National Weather Service Quad Cities IA/IL

Weather Home Companion

Volume 6 Issue 2

Fall/Winter 2009

INSIDE THIS ISSUE:

Summer 2009: Cool and Wet	*1*
How Many Employees Work at NWS Quad Cities?	*1*
August 3, 2009 Heat Burst	*4*
Cooperative Observers: Help the NWS Achieve Their Mission	*6*
What is the Value of Zero?	*6*
Snow: A Measurement Challenge	*7*
StormReady Continues to Grow	*8*
High Water Mark Signs	*8*
NWS Winter Outlook	*9*

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

Contact information can be found on page 10.

Summer 2009: Cool and Wet

David Sheets

At the time of this writing, an unusually late fall harvest was frantically underway across eastern Iowa and northwest Illinois. This delay is largely due to the exceptionally wet and cool weather that has been the rule across the area since spring. In many farm fields, the cool, damp weather delayed the spring planting and also slowed crop maturation in the summer. This was further compounded by wet weather that kept many farmers out of the fields this fall.

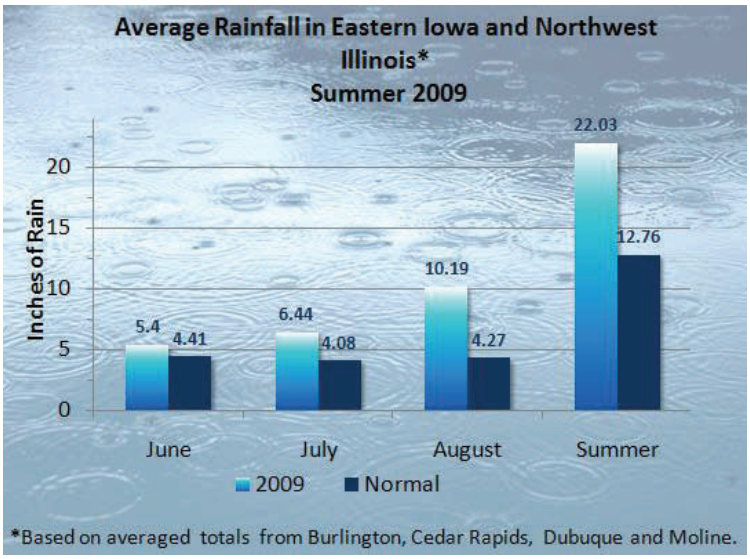


Chart showing eastern Iowa and northwest Illinois rainfall compared to climate normals for summer 2009. Rain averaged well above normal each month with August being especially wet.

Wet Summer of 2009

Rainfall across Eastern Iowa and Northwest Illinois averaged well above normal again in the summer of 2009. While the summer of 2008 will always be remembered for the

(Continued on page 2)

How Many Employees Work at NWS Quad Cities?

Steve Kuhl

The National Weather Service (NWS) Quad Cities Weather Forecast Office (WFO) is located at the Davenport Municipal Airport. The office has 23 employees who provide warnings, forecasts, and other hydro-meteorological information to the public, media, emergency management, aviation community, and other customers 24 hours per day, 365 days per year. The WFO is part of the National Oceanic and Atmospheric Administration (NOAA) which is part of the United States Department of Commerce.

Operational employees work 8 hour rotating shifts. Nine meteorologists/forecasters prepare graphical and digital forecasts, issue warnings, watches, and advisories, aviation forecasts, and river forecasts and warnings. Two Meteorologist Interns and two Hydro-Meteorological Technicians (HMTs) monitor weather observations, provide public service, and program/monitor broadcasts over eleven NOAA Weather Radio–All Hazards Stations. HMTs and Meteorologist Interns also launch weather balloons to gather upper-air weather data, administer the Cooperative Weather Observer Program, and prepare local climatological data summaries and

(Continued on page 2)

Summer 2009: Cool and Wet

Continued from page 1

exceptionally heavy rainfall and historic flooding in eastern Iowa, rainfall in the summer of 2009 actually *exceeded* 2008 across the region.

Rainfall across eastern Iowa and Northwest Illinois in the summer of 2009 amounted to 22.03 inches, which is well above the average of 12.73. This is based on averages of the summer season (June, July and August) rainfall totals recorded at Burlington, Cedar Rapids, Dubuque and Moline.

The graphic on page 1, shows that August was especially wet, with rainfall averaging nearly 6 inches above normal across the region. This can also be seen in the figure on the right, that illustrates how the unusually wet conditions evolved through the summer months across the area.

June had above normal rainfall across southeast Iowa, while east central Iowa into northwest Illinois were drier than normal. July had a nearly reverse trend, with above normal rainfall in far east central Iowa and northwest Illinois, while southeast Iowa into west central Illinois had below normal rainfall. August, however, trended well above normal over all of eastern Iowa into portions of northwest and west central Illinois.

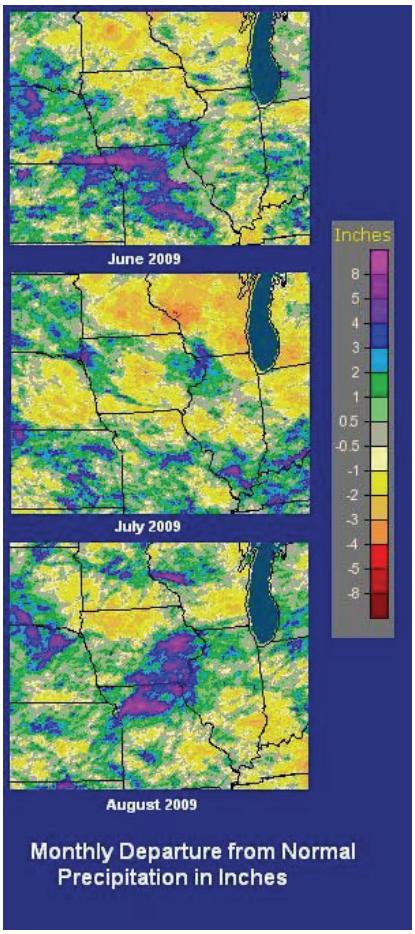
Cedar Rapids: Even Wetter Than 2008

The rainfall total for summer 2009 in Cedar Rapids was 25.56 inches. This surpassed the total of 19.86 measured in the summer of 2008, and was twice as much as the seasonal normal value of 12.76 inches.

Cedar Rapids was especially hard hit in August, with a total of 14.44 inches, as illustrated in the chart in the upper left on page 3. This was more than 10 inches above the monthly average of 4.23. The largest one day rainfall was on August 27, when 5.43 inches was recorded. This was part of a widespread heavy rain event that produced widespread rainfall amounts in the range of 2 to 6 inches, resulting in flash flooding.

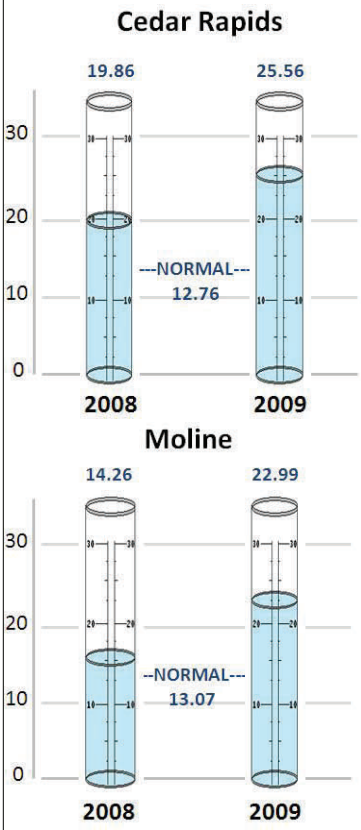
In comparison, the monthly and seasonal totals at Moline were also much above normal, but not by the same magnitude. August rainfall in Moline was nearly 6 inches

(Continued on page 3)



Graphics of monthly departure from normal rainfall distributions across the region. Warm colors indicate below normal amounts, cool colors represent above normal. *Data from NWS Advanced Hydrological Prediction Service (AHPS).*

Comparison: Summer Rainfall 2008 vs. 2009



...we are committed to providing you with the most reliable warnings and forecasts possible...

How Many Employees Work at NWS Quad Cities?

(continued from page 1)

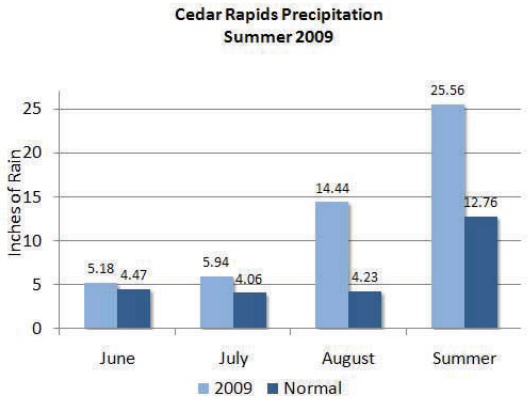
reports.

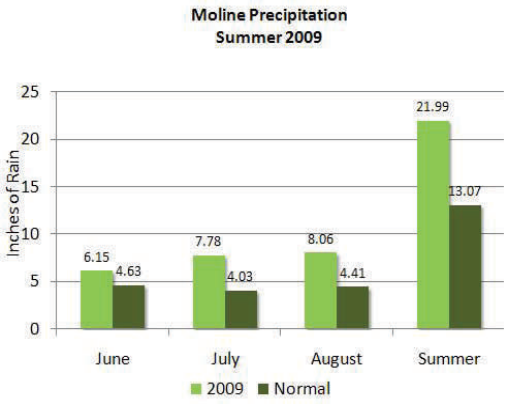
One Service Hydrologist administers the WFO Hydrologic Program, which provides river level forecasts and warnings.

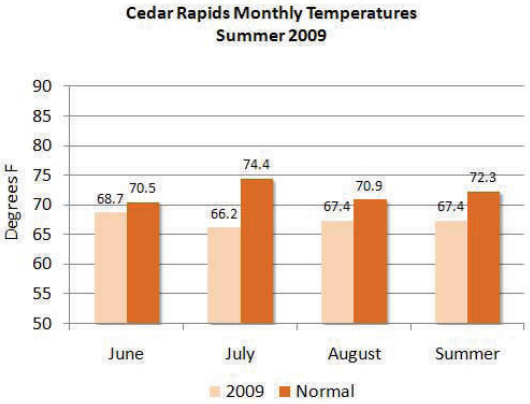
Two Electronic Technicians and one Information Technology Officer keep state-of-the-art weather radar, computers, and data collection systems up and running.

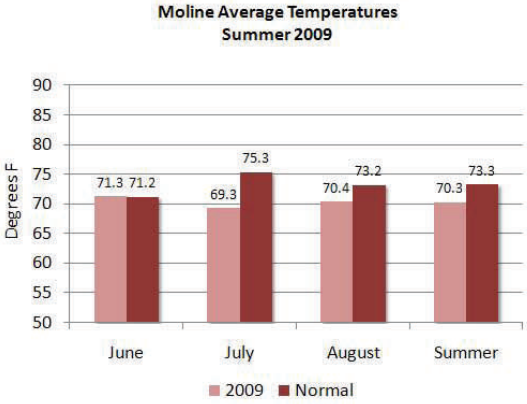
Office management and support staff include: the Meteorologist in Charge; Warning Coordination Meteorologist; Science and Operations Officer; Data Acquisition Program Manager; Electronic Systems Analyst; and Administrative Support Assistant.

It is my privilege to serve as the Meteorologist in Charge of such a highly talented and dedicated workforce. We are committed to providing you with the most reliable warnings and forecasts possible.









(Continued from page 2)

less than Cedar Rapids. This can be seen in the chart shown above in the upper right.

Cool Has Been the Rule

The summer season continued an overall cooler than normal trend that has prevailed through the past two years.

Starting with the spring of 2008, each climate season has averaged below normal in Cedar Rapids. In Moline, every season averaged below normal over the same period, with two exceptions. These were the fall of 2008 and Spring of 2009, where temperatures averaged a mere .2 degrees above normal.

In the summer of 2009, the average temperature across the area was 68.9 degrees. This is 3.6 degrees below normal, based on June, July, and August temperatures averaged from Burlington, Dubuque, Cedar Rapids and Moline.

July was exceptionally cool, with temperatures averaging 6.8 degrees below normal. While July is typically the warmest month of the year, in 2009 it turned out cooler than both June and August. This trend can be seen in both the Moline and Cedar Rapids charts (shown above).

Outlook For This Winter

While the prevalent cool and wet weather pattern persisted through most of the autumn season so far, there may be a change in store for the upcoming winter season. As of the time of this writing, November 2009 was entering the record books as an unusually warm and somewhat dry month across the region.

A strengthening El Niño, indicated by warmer waters in the equatorial Pacific, will favor weather patterns that may result in warmer than normal temperatures this winter.

The official NOAA/National Weather Service outlook for this winter calls for a 33 to 40 percent chance of warmer than normal temperatures for the local area. This Winter Outlook for the entire United States can be found on page 9. It also predicts equal chances that precipitation in our area will be in one of the following categories: above normal, normal, or below normal. This means that it is too close to call and that there is no strong indicator that precipitation will be above or below normal. El Niño typically does not have a large impact on winter precipitation in our region.

After the unusually long stretch of cool, wet weather, and the exceptionally wet summer of 2009, both forecasters and farmers alike will be closely watching trends through this upcoming winter hoping for a somewhat warmer and drier 2010.

What is *Normal*?

According to the American Meteorological Society Glossary, normal is "the average value of a meteorological element over a fixed period of years that is recognized as a standard for the country and element concerned".

In the United States, averages for temperatures and precipitation are based on a 30 year period. These are updated every 10 years. The current normals are based on the period from 1971 through 2000.

August 3, 2009 Heat Burst

Mike McClure

Residents of Cedar Rapids, Iowa experienced an unusual meteorological phenomenon prior to daybreak on Monday August 3rd, 2009. Dying thunderstorms and a very dry, warm lower and middle atmosphere led to the occurrence of a severe heat burst.

A **heat burst** is characterized by a dramatic, almost instantaneous, rise in air temperature and fall in dew point temperature. Most, but not all, heat bursts are also accompanied by a drop in surface pressure, little to no precipitation, and gusty, rapidly shifting winds. The most dramatic heat bursts can even cause severe wind gusts that result in property damage.

...the most dramatic heat bursts can cause severe wind gusts and property damage…

Winds associated with this heat burst in Cedar Rapids reached speeds of 60 to 70 mph, producing damage to trees and knocking out power to thousands.

What Causes a Heat Burst?

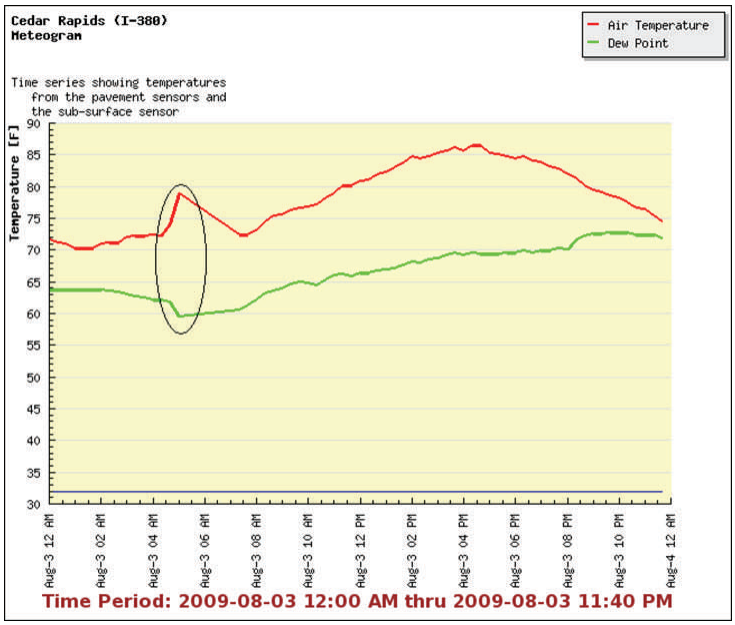
When thunderstorms are growing, they draw warm, moist air up and into the cloud where moisture condenses and falls out on the other side. But when a thunderstorm surpasses maturity and a lot of moist air is held high in the cloud, it begins to drop as the thunderstorm loses its updraft. As this heavy rain-cooled air begins to fall, it compresses due to higher pressure at the surface. As the air compresses, it heats up. This heating can be significant, resulting in a rapid and large spike in air temperature. In addition, as the air plummets from beneath the thunderstorm and hits the ground, it has no where to go except outward. In much the same dynamic principle as a thunderstorm microburst, the air crashes into the ground and spreads out in all directions, resulting in strong to severe wind gusts that may produce damage.

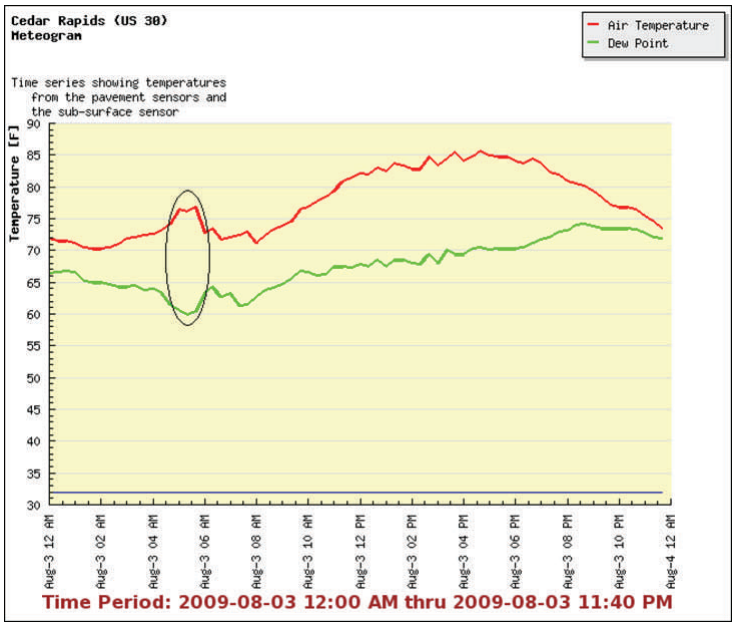
...heat bursts actually occur more often than many may think...

Heat bursts are typically a late spring and summer phenomenon, most common in the late evening and nighttime hours.

Although many regard the heat burst as a fairly rare phenomenon, heat bursts actually occur more often than many may think.

Areas that have a dense observation network, such as the state of Oklahoma, typically detect multiple heat burst occurrences each year.

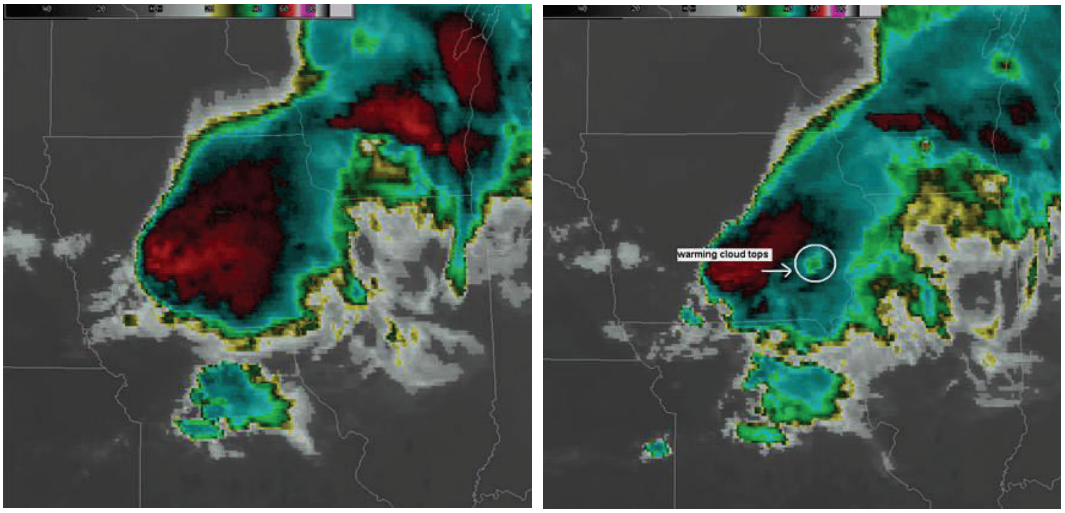




Meteograms (time traces of temperature and dewpoint) from Road Weather Information Systems (RWIS) in Cedar Rapids.

August 3, 2009 Heat Burst

(continued from page 4)



The satellite IR (Infrared) image on the left shows the tops of thunderstorms moving through central into eastern Iowa at 1015Z (5:15 am CDT) August 3, 2009. The color enhancement used in these images utilizes a cool to warm color scheme, that is where green and blue colors represent relatively warm temperatures, and shades of brighter red highlight more colder regions. The warm bright red color indicates the coldest cloud tops, and location of the strongest storms in central Iowa.

The image on the right from one hour later (1115Z or 6:15 am CDT) shows storms weakening (denoted by a decrease in red cloud tops). Note the pronounced warming of cloud tops highlighted in east central Iowa near Cedar Rapids.

```
PRELIMINARY LOCAL STORM REPORT...SUMMARY
NATIONAL WEATHER SERVICE QUAD CITIES IA IL
700 AM CDT MON AUG 03 2009
..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0528 AM     HIGH SUST WINDS  1 SSE CEDAR RAPIDS      41.95N 91.66W
08/03/2009  E60.00 MPH       LINN               IA   TRAINED SPOTTER

            WIND GUSTS ESTIMATED OVER 60 MPH. TEMPERATURE SHOT UP TO
            77 DEGREES.
0528 AM     NON-TSTM WND GST CEDAR RAPIDS            41.78N 91.32W
08/03/2009  M61.00 MPH       CEDAR              IA   BROADCAST MEDIA

            AT KCRG STUDIOS IN DOWNTOWN CEDAR RAPIDS. TEMPERATURE
            SPIKED TO 84 DEGREES.
0530 AM     NON-TSTM WND DMG CEDAR RAPIDS            41.97N 91.67W
08/03/2009                   LINN               IA   BROADCAST MEDIA

            TIME ESTIMATED. A NUMBER OF KCRG VIEWERS REPORT POWER OUT
            ON THE NORTHWEST AND SOUTHWEST SIDES OF CEDAR RAPIDS AS
            WELL AS A NUMBER OF TREES BLOWN DOWN.
0532 AM     HIGH SUST WINDS  1 SSE CEDAR RAPIDS      41.95N 91.66W
08/03/2009  E70.00 MPH       LINN               IA   TRAINED SPOTTER

            WIND GUSTS ESTIMATED OVER 70 MPH. POWER OUT. TREE
            BRANCHES COMING DOWN. LIGHTNING OFF TO THE SOUTHWEST
```

Storm reports from the event received at the National Weather Service Quad Cities.

...Areas that have a dense observation network, such as the state of Oklahoma, typically detect multiple heat burst occurrences per year...

Cooperative Weather Observers: Help the National Weather Service Achieve Their Mission

Terry Simmons

...Cooperative observers are frequently described as the backbone of the National Weather Service...

Many people are aware the National Weather Service mission to provide warnings and forecasts, to protect lives and property, occurs during severe and inclement weather; but fewer individuals are aware of the second half of the mission: to enhance Nation's economy. One way this economic aspect is achieved is from the data and information cooperative observers provide each day.

Cooperative observers are frequently described as the backbone of the National Weather Service because the vast quantities of information they provide are used in all aspects of the National economy. These daily snapshots of the environment create a comprehensive picture of the climatology for a given location. The more years a coop site remains in place the more valuable these data become for climatological research.

Climate data are used to develop manufacturing and marketing strategies; public utilities companies determine patterns of usage and compute rate adjustments; and the insurance industry uses climate data to create actuarial tables and in settling claims. Climate data are also used in housing and real estate, finance, communications, agriculture, architectural design, natural hazard mitigation, medical research and disease control, water resources, litigation, and in the transportation of perishable goods.

What is the Value of ZERO?

Terry Simmons

...A zero…removes all doubt whether rain or snow fell...

Answer: Priceless if it is a Measure of Precipitation

Precipitation data has many uses, but information on the lack of precipitation is even more valuable. Cooperative weather observations are a permanent record of what occurred at a given location in a specific period of time. These records have been used to determine whether counties are included in drought declarations, whether cities and road crews are reimbursed for salt and sand supplies used during winter storms, and they are used to settle numerous insurance claims.

On an observation form, there should be an entry for precipitation every day. When researchers encounter a blank space on an observing form they may wonder if precipitation occurred and was not measured, whether the gage was broken, or whether the reporting period was dry.

Observers, when you have an empty gage and there has been no precipitation please remember to code your precipitation column with a zero. A zero in the column removes all doubt whether rain or snow fell during your observing period.

COOP News

(continued from page 6)

Snow: A Measurement Challenge

Terry Simmons

Snow is beautiful to watch falling gracefully from the sky, wonderful to play in, but challenging to measure. First, what kind of snow measurement do you need?

Snowfall is the quantity of snow that falls before it is blown away, melts, or is packed down. If you see the flakes you can report a trace of snow. Snowfall is reported in whole inches and tenths of an inch. It is rare to have exactly 1.0 inches of snowfall.

Snow depth is a measure of the amount of snow that remains on the ground, or snow board, at observation time. Snow depth is the total depth of old and new snow. This can be very hard to determine if you have had gusty winds and all that remains are sections of bare ground and large drifts. Neither the drift, nor the bare ground provides an accurate description of snow depth. Snow depth is reported in whole inches.

Snow water equivalent is the amount of water obtained when accumulated snow is melted. This measure helps hydrologists determine stream flow forecasts, snow melt run off, and plan for spring and ice jam flooding. Snow water equivalent is reported in hundredths of an inch.

Snow measurement using a snowboard and ruler at the National Weather Service. *NWS file photo*.

Measuring Snow

It is best to use a snow board when measuring snow. Snow falling on sidewalks or pavement may quickly melt and in a yard the blades of grass may hold the snow above the ground, which will artificially inflate your readings. Accurate measurements are important so when you measure snow, keep your ruler perpendicular to the surface of the snow. Diagonal measurements are not accurate.

Snow Depth: An Observer's Challenge

It snowed all day and most of the night. During the evening the winds picked up and now that it is time to take your observation, the quantity of snow on the ground just doesn't seem right. You wonder: should you find the biggest drift possible and report that amount? What about all those bare spaces that were covered just a few hours ago?

Never fear, snow is rarely uniform in coverage. Finding a representative measurement is not impossible. Take several measurements, but avoid artificial accumulations like plowed piles, large drifts, or shoveled snow. Add all your measurements together. Divide this number by the quantity of measurements you have taken. This average is the snow depth. Snow depth is reported in whole inches and you may need to round your total up or down. For example 0.4 inch of snow is reported as a trace while a snow depth of 2.5 inches is rounded to 3 inches.

Snow Measurement Training

If you are not currently a snow observer but would like more information about measuring snow the Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) has training videos.

Snow Myth

Snow water equivalent ratios are dependent upon many factors. The adage that one inch of rain equals 10 inches of snow is a myth. Temperature is not the only variable in determining a snow water ratios and it is common for these ratios to vary from 8 to 1 to more than 20 to 1. To obtain a correct measurement melt the snow and do not estimate.

CoCoRahs snow measurement training videos can be found at:

www.cocorahs.org/Content.aspx?page=training_slideshows

StormReady Continues to Grow

Donna Dubberke

More About the StormReady Program:

www.weather.gov/quadcities?/n=stormready

What is StormReady?

In a nutshell, StormReady establishes an industry standard for severe weather preparedness and communication, based on the principles of redundancy and practicality. Counties, communities, businesses, and other organizations may be recognized as StormReady simply by meeting the population-based guidelines, working with the local NWS office, and completing a simple application-review process.

In the local area, Buchanan County, Iowa is the latest county to be recognized as StormReady. This brings the local StormReady count to 6 counties (Stephenson County, IL, McDonough County, IL, Benton County, IA, Johnson County, IA, Des Moines County, IA, and Buchanan County, IA). Two towns (Galva, IL and Kewanee, IL) as well as the University of Dubuque, have also received StormReady recognition.

Many businesses and organizations have an effective severe weather strategy, but the full StormReady program (which was designed with governments in mind) doesn't really apply. In these cases, the StormReady Supporter program fits the bill. StormReady Supporters apply the principles of the StormReady program to their own organization in an effective way. The Johnson County Conservation Board was the first StormReady Supporter recognized in our area (Oct. 2007), followed by the Howard H. Cherry Scout Reservation (Jan. 2008) and then Deere & Company World Headquarters (Jan. 2008).

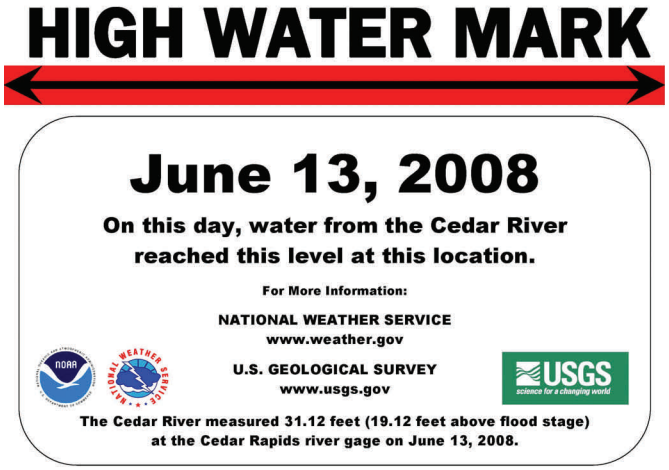
We would like to extend our congratulations to all of the communities, towns, and organizations that have been recognized through the StormReady program for implementing exceptional severe weather strategies.

High Water Mark Signs

Maren Stoflet

The purpose of the High Water Mark Signs is to recognize historic floods and to raise awareness…

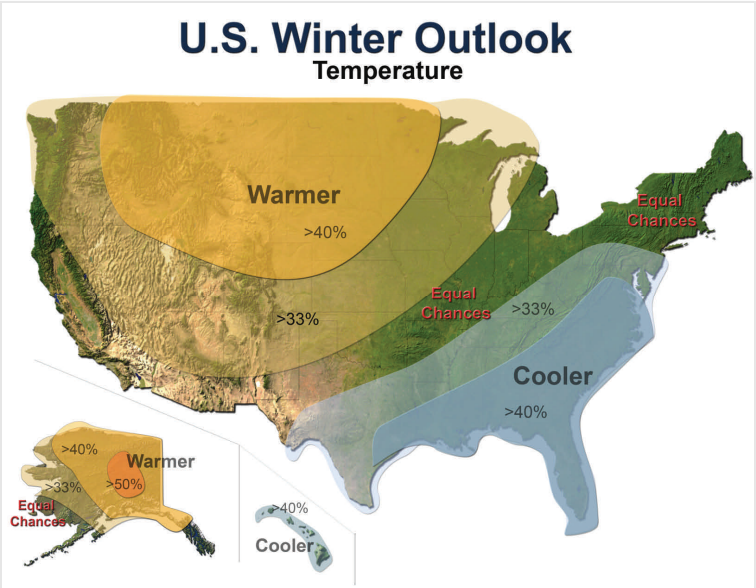
The Quad Cities National Weather Service (NWS) has worked with local emergency management officials, local communities and businesses affected by historic flooding to provide High Water Mark signs. The first High Water Mark signs provided by the NWS were within the southeastern United States. This effort has spread into the Midwest starting in 2009, and is hoped to continue in the future. The Quad Cities NWS provided over twenty High Water Mark Signs to communities within eastern Iowa and northwestern Illinois this year.

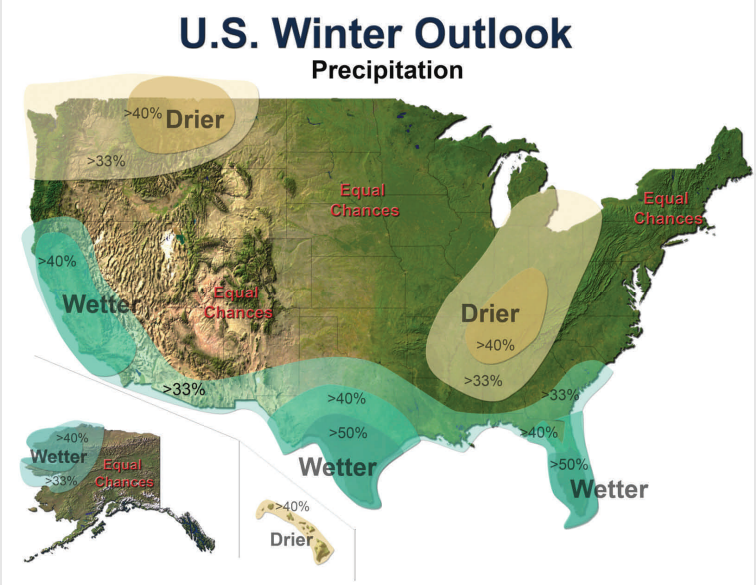


Signs similar to this will soon be popping up around the area marking significant flooding.

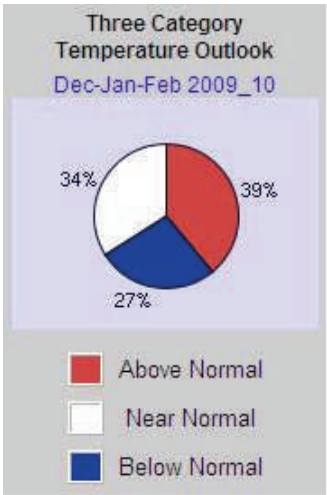
The purpose of the High Water Mark Signs is to recognize historic floods and to raise flood awareness within the local community, for visitors, and for future generations. The signs were installed in locations of relatively high visibility and in well-traveled areas in order to relay the information to many people. The signs display a line that is placed at the historic flood level, and list such information as the historic flood date, measured water level if available, river or creek affected, and references for further information.

NOAA/NWS Outlook for Winter 2009-2010





Winter Season Temperature Outlook for Eastern Iowa and Northwest Illinois:



On the Web:

www.weather.gov/climate/calendar_outlook.php?wfo=dvn

Did you know…

Hypothermia occurs when the body temperature drops below 95°F.

Warning signs: Uncontrollable shivering, disorientation, incoherence, slurred speech, drowsiness, and/or apparent exhaustion

Take Action! Immediately seek medical care! Slowly begin warming the person, *warming the body core first.* (Warming the arms and legs drives cold blood toward the heart and can lead to heart failure.) Get the person into dry clothing and wrap in a warm blanket, covering the head and neck. Do not give the person alcohol, drugs, or any hot beverage or food.

NWS Quad Cities
9050 Harrison Street
Davenport, IA 52806

National Weather Service Quad Cities IA/IL

Weather Home Companion

Volume 6 Issue 2

Fall/Winter 2009

Weather Home Companion

NWS Quad Cities
9050 Harrison Street
Davenport, IA 52806
Phone:
(563) 386-3976

On the web:
weather.gov/quadcities

Editor: ***David Sheets***
E-mail:
david.sheets@noaa.gov

Contributors:
Donna Dubberke, *Warning Coordination Meteorologist*
Steve Kuhl*, Meteorologist-in-Charge*
Mike McClure*, Senior Forecaster*
David Sheets*, Forecaster*
Terry Simmons, *Data Acquisition Program Manager*
Maren Stoflet*, Service Hydrologist*

INSIDE THIS ISSUE:

- ***Summer 2009: Cool and Wet***
- ***How Many Employees Work at NWS Quad Cities?***
- ***August 3, 2009 Heat Burst***
- ***Cooperative Observers: Help the NWS Achieve Their Mission***
- ***What is the Value of Zero?***
- ***Snow: A measurement Challenge***
- ***StormReady Continues to Grow***
- ***High Water Mark Signs***
- ***NWS Winter Outlook***