High Plains Wind

(Weather Information News Data)

March 10, 2014
Volume 8 Issue 1

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Photo Courtesy of
Elizabeth Lundquist, Goodland, KS

A Message from the Meteorologist-in-Charge

Spring & Summer Preparations

By Scott A. Mentzer

I realize that March and April are normally snowy months across the Tri-State area, but spring is approaching (I promise). The National Weather Service in Goodland is beginning to transition from winter operations to spring and summer operations. Here are just a few of the items our office is doing to prepare for the upcoming severe weather season.

- The annual severe weather spotter training for the public is occurring. Our office will visit all 19 counties it serves to provide basic cloud identification training to help us during severe weather. I cannot stress enough how valuable the information is from storm spotters during severe weather operations.

- Weather safety presentations will be conducted for elementary and middle school students.

- Meteorologists will undergo annual radar refresher training to ensure that interpretive skills using the radar remain sharp. This includes revisiting past thunderstorm cases from a radar perspective.

- The hydrologist who serves western Kansas will visit in the spring to provide flash flood forecasting training to our meteorologists.

- Staff schedules will be adjusted to provide more staffing during the afternoons and evenings, the normal times when severe weather is the most active.

So, the NWS is gearing-up for the 2014 storm season. You should take some time to develop a safety plan for yourself and your family. Be safe this storm season!

NWS Partners Meeting

By Joseph Moore

Photo of Randy Bowers giving a presentation at the Partners Meeting

On Wednesday, February 19, NWS Goodland hosted a meeting of over 40 partners from our local communities to discuss our performance during recent weather events, receive feedback on the products and services we provide, and listen to comments and concerns. Participants included Emergency Managers, local media, law enforcement, school officials, and more.

Meteorologist-In-Charge Scott Mentzer began the meeting with a few video clips about recent weather events from across the country. One of the clips was a news report of the impacts from a recent winter weather event in Georgia. Snow caused highways around Atlanta to come to a standstill and thousands of people became stranded despite only a few inches of snowfall. Another clip was from a late-night talk show which showed how local newscasters in Los Angeles covered rain – a rare event – almost to the degree that our local newscasters might cover a severe weather outbreak. Humor aside, Scott showcased how a high-impact event does not just depend on weather conditions, but also how people react to such conditions.

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Warning Coordination Meteorologist, WCM, Dave Floyd led a discussion of the January 16, 2014, High Wind/Dust Storm event and asked if there was anything else we could have done to get the word out more effectively. We discussed conference calls that our office holds for partners during high-impact weather events. Our partners were very supportive of our efforts to communicate hazardous weather to them and appreciated the work done by our office.

Dave also discussed the current state of the Wireless Emergency Alerts (WEA). Through a partnership between cell phone providers and federal agencies, certain weather warnings and other alerts are sent directly to capable phones. Anyone with a capable phone (generally, any phone sold in the last year or so as well as almost every new phone) will receive the alerts with no sign-up required. Nearly every cell provider is utilizing the storm-based warnings that our office issues, so only people within the warning are alerted instead of the entire county.

Meteorologist Randy Bowers gave a presentation on *NWSChat*, an internal chat service which allows our partners to chat directly with meteorologists at our office. While the service has been around for a few years, there were still many of our partners that did not know about the service or had not yet signed up. Randy gave examples from past events of how the service has been utilized, such as Emergency Managers asking for details or clarification of our forecast.

Meteorologist Joe Moore discussed social media with partners at the meeting, including an overview about how our office is using social media as well as how we can work together on social media. Strengths and weaknesses of different social media networks were discussed, including how messages can spread "virally." The response to social media was generally positive, with a number of participants discussing how it has become an effective tool to disseminate information in their communities.

The meeting was a success overall, with partners showing interest in some new ideas proposed by our office as well as providing valuable feedback for products and services we already provide. We appreciate all who were able to attend and look forward to continue serving the tri-state area with products and services to achieve our mission to protect life and property.

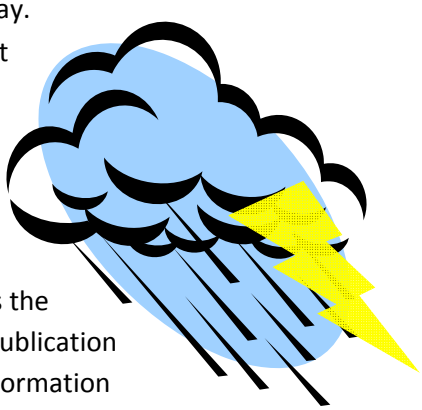
Dave Floyd, WCM, discusses WEA broadcasts with the partner group

Does My Severe Weather Report Matter? What Should I report?

By Jesse Lundquist

In short, yes your severe weather report is **very** important to us. The following is a reminder of why your report is so important:

- Our radar **can't** determine if a tornado is occurring, or what size hail is falling. We need spotters to confirm what we are seeing on radar.
- Our primary mission is to protect lives and property. Without your report we may not know what hazards a particular storm is producing; so we need your report to help us fulfill our mission to let other people in the path of the storm know what is coming their way.
- You help us improve our warning and forecasting skills. Your report gives us ground truth and helps us assess if our instruments are accurately analyzing a given storm. Your report may be the one we need to help make the decision to warn or not warn on a particular storm. Your report improves the accuracy of our warnings, should one be needed.
- Severe weather reports are published in Storm Data. Storm Data is the official record of severe weather climatology across the U.S. This publication is an invaluable resource for severe weather research and other information related to severe weather such as insurance claims and storm damage.



As you can see from the above list, your report is very valuable to us in many ways. Don't think that someone else will call in a severe weather report. With all the reasons to report severe weather, you may be asking what you should report when storms move over your location, or just need a reminder of what we're looking for. See Mike Kochasic's article on page 6 for a full listing of reports that will help us most.

Even though severe weather reports are important, the top priority is your safety. Delayed reports are still very helpful. Thanks for your help during this coming severe weather season. To report severe weather, call 1-800-272-7811. You can also post a report to our Facebook page.

CoCoRaHS Corner

By David Thede

We need more observers! Watch this video to find out why:

http://youtu.be/pgDkbEDOtHU

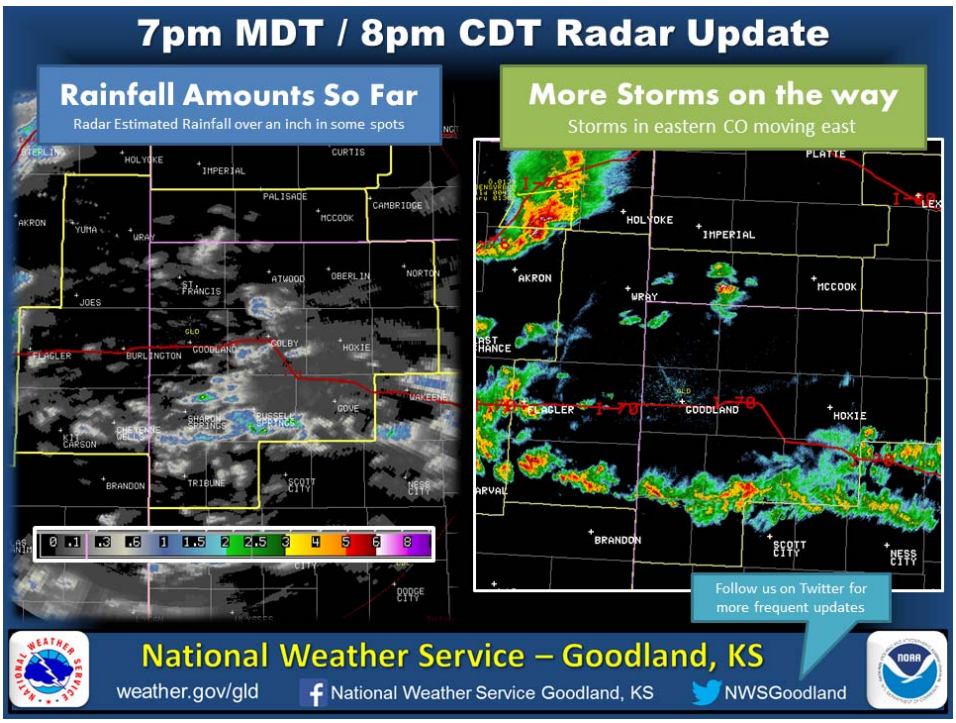
If you would like to volunteer contact the Northwest Kansas/East Central Colorado and Southwest Nebraska CoCoRaHS Coordinator, David Thede of the National Weather Service in Goodland. He can be reached at (785) 899-7119 or at david.thede@noaa.gov. You might be eligible to receive a free rain gauge if you live in a sparsely populated area.

To learn even more visit the website below:

http://www.cocorahs.org/

Reporting Severe Weather to the National Weather Service

By Mike Kochasic



As sunrise occurs a little earlier and sunsets a little later each day, the season of spring is fast approaching. With the onset of spring comes the increased likelihood of severe weather: thunderstorms with strong winds, large hail, or even tornadoes.

When severe weather develops in the tri-state area, meteorologists use all available tools to help decide whether or not a storm is severe. Radar is the main tool used by meteorologists to look at storms, along with satellite and automated weather station observations. While our technology has and continues to improve, it is not perfect. Forecasters at the National Weather Service (NWS) rely heavily on the valuable service provided by the public and weather spotters who tell us what is *actually* happening inside a storm.

Citizens of the Tri-State area can greatly assist the NWS and other public safety officials who make crucial decisions based on storm reports, such as when to issue a new or continue a storm warning, or when to cancel a warning because a storm has weakened. But what kind of information should be reported, and how do you report storm information to the NWS?

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Items that should be reported to the NWS includes storm damage to structures, vehicles, trees, power lines or poles, or any farm equipment or machinery. Flooding is also a good weather event to report to the NWS, especially when it impacts roads, homes, or businesses. Rotation in clouds, such as a rotating wall cloud or funnel cloud is an important feature to report to the NWS, especially when the rotation is persistent and organized. Of course, report *any* tornado to the NWS.

Some more complicated, but extremely valued, reports include strong wind gusts and large hail from severe thunderstorms. Unless you have wind measuring equipment, wind gusts can be hard to estimate. The best way to estimate wind gusts is to look at trees and damage (if any) to buildings and other structures. Figure 1 includes some helpful information developed by the NWS in Norman, OK when estimating strong wind gusts. When a strong thunderstorm moves through your area, take note of how the trees (if any) are behaving or if there is any structural damage.

General Guidelines for Estimating Wind Speeds

30-44 mph (26-39 kt)	Whole trees in motion. Inconvenient walking into the wind. Light-weight loose objects (e.g., lawn furniture) tossed or toppled.
45-57 mph (39-49 kt)	Large trees bend; twigs, small limbs break and a few larger dead or weak branches may break. Old/weak structures (e.g., sheds, barns) may sustain minor damage (roof, doors). Buildings partially under construction may be damaged. A few loose shingles removed from houses.
58-74 mph (50-64 kt)	Large limbs break; shallow rooted trees pushed over. Semi-trucks overturned. More significant damage to old/weak structures. Shingles, awnings removed from houses; damage to chimneys and antennas.
75-89 mph (65-77 kt)	Widespread damage to trees with large limbs down or trees broken/uprooted. Mobile homes may be pushed off foundation or overturned. Roof may be partially peeled off industrial/commercial/ warehouse buildings. Some minor roof damage to homes. Weak structures (e.g., farm buildings, airplane hangars) may be severely damaged.
90+ mph (78+ kt)	Many large trees broken and uprooted. Mobile homes damaged. Roofs partially peeled off homes and buildings. Moving automobiles pushed off the road. Barns, sheds demolished.

Figure 1. Guidelines for estimating wind speeds during storm (NWS Norman, OK).

Another tricky storm report that is very important to the NWS is hail size. Because most people do not carry a ruler in their back pockets, relating hail size to a coin or other round object is a good method when reporting hail stones. Figure 2, developed from the NWS in Norman, OK, shows some common hail size comparisons and their respective ruler sizes. You may notice that there is not a specified “object” for the half-inch size. Many people like to refer to this as “marble-sized”.

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The trouble is, marbles can vary in size, so mentioning “marble-sized hail” by the observer can sometimes be misleading. Although marbles are commonly about a half-inch, observers can greatly help by being clear and concise by saying the hail size is a half-inch. Another common occurrence in hail-storms is for different hail sizes to occur. Although you can mention the most common hail size, we are most interested in the *largest hail stone* that you had encountered.

Figure 2. Common comparisons of round objects to hail sizes

Severe wind speeds of 58 mph or greater or hail sizes of quarters or larger are considered severe by the NWS. Even if your wind damage or hail sizes do not meet our severe criteria, please tell us anyway. Your report will greatly help us confirm (or deny) what we see (or do not see) on radar.

The NWS is looking for certain information when receiving storm reports. Basically, we would like to know what, where, and when. First, tell us what weather event you are seeing or have seen. Next, tell us where you see or saw the weather event occurring. Specific location is very important, especially if more than one storm is affecting an area. For example, a report stating quarter-sized hail is falling five miles northwest of Hill City, KS, is much better than simply saying that large hail is falling at Hill City. Being specific about the location of the event makes a big difference to us. Third, be sure to mention when you observed the weather event. This can also mean a world of difference to the NWS, especially if more than one storm affects the same area. We want to make sure the correct report gets assigned to the correct storm in order to issue the correct warning(s).

Other important details to report to the NWS include damage, direction of travel, and length of time the event lasted.

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Two of the best ways to communicate your weather report to the NWS include social media and by phone. Reports can be given to the NWS through Facebook (US National Weather Service Goodland Kansas) or through Twitter (@NWSGoodland). Reports can also be given by calling the toll-free number: 1-800-272-7811.

If you call the NWS phone number or send a social media message and do not have all the information mentioned above, do not worry! A friendly staff member at the office will ask you questions and guide you through your storm report. Most storm reports take only a few minutes to complete by phone or social media. We love receiving storm reports from you! But please remember to be safe before reporting any damage or weather information to the NWS. For example, do not go out into a hail storm to pick up stones. This could result in serious injury! Wait until a storm passes, and then investigate and report weather event information to the NWS. We thank you in advance for your help!

Figure 3. An example of a good potential social media report with a picture: "We had baseball sized hail 2 miles south of the city of Wallace at 5:45 p.m."

During the holidays Goodland National Weather Service Employees donated 737 pounds of food to a local food bank! Other offices in the area collected an additional 572 pounds!

Frost and Rime Invade Goodland

By Joe Moore

On the morning of Sunday, February 23, a thick layer of freezing fog greeted the citizens of Goodland, KS. Temperatures remained in the lower 20s during the day as the fog gradually lifted to thick, low stratus clouds. With an abundance of low-level moisture – humidity remained above 95% for most of the day – and cold temperatures, frost began to develop on exposed surfaces such as small tree limbs. Then, on some surfaces, neat ice formations began developing, appearing as needles.

While freezing fog is a pretty normal occurrence, the types of frost formations seen on this day were a little unusual. The ice formations on exposed surfaces, like tree limbs, are fairly normal. Sidewalks and roads were also icy, but this also isn't out of the ordinary. The needle-like ice, however, was a special type of frost known as rime.

Different types of frost can form under the right conditions. Below is a table with a short description of some of the most common types.

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Frost	"Formation of thin ice crystals on the ground or other surfaces in the form of scales, needles, feathers, or fans. Frost develops under conditions similar to dew, except the temperatures of the Earth's surface and earthbound objects falls below 32°F"
Window Frost	"Window frost forms when a pane of glass is exposed to below-freezing temperatures on the outside and moist air on the inside"
Hoar Frost	"**Hoar frost** (also called **radiation frost** or **hoarfrost**) refers to the white ice crystals, loosely deposited on the ground or exposed objects, that form on cold clear nights when heat is lost into the open sky causing objects to become colder than the surrounding air."
Rime	"Rough white ice deposit which forms on vertical surfaces exposed to the wind. It is formed by supercooled water droplets of fog freezing on contact with a surface it drifts past"
Glaze	"Glaze can only form when supercooled rain or drizzle comes into contact with the ground, or non-supercooled liquid may produce glaze if the ground is well below 32°F. Glaze is a clear ice deposit that can be mistaken for a wet surface and can be highly dangerous."

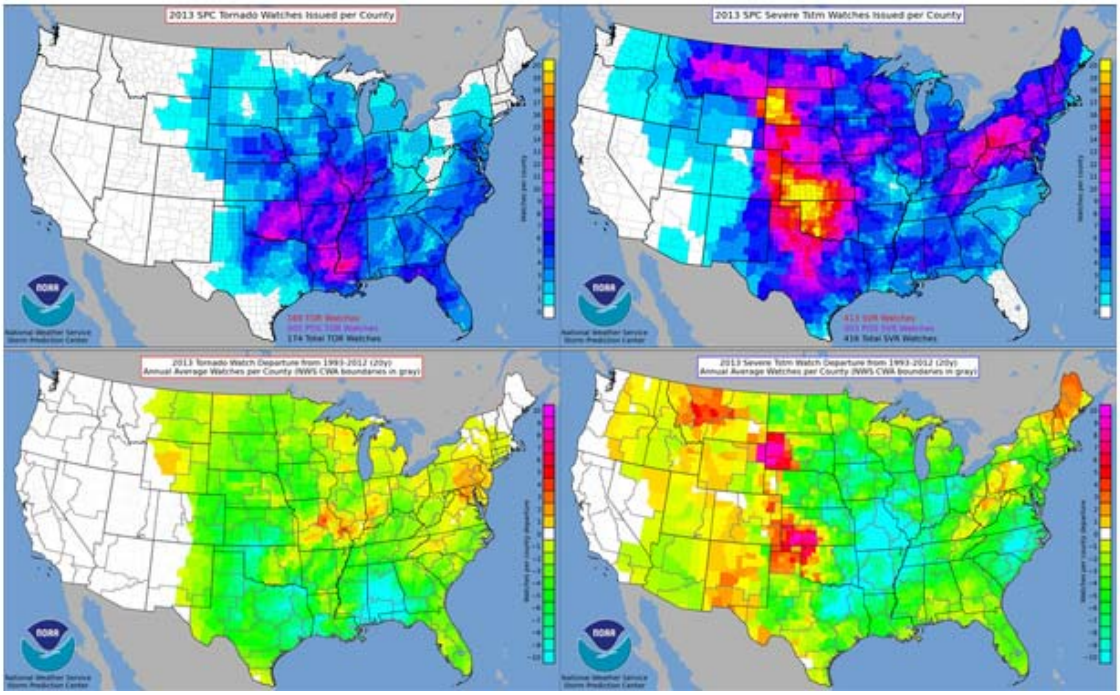
Definitions courtesy NWS Glossary, UK Met Office, Wikipedia

There are a few other types, but the types mentioned above are the most common. On this foggy day, we experienced a mix of rime, glaze, and 'normal' frost. You may have noticed early in the day that ice crystals began to form on thin tree branches. A steady southeast wind of 10 to 15 mph throughout the day continued to bring in moist air, which is why the frost on tree branches and other exposed objects continued to grow larger and more intricate. Glaze began to form on the cold ground – if you happened to be walking outside on the sidewalk or across a roadway you may have slipped on the black ice! Rime formed as well with the steady southeast wind, forming needle-like ice on the wind-facing direction of some objects, such as cars.

Because we remained cloudy for the entire day, we can't technically call the frost that formed hoar frost. These terms are sometimes misused, though, and sometimes rime is called hoar frost in non-technical literature.

Watch vs. Warning: There is a difference!

By Jesse Lundquist



Tornado Watch Frequency **Severe Thunderstorm Watch Frequency**

During the spring and summer these two terms are often heard. Although they sound very similar, they have very different definitions and require a different action from the intended audience.

A watch means that conditions are favorable for severe weather. For example, if a severe thunderstorm watch is issued for a given location, this means the weather environment is more favorable for severe weather than normal. A watch serves as a heads up that severe weather may develop, so be sure to take the appropriate actions to prepare for severe weather in order to be prepared in case a warning is issued. Watches normally last six to eight hours and are issued over a large geographic area, about 30 to 40 counties.

If a warning is issued, it means severe weather is imminent or expected shortly. Warnings are issued when a meteorologist is at least 80% confident a given storm or storms are capable of producing severe weather (hail at least 1” in diameter, 58+ MPH wind gusts, flooding, tornadoes), or if a storm spotter actually reports severe weather. A warning typically will last less than an hour and will cover a small geographic area, such as part of a county. Once a warning is issued for a given location, immediate action needs to be taken by those in the area of the warning to avoid personal injury or damage to property.

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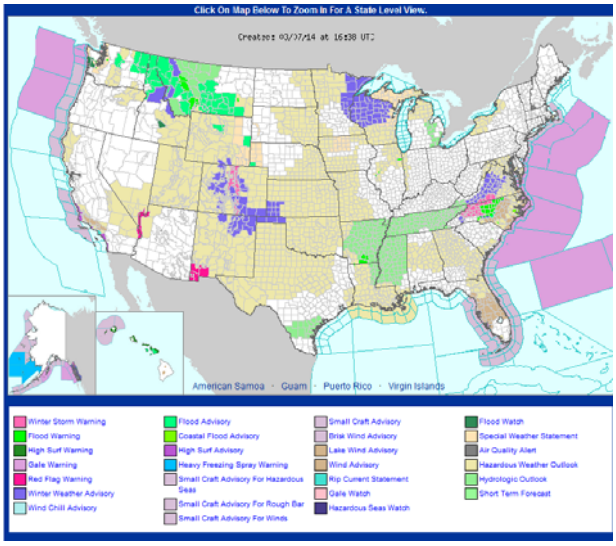
Warnings are not always preceded by watches. During the spring and summer months the best way to remain informed about the weather is to monitor our forecasts during the day. Our office strives to provide the best weather information for the Tri-State area. We continually monitor the weather and update the forecast as needed when we see the weather change from what is in the latest forecast. In addition, hourly weather information is provided through our web page, and can be found toward the bottom of the point-and-click forecast. One of our most popular weather information sources is our daily weather story, which highlights the what, where and when of the more important weather information of the day. The Hazardous Weather Outlook is another great source for the latest weather information; basically a text version of the weather story.

As a final note, our weather office greatly appreciates your weather reports. As mentioned in another article, our radar can't tell us what is going on at ground level. Your reports let us know what is really going on, and sometimes is the exact information we need to issue a warning. Thanks in advance for your help this year and stay safe.



Click on the photo above or go to our website www.weather.gov

for all the latest Watches and Warnings.

There is still time to attend a Spotter Training Class!

Spotter Training Schedule March 2014			
Day	**City, State**	**Time**	**Location**
10	**Hoxie, KS** (Sheridan County)	**6:30pm CDT**	Bowen Scout House - 1041 Sheridan St
11	**Norton, KS** (Norton County)	**6:30pm CDT**	Prairie Land Electric Coop Downstairs - 1101 W Hwy 36
12	**St Francis, KS** (Cheyenne County)	**6:30pm CDT**	High School Cafeteria - 100 S College
13	**McCook, NE** (Red Willow County)	**6:30pm CDT**	Senior Center - 1400 W 5th Street
14	**Sharon Springs, KS** (Wallace County)	**6:30pm MDT**	CAB - Fairgrounds south of town
17	**Tribune, KS** (Greeley County)	**6:30pm MDT**	4H Building - Fairgrounds North Edge of Town
18	**Yuma, CO** (Yuma County)	**6:30pm MDT**	Ambulance Building - 302 E 2nd St
19	**Oberlin, KS** (Decatur County)	**6:30pm CDT**	Gateway Building - 1 Morgan Drive
20	**Oakley, KS** (Logan County)	**6:30pm CDT**	Courthouse Downstairs - 710 W 2nd
24	**Atwood, KS** (Rawlins County)	**6:30pm CDT**	Prairie Developmental Center - 208 S 4th
25	**Trenton, NE** (Hitchcock County)	**6:30pm CDT**	EMS Building 333 Main St
26	**Benkelman, NE** (Dundy County)	**6:30pm MDT**	Dundy County EMS Building - 1305 A Street
27	**Cheyenne Wells, CO** (Cheyenne County)	**6:30pm MDT**	Fire House Hwy 385 and S 1st Street
28	**Colby, KS** (Thomas County)	**6:30pm CDT**	Community Building Downstairs - 285 E 5th

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It's time to begin preparing for the 2014 severe weather season. Here in the Tri-State area, conditions start to become favorable for severe storms by early April. Around that time of year, higher sun angles and longer days begin to warm the lower atmosphere helping to generate atmospheric instability. This, combined with wind shear, helps to create a favorable environment for severe storms capable of producing large hail, damaging winds and tornadoes. The severe weather season in eastern Colorado, northwest Kansas and southwest Nebraska usually winds down by early October.

All NWS offices rely on severe weather reports from storm spotters ... volunteers who make a commitment to observe and relay reports of large hail, damaging wind and tornadoes. Information from spotters is immediately passed along to broadcast media who then inform the public. Reports are also used to enhance the wording in warnings and often help the warning forecaster decide whether or not to issue, continue or cancel a severe thunderstorm or tornado warning.

To help prepare for the upcoming season, the National Weather Service Forecast Office in Goodland, KS is offering storm spotter classes in all 19 counties in the Tri-State area. The first class in 2014 was held Monday, March 3rd in Leoti, Kansas. Classes will continue just about every weekday evening during March and will conclude March 28th in Colby, Kansas. These interesting and informative classes are open to the public and are offered free of charge. If you would like to assist your local community by becoming a volunteer storm spotter, or if you simply want to learn more about severe weather on the High Plains, consider attending one of our classes.

Check out the list above to find a date and location near you. Call 785-899-7119 with any questions about spotter classes, content or locations.

Cooperative Observer News

Nebraska & Colorado Observers Needed!

Observers are needed in both Haigler, Nebraska and Stratton, Colorado. If you are interested in the weather and can report from one of these locations daily via computer or telephone, we need you!

Call 785-899-7119 and ask for Scott Mentzer. He will give you more details on this important work.

Having trouble measuring snow? Check out this handy reference:

http://www.nws.noaa.gov/om/coop/reference/Snow_Measurement_Guidelines.pdf

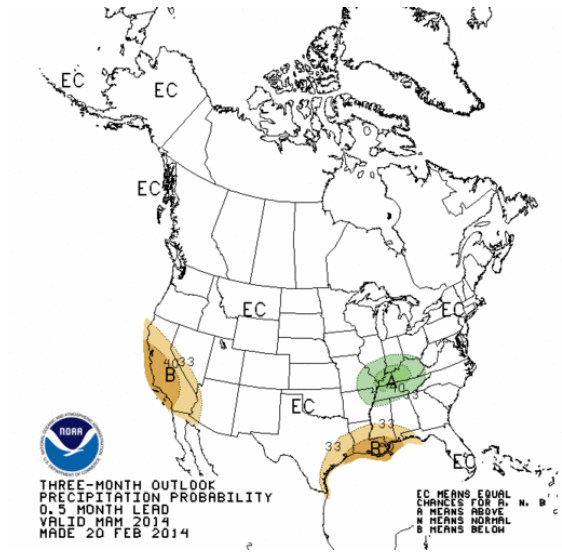
Although it is still too cold now, it won't be long until it will be warm enough to put your funnel back in your eight inch rain gauge. If you have any questions about the process, please give us a call. We are here to help!

Our staff undergoes constant training. One of our Electronic Technicians, Rodney Nelson, recently returned from WSR88D Dual Pol Training in Kansas City.

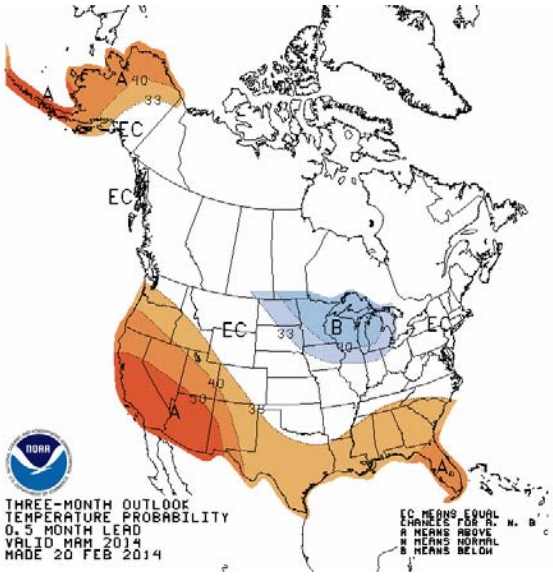
Climate Corner

Current Weather Information for Our Area

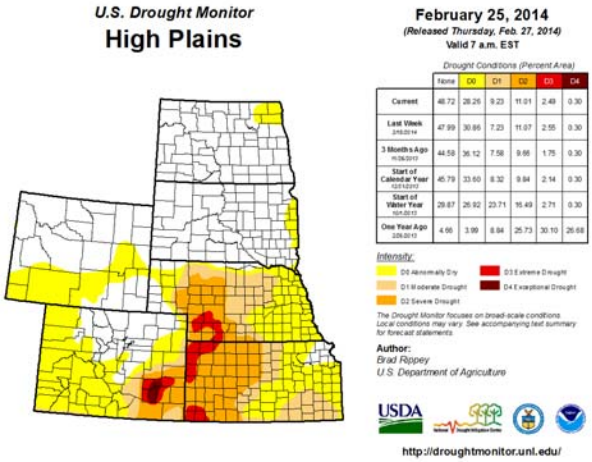
Latest Extended Outlooks



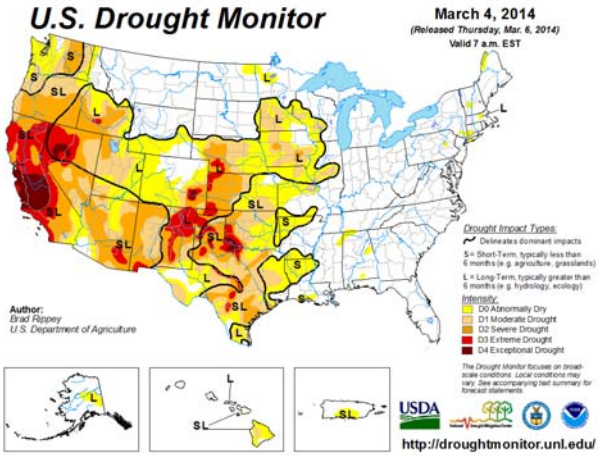
Precipitation Outlook (March - April - May 2014)



Temperature Outlook (March - April - May 2014)



Current Drought Monitor



Drought Outlook

Need more information? Check out the U.S. Drought Monitor website: http://droughtmonitor.unl.edu/

Site	Year-to-Date Precipitation	Departure from Normal
Burlington	0.70	-.21
Goodland	0.97	-.03
Hill City	0.49	-.63
McCook	0.49	-.81

What Is the Climate Outlook for the Upcoming Growing Season?

By Amanda Wertz

It's springtime, which means the growing season will begin in the next few months. Many people may be curious about what this year's growing season will be like in terms of temperature and precipitation. While day to day weather forecasting presents its challenges, there are outlooks which can be very useful for giving a big picture of general trends and what to expect. The National Weather Service Climate Prediction Center has just issued an El Niño Watch starting this summer, but what exactly does this mean for Northwest Kansas, Eastern Colorado, and Southwest Nebraska?

What is an El Niño?

El Niño occurs when the sea surface temperatures experience an increased warming in the Pacific Ocean along the Equator. During an El Niño, the warmer water influences atmospheric circulations, which in turn, causes changes in weather patterns across the United States and other locations across the globe. Here is an example of an El Niño that happened during the winter and early spring of 1998 from the Climate Prediction Center:

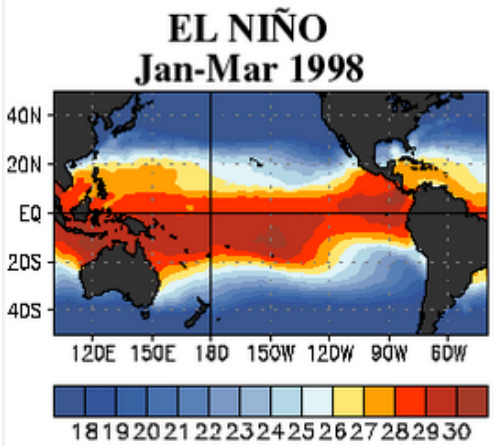


Figure 1. The red depicts the warm sea surface temperatures, while the blue depicts cooler sea surface temperatures.

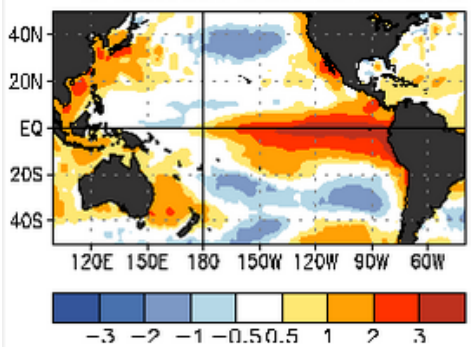


Figure 2. The red indicates where sea surface temperatures are above normal; blue indicates where sea surface temperatures are below normal.

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What is an El Niño Watch?

An El Niño watch is issued when conditions are favorable for the development of El Niño conditions in the next six months. El Niño conditions are defined as: when sea surface temperatures are 0.5 ℃ or more warmer as observed for one month in the Niño region (5 °N to 5 °S latitude and 120 °W to 170 °W longitude) of the Equatorial Pacific Ocean, an expectation that the 3 month Oceanic Niño Index threshold will be met, and an El Niño atmospheric response is observed over the Equatorial Pacific Ocean.

What effect does El Niño have on temperature and precipitation in Northwest Kansas, Eastern Colorado, and Southwest Nebraska?

The maps below, and on the following page, show temperature and precipitation anomalies which occurred during 15 previous El Niño summers. Looking at the Tri-State area for temperature, there is typically no tendency for either above or below normal values during an El Niño. But precipitation tends to be above normal in El Niño years in the summer (June, July, and August).

Temperature Anomalies **Frequency of Occurrence**

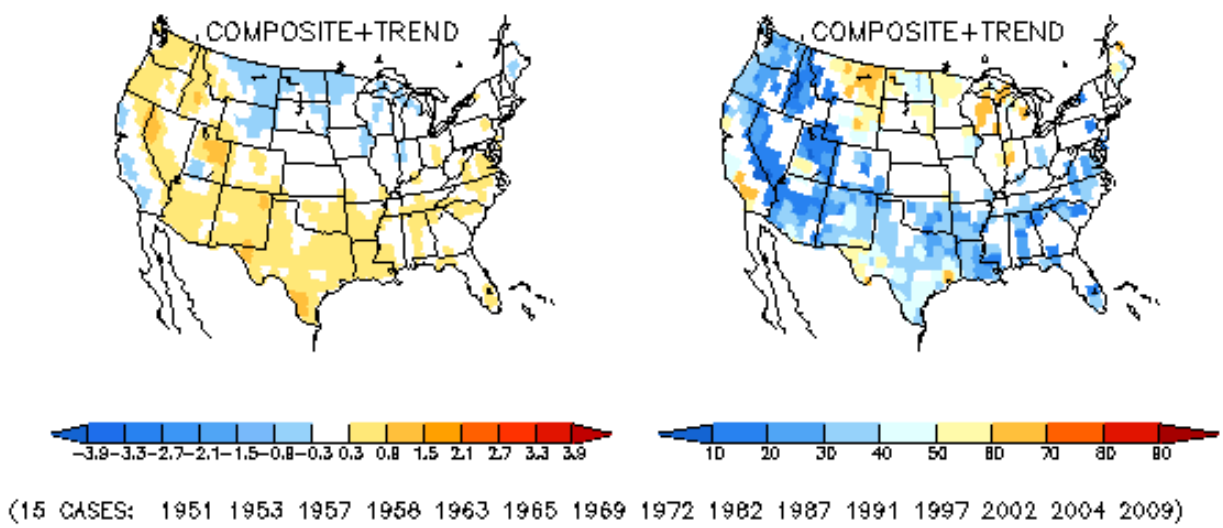

Figure 3. The graphic on the left depicts temperature departure from normal in summers with El Niños. The white color for Northwest Kansas, Southwest Nebraska, and Eastern Colorado means temperatures will not really be higher or lower than normal. The graphic on the right depicts frequency of occurrence, or how often, temperatures will be above or below normal. This graphic is white for Northwest Kansas, Southwest Nebraska, and Eastern Colorado since temperature anomalies are not present.

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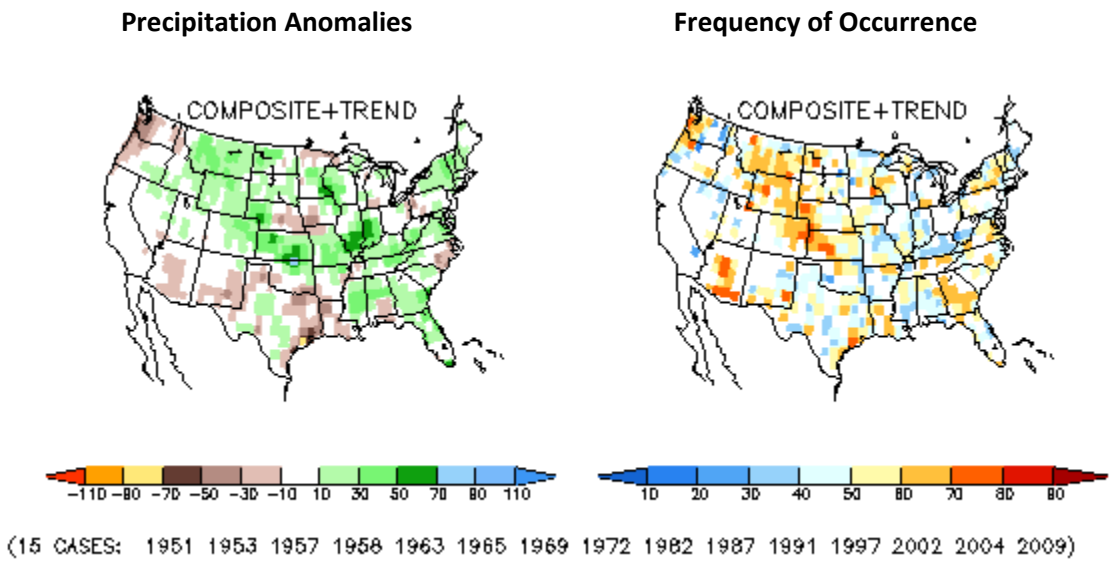

Figure 4. The graphic on the left displays precipitation anomalies in summers with El Niños. Northwest Kansas, Southwest Nebraska, and Eastern Colorado are typically above normal. The graphic on the right shows how high of a chance Northwest Kansas, Southwest Nebraska, and Eastern Colorado has of experiencing above normal precipitation, which is 60% to 80%.

How far away from normal is the area currently in terms of temperature and precipitation?

Temperatures in this area can change drastically on a day to day basis. However, we can get an idea of temperature trends by looking at monthly climate data. These data are gathered from Automated Surface Observing Systems that provide daily temperatures from which we can calculate monthly values. Here is a table showing the average temperature (in˚F) and how much above or below normal the temperatures were across the area so far for 2014:

Station	Goodland, KS	Hill City, KS	Burlington, CO	McCook, NE
January	Observed High: 44.6 Normal High: 42.4 Departure: +2.2 Observed Low: 15.5 Normal Low: 16.9 Departure: -1.4	Observed High:44.7 Normal High:41.8 Departure:+2.9 Observed Low:15.6 Normal Low:16.8 Departure:-1.2	Observed High:43.5 Normal High:42.1 Departure:+1.4 Observed Low:13.8 Normal Low:16.7 Departure:-2.9	Observed High:45.0 Normal High:40.6 Departure:+4.4 Observed Low:14.5 Normal Low:13.9 Departure:+0.6
February	Observed High:37.0 Normal High:45.3 Departure:-8.3 Observed Low:13.9 Normal Low:19.4 Departure:-5.5	Observed High:38.6 Normal High:46.0 Departure:-7.4 Observed Low:15.7 Normal Low:19.8 Departure:-4.1	Observed High:37.1 Normal High:44.7 Departure:-7.6 Observed Low:13.8 Normal Low:18.4 Departure:-4.6	Observed High:34.1 Normal High:44.6 Departure:-10.5 Observed Low:12.5 Normal Low:17.2 Departure:-4.7

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As the table above shows, high temperatures for January were above normal while lows were below normal for most locations (except McCook). By February, high and low temperatures were below normal across the area. Since this area historically shows no strong temperature signal during El Niño summers, the temperature outlook is uncertain for 2014.

Precipitation is often hard to come by throughout the area, as most people know too well. Let's take a look at some precipitation values so far for 2014 to get an idea of how much below normal the area has been:

Station	Goodland, KS	Hill City, KS	Burlington, CO	McCook, NE
January	Observed Precip:0.57 Normal Precip:0.38 Departure:+0.19	Observed Precip:0.10 Normal Precip:0.45 Departure:-0.35	Observed Precip:0.33 Normal Precip:0.38 Departure:-0.05	Observed Precip:0.20 Normal Precip:0.51 Departure:-0.31
February	Observed Precip:0.37 Normal Precip:0.49 Departure:-0.12	Observed Precip:0.36 Normal Precip:0.52 Departure:-0.16	Observed Precip:0.37 Normal Precip:0.42 Departure:-0.05	Observed Precip:0.29 Normal Precip:0.62 Departure:-0.33

As the table shows, precipitation across the area has been below normal in 2014 with the exception of Goodland, KS in January. Northwest Kansas, Southwest Nebraska, and Eastern Colorado rely on snowfall in the winter time to help saturate the ground for the planting season. However, with precipitation below normal even with a few significant snowfall events, it is going to take a lot of precipitation to make up for the deficits this area has seen in the last two years. The Climate Prediction Center is predicting an El Niño to develop, which in the case of precipitation for the area, is a good sign, given that this area typically experiences above normal rainfall in the summer when an El Niño is underway.

National Weather Service
920 Armory Road
Goodland, KS 67735

Phone:
785-899-7119

Fax:
785-899-3501

E-mail:
w-gld.webmaster@noaa.gov

Facebook:
http://www.facebook.com/US.NationalWeatherService.Goodland.gov

Twitter:
https://twitter.com/NWSGoodland

Please don't forget, if you have pictures or video to share of any severe weather events that take place this year, please contact ***david.l.floyd@noaa.gov***

With your permission, your pictures and video will provide information and training materials for future storm spotters and meteorologists!

The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community. It is accomplished by providing warnings and forecasts of hazardous weather, including thunderstorms, flooding, hurricanes, tornadoes, winter weather, tsunamis, and climate events. The NWS is the sole United States OFFICIAL voice for issuing warnings during life-threatening weather situations.