



# Central Illinois Lincoln Logs

Volume 19, Issue 1

Spring 2016

## Impact-Based Decision Support Service During Holiday Flooding

By: Ernie Goetsch, Meteorologist-in-Charge

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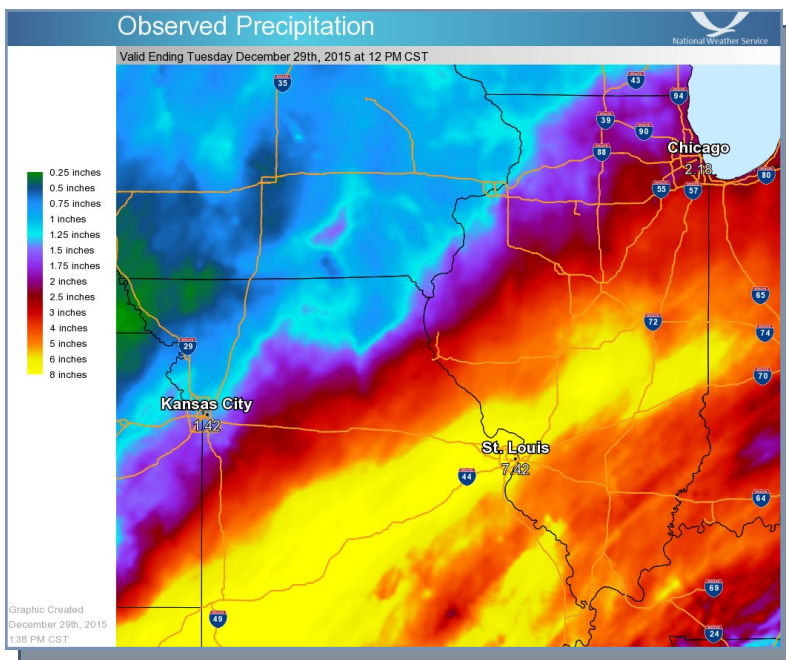
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Over the 2015 Christmas-New Year's holiday season, a major heavy rain and record flooding event occurred over mainly the southern half of Illinois. In addition to the huge impact this had on the residents of Illinois, it marked an example of future support that the Central Illinois NWS office will be providing. Up until that time, the Lincoln office had been providing support to the State Emergency Operations Center (SEOC) in Springfield, mainly by providing daily emailed briefings, conference calls, and on occasion, helping to staff the center after a hazardous weather event.

However in this event, the Governor activated the SEOC and our office provided NWS staffing on-site at the SEOC for an extended period of time, for 10 days. During that time, from December 28 through January 6, one shift was staffed each day, with two shifts on January 1 and 2 during the height of the flood fight operations. Total staffing hours at the SEOC was 127.5 hours during this 10 day period. While at the SEOC, numerous scheduled briefings were done, coordination with other state agencies and other NWS offices, plus briefings to the Governor's office, etc. In fact, the Governor visited the SEOC on one of the days. A total of 23 Illinois counties were declared disaster areas, and a federal disaster declaration was requested.

### Storm summary

One major storm system began the event, bringing heavy rainfall, record flooding, tornadoes, high wind, and damaging ice, from December 23rd through the 28th



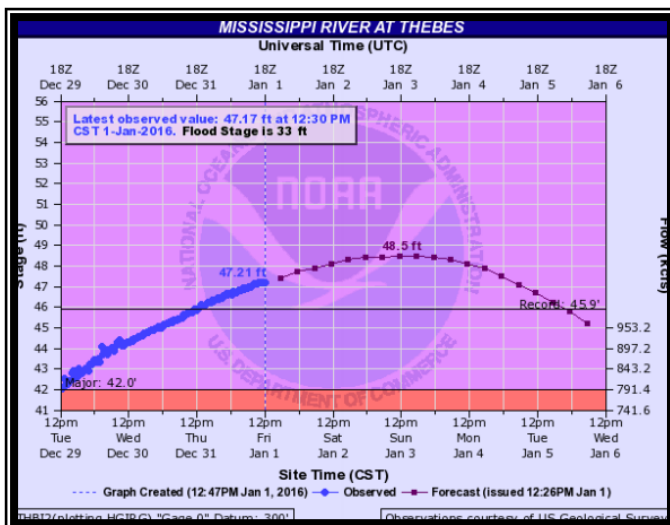
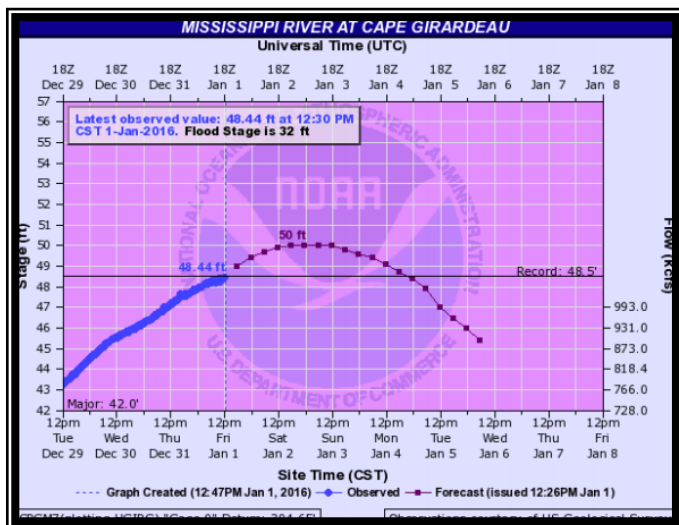
4-day precipitation totals ending at 7 am December 29. Areas in yellow received at least 6 inches of rain.

(cont. on page 2)

## Impact-Based Decision Support Service During Holiday Flooding (cont.)

across the state. Severe weather hit southern and western Illinois on December 23<sup>rd</sup>, along with wide-spread 0.50 to 1.50 inch amounts of rainfall. Five tornadoes were reported in Illinois, with dozens of reports of 60 to 70 mph wind gusts and wind damage. From December 25<sup>th</sup> into the afternoon of December 28<sup>th</sup>, additional rain fell over the central and southern portions of Illinois, with a mixture of rain, sleet, freezing rain, and snow across the northern third of the state. Record rainfall of 6 to 10 inches was reported in some areas.

Record river flooding was the result of the heavy rainfall. Even though both of the locations shown below are on the Mississippi River (Cape Girardeau and Thebes) and are covered by other NWS offices, the Lincoln office played a major role in keeping state agencies updated on the progress of the flooding and how high the flood crests were forecast. This extensive effort of working with our core partners to inform them about the impacts of the weather was a great example of providing impact based decision support services to emergency management partners, and where the future of the NWS will be.



River stages on the Mississippi River at Cape Girardeau, MO, and Thebes, IL, on New Year's Day (blue line) and the forecast (purple line).



Left: Sangamon River flooding on the east side of Petersburg. Right: Mississippi River flooding in Alexander County. Images courtesy of the Illinois Emergency Management Agency.

## An Active Year Coming Up at Our Office

By: *Chris Geelhart, Meteorologist*

Our last few newsletters have discussed how our operations have changed over the course of our 20 year existence here in Lincoln. Technology has changed, the state of the science of meteorology continues to evolve, and new operational requirements are being implemented. We'll review some of what's upcoming for our office.

### Digital Aviation Services

For many years, we have issued specialized forecasts for 5 airports in central Illinois (Bloomington, Champaign, Decatur, Peoria, Springfield). These forecasts, called Terminal Aerodrome Forecasts, or TAFs for short, contain specific information for the next 24 hours regarding wind speed and direction, weather types, visibility, and cloud heights. They are manually typed up every 6 hours, and updated as needed.

The remainder of our forecasts are created using "grids," in which the various forecast elements (wind, temperature, etc.) are "drawn" using model guidance or manual editing. With Digital Aviation Services, we will be adding aviation-specific grids for items such as cloud heights, visibility, and low-level wind shear. Combined with the regular forecast grids, the TAFs can be automatically assembled for the forecaster to review and update if needed. Additionally, locations such as small airports, which normally would not qualify to receive TAFs of their own, can use the grids via our forecast web page to basically come up with their own site-specific aviation forecast.

We have begun training on this new methodology, and will begin full practice mode with it this summer. The goal is for this to become operational in the fall.



### Impact-Based Decision Support Services

A fairly new aspect of our operations is referred to as "Decision Support Services" or DSS for short. We will work with local and state emergency management agencies to help provide specific localized forecasts for special events that have a significant public impact. Some of these will involve advanced planning, such as for gatherings that may have thousands of people at risk, such as at the State Fair; other events may come up on short notice, such as a hazardous materials explosion. Support may come via regular phone briefings, or by having one of our staff members on-site if needed. The support to the State Emergency Operations Center, detailed in the previous article, is a good example.

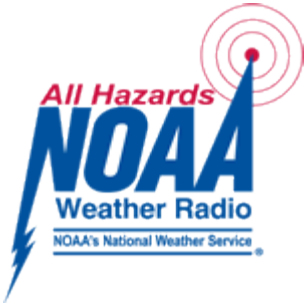
The NWS offices in the Central Region (basically from Wyoming to Indiana) are rolling out new methods to provide such support, and these generally should be similar from office to office, in order to aid emergency managers who may need to deal with more than one NWS office. This also allows for easier support if an NWS office has to provide backup service for an adjacent office. Regional implementation of these new methods is projected for June 1.

*(cont. on page 4)*



## An Active Year Coming Up at Our Office (cont.)

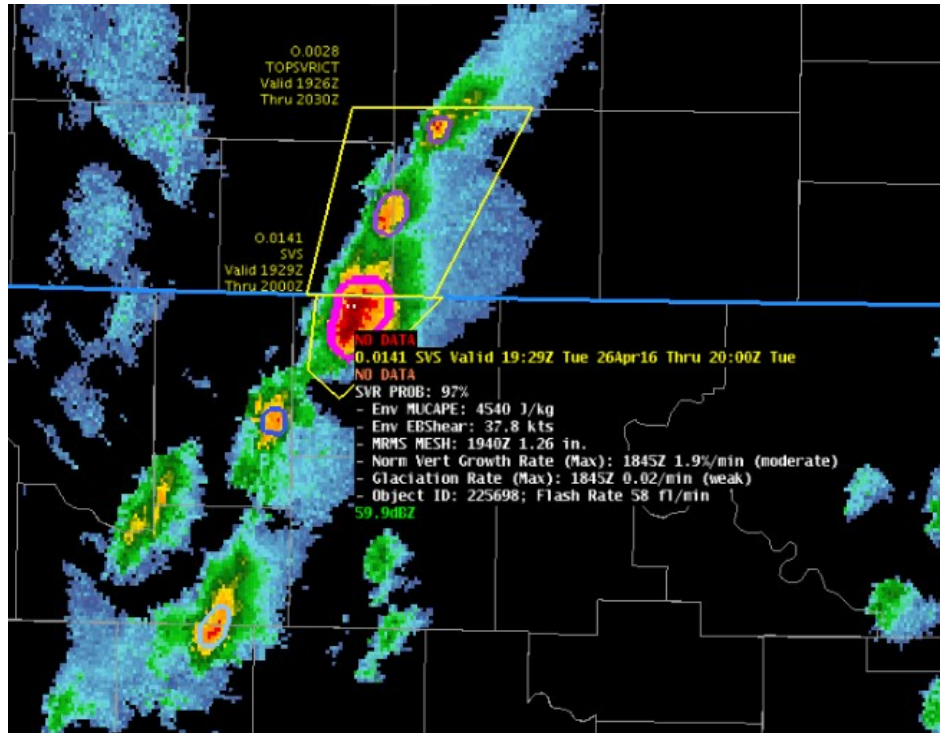
### Upgrade to the NOAA Weather Radio System



The current computer system used to operate NOAA Weather Radio was first implemented in the late 1990's, and the computers remain of that vintage. The equipment used is largely past its designed life span. A replacement system is in the process of being rolled out to NWS offices nationwide. This new system, called the Broadcast Message Handler, is more of a direct part of our main computer system (AWIPS), instead of using stand-alone computers and other hardware. We have received the required equipment. The target for use of the new system is early July.

### Experimental Operations and Data Reception

We have begun to receive new satellite and forecast data to analyze for future forecast operations. Satellite images taken at 1-minute increments have begun to flow into our computer system, although the exact location of the images depends on the more active weather "hot spots" on any given day. This is part of testing and preparation for the next generation of weather satellites, called GOES-R, which is scheduled for launch on October 13th. GOES-R offers 3 times the number of imagery channels, 4 times better resolution, and 5 times faster scans of the current satellite.



*Example of the ProbSevere model output from a severe storm along the Kansas/Oklahoma border on April 26.*

We have also begun receiving data from a model called ProbSevere, which is a statistical model that

predicts the chances of a storm becoming severe in the next 60 minutes. ProbSevere is from some of the research that has been tested at NOAA's Hazardous Weather Testbed in Norman, OK. The testbed has two parts, one that predicts hazardous events from a few hours out to a week in advance, and another part to predict the hazards on a small scale over the course of the next few hours. NWS staff members from around the country are brought in each spring during the 6 to 8 week experiment period, to analyze the new concepts and use them in a simulated operational environment. One of our lead forecasters, James Auten, will be participating in this experiment in early May. More information on the Hazardous Weather Testbed is available at <http://hwt.nssl.noaa.gov>.

## “Turn Around, Don’t Drown”



Flooding in Kincaid in late December. (Image from WICS-TV)


Last year, 14 people died across Illinois due to flooding, the highest total in nearly 50 years. This included 10 people during the record flooding shortly after Christmas. Most of these were due to people driving through flooded roads.

Flooding is the 2nd leading cause of weather-related fatalities in the U.S., following heat deaths. On average, 95 people die each year across the nation due to flooding. More than half of these occur from vehicles that are caught in flood waters,


including people that drive around barricades onto flooded roads.


People often underestimate the power of flowing water. It’s hard to tell how deep the water is, or how intact the road is underneath. Even heavier vehicles such as pickup trucks and SUVs can be carried away by only 18-24 inches of flowing water.


Simply put, **don’t drive across flooded roads**. Visit <http://tadd.weather.gov> for additional resources.




**Don't underestimate the power of water!**









6 inches of fast-moving water can knock over and carry away an adult.



12 inches of fast-moving water can carry away a small car.



18-24 inches of fast-moving water can carry away most large SUVs, vans and trucks.





We are looking for children to draw a picture of their favorite type of weather or weather scene. NWS's Owlie Skywarn's Weather Art Contest will recognize children who have created images of weather to be used in Owlie Skywarn's "The Weather Outside My Window" online book.

Winning artwork will be showcased throughout the new "The Weather Outside My Window" book featuring Owlie Skywarn and shared on NWS's social media.

The contest is open to children from 5 to 12 years old. **All entries must be original work.**

Please provide your illustrations in one of the following formats:

- Scan your pictures and send them to [owlie.skywarn@noaa.gov](mailto:owlie.skywarn@noaa.gov). Each scanned illustration must be submitted as a JPEG file.
- Mail your original work to the following address. Must be postmarked by May 20, 2016:

**NWS Office of Communications/Mary Fairbanks  
1325 East-West Highway SSMC2 Room 14472  
Silver Spring MD 20910**

Be sure to include your first name, age, city you live in, and caption describing your picture. NOAA/NWS will have unrestricted use of all submitted artwork. Please note all artworks will be available for public viewing.

**The submission deadline is May 20, 2016.**

**In submitting the artwork for this contest, you have accepted all rules and requirements and understand that the NOAA/NWS, has the right to use all submitted artwork in any future media, online, and print materials.**

Color illustrations are requested. **Entries not meeting the above requirements will be disqualified.** Additional NOAA websites may also consider publishing the artwork. There are NO monetary awards for this contest.

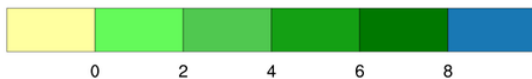
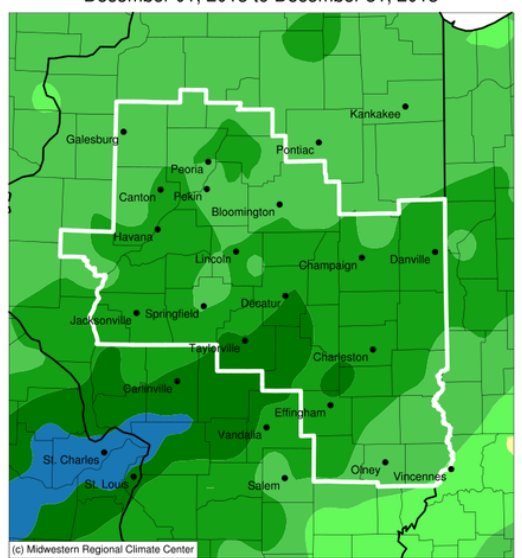
This contest is being sponsored by NOAA's National Weather Service Office of Communications. For more information, please email [owlie.skywarn@noaa.gov](mailto:owlie.skywarn@noaa.gov).

## A Mild and Wet Winter Season

With one of the strongest El Niños on record occurring over the winter, the forecast was for a warmer and drier winter over central Illinois. The “warmer” portion did verify correctly, with temperatures averaging 4 to 7 degrees above normal for meteorological winter (December through February). Precipitation ended up being above normal; however, this was mainly because of significant amounts of rain that occurred during the last week of December. The two maps below, from the Midwestern Regional Climate Center (MRCC), show the departure from normal of precipitation in December (left map), and collectively for January and February (right map). Totals for December averaged 4 to 6 inches above normal in many areas, while most of the area averaged 2 to 3 inches below normal for the remainder of the winter months.

Accumulated Precipitation (in): Departure from 1981-2010 Normals

December 01, 2015 to December 31, 2015

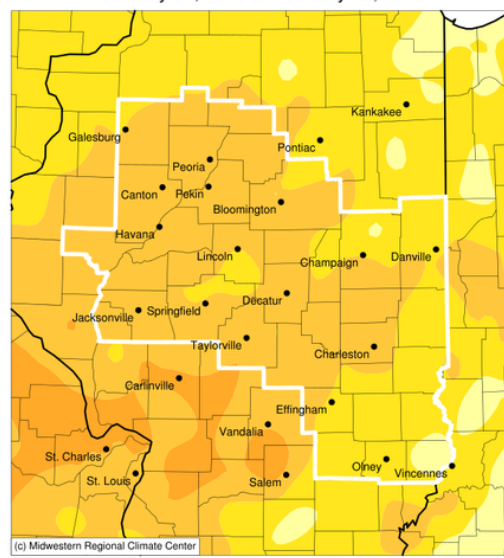


Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI,

Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
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Accumulated Precipitation (in): Departure from 1981-2010 Normals

January 01, 2016 to February 29, 2016



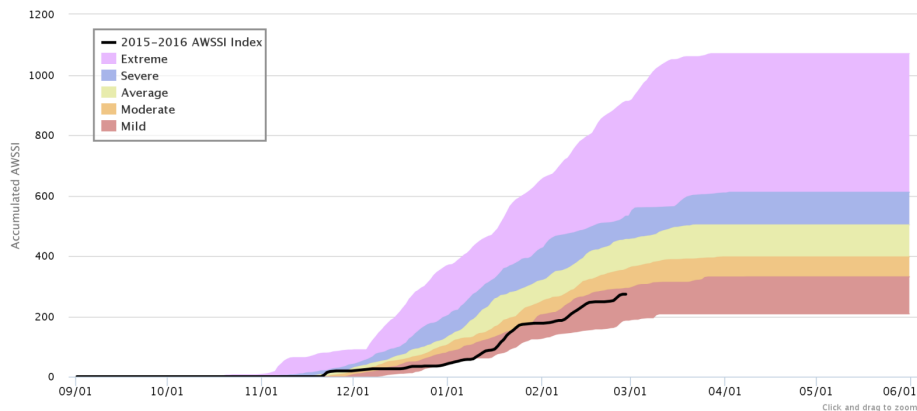
Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Missouri FSA, Missouri Mesonet,

Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
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With the warmer temperatures resulting in more rain-producing storm systems, snowfall was well below normal. Most of central Illinois averaged 10 to 15 inches of snow, which is 5 to 10 inches below normal.

2015-2016 AWSSI Index: "IL - Urbana"

Season: 2015-11-21 to 2016-02-28, 100 days



The MRCC’s Accumulated Winter Season Severity Index compares the winter to climatology in terms of severity of temperature, snowfall, and snow depth. The chart at left is for Urbana, but is fairly representative for much of central Illinois. The 2015-16 winter season was classified as “mild” on this index; comparatively, the previous winter was categorized as “extreme”.



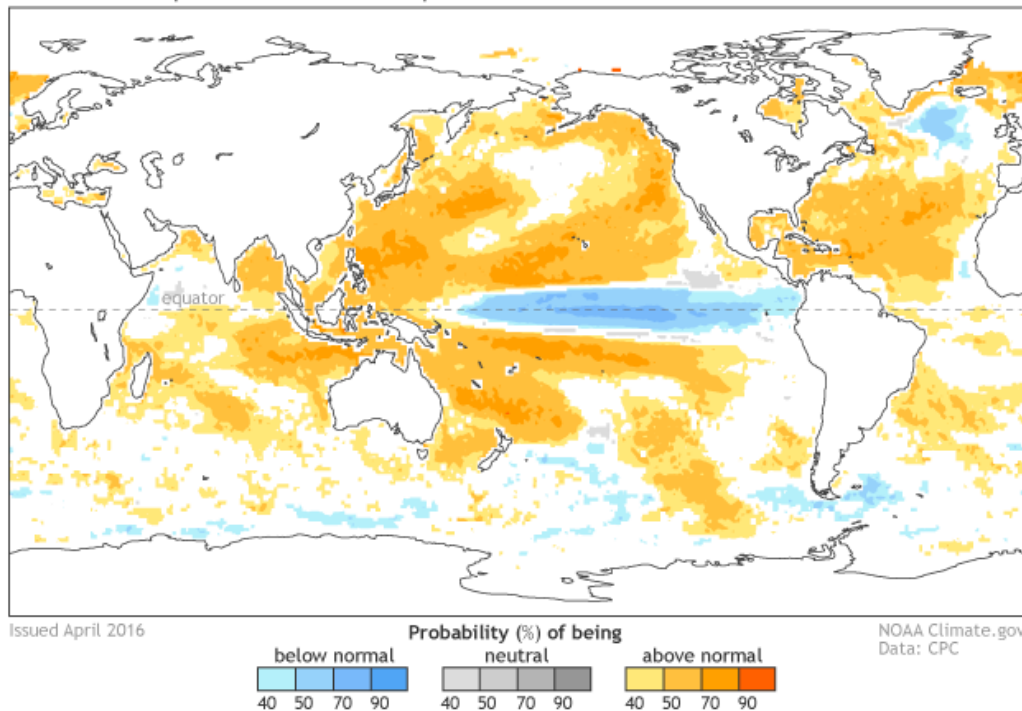
## El Niño/La Niña Update

The strong El Niño of 2015-16 is on its way out. Sea surface temperatures in the equatorial Pacific have been cooling since their peak near the end of 2015, and should fall to near normal values this summer. However, the trend is leaning toward the development of a La Niña during the second half of the year, with chances

exceeding 50% by late summer. La Niña is a cooler-than-average surface water temperature over the equatorial Pacific, and often follows an El Niño. The map at right shows the sea surface temperature forecast for the fall, and the area most favored to be below normal (blue shades).

On a national scale, La Niña can enhance hurricane formation in the Atlantic basin, while suppressing them in the eastern Pacific. In Illinois, impacts of a La Niña are not as clear cut due to the small sample size of stronger ones, but autumn tends to be cooler in the north and wetter in the southeast.

Sea surface temperature forecast for Sep–Nov 2016



## Winter Climate Statistics

(December 1 through February 29)

### Peoria:

- Average temperature: 33.6°F (6°F above normal)
- Total precipitation: 7.69" (1.70" above normal)
- Total snowfall: 10.5" (9.7" below normal)
- 4th mildest winter and 17th wettest on record

### Lincoln:

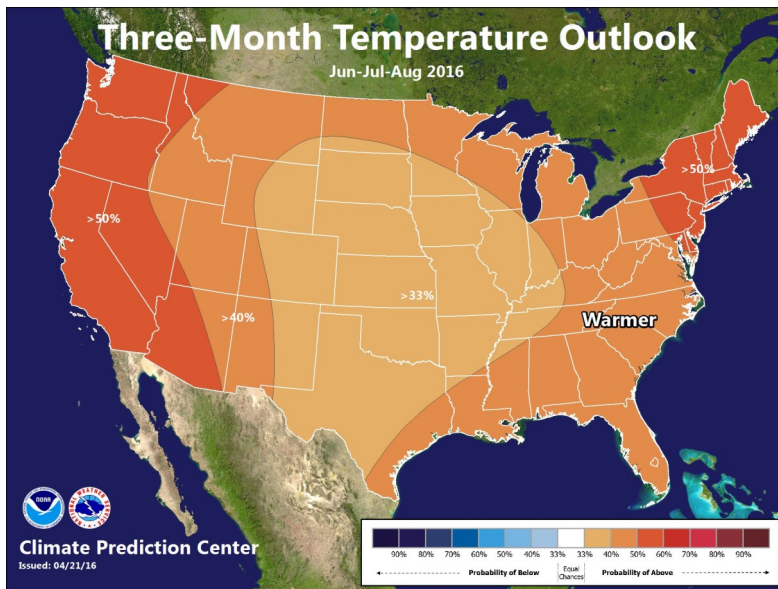
- Average temperature: 33.2°F (4.7°F above normal)
- Total precipitation: 9.05" (2.66" above normal)
- Total snowfall: 11.3" (6.6" below normal)
- 11th mildest winter and 12th wettest winter on record

### Springfield:

- Average temperature: 35.5°F (6.1°F above normal)
- Total precipitation: 8.89" (2.74" above normal)
- Total snowfall: 15.1" (2.4" below normal)
- 6th mildest winter and 18th wettest winter on record



## Summer Temperatures Favored to Average Warmer than Normal



The latest summer temperature outlook, issued April 21st by the NWS's [Climate Prediction Center](#), is shown at left. It favors temperatures averaging above normal across all of the "lower 48" states for meteorological summer (June, July, and August), reflecting some of the potential development of La Niña. No significant precipitation trends are shown over the Midwest, with equal chances of above normal, near normal, or below normal rainfall.

Localized climate outlooks are available for many locations in central and southeast Illinois, and show the specific chances for above

normal, below normal, or near normal temperatures. They generally indicate about a 40% chance of warmer than normal conditions. Specific values are available on our climate web page at

[http://w2.weather.gov/climate/calendar\\_outlook.php?wfo=ilx](http://w2.weather.gov/climate/calendar_outlook.php?wfo=ilx)

## Radar Updates Allow for More Frequent Low-Level Updates

Changes to the Lincoln radar, which originally were done a couple years ago, allowed for a feature called "Supplemental Adaptive Intra-Volume Low-Level Scans" (SAILS for short). In SAILS, the radar would interrupt its normal bottom-to-top scan in the middle to rescan the lowest elevation level, to increase the frequency of data (normally available every 4 minutes in severe weather). In the latest version of SAILS, which we recently installed, we can control the number of times this rescanning occurs, allowing for low-level updates potentially as frequently as every 75-90 seconds. As some smaller tornadic circulations could form and dissipate between the normal scan frequencies, the increased update times are

expected to help us detect these smaller circulations quickly, aiding in warning decisions.

### Upgrading the SAILS on Doppler Radar

*Supplemental Adaptive Intra-Volume Low-Level Scan*

The radar normally scans from lowest to highest elevation. When the radar operates in SAILS mode, it goes back periodically to rescan the lowest elevation, before resuming the normal sequence.

Frequent low-level scans help detect tornadic circulations faster.

Update frequency of lowest elevation scan (using pattern 12 or 212):

- No SAILS – 4 minutes
- 1 rescan – 2 minutes
- 2 rescans – About 1.5 minutes
- 3 rescans – About 75-90 seconds

Photo by Shae Cohan  
National Weather Service



## Central Illinois Lincoln Logs

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## End of an Era

For many decades, products issued by the National Weather Service were issued using all capital letters.

This dates back to the days when weather reports were



sent over teletypes. Teletypes were basically typewriters hooked up to phone lines. Originally, they only allowed for use of upper case letters and limited punctuation marks. Efforts to eliminate this format have periodically occurred over the last 20 years, especially given modern Internet and E-mail protocols that consider use of all capital letters to be “shouting.”

Over the last few years, several NWS offices have tested using upper and lower case in certain products, to determine if there were any lingering issues with the end users’ equipment not being able to handle this format. Our office has been involved, as we have been using mixed case in our Area Forecast Discussions, Regional Weather Summaries, Flood Warnings and Flood Statements (for river-related issues), and Public Information Statements. Any lingering issues have been resolved, and the entire NWS will begin to transition to mixed case on May 11.

The all-caps format will not become totally obsolete; forecasters will have the option to use them in weather warnings to emphasize threats during extremely dangerous situations. Also, there are certain products with international implications, such as with aviation and shipping, where international agreements standardizing product formats will continue to require all-caps.

### Phased implementation of changes:

- **May 11:** Area Forecast Discussion, Public Information Statement, Regional Weather Summary
- **July-August:** Tornado and Severe Thunderstorm Watches and Warnings, Flash Flood Warnings, Flood Advisories
- **Late Fall/Early Winter:** Flash Flood Watches, Winter Weather Watch/Warning/Advisory, Non-Precipitation Watch/Warning/Advisory (e.g. dense fog or smoke), Hazardous Weather Outlook, Zone Forecasts, Fire Weather Forecasts