National Weather Service Quad Cities IA/IL

Weather Home Companion

Vol. 4 Issue 2, Fall 2007

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Weather Home Companion is a semiannual publication of the National Weather Service office in the Quad Cities.

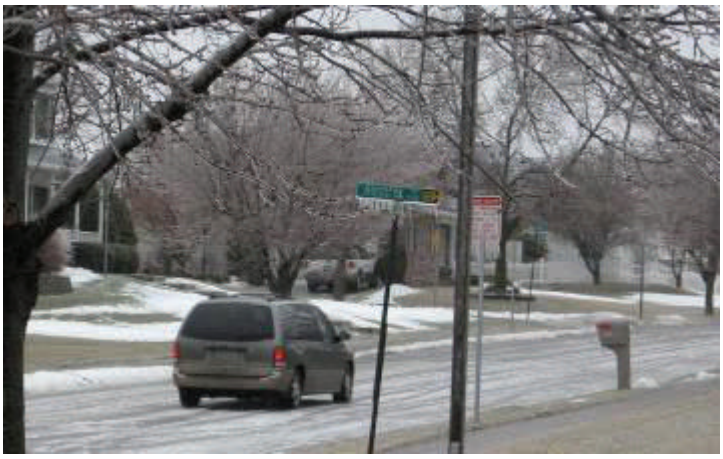
If you have an idea for an article or a question you would like to see answered, please write to us.

Contact information can be found on page 10.

Ice Storms: The Stealth Winter Hazard

David Sheets

Thunderstorms herald their arrival with flashing lightning, rumbling thunder, gusty winds and heavy rain, and most Midwesterners are well aware of the dangers associated with these storms. Likewise, in the winter, typical snowstorms are unmistakably punctuated by a rapidly whitening landscape, poor visibility, and often howling winds. When winter storms set in, people respond by staying indoors, or ensuring both they and their vehicles are prepared if they must travel. Ice storms, however, can develop without much fanfare. Freezing rain and freezing drizzle may go unnoticed for long periods of time by those casually looking out the window. What looks like a typical cloudy and possibly foggy winter day can lead to loud cracking and popping, often followed by power failure, as accumulating ice brings down tree branches and power lines. For travelers, and those caught outdoors, the onset of freezing rain will be immediately noticeable. Roads and sidewalks may quickly become slick and impassable, and under the right conditions, ice storms can bring both ground and air travel quickly to a halt.



The Ice storm of February 24, 2007 quickly caused hazardous driving conditions. Motorists, such as the one in this photo, found treacherous conditions on residential streets in Davenport, Iowa when ice accumulated over a half inch deep.

To forecasters, ice storms present

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Quality "Service" is in Our Name

Steve Kuhl

The National Weather Service (NWS) Quad Cities Weather Forecast Office strives each and every day to provide you with the very best possible products and services. These include timely and accurate: severe storm warnings; climate data and outlooks; river flood warnings and forecasts; aviation forecasts; meteorological data collection; and, other educational services. "Quality" is at the center of our jobs. To meet this demand for quality, the NWS Quad Cities Office applies nationally recognized quality principles to its day to day forecast operations and other supporting programs. These principles include: Leadership; Strategic Planning; Customer Service; Market Analysis; Process Management; Workforce Focus; and, Business Results. Our staff of highly trained and dedicated professionals understand the importance of "Service above Self" toward achieving the NWS mission to "protect life and property and enhance the national economy."

Quality "Service" is in our name. As Meteorologist in Charge, I can assure you we will strive to maintain the high level of service you have come to expect from your NWS Quad Cities Office.

Ice Storms: The Stealth Winter Hazard

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one of the biggest challenges in winter forecasting. Not only are they difficult to predict, but because of the potential for life threatening conditions and large economic impact, forecasting these events is done with great care.

The area served by the National Weather Service Quad Cities experiences an average of 4 days of freezing rain each year. One of the most devastating ice storms in this area occurred this past winter, on the 24th of February. To gain a better understanding of ice storms, it is helpful to look back at this event and discuss some of the unique challenges these storms present to forecasters.

...The area served by the NWS Quad Cities averages 4 days of freezing rain each year...

...AN ICE STORM WARNING MEANS SEVERE WINTER WEATHER CONDITIONS ARE EXPECTED. SIGNIFICANT AMOUNTS OF ICE ACCUMULATIONS WILL MAKE TRAVEL DANGEROUS OR IMPOSSIBLE. TRAVEL IS STRONGLY DISCOURAGED. COMMERCE WILL LIKELY BE SEVERELY IMPACTED. IF YOU MUST TRAVEL... KEEP AN EXTRA FLASHLIGHT...FOOD...AND WATER IN YOUR VEHICLE IN CASE OF AN EMERGENCY. ICE ACCUMULATIONS AND WINDS WILL LIKELY LEAD TO SNAPPED POWER LINES AND FALLING TREE BRANCHES THAT ADD TO THE DANGER…

Ingredients

The basic ingredients for a typical Midwest ice storm are, 1) a layer of warm moist air aloft; 2) cold (subfreezing) air at the surface; and 3) lift, or upward motion. Upward motion is most often provided by features associated with an approaching surface and upper level storm system moving toward the area from the southern or central plains. The counterclockwise motion around an advancing surface low typically draws a layer of warm, moist air northward over colder air that is already in place over the region. This generates precipitation, which falls in the form of freezing rain where the temperature profile aloft is ideal. This was the case last February, when these ingredients came together over Iowa and Illinois, resulting in a major ice storm.

February 24, 2007

On the morning of February 24, an area of low pressure was intensifying near the Oklahoma panhandle (Figure 1). A deep layer of warm, moist air drawn north ahead of this system from the Gulf of Mexico was riding over slightly cooler, but well above freezing air, at the surface. This was resulting in widespread rain across the central plains. In the colder air to the northeast, snow was falling across

Figure 1
6 am Feb. 24, 2007
Surface fronts, 32 degree F temperature contour and precipitation types

southern Wisconsin. Across much of eastern Iowa and northwest Illinois, temperatures were below freezing and precipitation had not yet developed. Above the ground, temperatures were above freezing over much of the central part of the country. Figure 2 shows that the freezing line at the 850 mb level (around 4,000 feet above the ground over Moline) was well north of Iowa and Illinois.

During the day, the storm system strengthened and drifted northeast. The area of rain shifted northeast and fell in the form of freezing rain across eastern Iowa and northwest Illinois, where surface temperatures remained below freezing (see figure 3). Several thousand feet above the ground, temperatures were still near or above the 32 degree mark over much of the region (see figure 4).

By the next morning, the surface low was tracking over eastern Iowa and northwest Illinois (see figure 5). The warm air at the surface, just east of the low pressure center, extended north into far eastern Iowa and northern Illinois. This caused the precipitation to change to rain, which was heavy at times. To the west, strong north winds and heavy snow was resulting in blizzard conditions across much of central and western Iowa, as cold arctic air was being pulled south into the system from the northern plains. In this area, the snow was falling on top of a heavy coating of ice laid out the previous day. In the

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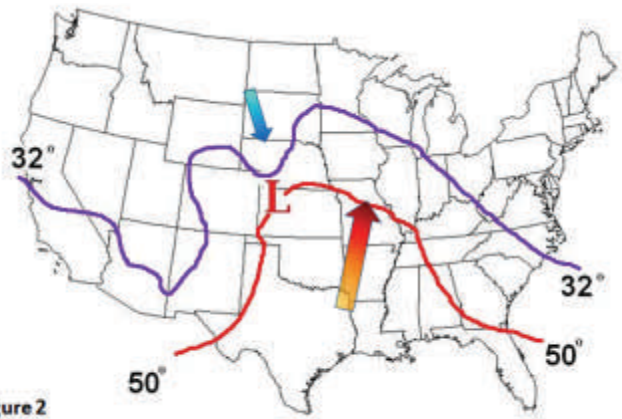

Figure 2
6 am February 24, 2007
850 millibar level – roughly 4,000 ft above ground level over the Quad Cities

Ice Storms and Blizzards and Power Outages, Oh My!

Donna Dubberke

Dorothy might be worried about lions and tigers and bears, but those of us living in the Midwest know that with the changing calendar comes a very real threat – winter!

The winter of 2006-07 was memorable for many of us. On February 24th eastern Iowa and western Illinois were layered with 1-2 inches of ice, leaving 400,000+ people without power, some for more than a week. Some communities lost their water supply due to the extended power outage. In the end, communities tallied more than $50 million dollars in storm related damage and losses. Over the course of the winter, parts of Iowa and Illinois also experienced deadly blizzards and snow storms that dumped more than 12 inches of snow in less than a day.

As we look toward this coming winter (and it IS coming…), it's a great opportunity to review our home emergency preparedness. Emergency management agencies and the American Red Cross recommend that every family be prepared to sustain themselves for at least 3 days. That includes food, water, medicines, and other supplies. This national recommendation is a practical guideline that applies to all sorts of disasters and threats – both natural and man-made.

The Department of Homeland Security has developed a terrific web site filled with specific preparedness information and resources for employers, families, educators, and even includes activities for children. The web site will walk you through the steps to develop a practical plan and build a preparedness kit. Check it out – you won't regret it! After all, winter is coming, whether we want it to or not!

For preparedness information, visit **www.ready.gov**

Ready America
Prepare. Plan. Stay Informed.

www.ready.gov

Winter Weather Terms

Winter Weather Advisory: One or more of the following is likely:

* 3 to 5 inches of snow
* Snow with wind and visibility less than 1/2 mile, considerable blowing and drifting
* Freezing rain/freezing drizzle with less than 1/4 inch ice accumulation
* Sleet with less than 1/2 inch accumulation

Specific types: Snow Advisory, Snow and Blowing Snow Advisory, Freezing Rain Advisory, Freezing Drizzle Advisory, Wind Chill Advisory, Wind Advisory

An advisory is issued for conditions that will cause significant inconveniences and , if caution is not exercised, could lead to life-threatening situations.

Winter Storm Watch: *Possibility* of one of the following: blizzard, heavy snow, heavy freezing rain or heavy sleet. Usually issued 12 to 48 hours before expected onset.

Specific types: Winter Storm Watch, Blizzard Watch, Wind Chill Watch

Winter Storm Warning: Hazardous winter weather, which may be a threat to life and property, is likely. Usually issued less than 24 hours before expected onset.

Specific Types and Expected Conditions:

Wind Chill Warning: Wind chill index of –30 deg F and below for a significant amount of time.

Winter Storm Warning: 6 inches or more snowfall in 12 hours or less, or 8 or more inches in 24 hours or less, with wind adding some impact. Storm may also have periods of freezing rain or sleet.

Heavy Snow Warning: Same snow as above, except precipitation expected to fall as all snow and wind expected to have little impact

Ice Storm Warning: Freezing rain causing accumulation of 1/4 inch or more of ice.

Sleet Warning: Sleet with 1/2 inch or more accumulation.

Blizzard Warning: Sustained wind or frequent gusts of 35 mph or greater with considerable falling, blowing, and drifting snow, frequently reducing visibility less than 1/4 mile.

Know the Difference:

ADVISORY: Winter conditions resulting in significant inconvenience are likely or occurring. Could lead to life-threatening situations.

WATCH: Hazardous winter weather, which may be a threat to life and property, is possible. Usually 12 hours or more in the future.

WARNING: Hazardous winter weather, which may be a threat to life and property is likely. Usually already occurring or imminent, beginning within the next 12 hours.

Ice Storms: The Stealth Winter Hazard

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Figure 3
6 pm Feb. 24, 2007
Surface fronts, 32 degree F temperature contour and precipitation types

transition area between, freezing rain and sleet continued over portions of eastern Iowa.

As the system continued to track northeast, and cold air continued to infiltrate the region, the precipitation changed to snow over all of eastern Iowa and northern Illinois before ending. At its worst, this storm produced ice accumulations from a half to as much as one and a half inches, going into the record books as one of the worst ice storms on record in the region.

Notable Ice Storms in the Past

Major Ice storms that have affected eastern Iowa, (listed chronologically and not necessarily by severity) include:

1) Feb 24, 2007. 1/2 to 1 1/2 inches of ice accumulation causes major power outages

2) Nov 28, 1983. Power outages lasting several days and radio transmission towers knocked down

3) Jan 22-23, 1965. Ice accumulations averaged 1 inch. Travel was impossible.

4) Feb 8-10, 1959. Some ice, but mainly a heavy snow event.

5) Jan 7, 1937. Ice accumulated up to 2 to 4 inches and ice was on the ground for the following 6 weeks. Probably the worst ice storm on record for eastern Iowa.

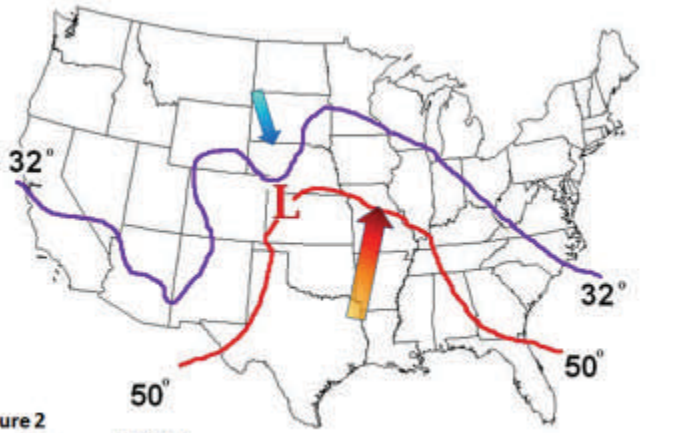

Figure 2
6 am February 24, 2007
850 millibar level – roughly 4,000 ft above ground level over the Quad Cities

Ice Storm Anatomy

Although most ice storms are much weaker, the basic features of the February 24th storm exemplify those of a typical ice storm. Cold air (much below 32 degrees F) is usually already in place over the area when a storm system approaches from the west or southwest. As a storm system approaches, counter clockwise motion causes warmer air several thousand feet off the surface to be drawn northward over the cold air. Upward motion, associated with the warm air being thrust above the cold air, along with that associated with the approaching upper level storm system, produces precipitation. This precipitation usually leaves the cloud base in the form of snow. What form it takes at the ground is determined by the depth of the warm layer aloft. The graphic in Figure 6 (on page 5) illustrates this process, showing how the thermal profile aloft affects precipitation types at the surface.

Figure 5
6 am February 25, 2007
Surface fronts, 32 degree F temperature contour and precipitation types

Freezing Rain

In the simplified graphic in Figure 6, warm air from the southern plains to the left is shown rising over a layer of cold air at the surface. This causes the precipitation, initially in the form of snowflakes, to completely melt into liquid droplets and fall as rain south of the surface warm front. North of the

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Ice Storms: The Stealth Winter Hazard

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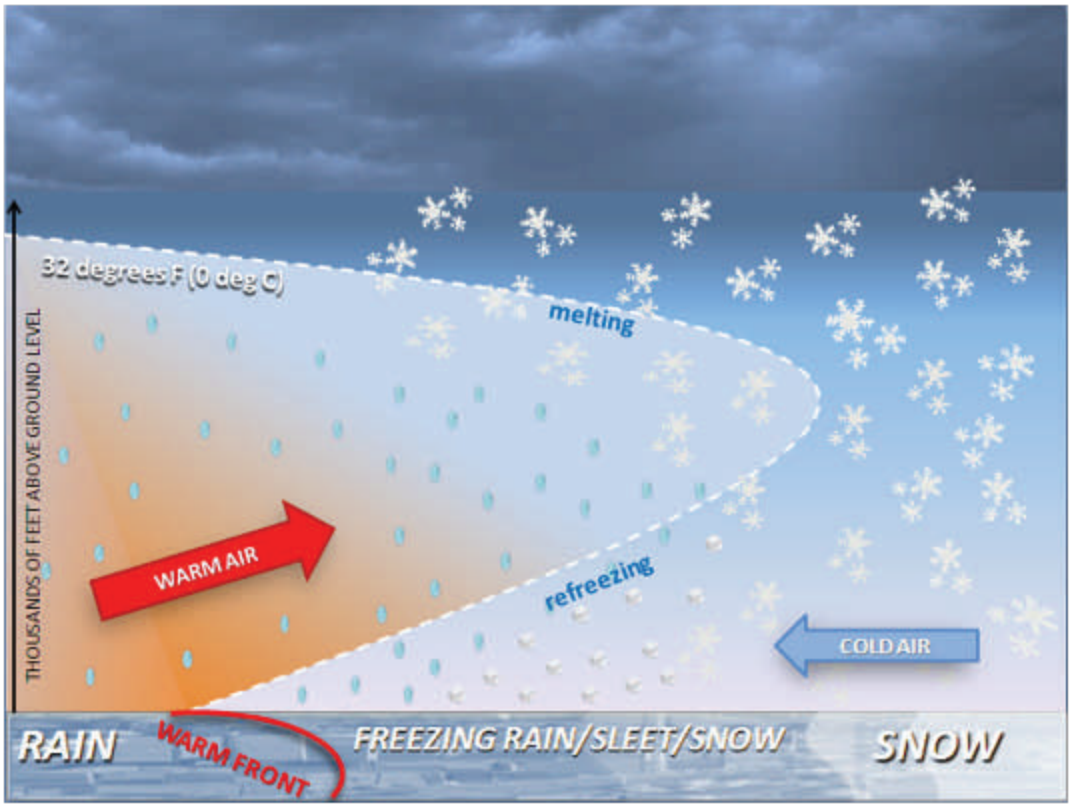

Figure 6. This graphic illustrates how the vertical temperature profile determines the type of precipitation at the surface. South is to the left, north to the right, and it is oriented looking west into the approaching storm.

warm front, where surface temperatures are below freezing in this illustration, the liquid precipitation freezes on contact with subfreezing objects at the surface. This results in freezing rain and ice accumulation at the surface.

Sleet

To the north, where the layer of cold air at the surface is deeper and the warm layer aloft a bit more shallow, the melting precipitation in the warm layer refreezes before reaching the ground. These small clear balls of ice, usually less than 5 mm in diameter (roughly 1/4 inch), are known as ice pellets or sleet. Under the right conditions, sleet can accumulate several inches deep and result in very slippery travel conditions.

Mixed Precipitation and Snow

Further to the north and to the right in the diagram, where the cold air is much deeper and the warm layer aloft is very shallow, there may be an area where the

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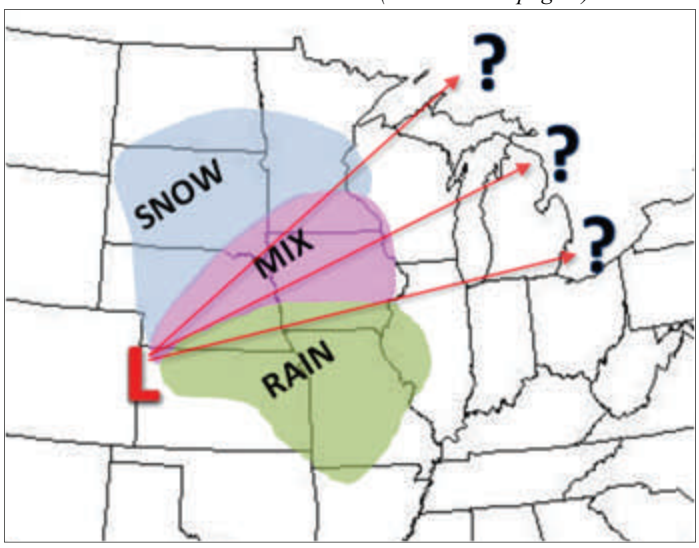


Figure 7. The path of the surface low as it approaches from the Central Plains is critical in determining what form precipitation will fall across Iowa, Missouri and Illinois.

Did you know...

Water drops can exist in liquid form well below freezing?

This commonly occurs inside clouds, and is a key factor in the formation of freezing rain. The properties of the water in droplets, along with other factors, determine the temperature at which freezing will occur.

In freezing rain and ice storms, these "supercooled" droplets in the subfreezing layer above the ground, freeze instantly on impact with the ground and objects near the ground, which often have temperatures well below freezing.

...The path of the low pressure system determines where precipitation falls as rain, freezing rain, a mixture, or all snow...

National Weather Service Snow Measurement Quiz

Contributed by Terry Simmons

Administered at NWS Snow Sensor Study Meeting, Salt Lake City, UT, Aug. 2006

Answers to this quiz appear on page 7.

1) In 1910, did: a) more weather observers, b) less weather observers, or c) about the same number of observers report 10:1 snowfall to water content ratios in their daily precipitation reports than today?

2) If during the same day it snowed 1.2", totally melted, and then snowed another 1.2", and then again totally melted so that no snow remained at the time of observation, then what should be reported as the snowfall for that day?
a) 0.0 b) T c) 1.2" d) 2.4" e) 3.6"
f) none of these choices

3) If the observer or automated system reported a period of time when snow was visible in the air but no new snow accumulation was observed on the ground or snow board, how much snow should you report for this period?
a) 0.0 b) T (trace) c) neither

4) Assume that your station is required to report hourly SNOINCR remarks when heavy accumulations of 1 inch or more per hour are occurring. If your station has reported SNOINCR 1 for six consecutive hours, but the maximum accumulation of new snow during this 6-hour period was 4 inches, would your correct 6-hour snowfall total be:
a) 0.0" b) 2.0" c) 4.0" d) 5.0" e) 6.0"
f) none of these choices

5) If precipitation falls as freezing rain and at the end of the day, the depth of clear ice on your snow board or other measurement surface has reached 1.0", what should you report as your daily snowfall?
a)0.0 b) T c) 1.0" d) 10.0" e) none of these choices

6) For the same situation above, what would you report for your depth on ground at the time of observation?
a)0.0 b) T c) 1.0" d) 10.0" e) none of these choices

7)If the snow fell uniformly (i.e. little or no drifting) for 24 hours and your snowfall measurements at each 6-hourly observation were 2.2, 3.7, 3.3 and 1.6", respectively, BUT your station also operated a 24 hour snow board which you check every 6 hours but only clear once daily and it's greatest depth during the day was 6.8" and the depth at the end of the day had decreased to 6.0", then what would you report as your official daily snowfall?
a) 3.7" b) 6.0" c) 6.8" d) 7.0" e) 10.8"
f) none of these choices

8) What is the lowest snowfall density you have ever experienced? (no multiple choice - each person should estimate this from their past experiences.)

9) What is the greatest density you have ever experienced? (again, no multiple choice and no correct answer)

10) Your station is experiencing blizzard conditions. After 12 hours of snow, blowing snow, and visibilities of 1/4 mile or less you notice your snow board is completely clear although at one time you saw 1" on the board before the strong winds blew it clear. Despite the poor visibilities, after 12 hours of snow the depth out in the fields around your station is only 2" except for a few large 3-ft. drifts. Your friend calls you from the south end of town where there is much less wind and drifting. He reports 8" in his relatively calm back yard. Your Standard Rain Gauge does not have a protective wind shield, and at the end of the 12 hours of blizzard conditions, the water content in the gauge is only 0.15". What would you report for your 12-hour total snowfall for your station?
a) T b) 1.0" c) 1.5" d) 2.0" e) 8.0"
f) 36.0" g) none of these choices

11) It has been snowing steadily for 6 hours and your 6-hour precipitation measurement is 0.35", but no snow has accumulated on streets, sidewalks, or your snowboard. However, 1.0" of snow has accumulated on the roof of your car and most grassy areas around your station. What should you report as your 6-hour snowfall?
a) 0.0" b) T c) 1.0" d) 2.0" e) 3.5"
f) none of these choices

CoCoRaHS: We Want You!

Barbara Mayes

CoCoRaHS (or Community Collaborative Rain, Hail, and Snow Network) is a non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, snow, and hail). Volunteers in 23 states across the country report precipitation via the Internet at www.cocorahs.org. The only requirements are an enthusiasm for weather and a low cost rain gage!

Observers can now sign up from every county that the National Weather Service office in the Quad Cities serves in Iowa, Illinois, and Missouri. The network can't have too many volunteers signing up to take observations – we want observers where we currently have large gaps, but we also want observers to continue to sign up in areas that already have a few volunteers!

Training Sessions

Each CoCoRaHS observer is asked to attend a training session to learn how to properly site their equipment, take readings, and report readings online. Training sessions are scheduled for the fall and early winter, so keep an eye on either the National Weather Service Quad Cities website (www.crh.noaa.gov/dvn) or the CoCoRaHS website (click on your state). Training dates will be posted on both websites as they are scheduled.

www.cocorahs.org

NWS Snow Measurement Quiz

Answers to quiz on page 6

Answer 1: Based on recent studies of NWS Cooperative snowfall and water content data, a much larger fraction of observers reported 10:1 ratios in 1910 than do so today.

Answer 2: d) The correct report for this situation would be 2.4" of snowfall because snowfall is defined as the maximum accumulation of the observation period (i.e. snow accumulated 1.2" twice). The correct report for the total depth of snow on the ground would be 0.

Answer 3: b) No accumulation is required in order to justify reporting a "T". As long as some flakes were observed in the air, that is sufficient for reporting T.

Answer 4: c) 4.0". Your 6-hour snowfall (or daily snowfall if measurements are only taken once daily) should represent the greatest observed accumulation prior to melting or settling but it should never be the sum of hourly measurements.

Answer 5: a) 0.0. Freezing rain is liquid precipitation that freezes on contact with the ground. It is not a form of "frozen precipitation".

Answer 6: c) 1 (one) Snow depth includes both snow and ice, so if the 1.0" of clear ice is the only form of accumulated ice and snow on the ground, then the depth at the time of observation would be 1.0" and it should be reported to the nearest whole inch.

Answer 7: 10.8" Weather stations that are authorized to measure at 6-hour intervals would simply sum the four 6-hourly measurements to get a total of 10.8" of snowfall. However, a cooperative observer who is only obligated to measure once daily should observe and record the greatest depth during the day – in this case 6.8" Since the question did not specify the type of weather station, then either 6.8" or 10.8" could be the correct answer. This points out some of the inconsistency in manual snow observations which we still have to deal with.

Answer 8: Answers could range as low as 1% to 3% which corresponds to a 100" snow to 1" water or 33" of snow for each 1" of water content.

Answer 9: Answers often fall in the 25 – 50% range which means 10 inches of very heavy, wet snow could yield as much as 2.5 to 5.0" of water content. For a major snow-only storm, densities above 25% are rare.

Answer 10: d) 2.0. While it would be tempting to apply the 8.0" backyard reading from your friend's place a few miles away, you shouldn't use data from a different location to help with your measurement. Blizzard conditions make snowfall measurements nearly impossible, but based on the information you have the best and most substantiated estimate would be 2.0". That was an observable accumulation at the majority of the area near your measurement location. Since there are a few larger drifts, a slightly higher snowfall number could be justified but not as high as 8.0"

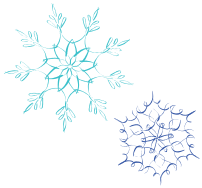
Answer 11: c) Even though your snow measurement board had no accumulation, you would need to report 1.0" as your 6-hour snowfall since the majority of the ground enjoyed a 1.0" accumulation. Streets and sidewalks are not considered representative snow measurement surfaces so are not included in averaging the snow over multiple measurements near your station.

Annual Snowfall

Total Snow Last Season and 30 Year Average

	'06-'07	Average
Iowa:		
Dubuque*	40.3	43.5
Cedar Rapids*	20.2	29.2
Burlington*	24.5	29.4
Illinois:		
Freeport	37.2	31.3
Moline*	34.0	34.1
Macomb	28.3	34.2

* Denotes official NWS climate site



Flood Insurance: Know the Facts

Jeff Zogg

...Flood losses in the United States have averaged 2.4 billion per year over the last decade...

...Any given house has a 26% chance of being damaged by a flood during the course of a 30-year mortgage...

Flooding is our Nation's number 1 natural disaster, ahead of tornadoes and severe thunderstorms. Do you think that your home is not in danger of flooding? Think again. Flooding is not just contained to our Nation's coastlines or along our major rivers. You don't need to live near water to be flooded. Take, for example, the recent flash flooding that affected the Manchester, Iowa, area on October 7-8. Heavy rain led to flooded buildings, including several inches of water in area basements. Many of these flooded buildings were not on the flood plain for the Maquoketa River, the area's major stream. Rather, the ground was saturated enough that water simply flowed through it and into many structures.

Flash floods, inland flooding and seasonal storms flood every region of our country, including our Iowa-Illinois-Missouri region. Flood losses in the United States have averaged $2.4 billion per year over the last decade. It doesn't take much water to cause problems either--just one inch of water in your house can cause significant damage to your property.

Homeowners' Insurance Covers Flood Damage, Right?

Wrong. Most policies do not cover flood damage. In most cases you must purchase a separate flood insurance policy to cover yourself against flood losses. Federal disaster assistance is usually a loan that must be paid back with interest--and is only available when a disaster has been federally declared. In contrast, flood insurance pays even if a disaster is not declared.

Who Can Buy Flood Insurance?

Everyone can buy flood insurance. You can buy flood insurance no matter what your risk is. You can buy flood insurance as long as your community participates in the National Flood Insurance Program (NFIP). The Federal government maintains the NFIP which includes setting the premiums for coverage. Contents coverage is separate from structural coverage so renters can buy flood insurance, too.

What's My Risk?

Everyone lives in a flood zone. Nearly every house in the U.S. is at risk for experiencing flood damage. Any given house has a 26% chance of being damaged by a flood during the course of a 30-year mortgage, compared to a 9% chance of fire. Your flood risk can increase with time, too. New construction can increase flood risk, especially if it changes natural runoff paths or creates impervious areas where water cannot soak into the ground. Flood damage can be expensive, too--in 2005, $16 billion in flood damage claims were paid.

How Much Does Flood Insurance Cost?

That depends. Your flood insurance premium will depend on a few factors, including your area's flood risk as well as the amount of coverage you wish to purchase. If you live in a low to moderate risk area and are eligible for the Preferred Risk Policy, your flood insurance premium may be as low as $112 a year, including coverage for your property's contents. Your premium will likely be a lot lower than the actual cost to repair your home if you don't have flood insurance. A $50,000 disaster home loan can cost you about $240 a month at 4% interest over 20 years.

Please note, however, that there is typically a 30-day waiting period from the time you purchase flood insurance until it takes effect. Thus, you need to purchase flood insurance before the rain begins falling!

Who Determines the Flood Risk?

The Federal Emergency Management Agency (FEMA) works with local communities to determine flood risk. FEMA publishes Flood Insurance Rate Maps (FIRMs) which delineate the locations of flood risk categories. Some maps

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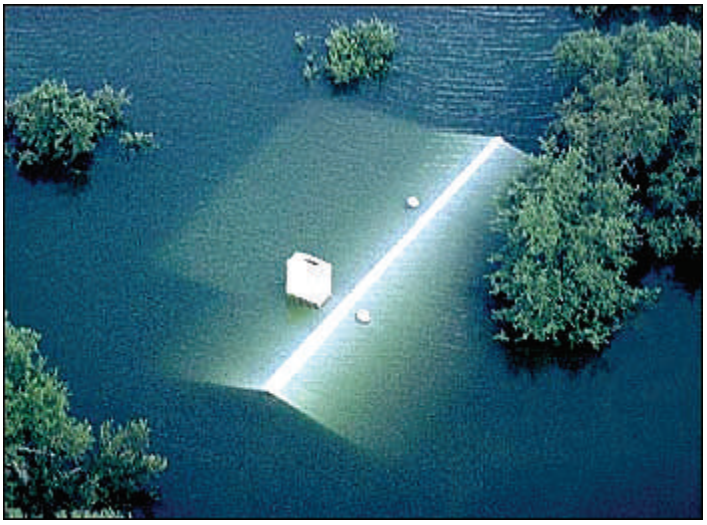
Flood Insurance: Know the Facts

(continued from page 8)

show street-level detail. Special Flood Hazard Areas are located in the 100-year flood zones. The information in the FIRMs is a major factor in setting the flood insurance premiums.

What Does the 100-Year Flood Mean?

This term is often misunderstood. It refers to a flood that has a 1% chance of occurring in any given year. It is not a flood that will occur once every 100 years. Since the 100-year flood term refers to the magnitude of a flood rather than its frequency of occurrence, it is possible to have multiple 100-year floods in any given year.



What about Low-Risk Areas?

You're still at risk. Typically, 20 to 25% of all flood insurance claims are filed in low- to moderate-risk areas. In 2006, one-third of all claims paid were for policies in low-risk communities.

Where Can I Buy Flood Insurance?

Your existing insurance agent may sell flood insurance so start with them. If you need to find an agent in your area who sells flood insurance, you can visit www.FloodSmart.gov or call the NFIP at 1-800-427-2419. Flood insurance premiums are the same regardless of where you purchase coverage.

Where Can I Find More Information?

Learn the basics about floods and flood insurance and better understand your options. Visit the NFIP's Web site or call the NFIP at the number listed above. On the Web site you can see how much damage a few inches of water can cause with an interactive demo. You can also contact me at Jeff.zogg@noaa.gov or at 563-386-3976.

www.FloodSmart.gov

Ice Storms: The Stealth Winter Hazard

(continued from page 5)

precipitation falls as a mixture of sleet and snow. This mix of precipitation typically does not last long, but can accumulate several inches deep. Even further to the north, where the entire column is below freezing, the precipitation remains in the form of snow.

Forecast Challenges

All winter storms present unique challenges to weather forecasters. Everything must come together in just the right way to create a major winter storm. One of the most significant challenges to forecasting an ice storm is determining the path of the storm center. As shown in Figure 7 (on page 5), the path of the low pressure system will determine where precipitation falls as rain, freezing rain, a mixture, or all snow. Once this is determined, and a forecast is made, any deviation in the path of storm, or unexpected weakening or strengthening can change the predominant precipitation type at any given location. For instance, if the storm takes a more southerly route than expected, the precipitation may fall as mainly snow, while if it goes further north, one could end up with all rain. In between, there may be a mix of all precipitation types.

Forecasters at the Quad Cities National Weather Service office have well over 70 years of combined forecast experience and the majority of the staff have been forecasting winter weather in this area since the late 1990s. With this amount of experience, forecasters at NWS Quad Cities are prepared for the unique challenges of forecasting these often stealthy winter storms.

...Forecasters at NWS Quad Cities have well over 70 years of combined forecast experience...

NWS Quad Cities
9050 Harrison Street
Davenport, IA 52806

Weather Home Companion

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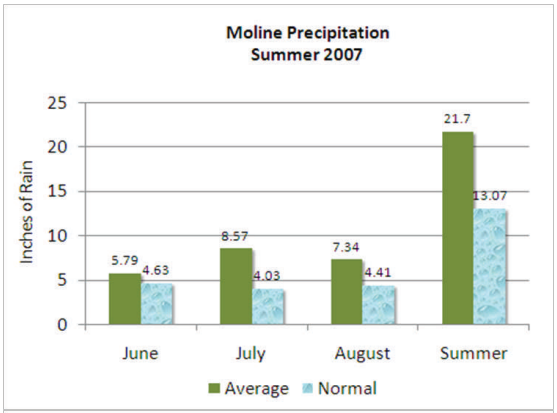
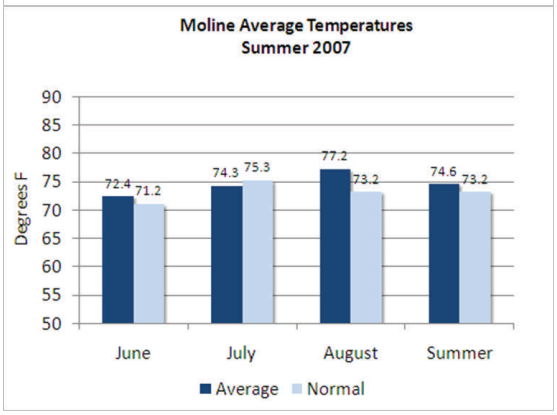
Summer 2007: Wet and Warm

David Sheets

It may not come as a surprise that summer 2007 turned out to be the second wettest in history at Moline. The total rainfall for the months of June, July and August was 21.7 inches. This was second only to 1993, which had a total of 26.79 inches observed at the official observing site at the Quad Cities International Airport. The normal rainfall for the period is 13.07 inches. Another notable record occurred on July 4th, when 3.56 inches was measured, exceeding the old record of 2.06 inches set in 2000. As of mid October, the year 2007 was on track to be one of the top 5 wettest in the state of Iowa.



Looking at temperatures, the summer averaged 1.6 degrees above normal. June and July were close to the long term averages, followed by a much above normal August. August was the start of a long stretch of unusually warm weather that lasted well into October. Overall, summer 2007 averaged 1.4 degrees above normal.



If you would like to find a more up-to-date tracking of daily temperature and precipitation, check out the graphs updated daily on our website at: www.crh.noaa.gov/dvn/?n=climategraphics .