The Weather Whisper

Cover photo by Kevin Skow

Winter Hazard Simplification Coming this Winter

Mindy Beerends, Senior Meteorologist

The National Weather Service will be simplifying the current winter hazard headline products for the upcoming winter season. This will involve the current watch, warning and advisory products issued by the National Weather Service in regards to hazardous winter weather systems. The changes are being implemented to make sure our messaging regarding hazardous winter weather headlines is as clear and focused as possible. The same information regarding winter weather hazards will remain; it will just be delivered in a simpler package with no impacts to service anticipated. These changes are in effect as of October 2nd, 2017. Additional changes to flooding products are expected in the Spring of 2018.

There are two components involved in the simplification project.

The first component will be to consolidate some of the winter weather headline products. This means that for the upcoming winter season, the Freezing Rain Advisory will now be consolidated into the existing Winter Weather Advisory, and the Blizzard Watch consolidated into the existing Winter Storm Watch. Therefore the Freezing Rain Advisory and Blizzard Watch will no longer be issued, with them being encompassed by the existing Winter Weather Advisory and Winter Storm Watch headlines respectively. Specific information regarding these two types of weather hazards will be found in the "what" section of the existing winter weather products.

The second component of the simplification project is to reformat the existing products to create a more clear and organized look and feel to the headline products. This will allow for critical decision-making information to be more readily available and easier to find within the product. All winter headline products will be reformatted into a "What, Where, When, Additional Details, and Precautionary / Preparedness Actions" format.

If you would like to find out more information regarding the project, please visit weather.gov/hazardsimplification.

Summary of Changes for Winter Weather Products for Iowa.
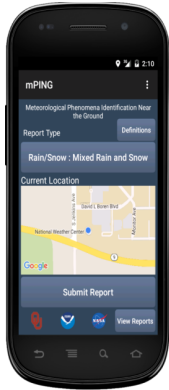
mPING—Crowdsourcing Weather Reports

Brad Small, Senior Meteorologists

Whether they are doing research or operational forecasting, meteorologists love data and the more the better. The NOAA National Severe Storms Laboratory (NSSL) is collecting public weather reports through a free app available for smart phones, tablets and mobile devices. The app is called 'mPING', for **Meteorological Phenomena Identification Near the Ground.** These anonymous reports collected from citizen scientists are immediately archived into a database at NSSL and displayed on a map accessible to the public. Weather radars cannot "see" what is occurring at the ground, so mPING reports are used to calibrate new radar algorithms, forecasting technologies and techniques.

Meteorologists also use information received via the app to improve forecasts and issue better warnings and advisories. Spotters can provide beneficial, detailed information during cool and warm seasons with real-time reporting of the following phenomena.

⇒ **Drizzle**
⇒ **Freezing Drizzle**
⇒ **Rain**
⇒ **Freezing Rain**
⇒ **Sleet**
⇒ **Snow**
⇒ **Rain/Snow Mix**
⇒ **Rain and Sleet Mix**
⇒ **Sleet and Snow Mix**
⇒ **Hail (including size)**
⇒ **Wind Damage**
⇒ **Tornado**
⇒ **Floods**
⇒ **Dense Fog**

These reports are alerted at forecasters' workstations and can be readily plotted on maps compared to current radar data. The application automatically records the time and location of the event, creating an efficient and streamlined way to submit reports versus phone calls or emails. This information helps meteorologists better ascertain where the transition from rain to snow is occurring, what storms are producing hail and what size, and whether wind damage is occurring, just to name a few things. All spotters and anyone interested in the weather are encouraged to download the app and contribute reports.

Free and available on the App Store or Google Play

"This app is called 'mPING', for Meteorological Phenomena Identification Near the Ground."

NWS Des Moines Hosts Open House

Mindy Beerends, Senior Meteorologist

Brad Small, Senior Meteorologist demonstrating AWIPS and answering questions.

The National Weather Service (NWS) office in Des Moines (DMX) hosted a public open house on Saturday, September 16th. Over 400 people from the area visited the office during the event. The event aimed to highlight both NWS DMX products and services, but also showcase several partners that work closely with the office. The partners hosted informational booths and some also provided hands-on activities for children. The partners involved were the Polk County Amateur Radio Emergency Services, Iowa State Climatologist, US Army Corps of Engineers from Saylorville Lake, Iowa Environmental Mesonet, Iowa State University Student Chapter of the American Meteorological Society, and the Iowa State University 4-H Extension and Outreach office. Unfortunately several close partners had to back out at the last moment due to deployments to help with both Hurricane Harvey and Irma. Several NWS DMX staff members prepared posters of past events, informational graphics and demonstrations of AWIPS, WarnGen and GOES-16 for the event along with staffing tour locations throughout the office and answering attendee questions.

# GOES-16 Training Comes to NWS Des Moines

Andrew Ansorge, Meteorologist

Our office hosted Dr. Chad Gravelle, GOES-R Satellite Liaison from the National Weather Service (NWS) Operations Proving Ground, on July 31 and August 1, 2017 to provide a GOES-16 applications training session for its staff and an introduction to GOES-16 for broadcast meteorologists. The training was organized by General Forecaster Andrew Ansorge and Science and Operations Officer Mike Fowle who have experienced GOES-16 training sessions given by Chad where he focused on applying the satellite imagery into NWS forecast operations.

The training for the staff included a discussion of current GOES-16 data quality, understanding how NWS Forecast Offices request Mesoscale Domain Sectors (MDS), and a convective case that highlighted the importance of 1-minute resolution satellite imagery for convective warning operations. As Chad walked through the convection case from a developing cumulus field to convective initiation to severe thunderstorms, he queried the staff asking for their observations while sharing his insights on integrating the imagery into warning decision making. Kenny Podrazik, meteorologist at the office, said he found the training "extremely helpful in understanding the potential uses in severe weather operations as well as how to request a MDS for our forecast area." A candid discussion rounded out the session on how to incorporate GOES-16 data effectively into warning operations where warning forecasters already are interrogating numerous high spatial and high temporal datasets.

The following day, broadcast meteorologists from Des Moines and Cedar Rapids visited the office to learn about GOES-16. Chad provided an overview of the satellite which included discussion of the increased spectral, spatial, and temporal capabilities of GOES-16, and concluded with applying the imagery for a convection and fog and low stratus case. A discussion of online resources to view GOES-16 imagery occurred and reference documents were shared. Amber Alexander, meteorologist at WHO-TV in Des Moines said, "Dr. Gravelle's training gave a deeper insight to some of the data we will be able to access with GOES-16. I think many of these things will be helpful when it comes to severe weather. Specifically, I believe the GLM (Geostationary Lightning Mapper) will help show viewers how lightning can occur miles away from the center of the thunderstorm which will hopefully educate them on lightning safety." And Justin Gehrts, meteorologist with KCRG-TV in Cedar Rapids said, "It's hard to imagine all the ways that the new data from GOES-16 will help us give better information to our viewers, and Chad's training was a helpful start. Since we're in a visual medium, GOES-16's high resolution is exciting to us from both a data standpoint and a "people will think this looks cool" standpoint."

Training was a success for both office meteorologists and broadcast meteorologists with a deeper understanding of using of GOES-16 in real-time operations.
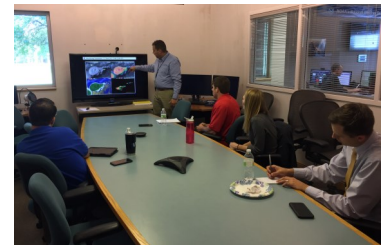
Top Photo: Dr. Chad Gravelle, center background, discussing GOES-16 convective initiation with NWS Des Moines meteorologists.

Bottom Photo: Broadcast meteorologists take notes and look on as Dr. Chad Gravelle points out cloud-top features in GOES-16 imagery.

"I believe the GLM (Geostationary Lightning Mapper) will help show viewers how lightning can occur miles away from the center of the thunderstorm which will hopefully educate them on lightning safety."

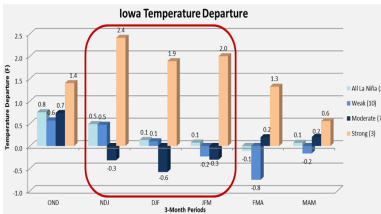## Iowa Winter Outlook, *Allan Curtis, Meteorologist Intern*

Image 1: *Iowa Temperature Departures for Various La Niña Events. Click image to enlarge.*
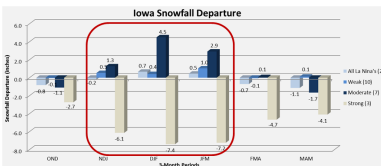

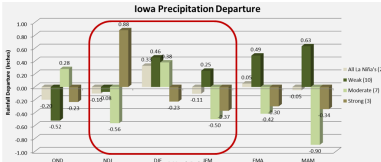**Image 2:** *Iowa Snowfall Departures for Various La Niña Events. Click image to enlarge.*

Image 3: *Iowa Precipitation Departures for Various La Niña Events. Click image to enlarge.*

"Iowa often finds itself in a transition zone in the winter where a shift in a ridge or a trough by just a hundred miles or less can greatly affect whether temperatures will be well above or below normal and related, whether rain or snow will fall."

It may be a different year, but it's basically the same story as last winter. Much of the talk heading into this fall and winter was the possibility (if not probability) of La Niña emerging and settling in for winter and into the spring. Now we will get to what that means for Iowa and the region in general, but first let's have a quick refresher on what El Niño and La Niña are.

El Niño or La Niña are phenomena along the equatorial Pacific Ocean. An El Niño event is characterized by anomalously warm sea surface temperatures that propagate eastward towards the South American coast. Conversely, a La Niña event is characterized by anomalously cool sea surface temperatures off the coast of South America that propagate into the central Pacific Ocean. The oscillation between the two is called the El Niño-Southern Oscillation (ENSO). For an event to be categorized as an El Niño or La Niña, the Oceanic Niño Index (ONI) is used. The ONI is a measure of above and below normal sea surface temperatures within a specific region of the equatorial Pacific. Anomalous values of 0.5 C or greater for 5 consecutive over-lapping seasons would be an El Niño. Conversely, values of -0.5 C or less for 5 consecutive over-lapping seasons would be a La Niña. In between 0.5 C and -0.5 C or for periods that do not meet the 5 consecutive over-lapping seasons, would be categorized as a neutral event.

What do Pacific Ocean sea surface temperatures have to do with weather in the in the United States, let alone Iowa or anywhere many miles away from the equatorial Pacific Ocean? Good question. The atmosphere is constantly in flux, responding to various inputs such as El Niño or La Niña in an attempt to

reach equilibrium. Phenomena that last long periods of time and occur regularly can affect atmospheric conditions in ways that lead to tendencies in other areas, known as teleconnections. A number of phenomena across the globe have been researched and found to correlate to weather patterns in other locations across the globe, and El Niño and La Niña are probably the most researched and well known teleconnections. We'll proceed to take a look at the tendencies in Iowa during La Niña conditions and how they compare to the current winter outlooks from the Climate Prediction Center.

For more detailed information about El Niño and La Niña, atmospheric conditions, thresholds, U.S. impacts, global impacts, and more, check out:

www.climate.gov/enso

For more detailed information about the Oceanic Niño Index, check out:

www.cpc.noaa.gov/products/
analysis_monitoring/ensostuff/
ensoyears.shtml

Winter

Iowa often finds itself in a transition zone in the winter where a shift in a ridge or a trough by just a hundred miles or less can greatly affect whether temperatures will be well above or below normal and related, whether rain or snow will fall. Take for example a weak disturbance moving through the atmosphere. It could be drowned out or amplified by any number of other disturbances or phenomena before it gets to Iowa. Would the original weak disturbance have an effect on the end result? Of course, but it makes it much more diffi-

Iowa Winter Outlook, *Allan Curtis, Meteorologist Intern*

(Continued from page 4)

cult at times to figure out its effect. Now if the original disturbance was large or strong, other disturbances and phenomena would likely have a harder time drowning out the original disturbance and result in an easier to define effect.

The example of a weak versus strong disturbance tends to be the case across Iowa during La Niña events. Weak to moderate events tend to be closer to normal than strong events. Looking at temperatures **(Image 1: Iowa Temperature Departures for Various La Niña Events)** and snowfall **(Image 2: Iowa Snowfall Departures for Various La Niña Events)**, the differences between the weak/moderate and strong categories is quickly evident. With large departures in the warm direction during strong La Niña events, you get a corresponding reduction in snowfall. On the total precipitation side **(Image 3: Iowa Precipitation Departures for Various La Niña Events)**, there is not as strong or clear of a departure, though strong La Niña events have all shown a reduction in precipitation. In all cases, temperatures, precipitation, and snowfall, it is also difficult to draw statistically significant conclusions considering that only 20 La Niña events are included, with a distribution of 10 weak, 7 moderate, and only 3 strong.

Before taking a look at the official Climate Prediction Center (CPC) Winter Outlook, let's take a look at the ENSO forecast. Is a weak, moderate, or strong La Niña forecast? Based on the North American Multi-Model Ensemble (NMME) from the CPC **(Image 4: NMME ENSO Forecast)**, there is a high likelihood of a La Niña event devel-

oping. The majority of model members favor a weak to moderate event, with the ensemble mean depicting a weak event.

Now, finally, on to the CPC Winter Outlook! But first, thinking about what was mentioned above and knowing that a weak to moderate La Niña is most likely, what might be your guess for Iowa? Recall there was not a large departure from normal for any of temperature, precipitation, or snowfall for Iowa during weak or moderate La Niña events. So a near equal chances outlook or only slight tendencies one way or another would probably be our initial guess devoid of any other strong indicator besides La Niña, right? That would be correct, at least in this case. The CPC Winter Outlook for temperature **(Image 5: Climate Prediction Center Three-Month Temperature Outlook for DJF)** and precipitation **(Image 6: Climate Prediction Center Three-Month Precipitation Outlook for DJF)** both hedge towards equal chances for above, near, or below normal values. There is a slight tendency towards above normal precipitation across the eastern half of the state, but only slight. Regardless of what the winter as a whole ends up being like, make sure to pay attention to forecasts throughout the winter as a seasonal forecast says nothing with regards to the magnitude or severity of individual events. Until next time.
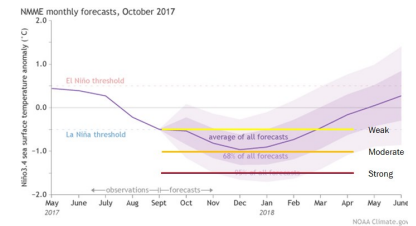

Image 4: *North American Multi-Model Ensemble (NMME) El Niño-Southern Oscillation (ENSO) Forecast. Click image to enlarge.*
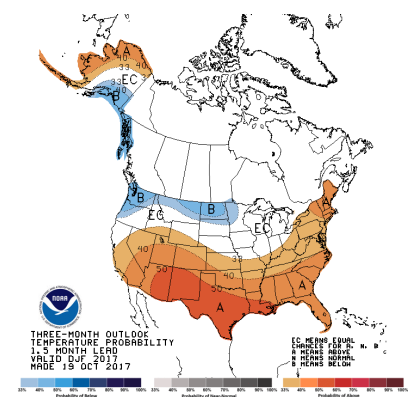

Image 5: *Climate Prediction Center Three-Month Temperature Outlook for DJF. Click image to enlarge.*
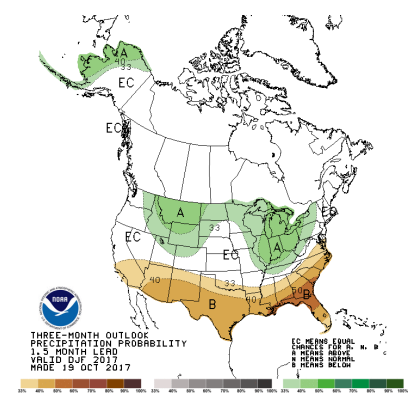

Image 6: *Climate Prediction Center Three-Month Precipitation Outlook for DJF. Click image to enlarge.*

June 28, 2017: Tornadoes Sweep Across South-Central Iowa

Cory Martin, Meteorologist Intern

Tornado near Stuart shortly after 4 p.m. CDT on June 28, 2017. Photo by Robert Kempf.

An active day of severe weather unfolded across the state on June 28th as numerous thunderstorms produced large hail, damaging winds, and several tornadoes. A total of 13 tornado warnings and 21 severe thunderstorm warnings were issued by NWS Des Moines by the end of the evening. Four of the tornado warnings were issued within a 20 minute stretch as thunderstorms rapidly developed over south central Iowa shortly after 4 PM.

Damage surveys and reports from local officials confirmed 5 tornadoes over south central Iowa. The first tornado of the day developed near Stuart during the late afternoon hours. Numerous storm spotters in the area documented the photogenic storm as it moved over mainly rural parts of Adair and Madison counties. A tornado warning was issued for the western part of the Des Moines metro as the storm approached from the west, but fortunately the tornado lifted as it passed south of Dexter. The storm reorganized again as it moved southeast of Des Moines, eventually spawning another tornado that produced EF-1 damage as it tracked east for 17 miles between Pleasantville and Knoxville in Marion County.

Another tornado was confirmed in Taylor County near Bedford shortly after 5 PM. Damage was reported to several homes and outbuildings. A damage survey the following day estimated peak winds speeds of around 110 mph (EF-1 strength). Several other tornadoes were confirmed in east central Iowa in the NWS Quad Cities service area that evening, including an EF-2 tornado that impacted the town of Central City. A total of 13 tornadoes were confirmed across the state that evening. This severe weather outbreak currently stands as the 2nd most active tornado day for the state of Iowa in 2017, trailing only the 18 tornadoes seen on March 6th.
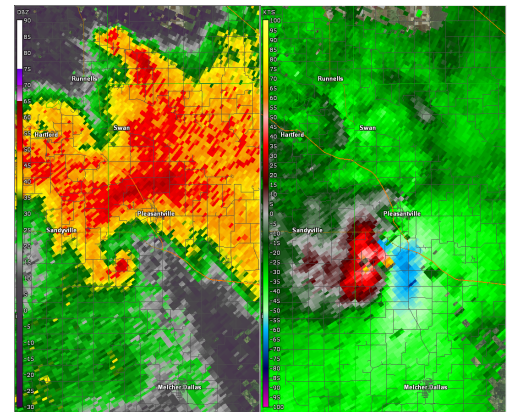
Radar reflectivity (left) and storm-relative velocity (right) show a strong tornadic circulation just south of Pleasantville (Marion County). Click image to enlarge.

Latest Cooperative Observer Awards, *Brad Fillbach, Observations Program Leader*

David Harner (left) of Swea City, Iowa receives his 15-year Length of Service Award.

Grace Barter (centerright) of Kesley, Iowa receives her 25-year Length of Service Award.

Employee Spotlight—Brooke Hagenhoff, *Meteorologist Intern*

I was born and raised in Jefferson City, Missouri and graduated with a B.S. in Meteorology from the University of Oklahoma in 2015. While the weather was always something I was interested in, at OU I absolutely fell in love with the field, thanks in part to opportunities to participate in research projects and outreach opportunities during my time there. Some of my research there was done in partnership with scientists at the Storm Prediction Center and National Severe Storms Lab, and I also had the incredible opportunity to spend a summer in Washington, D. C. interning at the Environmental Modeling Center.

From there I went on to the University of North Dakota to pursue a master's degree in Atmospheric Science, finishing up in August of 2017. My thesis work focused on understanding different scenarios when a forecast model may produce an error, which then helps the meteorologist anticipate those errors and adjust their own forecast.

Outside of work and research, I love spending time outside on long runs, reading, or paddle boarding. Living in such different areas of the country has given me a huge appreciation for weather - in all of its forms. I'm excited to return to the heartland and cannot wait to begin my career with the National Weather Service in Des Moines.

"I'm excited to return to the heartland and cannot wait to begin my career with the National Weather Service."

Employee Spotlight—Alex Krull, *Meteorologist Intern*

Hello! My name is Alex Krull, and I am one of two new meteorologists here at the Des Moines Weather Forecast Office. I moved here in the begging of September from Lincoln, Nebraska, where I have been working toward my Master's Degree in meteorology. I completed my Bachelor of Science in Meteorology at Valparaiso University, which is in northwest Indiana.

My first trip through Iowa was in the Summer of 2014 with the Valparaiso University Storm Intercept Team, where I experienced some of the highest dewpoints at that point in time. This particular trip, we did not see any storms in Iowa, but I knew at some point I would be back.

During my time at Valparaiso, I had the opportunity to serve as a student volunteer at the Chicago NWS office. After my time as a student volunteer, I knew I wanted to join the National Weather Service. My next step after Valparaiso was University of Nebraska - Lincoln participating in research on thunderstorm initiation processes. While at Nebraska, I had the opportunity to participate in field work for STORM, CLOUD-MAP, and RiVors. Our main task was to use unmanned aircraft systems to gather upper-air observations in supercell thunderstorm environments throughout the Great Plains and Midwest.

I am excited to be here in Des Moines, IA working at the National Weather Service. With my time at Valparaiso and University of Nebraska - Lincoln, I am ready to take on the challenges of Spring and Summer thunderstorms, as well as the cold and snowy winters. After just driving through Iowa over the last 3 years, I look forward to getting to know the area better.
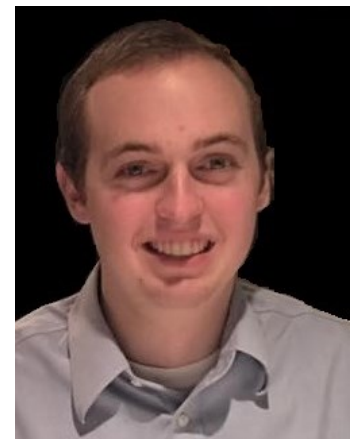
"After my time as a student volunteer, I knew I wanted to join the National Weather Service."

Fire Weather Update, *Frank Boksa, Meteorologist*
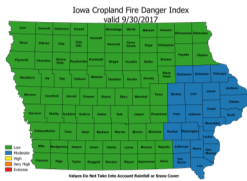
Example of the Iowa Cropland Fire Danger Index available: www.weather.gov/dmx/fire

"If a Fire Weather Watch or Red Flag Warning is in place for your area, please refrain from activity that could easily start or spread a fire until conditions subside either through lower wind speeds or higher relative humidity."

The fall fire weather season began September 1st and will run through mid to late November, dependent of course, on fuel condition. During the fall fire weather season, fire weather planning forecasts will be issued twice daily, by 6 AM and 4 PM. While harvesting is occurring, we will be issuing a CuringAg map that will give farmers an idea of the threat of fire spread on a given day. This is in addition to a Grassland Fire Danger Index map that is issued daily from Spring through Fall.

It has been an interesting fall. We started late summer into early fall with drought conditions across much of southern Iowa while northern Iowa had more than adequate rainfall. As a result, fuels as well as crops across southern Iowa are stressed. However late season rainfall came and relieved some of the stress from the drought. I drove around some of the drought impacted areas of southern Iowa right after the rainfall and it was quite surprising to see how warm season grasses had "perked up" and even greened up from the rainfall. As we head into late fall, drought conditions still exist but warm season grass curing was slowed by the rainfall and as such we will see a later dry down of fuels.

Harvesting of crops is always a bigger threat in the early to mid-fall season as often times a higher priority is placed on harvesting than safety. Please remember to check your local public and fire weather planning forecasts as well as the CuringAg map to get an idea of the fire threat from crops and what the wind and relative humidity is forecast to be. If a Fire Weather Watch or Red Flag Warning is in place for your area, please refrain from activity that could easily start or spread a fire until conditions subside either through lower wind speeds or higher relative humidity.

The National Weather Service is moving forward with the revision of the GFDI categories. The range values of the categories have been adjusted to better fit the conditions of the Midwest. Although we had few opportunities in the spring to test these values, the fall may provide some better opportunities. In other news, the new spot request page has worked well in the spring though those agencies that can request a spot forecast are reminded to pay close attention to your request and ignition times. Advances in the method of issuing these forecasts have improved the turnaround time to receive them but numerous requests that come in at once may still slow the process some.

To view the fire weather forecasts, fire weather planning tools and the 2017 Annual Operating, please visit the National Weather Service website at: www.crh.noaa.gov/dmx/firewx.php

Latest Cooperative Observer Awards, *Brad Fillbach, Observations Program Leader*

The Staff at the Iowa Falls Water Pollution Control Plant is receiving their 25 year Length of Service.
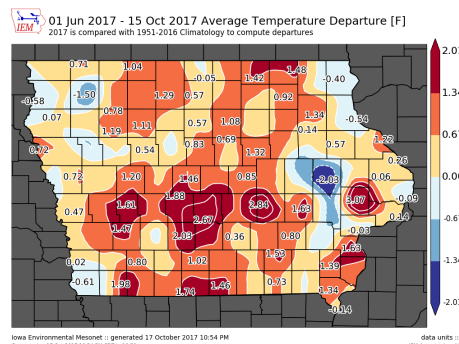
Summer and Early Fall Weather Review, *Craig Cogil, Senior Meteorologist*
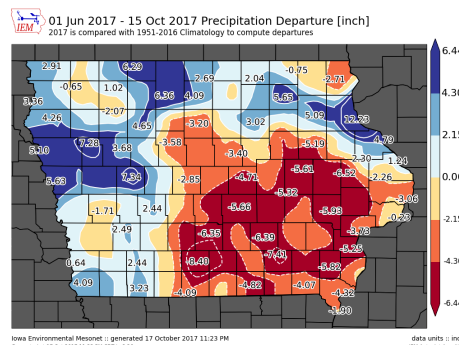
Temperatures

Temperatures during the summer to early fall where warmer than normal for much of the time. June into much of July was mostly above normal with a few periods of hot weather. In particular, temperatures around the 20th of July saw readings reach 100 degrees in a few locations including Ottumwa and Des Moines. However, the heat broke by late July with readings much below normal throughout the state during the month August. The cool readings in August were enough to cancel out the heat of June and July producing a near normal temperature for the summer season (June-August). September saw a return to above normal readings statewide with these warmer readings continuing into October.

The June 1st to October 15th temperature departure in Iowa. Other than a very cool August, temperatures have been mostly above normal across the state. Click image to enlarge.

Precipitation

It was feast or famine with rainfall across the state this past summer with some locations receiving adequate precipitation while other saw record low values. Locations primarily across northern Iowa saw periodic rainfall with a few heavy rainfall events in June. However, farther south, rainfall became much more spotty and light with large swaths of central and southern Iowa having rainfall deficits of 6 to 10 inches by late August. This produced severe to extreme drought conditions in south central to southeast Iowa by mid to late summer and ruined crops in some instances. There was some relief by later September into October as rainfall returned across much of the state, although much too late to help crop that had already matured.

The June 1st to October 15th rainfall departures – much of the southeast third of the state was well below normal. Click image to enlarge.

Month	Average Temperature	Departure from Normal	Rainfall	Departure from Normal	Temperature Ranking	Precipitation Ranking
June	71.2°F	+1.5°F	3.53"	-1.49"	23rd Warmest	37th Driest
July	74.9°F	+1.3°F	3.19"	-1.31"	44th Warmest	51st Driest
August	68.0°F	-3.5°F	3.94"	-0.26"	15th Coolest	61st Wettest
September	66.8°F	+3.6°F	2.33"	-1.05"	15th Warmest	45th Driest
Summer (JJA)	71.4°F	-0.2°F	10.66"	-3.05"	72nd Warmest	38th Driest

Rankings are base upon 145 years of statewide climate records. All values are preliminary.

Weather.gov/desmoines

Winter Weather Awareness Day is Thursday November 9, 2017

NWS Des Moines Provides IDSS to Iowa State University,

Andrew Ansorge, Meteorologist

The National Weather Service Des Moines office provided remote and on-site weather support to Iowa State University (ISU) and Story County Emergency Management in support of public safety for the Texas vs. Iowa State football game on Thursday, September 28. Leading up to the event, Warning Coordination Meteorologist Kelsey Angle and Senior Meteorologist Mindy Beerends provided email weather briefings for inclusion in their Event Action Plan.

On game day, Kelsey and General Forecaster Andrew Ansorge staffed the ISU Emergency Operations Center (EOC) along with partners from ISU and Story County Emergency Management, Ames Police and Fire, ISU Police, Iowa National Guard's 71st Weapons of Mass Destruction Civil Support Team and the Ames City Manager's office. Discussions were held with the ISU Emergency Director on weather thresholds that could impact public safety and a short weather briefing was given about an hour before the game. A HYSPLIT dispersion model plume was also shown and explained for pre-planning purposes in the event of an incident. Relationships were further strengthened while on-site talking with several partners about the services that are available to them.

NWS Des Moines meteorologists will have additional opportunities to exercise their weather briefing and IDSS skills through the remainder of Iowa State home football games.
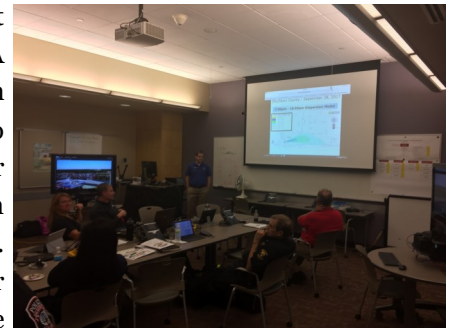
Andrew Ansorge provides a weather briefing to ISU EOC staff. (Photo Credit: Michael Newton)