National Weather Service Forecast Office Chicago

CHICAGO

Weather Currents

Winter 2011

Volume 9, Issue 4

Inside this issue:

Top Weather Events of 2011 North Central and Northeast Illinois, and Northwest Indiana

by Jim Allsopp, Warning Coordination Meteorologist

February 1-2 Blizzard

Northeast Illinois and northwest Indiana were hit by one of the most powerful winter storms in history. There is no doubt that this event had more impact and notoriety than any other weather event in 2011. Although it ranks third in total snowfall for a Chicago winter storm (after the 1967 and 1999 storms), in terms of snow intensity, wind, and lightning production, this blizzard was second to none. Fourteen people died in the storm.

Stranded vehicles on Lake Shore Drive – photo by Darin Repp

Light snow began late on January 31 as a weak impulse moved out ahead of the main storm system. This produced one to two inches of light snow over parts of northern Illinois. In the wake of this initial shot of snow, cold northeast winds developed producing some lake effect snow over parts of northern Illinois during the morning of February 1. As the main storm moved northeast out of the southern Plains, snow and wind intensified during the afternoon of February 1. Blizzard conditions, with winds of 30 to 50 mph, heavy snow and blowing snow, and visibilities reduced to a quarter mile or less, developed by the evening of February 1 and continued into the morning of February 2.

Top Weather Events of 2011 (cont)

Photo by Winston Olson, Plainfield, IL

Hundreds of motorists were stranded on roadways. Parts of Interstates 39, 57, 80 and 290/Route 53 were closed. The National Guard was activated to assist stranded motorists. In Chicago, a bus got stuck on Lake Shore Drive blocking the northbound lanes. Heavy snow and 50 mph winds trapped 1000 vehicles in the traffic jam, and drivers had to be rescued. Some were trapped in their vehicles for up to 12 hours. More than 1300 flights were cancelled at O'Hare and Midway Airports, and Amtrak service out of Chicago was halted.

Storm total snowfall was 21.2 inches at O'Hare Airport, and 15.1 inches at Rockford Airport, making this the third largest snowstorm on record for both cities. Other snow totals included 17.1 inches at National Weather Service in Romeoville, 21.7 inches at Chicago Midway Airport, 24.2 inches at Beach Park, 23.7 inches at Elk Grove Village, 23.5 inches at Spring Grove and 23.1 inches at Inverness.

There was frequent lightning and thunder in Chicago and the southwest suburbs during the height of the storm on the evening of February 1, and small hail was reported in a thunderstorm at Midway Airport. Winds gusted as high as 61 mph at O'Hare and visibility was reduced to at least one quarter mile for eleven consecutive hours.

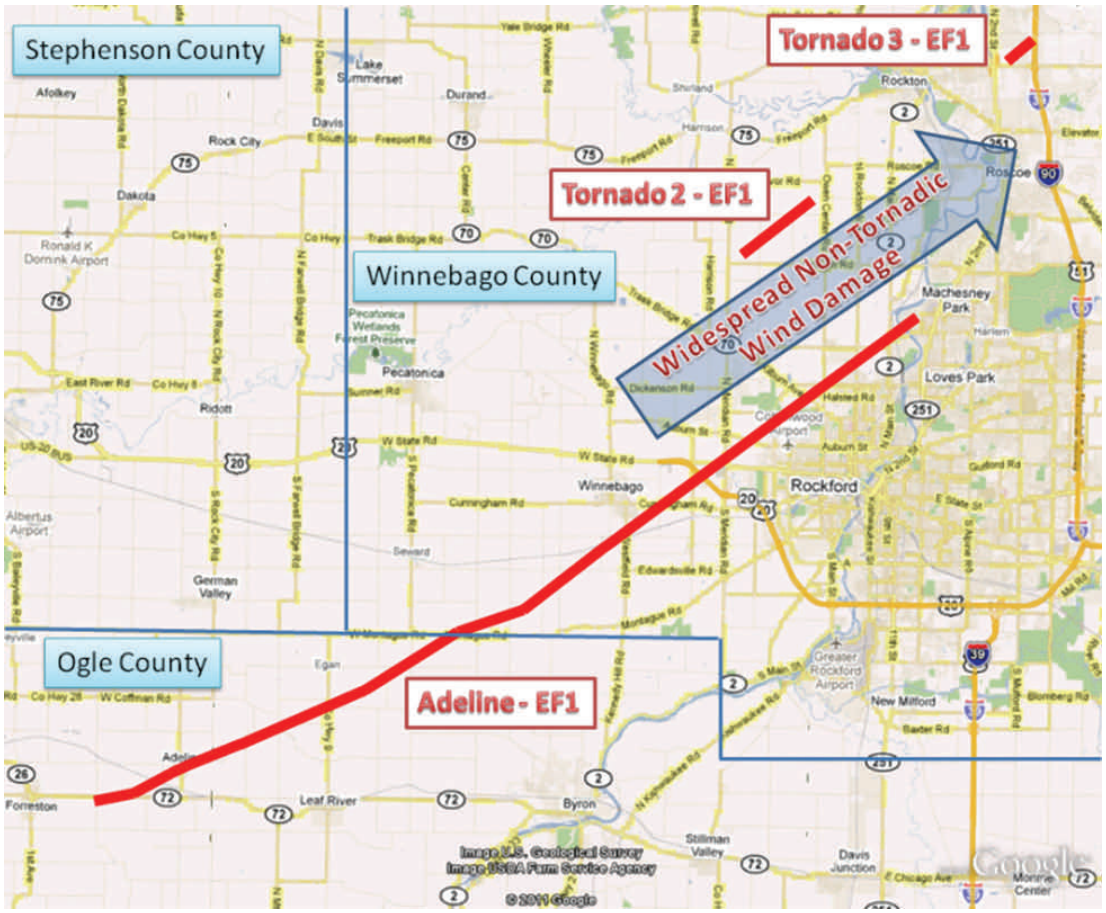
February 9-10 Bitter Cold

The coldest 48 hours of winter occurred in early February. On the 9th at Chicago the low was -2F and the high was 12F. On the 10th the low was -9F and the high 16F. At Rockford on the 9th the low was -7F and the high was 9F and on the 10th the low was -20F and the high was 17F. The -20F at Rockford set a record for the date. Other low temperatures on the 10th included -20F at West Chicago, -21F at Aurora, and -21F at Rochelle and Marengo.

May 22 and 25 Tornadoes

On May 22 a strong line of thunderstorms moved through north central Illinois producing damaging winds and several tornadoes. An EF1 tornado produced a 29 mile long path through Ogle and Winnebago Counties. The tornado started just east of Forreston. Two mobile homes were severely damaged in Ogle County. In Winnebago County several outbuildings were damaged or destroyed and the roof was damaged at Kennedy Middle School on the west side of Rockford. Many large trees and limbs were snapped by the tornado as well. At least four other small brief tornadoes were documented in Ogle and Winnebago Counties. In addition there was widespread tree damage from strong straight-line winds over Winnebago County. Another brief EF1 tornado occurred on the north side of Rensselaer in Jasper County, Indiana, damaging a Farm Bureau building and an Agricultural Extension office.

Top Weather Events of 2011 (cont)

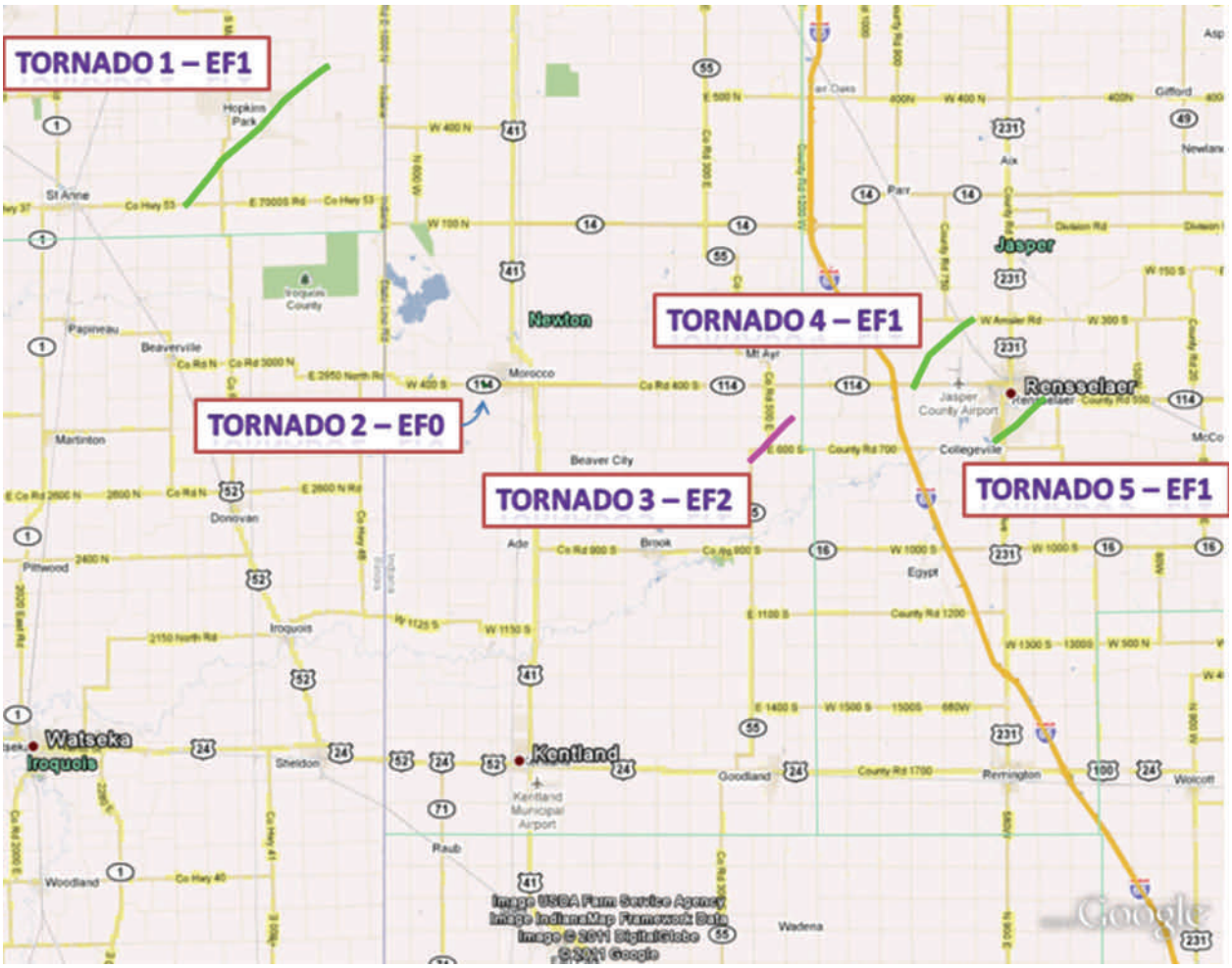


Map of tornado and wind damage in Ogle and Winnebago Counties May 22, 2011. Damage surveys by Eric Lenning, Ricky Castro, Jim Allsopp, National Weather Service

Tornado in Rensselear, IN – from video by Joann Skinner

Top Weather Events of 2011 (cont)

A series of small supercells developed in the morning of May 25 producing several tornadoes over east central Illinois and northwest Indiana. An EF1 tornado occurred northeast of Hopkins Park in Kankakee County. The tornado damaged a garage, a grain bin, and other outbuildings, poles and trees. Two tornadoes occurred in Newton County, one rated EF1 and the other EF2. The twisters mostly damaged outbuildings, grain bins, trees and poles. Two more tornadoes occurred in Jasper County, including one that hit the southeast side of Rensselaer – the second tornado in three days to hit the town. Storms also produced wind damage in Iroquois County and elsewhere in northwest Indiana.



Map of May 25 tornado tracks east central IL and northwest IN – damage survey by Tony Lyza, Valparaiso University

Top Weather Events of 2011 (cont)

June 4 Northwest Indiana Blowdown

Thunderstorms produced a swath of wind damage from St John and Crown Point in Lake County Indiana, southeastward into southwest Porter and northern Jasper Counties. Winds were estimated to 90 to 110 mph in some locations. Trees and signs were blown down and semis were overturned. A weigh station on I-65 was damaged. The most intense damage occurred near Route 2 between I-65 and Route 231 southwest of Hebron. Large groves of trees were flattened, garages, outbuildings and grain bins were destroyed and metal truss power line towers were collapsed.

Garage and outbuildings destroyed near Hebron, IN – photo by Jim Allsopp

Trees flattened near Hebron, IN – photo by Jim Allsopp

Top Weather Events of 2011 (cont)

June 21 Chicago area Wind and Tornadoes
A powerful line of thunderstorms moved southwest to northeast from LaSalle County to the Chicago metro area producing damaging winds and a couple of brief tornadoes. Widespread winds of 50 to 70 mph blew down hundreds of trees, tree limbs and power lines. There were scattered pockets of winds 70 to 90 mph with more extensive tree damage and some structural damage over the west and north suburbs of Chicago. The worst of the storms hit DuPage County, north and west Cook County and eastern Lake County. Some trees and limbs fell on homes and vehicles. Two people were injured when a tree crushed a car on the north side of Chicago. The roof of a building near Wrigley Field was damaged. Apartment roofs were damaged in Maine Township and Prospect Heights. A wind gust to 81 mph was measured at Palwaukee Airport, where hangars were damaged and two planes were flipped. Brief tornadoes occurred in Downers Grove and Mt. Prospect, where more extensive tree damage occurred.

Wind damage at Palwaukee Airport in Wheeling, IL where a wind gust to 81 mph was recorded – photo by Jim Allsopp

Top Weather Events of 2011 (cont)

June 30 Lakefront Supercell
A powerful supercell thunderstorm developed just off the Illinois lakefront. The storm spawned a waterspout over Lake Michigan. The rear flank of the storm produced winds to 80 mph along the shoreline of Lake County blowing down hundreds of trees. Later the storm produced hail up to the size of baseballs over the west side of Chicago. Hail caused $2 million in damage to glass panels at the Garfield Park Conservatory. Also on the west side of Chicago, 130 police cars were damaged by large hail.

Hail damage to Chicago police car

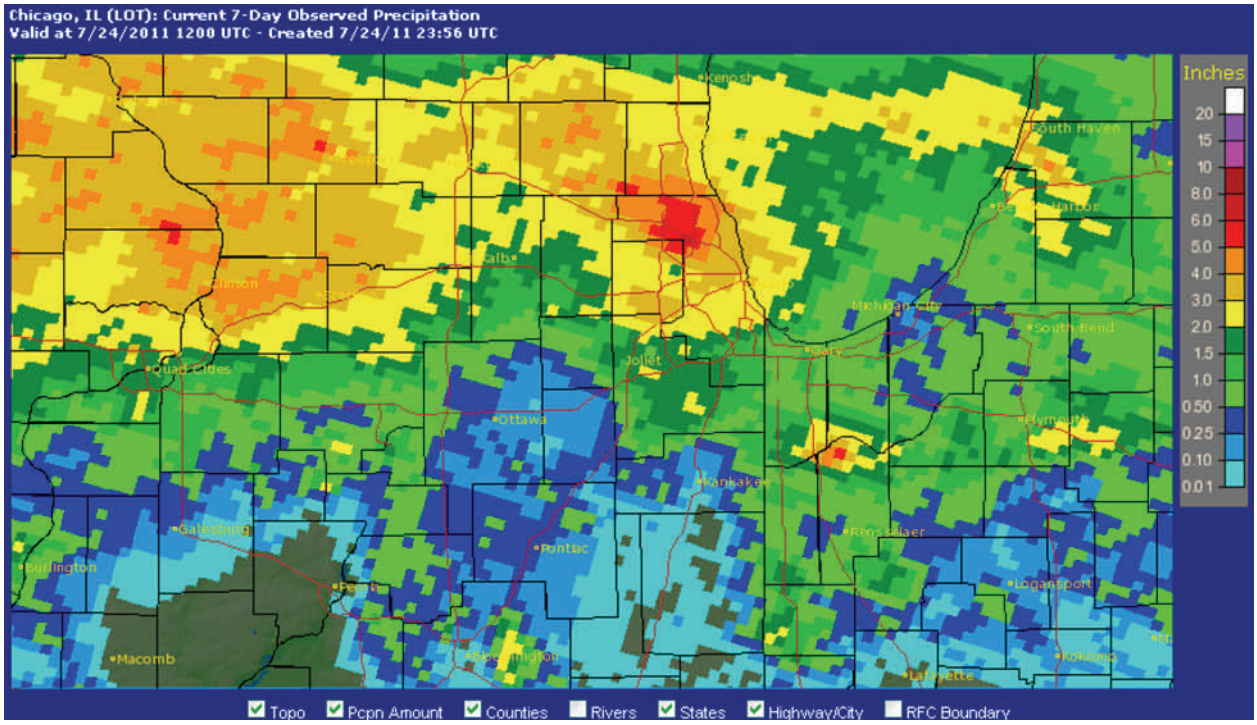
Hail damage to Garfield Park Conservatory

Top Weather Events of 2011: (cont)

July 11 Derecho
A long lived, intense line of thunderstorms, known as a Derecho, swept across northern Illinois in the early morning hours of July 11. The winds flattened corn fields, blew down power lines and poles, and damaged thousands of trees. The worst damage occurred over the northern tier of Illinois counties from Winnebago and Ogle Counties eastward to the north suburbs of Chicago. The high winds and falling trees caused roof damage to buildings and homes. Falling trees and limbs also damaged vehicles. A few semis were overturned. A man was killed on the west side of Chicago when a tree fell on his car. As many as 850,000 customers lost power. ComEd deployed more resources to this storm than any event in its history. A total of 1100 crews from 14 states repaired or replaced 78 miles of wire, 600 poles and 1000 transformers.

July 17-21 Heat Wave
An intense heat wave gripped northern Illinois and northwest Indiana through mid and late July. Temperatures were in the 90s for 5 straight days topping out at 99F on the 20th and 21st in Chicago, while Rockford had highs of 100F on the 19th and 20th. These were the first 100F degree temperatures in Rockford since 1989. 16 people died from the heat in Cook County. Thunderstorms brought some relief on the 22nd and 23rd but very warm weather persisted through the end of the month. In Chicago, July ended up 5.7 degrees above normal, making it the third warmest July on record. At Rockford, July was 6.0 degrees above normal. It was the fifth warmest July on record.

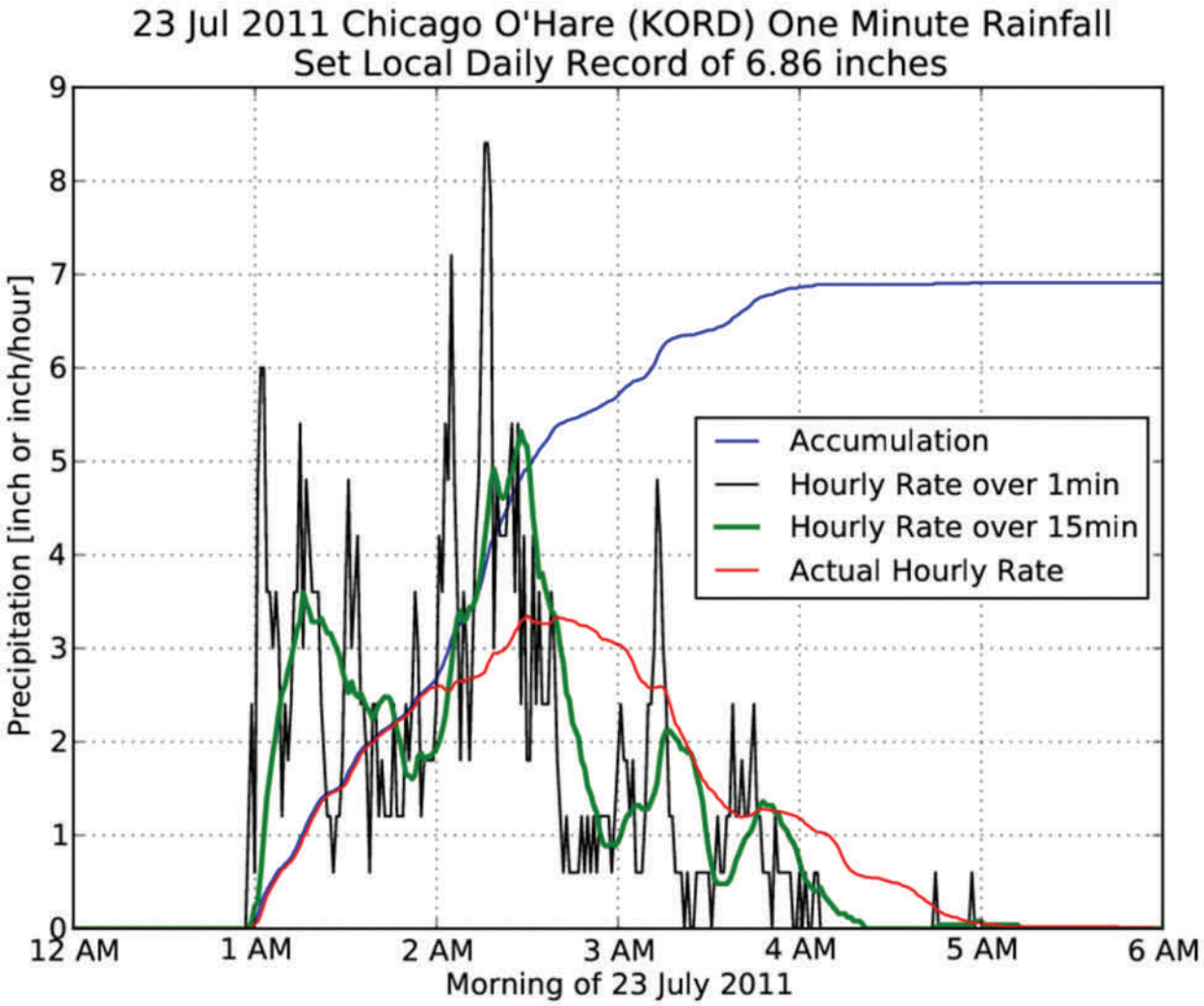
July 22-23 Flood
Thunderstorms produced locally heavy rain and flooding in the north suburbs of Chicago on July 22. Additional thunderstorms later that night into the morning hours of July 23 produced torrential rain over parts of Cook and DuPage Counties. Rainfall rates of 2 to 4 inches per hour resulted in widespread flash flooding. Thousands of basements were flooded, some with as much as 8 to 10 feet of water and sewage. Many roads, viaducts and intersections were flooded and many cars were stranded in flood waters. Sections of Interstate 57, Interstate 94 and Lake Shore Drive were closed by flood waters.



Map of radar estimated rainfall over northern Illinois July 18-24

Top Weather Events of 2011: (cont)

The heaviest rain was over northern Cook County. Thunderstorms dumped 6.86 inches of rain at O'Hare International Airport on July 23, a new Chicago daily rainfall record. Total rainfall for the event was 8.20 inches. The total for the month of July was 11.15 inches, which was a record, and 7.64 inches above normal. Other rainfall totals included 7.25 inches in Arlington Heights, 7.17 inches in Elk Grove Village, and 6.06 inches at Palwaukee Airport. Rainfall was 3 to 6 inches across parts of DuPage and central and southern Cook Counties.



Top Weather Events of 2011: (cont)

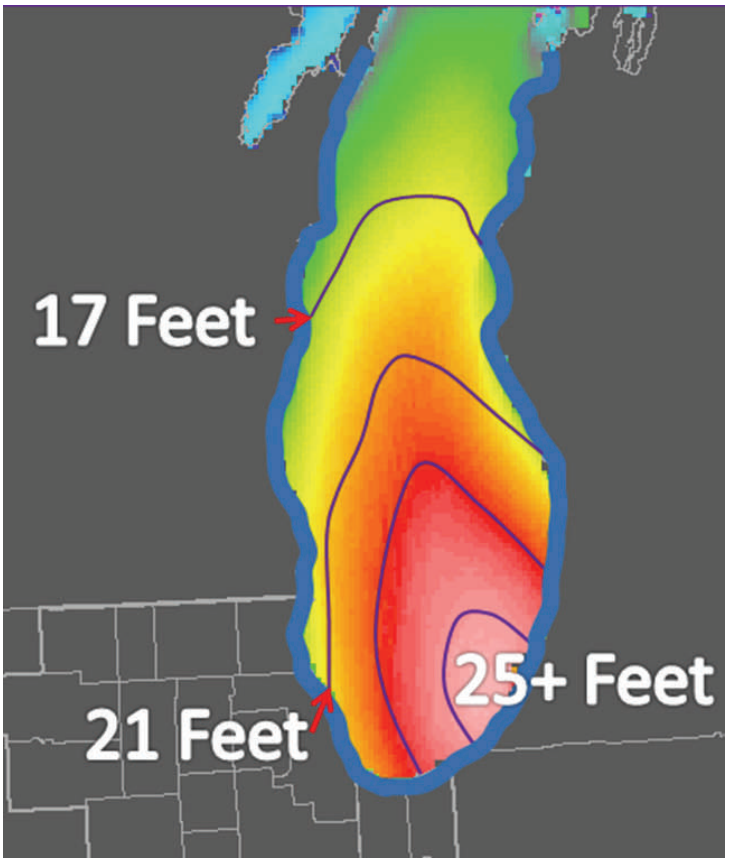
September 24 Waterspouts
At least a half dozen waterspouts were observed and photographed over southern Lake Michigan from Zion to Chicago, with additional waterspouts off the Wisconsin lakefront. Most of the waterspouts occurred in the morning between 7:00 a.m. and 11:00 a.m. None of them made landfall or caused any damage.

Waterspout off Milwaukee September 24, 2011 – courtesy WISN TV Milwaukee.

Fall Lake Michigan Storms
Deep low pressure over the Great Lakes produced very strong winds and high waves over Lake Michigan on September 30. Peak wind gusts from Chicago to Michigan City were 50 to 60 mph. Waves were as high as 20 to 25 feet.

Large waves at Indiana Dunes – photo by Doug Stukey, Indiana Dept. of Natural Resources

Top Weather Events of 2011: (cont)



Estimated wave heights September 30, 2011.

Another strong low pressure moved north from the Ohio Valley to the lower Great Lakes October 19 and 20. Once again very strong winds occurred over Lake Michigan and the Illinois and Indiana shores of the lake. Winds gusted to over 60 mph along the lakefront from Michigan City to Waukegan. Waves up to 20 feet high battered the lakefront. Twenty boats were damaged or destroyed when they broke free from their moorings in Monroe harbor.

Damaged boats in Monroe Harbor – photo courtesy Coastal News Today

Give the gift of All Hazards NOAA Weather Radio

by Amy Seeley, Hydro Meteorological Technician

Are you looking for that perfect last minute holiday gift? Do you know someone who is a weather enthusiast?

Here's a great idea for a gift, and it's good for the entire family --- All Hazards NOAA Weather Radio (NWR)!

NWR, also known as the "Voice of NOAA's National Weather Service", is your single source for comprehensive weather and emergency information. It broadcasts official National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week.

NOAA Weather Radios with the ***SAME*** receiver can be programmed so that they alert for the county or marine areas that you choose. NWR receivers without the SAME capability alert for emergencies anywhere within the coverage area of the NWR transmitter, typically several counties, even though the emergency could be well away from the listener.

NWR also broadcasts warning and post-event information for all types of hazards – including natural (such as earthquakes or avalanches), environmental (such as chemical releases or oil spills), and public safety (such as AMBER alerts or 911 Telephone outages).

During severe weather, if power goes out, your NWR can still be used as most of them can run on battery. You can always have the latest information on the weather and what is happening in your area.

There are over 1000 transmitters, which cover all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands and the U.S. Pacific Territories. That means you will have the latest weather information no matter where you are!

NOAA Weather Radios can be purchased at most boating, electronic and outdoor stores.

Introducing WFO Chicago's Newest Forecasters

Matt Friedlein – Lead Forecaster

Matt Friedlein comes to our office from the NWS in Minneapolis, where he was a forecaster for five and a half years. His career in the NWS began here in Chicago as a volunteer and student trainee while he studied meteorology at Northern Illinois University, of which he is a proud 2004 graduate. Between his first stint at Chicago and Minneapolis, Matt also worked at the NWS in Paducah, Kentucky. Matt grew up in the farming community of Mendota, which is where his interest in weather blossomed. He especially owes that to his grandmother, whose concern over inclement weather sparked Matt to understand it further.

Matt's career within the NWS continues to be a pleasure for him, and he is energized about the responsibilities and challenges of his new job. Matt brings with him to Chicago experience in working with and leading others in severe, winter, and hydrologic weather forecasting and operational research, as well as actively engaging in partner and public communication and outreach. Matt has these and more goals set here in Chicago, believing that these are essential toward furthering our weather services. He plans to be involved with seeking out and working with our partners, and envisions Chicagoland at the forefront of the NWS vision of a Weather-Ready Nation.

Outside of work, Matt cherishes time with family and friends, and loves meeting new people. He enjoys traveling, especially by train, and plans to visit Minnesota regularly and perfecting his fishing. You can also catch Matt on the tennis courts in the warm season, and according to him, his tennis is much better than his angling! He considers several people as strong mentors in his life and career, but none more so than his father. Even when away from Illinois, Matt had always considered it his home and is happy to be here to serve the area's citizens as an NWS forecaster.

Jamie Enderlen - Forecaster

Hi everyone, my name is Jamie Enderlen, and I am honored to be a general forecaster here in Chicago. I was born and raised in Oak Lawn, Illinois, and growing up with Chicago's diverse weather was what inspired me to become a meteorologist. In 2007 I graduated with a B.S. in Meteorology from Valparaiso University and then went on to obtain a M.S. in Atmospheric Science from the University at Albany in 2009. I was lucky enough to be hired as a Meteorological Intern at the Charleston, WV NWS Office in February 2010. In September 2011, I was selected to be a general forecaster by the Chicago NWS Office. I was beyond thrilled to return home to serve the area and people I grew up with as well as forecast the weather that got me interested in meteorology in the first place. I'll also admit I was ecstatic to be able to watch Blackhawks and Bears games more regularly too.

While Charleston was certainly different from Chicagoland, I learned many things about forecasting and providing the best service possible from the NWS Charleston, WV staff. I also fell in love with public outreach, aviation, and decision support services. Along with another forecaster, I developed a decision support program in Charleston, and I would like to create a similar program here. The program would focus on understanding what our users' needs are and learn how to better serve our users whether it be in our everyday forecasts or extreme weather situations. My other goals for the Chicago office are to get involved in the outreach and aviation programs, become an Incident Meteorologist, and use my experience forecasting with the Enhanced Short Term Forecast and Gridded Aviation programs to get these programs established in Chicago. My eventual career goal in the NWS is to become a Warning Coordination Meteorologist or an Emergency Response Specialist. As I mentioned before, my husband, Kevin, and I are extremely happy to call Chicago home. I look forward to meeting and interacting with as many of you as I can!

Skywarn Recognition Day, 2011

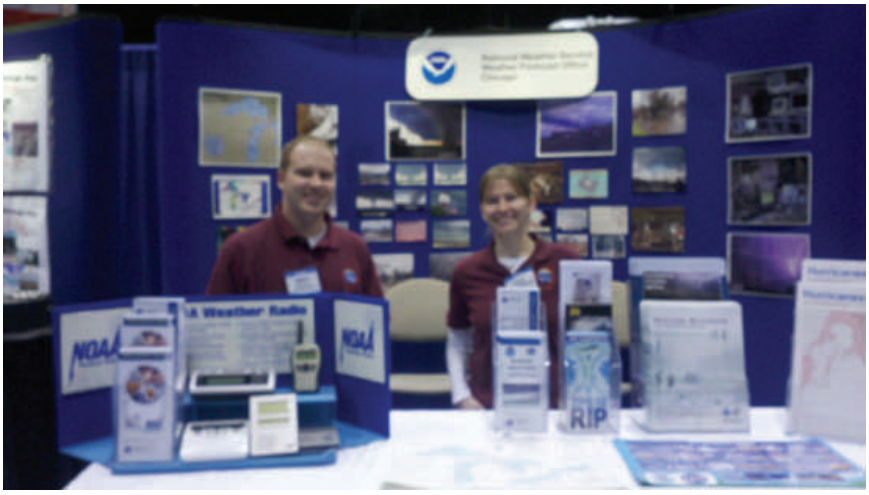
by Ben Deubelbeiss KF7JCC

Amateur radio operators and the National Weather Service celebrated the 13th annual SKYWARN Recognition Day on December 2nd and 3rd. The annual event celebrates the contributions that amateur radio operators make during severe weather. Each year, operators try to make as many contacts as possible during a 24-hour period, and get points for each National Weather Service office it contacts. This year, our team made 350 contacts across the US and Canada. We hit 46 of the 50 states, and contacted 44 of our sister National Weather Service offices across the country. This event is co-sponsored by the National Weather Service and the American Radio Relay League (ARRL). If you'd like to become a licensed HAM operator or become active with a SKYWARN net, check out the ARRL website (www.arrl.org) and look for a ham radio club in your area.

NWS Chicago to be at the Chicago Boat Show

By Amy Seeley, Hydro Meteorological Technician

If you are headed out to the Chicago Boat, Sports & RV at McCormick Place in January, why not stop by the Chicago National Weather Service booth!



We will be handing out pamphlets on weather and safety, talking about NOAA All Hazards Radio, answering your questions, and showing off our webpage.

If you would like help in programming your NOAA Weather Radio, feel free to bring it with you and we will help with that. Find out the latest on the newest weather products and services we are offering.

Hope to see you there!

Seeking Winter Weather Information?

by Matt Friedlein, Lead Meteorologist

Through our web page and our Facebook page, meteorologists at the NWS in Chicago provide a variety of winter weather forecast services, as well as recapping information after an event. This is a quick and easy guide on how to find some of the most pertinent winter weather information.

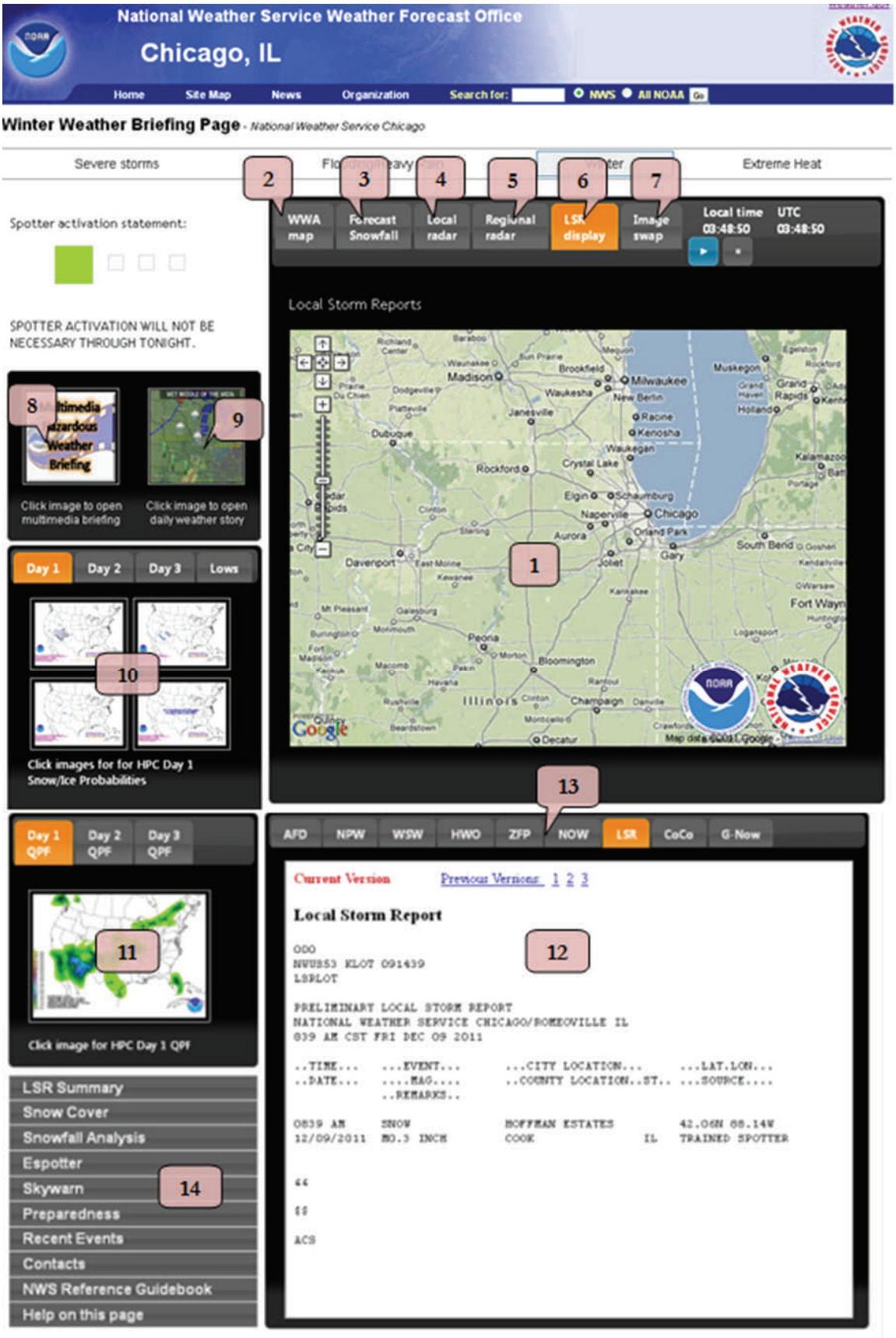
Preparedness

Weather safety always begins with preparedness. We know that ice, snow, and bitter cold air can be extremely dangerous. Guides to help you and your family prepare are available from our web page. These can be found by clicking on Preparedness on the left-hand side of our home page. Guides to winter weather safety, including for those traveling, can be found on that page. School administrators can find a school guide designed by our office. Even a winter weather safety book for the little ones is available. To understand the difference between a winter storm warning, watch, and a winter weather advisory, read our winter weather overview web page. Another national warehouse for winter safety information available from the NWS can be found here. From there, one can also access a wind chill chart and calculator.

Ahead and During a Winter Storm

The NWS in Chicago will be providing a Winter Weather Monitor once again this winter, which can be found throughout the year at http://www.crh.noaa.gov/lot/?n=winter_briefing, or by scrolling on our home page to the Winter Weather Monitor in the bottom right. The monitor has been enhanced even further than last year, and is encouraged to be your one-stop shopping for the latest weather information before and during a snowfall event. The following will be a tutorial of the monitor page.

Seeking Winter Weather Information? (cont)



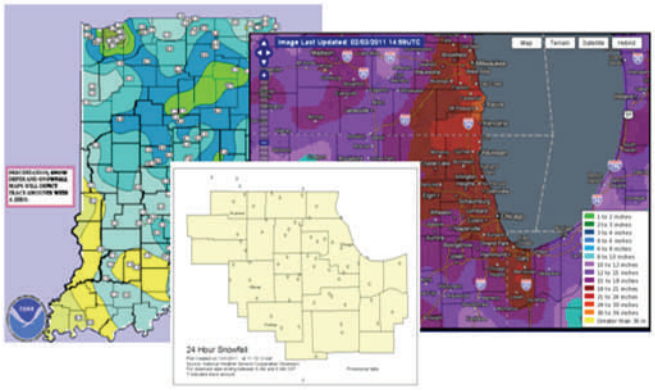
Seeking Winter Weather Information? (cont)

1. Image display area, which will display images #2 through #6.
2. Displays a map of warnings, watches, and advisories.
3. A storm total snowfall map, which can also be found here.
4. Radar graphic from the local area.
5. A composite of multiple radars from across the Midwest.
6. A clickable and zoom capable map of initial snowfall reports.
7. Click this to load images #2 through #6.
8. A multimedia briefing used ahead of and during most potential high impact weather events.
9. The latest NWS Chicago Graphical Weather Story.
10. Nationwide probabilistic snowfall and ice forecasts.
11. Nationwide forecast precipitation (rainfall and liquid equivalent of snowfall).
12. NWS product display area, where options in #13 can be displayed.
13. NWS products including the forecast discussion, the latest winter weather statement, snowfall reports, and short term graphicast.
14. Various links to other pertinent information.

Storm Total Snowfall Information

The NWS mission is not complete once the snow event has ended, as we know many of our users want detailed information on how much snow occurred and where. Dedicated and trained volunteer observer groups throughout northern Illinois and northwest Indiana provide the NWS with total snowfall reports. We provide their observations to the public in various means, which can be found in the links below. While we will often place these at the top of our web page and as Facebook wall posts after an event, feel free to save these links so you know right where to go for the latest snowfall information!

- Zoom capable map
- Illinois snowfall (NWS Lincoln)
- Indiana snowfall (NWS Indianapolis)
- Local area snowfall
- Summary of snowfall reports
- Chicago and Rockford snowfall
- CoCoRaHS observer reports
- More snowfall amount options



Weather Observing 1870-2011

by Mike Richter and Kirsten Trout, Student Volunteers

The recent dual-polarization upgrade to the radar at NWS Chicago, which was completed in late October, has motivated us to pause and briefly reflect on some of the ways weather observing technology has evolved since 1870, when the first federal weather office was established in Chicago.

early U.S. Weather Bureau office

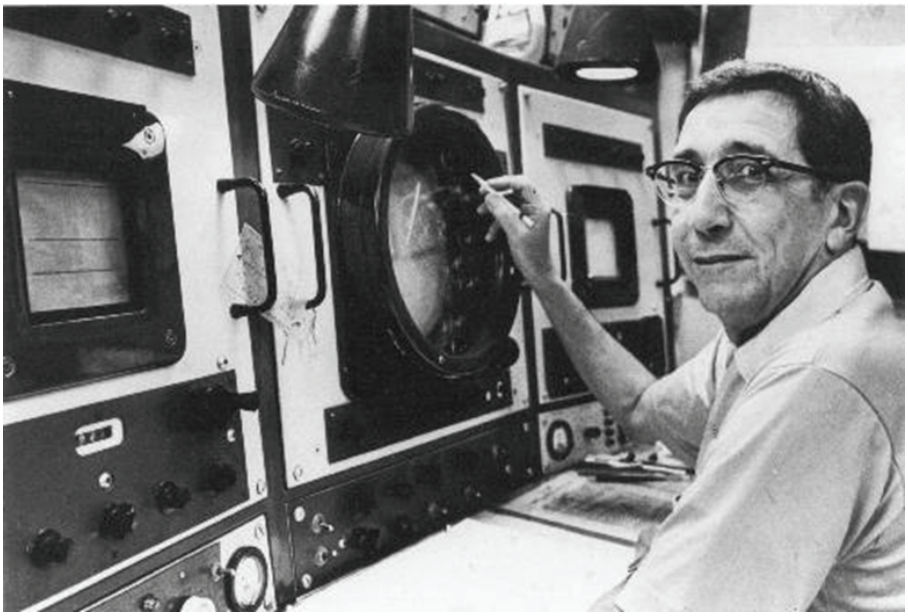
Even before a national weather service was established, hundreds of volunteers across the United States were regularly submitting their daily weather observations to the Smithsonian Institution via telegraph. The Smithsonian used these reports to create maps providing a general idea of the weather that had occurred each day, but the first effort to take a "snapshot" of atmospheric conditions was made on November 1, 1870. At 7:35 a.m. that morning, 24 federal weather stations first began recording synchronous observations and transmitting them to a central site in Washington, DC. Early observations, usually made at least twice daily, included temperature, wind, precipitation, sky cover, and barometric pressure.

An important advancement in observation technology came in 1885 when the first balloon launch took place to gather data above the surface. The data were found to be useful but it was not until 1909 that daily balloon launches started. Thanks to the invention of the radiosonde in 1938, valuable observations were regularly obtained from much higher altitudes.

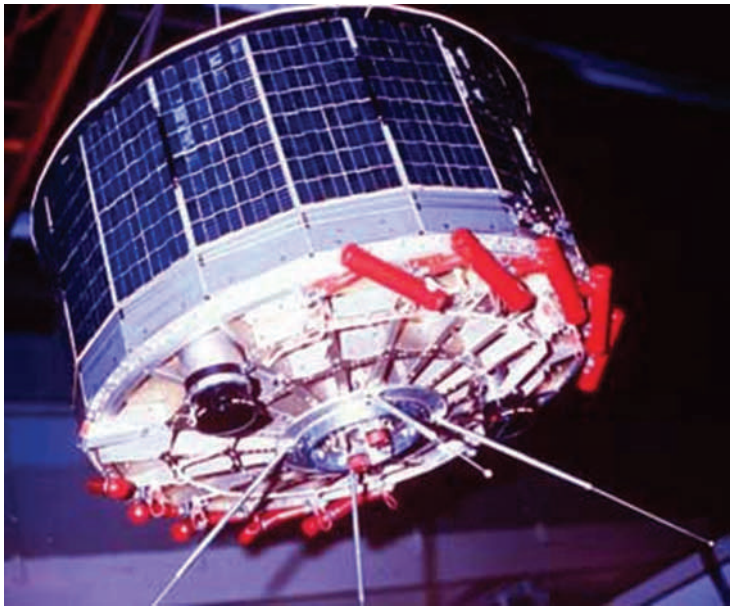
early radiosonde launch

Weather Observing 1870-2011 (cont)

Enormous advancements in weather observing technology were made during the 1950s with the development of radar and satellites. The first Weather Bureau radar network of 66 radars was deployed around the country during the late 1950s and early 1960s. The first one went in at Miami in 1959. The radar network was later supplemented in the mid to late 1970s with a similar but more reliable solid state model. The first weather satellite, TIROS-1, was launched in April, 1960. Eventually additional weather satellites were launched.



First network radar installed in Miami, June 1959

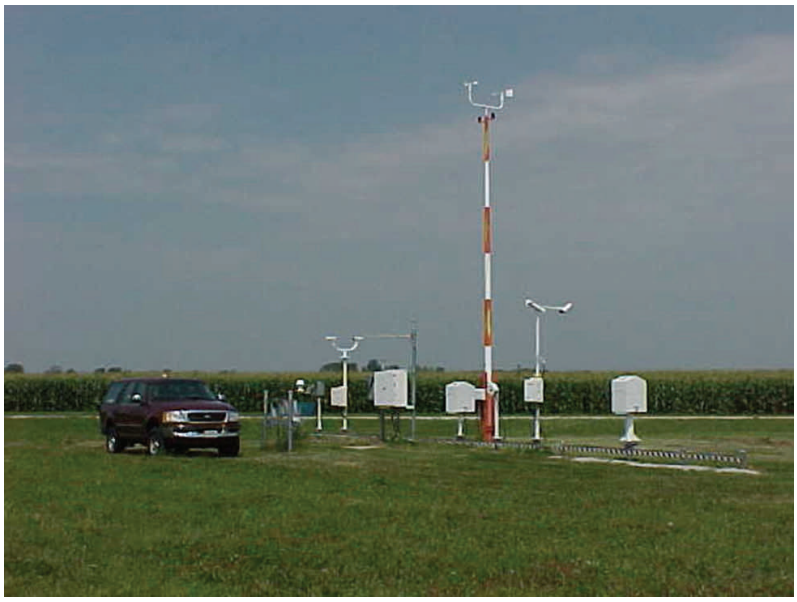


TIROS 1 satellite launched in 1960

Weather Observing 1870-2011 (cont)

by Mike Richter and Kirsten Trout, Student Volunteers

During the 1990s the National Weather Service undertook an ambitious Modernization and Restructuring (MAR) program. One key aspect of this program was a major upgrade to its radar network, adding "NEXRAD" Doppler technology to measure the motion of hydrometeors (liquid or solid water particles) in 5 to 6 minute intervals.



Automated Surface Observing System (ASOS)

Another major change during MAR was the installation of thousands of Automated Weather Observing System (ASOS) units, which can record and transmit evolving weather conditions on a minute-by-minute basis. This is a huge leap forward from the earliest days of daily or even hourly observations. Weather elements an ASOS unit can measure include: wind speed and direction, visibility (and most probable obscuration to visibility), present weather (precipitation type), cloud coverage and height, temperature and dew point, barometric pressure, precipitation amount, icing, and lightning. At certain high-traffic airports, human observers will augment ASOS observations and report elements that are beyond the capability of ASOS to measure.

The current dual-polarization upgrade, which in addition to motion will allow for the measurement of hydrometeor size and shape, is the first significant change to the NWS radar network since the addition of Doppler technology. This upgrade will take about two years to complete nationwide, but already researchers have been exploring the next big advancements in radar technology. These advancements likely will come in the form of phased array radar, which reduces the scan time to only one minute, as opposed to the five or six minutes required for the current NEXRAD radar.

All of these advances in observing technology through the years have been made with one common goal – the improvement of weather forecasts. Better, more numerous, and more frequent observations lead directly to more accurate forecasts.

Skywarn Severe Storm and Tornado Spotting

by Jim Allsopp, Warning Coordination Meteorologist

Spotter training classes will be offered during late winter and early spring throughout northern Illinois and northwest Indiana. A complete schedule of classes will be posted on the NWS Chicago web page, www.weather.gov/chicago, by mid January. The schedule will be found at the top of the page under “Top News of the Day”. The classes are free and open to anyone, and they take about 2 hours. There is an online course available at https://www.meted.ucar.edu/training_course.php?id=23. This is a good introduction or a good refresher for someone who has been trained. Spotters are encouraged to attend a full spotter class.

More information on storm spotting and storm chasing can be found at http://www.crh.noaa.gov/lot/?n=spotterfaq.

What is Typical During the Winter Season?

by Kevin Birk, Climate Program Leader

Anyone who has lived in northern Illinois during the winter knows that it can be cold and snowy. However, this is not always the case. The winter season is known for extreme day to day variability. So, with this in mind, what exactly are the typical winter days like? Recently the National Weather Service changed the 30 year normal period from 1971-2000 to 1981-2010. Overall, this change led to a slight warming in the daily normal temperatures during the winter season. The tables below display the probabilities of exceedance for daily high and low temperatures during the months of December, January and February using the new 1981-2010 climate normal period. Both Chicago and Rockford are shown. This gives an idea of what kind of daily temperatures are possible during the winter season. In order to interpret these probabilities of exceedance, consider, for example, the 80th percentile for high temperatures in December. From the table below for Chicago it is apparent that the 80th percentile is 26°F. This simply means that on any given day during the month of December there is an 80% chance that the high temperature will be at or warmer than 26°F. Likewise, there is a 50% chance of daily high temperatures exceeding 35°F and a 30% chance they will exceed 40°F.

From these tables and also the figures on the next page (displaying the frequency distribution of daily high and low temperatures), it is definitely apparent that a typical winter season day could be very cold, with a 10% probability of daily high temperatures remaining colder than 16 degrees in January. On the other end of the spectrum, it could also be quite mild, with a 10% probability of daily high temperatures being warmer than 50 degrees during February. However, in order to determine what the most typical daily high and low temperature is during each month, it is good practice to consider a range of temperatures, rather than just looking at the average high or low temperature for a certain day. Daily high and low temperatures throughout the month rarely match their average values exactly. Instead, temperatures tend to deviate slightly above and below their average values, but on occasion do deviate significantly from the average. Considering this, we can gather a range of temperatures from the tables below for on both sides of the average (or median) that represent 60% of the data. Therefore, if we take the 80 percentile of 26°F and the 20 percentile of 43°F at Chicago we now have a range that represents the middle 60% of the distribution, which can be thought of as representing the most typical high temperatures experienced during December. So any days in December in which the daily high temperature falls between 26°F and 43°F can be thought of as a typical December daily high temperature. If, however, temperatures are either colder than 26°F or warmer than 43°F, then this could be considered as abnormal.

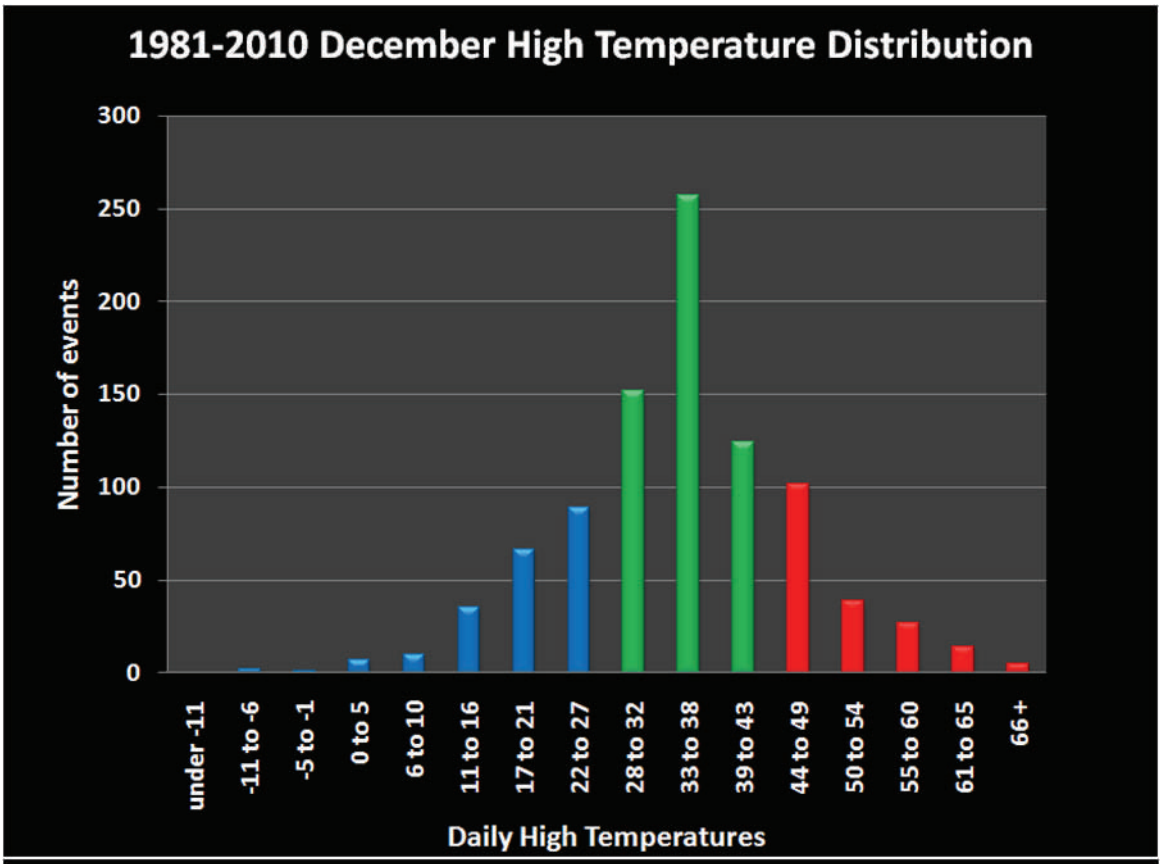
This same technique can be used for other months throughout the year for high and low temperatures as well. The 80th and the 20th percentiles are highlighted for convenience. Notice that this technique produces a rather large range of temperatures that can be considered typical. In fact for low temperatures, this range is over 20°F for each winter season month. This illustrates how much day to day variability occurs across the area during the winter season, and more importantly why a simple comparison to the daily average high and low temperature is a poor discriminator of how typical or abnormal temperatures are.

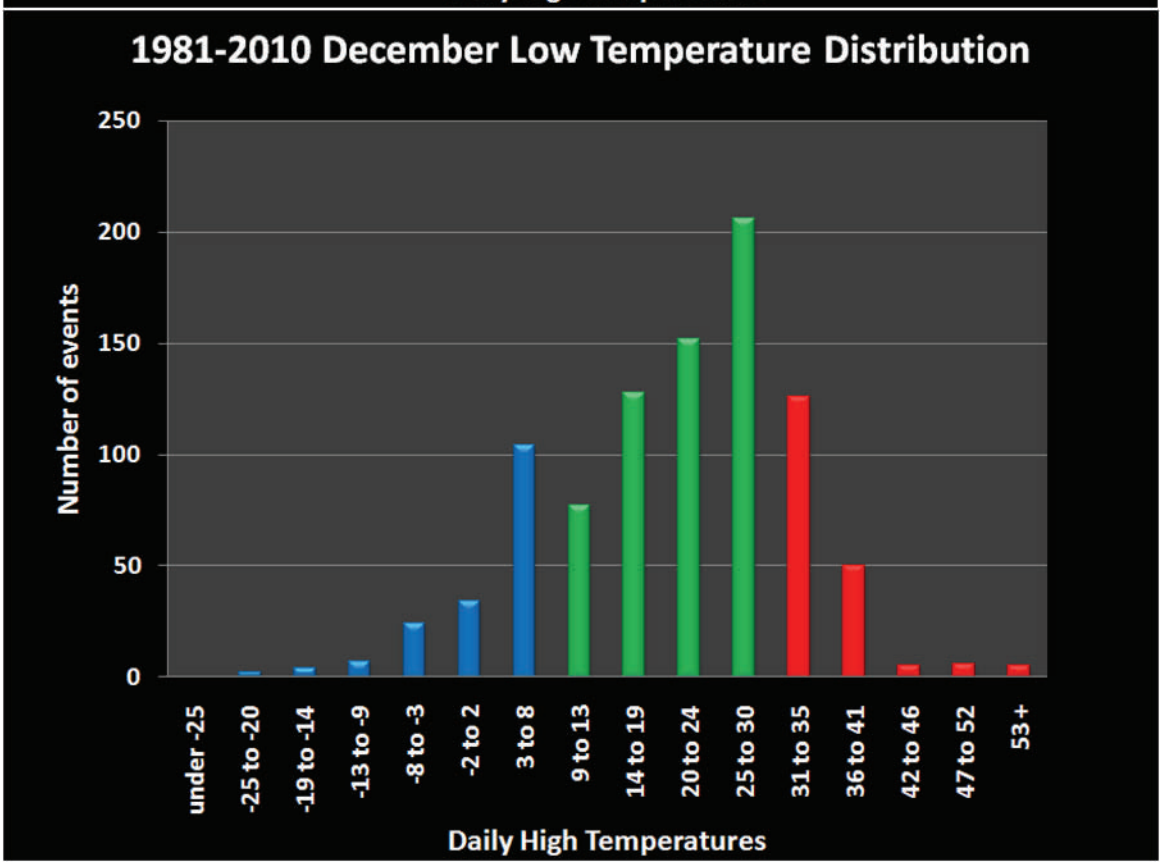
What is Typical During the Winter Season? (cont)

Chicago , IL						
Probability of	High Temperature			Low Temperature		
	Decemb	January	February	Decemb	Januar	February
90%	19°F	16°F	20°F	4°F	-2°F	3°F
80%	26°F	22°F	27°F	9°F	5°F	10°F
70%	30°F	26°F	30°F	15°F	10°F	16°F
60%	33°F	29°F	32°F	19°F	14°F	20°F
50%	35°F	31°F	35°F	22°F	17°F	23°F
40%	37°F	34°F	37°F	25°F	21°F	26°F
30%	40°F	36°F	41°F	28°F	25°F	30°F
20%	43°F	40°F	45°F	31°F	28°F	33°F
10%	49°F	45°F	50°F	34°F	32°F	39°F

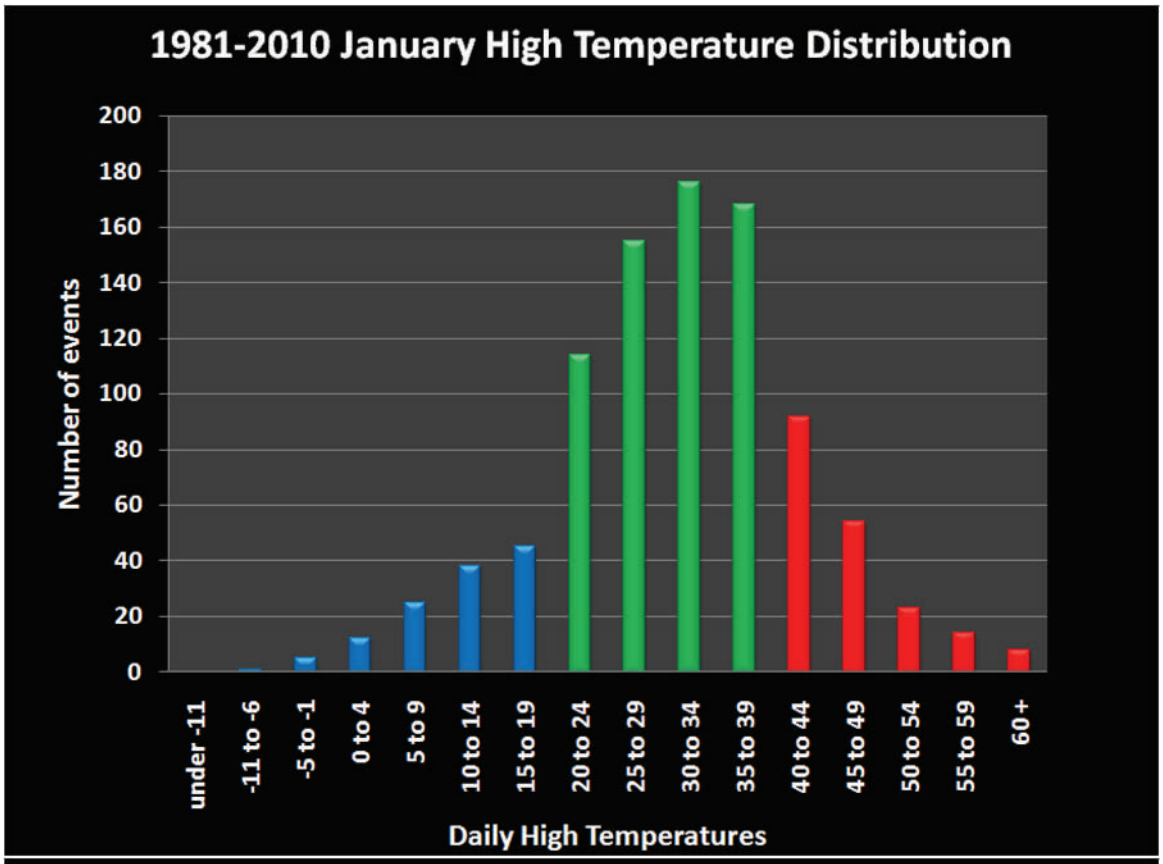
Rockford, IL						
Probability of	High Temperature			Low Temperature		
	Decemb	January	February	Decemb	Januar	February
90%	17°F	13°F	18°F	-1°F	-6°F	-1°F
80%	23°F	20°F	26°F	5°F	0°F	6°F
70%	28°F	24°F	29°F	11°F	5°F	11°F
60%	31°F	27°F	32°F	15°F	10°F	16°F
50%	33°F	30°F	34°F	19°F	15°F	19°F
40%	35°F	32°F	36°F	22°F	18°F	23°F
30%	37°F	35°F	39°F	25°F	22°F	26°F
20%	41°F	37°F	43°F	29°F	26°F	29°F
10%	46°F	42°F	48°F	32°F	30°F	32°F

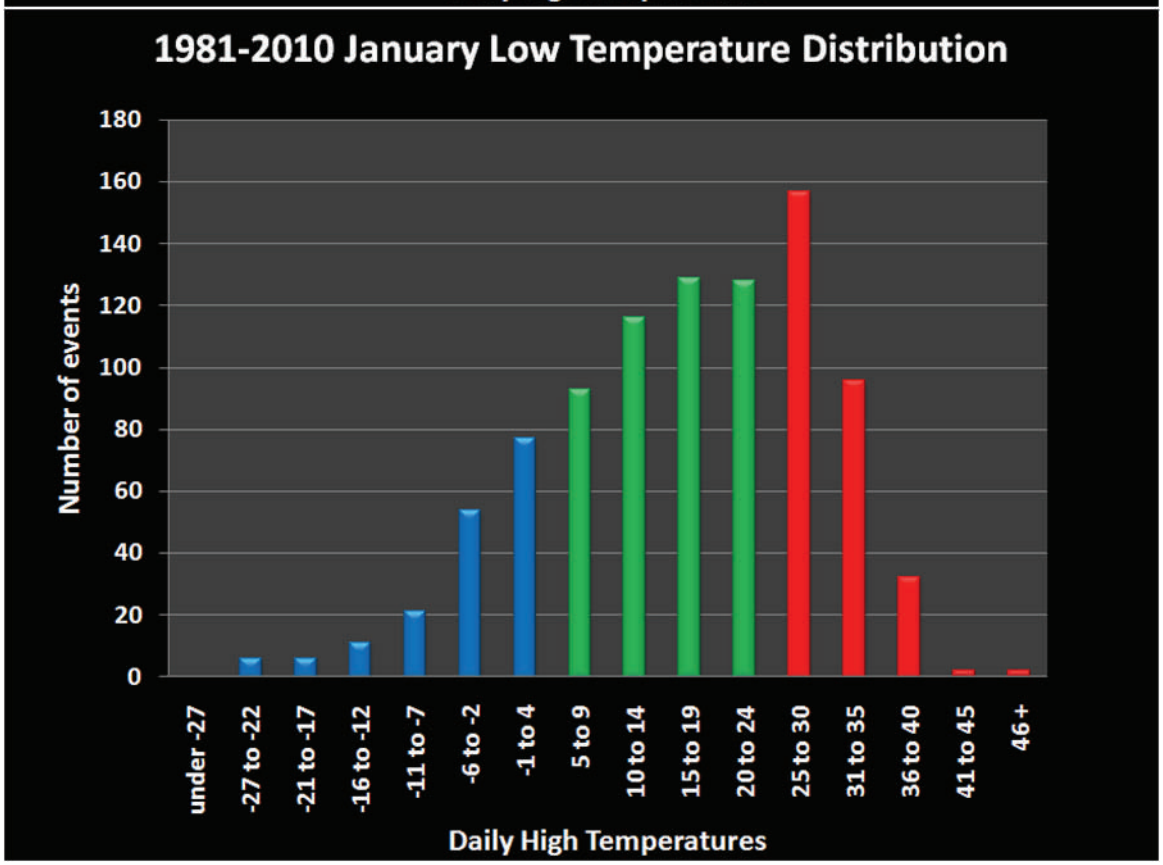
What is Typical During the Winter Season? (cont)



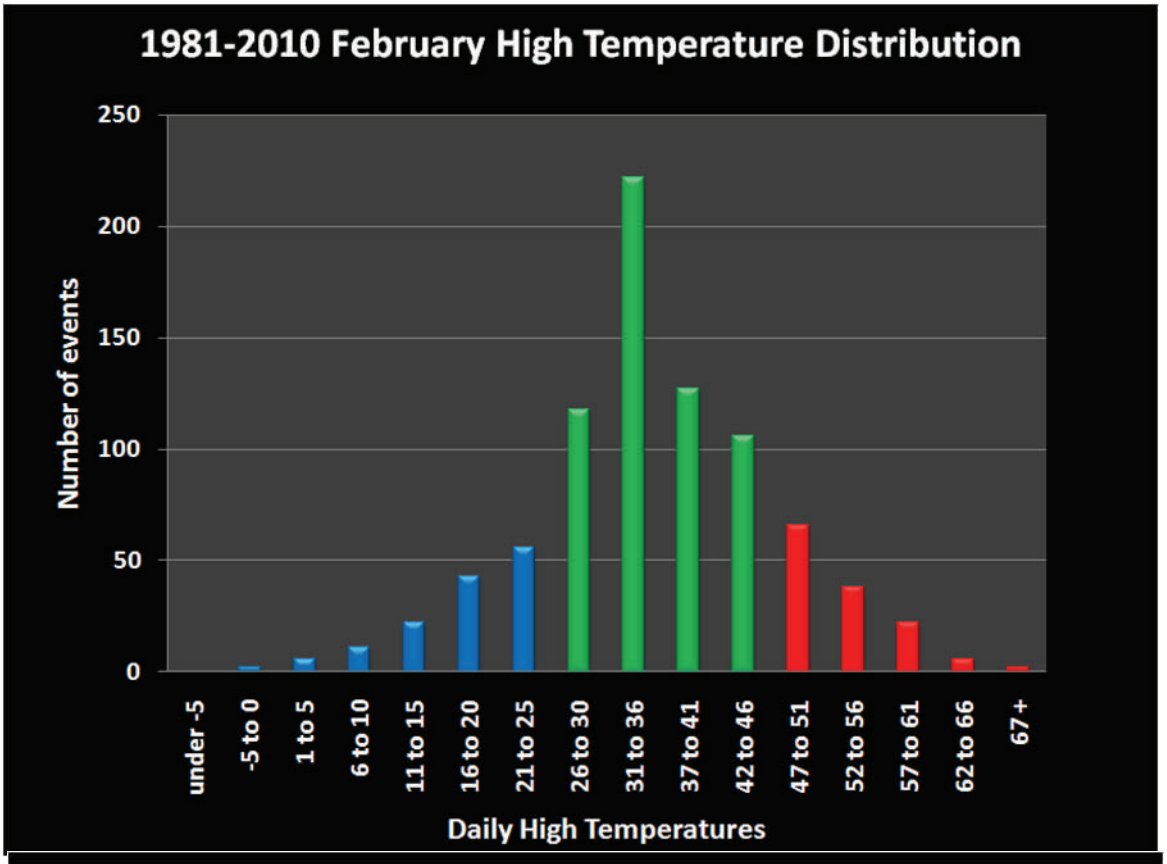


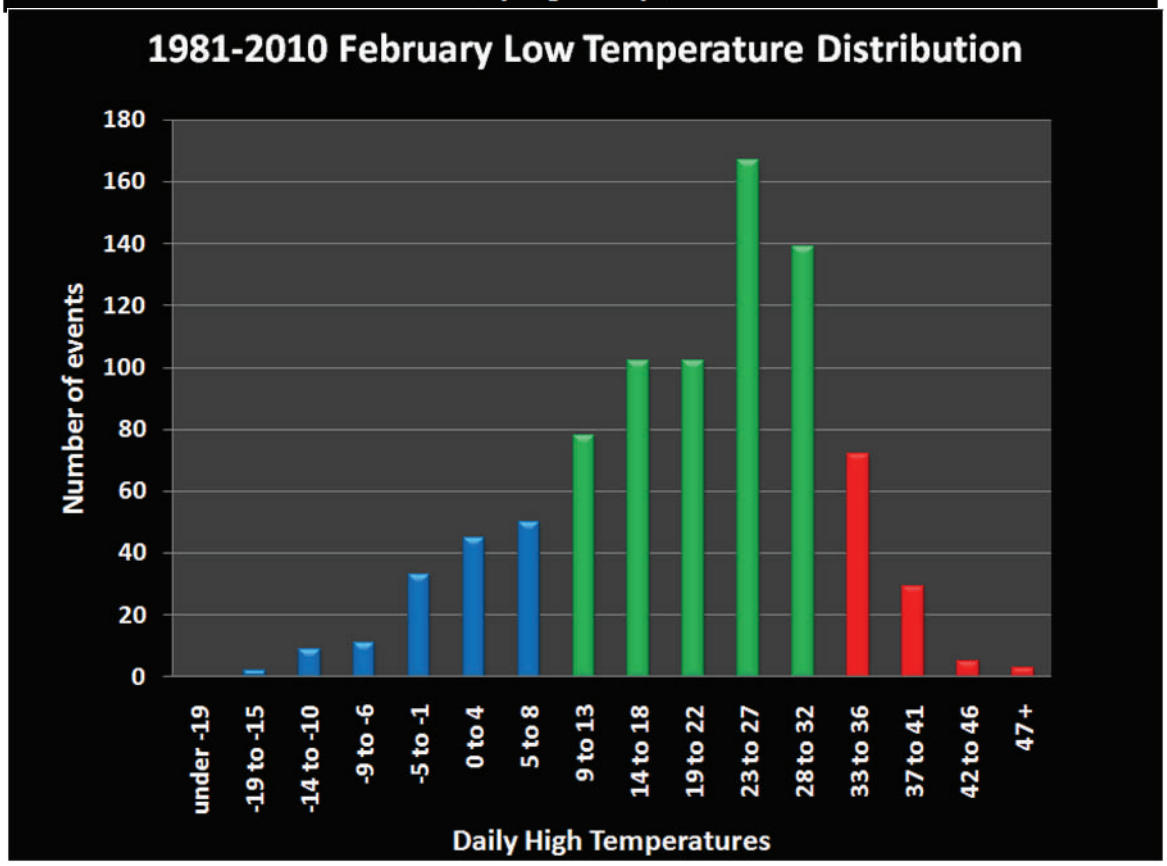
What is Typical During the Winter Season? (cont)





What is Typical During the Winter Season? (cont)



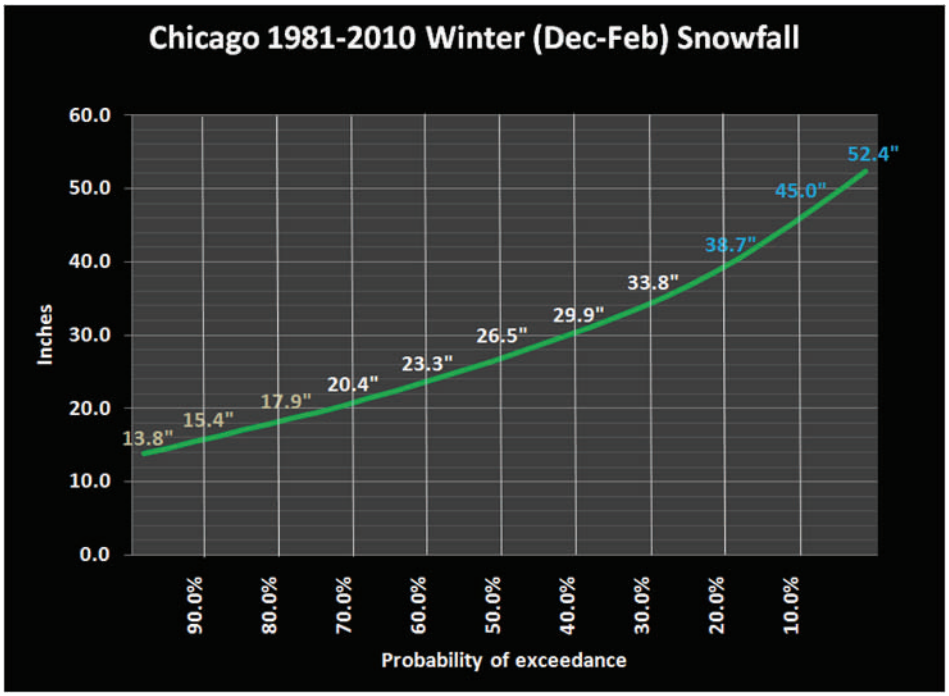


What is Typical During the Winter Season? (cont)

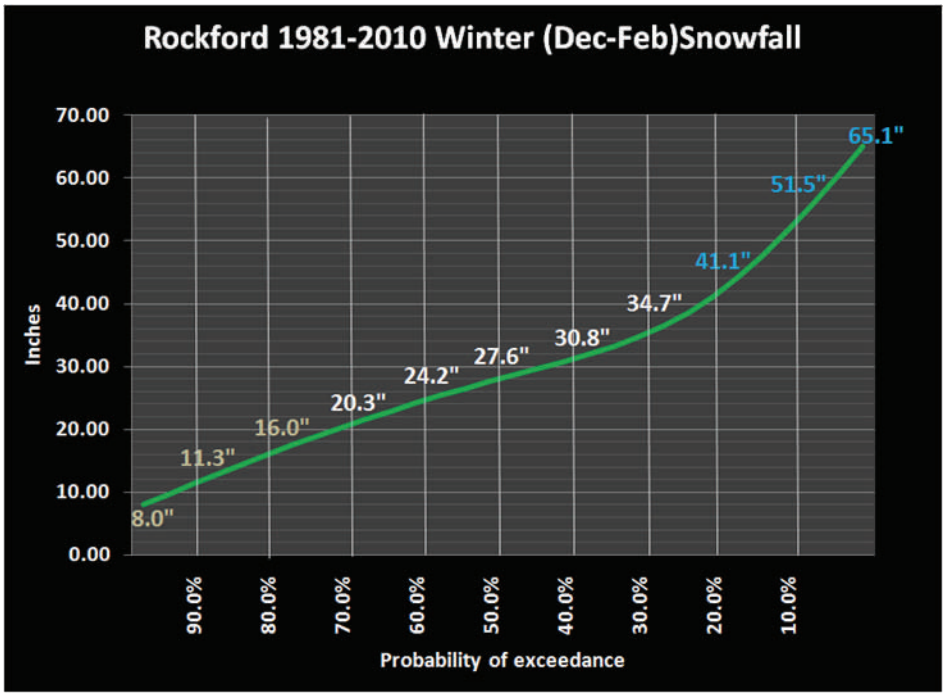
Snowfall

The two figures below display the probabilities of exceedance for winter season snowfall during the 1981 to 2010 climate normal period. During these 30 winter seasons, snowfall amounts at Chicago ranged from a low of 13.8” in the 2002-2003 winter, to as much as 52.4” during the 2009-2010 winter season. In Rockford the spread was slightly higher. From these figures it is apparent that snowfall in Northern Illinois can be highly variable from year to year during the meteorological winter season (defined as December through February). However, in spite of this variability, snowfall during the past few winter seasons in both Chicago and Rockford has been well above the 30 year median of 26.5” and 27.6”, respectively. In fact, the snowfall amounts during each of these past 4 seasons has fallen within the far right side of the figures below (above 45”), meaning that the probabilities for experiencing snowfall amounts of that magnitude are very low (less than 10%) for a given year.

Similar to the temperatures, a range of typical winter season snowfall amounts can be extracted from the charts below. For Chicago, 60% of the winter seasons had snow between 17.9” and 38.7” (the 80th and 20th percentiles in the chart). Therefore, in spite of the fact that the average snowfall during this 30 year period is 28.5”, a more appropriate typical winter season snowfall for Chicago might be within the 17.9” to 38.7” range. Similarly, at Rockford this typical winter season snowfall range would be between 16.0” and 41.1”. These ranges are quite large, further illustrating the extreme amount of year to year variability in winter snowfall.



What is Typical During the Winter Season? (cont)



Chicago , IL	Snowfall
December	8.5”
January	10.8”
February	9.1”

Average monthly snowfall amounts

Rockford , IL	Snowfall
December	11.3”
January	10.2”
February	7.7”

Average monthly snowfall amounts