Central Illinois Lincoln Logs

National Weather Service
Lincoln, Illinois

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Impact Based Warning Experiment for Tornadoes

By: Chris Miller, Warning Coordination Meteorologist

Damage to St. John's Regional Medical Center in Joplin, MO, on May 22, 2011. Photo by NWS Springfield, MO.

The United States was ravaged by tornadoes two years ago in 2011. Record numbers of tornadoes occurred in many areas of the country – and several of them were deadly. More than 550 people were killed by tornadoes, including 158 in Joplin, MO alone. Nearly all of the deadly tornadoes in 2011 were preceded by NWS Tornado Warnings – some with 20 to 30 minutes of advance notice or more. However, the death tolls were extremely high, despite warnings being issued through multiple communications methods (weather radio, TV/radio, cell phone alerting, social media pages, sirens, etc…). One of the main questions was "Why is this happening?"

Following the historic Joplin tornado, the National Weather Service (NWS) conducted a service assessment for the purpose of evaluating NWS warnings and societal response. The key findings from the 2011 Joplin assessment included:

- A majority of people identified "outdoor" warning sirens as their first source of warning for a tornado.
- Many people did not seek shelter until they sought confirmation of the tornado from additional sources.
- It took extraordinary signals, or pieces of information, coming from a credible source before many people would take protective action from a tornado.

One of the things people also mentioned in the Joplin service assessment (as well as other assessments done in the recent past) was that NWS Tornado Warnings all looked and sounded the same regardless of the size of the tornado, or the potential damage it might do. To address the various questions and findings, the NWS offices in Kansas and Missouri experimented with enhancing tornado warnings in 2012. The 2012 experiment yielded some successful results; however, due to the drought there were a limited number of cases. The decision was made to expand this experiment to all NWS offices in the Central Region – including NWS Lincoln – **starting April 1, 2013**.

(continued on page 2)

Impact Based Warnings (cont.)

The "enhanced" Tornado Warnings – or Impact Based Warnings – are intended to give the public, emergency managers who activate outdoor warning sirens, and the media more information about the tornado threat. NWS tornado warnings will look similar, however the information will be streamlined and a new "Impacts" section will be included. The "Impacts" portion of the warning is intended to describe what type of damage can be expected from the warned tornado.

The Impact Based Tornado Warnings will be sent from the NWS in the same manner as in the past, so no changes are needed to weather alert radios or computers/mobile devices programmed to receive these messages. The information within the warning, though, will look and sound a bit different. There are three possible impacts that will be communicated in Tornado Warnings:

- **Tornado damage is possible within the area of the warning. The duration of the tornado is generally expected to be short-lived.** *(Based on the tornado climatology of central and eastern Illinois, nearly 75 to 80% of our tornado warnings will be like this.)*
- **Credible evidence indicates that considerable tornado damage is imminent or on-going, and the tornado duration is expected to be long lived.** *(These are fairly rare in central and eastern Illinois, occurring with about 20% of our tornadoes.)*
- **Catastrophic damage from a tornado is occurring and there is a severe threat to human life, and the tornado duration is expected to be long lived. This will be exceedingly rare – and only used when reliable sources confirm a violent tornado.** *(This type of tornado has only occurred 8 times in central and eastern Illinois the past 63 years – very rare.)*

Previously, tornado warnings frequently did not indicate what sort of damage was expected, and would sound the same regardless if the expected damage was to a farm outbuilding vs. substantial structures.

In addition, Severe Thunderstorm Warnings will be enhanced in the Impact Based Warnings Experiment. With many Severe Thunderstorm Warnings, the primary threat is damaging straight-line wind or severe wind from a downburst. However, sometimes, short-lived tornadoes can rapidly develop and cause enhanced damage within an area of high wind. In this case, the Severe Thunderstorm Warning will indicate that there is some potential for a short-lived tornado by stating a tornado is "possible". This will be used when the available radar and storm spotter information does not indicate a widespread, long track tornado threat, and that a brief tornado touchdown may occur.

The intended outcomes of providing extra information in the Impact Based Warnings are to improve NWS communication of critical information, to make it easier to read and identify the most important information, to highlight storms that are particularly dangerous, to provide different levels of potential storm impacts within the same product, and enable people to prioritize warnings in or near their areas of interest.

Ultimately, our goals are to improve public response and decision making, and to better meet people's needs in the most life-threatening weather events.

A web page has been created that discusses the Impact Based Warning project, including sample warnings and a place to offer feedback. You can find this at:

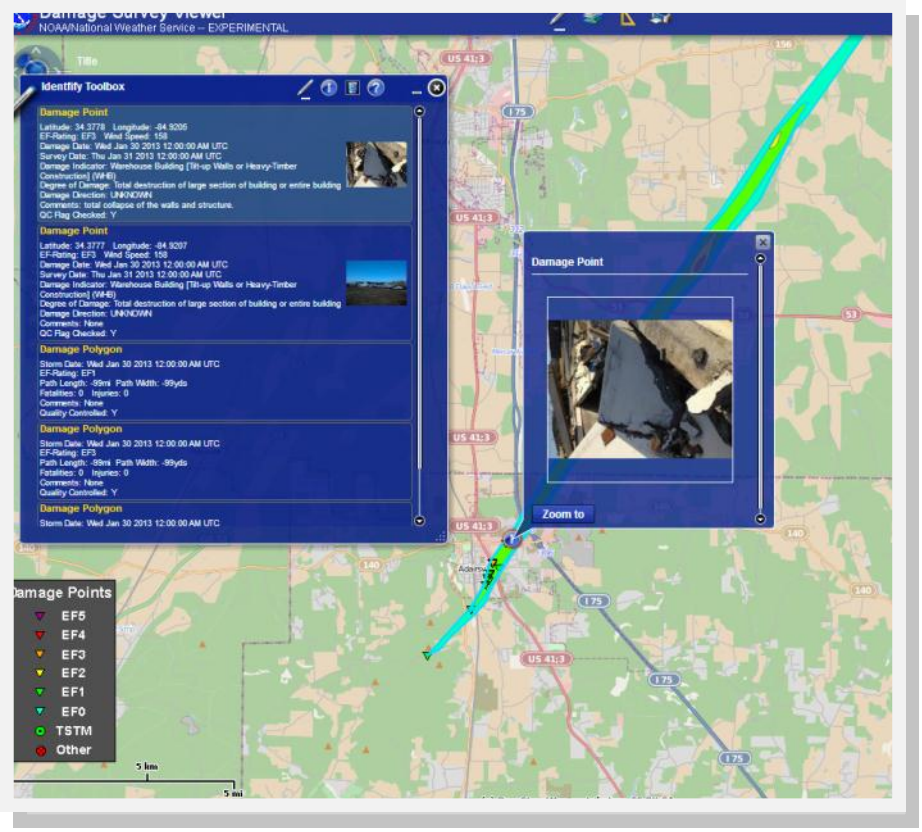
http://www.crh.noaa.gov/crh/?n=2013_ibw_info

New Tools for Storm Damage Surveys

The National Weather Service has been working on new, more modern ways to complete damage assessments following tornadoes and severe thunderstorms. Over the years, survey methods have ranged from use of paper maps and notebooks, to more recently, use of GPS and laptops. Film cameras have evolved to digital imaging. Now, testing is ongoing on ways to consolidate these methods into a single, easy to use procedure.

The Damage Assessment Toolkit consists of several items:

- A GIS application designed for efficient collection, analysis and delivery of storm damage data. It runs on either a mobile device or a laptop, utilizes GPS technology, and contains detailed street and base maps. The Lincoln NWS has recently obtained an iPad for this purpose, while also maintaining the ability to use a laptop in case there are multiple surveys going on at the same time.
- NWS staff conducting the surveys are able to use the application to assign specific damage points, including pictures that are geotagged for that specific location.
- Once data has been collected with the mobile application, the data is then transmitted back to a central server. Information can be uploaded "on-the-fly" via cell phone coverage, or can be held for later retrieval.
- Staff back at the office can review the data as it is received, or after the survey is complete. The data is then analyzed and processed using Google Earth, ArcView, or a Web Editor application. The central GIS server allows data to be shared with neighboring offices, and can be used to prepare maps and survey results for public dissemination.



Darrin Hansing, service hydrologist at the Lincoln NWS, has been working on the team that has been testing this program. While the laptop version was available for testing last year, the lack of severe weather prevented its use in our area.

This example was taken from an EF-3 tornado which occurred in Adairsville, GA, on January 30. NWS employees in the field will be able to upload data to a central server as the survey is in progress, allowing staff at the office to see the results.

New Staff Members at the Lincoln NWS

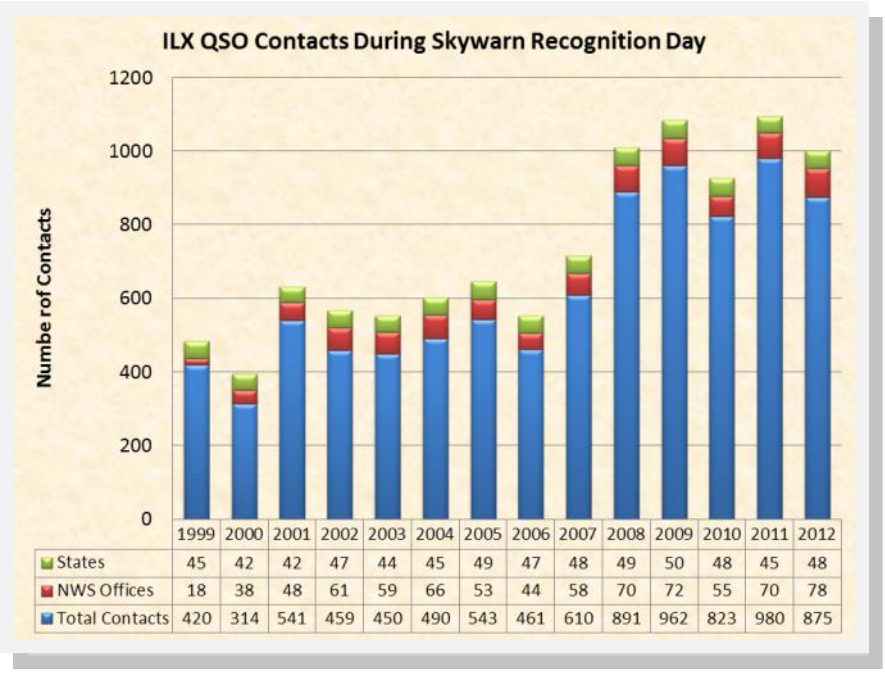
During the winter, we welcomed two new staff members to the office.

Bryan Schuknecht is our new Information Technology Officer. Bryan comes to us from the NWS office in Billings, MT, where he was a general forecaster. He began his NWS career as a student employee at the NWS Meteorological Development Laboratory in Silver Spring, MD. After graduating from the University of Missouri with a degree in meteorology, he started working full-time in Billings as a meteorologist intern, before later being promoted to general forecaster. He has been involved in the project to upgrade the software for the NWS's AWIPS computer system, which is undergoing testing at several NWS offices nationwide. Bryan replaces Tom Raineri, who transferred to the NWS office in St. Louis last summer.

Debbie Johnson is our new Administrative Support Assistant. Debbie joins us after working at the Pentagon as a secretary for the Under Secretary of Defense for Personnel and Readiness and Department of Veterans Affairs. She also has worked for the National Guard in Arlington, VA, and then for the State of Illinois in Carlinville. Before that, her administrative background was gained by 23 years in the U.S. Air Force. Debbie replaces Patty Peifer, who retired in August.

Skywarn Recognition Day Held December 1

The National Weather Service in Lincoln participated in the annual Skywarn Recognition Day, which ran from on December 1 from 00Z to 24Z (6 pm CST November 30, through 6 pm CST December 1). Skywarn Recognition Day, which has been conducted annually since 1999, is an annual event conducted by the NWS and the American Radio Relay League, to celebrate the contributions that volunteer radio operators make to NWS operations.



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
States	45	42	42	47	44	45	49	47	48	49	50	48	45	48
NWS Offices	18	38	48	61	59	66	53	44	58	70	72	55	70	78
Total Contacts	420	314	541	459	450	490	543	461	610	891	962	823	980	875

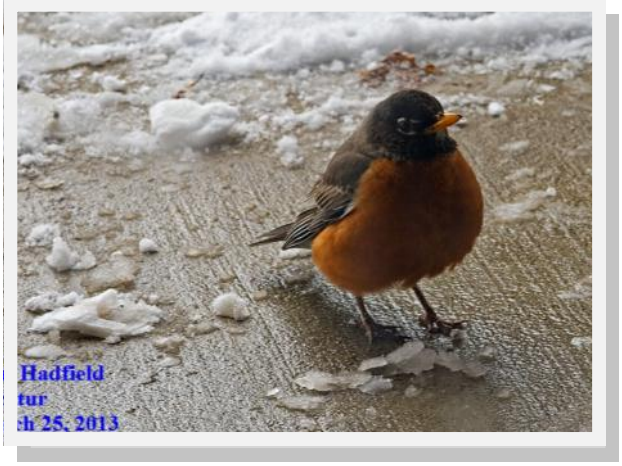
During the 2012 event, we made 875 contacts, including 78 different NWS offices. The NWS office in Melbourne, FL, led the nation with 978 contacts.

Winter Starts Slow but Finishes With a Bang

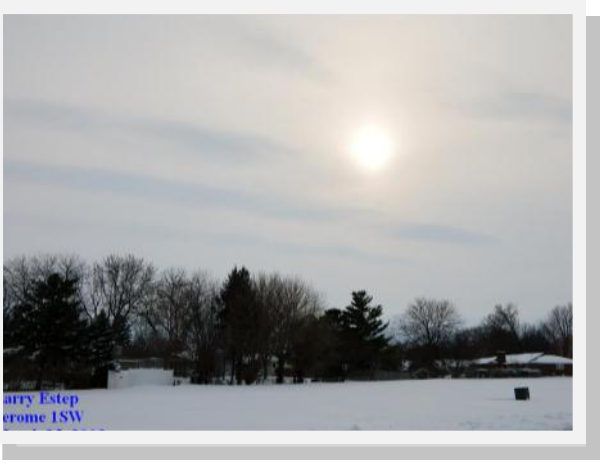
By: Chris Geelhart, Meteorologist

As this past winter began, the main question in much of the Midwest was, "Where is it?" Many locations were awaiting the first measurable snowfall of the season well into December. This finally was observed around the middle of the month in central Illinois, in many cases at least 290 days since the last measurable snowfall of the previous season. Southeast Illinois had to wait until just after Christmas, but made up for it in a big way, with one storm on the 25-26th producing a foot of snow at Lawrenceville and another storm a couple days later producing another 7 inches there.

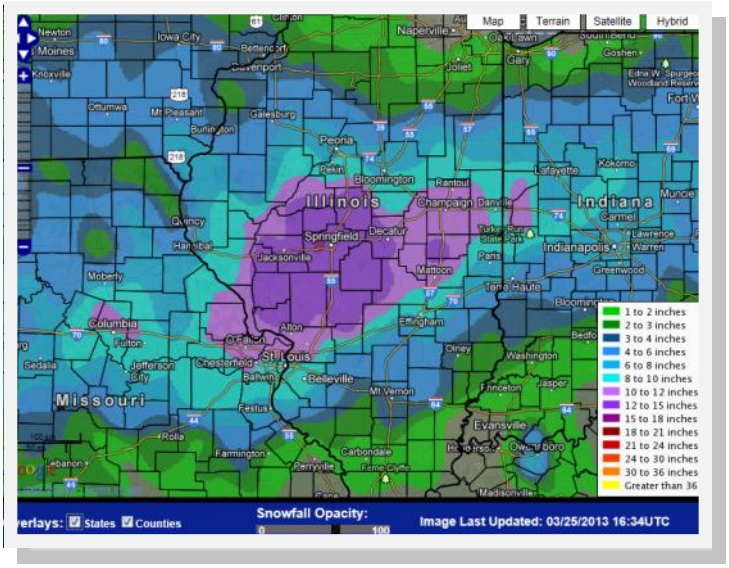
The general trend through the middle of February kept much of central Illinois with less snow than normal, and in some cases even lower than the previous winter, which was one of the least snowy on record in the area. However, the pace picked up a little during the latter part of February. Four to 8 inches fell northwest of the Illinois River on February 26-27, and a few inches fell in early March. In addition, many areas failed to see temperatures fall below zero.



This robin near Decatur was wondering what exactly happened to spring. Photo by Paul Hadfield.



A wintry landscape was observed in Jerome on March 25, after 16 inches of snow had fallen. Photo by Larry Estep.



However, just as it appeared that winter was over, the biggest snowstorm of the season struck on Palm Sunday, March 24. Over about a 36 hour period, a large part of the Midwest received over a foot of snow, from the St. Louis metro area northeast through Springfield and Decatur to near Danville. All-time record 24-hour snowfalls were observed at Springfield (17.4 inches) and Taylorville (17.7 inches). Seasonal totals jumped to 25 to 35 inches in many areas after this storm passed, and actually put the seasonal totals well above normal!

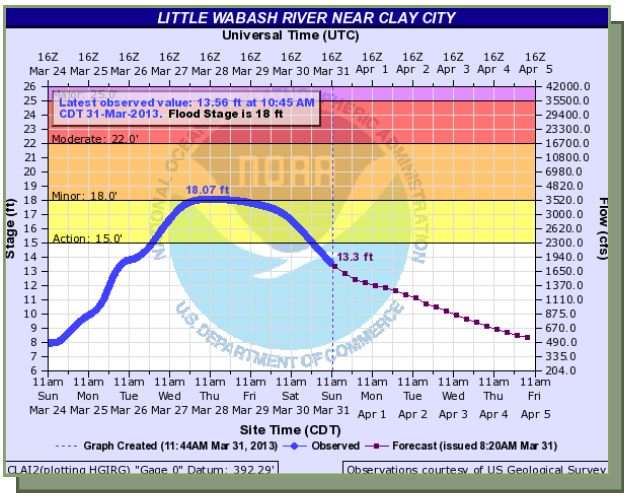
Snowfall during the Palm Sunday snowstorm. Areas in dark purple received at least a foot of snow.

Flood Stage Adjusted on Little Wabash River near Clay City

On February 7, the NWS changed the flood stage for the Little Wabash River near Clay City, adjusting it upward to **18 feet** (from the previous 16 feet). No changes were made to the levels for moderate flood stage (22 feet) and major flood stage (25 feet).

Through multiple site visits by the National Weather Service and Clay County Emergency Management, it has been determined that impacts due to high river levels are not observed until the river reaches at least 18 feet. At that level, agricultural land that is not immediately adjacent to the river begins to flood. Upon reaching a stage of 18.5 feet, two roads within the reach of the river have water over them.

The adjustment of flood stage will benefit the residents near Clay City by allowing the National Weather Service to more accurately convey the threat of flooding, thereby reducing the amount of unnecessary flood warnings issued for this location. This change has been coordinated with the U.S. Geological Survey (USGS) and the local Emergency Management.



Minor flood stage is the river level at which minimal human impact from floodwaters begins, and the level the National Weather Service uses as a threshold for issuing river flood warnings. Moderate and major flood levels are levels at which human impact increases noticeably. Numerous secondary roads are often inundated and some outbuildings may be flooded. At major levels, primary roads and highways can become flooded along with residences and businesses.

Winter Climate Statistics
(December 1 through February 28)

Peoria:

- Average temperature: 30.7°F (3.1°F above normal)
- Lowest temperature: 1°F on February 1
- Total precipitation: 8.71" (2.72" above normal)
- Total snowfall: 11.9" (8.3" below normal)

Lincoln:

- Average temperature: 31.4°F (2.9°F above normal)
- Lowest temperature: 2°F on January 2 and 22
- Total precipitation: 7.89" (1.50" above normal)
- Total snowfall: 10.3" (7.6 inches below normal)

Springfield:

- Average temperature: 33°F (3.6°F above normal)
- Lowest temperature: 1°F on January 2
- Total precipitation: 9" (2.85" above normal)
- Total snowfall: 13.5" (4" below normal)

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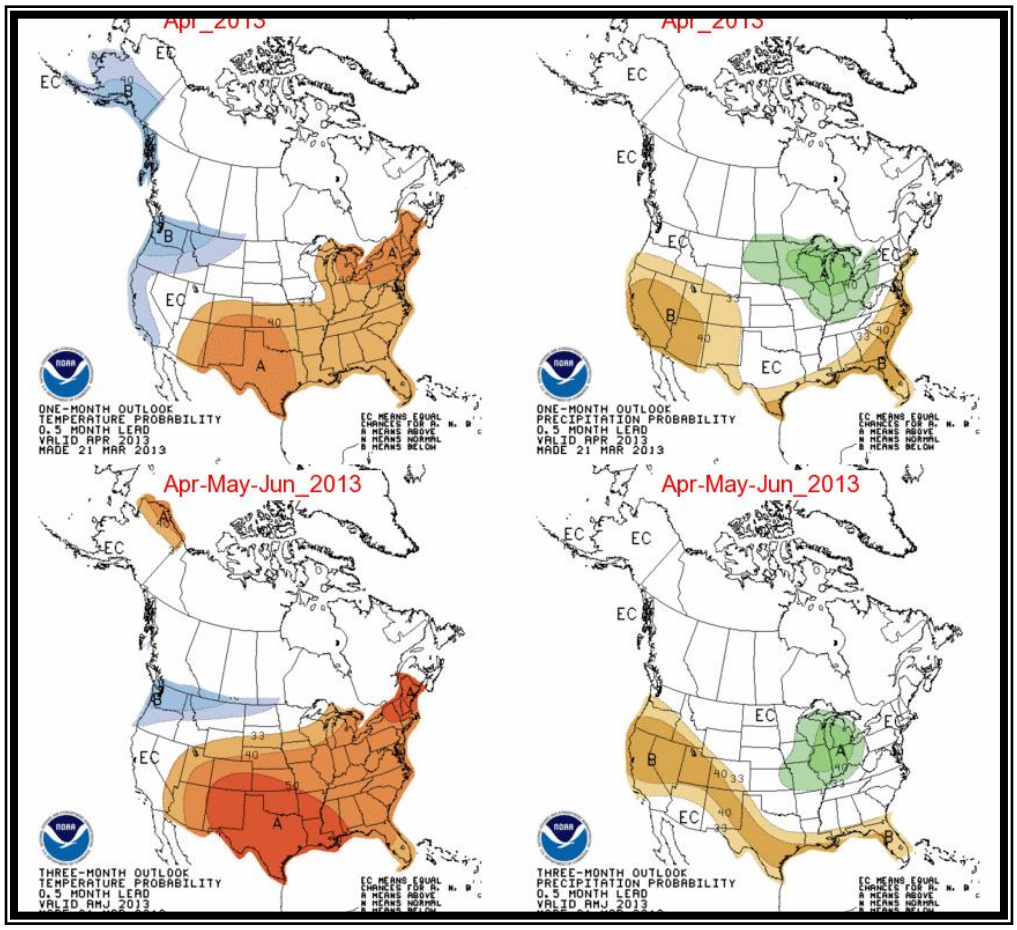
Long Range Outlooks



These are the latest long range outlooks, issued by the Climate Prediction Center (CPC) on March 21.

The top left image shows the expected temperature trend for April. Much of the "lower 48" is favored to average warmer than normal for April (orange shading), while the Pacific Northwest and the California coast is favored to be cooler than normal (blue shading). No clear trend could be determined for the northern Plains into the central Rockies, meaning there was equal chances of conditions being warmer, near, or cooler than normal.

The top right image shows precipitation trends for April. Much of the northern Plains and Midwest is favored to be wetter than normal (green shades), while drier than normal conditions (brown shades) are favored for the southwest U.S., the Gulf Coast, and much of the East Coast.

The lower left image is the temperature outlook for the 3-month period from April through June. Most of the nation is expected to trend warmer than normal, except for the Pacific Northwest.

The lower right image is the precipitation outlook for April through June. Above normal precipitation is favored for the Midwest, with drier than normal conditions from the West Coast to the Gulf Coast.