



NATIONAL WEATHER SERVICE  
DES MOINES IA

• **Des Moines Summer Temperatures**



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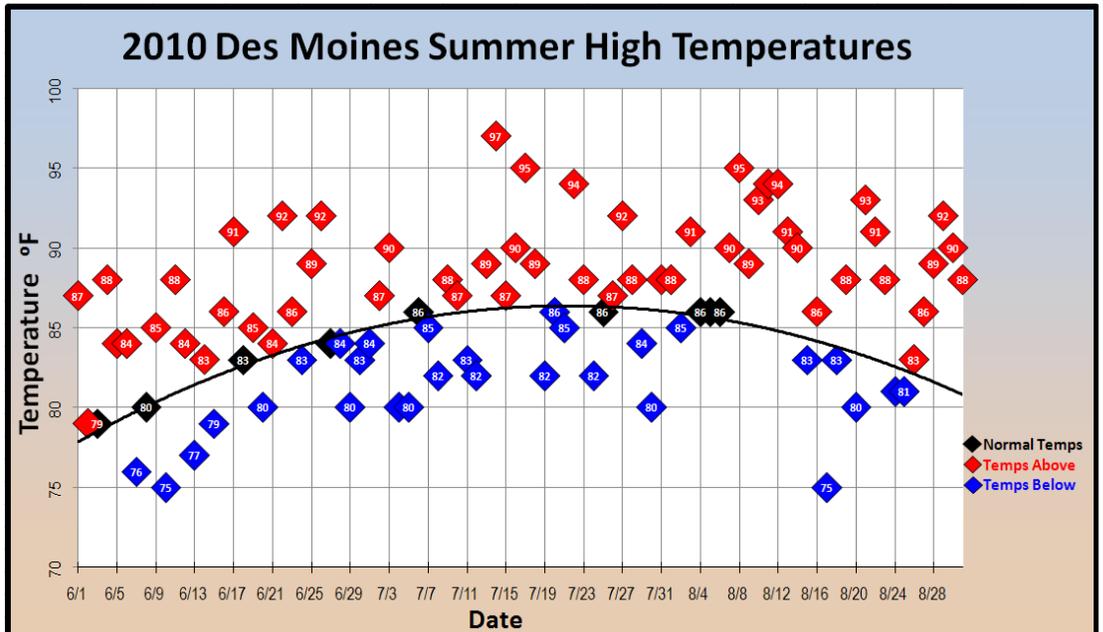


**Volume 4, Issue 3**

**Fall 2010/Winter 2011**

**Des Moines Temperatures From the Summer**—*Jacob Beitlich, Meteorologist Intern*

In Des Moines, the summer of 2010 was the 7<sup>th</sup> warmest on record, with an average temperature of 76.8 degrees. When looking separately at the high temperatures and low temperatures, one can immediately see that the *low* temperatures stand out. As Table 1 below shows, of the 92 total days of summer from June 1 to August 31, well over half had a high temperature (54 days) and low temperature (74 days) above normal. It is important to understand that “normal” refers to the 30 year average from 1971-2000. The 74 days of low temperatures above normal during the three summer months broke a record during this period. The previous record was 69 days set back in 1983.

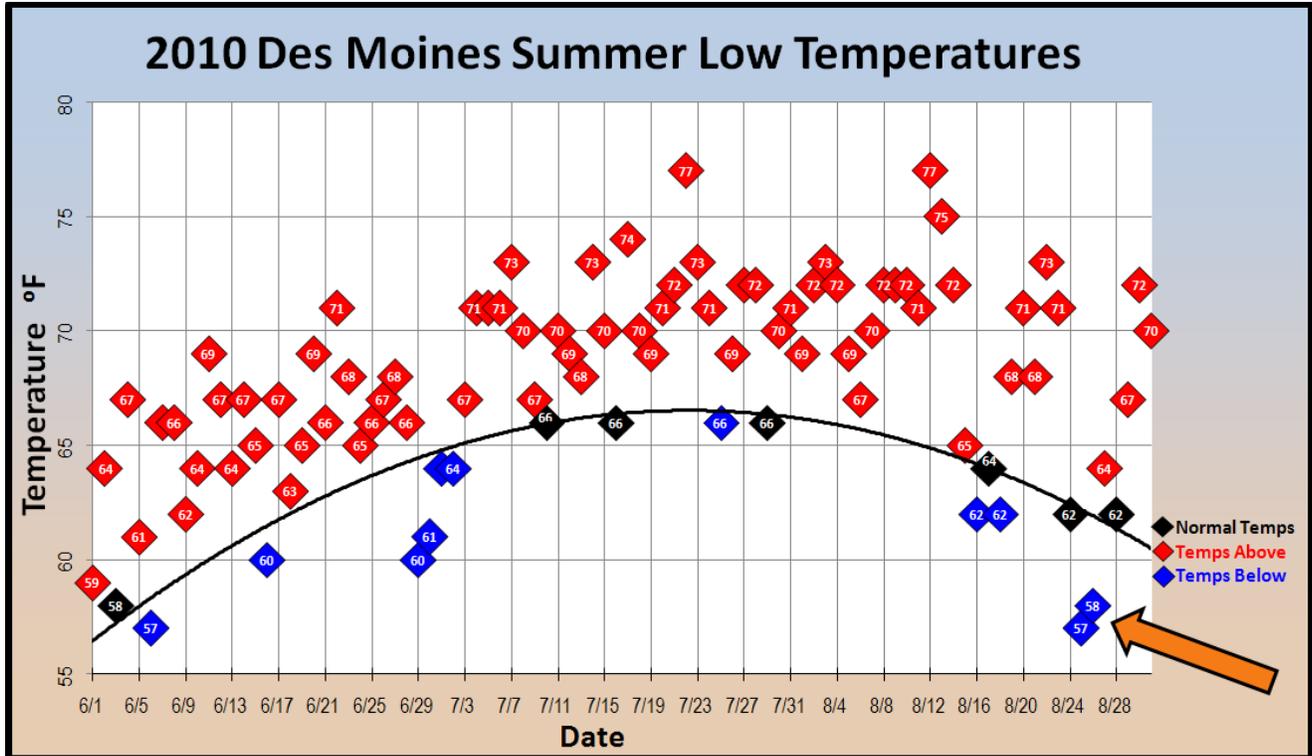


**Graph 1 (above) and Graph 2 (page 2): Daily high and low temperatures for Des Moines. Red marks are temperatures above normal and blue marks are temperatures below normal. The black line is the 30 year-average 1971-2000.**

| High Temperatures |                   |                   |                |
|-------------------|-------------------|-------------------|----------------|
| Month             | Days Above Normal | Days Below Normal | Days At Normal |
| June              | 17                | 9                 | 4              |
| July              | 16                | 13                | 2              |
| August            | 21                | 7                 | 3              |
| Summer            | 54                | 29                | 9              |
| Low Temperatures  |                   |                   |                |
| Month             | Days Above Normal | Days Below Normal | Days At Normal |
| June              | 25                | 4                 | 1              |
| July              | 25                | 3                 | 3              |
| August            | 24                | 4                 | 3              |
| Summer            | 74*               | 11                | 7              |

Graph 1 (above) and Graph 2 (page 2) show the daily high and low temperatures for Des Moines, and are color-coded with red marks representing temperatures that were above normal, while blue marks representing temperatures that were below normal. In the graphs above, the black curve represents the 30 year average temperature from 1971-2000. The diamonds show the observed high (top) and low (bottom) temperatures for the summer of 2010. In the bottom image, the orange arrow points to the two days when the low temperature dropped below 60 degrees, ending the consecutive streak at 79 days dating back to June 7, which was 2 days short of the all-time record of 81 days set in 1983.

**Table 1 shows the number of days above and below normal for maximum and minimum temperatures during the summer months. \*Most ever from 1893-2010.**



### Outlook for Winter 2010-2011—*Miles Schumacher, Senior Meteorologist*

Following the cooler than normal and very snowy winter of 2009-10, temperatures turned warm across Iowa in March and have remained above normal ever since. The summer of 2010, defined by the months of June-July-August, was the 7<sup>th</sup> warmest summer on record for Des Moines. For the April through September period in Iowa, it was the 10<sup>th</sup> warmest period of record. The very warm summer was not the result of excessive daytime temperatures, but was due to very warm nighttime temperatures. We entered the spring with a decaying El Niño pattern. This continued through the summer, and by the fall the pattern had transitioned into a moderate La Niña.

As we head into the winter season, many have concerns of whether the warm summer will mean a cold winter, or will the warmer than normal pattern continue into the winter. There is not a strong correlation between summer temperatures and the subsequent winter. The more significant factor will be the state of La Niña during this upcoming winter. Currently the La Niña is moderate to strong in strength as depicted by the large area of colder than normal water in the equatorial Pacific as shown in Figure 1. It appears it will remain a factor through the winter, and remain at least moderate strength into the summer of 2011.

The atmospheric response to La Niña is significant in the winter, though the affects are most noticeable during the mid to late winter months into early spring. Typically, La Niña will bring warm and dry conditions across the south-central into the south-east U.S., with cool and wet conditions over the north-central and northwest U.S. into western Canada. Unfortunately for Iowa, that places the state in the area between warm weather to the south and cool weather to the north. Typically the storm track results in heavy precipitation to the southeast of Iowa as well. No two La Niña events are the same. With the enhanced temperature contrast present during La Niña winters, a slight shift in the jet stream can make a large difference in the sensible weather. Figure 2 shows typical global weather patterns during a La Niña event.

In Iowa, there is not a clear cut signal as a result of La Niña. Being as Iowa is between the cooler air to the north and warmer air to the south, the weather pattern is typically active. Depending on the position of the jet stream, the precipitation can fall as either rain or snow, so a stormy season does not guarantee a heavy snow season for example. There are questions as to how strong La Niña will be, and if it will persist through the whole winter. Various models are used as a guide and the over-all consensus is that there will be at least a moderate to strong signal through the entire boreal winter. That would suggest there will be a significant influence on the weather in Iowa this winter. Figure 3 below shows the central Pacific sea surface temperature departure (black line) and a series of forecasts (red and blue lines) through the time period based on the initial conditions from 13-22 October 2010.

*(Continued on page 3)*

SST Anomalies (°C)  
13 OCT 2010

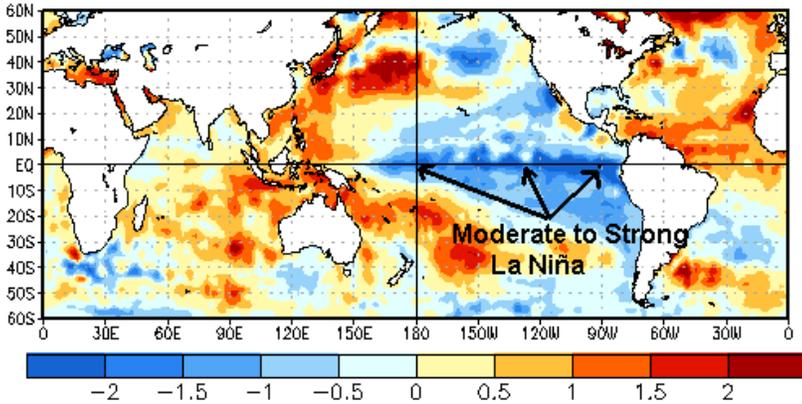


Figure 1: Sea surface temperature departure from normal, equatorial Pacific.

**Winter Outlook** *Continued from page 2*

Although in meteorology no two years are the same strictly speaking, one can look at weather patterns of the recent past to give some indications of near term weather trends in the future. This forecast is based on the best fit from several of the years that were similar to the fall pattern so far. Considerations were also made for the developing La Niña and other factors that control our weather. It is likely that La Niña will have significant influence on the weather this winter. There can be considerable variability from one La Niña event to another. The wide variation is in part due to the fact that a typical La Niña winter features the jet stream close to Iowa. For that reason, a minor shift in its position can result in a significant change in temperature and precipitation. Looking at years similar

to the recent past suggest temperatures are likely to average a little below normal over the northwest, with temperatures averaging close to normal over the southeast. Precipitation for the winter is expected to be fairly close to normal over a large part of the state. Above normal precipitation is indicated for the southeast part of Iowa. See Figure 4 for details on the following page.

Another typical feature of La Niña winters is a tendency to "lock" into pat-

**COLD EPISODE RELATIONSHIPS DECEMBER - FEBRUARY**

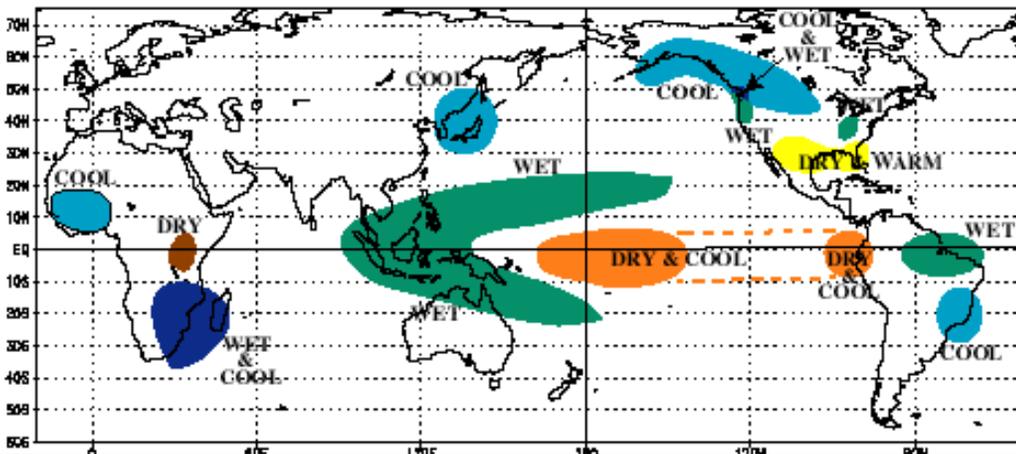


Figure 2: Typical affects around the globe resulting from La Niña.

terns for long periods of time. Trying to time periods of warmer than normal or cooler than normal weather is not realistic, however there are some indications in the data. The effect of La Niña is most felt during the later part of the season, from late January into the spring. There is no real strong signal during December with either temperature or precipitation. The signals in the data indicate that January is more likely to be warmer than normal rather than cooler than normal, while February and March lean toward cooler than normal. The signal for precipitation is not strong through January, with a tendency to be wet in Iowa in February into March.

These outlooks are based more heavily on statistics than many of the methods used by the [Climate Prediction Center](#). The complete set of official forecasts from the Climate Prediction Center can be found on our [website](#).

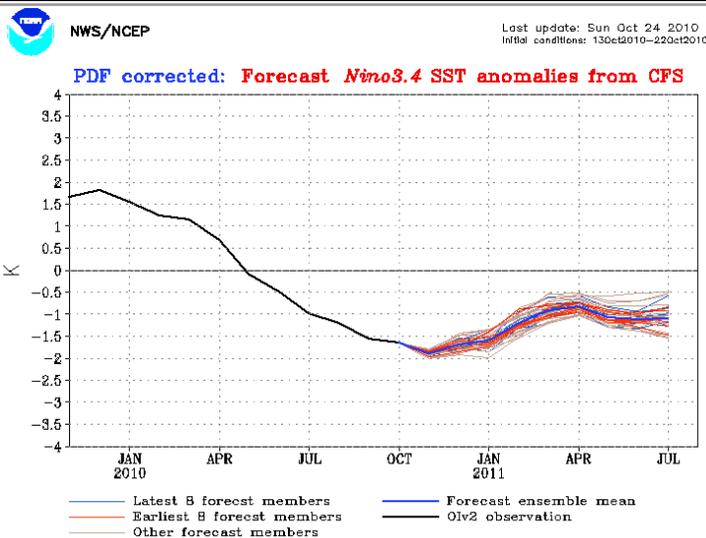


Figure 3: Sea surface temperature departure for the past year and projection into the Summer of 2011. Departure in degrees Kelvin is shown on the ordinate, with time on the abscissa.

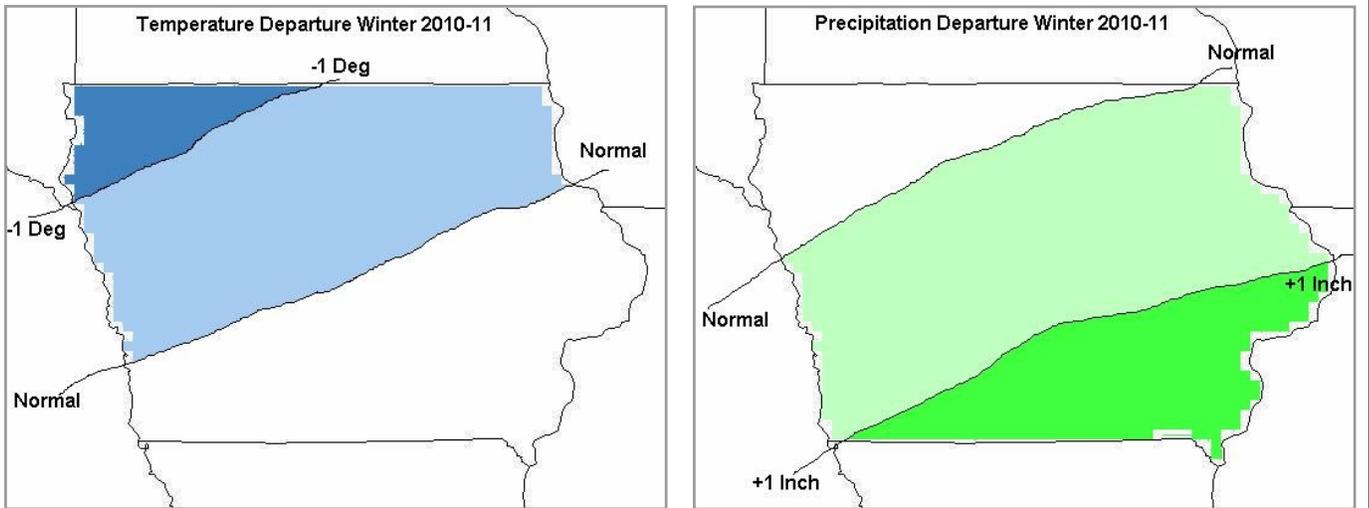


Figure 4: Mean temperature (left), precipitation (right) departure forecast for the winter.

### 2010 Cooperative Observer Length of Service Awards

by Brad Fillbach, Hydro-Meteorological Technician/Cooperative Program Manager



David McHone of Maxwell, Iowa receives his 15 year Length of Service award. Photo by Brad Fillbach, HMT, NWS—Des Moines.



Randy Cooper (right) of Toledo, Iowa receives his 10 year Length of Service award from Brad Fillbach (left) HMT, NWS—Des Moines.



Ed Long of Lorimor, Iowa receives his 15 year Length of Service award along with his wife Margaret (not pictured). Photo by Brad Fillbach, HMT, NWS—Des Moines.



John Irving of Columbia, Iowa receives his 30 year Length of Service award. Photo by Brad Fillbach, HMT, NWS—Des Moines.

◆ **Fun Fact:** The record for most snowfall in a season (July 1–June 30) is 1,140” of snow at Mt. Baker in Washington State.

◆ **Fun Fact:** The record for most snowfall in a one-year period is 1,224” of snow. It was recorded from February 19, 1971–February 18, 1972 at Mt. Rainier in Washington State.

## River Levels: August and Now *By Jeff Zogg—Senior Hydrologist*

River flooding was a common occurrence during this year's warm season. Numerous rounds of heavy rainfall led to multiple episodes of river flooding in different locations. Some locations experienced major flooding.

### August River Levels

The most severe flooding occurred in early to mid August due to very heavy rain across central Iowa (Figure 1). During that time, record river flooding and flash flooding impacted central Iowa. One person lost her life and several others were injured. In addition, many people lost their homes and most of their possessions. The Des Moines, Ames, Oskaloosa and Colfax areas were hardest hit, including Iowa State University in Ames. The South Skunk River, along with Fourmile Creek and Walnut Creek, were the most affected streams. Preliminary estimates indicate that flood-related damages approached or exceeded \$100 million. The recovery is still ongoing at many locations in those towns. Rainfall for the rest of August was not as heavy. River levels gradually fell in response. At the end of the month, only the lower Des Moines River remained above flood stage.

| River             | Town / Location           | Site ID | Crest Value (ft) | Crest Date (CDT) | Crest Time (CDT) | Annual Exceedance Probability | Average Recurrence Interval | Notes                       |
|-------------------|---------------------------|---------|------------------|------------------|------------------|-------------------------------|-----------------------------|-----------------------------|
| Fourmile Creek    | Des Moines<br>Easton Blvd | DFMI4   | 16.14            | 8/11/2010        | 9:30 am          | ~ 2%                          | ~ 50 years                  | Record crest                |
| South Skunk River | Ames<br>W Riverside Rd    | AMEI4   | 19.55            | 8/11/2010        | 1:00 pm          | ~ 0.02%                       | ~ 500 years                 | 4th highest crest on record |
| South Skunk River | Ames Hwy 30               | AESI4   | 26.72            | 8/11/2010        | 10:00 am         | < 0.02%                       | > 500 years                 | Record crest                |
| South Skunk River | Colfax                    | CFXI4   | 23.85            | 8/14/2010        | 1:45 am          | 2% - 4%                       | 25 - 50 years               | Record crest                |
| South Skunk River | Oskaloosa                 | OOA4    | 26.40            | 8/16/2010        | 1:30 am          | 1% - 2%                       | 50 - 100 years              | Record crest                |
| Squaw Creek       | Ames Lincoln<br>Way       | AMWI4   | 18.13            | 8/11/2010        | 8:00 am          | ~ 0.02%                       | ~ 500 years                 | 2nd highest crest on record |
| Walnut Creek      | Des Moines<br>63rd St     | DOSI4   | 18.59            | 8/9/2010         | 7:45 am          | ~ 1%                          | ~ 100 years                 | Record crest                |

**Table 1: River crest information. Crest values are preliminary until verified by the U.S. Geological Survey.**

Table 1 highlights crest information for the major to record flooding in central Iowa for August. It includes the location, crest value, crest date and crest time. It also includes the annual exceedance probability (AEP) and the average recurrence interval (ARI) for each crest. Please note that the crest values are preliminary until verified by the U.S. Geological Survey. The annual exceedance probability (AEP) is the chance of a flood of a given size (or larger) occurring in any one year. The AEP is usually expressed as a percentage. For example, Table 1 shows that the Fourmile Creek at Des Moines Easton Blvd crested at 16.14 feet. Its AEP is approximately 2%. This means that there is approximately a 2% chance (i.e., a 1 in 50 chance) of a crest of 16.14 feet (or higher) occurring in any one year at that location. The average recurrence interval (ARI) is the long-term average number of years between the occurrence of a flood as big as (or larger than) the selected event. For example, the above table shows that the Walnut Creek at Des Moines 63rd Street crested at 18.59 feet. Its ARI is approximately 100 years. This means that a crest of 18.59 feet (or higher) can be expected to occur, on average, about once every 100 years at that location. ARI is another way of expressing the likelihood of occurrence of a flood event. The AEP and ARI are reciprocals of each other. In other words, if you know one you can find the other. In the case of the Fourmile Creek at Des Moines Easton Blvd, its AEP is ~ 2%. Its ARI would be 1 divided by ~ 2%, or  $1 / \sim 0.02 = \sim 50$  years.

### September and October River Levels

River levels continued their gradual fall through the middle of September. The lower Des Moines River fell below flood stage early in the month. On September 7th, the Des Moines River at Ottumwa fell below flood stage. The Des Moines River had been above flood stage at Ottumwa since June 19th, or for 80 days.

(Continued on page 6)

**River Levels** *Continued from page 5*

A strong low pressure wave developing along a front stalled out over the upper Midwest from September 22-23. It produced extremely heavy rain from southern Minnesota into central Wisconsin. Three to six inches of rain in 24 hours was common, with a band of six to ten inches of rain in extreme southern Minnesota (Figure 2). This heavy rainfall led to renewed river flooding in Iowa. In the NWS Des Moines service area, flooding occurred along the West Fork Des Moines River and the main stem Des Moines River. The flooding affected other streams in Iowa, including the Mississippi River in far eastern Iowa. Major to record flooding occurred along Big Sioux River, which forms much of the border between Iowa and South Dakota.

All locations in the NWS Des Moines service area fell below flood stage in October. The lack of widespread heavy rainfall helped keep rivers below flood stage for the rest of that month.

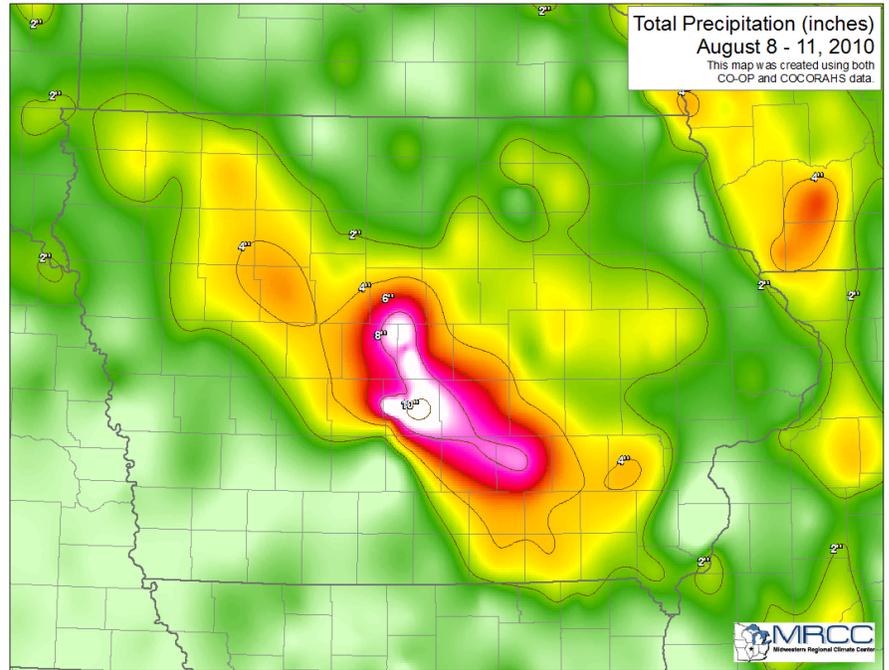


Figure 1: August 8-11 rainfall across Iowa. Source: Midwestern Regional Climate Center.

**November River Levels**

Although all rivers in Iowa have stayed below flood stage thus far for November, many river levels remained above average. Figure 3 shows the 14-day average stream flow percentiles for Iowa. Despite our relatively dry October, soil moisture levels remain near to above normal across much of the state. Figure 4 shows the soil moisture percentiles for the U.S. Note that these values are for the entire soil column, not just the top parts which are relatively dry. The elevated soil moisture levels below the top layers have helped contribute to higher than normal base flows in many rivers statewide.

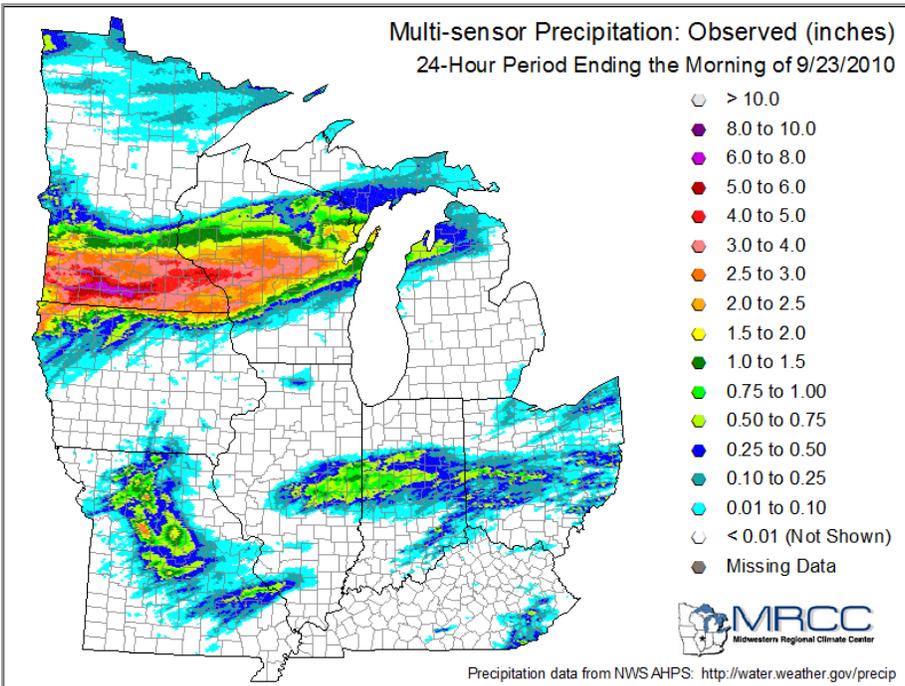
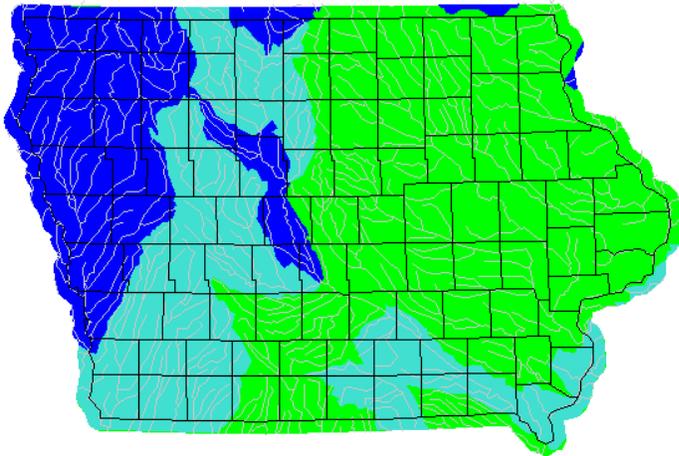


Figure 2. Rainfall amounts from September 22-23. Source: Midwestern Regional Climate Center.

**Summary**

Figure 5 shows a graph of the percentage of flood gages in Iowa that have been experiencing normal, above normal, much above normal and record high stream flows for this time of year. The graph starts in late September and finishes in early November. The graph shows that the percentage of flood gages experiencing normal flows has gradually increased. The percentage of gages experiencing much above normal and record flows has also been decreasing. Thus, this graph shows that river levels have trended lower, or closer to normal, since late September. There still are many gages, though, that are experiencing flows above or much above normal.

Tuesday, November 09, 2010



| Explanation - Percentile classes |                   |              |        |              |                   |      |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|------|
| Low                              | <10               | 10-24        | 25-75  | 76-90        | >90               | High |
|                                  | Much below normal | Below normal | Normal | Above normal | Much above normal |      |

Figure 3. Fourteen-day stream flow percentiles for lowa as of 11/9/2010. Source: U.S. Geological Survey.

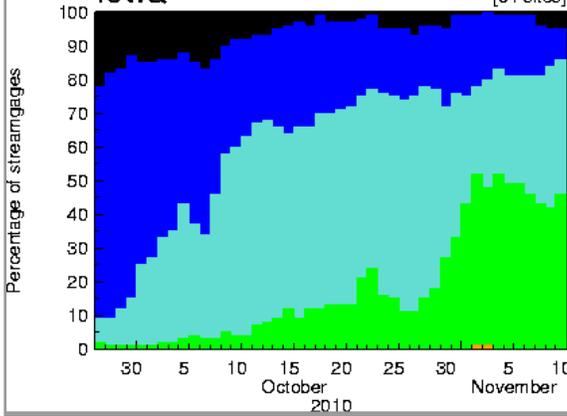
**Fun Fact:** On June 22, 1947, 12" of rain fell in 42 minutes in Holt, MO.



**Last 45 Days**

Iowa

[81 sites]

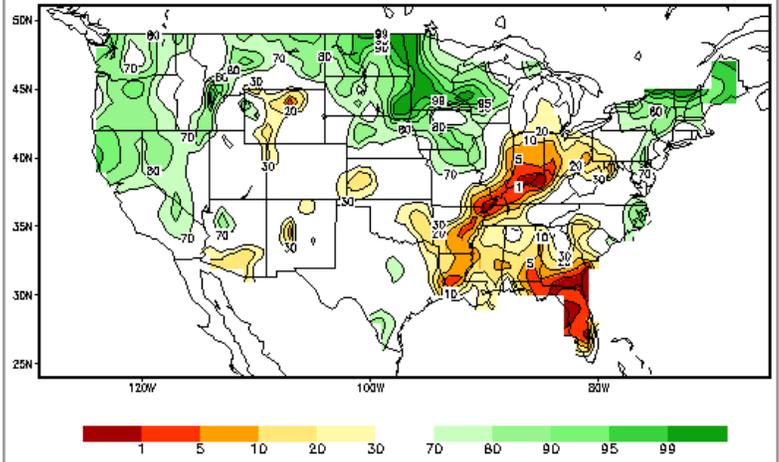


| Explanation - Percentile classes |                   |              |        |              |                   |      |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|------|
| Low                              | <10               | 10-24        | 25-75  | 76-90        | >90               | High |
|                                  | Much below normal | Below normal | Normal | Above normal | Much above normal |      |

Figure 5. Percentage of flood gages in Iowa experiencing normal, above normal, much above normal and record high flows for this time of year, from late September into early November. Source: U.S. Geological Survey.

Figure 4. Soil moisture percentiles for the U.S. as of 11/9/2010. Source: NOAA/Climate Prediction Center.

**Calculated Soil Moisture Ranking Percentile NOV 09, 2010**



**Fun Fact:** The record for the largest hail stone to fall in the U.S. was recently broken. A hail stone that measured 8.0" in diameter and weighed nearly 2 pounds fell in Vivian, SD on July 23, 2010.



## StormReady® News *Brad Small – Senior Meteorologist / StormReady Program Leader*

StormReady® is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather, from tornadoes to tsunamis. The program encourages communities to take a proactive approach to improving local hazardous weather operations by providing emergency managers and other officials with clear-cut guidelines on how to improve their hazardous weather operations.

To become StormReady®, cities, counties or universities must:

- Establish a 24 hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather operations plan which includes training severe weather spotters and/or holding emergency training or exercises

The National Weather Service in Des Moines currently has eight communities in their forecast area that have been recognized for meeting these StormReady® requirements. This includes the following counties, cities, colleges and universities and their initial date of recognition.

- ⚡ Polk County (2001)
- ⚡ City of Newton (2001)
- ⚡ Iowa State University (2004)
- ⚡ Carroll County (2007)
- ⚡ Drake University (2007)
- ⚡ Marshall County (2007)
- ⚡ City of Dallas Center (2008)
- ⚡ Grinnell College (2008)



The City of Newton, Iowa State University and Marshall County should all be commended for their recent StormReady® renewal efforts and commitment to the StormReady® Program.

If your county, city or institution of higher learning would like more information on the StormReady® program, please contact Brad Small (bradley.small@noaa.gov), StormReady® Program Leader.

## Winter Weather Awareness *Aubry Wilkins—Meteorologist Intern*

### Wind Chill

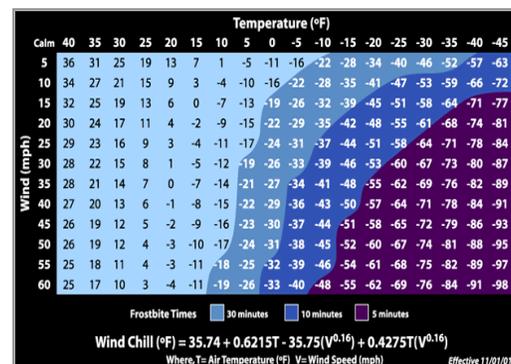
The wind chill temperature is not the actual air temperature, it is a “feels like” temperature; the temperature it feels like outside based on the rate of heat loss from exposed skin caused by the effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. Animals are also affected by wind chill; however, objects like cars and other inanimate objects are not affected by wind chill since they cannot cool below the actual air temperature. The wind chill chart was developed based on joint U.S.-Canadian research. The chart includes a frostbite indicator, showing the points where temperature, wind speed and exposure time will produce frostbite on humans. Each shaded area shows how long a person can be exposed before frostbite develops.

### Driving In Winter Weather

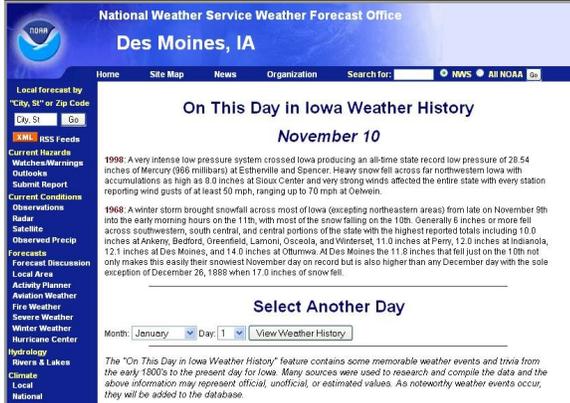
Driving in the wintertime can be extremely treacherous, especially during winter storms. Before heading out in the wintertime it is important to check the weather forecast to know what to expect for your drive. Weather conditions can change quickly in the wintertime. Forecasts can also change significantly as a storm nears. Road conditions can be checked by using the Department of Transportation website. Iowa road conditions can be found at [www.511ia.org](http://www.511ia.org). Road conditions are also available by phone by dialing 511 or 1-800-288-1047. The National Weather Service is separate from the Department of Transportation and is not who you should contact about road conditions.

### Know Before You Go:

- ❄ Have your vehicle winterized before the winter storm season.
- ❄ Keep the gas tank full so you are ready in case of an emergency and to prevent the gas line from freezing.
- ❄ Take a fully charged cell phone or two-way radio with you.
- ❄ Plan to travel during the daylight and, if possible, take at least one other person with you.
- ❄ Let someone know your route and when you expect to arrive.
- ❄ Be sure to check the weather before leaving.



## New Weather History Database Now Online *Jim Lee—Meteorologist*



The screenshot shows the NOAA website interface for Des Moines, IA. The main content area is titled "On This Day in Iowa Weather History" for November 10. It lists two significant weather events: a 1998 low pressure system and a 1968 winter storm. A "Select Another Day" section allows users to search by month and day. A sidebar on the left contains various weather-related links and tools.

The National Weather Service in Des Moines has released a database of record-breaking, unusual, and otherwise interesting weather events in Iowa history. This database contains descriptions of weather events that occurred all the way from the early 19<sup>th</sup> century through the present day, and can be accessed through our website at [weather.gov/desmoines](http://weather.gov/desmoines).

Near the bottom of the main webpage a daily feature called "On this day in Iowa weather history" will update automatically at midnight each day to describe an event that occurred on that day of the year. Just below this feature is a link to "More Iowa Weather History" directing the user to a page where historical weather events for any date of the year can be looked up. Want to know what happened on your birthday in years past? Looking for a weather event you remember from your youth?

Curious about early snowfalls, late freezes, killer tornadoes, or other weather phenomena? This is the place to find information on historical Iowa weather. If you have any questions about specific events or the

database in general, please direct them to [jim.w.lee@noaa.gov](mailto:jim.w.lee@noaa.gov). Here is a selection of five particularly interesting or unusual events from Iowa weather history. Additional details on these events can be found in the database using the website as directed above.

On January 24, 1967 an unprecedented winter tornado outbreak struck eastern and southeastern Iowa where at least 13 tornadoes touched down, several of which produced significant F2 or F3 damage as well as numerous injuries and one fatality.

On April 19-21, 1918 an incredible late season winter storm produced heavy snowfall across portions of southwestern and southern Iowa, with an observer at Lenox in Taylor County measured an amazing 24" of snow on the 20<sup>th</sup> alone, establishing the all-time Iowa record for snowfall on a single calendar day.

On May 28, 1947 a remarkable late season snowstorm produced accumulations across about the northwestern half of Iowa, ranging up to 10" at Le Mars. No snow has ever been recorded in Iowa on a later date in the spring.

On August 9, 1922 a very severe hail storm struck portions of west central Iowa. An observer wrote that "chickens and young pigs were reported killed by the score and two cows were killed" and that "In Guthrie County fields were white with hail and ditches two feet deep were completely filled. Four days after the storm there was sufficient hail in the ditches to make ice cream."

On October 30-November 2, 1991 a severe winter storm pounded the upper Midwest causing a significant disruption of Halloween festivities across the region. From southwestern into northeastern Iowa 1-2" of freezing rain fell, while in northwestern Iowa heavy snow fell with accumulations ranging up to 15" at Estherville.

## New Fire Weather Product and Partners *Frank Boksa—Meteorologist, Fire Weather Program Leader*



This fall the National Weather Service in Johnston introduced the Grassland Fire Danger Index product to central Iowa. The Grassland Fire Danger Index Product for central Iowa is used as an advisory type of product. When the relative humidity drops to low levels and wind speeds are above 25 mph and field plants and grasses are quite dry (cured), this presents a fire danger. The intent of this product is to let local officials and the public know when these conditions exist so that they can take appropriate actions to avoid the risk of fire. This product will be issued anytime there is a drought situation or when weather conditions warrant but the main periods of issuance will be in the spring, before green up and in the fall as warm season grasses dry and cure.

One of the important criteria used in determining the fire danger is where plants and grasses are in their stage of maturity and how cured the vegetation is in areas around central Iowa. To get the most accurate and up to date data possible, the National Weather Service in Johnston has partnered with the County Conservation Board in several counties within our forecast area of responsibility. County Conservation Board staff report curing data of vegetation in their area each Monday and Thursday morning from March 1<sup>st</sup> through May 1<sup>st</sup> and again September 1<sup>st</sup> through November 15<sup>th</sup> to the National Weather Service. The sharing of data between the County Conservation Board and the National Weather Service has proved to be valuable and we are looking forward to continued work with the local County Conservation Board folks in the future.

## Climatological Data for July to October 2010

| Location   | Month     | Average Temp | Departure | Highest                                     | Lowest                                    | Rain / Snow   | Departure      |
|------------|-----------|--------------|-----------|---|---|---------------|----------------|
| Des Moines | July      | 78.2°F       | +2.1°F    | 97°F (14 <sup>th</sup> )                    | 64°F (2 <sup>nd</sup> , 1 <sup>st</sup> ) | 5.44" / 0.0"  | +1.26" / 0.0"  |
|            | August    | 78.0°F       | +4.1°F    | 95°F (8 <sup>th</sup> )                     | 57°F (25 <sup>th</sup> )                  | 10.75" / 0.0" | +6.24" / 0.0"  |
|            | September | 66.6°F       | +1.5°F    | 89°F (20 <sup>th</sup> )                    | 44°F (26 <sup>th</sup> )                  | 4.10" / 0.0"  | +0.95" / 0.0"  |
|            | October   | 57.6°F       | +4.8°F    | 87°F (8 <sup>th</sup> )                     | 28°F (29 <sup>th</sup> )                  | 0.60" / T     | -2.02" / -0.6" |
| Mason City | July      | 73.4°F       | +1.0°F    | 95°F (14 <sup>th</sup> )                    | 57°F (1 <sup>st</sup> )                   | 4.93" / M     | +0.59" / M     |
|            | August    | 73.5°F       | +3.7°F    | 92°F (29 <sup>th</sup> )                    | 44°F (26 <sup>th</sup> )                  | 2.10" / M     | -2.42" / M     |
|            | September | 60.5°F       | -0.5°F    | 88°F (20 <sup>th</sup> )                    | 35°F (27 <sup>th</sup> )                  | 2.14" / M     | -1.14" / M     |
|            | October   | 51.6°F       | +2.9°F    | 89°F (9 <sup>th</sup> )                     | 19°F (29 <sup>th</sup> )                  | 0.68" / M     | -1.82" / M     |
| Waterloo   | July      | 74.4°F       | +0.8°F    | 93°F (14 <sup>th</sup> )                    | 59°F (29 <sup>th</sup> )                  | 10.91" / 0.0" | +6.70" / 0.0"  |
|            | August    | 74.0°F       | +2.8°F    | 91°F (12 <sup>th</sup> , 29 <sup>th</sup> ) | 45°F (26 <sup>th</sup> )                  | 5.46" / 0.0"  | +1.38" / 0.0"  |
|            | September | 62.7°F       | +0.1°F    | 88°F (20 <sup>th</sup> )                    | 36°F (27 <sup>th</sup> )                  | 2.43" / 0.0"  | -0.52" / 0.0"  |
|            | October   | 52.9°F       | +2.7°F    | 88°F (9 <sup>th</sup> )                     | 20°F (29 <sup>th</sup> )                  | 0.32" / T     | -2.17" / -0.3" |
| Ottumwa    | July      | 76.0°F       | -0.7°F    | 93°F (14 <sup>th</sup> )                    | 59°F (1 <sup>st</sup> )                   | 10.24" / M    | +5.79" / M     |
|            | August    | 75.0°F       | +0.8°F    | 92°F (8 <sup>th</sup> , 10 <sup>th</sup> )  | 51°F (26 <sup>th</sup> )                  | 12.52" / M    | +8.49" / M     |
|            | September | 64.6°F       | -1.0°F    | 88°F (20 <sup>th</sup> )                    | 40°F (27 <sup>th</sup> )                  | 5.44" / M     | +1.37" / M     |
|            | October   | 55.1°F       | +1.4°F    | 85°F (9 <sup>th</sup> )                     | 25°F (29 <sup>th</sup> )                  | 0.75" / M     | -2.00" / M     |

### Employee Spotlight—Miles Schumacher Senior Meteorologist

I was born on a farm in northeast North Dakota and grew up in Duluth, Minnesota. I became interested in weather at the age of 5 by watching clouds and their development. By age 10, I became interested in forecasting it. I went to college at the University of Michigan – Ann Arbor, and graduated with a BSE in Atmospheric and Oceanic Science in 1977.

I began my professional career in meteorology working with a private meteorological consulting firm in Detroit during my last two years in college. I moved to a private meteorological consulting firm in Des Moines in 1978 before starting with the NWS in 1982. My strongest meteorological interests are in extended range forecasting and winter weather. Iowa presents a challenging environment, both in the summer and the winter.

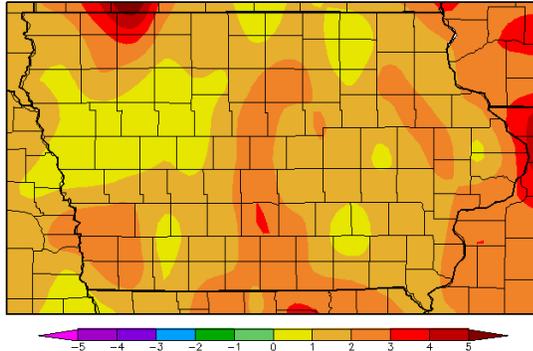
Being in the battleground between the polar air and the warmer air to the south, the clash makes Iowa one of the more convectively active areas in the country during the warm season, and may produce any type of precipitation in the cold season.

Outside of the office I enjoy spending time with my wife, as well as our dog and cat. My interests include history as well as most of the natural sciences. My wife and I are both avid trivia buffs and at one time used to play trivia games competitively.



## June through September Weather Review *Craig Cogil, Senior Meteorologist*

Departure from Normal Temperature (F)  
6/1/2010 – 8/31/2010



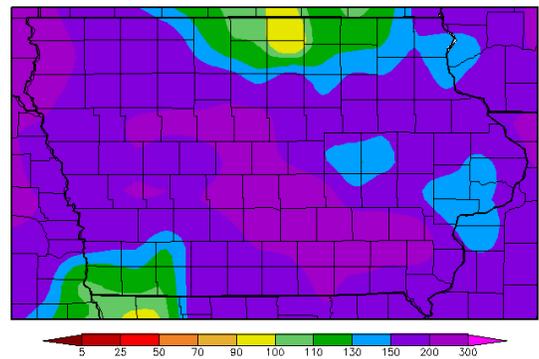
Generated 9/11/2010 at HPRCC using provisional data. Regional Climate Centers

**Figure 1: Departure from normal temperatures across Iowa for the period June 1, 2010 through August 31, 2010. Temperatures in degrees Fahrenheit**

**Temperatures:**

The warm weather from spring continued into the summer with temperatures remaining above normal across the entire state. The heat was accompanied by very moist conditions with high dewpoints making conditions uncomfortable outside for much of the time. The greatest departures were in central portions of the state, as well as along the Mississippi River valley in eastern Iowa. The summer ended up being the 7<sup>th</sup> warmest on record in Des Moines, and the 19<sup>th</sup> warmest for the state as a whole, despite 100°F never being reached in the state during the summer. Figure 1 shows temperature departures from normal across Iowa.

Percent of Normal Precipitation (%)  
6/1/2010 – 8/31/2010



Generated 9/11/2010 at HPRCC using provisional data. Regional Climate Centers

**Figure 2: Percent of normal Precipitation across Iowa for the period June 1, 2010 through August 31, 2010. Purple represent 150%-300% above normal precipitation values.**

**Precipitation:**

Rainfall was frequent and heavy during the summer months with very little let-up during that time. June was exceedingly wet with the second wettest month ever when an average of 10.45” of rain fell. The entire state saw above normal precipitation with almost 300% of normal rainfall in the southeast as seen in Figure 2. The rains lead to widespread flooding, especially in the Des Moines and Chariton river basins. July continued the moist conditions with an almost 8 inch average in the state as thunderstorms pounded the state with more heavy rainfall. Conditions were somewhat drier in northern and far southern Iowa in August. However, a very heavy rain event occurred in central portions of the state in the middle of the month. This led to near record to record flooding along Squaw Creek and the Skunk Rivers in central Iowa.

### Iowa Statewide Averages and Rankings for Temperature and Precipitation

| Month                            | Temperature   | Departure from Normal | Rainfall      | Departure from Normal | Temperature Ranking            | Precipitation Ranking         |
|----------------------------------|---------------|-----------------------|---------------|-----------------------|--------------------------------|-------------------------------|
| June 2010                        | 71.4°F        | +1.6°F                | 10.38”        | +5.74”                | 33 <sup>rd</sup> Warmest       | 1 <sup>st</sup> Wettest       |
| July 2010                        | 75.3°F        | +1.5°F                | 7.93”         | +3.68”                | 45 <sup>th</sup> Warmest       | 5 <sup>th</sup> Wettest       |
| August 2010                      | 75.2°F        | +3.9°F                | 4.92”         | +0.73”                | 16 <sup>th</sup> Warmest       | 29 <sup>th</sup> Wettest      |
| <b>Summer 2010 (June—August)</b> | <b>74.0°F</b> | <b>+2.4°F</b>         | <b>23.23”</b> | <b>+10.15”</b>        | <b>19<sup>th</sup> Warmest</b> | <b>2<sup>nd</sup> Wettest</b> |
| September 2010                   | 63.5°F        | +0.6°F                | 5.54”         | +2.13”                | 68 <sup>th</sup> Coolest       | 19 <sup>th</sup> Wettest      |

Rankings are based upon 138 years of records. All values are preliminary.

- **Fun Fact:** During what is now called the “Super Outbreak” which occurred April 3-4, 1974, 148 tornadoes occurred in a span of 16 hours. Tornadoes affected 13 US states and Ontario Canada. The storms produced 24 F4 and 6 F5 tornadoes. 6 F5 tornadoes is more than have been reported in any other year. There were also more significant tornadoes than any other week on record.

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## Upcoming Events for the National Weather Service

### 2010 SKYWARN™ Recognition Day

<http://www.wrh.noaa.gov/mtr/hamradio/>



## Spring Flood Outlook *By Jeff Zogg—Senior Hydrologist*

With all the flooding that occurred this summer, it may be difficult to think that the annual spring flood outlooks are not that far away. The National Weather Service in Des Moines will issue at least two spring flood outlooks in early 2011. We may issue additional outlooks depending on the situation and flood threat. Below are the dates of our scheduled outlooks. Please note that we will issue both outlooks on Thursdays. In past years we issued them on Fridays. We decided to issue our outlooks on Thursdays to give our partners and users more time to look through the outlooks and ask questions before the subsequent weekend.

- ◆ Thursday, February 17, 2011.
- ◆ Thursday, March 3, 2011.

At this time it is difficult to provide a substantive spring flood outlook with confidence. This is due in part to the official NOAA winter outlook, which indicates equal chances of experiencing above, normal or below normal conditions for both temperature and precipitation. Thus there is no strong indication of temperature or precipitation tendency. We will continue monitoring river and weather conditions this winter.