Central Illinois Lincoln Logs

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Tornado and Flooding Trends in Central and Eastern Illinois: Preparedness for Severe Storms is Important All Year

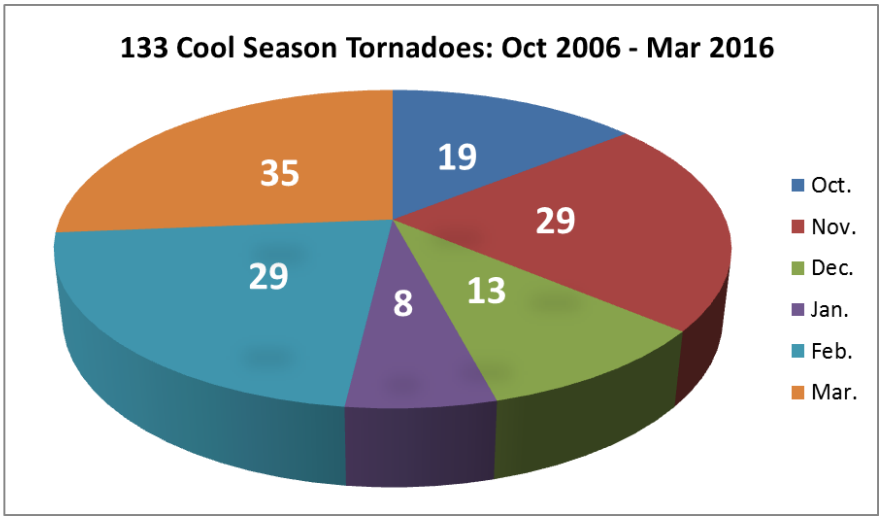
By: Chris Miller, Warning Coordination Meteorologist

Inside this issue:

Autumn activities typically include harvesting crops, weatherproofing homes and automobiles, yard-work and outdoor chores, and getting ready for the next inevitable season – winter. Every year in late autumn, specifically the first full week prior to Thanksgiving, the National Weather Service offices in Illinois share winter preparedness tips to help people get ready for the cold, snowy, icy weather that will soon follow.

However, recent trends in tornadoes and flooding the past 10 years have taught us that we need to be prepared for more than just snow and ice during the "Cool Season". Many people (including a large percentage that took our informal weather preparedness poll at the 2016 Severe Weather Awareness Expo in Springfield on September 17th) believe that once the spring and summer months are over, then the threat for tornadoes and severe thunderstorms ends.

Tornado reports across the state of Illinois indicate that 490 twisters have been reported between October 2006 and September 2016. If we define the "Cool Season" as the six months from October through March, and the "Warm Season" as April through September, then 73% of the tornadoes (357) occurred in the Warm Season, with 27% (133) in the Cool Season. In fact, we can say that this actually occurred within nine years since NO tornadoes were reported in Illinois during the October 2009 to March 2010 cool season.



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Preparedness for Severe Storms is Important All Year *(cont.)*

These numbers may not seem surprising until you consider that it took 22 Cool Seasons (October 1984 through March 2006) to get the same number of tornadoes (133). A portion of this increase can be attributed to better reporting of the "Weak" tornadoes (EF-0 & EF-1) the past 10 years. However, a majority of it is due to an increase in warmer, more humid days in the Cool Season – which combined with stronger winds aloft (which is typical during the Cool Season) – leads to more severe thunderstorms, tornadoes and flash floods, despite what the calendar may say.

Three recent Cool Season months – November 2013 (25 tornadoes), February 2014 (12 tornadoes) and October 2014 (8 tornadoes) – set all-time records for the number of tornadoes during those respective months. Notable tornado and severe weather outbreaks that occurred the past 10 years during the Cool Season in Illinois include:

- **January 7, 2008** – Three tornadoes resulted in 5 injuries and more than $4 million in damages. The strongest was an EF-3 tornado in extreme northern Illinois, which tracked from near Poplar Grove (Boone County) toward Harvard (McHenry County).

A large pile of snow is covered by tornado debris after an EF-3 tornado struck Boone and McHenry Counties on January 7, 2008.

- **March 8, 2009** – A total of 19 tornadoes were reported across the state of Illinois – for the eighth highest number of twisters in a single day since 1950. Five people were injured and more than $3 million in damage was reported. Three of the tornadoes were rated as EF-2: northern Wayne County (near Enterprise & Wynoose), Jersey County (near Rosedale), and Washington County (near McKinley & Oakdale).

- **December 31, 2010** – The "New Year's Eve Storm" produced four tornadoes, including an EF-3 tornado which injured one person and did more than $12 million in damage in the Lake Petersburg area (Menard County). The storms also produced damaging winds and large hail in a large part of central and southwest Illinois.

- **February 29, 2012** – The Harrisburg EF-4 tornado was one of six early morning tornadoes that occurred between 4 and 6 am in southern Illinois. Eight people were killed and 108 injured.

- **November 17, 2013** – This was the fourth largest tornado outbreak in Illinois since 1950 with 25 tornadoes in one day, including EF-4 tornadoes in Washington and New Minden, and EF-3 tornadoes in Gifford, near Villa Grove/Broadlands, and Brookport/New Liberty. Eight people were killed, more than 180 injured and greater than $1.3 billion in damages.

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Preparedness for Severe Storms is Important All Year (cont.)

- **February 20, 2014** – 12 tornadoes were reported in central and southern Illinois, with two strong EF-2 twisters (Martinsburg/Detroit in Pike County and north of Tower Hill in Shelby County) which injured two people and caused around $2 million in damages.

- **October 13, 2014** – Eight tornadoes in central and southern Illinois did nearly $1 million in damage. The strongest was an EF-2 tornado near the Shelby/Macon County line.

- **December 23, 2015** – Severe storms produced six tornadoes, dozens of wind damage reports and heavy rain across much of Illinois. The heavy rain from this event set the stage for extensive flash flooding in the southern half of Illinois between **December 26th and December 31st**, and prolonged river flooding through the third week of January 2016. The flooding claimed 11 lives in central and southern Illinois.

The numbers show that in central and southeast Illinois we need to **be prepared for the dangers of tornadoes, flooding and severe thunderstorms ALL YEAR LONG**! Here's **what YOU CAN DO during the Cool Season to be prepared:**

⇒ Continue to **maintain awareness for the threats of tornadoes and flooding**, especially when there are thunderstorms in the forecast during the fall and winter.
⇒ **Be ready to seek secure shelter** when you are alerted to tornadoes and severe thunderstorms
⇒ **Use various methods to get weather alerts**! Don't just rely on one method – especially just outdoor warning sirens. Smart phones have Wireless Emergency Alert capability to warn you of tornadoes and flash floods close to your area – even when traveling. Check social media accounts – particularly those updated by the NWS. Tune to your local radio and TV stations. Get a weather alert radio – which makes a great gift during the holidays!

Left: An EF-4 tornado enters Washington, IL on 11/17/2013. Photo by Anthony Khoury.

Above: Damage from an EF-3 tornado near Petersburg on 12/31/2010.

NWS Soliciting Feedback on Hazard Simplification

NWS Headquarters is asking for input on the first stage of its Hazard Simplification project.

Overview

For decades, the NWS has used the Watch, Warning, and Advisory (WWA) system to alert users of forecasted hazards. In many ways, this system has been highly effective in protecting life and property. However, some users find the WWA terms confusing. Also, users are sometimes confused about how to interpret and distinguish among the large number of individual WWA "products" (e.g., Wind Advisory, Flood Watch, Winter Storm Warning, etc.). Mapping of the hazards on our web pages can also be confusing, as there are 122 different colors used for the various hazards, some of which are nearly indistinguishable from one another.

Based on this initial feedback, and with support from social and behavioral scientists, NWS is exploring alternatives for more effectively communicating our hazard messages. The NWS is not making any changes to the operational system at this time but we are carefully considering a number of options, as follows:

- Keep the current WWA system as is;
- Make small to moderate changes; or
- Make a transformational change to the WWA system.

Given that the WWA system has been in place for a very long time, it will be important to weigh any and all new ideas carefully, and to consider making initial small improvements while we continue to investigate the possibility of larger change. To support both efforts, we are collecting public comments on these options as we move forward.

Some methods being considered are:

- **"Repairing" the system:** This is defined as a relatively small change that could be implemented by altering our policy and/or making minor adjustments to our current weather and water hazard messaging system.
- **"Revamping" the system:** This is defined as a larger change that would require significant policy revision, could result in an overhaul and/or revisualization of the current hazard messaging paradigm and could require major software adjustments. A Revamp would need to be widely advertised in advance, and would also require extensive education and outreach to facilitate any transition.

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NWS Soliciting Feedback on Hazard Simplification (cont.)

Other Data Collection Efforts

As we carry out our Repair and Revamp comment collection process, we will also collect other information that is critical to the project.

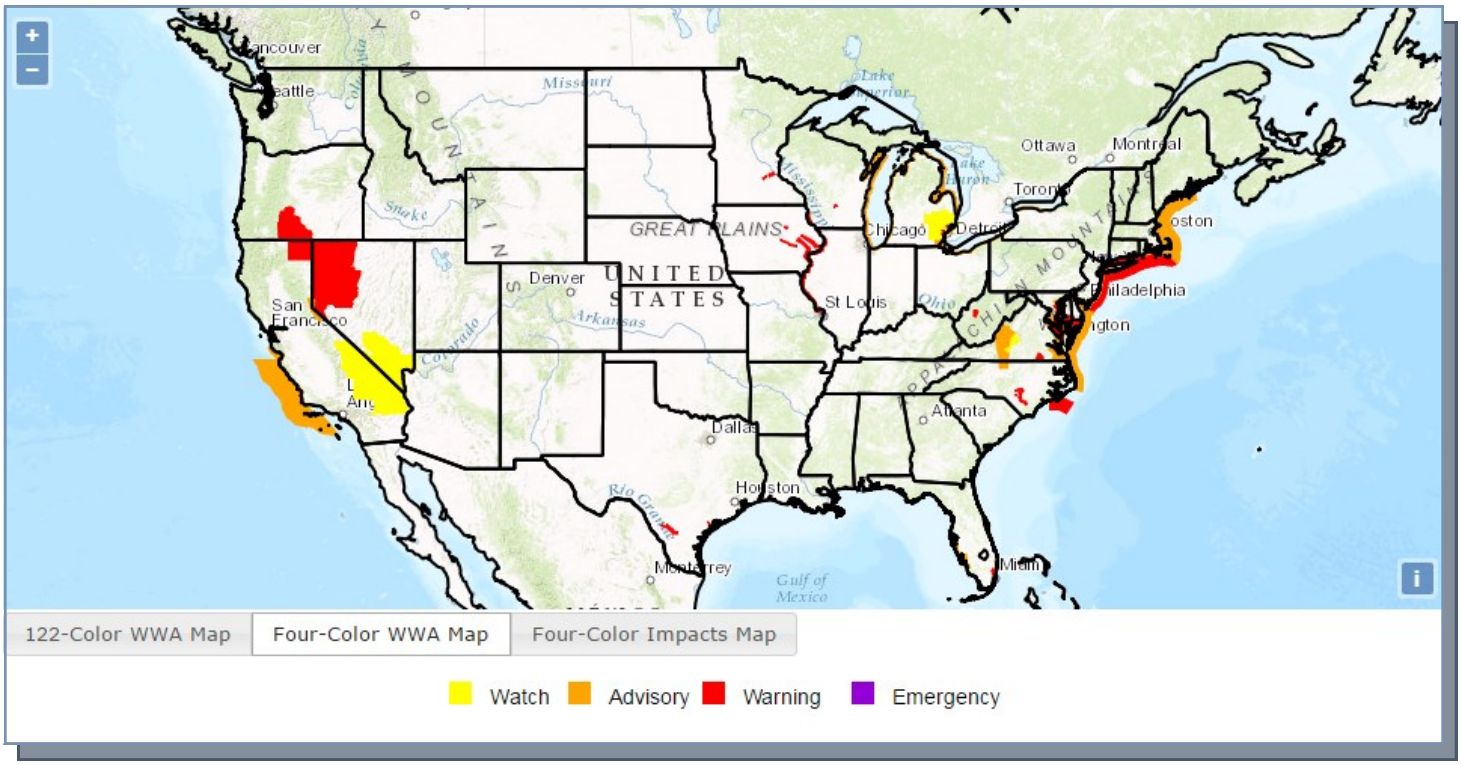
First, we will be conducting a survey to be completed by federal, state, and local government partners, and private organizations to assess the level at which the WWA system is "institutionalized" into operational policies and law. We are calling this survey the "WWA Decision-maker Survey".

Second, based on recurring feedback, we will also conduct a generalizable public survey for all demographic groups to better understand whether or not we should strongly consider permanent changes to the WWA system. Such changes could include modifications to our current WWA headlines, new approaches to communicate the transition from one hazard type to another, and the use of color to delineate differences in the impact and/or certainty of various hazards.

How You Can Participate

We will be asking for public comment on a variety of proposed Repair and Revamp ideas. We will be advertising the opportunities for comment on this website, social media and via a variety of mailing lists. This page will be updated to include links to new comment opportunities as they become available.

If you are interested in viewing or commenting on our ideas, please visit the following Internet address: http://www.weather.gov/hazardsimplification/



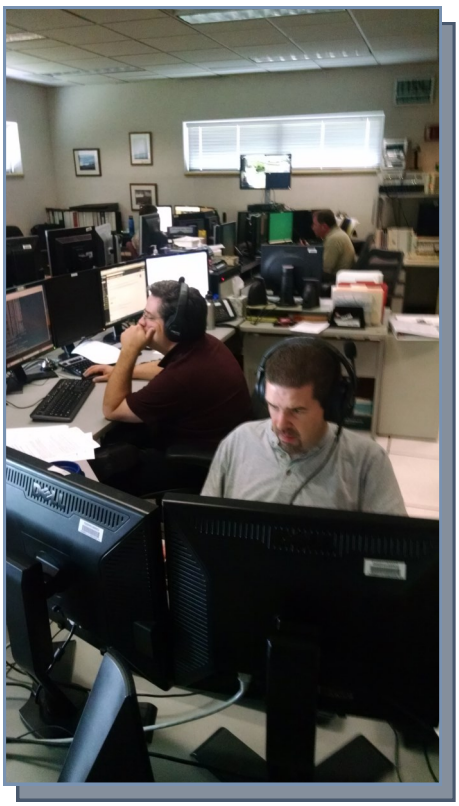
An example of a prototype hazard map reducing the 122 individual product colors down to 4 categories (watch, advisory, warning, emergency). Real-time map examples are available at http://www.weather.gov/crh/alt_wwa

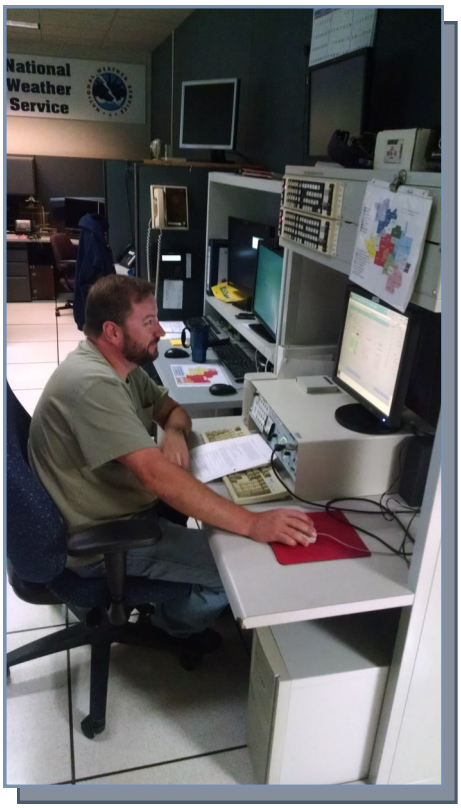
NOAA Weather Radio System Upgrade

By: Ed Martin, Electronics Systems Analyst

In July, the Console Replacement System (CRS) that was used to program weather radio transmitters was replaced by a new system. CRS was installed in the summer of 1998. CRS was a separate system consisting of 2 main processors and 3 front end processors, and was connected to our AWIPS system via a network bridge. CRS was shut down for the final time on September 9. The new system is called Broadcast Message Handler (BMH).

BMH is integrated into the AWIPS system and removes many points of failure. Another benefit of the BMH upgrade is an improved operating system, and better flexibility in monitoring the system. The CRS system used an antiquated Unix operating system, and because BMH is now part of AWIPS, it uses the latest operating system. The BMH system can be monitored from any of our operational workstations, whereas the CRS system could only be monitored at two locations. BMH is supported 24/7 by a network control facility. BMH also uses an improved voice system. The BMH system required many hours of configuration, alignment and testing.





Left picture: Electronics technician Mark Stacey works on aligning the new equipment's audio levels.

Center picture: Meteorologists Chris Geelhart and Patrick Bak work on configuring the software and programming the pronunciation dictionaries.

Right picture: Electronics technician Kyle Clark powers down the old system for the last time.

White Oaks Mall Severe Weather Awareness Expo

By: Chris Miller, Warning Coordination Meteorologist

White Oaks Mall / Simon Properties Inc. in Springfield hosted their first ever Severe Weather Awareness Expo on Saturday, September 17th. NWS Lincoln staff members participated in the three hour event with representatives from the American Red Cross, the Sangamon Valley HAM Radio Club, and meteorologists Joe Crain and Thomas Patrick from WICS-TV (News Channel 20) in Springfield.

The most popular section of the NWS booth was the Flood Plain model, led by service hydrologist Darrin Hansing. The model simulates the impacts of differing intensities of rainfall on various landscapes and drainage basins. Participants were able create flash flood and flood scenarios, and then visualize what the impacts would be on rivers, dams, and urban settings.

Other activities at the NWS booth included an informal weather preparedness poll, a severe weather warning simulation program, a weather balloon/radiosonde display, and numerous preparedness handouts. NWS Lincoln Meteorologist-in-Charge, Ernie Goetsch, Lead Forecaster Daryl Onton and Warning Coordination Meteorologist, Chris Miller were also on hand to answer questions and interact with visitors.

Joe Crain, from WICS-TV conducted a Facebook Live session for more than 20 minutes at the beginning of the Expo, interviewing all of the NWS Lincoln participants. The Red Cross and Sangamon Valley Radio Club had preparedness related giveaways and information on hand for visitors.

Nick Strause, General Manager of the White Oaks Mall / Simon Properties hosted the event to stress the importance of preparedness in central Illinois communities. White Oaks Mall / Simon Properties has been an NWS StormReady certified business for the past seven years because of their commitment to the safety of their patrons, employees and tenants when it comes to high impact, hazardous weather events. In fact, Simon Properties, Incorporated – based in Indianapolis, achieved the goal of having every one of their properties declared StormReady across the country this past summer!

Chris Miller (right), Warning Coordination Meteorologist, conducts a Facebook Live interview with WICS-TV meteorologist Joe Crain.

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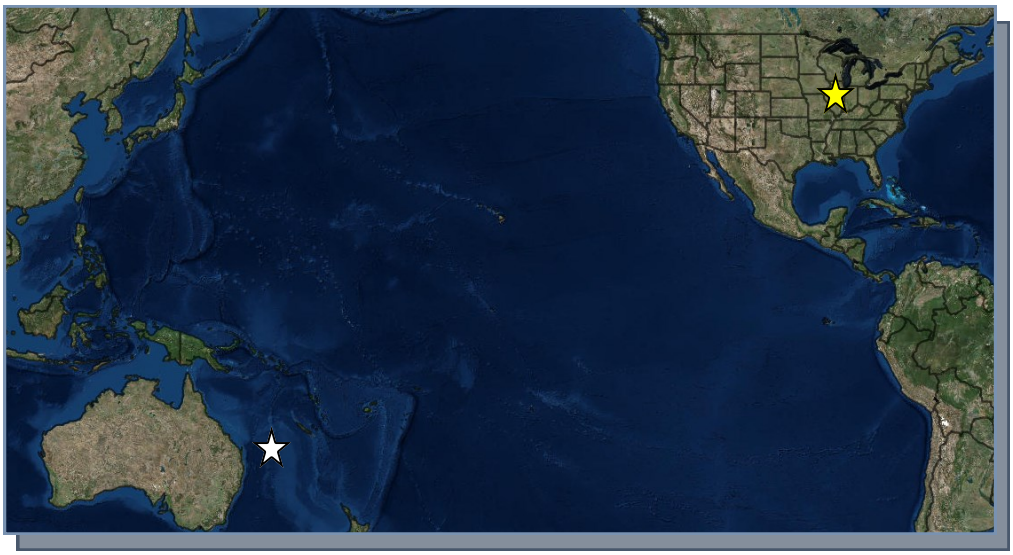
Visit from Australian Bureau of Meteorology

By: Chris Miller, Warning Coordination Meteorologist



Lord Howe Island is 5.62 square miles in size, located in the Tasman Sea between Australia and New Zealand. It has a population of 360 people.

Despite differences in seasons, high impact weather types, and the direction the wind blows around high and low pressure systems, Lincoln NWS staff members learned there are numerous similarities between the Australian Bureau of Meteorology (BOM) and the National Weather Service. Field Office Manager Amy Debattista, from the BOM office at Lord Howe Island, New South Wales, compared notes with several of our staff members during her visit on May 27. “We are also going through a reorganization of the entire Australian Bureau of Meteorology by looking at our future goals and the needs of our partners,” said Debattista. “The automation of remote sensing, improved forecast models and satellite imagery, and support for our core partners, particularly those in aviation, is driving the change in our agency.”

The National Weather Service is currently undergoing an internal evaluation on its future operations model. Ernie Goetsch (Meteorologist-in-Charge) and Chris Miller (Warning Coordination Meteorologist) shared how this evaluation in the process of addressing many of the same things with Debattista. “It was fascinating to compare the future of meteorological services between the BOM and NWS,” said Miller. “Listening to Amy talk about the changes being considered by the Australian BOM, really drove home the message that the worldwide meteorological community is adapting sooner than later to stay relevant in the eyes of our core partners.”

Debattista was extremely impressed with NWS Doppler radar, its update frequency, and the number of low-level elevation scans available. She said that most radar in Australia only samples as low as 5° elevation (as compared to 0.5° with the NWS Doppler radars) due to a combination of terrain issues, their primary use as an aviation tool, and to detect the beginning of higher based convection. Tornadoes rarely occur in Australia, so she stated it is not as important to scan the lowest elevations, compared to the United States. She also mentioned that most of the upper air systems used by the BOM are automated weather balloon/

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Visit from Australian Bureau of Meteorology *(cont.)*

radiosonde launching systems, primarily for safety purposes, since every site uses hydrogen gas for balloon inflating. Australia does not have their own satellite systems, so they rely heavily on agreements with other government agencies, particularly Japan, when assessing high impact weather systems such as hurricanes (which are referred to as "cyclones" in the "Land Down Under").

Amy Debattista from the Australian Bureau of Meteorology stands outside our office with Ernie Goetsch, Patrick Bak, John Parr, Chris Miller, and Kirk Huettl of our office.

Debattista pointed out that Australian forecasters use a computer system very similar to the NWS's "AWIPS" system, with a graphical editing software package to create forecasts out to five days. She stated that they rely heavily on computer models produced by the U.S. and Europe to do most of their forecasting. Many Australian states have emergency management coordinators, but she said that the main users of forecast information were their public and private aviation partners who need detailed information about flying conditions in remote areas of the country. "We provide a large amount of information to our aviation partners in Australia. However, I am very impressed with the amount and types of forecast data NWS have available to our aviation partners in Australia. I am also very impressed with the amount and types of forecast data NWS have available to the public and their partners in emergency management," said Debattista.

White Oaks Mall Severe Weather Awareness Expo *(cont.)*

White Oaks Mall also became an NWS Weather-Ready Nation (WRN) Ambassador in May 2016. This program formally recognizes NOAA partners who are improving readiness, responsiveness and resilience against extreme natural hazards in our country. For more information about the WRN Ambassador program visit our web page at: http://www.nws.noaa.gov/com/weatherreadynation/ambassadors.html

Service hydrologist Darrin Hansing demonstrates the flood plain model for an expo visitor and News Channel 20.

Benjamin Franklin Award to be Presented in October

By: Billy Ousley, Data Acquisition Program Manager

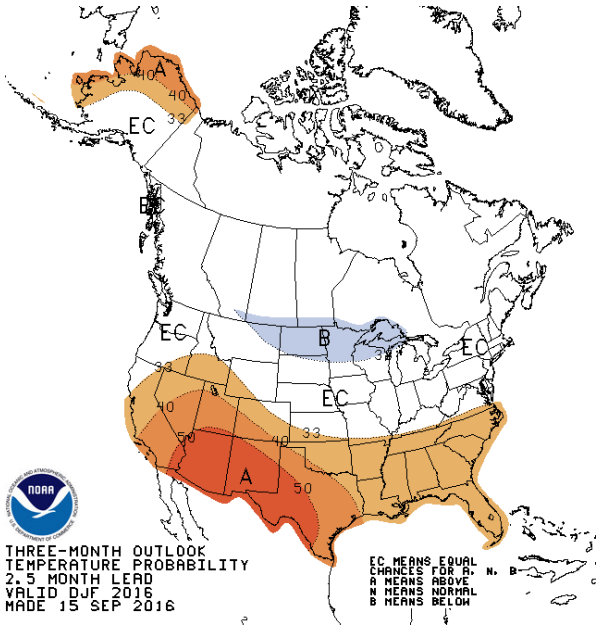
On October 18, officials from the National Weather Service office in Lincoln will present Bill and Dorothy Bullard of Morrisonville (Christian County) with the Benjamin Franklin Award in Morrisonville. This award is given to cooperative observers completing 55 years of service. Mr. and Mrs. Bullard and their family have provided the NWS Lincoln office with weather data for over 20,000 days during that period! Said Billy Ousley, NWS Lincoln Data Acquisition Program Manager, "Bill and Dorothy Bullard are truly unique Americans who stand out among the 11,000 cooperative observers nationwide."

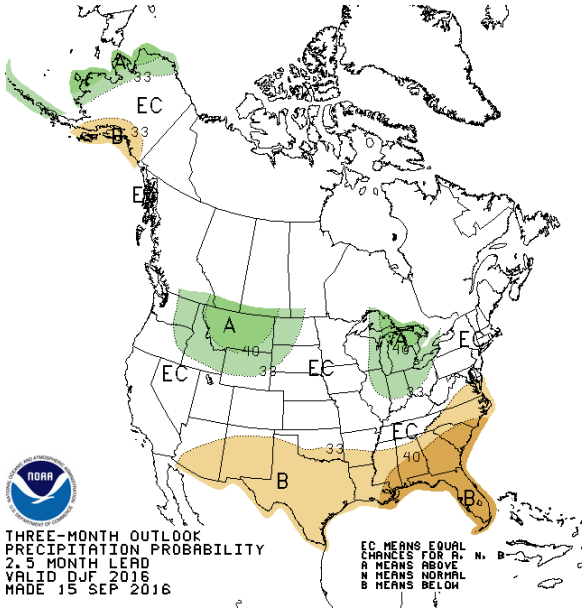
This award was created in honor of Benjamin Franklin (1706-1790). Like everyone else, Franklin was affected by weather; but unlike most people of this time, he tried to explain the reasons for various weather related phenomena, and even discovered some ways to predict the weather. The Benjamin Franklin award is signed by the NOAA Assistant Administrator of Weather Services (Director of the NWS), Dr. Louis W. Uccellini. Bill and Dorothy Bullard have also been recognized several other times for various awards. Among them is the John Campanius Holm Award, which is granted each year to a maximum of 25 cooperative observers across the nation for outstanding accomplishments in the field of cooperative observations. Holm was the first person known to have taken systematic weather observations in the American colonies in 1644 and 1645.

Additionally, Mrs. Bullard has also received the Thomas Jefferson Award, the highest and most prestigious award bestowed on Cooperative Weather Observers. The Thomas Jefferson award is named for our nation's third President, who kept an almost unbroken series of weather records from 1776 to 1816. This award is given to very few observers each year, usually not more than five across the United States, for outstanding and unusual achievements. All candidates for the Jefferson Award must have received the Holm Award in the past and allow five years to pass after receiving the Holm Award before observers are eligible for the Jefferson Award.

Bill and Dorothy Bullard at the award ceremony after receiving the Edward Stoll Award, given to observers who have completed 50 years of service.

Winter Outlook as of September 15





The Climate Prediction Center issued its latest long-range outlooks on September 15. The outlook for meteorological winter (December 1 through February 28) does not favor any particular temperature trend over our area, although most of the southern half of the contiguous United States has better odds for a milder than normal winter (orange and red shades in the top left map). The precipitation outlook favors a wetter than normal winter (green shades on the right map) over the Great Lakes and northern Rockies, with drier weather over the southern U.S.

Earlier in the summer, it was looking like La Niña conditions would likely affect the winter weather. However, the latest guidance from early September indicates only around a 40% chance of La Niña forming.

Summer Climate Statistics

(*June 1 through August 31)*

Peoria:

- Average temperature: 76.1°F (2.4°F above normal)
- Highest temperature: 96°F on June 15
- Total precipitation: 15.90” (5.28” above normal)

Lincoln:

- Average temperature: 74.4°F (1°F above normal)
- Highest temperature: 93°F on June 10 & 15, and July 21
- Total precipitation: 17.49” (4.19” above normal)
- 8th wettest summer on record

Springfield:

- Average temperature: 77.3°F (3.1°F above normal)
- Highest temperature: 95°F on June 15, 22 & 25
- Total precipitation: 22.26” (10.62” above normal)
- 2nd wettest summer on record, and 5th wettest of any season on record

Central Illinois Lincoln Logs

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GOES-R Satellite Preparing for Launch

NOAA's GOES-R satellite arrived at NASA's Kennedy Space Center in Florida on August 22, aboard a U.S. Air Force C-5 Galaxy cargo jet. It is scheduled to be launched on November 4 at 4:40 pm CDT, aboard an Atlas V541 rocket launched from Cape Canaveral.

GOES-R will be the first satellite in a series of next-generation NOAA Geostationary Operational Environmental Satellites (GOES), which will also include GOES-S, T, and U. These satellites will provide significant enhancements for weather forecasters at NOAA's National Weather Service, giving them the ability to observe the Western Hemisphere in near-real time. GOES-R will offer three times more spectral channels, four times better resolution, and provide five times faster scans of the Earth compared with current GOES satellites.

GOES-R, which will be known as GOES-16 once it reaches orbit, will become operational following a one-year checkout and validation phase. The satellite's operational location (either 75 degrees West or 137 degrees West) will be determined by NOAA's Office of Satellite and Product Operations based on the health and performance of the current GOES constellation.

Right: Improvements with the GOES-R satellite compared to the previous satellite network.

Below: The GOES-R satellite arrived at NASA's Kennedy Space Center Shuttle Landing Facility on August 22, aboard a U.S. Air Force C-5 Galaxy cargo jet. Image courtesy NASA/NOAA.