National Weather Service Quad Cities IA/IL

Weather Home Companion

Vol. 4,

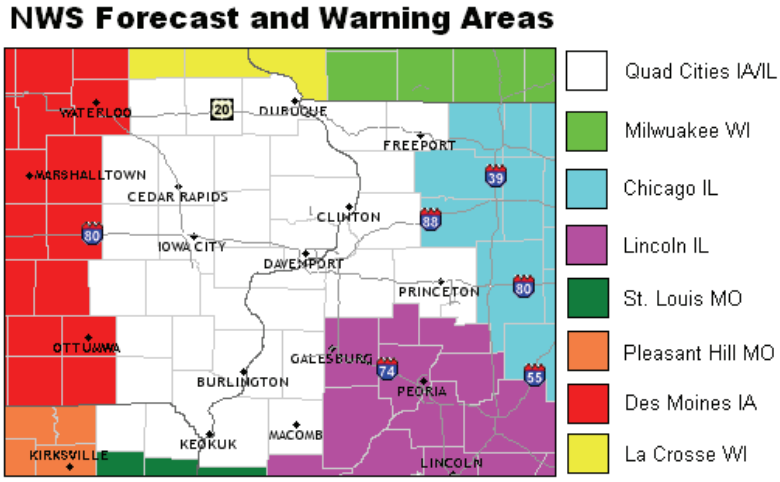
INSIDE THIS ISSUE:

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.

Severe Weather Climatology in the NWS Quad Cities Warning Area

John Haase

Recently, meteorologists at the Quad Cities National Weather Service Forecast Office, meticulously went through the severe weather database to update the area's severe weather climatology. The Quad Cities office has the responsibility for forecasts and warnings for 36 counties in eastern Iowa, western and northwest Illinois, and extreme northeast Missouri. Each damaging wind and large hail event was categorized into reports by month and by hour. Tornadoes were broken down into these same categories, and also included by decade and F-scale.



Warning area covered by the NWS Quad Cities. The Quad Cities NWS office is part of a national network of local forecast offices. NWS offices responsible for surrounding areas are indicated by the color key on the right.

The data from 1950 to 2006 was perused, with a total of 1,561 damaging wind reports; 1,346 large hail reports; and 701 tornadoes in the 36-county region.

Eight bar graphs on proceeding pages provide a snapshot of our severe weather climatology in our region. Here are some of the details of our climatology 1950-2006:

Damaging wind

There is a distinct peak for damaging wind occurring in the late afternoon and evening hours, with the most reports around 5 pm. This correlates well with the time of peak heating. There is a secondary peak in the wee hours of the morning, from about midnight to 5 am.

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Mission, Vision, and Values

Steve Kuhl

The NOAA National Weather Service Quad Cities Forecast Office is committed to providing you with the highest-quality weather, hydrologic, and climate forecasts and warning information. The office is staffed by highly educated, trained, and dedicated individuals who are passionate about the opportunity they have to use their knowledge and tools to serve the public.

Our staff of 23 professionals is responsible for forecasting floods along the Mississippi River and its tributaries, issuing hazardous weather warnings and forecasts for tornadoes, blizzards, ice storms (etc), and disseminating civil emergency messages and Amber Alerts over our NOAA Weather Radio

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Severe Weather Climatology

(continued from page 1)

This is due to clusters of thunderstorms that develop in the plains states and roll into our region late at night. This is especially true during the summer months. The peak month for damaging wind is June, followed closely by July and then August.

...There has never been an F5 tornado documented in our 36 county warning area going back to 1950...

Large Hail

There is also a vast majority of large hail falling in the late afternoon and evening hours, with the most reports around 4 pm. This also is due to the maximum time for peak heating. However, a fairly uniform (but small) number of reports occur outside of the period of peak heating. The month with the most hail reported is May, followed very closely by April, and then June. Hail events then gradually taper off later in the summer and fall.

Tornadoes

...Weak tornadoes (F0-F1) account for about 73% of all tornadoes...

The vast majority of tornadoes touch down in the 2 pm to 8 pm time frame, with the most reported around 4 pm. As with damaging wind and hail, heating from the sun provides the energy source to help develop supercell thunderstorms that may produce tornadoes. Outside of the afternoon and evening hours, a small number of tornadoes have materialized every hour of the day or night. The month with the most tornadoes is May, followed closely by April, and then June. The greater number of tornadoes strike during these three months. However, every month has had twisters, except February. Weak tornadoes (F0-F1) account for about 73% of all tornadoes, strong tornadoes (F2-F3) account for about 25%, and violent tornadoes (F4) account for only 2%. There has never been an F5 tornado documented in our 36 county warning area going back to 1950. Let's hope this doesn't change! This is because the majority of tornado fatalities are caused by violent

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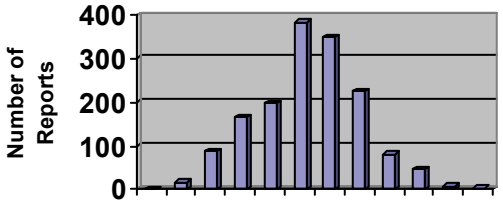
Damaging Wind Reports by Month
(1994-2006)



Note: All Reports Included - Total 1,561

Damaging Wind Reports by Hour
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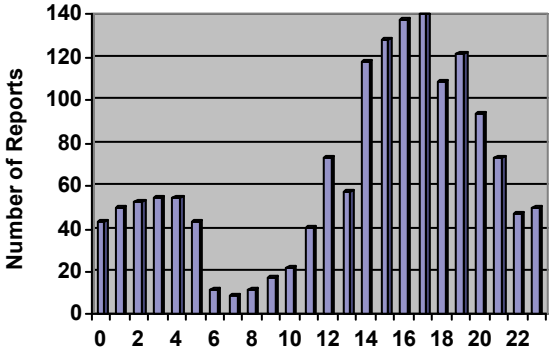

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Large Hail Reports by Month
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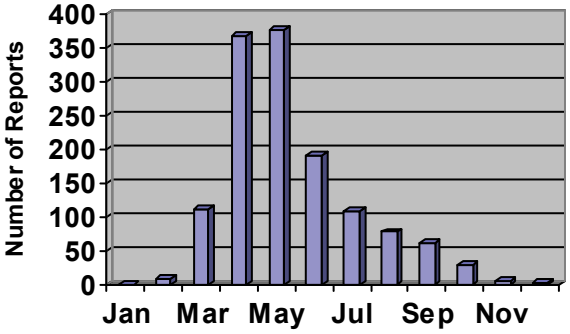

Note: All Reports Included - Total 1,346

Mission, Vision, and Values

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network.

The NWS Quad Cities' Mission is to *"Provide weather, hydrologic, and climate forecasts and warnings for the protection of life and property and the enhancement of the national economy;"*

Our Vision is to *"Provide "World Class" climate, water and weather products and services, through the infusion of advanced science and technology, dedicated teamwork, superior customer service, and steadfast public outreach;"* and,

Our Values are to be "C*ommitted to excellence, providing customer - oriented service through teamwork, professionalism, and integrity."*

As the Meteorologist in Charge of WFO Quad Cities, I can assure you that our staff of dedicated professionals will continue to safeguard our public from the threats of hazardous weather and flooding. By adhering to our vision and values, we will accomplish our mission to protect life and property!

Is Your Severe Weather Plan Effective?

Donna Dubberke

When it comes to severe weather and disasters, we hear in the news of success stories and failures. But how do you know if your own plan is effective?

When we look at recent severe weather events such as Van Wert, Ohio, Roanoke, Illinois, Utica, Illinois, and most recently Iowa City, Iowa, what stands out in the success stories – and lacks in the failures – is a severe weather strategy that covers all the bases. In a nutshell, it's "***Plan - Practice – Monitor – Act!***"

Plan

Have a severe weather plan for your home and business. Know where your shelters are located. Have a disaster supply kit in your shelter area.

Practice

Have a tornado drill. Make sure everyone knows the plan.

Know how long it takes to get everyone into the shelter.

Monitor

Keep an eye on the weather, via the internet, NOAA Weather Radio, local media, or perhaps your own storm spotters. Use a weather radio for alerts while you are asleep.

Act

Take immediate protective action if a warning is issued or you see severe weather!

If any one of these ingredients is missing, the results can be disastrous. For more information about severe weather preparedness or "***Plan – Practice – Monitor – Act!"***, visit these web sites:

www.weather.gov/quadcities/preparedness/ppma.php

PPMA for Business:

www.weather.gov/quadcities/preparedness/industry

PPMA for Schools:

www.weather.gov/quadcities/%20downloads/school_guide.pdf

NOAA Weather Radio:

www.weather.gov/quadcities/wxradio

For more information, visit www.ready.gov

New on the Web Site:

Watches/Warnings Severe Weather Summary Page (Under Current Hazards: Watches/Warnings)

www.crh.noaa.gov/hazards/dvn (see story on page 9)

Daily Climate Maps of Yesterday's High, Low, Rainfall

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

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Mission:

"Provide weather, hydrologic, and climate forecasts and warnings for the protection of life and property and the enhancement of the national economy."

Vision:

"Provide "World Class" climate, water and weather products and services, through the infusion of advanced science and technology, dedicated teamwork, superior customer service, and steadfast public outreach."

Values:

"Committed to excellence, providing customer - oriented service through teamwork, professionalism, and integrity."

Is Your Severe Weather Plan Effective?

(continued from page 3)

A Disaster Supply Kit should include:

- A 3-day supply of water (one gallon per person per day) and food that won't spoil
- one change of clothing and footwear per person
- one blanket or sleeping bag per person
- a first aid kit, including prescription medicines
- emergency tools, including a battery-powered NOAA Weather Radio and a portable radio, flashlight, and plenty of extra batteries
- an extra set of car keys and a credit card or cash
- special items for infant, elderly, or disabled family members.

What is CoCoRaHS?

Community
Collaborative
Rain,
Hail, and
Snow Network

www.cocorahs.org

Cuckoo for CoCoRaHS!

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, hail, and snow). Volunteers in several states across the country report precipitation via the Internet (www.cocorahs.org). The only requirements are an enthusiasm for weather and a low-cost rain gage!

How are the reports used?

The amount of rain or snow that falls can vary greatly over short distances. For example, thunderstorms can produce heavy rainfall in one corner of the county, while the opposite side sees just a sprinkle. CoCoRaHS observers provide information that fills in the gaps between "official" reporting stations, helping us pinpoint areas that have received more precipitation (or less!) than their neighbors. That information can help the National Weather Service in forecasting flash flooding and small stream flooding. It can help the USDA evaluate drought impacts by providing more detailed information on areas that have lacked precipitation. And it can give the National Weather Service information about heavy rain, snow fall, and hail, allowing us to understand more about the storms affecting the area.

Who sees the reports?

Anybody with Internet access can see the daily precipitation reports on the CoCoRaHS website. Many groups and agencies use the information, including meteorologists and hydrologists at the National Weather Service as well as TV meteorologists, the U.S. Department of Agriculture, farmers, researchers, state climate offices, teachers, students, and neighbors, just to name a few examples.

What do I need?

We ask that every CoCoRaHS volunteer use the same type of rain gage, a 4-inch plastic gage that is read manually. Using the same gage at every site allows us to compare rainfall readings more carefully. Local coordinators provide training

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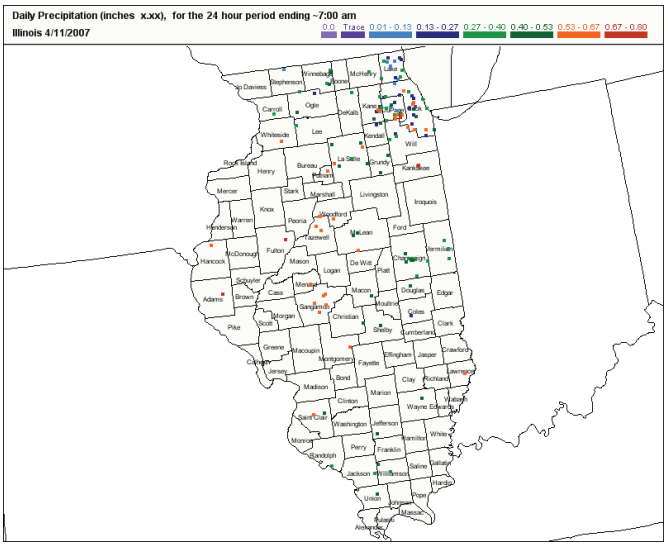

24 hour precipitation image from the CoCoRaHS website.

Severe Weather Climatology

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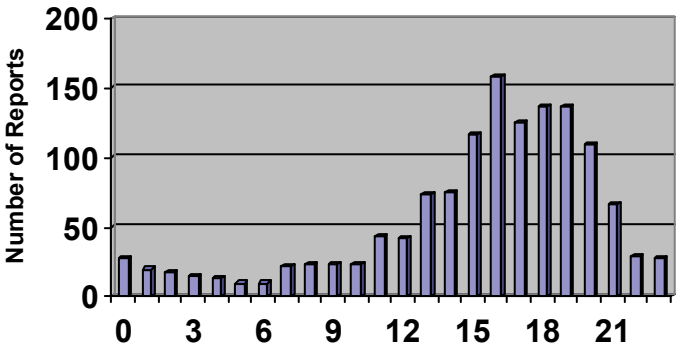
tornadoes. There have been 701 tornadoes in the Quad Cities county warning area from 1950 to 2006, for a yearly average of 12 tornadoes.

Summary

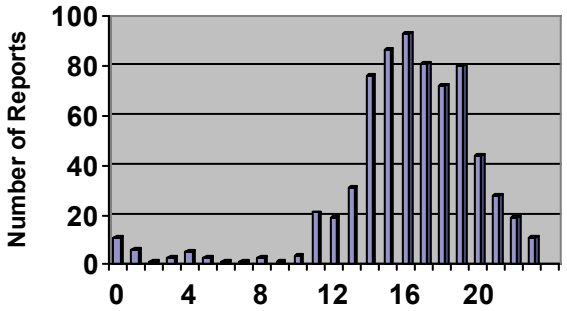
While severe weather can occur *anytime* of the year, day or night, the majority strikes during the late afternoon and evening hours. Most storms with large hail and tornadoes occur during the spring, while damaging wind events are mostly in the summer. With much of the severe weather during the April through August time frame, this makes for a rather lengthy severe weather season in our region!

Large Hail Reports by Hour (1994-2006)



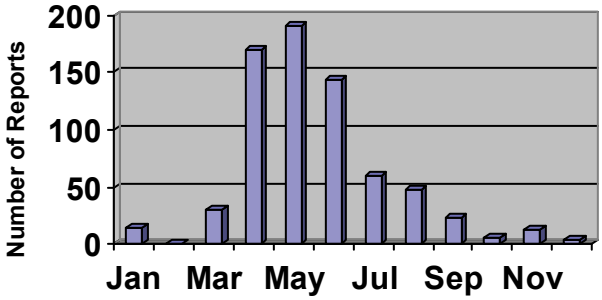
Note: All Reports Included - Total 1,346

Tornado Reports by Hour (1950-2006)



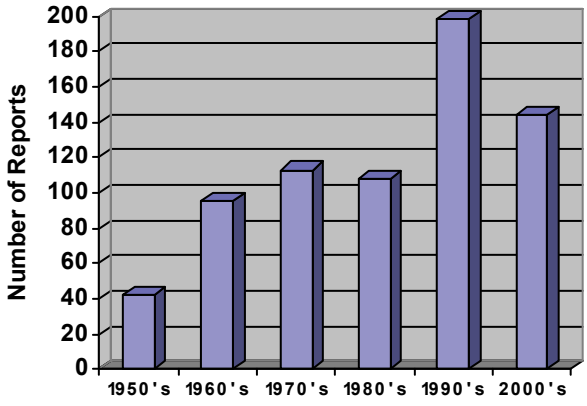
Note: All Reports Included-Total 701
Average 12.5 per year

Tornado Reports by Month (1950-2006)



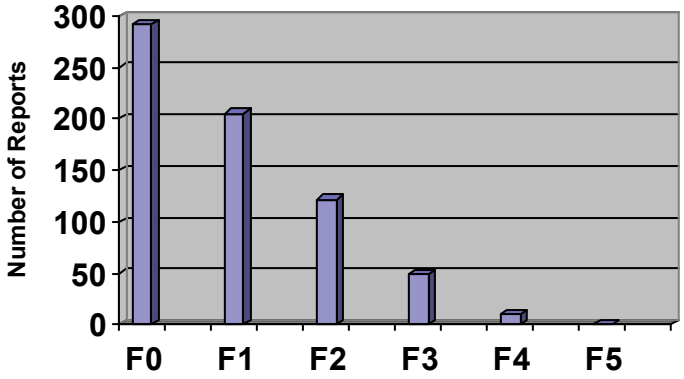
Note: All Reports Included - Total 701
Average 12.5 per year

Tornado Reports by Decade (1950-2006)



Note: All Reports Included - Total 701

Tornado Reports by F-Scale (1950-2006)



Note: Number of Tornadoes Ranked - 678 of 701
F0 - 292 F1 - 205 F2 - 122 F3 - 49 F4 - 10 F5 - 0

Flash Flooding: The Underrated Severe Weather Hazard

Ray Wolf

...More weather fatalities occur in floods (of which flash flood are a subset) than any other weather phenomena...

Flash floods are one of the more challenging and significant weather phenomena for which meteorologists provide warnings. More weather fatalities occur in floods (of which flash flood are a subset) than any other weather phenomena. About half of the flash flood fatalities occur in vehicles.

First, there is no clear cut definition of what is a flash flood. Second, flash floods are caused by both meteorological and hydrological factors, the latter of which can be impacted by humans.

Flash floods are generally defined as streams rising rapidly beyond bankful or ponding water rising rapidly to a level presenting a threat to life and/or property. The time between heaviest rainfall and flooding requires immediate action to mitigate. The National Weather Service uses a time period of 6 hours or less between the heavy rainfall and onset of flooding.

Urbanization results in increased runoff and can increase the risk of flash floods. Building in flood plains, poorly designed culvert systems, and other human made structures which do not properly account for water can also increase flash flood risk. Flash floods can also be caused by dam breaks and ice jams, indicating they can occur in any season and any time of day or night.

Some examples of flash flood impacts include floating or flooding cars: 6 or more inches of water covering roads; road or bridge closures due to high water; flooding in the basements or lowest floor of homes or businesses; mud or rock slides; or exceedance of flood stage on a gaged creek or river.

Flash floods occur most commonly during May, June, and July. They can occur anytime of the day, but most frequently during the afternoon and evening hours. On average for a year, we have around 10 flash floods occurring on about 4 days somewhere across eastern Iowa, northwest and west-central Illinois, and northeast Missouri. At least four people have died from flash floods in our area since 1995, more than from tornadoes.

Two key safety measures will ensure you avoid becoming a flash flood fatality. First, never drive into water over a road. The road could be washed out, plus flowing water as shallow as 1 foot can easily sweep a vehicle (including SUVs and pickup trucks) off a road. Second, avoid flash flood prone areas, such as campsites near streams, when the threat of heavy rain exists.

Your assistance by providing rainfall amounts, whether on a daily basis as a coop observer or as it occurs as a storm spotter, provides important information which helps us assess the likelihood of flash flooding. If you note any of the examples cited above which indicate a flash flood, please report those to us too.

Cuckoo for CoCoRaHS!

(continued from page 4)

on how to put up a rain gage to get the most accurate readings, as well as how to read the gage, measure snow, and report all of the information. These training sessions are posted on the state's CoCoRaHS page, so watch that page carefully for updates!

Volunteers are asked to measure precipitation daily and report it at about the same time every morning. (Don't worry… volunteers are allowed to take vacations! The CoCoRaHS website provides a way to report rainfall that has accumulated over several days if the volunteer was not available to observe the rainfall each day.) Even a daily report of no precipitation is valuable; it is just as important to know where rain and snow are not falling as it is to know where they did fall! Volunteers are also asked to report any hail through CoCoRaHS. Of course, we also encourage you to call in hail reports to the National Weather Service when thunderstorms occur!

How do I join?

Signing up to be a CoCoRaHS volunteer is as easy as a few clicks on the website (www.cocorahs.org) – just click on your state and scroll until you see the "Join CoCoRaHS" link. Then just enter a few important pieces of information, such as your street address so that we can accurately place your "dot" on the map, your email address so that we can stay in touch, and your name so that we can thank you for joining! You will be given a unique station name that will identify your reports based on your location. Right now, Illinois and Missouri are already active CoCoRaHS states. The wheels are in motion to add Iowa this summer, as well, so watch that website for updates.

On the web:

www.cocorahs.org

COOP NEWS

Phenology: Better Than a Bump on the Head

Terry Simmons

This spring, some NWS Cooperative Observers in the central United States were invited to join a new environmental observation network. In case you received an invitation and wondered why you were contacted, let me provide a little background about the United States National Phenological Network (USA-NPN) and the important contributions this observation network provides.

Phenology, the study of the annual cycles of plants and animals and their response to seasonal change, has been practiced for centuries. Farmers have used plant and animal observations to maximize crop production. Nature-lovers and folks afflicted with seasonal allergies have studied annual plant cycles to anticipate prime wildflower viewing conditions, and peak pollen times. Today, phenology is used to predict the future health of the environment.

From historical records and observations, we know phenological events can vary over time. Ecosystems can recover from seasonal variation, but when changes happen over many years, the timing of events such as flowering, leafing, migration, and insect emergence can impact how plants and animals are able to thrive in their environments.

Phenologic data from the same location as weather data provides valuable information for agronomists, biologists, and climatologists researching and monitoring changing environmental conditions. We know many weather observers already have an interest in the effects of weather and climate in their own backyards, for they add comments and information to forms they provide to the National Weather Service each month. The ability for researchers to tap into this source of data may help uncover new and beneficial information.

Over the past few years researchers have noted their individual needs for biologic information could be satisfied with a national observing network, and this spring the United States Geological Service (USGS) drafted a plan to coordinate this effort. USA-NPN prepared letters were sent to coop sites with lengthy climate histories at no cost to the National Weather Service. There is no connection between the NWS Cooperative Observation Program, USGS, and the USA-NPN. If you did not receive an invitation, but are interested in learning more about phenology please check the following web sites:

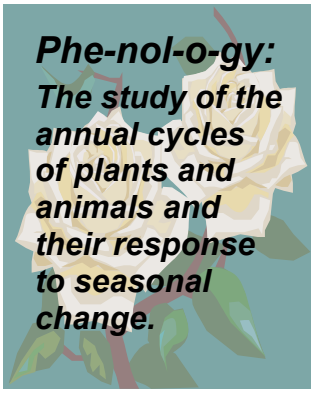
National Climatic Data Center, Ashville, North Carolina:
www.ncdc.noaa.gov/paleo/phenology.html

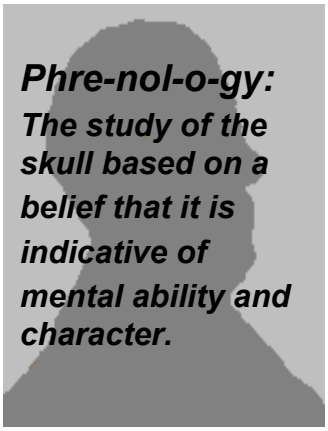
USA National Phenology Network:
www.uwm.edu/Dept/Geography/npn/

Project Budburst
www.windows.ucar.edu/citizen_science/budburst/

Uses of Phenology

- Correlation with insect emergence and pest control
- Correlation with crop planting dates
- Farmscaping with insect refugia (cover crops, hedgerows, strip crops) to attract beneficial insects and enhance natural biological control
- Designing orchards for pollination and ripening sequence
- Designing bee forage plantings
- Designing perennial flower beds and wildflower plantings
- Prediction of global warming trends





Why Do River Stages Change by Different Amounts at Different Locations?

Jeff Zogg

You may have noticed that when river stages rise or fall, they often do not change by the same amount at different gauging sites even on the same river. This phenomenon can happen before or after floods, or even day to day. Why is this so?

Photo from Dewitt gage site (DEWI4) on the Wapsipinicon River looking upstream from the bridge on old highway 61.

...when river stages rise or fall, they often do not change by the same amount at different gauging sites even on the same river.

Unfortunately, a given difference in stage at one river gauging site does not necessarily mean the same amount of water as that same difference in stage at another river gauging site. You cannot compare the differences. It's like comparing apples to oranges.

These differences arise because of various factors including stream channel shape, depth, obstructions such as trees or sandbars in the river, etc. For stages above bank full or flood stage, additional factors such as stream bank height and topography of the flood plain also play a role. In addition, as higher water moves downstream, its height will diminish (i.e., attenuate) in the absence of additional water input. To further complicate things, a given difference in stage can mean different amounts of water at different stages even at the same gauging site.

Let's look at two examples that show how the same change in stage at different gauging locations on the same river can result in different amounts of water.

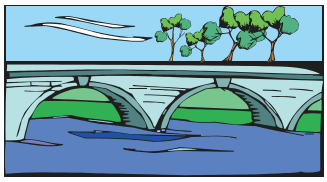
Example #1

Consider the Wapsipinicon River in Iowa. We will look at the gauging sites at Anamosa Shaw Rd and at De Witt. The flood stages at these locations are 14 feet (ft) and 11 ft respectively. For the Anamosa gage, the difference in water between flood stage and 1 ft above flood stage (i.e., 15 ft) is 1,330 cubic feet per second (cfs). For the De Witt gage, the difference in water between flood stage and 1 ft above flood stage (i.e., 12 ft) is 2,840 cfs. Thus, a 1 ft difference above flood stage at both locations yields a difference in water of 1,510 cfs, or 114% more water at the De Witt gage than at the Anamosa Shaw Rd gage.

Example #2

Now let's use the difference for the De Witt gage between flood stage and the 6/5/2002 crest of 11.35 ft. The crest was 0.35 ft above flood stage (i.e., 11.35 ft - 11 ft = 0.35 ft). The corresponding difference in water is 714 cfs. For the Anamosa Shaw Rd gage, the same difference in stage compared to flood stage is 14.35 ft (i.e., 14 ft + 0.35 ft = 14.35 ft.) The corresponding difference in water is 456 cfs. Thus, a 0.35 ft difference above flood stage at both locations yields a difference in water of 258 cfs, or 57% more water at De Witt than at Anamosa Shaw Rd.

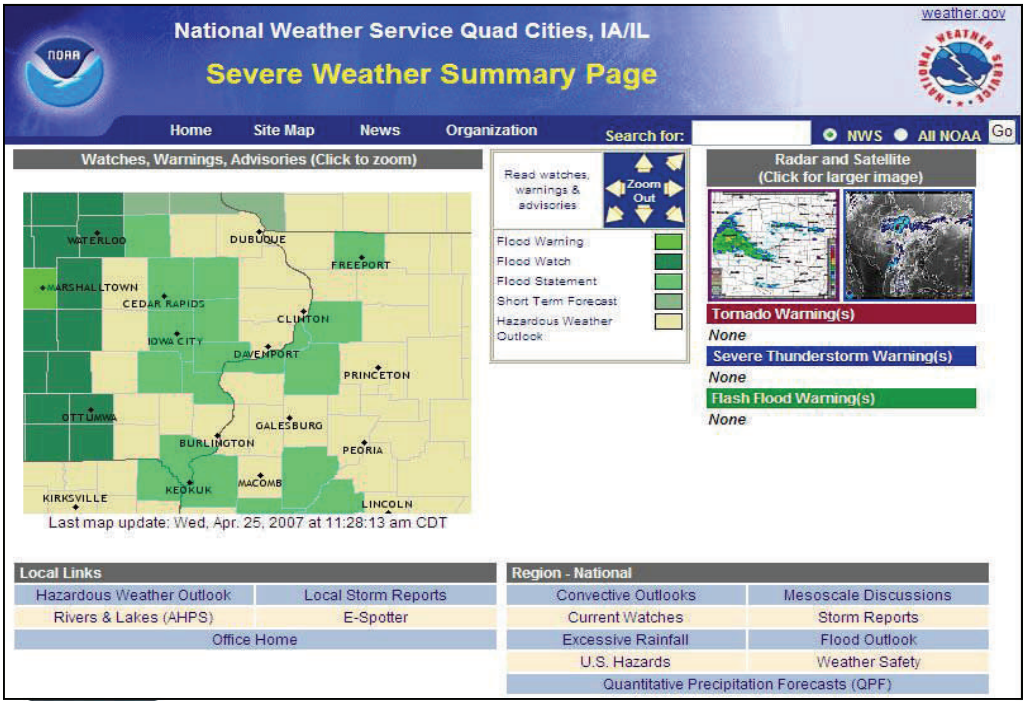
From these examples, you can see that a given difference in stage can mean a different amount of water at one gauging site than it can at another. Sometimes those differences can be significant.



Severe Weather Home Companion

New Standardized Web Page for "One-Stop Shopping"

David Sheets



Spring is here and summer is just around the corner. In this part of the country, this is the primary season for severe thunderstorms, flooding and tornadoes. This year, when your weather radio begins wailing with watches and warnings, there will be a new source of information on our web site for monitoring severe weather.

The National Weather Service has implemented an all new standardized severe weather webpage that will serve as a "one-stop shopping" source for the most up-to-date local hazardous weather information. This Severe Weather Summary page is standardized, in that the format and presentation of information is the same from office to office.

Above is a recent example from the Severe Weather Summary Page from the Quad Cities NWS website (This can be accessed by clicking on "Watches/Warnings" at the top of the left menu bar, or directly by www.crh.noaa.gov/hazards/dvn).

On the left, is a map of our warning area that is color coded to show what NWS products are in effect. Below that, are links to the latest Hazardous Weather Outlook, AHPS page (river and lakes information), Local Storm Reports, and the E-Spotter login page.

On the top right, there are quick links to the latest warnings for tornadoes, severe thunderstorms and flash floods. There are also thumbnails of the current NWS radar image and satellite picture, that take you to the local NWS radar page and NOAA satellite web pages. Below that are links to the latest products and information from national NWS Centers, including the Storm Prediction Center.

The information on this page will generally be updated each minute, but you may need to click "refresh" to get the latest information in your internet browser. As always, however, we urge you to keep your weather radio handy or monitor local media when severe weather is in your immediate area. NOAA Weather Radio All Hazards is still your most timely source of severe weather information, as warning information usually goes out through this system within seconds of the forecaster's decision to warn.

Information from this page can be useful in both daily planning for severe weather, and tracking of on-going events during active weather. We hope you find this page useful and that you make us your "Weather Home Companion" when severe weather strikes.

...Your "one-stop shopping" source for the most up-to-date local hazardous weather information…

www.crh.noaa.gov/hazards/dvn

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***Jeff Zogg**, Hydrology Program Manager*

A Look Back at Winter 2006-07

David Sheets

Looking at the statistics from the official observing site at the Quad Cities International Airport in Moline, Winter 2006-07 will be remembered as snowy and slightly warmer than normal. The average temperature was 26.6 degrees, which is 1.8 degrees above normal. Snowfall totaled 31.6 inches, which is 6 inches above normal.

From the graphs on the right, it can be seen that December and January average temperatures were much above normal, while snowfall was near normal. This was followed by an unusually cold and stormy February. The first half of the month was bitter cold, averaging 14 degrees below normal over the 14 day stretch. 10.5 inches of snow fell during the same period. This stretch compensated for the relatively mild winter up to that time, bringing the averages closer to 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.

There, you will find data for Burlington, Dubuque, Cedar Rapids, as well as Moline.