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Winter 2007

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Top Ten Weather Events for 2007

by Jim Allsopp, Warning Coordination Meteorologist

Northern Illinois and northwest Indiana are subject to a wide variety of weather phenomena, and sometimes experience extreme or unusual weather. The year 2007 was no exception. This is a list, in chronological order, of the top ten weather events in north central and northeast Illinois and northwest Indiana through December 20, 2007.

Late January-Mid February Cold Snap. Temperatures were below freezing for twenty two consecutive days from January 28 through February 18 at both Rockford and Chicago. Low temperatures fell below zero eight days in a row at Rockford from February 3 through 10, and seven of eight days in Chicago. The coldest day was February 5th. In Chicago the high was 5 above and the low was 10 below zero. Rockford had a high of 2 above and a low of 13 below. Wind chill values were 20 to 30 below zero. At least four deaths in Chicago were attributed to the late January cold.

The month of February averaged 9.0 degrees below normal in Chicago, making it the 11th coldest February on record. Rockford was 8.8 degrees below normal, making it the 4th coldest.

February Blizzard and Ice. On February 13, more than 6 inches of snow fell southeast of a line from LaSalle to Waukegan with wind gusts of 35 to 40 mph, creating blizzard conditions. The heaviest snow was over Livingston, Ford, Iroquois, and Kankakee Counties in Illinois into Lake County, Indiana where 12 to 16 inches fell. Officially, 8.8 inches of snow fell at Chicago O'Hare. The Rockford area had less snow, but strong winds caused blowing and drifting of the snow. Less than two weeks later, on the 25th, heavy snow fell over far northern Illinois, near the Wisconsin border. The rest of northern Illinois and northwest Indiana had a mix of snow, sleet, freezing rain and rain. Some areas received a quarter of an inch of ice. Wind gusts over 35 mph accompanied the storm.

March 31 Microbursts. Fast moving thunderstorms produced brief but intense wind damage at several locations in northern Illinois. One storm knocked down several trees and limbs along Route 23 from DeKalb to Sycamore. A building under construction collapsed in Sycamore. Another storm damaged roofs and a maintenance building at a condominium complex in Aurora. This storm later caused significant damage in Carol Stream and Glendale Heights. A large roof section of a three story apartment building was peeled off. There were also windows blown out and other nearby buildings had some roof damage. Trees were also damaged in the area.

April 11 Late Season Snow. An unusually late season snow fell in northern Illinois on April 11 and 12. Rockford had 2.9 inches and Chicago had 3 inches.

May 24 Wind and Wildfire. Winds gusted to 40 to 50 mph across northern Illinois and northwest Indiana. Peak gusts included 54 mph at the NWS office in Romeoville, 49 mph at DeKalb, 47 mph at Aurora, 46 mph at Rockford, and 41 mph at O'Hare. The high winds damaged tree limbs and power lines throughout the region. Trees fell on vehicles in West Chicago and Batavia, and a tree fell on a house in Wheaton. The high winds combined with low humidity created a fire danger. A fire broke out at an RV facility in Bolingbrook and I-55 had to be shut down because of thick smoke. Another fire occurred in an industrial park in Harvey and spread through several buildings in a one square mile area.

July 8 Heat. July 8 was the hottest day of the summer with the high temperature 94 and the low 75 at Chicago. Rockford had a high of 93 and a low of 72. Peak heat index values were 99 at Rockford, 98 at O'Hare, and 104 at Northerly Island at the Chicago Lakefront.

August Flooding. Several waves of thunderstorms dumped heavy rain over southern Wisconsin and northern Illinois, which resulted in flooding of the Des Plaines, Fox, Rock, Illinois, Little Calumet, and Kishwaukee Rivers. The first round of heavy rain on August 7th caused flash flooding from Rockford and Belvidere east to Lake County. The Keith Creek basin on the southeast side of Rockford was hardest hit as more than 6 inches of rain fell in about 3 hours. Residents were evacuated and some homes were inundated by flood waters.

The final wave of heavy rain was on the 23rd. This resulted in major flooding of the Des Plaines River at Russell and Gurnee, flooding of DeKalb and Sycamore from the South Branch Kishwaukee River, and flooding from Algonquin to Montgomery from the Fox River as well as along portions of the Little Calumet, Rock, and Upper Illinois rivers. New record crests were set at locations on Hart Ditch in Indiana. The South Branch of the Kishwaukee River at De Kalb experienced the second highest crest on record. The Illinois River at La Salle reached the sixth highest crest on record, a significant event as most recorded crests for a watershed of that size normally occur during the late winter or early spring period due to rain and snowmelt.

Rainfall totals for the month of August included 16.56 inches at Genoa, 15.69 inches at Elgin (record), 14.46 inches at Marseilles (record), 14.27 inches at Ottawa (record), 13.98 inches at Rockford (record), 13.84 inches at Barrington (record), 12.71 inches at McHenry (record), 12.59 inches at Morris, 12.02 inches at De Kalb, and 11.41 inches at Antioch (record).

August Blowdowns. On August 15, a supercell thunderstorm moved southeast from near Gary and Highland in Lake County, Indiana to near Kouts in Porter County Indiana. The storm produced a 10 mile wide swath of 50 to 70 mph winds with isolated pockets of winds of 90 to 110 mph. The storms knocked down tree limbs and snapped and uprooted entire trees. Some trees fell on vehicles and roofs of homes and farm buildings. Winds also flattened corn fields, blew down billboards and road signs, and destroyed a large horse barn. Twenty three large steel truss towers for power lines were toppled near Kouts.

About a week later, on August 23, a derecho blasted northeast Illinois and far northwest Indiana. Two short thunderstorm lines rushed across the area producing wind damage. (An area of thunderstorms that produces a long continuous path of intense wind damage is known as a derecho.) One line of storms cut a path from Ogle County, through DeKalb, Kane, DuPage, and northern Cook Counties. Another area of storms moved from LaSalle County to Grundy and Will Counties and moved into northwest Indiana. Both storms produced winds in excess of 50 to 60 mph. Winds were estimated to be 80 to 100 mph in a few spots. An EF1 tornado spun up briefly at Winfield. The thunderstorms snapped and uprooted thousands of trees. Many trees and limbs fell on vehicles, homes and power lines. More than 600,000 customers lost power. Many residents and public works officials in DuPage and northern Cook Counties said it was the worst damage they had seen in many years. A warehouse was damaged in West Chicago, injuring 40 people. A man was killed by falling debris in the Wrigleyville neighborhood of the north side of Chicago.

Warm October. It was a very warm October. Chicago O'Hare averaged 6.9 degrees above normal, making it the 11th warmest October on record. Rockford's monthly average temperature was 7.5 degrees above normal, making it the 4th warmest on record. Temperatures were in the 80s for five straight days from the 4th through the 8th, including a record high of 87 at O'Hare and 88 at Rockford on the 7th. The thermometer cracked the 80 degree mark again on the 21st.

Ice and Snow During the First Half of December. The area experienced its harshest December since 2000. The winter season opened with a winter storm on December 1st. Snow quickly changed to freezing rain. Areas along and north of I-80 received over a quarter of an inch of ice. The Rockford area was hardest hit with around half an inch of ice. This resulted in widespread damage to trees and power lines. A few days later, on December 4 and 5, three to 5 inches of snow fell across the same area. Some enhancement from Lake Michigan bumped up totals to 6 to 8 inches north of Chicago. Two more ice storms hit on December 9th and 11th. On December 9th, it was areas south of Gibson City to Watseka, Illinois to Rensselaer, Indiana that received heavy freezing rain. On the 11th, areas along and north of I-80 received some early morning snow, sleet and ice, but temperatures quickly climbed to freezing or above by mid-morning. The far northern tier of counties in Illinois had around a quarter of an inch of ice. The next blow was a snowstorm on the 15th. Much of northern Illinois received 3 to 6 inches of snow and areas along and east of I-57 had 6 to 12 inches of snow. Winds gusting to 30 mph made roads impassible in rural areas.

Winter Weather Safety Tips

by Matt Wojtowicz, Student Volunteer

The days are short, the nights are long, and temperatures are dropping. That can only mean one thing, winter is here! This can be a very fun and exciting time of the year, but it is important that we keep winter safety in mind. It is important to dress warm, and to be prepared for a winter weather emergency whether in a vehicle, at work or at home. Weather is always changing and it is very important to have the current forecast when planning winter travel. Here are a few safety tips to keep in mind for the winter season.

Overexertion.

Shoveling snow, or pushing a car stuck in snow in cold temperatures can put extreme amounts of stress on our bodies. Sometimes we don't notice how tired we actually are, which can lead to overexertion. It is very important to take breaks when doing physical work in the cold.

Extreme cold.

Sub-zero temperatures are one of the most dangerous aspects of winter. To avoid frostbite and hypothermia, always dress in layers. Air trapped between layers of clothing helps insulate the body from the cold. Remember to wear a hat and gloves. Up to 50 percent of body heat can be lost through the head and hands. Keep clothing as dry as possible. The wetter your clothes get the less efficient they will be at keeping you warm.

Vehicle Safety.

Make sure your car, truck or van is ready for winter. Check your tires, battery, and wiper blades before you take a long road trip. Have your car battery tested throughout winter. If there are any mechanical defects try to have them fixed as well. Check all fluids before traveling. Becoming stranded in winter could be life-threatening.

Vehicle survival kit.

Do not drive in a snow storm unless absolutely necessary. Its best to stay at home until the storm is out of the area and the roads are clear. If you must travel in snowy or icy conditions make sure you are prepared. Fill up on gas. Carry a winter survival kit including blankets or a sleeping bag, a cell phone and a car charger, a first aid kit, water container, flash light and batteries, non-perishable, high energy snack foods, small shovel and ice scraper. Let someone know of your travel plans.

Stranded in a vehicle.

If you do happen to get stranded, always stay with your vehicle. Keep as much heat in the car as possible. Only run the engine for ten minutes every hour for heat. Make sure the tail pipe on the vehicle is not blocked. Crack the window slightly for ventilation and to avoid carbon monoxide poisoning. Keep flashers or dome lights on when running your engine to make your car easer to spot for the emergency team. Putting a bright colored cloth around your car antenna will make you car stand out as well. If you are sitting in the vehicle make sure to move your hand and legs vigorously from time to time to keep the blood circulating. This will help maintain heat throughout your extremities, keeping chances of frostbite and hypothermia down.

At home.

Keep a winter survival kit in your home in case you are stuck in a snow storm or in case you lose power for an extended period. Have an alternative source of heat such as a backup generator, kerosene heater, or fireplace. Use alternative heating with care and only in well ventilated areas to avoid fire or carbon monoxide poisoning. Have bottled water and non-perishable snack foods on hand. Keep flashlights with extra batteries and a NOAA Weather Radio or portable AM-FM radio, and a first aid kit handy. Keep a supply of needed medications.

The winter season can be a dangerous time, but it also can be fun. It is always important to know the latest forecast. NOAA Weather Radios are one of the best ways to get around the clock coverage of changes in the weather. Also, frequently check our web page, weather.gov/chicago, for the latest information. With the right forecast information and emergency plan in place we can take some of the stress out of winter and enjoy the season.

30 Years Ago – One of Chicago's Harshest Winters

by Jim Allsopp, Warning Coordination Meteorologist

The winter of 1977-1978 was one of the most brutal winters on record in Chicago, and one of three back to back to back harsh winters which gripped the city in the mid to late 1970s.

The Cold. The average temperature for the three winter months of December through February was only 19.1 degrees, which was 6.4 degrees below normal. It was the fifth coldest winter on record. Chicago temperature records go back to 1871. Winter 1976-1977 was the fourth coldest and winter 1978-1979 was the second coldest. So three of the five all time coldest winters in 136 years of record keeping occurred consecutively in the 1970s.

While temperatures were cold, they were not as extreme as 1976-1977 or 1978-1979. There were 19 days with a temperature at or below zero, but the coldest reading was -7 on December 10 and again on January 10. However, the cold was very persistent. February had only 3 days when the temperature climbed above freezing and the highest was 37. In fact, the temperature never climbed above 40 degrees from December 19 through March 9! December averaged 2.7 degrees below normal. January's average temperature was only 15.9, which was 6.1 degrees below normal – the tenth coldest on record. February averaged 16.8 degrees, 10.2 degrees below normal – the fourth coldest on record.

The Snow. Total snowfall for the season was 82.3 inches, second only to the 89.7 inches that fell during the following winter, 1978-1979. This broke the previous records set in 1969-1970 and 1966-1967. It was more than double the normal seasonal snowfall for Chicago, which is 38 inches. The biggest snowstorm was 12.4 inches that fell January 25-27. A week and a half later, 10.3 inches fell on February 6 and 7. Midway was the official reporting station for Chicago at the time. A few miles further north at O'Hare, snowfall was still above normal but considerably less than Midway – only 52.4 inches.

3 brutal winters

Winter Season	Snow (inches)	Departure from Normal	Rank	Average Temp (°F)	Departure from Nor-	Rank
1976-1977	54.1	+16.1	14th	19.0	-6.5	3rd
1977-1978	82.3	+44.3	2nd	19.1	-6.4	5th
1978-1979	89.7	+51.7	1st	18.4	-7.1	2nd

NWS Chicago to be at the Chicago Boat Show

by Amy Seeley, Port Meteorological Officer

78th Annual CHICAGO BOAT, RV & OUTDOORS SHOW

January 16-20, 2008

McCormick Place, Chicago, IL

If you are headed out to the Chicago Boat, RV & Outdoors Show, why not stop by the Chicago National Weather Service booth! We are booth #6626 and we will be handing out lots of pamphlets on weather and safety, talking about NOAA All Hazards Radio, and showing off our webpage. Find out the latest on the newest weather products and services we are offering.

Hope to see you there!

Give the gift of All Hazards NOAA Weather Radio

by Amy Seeley, Port Meteorological Officer

Are you still looking for that perfect last minute holiday gift?

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

NWR is your single source for comprehensive weather and emergency information. NWR broadcasts official Weather Service warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week.

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 will 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.

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

The Challenges of Winter Weather Forecasting

by Christopher Gitro, Meteorological Intern

Winter weather forecasting poses one of the biggest challenges to any meteorologist. Not only does a forecaster have to decide in what form precipitation will occur and how much, but additional consideration must be given to factors such as the time of day, time of year, and who the event will impact the most. For example, if a forecaster is trying to decide whether to issue a winter weather advisory or not, an early season snow event may have a greater impact on travel and require an advisory, while a similar snow event in the dead of winter, after everyone has become accustomed to such conditions, might have less impact. This short article will take a brief look at some of the methods and considerations a meteorologist must take into account when preparing winter weather forecasts. We'll touch on some of the common winter weather signatures associated with freezing rain, sleet, and snow, as well as some additional information on processes that lead to banded precipitation events. Banded snow tends to produce heavy snowfall in long narrow swaths, while adjacent areas receive much lower snowfall totals. This article is by no means all inclusive; however it serves as a brief introduction to what a forecaster may be looking for with regards to winter precipitation.

Freezing Rain

This destructive and potentially dangerous form of precipitation occurs when temperatures along the earth's surface are below freezing, while air just above the ground is above freezing. Most precipitation in the United States starts out as snow as it forms in clouds, even in the summer time! During a freezing rain scenario, as the snow falls through the elevated warm layer, the snow flakes melt into liquid raindrops. The liquid raindrops will then continue falling into the shallow cold layer residing along the Earth's surface. Often times, this shallow cold layer is not thick enough or cold enough to support refreezing, and as the raindrops hit the ground, they instantly freeze into a layer of ice.

These weather events are one of the most beautiful and destructive Mother Nature has to offer. Although one often finds themselves staring at trees and other objects covered in shiny layers of fresh ice, the increased weight from the ice causes catastrophic tree and power line failures. One of the most destructive ice storms in recent memory occurred across northern New York, northern New England, and southeastern Canada where up to four inches of freezing rain fell over a six day period. When the event was over, 32 deaths were attributed to the storm as well as a loss of power to more than five millions US and Canadian customers.

Some common thermodynamic signatures indicative of freezing rain are the elevated warm layer and cold surface layer. The example to the left is a forecast thermodynamic profile which shows the vertical structure of temperature (red) and dew point (green) through the depth of the atmosphere. This forecast depiction of what the vertical structure of temperature and dew point would look like in the future was taken from the Tulsa, Oklahoma metro area, shortly before the devastating ice storm in early December, 2007. One can see an expansive area of warm air above 0°C (32°F) above the surface. Meanwhile, along the surface, temperatures were below the 0°C line indicating that a shallow cold layer along the Earth's surface existed. Precipitation falling through the elevated warm layer melted into liquid raindrops, which essentially froze on contact when they hit the earth's surface. As a result of this ice storm, hundreds of thousands of citizens were without power, making this event the single most catastrophic ice storm in Oklahoma.

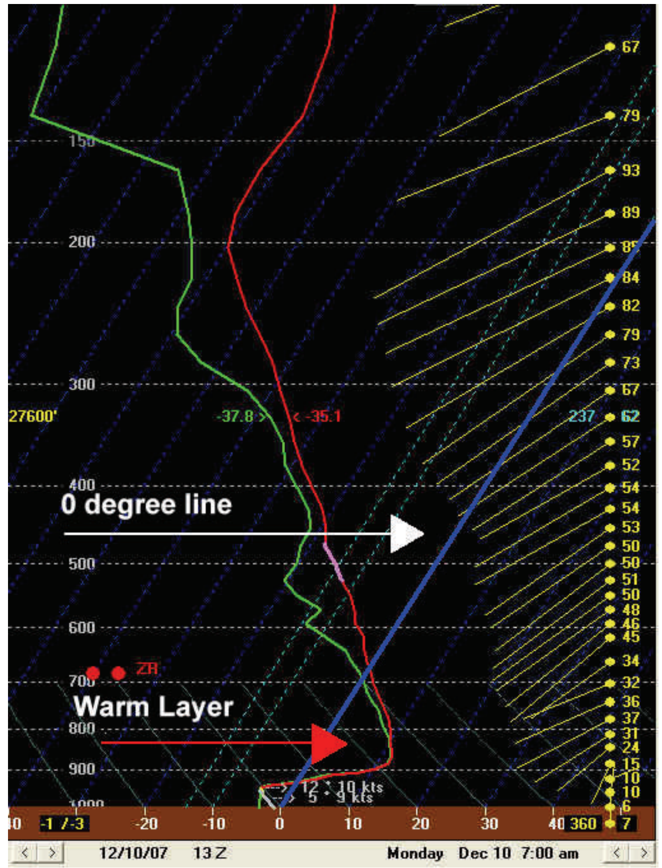
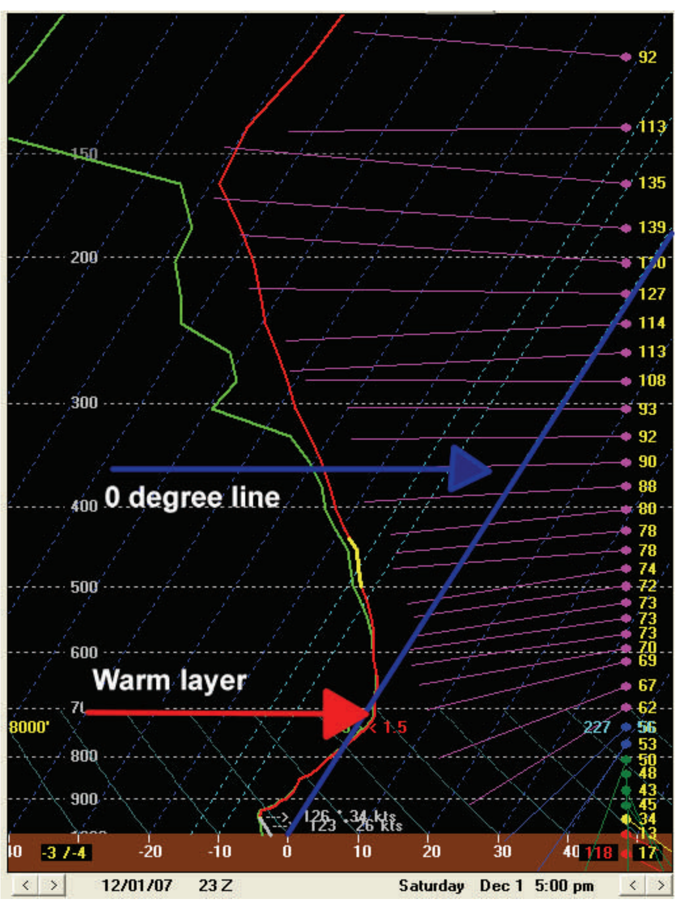


Figure 1: WRF 12z (6 a.m. CST) Bufkit forecast valid for 13z (7 a.m. CST) December 10, 2007 for Tulsa, OK International Airport.



Sleet

Another type of freezing precipitation that is of concern to a meteorologist, as well as the general public, is sleet. Sleet by definition is a form of precipitation that travels through an elevated warm layer similar to freezing rain. However the main difference is that the elevated warm layer is usually not as warm as in freezing rain events, leading to only partial melting of the precipitation particle. For sleet to form, the air along and immediately above the surface needs to be below freezing which will promote at least partial refreezing of the particle before it strikes the Earth's surface. Upon striking the surface, sleet particles often times bounce or shatter on impact. Sleet can also make area roadways very slippery, thereby creating another challenging forecast scenario for any meteorologist.

Common thermodynamic signatures indicative of sleet are similar to signatures supportive of freezing rain, however the elevated warm layer is usually between 1°C to 3°C above zero. Any temperatures warmer that 3°C would promote total melting and a greater likelihood for freezing rain as opposed to sleet. Again, as is in the case for freezing rain events, surface temperatures must be at or below freezing in order to assist in partial refreezing of the precipitation particles as they enter the surface cold layer.

Figure 2: WRF 12z (6 a.m. CST) Bufkit forecast valid at 23z (5 p.m. CST) December 1, 2007 at Rockford, IL Airport.

Snow

The most common and easily recognizable form of precipitation in the winter time is snow. Without a doubt, anyone accustomed to winter in the Great Lakes region has had to deal with their fair share of snow storms. From a thermodynamic point of view, snow forecast soundings are easily recognizable, since for the majority of cases, the entire atmospheric column is below 0°C. Careful inspection of the sounding is critical, however, as one must determine if the column will support effective ice nucleation and snow growth. Typically, the most effective snowfall production occurs when the atmosphere is saturated (temperature and dew point are equal) between -12 to -18°C. At these temperatures, snow growth reaches its peak, as ice crystal growth maximizes through a process called deposition. Supercooled water droplets are actual water droplets in the atmosphere that maintain their liquid form below temperatures of 0°C. As the atmospheric temperature approaches -15°C, ice crystals grow as supercooled water droplets are removed through the process called deposition.

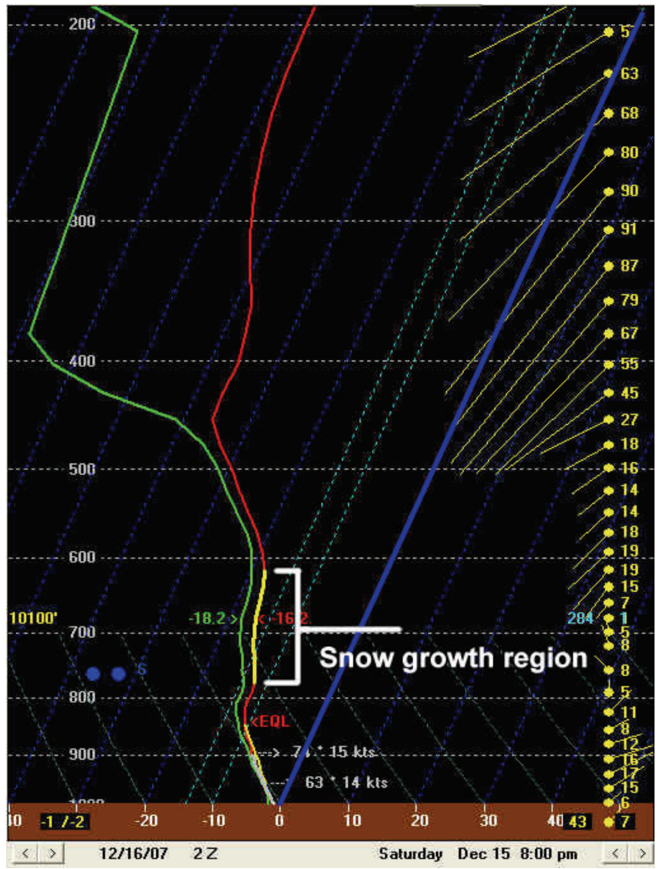


Figure 3: WRF 12z (6 a.m. CST) Bufkit forecast valid at 02z (8 p.m. CST) December 15, 2007 at Chicago OHare International Airport.

Forecasting of heavy snow as opposed to light general snowfall is another area that requires a great deal of knowledge and experience. Not much can bring more anticipation and energy to a forecast office than a significant winter storm bearing down on the area. For a well developed area of low pressure, the most likely area for heavy snowfall is to the north and northwest of a surface cyclone, in an area typically referred to as the deformation zone or comma head. (The term comma head comes from the fact that well developed storms often develop a well defined cloud mass that looks like a large comma shape from satellite images.)

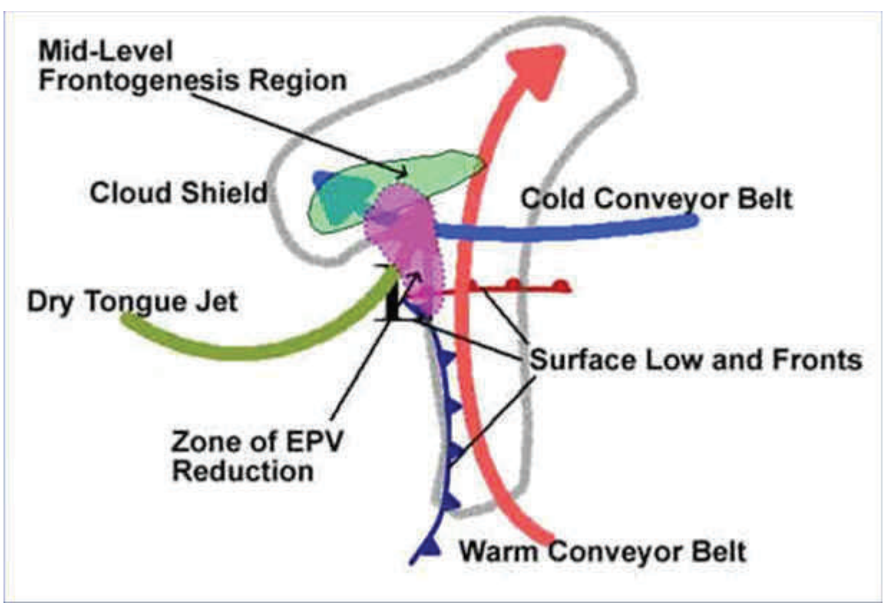


Figure 4: An idealized depiction of separate conveyor belts through a fully developed low pressure system. From Nicosia and Grumm, 1999.

The comma head, or deformation zone is an area where heavy snowfall is generated due to multiple facets of heavy snowfall production coming together simultaneously. First, cold air flows westward into the deformation zone from the east, via the cold conveyor belt. Thus, cold air for snowfall production is typically already in place, and it's this ensemble of air parcels which helps organize precipitation within the comma head or deformation zone. Second, within the deformation zone, a strong temperature gradient exists over a relatively small area, in which temperatures can vary considerably over a very small distance. Under these circumstances, the atmosphere is said to be out of geostrophic balance, simply meaning that normal atmospheric circulations are disrupted.

When this occurs, secondary circulations result in an effort to restore normal atmospheric balance. In response to this, enhanced areas of upward vertical motion, necessary for heavy snowfall production are realized as a result of strong frontogenetical forcing.

Additional circulations are also prevalent in the deformation zone which help lead to heavy snowfall production. Banded precipitation often results in this area and as a result, it's not uncommon to have areas that receive heavy amounts of snowfall in long linear bands in relative close proximity to areas that receive substantially less snow. One of the main factors in heavy banded snowfall scenarios is the release of conditional symmetric instability, or CSI. When CSI is released, the atmosphere is said to be stable in regards to both gravitational (upward) and inertial (horizontal) movements. However, if slantwise circulations result, instability can be released which helps lead to enhanced areas of upward vertical motion, which is necessary for heavy precipitation as previously mentioned. CSI is one of the most difficult atmospheric instabilities to forecast and it has only been in recent years that the science of meteorology has been able to successfully understand and quantify this phenomenon.

To understand why heavy snowfall production is favored in the comma head, or deformation zone, in a well developed cyclone, one need not look much further than frontogenesis and CSI. In fact, recent research has determined that frontogenesis and CSI often times work in tandem with one another, creating areas of enhanced upward vertical motion. Typically the frontogenesis circulations are most prevalent in the middle reaches of the atmosphere, while CSI circulations are most pronounced slightly above the maximim frontogenesis regions. The release of instability from areas of CSI helps to enhance the upward vertical motion already established from the frontogenetical circulations, and as a result, narrow areas of enhanced snowfall can result.

Below is a map from the RUC (Rapid Update Cycle) mesoscale short-term model for the 21st of January, 2005. On this day, a low pressure system traveled from the mid-Mississippi Valley into the Ohio River Valley. Based on the path of the surface low, northern Illinois was located in the favorable comma head/deformation zone as the low passed to the southeast. As a result, a narrow band of heavy snow resulted, primarily from northern Kane County, northeastward through northern Cook and much of Lake County in northeast Illinois. The map below shows an area of enhanced frontogenesis (shaded blue to yellow image) stretched from the southwest to the northeast, primarily through western and northern sections of Illinois. Overlaid on top of the frontogenesis are areas of negative equivalent potential vorticity (yellow lines), a parameter used to identify areas in which CSI circulations may be possible. It's easy to see that the frontogenesis and CSI were nearly co-located, creating a favorable area of enhanced upward vertical motion and heavy snow production. Although the frontogenesis region is shifted to the west of where the actual axis of heavy snow actually fell, likely the result of a small error in the weather model, the forecast depicting of future weather conditions was rather reasonable. As a result of these circulations, some locations received close to a foot of new snow while surrounding areas saw less than five inches. This is a classic example of how difficult a winter weather forecast may be, as multiple parameters must be investigated in order to develop an accurate picture of how the winter weather situation is developing.

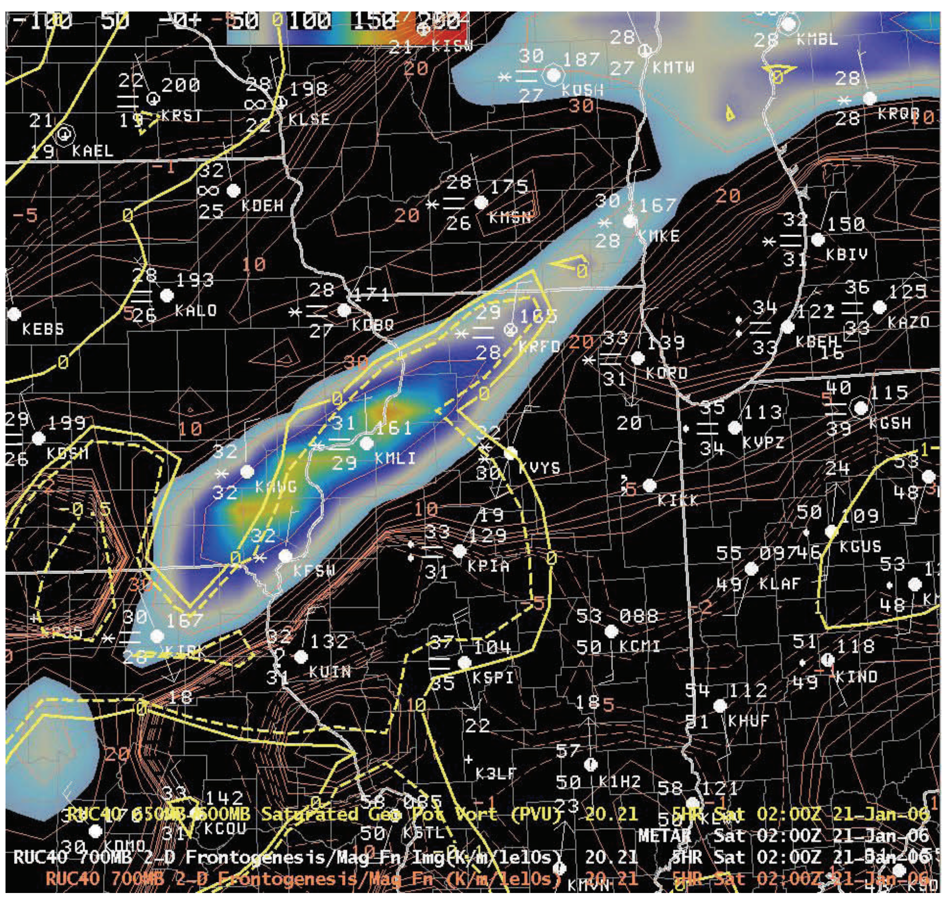


Figure 5: 700 mb frontogenesis and 650-600 mb equivalent potential vorticity.

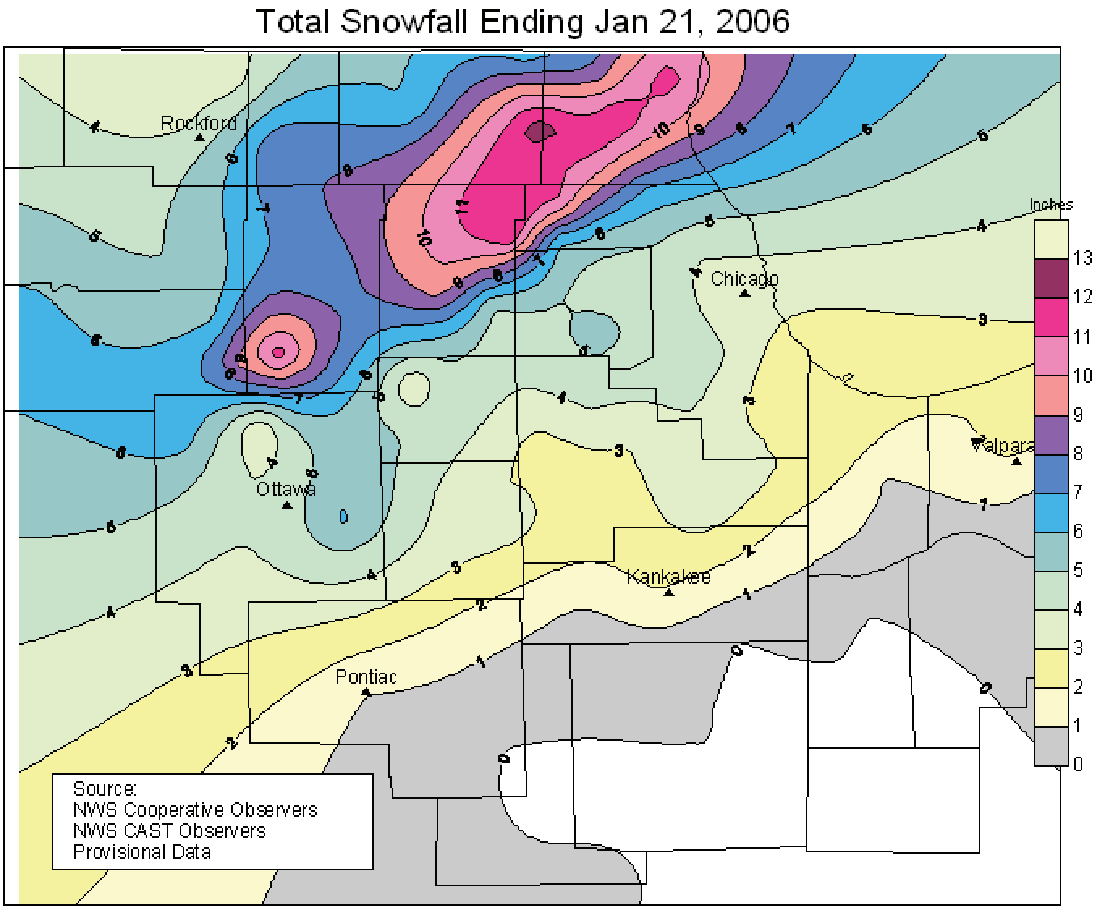


Figure 6: Contoured map of snowfall totals for the Jan 20-21, 2005 heavy banded snowfall event.

Conclusion

As one can see from reading this short article, winter weather forecasting is one of the most difficult scenarios any operational meteorologist will face during his or her career. Multiple circulations can be occurring at once, which can lead to enhanced areas of snowfall over a particular location, while areas in close proximity receive substantially less amounts. Additionally, the thermodynamic structure of the atmosphere must also be investigated in order to determine which type of precipitation is most likely, whether it be freezing rain, or frozen precipitation such as sleet or snow. Other potential issues for winter weather forecasting, not specifically mentioned in this short article, include lake effect snow forecasting, in which temperature differences between the lake water and the overlaying air can create areas of enhanced instability, resulting in very heavy snowfall across areas adjacent to, and directly downstream of a major lake. Recent lake effect snow storms in portions of upstate New York have resulted in snowfall rates of three to four inches per hour, often times accompanied with thunder and lightning, a shear measure of the extreme instability present in the atmosphere.

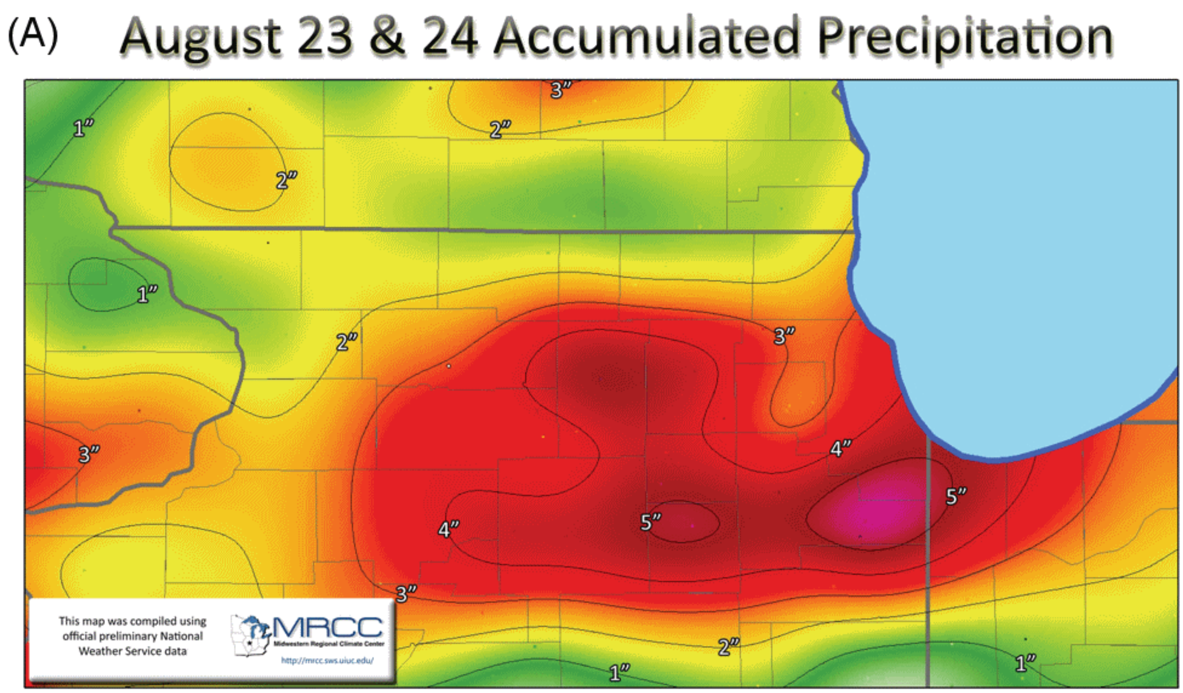
Although this article is by no means all inclusive, it will hopefully shed some light on just how difficult winter weather forecasting can be.

CoCoRaHS marks 1 Year Anniversary in Illinois

by Tim Halbach, Meteorologist

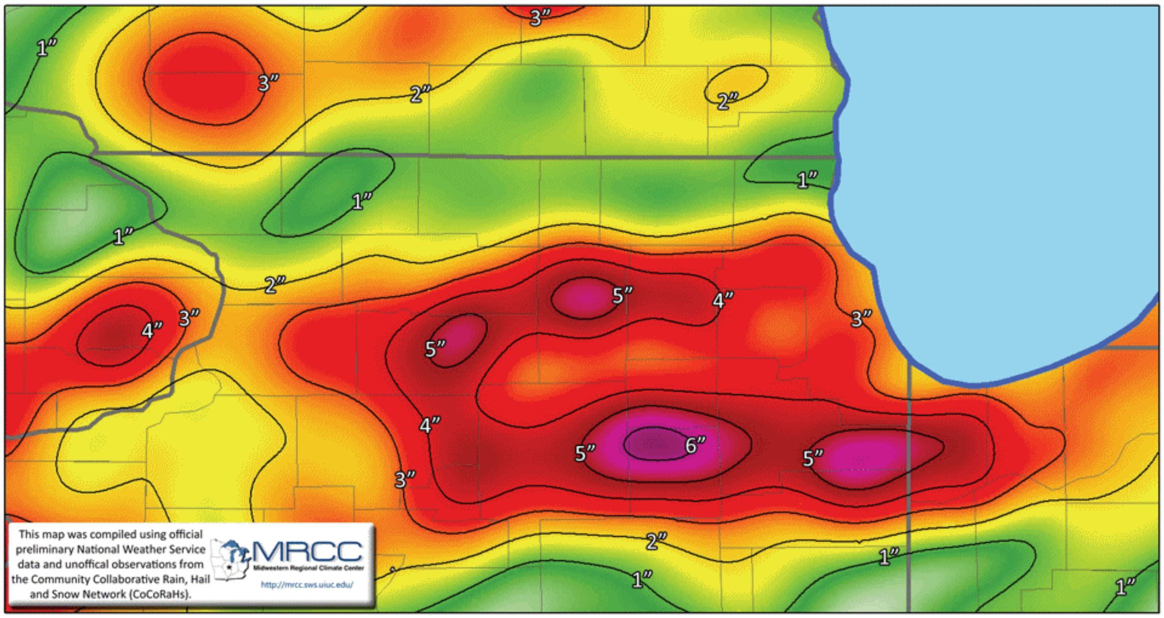
December 1st marked the one year anniversary of the Community Collaborative Rain, Hail and Snow (CoCoRaHS) network's participation in the state of Illinois. Even though the program started up in the middle of winter, over 200 volunteers had signed up by the end of winter; including over 50 on the first day that the program officially began. As of December 1st of 2007, over 600 volunteer observers have signed up across the state, of which 373 are in the NWS Chicago's county warning/forecast area. Add another 136 observers from northwest Indiana, and we have over 500 observers across our region that have signed up to participate in CoCoRaHS.

The results so far have been remarkable. On a typical day, around 150 precipitation reports come in from across northern Illinois and northwest Indiana. This additional dataset of precipitation added to the existing long term Coop, automated airport stations, radar estimates and other daily supplemental reports have helped to better define precipitation trends across the region and give the meteorologists at the NWS a better idea of how much rain, snow, or hail has actually fallen. Below is an example, which was created by Sam Shea at the Midwest Regional Climate Center, of how the supplemental CoCoRaHS data has added more definition to the other NWS observations:



-Rainfall analysis for August 23rd and 24th, 2007 using NWS observations only

(B) August 23 & 24 Accumulated Precipitation



-Rainfall analysis for August 23rd and 24th using NWS and CoCoRaHS observations

CoCoRaHS observers mainly measure rain and snowfall on a daily basis, but also can report hail and intense precipitation when warranted. These extra real time reports get sent directly to the NWS and are used to monitor the potential for flooding, heavy snow or severe hail. The CoCoRaHS program initiated in Colorado in 1997 after a deadly flash flood went un-measured on the west side of Fort Collins. Having this high density precipitation network in place across northern Illinois and northwest Indiana will help to further lead time on any flash flood warnings that our office may issue. It won't stop the flooding from occurring, but making people aware of the flooding can save lives.

We will always be looking for new observers that may be interested in volunteering, particularly in areas that we normally do not receive precipitation reports from. People normally think that if there is an observer in their town that there isn't a need for any other observers, but this couldn't be further from the truth. How many times have you called a friend on the other side of town and found out that they had no rain when you had a torrential downpour? Volunteers in the program include anyone from families trying to learn more about the weather to 9 to 5 day workers to retirees and report once a day in the morning but do not necessarily have to report every day. One group that CoCoRaHS is interested in expanding the program with are golf course superintendents because of wide open areas to take the observation and their need for understanding precipitation on their golf course.

The ultimate goal of the program is to have one observer per square mile in urban/suburban areas and one observer per 36 square miles in rural areas. Having this dense of an observing network would greatly increase the amount of catches of high end precipitation events, particularly thunderstorms and banded snow squalls off of Lake Michigan.

For more information on CoCoRaHS or if you are interested in joining, please visit the CoCoRaHS main web page at www.cocorahs.org or send an email to Timothy.J.Halbach@noaa.gov.