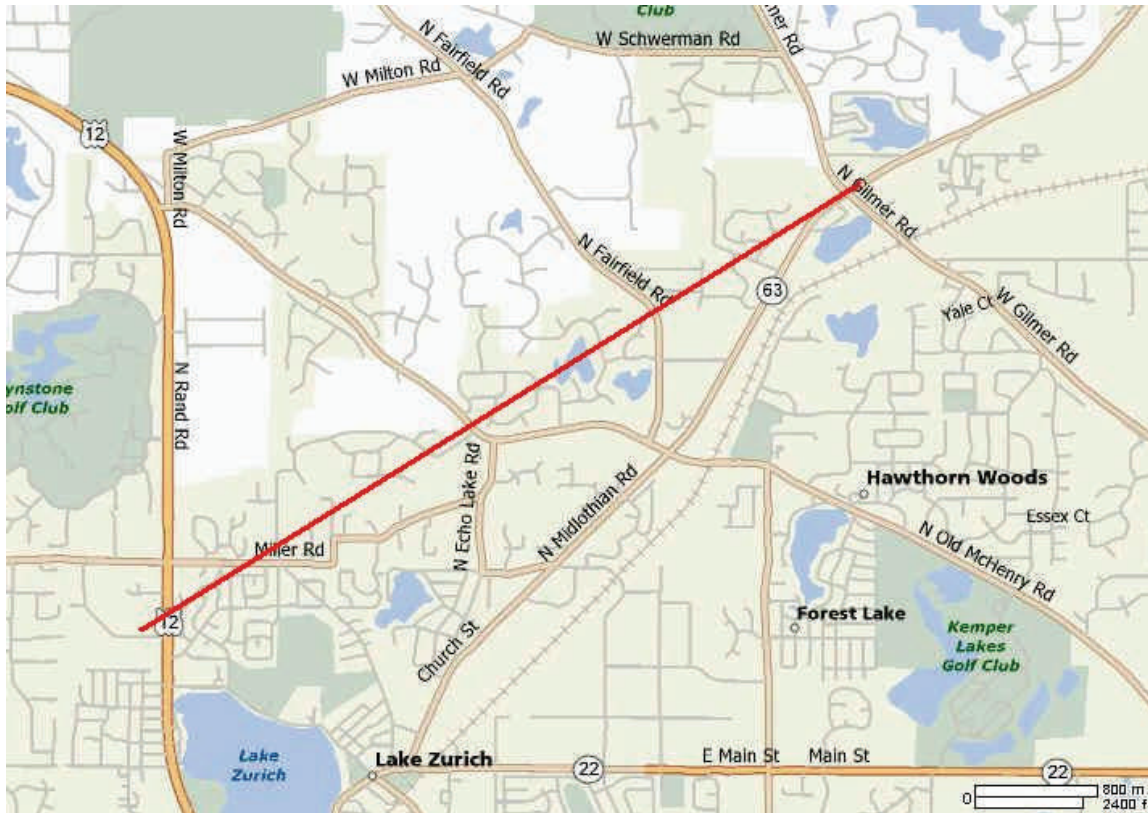


The tornado first struck at 350 PM two miles southeast of Cherry Valley. The tornado passed the Chrysler plant near I-90 where 300 new cars and 100 employee cars were destroyed. The tornado continued east northeast through the southeast side of Belvidere. One hundred twenty seven homes were destroyed, and hundreds more were damaged. The most notable and horrific part of this tornado was the mayhem at the Belvidere High School. Buses had already picked up the elementary school children and were loading the high school students when the tornado struck. Twelve buses were rolled over. Students were flung like leaves into the muddy field. Thirteen of the 24 fatalities and 300 of the 500 injuries in this tornado occurred at the high school. According to Tom Grazulis of The Tornado Project, this was the nation's sixth worst school death toll from a tornado. (Numbers one and two were also in Illinois - from the great Tri-State Tornado of 1925.) The tornado ended in McHenry County, about two miles north of Woodstock.

For damage pictures from this event, [click here](#).

The Lake Zurich Tornado

F4 Tornado, path length 9 miles, width up to 150 yards, 1 killed, 100 injured

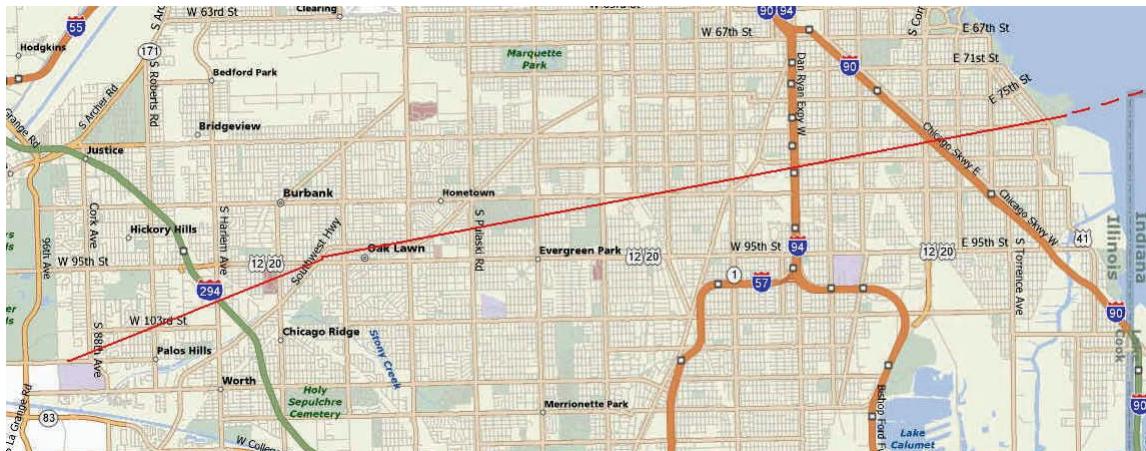


At 5:03 PM another tornado struck Fox River Grove, North Barrington, and Lake Zurich. Lake Zurich Manor, a subdivision 1 1/2 miles northwest of the center of town was hardest hit. Around 75 homes were completely destroyed. Another 200 homes had extensive damage. Seth Paine School was destroyed. Acorn Acres, a new subdivision of luxury homes northeast of Lake Zurich Manor had spotty damage and debris. About a dozen homes had extensive damage. More homes had extensive damage in Hawthorne. At Gilmer and Route 63, four homes, a brewery and a plastic factory were destroyed. Much of this area was rolling wooded hills where there were large trees damaged. Several residents who were interviewed saw no noticeable funnel or roar until it was upon them, just heavy low black clouds swirling.

For the complete Weather Bureau survey of the damage in Lake Zurich, [click here](#).

The Oak Lawn Tornado

F4 Tornado, path length 16 miles, width up to 200 yards, 33 killed, 500 injured



The worst storm of the day was approaching the southwest suburbs around 500 PM. At 515 an off duty Weather Bureau employee 10 miles north of Joliet saw a rotating cloud mass over his house near Route 53 and Naperville Road which is now Romeoville. Minutes later a restaurant at McCarthy Road and 127th Street in Lemont had its windows blown out. At 524 PM an observer at The Little Red School House at 99th and Willow Springs Road observed a lowering funnel just to his south. This was the first report of the funnel to the Weather Bureau. (The Weather Bureau employee couldn't get through.) The Little Red School House observer said, "My ears popped, the building shook and cars in the parking lot bounced". The funnel passed LaGrange Road and Kean Avenue just south of 107th Street. The tornado touched down just east of 88th Avenue between 105th and 106th Streets at 524 PM (24 minutes after the tornado warning was issued for Cook County!) This is now the site of Morraine Valley Community College. The tornado destroyed trees, bent power poles and picked up mud for the first part of its journey. The tornado hit its first homes around 83rd Avenue and 103rd Street. The tornado crossed the Tri-State Tollway and then hit an area of homes near Harlem Avenue and 98th-99th Streets. The tornado then hit a drive in movie theater near Chicago Ridge an hour before it was set to open. The screen's steel supports were bent and speakers and speaker stands were pulled from the ground.

The tornado then moved into the heart of Oak Lawn where it did the most severe damage. The tornado was a block wide at this point. Many homes were leveled. The busy intersection of 95th Street and Southwest Highway was clogged with Friday evening traffic when the tornado struck. Twenty five to 40 cars were thrown in all directions. The greatest death toll occurred in this area. The high school was hit as well as a bus garage. Buses were thrown like toys, one landing on a house. The tornado weakened slightly from here but intensified again near Cicero Avenue and 92nd Street where a mobile home park and roller skating rink were leveled. The tornado then ripped through Hometown.

It swept across St.Mary's Cemetery, knocking down 200 monuments. It then moved on to Evergreen Park. It weakened slightly through this area. It moved through Beverly Hills Country Club and Dan Ryan Woods. It hit a more populated area again near 87th and Damen Ave. Damage was mostly to trees, roofs, windows, and garages. It crossed Halstead near Vincennes Ave where it damaged apartments and factories. The tornado crossed the Dan Ryan Expressway at 535 pm, flipping a semi. There was so much debris thrown on the highway that it had to be closed for hours. Damage was lighter beyond this point – mostly roofs, chimneys, and windows. The path widened and became more diffuse as the storm approached Lake Michigan. The final report was at the water filtration plant at 78th and the lakefront, where a 100 mph wind gust was recorded. The tornado made the 16.2 mile trek in 15 minutes, moving across the ground at over 60 mph!

For the complete Weather Bureau survey of this tornado, [click here](#). For the detailed survey map, [click here](#).

For damage pictures from this event, [click here](#).

In the aftermath, 800 National Guard troops were brought in to search for bodies and keep out sight-seers. One hundred thousand customers were without power. President Johnson declared tornado ravaged communities a Disaster Area. The Salvation Army and American Red Cross provided food and shelter to the homeless.

Other Tornadoes

Details of the other tornadoes that day are not as complete. Here is a list of other tornadoes that occurred in the area that day;

- A brief F2 tornado occurred at La Fox in rural Kane County
- An F2 tornado occurred at Batavia and Geneva.
- A brief F2 tornado occurred on the southwest side of Elgin. There was also storm damage reported at Streamwood.
- A brief F1 tornado occurred near Bloomingdale.
- An F1 tornado had a 7 mile path from Addison to Schiller Park
- An F1 tornado occurred briefly on the north side of Chicago near Lincoln and McCormick, causing damage to Kiddyland Amusement Park
- A brief F1 near South Holland.

There were no fatalities or significant injuries from these tornadoes.

Conclusions

Tornadoes can occur anywhere in northern Illinois or northwest Indiana – rural areas, suburbs, highly urbanized areas, even at the chilly lakefront. They can hit the north suburbs, the west suburbs, the south suburbs or the city. They can occur at the worst possible times, whether its school dismissal or rush hour at a busy intersection on a Friday afternoon. Violent tornadoes have struck this area before, and they will strike again (see [Chicago Area Significant Tornadoes](#)).

Preparedness is the key to survival.

- Have a NOAA All Hazards Weather Radio to receive watches and warnings direct from the National Weather Service with an audible tone alarm. These radios can be purchased from electronics and discount department stores for as little as \$30 to \$50. Be sure to look for the “Public Alert” icon, which means the radio has a battery backup and Specific Area Message Encoder (SAME) technology, which allows you to program your radio to alert you only for storms that affect your county. The alarm can wake you even if storms come in the middle of the night, like they did in Florida earlier this year, and in Evansville, Indiana in November of 2005.
- Have a preparedness plan for your home, and your workplace. Make sure you know the location of the best tornado shelter. Conduct periodic drills so that everyone in your family and everyone at your workplace knows where to go and what to do.

For tornado safety rules click [here](#).

For information on the Oak Lawn High School Commemoration, [click here](#).

For information on the Belvidere commemoration, [click here](#).

Credits

Information about the tornado tracks from NOAA National Weather Service and Tom Grazulis, “Significant Tornadoes 1680-1991”. Weather maps provided by Jonathon Finch, NOAA NWS Dodge City, Kansas. Black and white aerial photos of storm damage from T. Lebaron, Oak Park, IL. Color storm damage photos from Dr. T. Fujita, University of Chicago, courtesy Brian Smith, NOAA NWS Omaha, NE. Photograph of Oak Lawn Tornado (only known tornado photo of this event) by Elmer Johnson, La-grange, IL – courtesy Chicago Tribune.

How Does the National Weather Service Use Your Storm Reports?

by Casey Sullivan, Forecaster

Despite all of the technological advancements and improved detection techniques, the NWS relies on spotters to confirm what forecasters see on radar, or what we refer to as "ground truth." The radar may indicate hail is falling, but without your report, we don't know for sure if hail is actually falling, or how large it is.

Storm reports are submitted through local and county emergency management agencies, law enforcement agencies, through amateur radio networks, and directly to the NWS through our webpage. Trained Skywarn spotters can submit a web form report through eSpotter (<http://espotter.weather.gov>) If you are not a trained spotter you can report through the online "Submit a Report" form at weather.gov/chicago, from the main menu on the left, under "Current Hazards".

When a storm report is received, the warning forecaster is made aware of the report. The warning forecaster is the individual(s) who is interrogating the radar data, looking at storm structure and issuing warnings. Once your report is relayed to the warning forecaster, it allows him/her to confirm what they are seeing on the radar. This is very important, especially in the early stages of a severe weather event.

Once the warning forecaster has been made aware of your report, it is then transmitted as a "Local Storm Report," or LSR. In most cases, we only transmit severe reports, such as hail three quarters of an inch or larger, wind damage, tornadoes, and flash flooding. However, ALL reports are important and useful. LSR reports are used by our neighboring NWS offices, TV and private meteorologists, emergency managers and the general public.

To see the latest LSR reports, click this link, <http://www.crh.noaa.gov/product.php?site=lot&product=LSR&issuedby=LOT> LSR reports are issued frequently during a severe weather episode. Click on previous version to see more reports. At the end of the severe weather event, all of the LSR reports are combined in a summary report. Reports may be added in the days following the event.

After the severe weather event is over, all of the reports are gathered together and entered into a database, called "Stormdata." Stormdata is an official publication listing all severe weather and hazardous events for the entire country. Your severe weather report becomes part of the official climate record! Stormdata is used by researchers, climatologists, insurance companies, and many others.

To see local Stormdata reports, click this link, <http://www.crh.noaa.gov/lot/?n=stormdata>

Finally, the National Weather Service Chicago office, located in Romeoville, IL, would like to say THANK YOU to all of our spotters, law enforcement, fire fighters, emergency managers, rescue workers, amateur radio volunteers, and the general public for all of your reports. We greatly appreciate your time and effort! Keep those reports coming!



Added Radar Data Becomes Available

by Ken Labas, Science Operations Officer

In late March the NWS office in Romeoville began having access to Terminal Doppler Radar Data (TDWR) from O'Hare International Airport and Midway Airport. This data is used by controllers at both facilities to monitor weather within about 50nmi of the runway complexes.

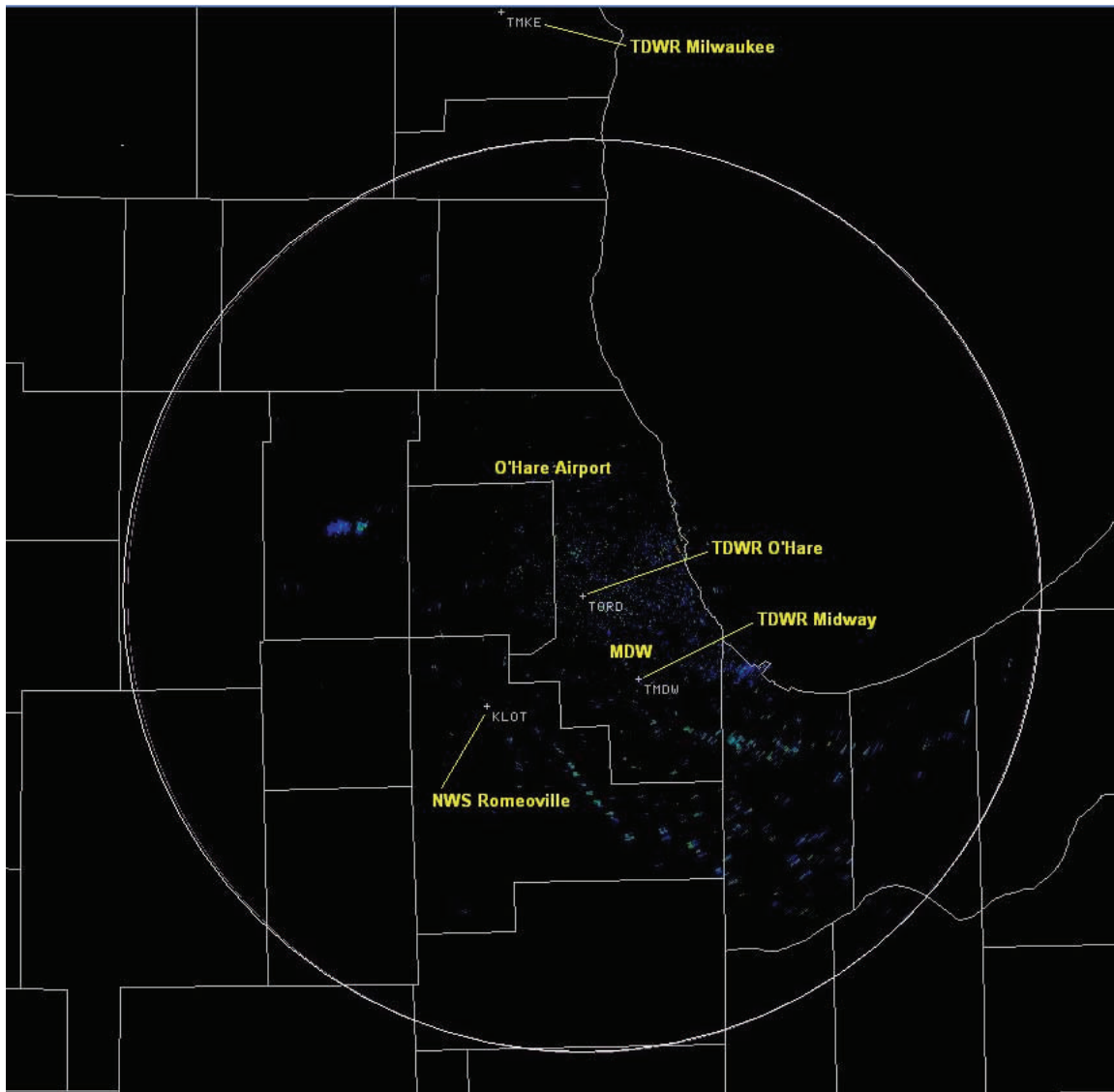
The actual radar sites are south of the fields by about 10 miles in western and southern Cook County. They need to be away from the intended targets (O'Hare and Midway) to be able to monitor those areas.

The data from these radars will allow the National Weather Service to more fully monitor precipitation and non precipitation events more closely. Non precipitation events include the placement and advance of the lake breeze which is common during the spring and summer months. It will also provide better coverage of convective storms both in the urban corridor as well as near shore areas of Lake Michigan where boaters frequent during the warm season.

The data includes low level reflectivity as well as velocity. This means air motions in the lower levels associated with thunderstorms can be monitored and tracked for warning purposes.

On the technical side, the main NWS Doppler radar at Romeoville cannot monitor weather directly overhead. No weather radar can. This means storm detection and monitoring in northern Will County is limited. Since these TDWR sites are at least 10 miles from Romeoville the ability of the NWS to detect storms over northern Will County is greatly enhanced. They also provide a secondary source of data if, for some reason, the NWS radar were to go down.

Below is a sample image showing the range of the O'Hare TDWR and its relationship to other radars and main airports in the area.



Illinois and Indiana have gone Cuckoo for CoCoRaHS!!!

by Tim Halbach, Climate Program Leader

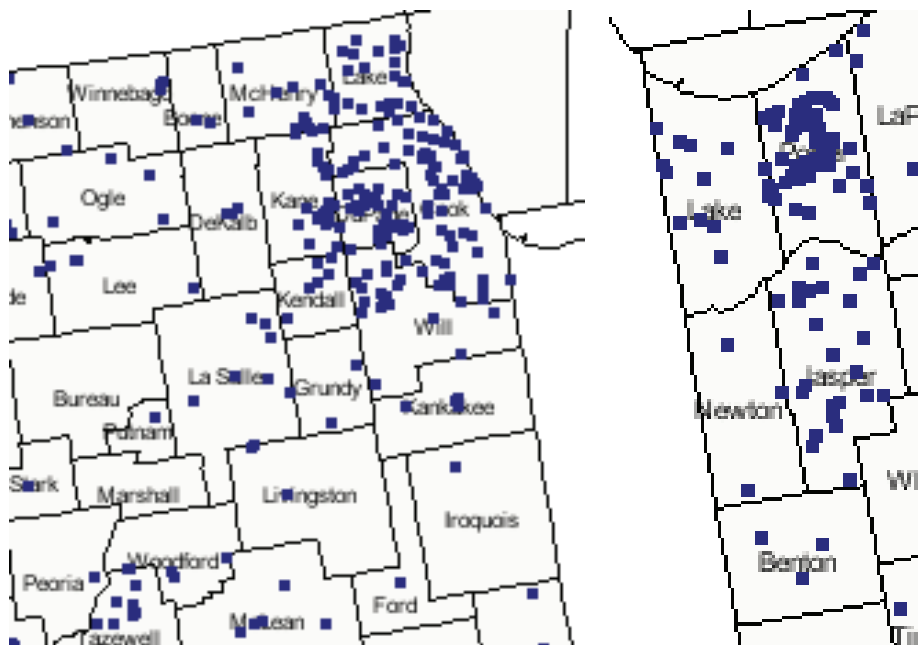


The Community Collaborative Rain, Hail and Snow network started up in Illinois this past December and within 4 months there have been over 400 voluntary observers that have signed up! Indiana has been up and running for over a year now and have over 500 volunteers. Some observers toughed it out through the winter months and provided valuable snowfall data, while most people that signed up at the end of winter were waiting for the warm temperatures to come to thaw out the ground so that they could get their gages in the ground. Since the temperatures have been warmer lately, there have been over 100 reports across Illinois and over 200 reports daily in Indiana.

For those not familiar with CoCoRaHS, it is a volunteer, high density network made of individuals of all sorts of backgrounds. It ranges from families to retirees to meteorologists to school teachers and so on. The common theme between everyone is an interest in weather and wanting to measure it. Observers use low cost measuring tools, such as a 4" diameter plastic rain gage, and attend a training session.

How often have you called around town to see what everyone measured for rainfall after a thunderstorm came through? Co-CoRaHS is pretty much the same thing, except that you get to see what everyone had via the internet. Observers in the network report their data once a day every morning at about 7a.m. They report the amount of rainfall, snowfall or hail that they had that day. The hail reports that they give assist the NWS in issuing and verifying severe thunderstorm warnings. While the precipitation reports are important for knowing how much rain or snow was produced across the region and whether we will be having problems with the rivers.

If you are interested in being a part of this program, or just interested in looking at the data, please visit <http://www.cocorahs.org>.



Blue dots represents observers in Illinois and Indiana as of 3/23/07