

Chicagoland Skywarn

Issue 2, Volume 3

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Regional Skywarn Instant Messaging

By Mike Swiatkowski, AA9VI

Are you part of a local Skywarn leadership team? Chicagoland Skywarn's core mission is to act as a communications bridge between existing Skywarn agencies in the area. So, we have established a Regional Instant Messaging service for local Skywarn agencies. Over the last few months we have beta tested this with Northern Cook, Lake, and DuPage Counties and FISHFAR leadership. Now it's time for the other collar counties to jump on board! We can all communicate incoming weather and discuss activation of nets.

Email me at <u>aa9vi@arrl.net</u> with your name, callsign, and a description of your Skywarn duties. We are asking that only those who act as net controllers or forecasters for local Skywarn nets sign up for this service since we can't give out a hundred accounts. We hope to reestablish the Multi-county Skywarn initiative with this new IM service.

Tornadoes in Northern Illinois on June 5th

From NWS Chicago Website: WEATHER.GOV/CHICAGO

National Weather Service survey teams have confirmed seven tornadoes moved across portions of northern Illinois Saturday evening, causing significant damage across portions of La Salle, Livingston and Kankakee Counties. Six of these tornadoes appear to have been associated with particular cyclic supercell storm.

- Extreme Southwest LaSalle County
- <u>Streator</u>
- St. Anne
- Livingston County (between Streator and Dwight)
- **Dwight** (northern tornado)
- <u>Dwight</u> (southern tornado)
- <u>Chatsworth</u>

Meteorological Overview:

Showers and thunderstorms had moved east across portions of central and northern Illinois during the overnight and early morning hours of Saturday morning. This left much of northern Illinois cloudy and somewhat rain-cooled after sunrise, which inhibited development of storms for a good portion of the day. However, clouds began to thin by mid-day across parts of north central Illinois, which allowed temperatures to climb into the lower 80's during the afternoon hours. The following image is a visible satellite image at 2:02 pm CDT. Note the thinning cloud cover over La Salle and Livingston County.

Special Interest Articles:

- Tornadoes in Northern Illinois on June 5
- The Spotter Network

Individual Highlights:

Regional Skywarn Instant Messaging

Weather Fun Facts

Tornado Icons Require Caution

Storm Calls to 911

Chicagoland Skywarn

Page 2 of 10



Also note in the preceding satellite image the band of clouds extending from central Illinois west into northern Missouri. This is likely enhanced low level cloudiness along the outflow boundary from the morning showers and storms.

As the afternoon wore on, temperatures in the lower 80s combined with dew points in the lower 70s to make for very warm, humid and unstable conditions. Meteorologists measure instability in the form of Convective Available Potential Energy, or CAPE. The following image depicts the unstable character of the air mass using surface based CAPE at 8 pm CDT, with values of 2000-3000 j/kg over north central Illinois at that time.

Page 3 of 10

Chicagoland Skywarn



At the same time, a mid level disturbance was approaching from the west. This disturbance was helping to increase mid level winds to 60-70 knots across the Midwest, resulting in strong deep layer wind shear, which would result in rotating storms to develop, which are known as supercells. The following image depicts 500 mb (around 18,000 feet MSL) conditions at 00Z (7 pm CDT). The orange colors denote the mid level wind speeds, indicating the jet maxima across Nebraska and Iowa at this level.



While increased deep layer shear supported the development of rotation within thunderstorms, low level shear was also increasing, which supported the potential for these storms to produce tornadoes. The outflow boundary which was lifting north from central Illinois likely aided in increasing low level shear and helicity, which led to an environment supportive of tornadic supercells across the area by the evening hours.

The following image shows surface to 1 km Storm Relative Helicity (SRH), which is a measure of the low level wind shear. Values of SRH approaching 400 m2/s2 are more than sufficient for tornado development, given the instability and deep layer shear present in the storm environment.



The Storm Prediction Center (SPC) produces a "Significant Tornado Parameter" which combines instability, deep and low level shear, and low level moisture in addition to a couple of other parameters favorable for tornado development. The next image is the SPC Significant Tornado Parameter for 01Z (8 pm CDT). Note the peak values near 7, just upstream of La Salle county.



Within this environment supportive of producing tornadic supercells, thunderstorms indeed developed across western Illinois around 7 pm CDT. These storms developed ahead of a cold front approaching from the west, as seen in this surface map from 00Z (7 pm CDT).



Weather Fun Facts

By George Geosalitis, NB9R

How much does a thunderstorm weigh?

If one inch of rainfall over an acre of land weighs approximately 113 tons (and it does); then a similar rainstorm occurring evenly over an 18.5 square mile area (the size of DuPage County), would dispense (on the order of) 24.7 million **tons** of rain water.

Does a rising barometer always indicate fair weather?

Normally yes, with the notable exception, that pressure can (and does) increase dramatically as large thunderstorms move toward and over a location. This atmospheric weight increase is caused by the rain-cooled air in the downdraft.

What measurements can grave diggers provide?

A key measurement for Hydrologists and other scientists dealing in problems with "soils" is "frost-depth." Since there are no reliable tools, scientists seek advice from the one group who would know. Consequently, the folks who dig graves are routinely consulted.

Why do some people sneeze when they look into the sun?

Looking into the sun can make me (and probably you) sneeze. This phenomenon is, actually, caused by an odd allergy called Allergic Conjunctivitis; which is an inflammation of the lower eyelid that reacts to the ultraviolet portion of the sun's spectrum.

What is the nation's one-minute rainfall record?

On the Fourth of July, 1956, in Unionville, Maryland, 1.23 inches of rain fell.....in exactly 60 seconds!

Can people be weather-phobic?

Yes, people can develop phobias associated with weather. *Keraunophibia* is the fear of lightning, *Anemophibia* is the fear of wind, *Ombrophobia* is the fear of rain, *Chionophobia* is the fear of snow, *Tonitrophobia* is the fear of thunder and *Homichiophobia* is the fear of fog.

What is the average temperature of the earth?

The surface temperature of our atmosphere (averaged globally) is 59° F. If it were not for the **natural effects** of greenhouse gases such as carbon dioxide and water vapor, the global mean temperature would be 4° F.

What happens to the Carbon Dioxide released into the atmosphere?

Not all of it remains in the atmosphere. While vegetation and oceans were thought to absorb about 50%, it appears that the forests of the Northern Hemisphere absorb 3.5 billion tons per year (twice that of the oceans).

How many raindrops fall in a year?

If the annual rainfall for a given location is 30 inches, then each square yard receives (about) one billion raindrops.



Northern Cook County Skywarn

---WX9NC----

442.725+ (PL 114.8 primary) 147.09 (PL 107.2, secondary and linked to primary)

Advertise local amateur radio license classes and exam sessions FOR ABSOLUTELY FREE at

ChicagolandSkywarn.org

YOUR 1 STOP FOR LOCAL INFORMATION

Page 6 of 10

The Spotter Network

By Mike Swiatkowski, AA9VI with information from the

WEBSITE: SPOTTERNETWORK.ORG

Would you like to see a google-map interface of reports from trained spotters? Would you like to have your report available to other spotters and the NWS? Well, the Spotter Network brings this all home. Think of it as WX-Spots with more quality control, a real-time map interface, and a leadership team that we know we can trust.

Here's how they describe it:

"The Spotter Network is dedicated to bringing storm spotters, storm chasers, coordinators and public servants together in a seamless network of information. We strive to provide accurate position data of spotters and chasers for coordination/reporting which in turn provides ground truth to public servants engaged in the protection of life and property. The network is a combination of locally installed software for position and status reporting, and web based processing and mapping.

Board of Directors

Tyler Allison - Original Developer of the Spotter Network Paul Sirvatka - Professor of Meteorology, College of DuPage

Gilbert Sebenste - Staff Meteorologist, Northern Illinois University

Though National Weather Service staff and offices utilize the data that flows through the network, the Spotter Network is in no way sanctioned or affiliated with the NWS nor any of the other government agencies that benefit from spotter information and coordination efforts.

The original Spotter Network went operational in April 2006 and quickly grew to over 100 spotters. Since that time, several National Weather Service employees and other officials have taken an interest in the capabilities it brings to them to integrate ground truth provided by spotters into their operational responsibilities. All at **ZERO** cost to them. Subsequent versions of the network expanded the coordinator and reporting capabilities and the NWS eSpotter integration was completed in early September 2006"

Screen capture from the spotter network's website:



Spotter Network Reports (Red Icons sorted by Date order, last 3 hours)

Event	Date	Nearest City	Narrative
Other	2010-06-08 01:53:00 UTC	0 miles SSW of Melbeta, NE	Extensive tree damage in ar
Hail	2010-06-08 01:39:00 UTC	1 miles N of Scottsbluff, NE	Measured; minor street floc
Hail	2010-06-08 01:30:00 UTC	1 miles N of Sunrise Village Mobile Home Park, NE	~approximate size, measure
Hail	2010-06-08 01:04:00 UTC	0 miles NE of Mitchell, NE	1.75 hail (measured) for 5 n

Tornado Icons Require Caution

By George Geosalitis, NB9R

A growing number of internet web sites, radar software and weather data vendors are now showing radar maps that display an icon to indicate a possible tornado. The display of this TVS icon (Tornado Vortex Signature) can be misleading to the untrained emergency manager, spotter or weather enthusiast. Todd Shea of the La Crosse Wisconsin National Weather Service says "many spotters and net controllers use private software that displays NWS Doppler Radar data, including some of the algorithm output. One of the items that often appear with stronger storms is the Tornado Vortex Signature (TVS) that indicates strong rotational wind shear at a certain layer based on radar data.

Care should be used with this information. A TVS indicates rotation and does not automatically mean a tornado is occurring or likely to occur. It's often dangerous to imply that a tornado is likely, given the appearance of a TVS. There are many factors that go into tornado detection and formation. You also have to have a good understanding of the environment on that day and overall storm structure.

Storm Calls to 911

By AI Fisher, NEMA Weather Officer

As you all know, some severe storms passed thru about the north 1/2 of the metro area early in the week. Below are some radar pictures, and a very very important storm concept to help manage your storm expectations and reaction.

The first picture below is from the NWS radar at 10:02 PM. A classic supercell storm (storm with rotating updraft), as a result of the very strong shear acting upon the strong push of warm/moist/unstable air over the surface warm front down in central IL. The actual upper air front right overhead.

The cell shows a classic curvature on the south end, an inflow notch on the SW end, and what used to be called the "hook" coming out of the SW part of the cell. Notice the very strong radar returns in the area north of the curvature, in the vicinity of the towns of Hampshire and Burlington in Kane county. This is the part of the cell where very heavy rain and large hail is located and falling down to the ground.



The next picture shows the base velocity from LOT. Notice the very strong inbound (relative to the radar) green colors representing winds of 60-70 mph blowing out of the storm in the area from around Hampshire to Burlington, outbound (red) colors next to inbound (green) colors ESE of Sycamore, and an arch of very strong winds of over 55 mph in the area marked by the pointer NE of Maple Park in Kane county. Both picture times are 10:02 pm.

Page 9 of 10



So let us think what the radar is trying to tell us is occurring, and what the public "thinks" is happening.

1. The radar is telling us that a combination of very heavy rain, very large hail, and very strong damaging winds are occurring in the center of the storm, around Hampshire. Imagine if you are the public, and maybe even an excited spotter, seeing this outside your window, or maybe even hearing this from the basement as you ran for cover. The public (at least some) is likely thinking "tornado". It must be, all hell has broken loose outside. So what are they telling the 911 operators "must" be happening, a "tornado".

2. The radar is telling you it definitely, 100% positive, no doubt, it is <u>NOT</u> a tornado. How can that be? The public is never wrong. Spotters are never wrong.

As an emergency manager, you have attended the NWS spotter talks, you have attended the DuPage severe seminar, you have attended my training. Remember what was taught to you. Tornadoes "only" occur in areas of updraft or on the updraft/downdraft interface. At Hampshire, where the heavy rain, large hail, and very strong winds are all falling down, it is the center of 100% pure downdraft in the storm. A tornado is "impossible" in the middle of the strongest downdraft portion of the storm. All the air is moving down at this spot in the storm. All you have to do is match the location of the report to where it is in relation to the storm. Exactly what you were taught at the talks. Know where the report is in relation to the storm structure. That is why you have Stormlab, to tell you the storm structure. To tell you where that report is located in the storm. To show you if there is indeed a rotation couplet, or it is straight line winds in an arch shape. Tornadoes do not have arch shaped winds.

The arch of strong inbound (relative to the radar) winds NE of Maple Park is the rear flank downdraft. An area of straight line winds, no tornado. Remember the Tornado genesis slide from my training? You did attend my training? Where a tornado would be "possible" is the interface area where the green and reds abut, east of Sycamore. That is your possible location, not in the middle of the downdraft near Hampshire. This is when you need to coordinate with your 911 people. To make sure not only the storm reports make it to the radar people, but also that the radar people tell the 911 people that no matter what is being said on the phone from the people around Hampshire, there is =u>**no** tornado. The storm reports definitely need to be conveyed to the NWS. **NO** tornadoes occurred that night, just hail to 2 1/2" and damaging winds to 70 mph. Certainly exciting and damaging. I have no idea if any town panicked and set off their sirens. I certainly hope not. Knowledge is power.

Chicagoland Skywarn

Page 10 of 10



I'll be there to talk more about Chicagoland Skywarn! -Mike, AA9VI

CHICAGOLAND SKYWARN

A BRIDGE BETWEEN METRO CHICAGO SKYWARN **AGENCIES**

> We're always looking for contributions to our newsletter which is published every other month. Please email aa9vi@arrl.net with your article, announcement, or weather story.

Special thanks to AI Fisher for this month's contribution!



Skywarn Reporting Repeaters Chicago: 442.725+ PL 114.8 Downers Grove: 145.43- PL 107.2 Frankfort: 444.55+ PL114.8 Gilberts: 146.925- PL 100.0 Glenview: 147.09+ (PL 107.2)* Grant Park: 441.3+ PL 114.8 Homewood: 442.375+ PL 114.8 Kankakee: 146.94- PL 107.2 Libertvville: 147.18+ PL 127.3 Woodstock: 146.835- PL 91.5 Malta: 146.73- PL 100.0 Marseilles: 146.745- PL 114.8 Merillville: 146.7- PL 82.5 Morris: 147.27+ PL 107.2 Rockford: 147.255 PL 114.8 St. Charles: 145.47 PL 103.5

Chicagoland Skywarn

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S.E. Wisconsin Skywarn 145.13- MHz PL 127.3 Hz

APRS Packet WX: 144.39 MHz Winlink Packet: 145.61 MHz

NWS Chicago Website:

weather.gov/chicago