Central Illinois Lincoln Logs

National Weather Service, Lincoln, IL

Winter 2006 **Volume 9, Number 3**

In This Issue

Thunder in Winter?

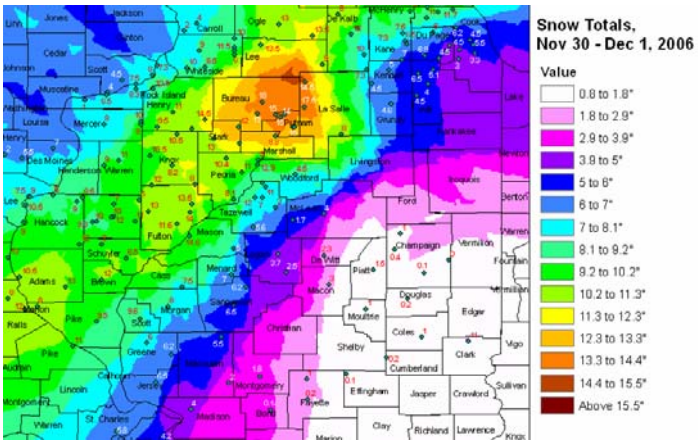
By: Ed Shimon, Lead Meteorologist

Did you think thunder was only for the summer? Not necessarily! Winter storms can become so strong that lightning develops in the billowing winter storm clouds. The winter version of the thunderstorm is called “thundersnow.”

Thundersnow lightning develops the same way as summertime thunderstorms. Ice crystals collide and shatter, and this creates positively and negatively charged particles. The charged particles gather in groups, especially at the base of the thunderstorm, and feel around toward the ground for a place to strike, usually a tall object with an opposing charge. Hopefully it isn’t you! So remember your lightning safety any time of year!

We ushered in the winter season this year with a tremendous winter storm on December 1st. For this storm there was such a clash of warm and cold air, and moist and dry air, that the atmosphere responded by generating thunder. It was so intense that the storm laid a swath of snow, sleet, and ice from Oklahoma to Michigan. Reports of thunder were recorded all along the path of the storm, and specifically across central Illinois.

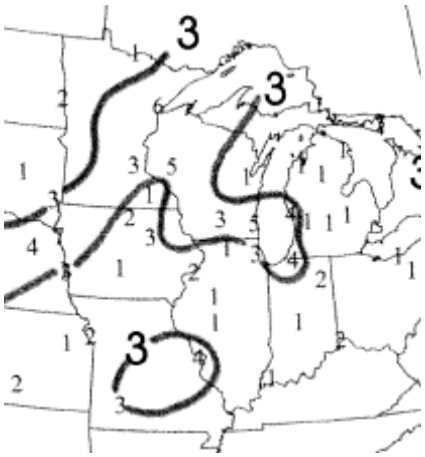
Snow storms with thunder have the potential to drop snow at rates up to 2 or 3 inches per hour. Also, sleet can quickly pile up 2 to 3 inches deep. This storm had both of those, but also went beyond that. It dropped freezing rain across a large portion of the Midwest, especially in areas from Decatur to Bloomington, in central Illinois. Ice accumulated on trees and power lines up to 1.5 inches thick. This caused the trees to snap and power lines to fall, knocking out power to thousands of people across central Illinois.



Snowfall totals in the main snow band ranged from 8 to 14 inches, which extended from Schuyler County, through Peoria and Stark Counties, and north toward Rockford. The snow fell on top of 2 inches of sleet, which added to the hazardous travel conditions across central Illinois. Areas farther south and east of the main snow band received less snow and sleet, and more ice from freezing rain.

The storm was an incredible sight to see, and generated a swirl of media interest, due

to the tremendous public impact from the snow and ice, and power outages. To learn more about this storm, go to a special section of our website at http://www.crh.noaa.gov/ilx/?n=2006-Dec01



Thundersnow is not very common and typically occurs in central Illinois once every 30 years. Its occurrence increases to once every 10 years as you head southwest into central Missouri and north into Wisconsin and Minnesota. Below is a map depicting the 30 year average for the occurrence of thundersnow in the Midwest (during the period 1961 to 1990).

So if you find yourself in the midst of a winter time thunderstorm, consider yourself special, and get ready to grab your shovel!

Need for Preparedness Driven Home in 2006

By: Patrick Bak, Lead Meteorologist

The National Weather Service (NWS) conducts two preparedness weeks each year. Severe Weather Awareness Week occurs in the spring and Winter Weather Awareness Week occurs in the fall. The purpose of these two weeks is to remind people of the proper steps to take before, during, and after severe summer and winter weather events to enhance their safety and comfort. While it may seem repetitive to do these events each year, it is important to keep preparedness fresh in people's minds.

The need for preparedness was driven home across central and southeast Illinois in 2006. There were a record 72 tornadoes reported in the Lincoln NWS Office's County Warning Area (CWA) in 2006, breaking the previous record of 63 reported in 2003. Several of these tornadoes occurred during outbreaks on March 12th and April 2nd, both of which impacted the city of Springfield. Also, a major snow and ice storm impacted much of the CWA from November 30th -December 1st, resulting in a disaster declaration from the Governor for 22 of our 35 counties. In addition to the short term threats associated with these weather events, hazards and inconveniences lingered for several days due to power outages and debris.

For more information on weather safety and preparedness, please check the following page on our website: http://www.crh.noaa.gov/ilx/wxsafety.php

Severe Storm Spotters – Keeping an Eye on the Weather

By: Chris Miller, Warning Coordination Meteorologist

A record number of 124 tornadoes descended upon the state of Illinois in 2006 – nearly 60% of them right here in central and southeast Illinois (click here ***for a listing of the tornadoes in central Illinois during 2006***). One of the main reasons that there has been a dramatic increase in tornado reports the past ten years is because of dedicated, volunteer storm spotters who are keeping a watchful eye to the sky in their communities. This statement is bolstered by tornado statistics which show an increase in the weak, short lived tornadoes (F0 and F1). Typically these tornadoes will not be sampled well by the Doppler radar, which makes real time spotter reports critical for Tornado Warnings, and official storm report databases.

Skywarn Recognition Day

The NWS office in Lincoln participated in the 8th annual Skywarn Recognition Day on December 2. During this event each year, ham radio operators visit NWS offices and contact other ham radio operators around the world. Operators from the Lincoln office made 461 contacts during the event.

Volunteer ham radio operators work in NWS offices during severe weather. They relay information between the the NWS, storm spotters in the field, and emergency managers.

Northern Lights in Illinois

Meteorologist Mike Hardiman took this picture near Lincoln of the Northern Lights on Dec. 14. A giant solar flare erupted on Dec. 12, resulting in development of a geomagnetic storm.

It used to be said that these lights were reflections from the polar ice caps, or were lights from demons' lanterns as they searched for lost souls. They are actually caused by high-energy particles from the Sun entering the Earth's atmosphere. The particles collide with air molecules, causing them to vibrate. When they stop vibrating, they sometimes produce visible light, which can be colored green, violet, red, or white.

Northern Lights are fairly common at more northern latitudes, but solar storms can bring the displays further south. The Northern Lights from this event were reportedly visible as far south as Oklahoma.

In 1996, the Lincoln NWS office had around 2,100 trained spotters in 35 counties across central and southeast Illinois. Through 2006, that number has more than doubled to nearly 5,200 spotters! In 2006 alone, the Lincoln NWS office provided spotter training to more than 2,300 people, about 700 of which were new. Central and southeast Illinois covers nearly 20,000 square miles, so additional storm spotters are always welcome!

Spotter training classes are currently being scheduled for 2007. If you are interested, go the NWS Lincoln "Spotter Training Calendar" web site (after January 5, 2007) at:

http://www.crh.noaa.gov/ilx/spotter2.php

for a list of spotter classes near you. Most spotter classes will be scheduled between March 1st and April 30th. If you don't see a spotter class listed in your area, check back for updates, or plan to attend one in a location near you. There are no fees for spotter classes – only 2 to 3 hours of your time, and an interest in learning about severe thunderstorms and tornadoes. If you have any questions, go to the website listed above, or e-mail the Warning Coordination Meteorologist – Chris Miller at chris.miller@noaa.gov

Wanted – Volunteers to Study Storms

Volunteers are needed to participate in the Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) in Illinois!

Anyone can participate; young, old, and in-between. The only requirements are an enthusiasm for watching and reporting weather conditions, and a desire to learn more about how the weather can affect and impact our lives.

CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds, working together to measure and map precipitation (rain, hail and snow). By using low-cost measurement tools, stressing training and education, and utilizing an interactive Web site, the aim is to provide the highest quality data for natural resource, education and research applications. It began in Colorado in 1998, and currently has over 2500 observers in 13 states.

CoCoRaHS in Illinois is sponsored by the National Weather Service and the Illinois State Water Survey.

To learn more about CoCoRaHS and what is needed to participate, visit the CoCoRaHS web site at http://www.cocorahs.org. Click on Illinois on the map to see more about CoCoRaHS in Illinois.

Significant Weather Observer Program Update

By: Chuck Schaffer, Meteorologist

The Significant Weather Observing Program (SWOP) at the Lincoln NWS office provides the forecast staff with real-time weather information during severe weather, and precipitation totals for significant events. A network of over 150 volunteers across central and southeast Illinois send real-time reports via computer to the NWS team including: rain and snowfall amounts, thunderstorm damage, wind gusts, hail size, and

Recent Cooperative Observer Awards:

Representatives of the **Bloomington Waterworks** accept the 50-year Institutional Length of Service Award

Linda Casper of Lewistown receives a 10-year Length of Service Award

Phillip Frank (left) of Athens receives a 10-year Length of Service Award from Dan Kelly

flooding. These data from the SWOP observers assist forecasters by providing ground-truth which aids in issuing warnings, advisories, and statements.

We are continually looking to improve the quality and density of our network, and very much value new, dedicated observers. Several training sessions were held this fall throughout central and southeast Illinois, and several new observers were recruited. Of particular focus this fall was the addition of new observers along and south of the I-70 corridor in southeast Illinois. While this region has several great observers, it lacked the density of observers in other parts of the Lincoln county warning area. New observers were provided training, along with a rain gauge and snow stick, and access to an online storm reporting network. Anyone within central or southeast Illinois who is interested in joining the SWOP program is encouraged to send an email to: nwsliilx@noaa.gov.

Changes to Historical Climate Database for Peoria and Springfield

By: Chris Geelhart, Hydrometeorological Technician

As part of a project involving NOAA's NOWData climate archives online, a thorough review has been done on the climatological databases for Peoria and Springfield. The existing listings of record highs, lows, precipitation and snowfall, were compared to the original records submitted to the National Climatic Data Center. Several dozen discrepancies were found at each site. There were several reasons for these discrepancies:

- Some data was not available at the time the record books were being compiled.
- There was misinterpretation of the original hand-written forms (due to fading ink, handwriting style, etc.).
- Changes in observing methods over the years.
- Transcription errors between computer databases.
- Logging the records on the wrong dates.
- Failures to update the record books as needed.

Peoria:

The earliest climate records for Peoria date back to 1856. Values from the period 1856 through 1883 were originally used in the "Top 10" listings (warmest, coldest, wettest, driest) for months, seasons and years. (Daily readings during this period had not been used in the daily record listings.)

Upon closer inspection of the original records, it was determined that the temperatures were not registered in a format compatible with later records. For example, the daily average temperature today is calculated by taking the mean of the observed high and low temperature. In the early records mentioned above, it was determined using a formula:

Average Temperature = (7 am observed reading) + (2 pm observed reading) + (2 times the 9 pm observed reading), all divided by 3.

The actual high and low for each day was not measured (thus why there were none of these readings available for the daily record database). Early observations were taken under the guidance of various authorities (the Smithsonian Institution, the U.S. Army

Autumn 2006
Climate Statistics:
Peoria:

- Average temperature 53.2°F (0.2°F above normal)
- 7.70 inches of precipitation (1.17 inches below normal)
- 1.3 inches of snow (0.8 inches below normal)

Springfield:

- Average temperature 53.8°F (1.2°F below normal)
- 8.75 inches of precipitation (0.43 inches above normal)
- 0.7 inches of snow (0.9 inches below normal)

Lincoln:

- Average temperature 52.6°F (0.8°F below normal)
- 9.63 inches of precipitation (0.69 inches above normal)
- 0.6 inches of snow (0.9 inches below normal)

Signal Service, and the U.S. Weather Bureau), who each had different instructions for observers.

Precipitation was generally measured over a 24-hour period. However, what counted as "precipitation" varied. If the precipitation fell completely as snow, the water equivalent of it was generally not determined. Snowfall totals were largely entered as only remarks and then only done if significant, making it difficult to obtain overall snow amounts. Small values of precipitation and snowfall were not always logged.

The record values for temperature, precipitation and snowfall also extended for different time periods, for some reason. We had the following listed in the climate record books:

- Daily record high and low temperatures dated back to 1884.
- Daily records for "warm lows" and "cold highs" only dated back to 1886, even though they use the same observed data as the regular high/low records.
- Daily precipitation records dated back to 1894.
- Daily snowfall records dated back to 1905.

After review of the various observations available, all daily temperature records have been extended back to 1883. Precipitation records were extended back to 1884. Daily snowfall records were extended back to 1893.

Springfield:

Daily records for Springfield were originally marked as beginning in July 1879, and this remains the case. It was determined that records under Smithsonian Institution rules were taken from 1865 to 1870, but these were not considered due to the issues mentioned earlier (plus the large gap in observations for most of the 1870's).

The main issue with observations for Springfield involved the period from 1935 through 1954, when two Weather Bureau stations were in operation. One was at the office downtown at the Federal Building at 7th and Monroe Sts, while the other was at the airport (Southwest Airport from November 1935 to November 1947, and at Capital Airport beginning December 1947). The official switchover date for using the airport readings as the "official" readings was January 1, 1948. However, many daily and monthly records during this 20 year period were being listed as broken if either of the two sites surpassed the record value.

After this review was completed, the record listings on our homepage were updated for both sites, and are available at the following links:

Peoria: http://www.crh.noaa.gov/ilx/clipia.php
Springfield: http://www.crh.noaa.gov/ilx/clispi.php

National Weather Service
1362 State Route 10
Lincoln, IL 62656

Phone (217) 732-3089
(8:30 am to 4 pm weekdays)

The *Central Illinois Lincoln Logs* is a quarterly newsletter of the NWS office in Lincoln, and is available on our Internet page at

http://www.weather.gov/lincoln

Your comments are welcomed and can be addressed to either editor at our office.

Co-editors.....

Chris Miller, Warning Coordination Meteorologist
Chris.Miller@noaa.gov

Billy Ousley, Data Acquisition Program Manager
Billy.Ousley@noaa.gov

Newsletter designer/editor....

Chris Geelhart, HMT
Chris.Geelhart@noaa.gov

Meteorologist-In-Charge.....
Ernie Goetsch
Ernest.Goetsch@noaa.gov

U.S. Weather Highlights for 2006

The average annual temperature for the contiguous U.S. will likely be the third warmest on record in 2006, according to scientists at the NOAA National Climatic Data Center in Asheville, N.C.

U.S. Temperatures
NOAA scientists report that the 2006 annual average temperature for the contiguous United States (based on preliminary data) will likely be 2°F above the 20th Century mean, which would make 2006 the third warmest year on record, slightly cooler than 1998 and 1934. Three months (January, April and July) were either warmest or second warmest on record, while only September and October were cooler than average.

The warmer than average conditions impacted residential energy demand for the U.S. in opposing ways as measured by the nation's Residential Energy Demand Temperature Index. Using this index, NOAA scientists determined that the nation's residential energy demand was approximately 9 percent less during the winter and 13 percent higher during the summer than that which would have occurred under average climate conditions.

The near-record warm summer was highlighted by a July heat wave that peaked during the last half of July. All-time records were set in a number of locations across the central and western U.S., breaking records that had stood for decades in many places.

U.S. Precipitation and Drought
For the contiguous U.S. as a whole, five of the first seven months of the year were drier than average. Combined with unusually warm temperatures, drought conditions persisted in much of the country. By late July, half of the contiguous U.S. was in moderate to exceptional drought.

Above average precipitation from August through November helped end drought in many areas, although in places such as western Washington, record rainfall in November led to extensive flooding. Drought coverage fell from the July peak to 25 percent by early December. Widespread severe drought remains over much of the southern Plains, the northern High Plains and northern Rockies, as well as parts of Arizona and Minnesota.

Drought and anomalous warmth contributed to a record wildfire season for the nation, with more than 9.5 million acres burned through early December, most of it in the contiguous U.S., according to the National Interagency Fire Center.

Tropical Cyclones and Hurricanes
The 2006 hurricane season was classified as near-normal. This activity was far less than most other seasons since the current active Atlantic hurricane era began in 1995. Nine, the number of named storms during the 2006 season, is the second lowest since 1995. Only the below-normal 1997 season had fewer. This reduced activity in both years is attributed largely to the rapid onset of El Niño in the equatorial Pacific, which suppresses conditions conducive to hurricane formation in the Atlantic.