High Plains Wind

(Weather Information News Data)

November 14, 2014
Volume 8 Issue 3

Inside This Issue

1 Local Winter Storm Scale

2 Leaves During Fall

7 CoCoRaHS Corner

8 Cooperative Observer News

10 U. S. Winter Outlook

11 First & Last Snowfall

13 Climate Corner

A Message from the Meteorologist-in-Charge

Local Winter Storm Scale

By Scott A. Mentzer

Two meteorologists, Brian Cerruti and Steven Decker, published a paper in 2011 that developed a classification system to compare historical winter storms. This scale, pictured below, called the Local Winter Storm Scale (LWSS), used five parameters to make the classification: total snowfall, total ice accumulation, highest wind gust, highest sustained wind, and the lowest visibility. These parameters were weighted and summed. The final score divided individual winter storms into seven categories on a scale from zero (nuisance) to six (catastrophic).

Storm element score (LWSS descriptor)
Weighting function
0 (nuisance)
1 (moderate)
2 (significant)
3 (major)
4 (crippling)
5 (extreme)
6 (catastrophic)

Continued on page 4

The Role of Weather on the Color of Leaves During Fall

By Mike Kochasic

The fall season is in full swing across the High Plains region, and one of my favorite parts of this time of year is the changing color of the leaves on the trees. With the leaves turning different colors around the area, I was left wondering why trees may differ in color or brightness from one fall season to another. After a little searching on the subject, the weather actually plays a role in how the color of the leaves will appear in any given fall.

Although we only see different colors (reds, oranges, yellows, etc.) during the fall season, those colors are actually present at all times during the year when most leaves appear green. The reason for the green color during the year is because of chlorophyll, which gives tree leaves their prominent color and "hides" the other colors. Chlorophyll is a necessary ingredient for photosynthesis to occur, which is the process that involves sunlight for plants to create their own food. Along with chlorophyll, there are also carotenoids, xanthophylls, and anthocyanins within leaves. Carotenoids are responsible for producing the orange color in leaves, xanthophylls produce yellow colors, and anthocyanins give red and purple colors.

Changes in the length of daylight during the fall season cause leaves to stop the food production process, which then causes chlorophyll to break down. The green color of

Continued on page 3

Continued from page 2

leaves fades away as chlorophyll diminishes, which allows the other elements within leaves to become visible (carotenoids, xanthophylls, and anthocyanins).

But where does weather come into play? Temperature and moisture play a role in how the leaves look during the fall season, in addition to sunlight. Plenty of sunlight and lower temperatures will cause chlorophyll amounts to recede faster, and thus speeding up the progression of the color change in the leaves. In particular, cool temperatures at night and lots of sunshine during the day promotes red and purple colors in leaves. If temperatures get too cold, freezing conditions will destroy the ability for leaves to produce the red and purple colors, and most often will bring an end to the further progression of changing leaves. Drought during the spring and summer months can cause leaves to drop from trees early before they begin to change colors. The best weather ingredients to enhance the color of the leaves during the fall season is to have plenty of moisture during the spring and summer months, followed by a fall season with dry weather, sunny skies, warm days, and cool (but frostless) nights.

The amount of sunlight and weather conditions does not entirely determine the color of the leaves. The color of the leaves also depends on the species of the tree (oak, maple, etc.). Although the peak season for observing tree leaves occurs in late October, there is still time to see some leaves before winter sets in across the area. So, be sure to get outside and see the colors before it's too late!

The U.S. Forest Service maps the areas where leaves are changing – check it out at www.fs.fed.us/fallcolors/2014/index.shtml

Continued from page 1

The National Weather Service in Goodland input all the parameters for winter storms that occurred here since 1965 to determine the strongest winter storm. Note: this is only for the Goodland area and does not consider winter storms prior to 1965. Over one thousand snow events were examined. Only six achieved a LWSS score of five or higher. They were:

Date	LWSS Score
03/27/1980 to 04/02/1980	6.0
11/26/1983 to 11/28/1983	5.6
12/29/2006 to 12/30/2006	5.6
01/18/1988 to 01/19/1988	5.4
10/25/1997 to 10/26/1997	5.4
11/18/1975 to 11/19/1975	5.4

The highest impact winter storm using this scale occurred from March 27 through April 2, 1980. Over two feet of snow fell from Stratton, Colorado, to Goodland, Kansas. Another heavy snow band fell from Wray, Colorado, to Trenton, Nebraska. While Goodland, Kansas, received 32.3 inches of snow during the seven day period, McDonald, Kansas, received 35 inches. Sustained winds were mainly 20-30 MPH during that week with the highest wind gust at 51 MPH.

Many people forget about this storm since it occurred over an extended period of time. In fact, there was a series of storms that moved across the area during this time, so the large snow amounts were not produced by one separate winter storm.

The other five storms on the list were generally produced by individual storms over a span of 24 to 36 hours. These storms, in general, stick in the memories of more people since the impacts were felt quickly and suddenly. For example, the storm that produced the highest LWSS score (5.4) with a limit of 24 hours occurred on October 25, 1997.

All of these storms produced widespread closures to roads (including Interstate 70), schools, and businesses. Livestock losses also occurred.

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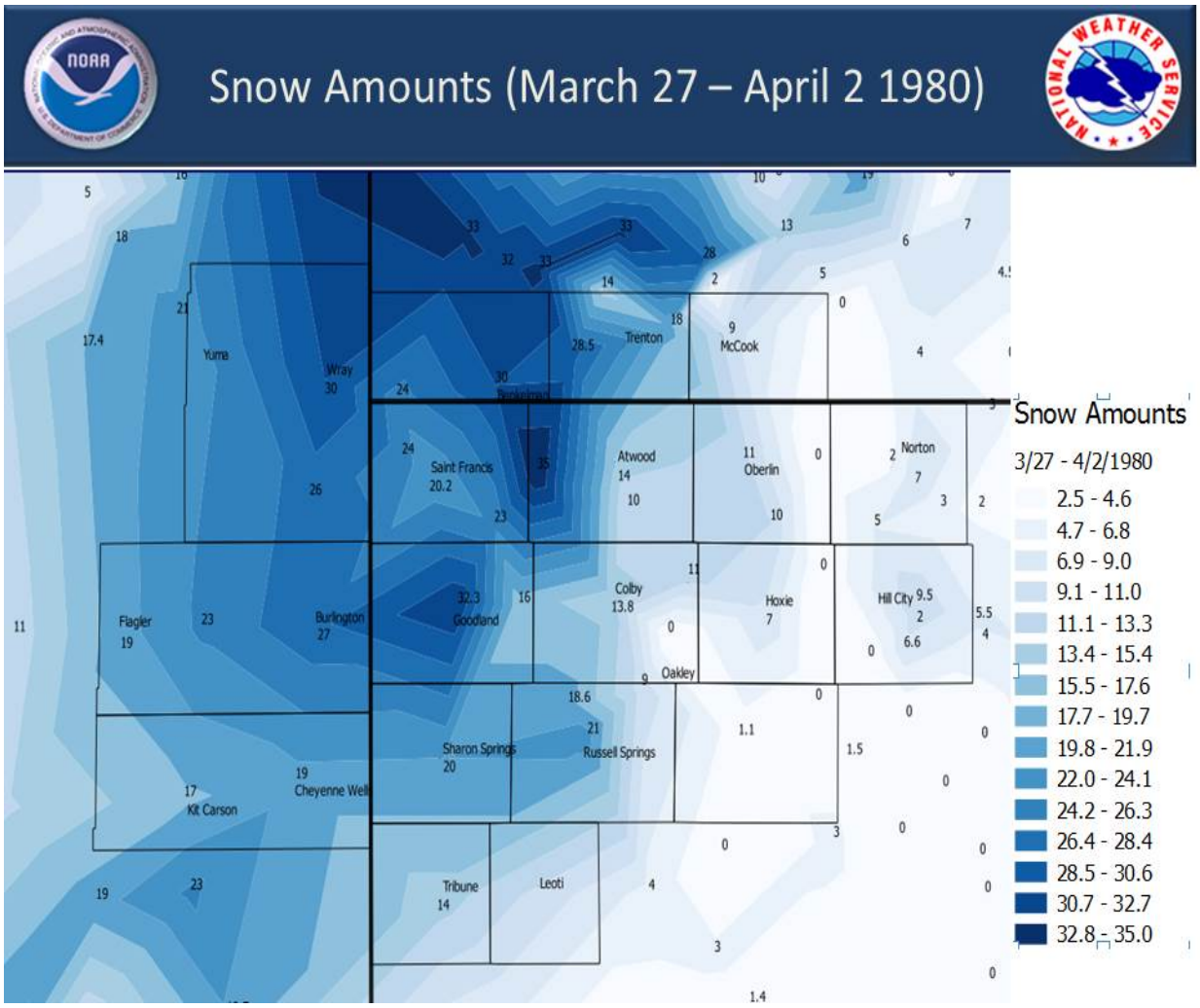

Check out our website for more information or catch up with us on Facebook or Twitter

Pictured above is our Science Operations Officer, who recently completed training at the National Weather Service Training Center in Kansas City. Jeremy Martin is in the back row on the left. You might also recognize the man in front of him, Aaron Johnson, who worked at the Goodland office at one time, and is originally from the Brewster, Kansas area.

Front Row: Grady Bonsall (Goodland, KS); Wanda Gaines (White Lake,MI); Bryan Ramos (Brownsville, TX)
Back Row: Instructors - David Emery, Jim Bollinger

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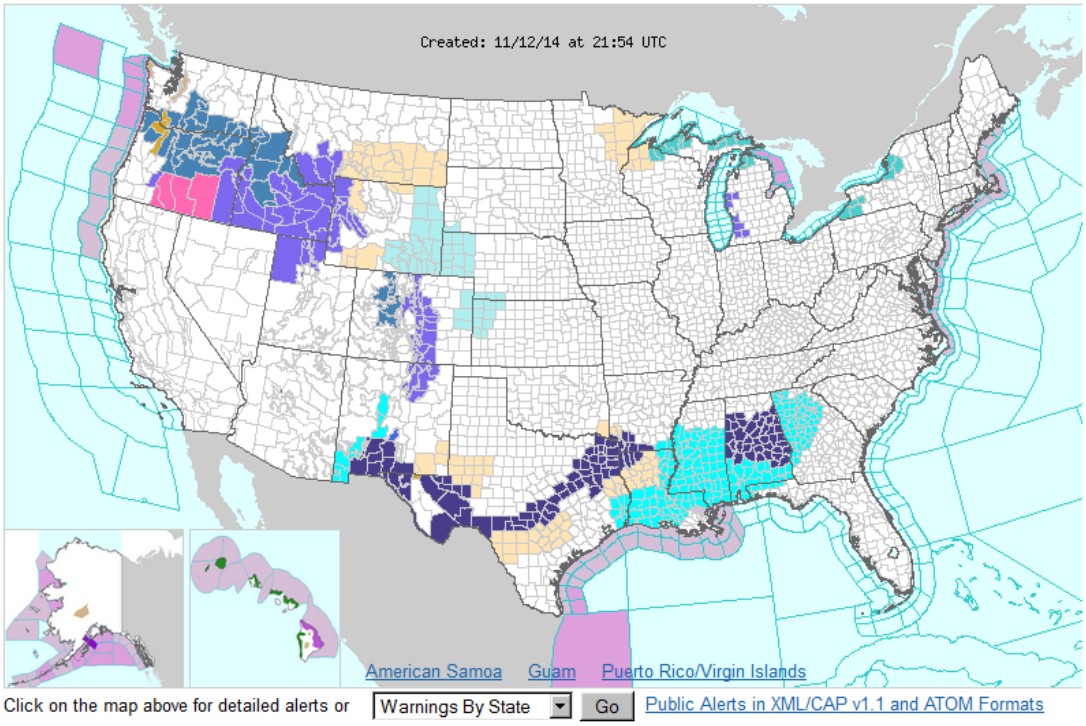
Grady Bonsall, who is in charge of the electronics and facility systems at our office, recently completed WSR-88D Dual Pol Radar training in Kansas City. Our staff is constantly attending training to improve their skills and advance their education in their respective fields.



Click on the photo above or go to our website www.weather.gov for all the latest Watches and Warnings.

CoCoRaHS Corner

Get ready for winter! Click on the link below to learn how to properly measure snow with your CoCoRaHS gauge:

http://cocorahs.org/media/docs/measuringSnow2.1.pdf

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.

Cooperative Observer News

We take great pleasure in introducing you to our new Observation Program Leader, Brian Warren. Brian retired from the Navy with twenty years of service. Following his service to our country he was hired by the National Weather Service. He transferred to our office from the NWS office in Bethel, Alaska. Brian is looking forward to meeting all the cooperative observers in our area over the next few months.

Don't forget to take the funnel out of your rain gauge before winter!

Pictured above is Herbert Queen, who was recently presented a 25-year award for his service to his community in Grainfield, Kansas. Herby has been doing the reports for much longer than that though, as his father did the reporting from the yard across the street for many years before Herby took over. The National Weather Service greatly appreciates all observers like Herby who faithfully report the conditions in their area each day.

NWS Special Event

Coming Soon!

2014 SKYWARN™ Recognition Day

December 6, 2014
(0000 - 2400 UTC.)

For more information contact our office
or visit the website at:

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

U.S. Winter Outlook

The U.S. Winter Temperature Outlook issued by NOAA's Climate Prediction Center in October calls for below average temperatures to be favored in parts of the south-central and southeastern United States, while above-average temperatures are most likely in the western U.S., Alaska, Hawaii and New England.

The Precipitation Outlook favors above-average precipitation across the southern tier, from the southern half of California, across the Southwest, South-central, and Gulf Coast states, Florida, and along the eastern seaboard to Maine. Above-average precipitation also is favored in southern Alaska and the Alaskan panhandle. Below-average precipitation is favored in Hawaii, the Pacific Northwest and the Midwest.

Last year's exceptionally cold and snowy winter across most of the United States, east of the Rockies is unlikely this year, although the Outlook does favor below-average temperatures in the south-central and southeastern states.

Next update available 11/20/14 at:

http://www.cpc.ncep.noaa.gov/index.php

Source: http://www.noaanews.noaa.gov/stories2014/20141016_winteroutlook.html

First and Last Snowfall

By Dave Floyd, Warning Coordination Meteorologist

Autumn of 2014, at least through the first ten days of November, was mild and dry across the Central High Plains. When the calendar reached November 1st and there was no hint of winter on the horizon, questions arose asking when we typically get our first snowfall of the season.

Sporadic snowfall records for Goodland date back to the 1890s. Snow measurements became more reliable and consistent in the 1920s, but there are still some gaps in the 1920s, 1930s and early 1940s, so I decided to begin my study with the winter of 1945-1946. The National Weather Service has a climate program which gives the ability to slice and dice weather records in a number of different ways. Using that data and having a working knowledge of spreadsheets, I came up with the chart on the following page. I queried the climate database for the date of the first and last measurable snow of the season. "Measureable" snowfall is any accumulation one tenth of an inch or greater. If snow falls but does not accumulate to one tenth of an inch, the observer logs a "Trace" for snowfall.

The chart on the following page is laid out with years along the bottom, beginning with the winter of 1945-1946 on the left and the winter of 2013-2014 on the right. Going up the chart and looking at the labels on the left side, dates increase from bottom to top, beginning with Sep 3 on the bottom and May 29 on the top. The blue bars represent the length of the winter snow season; the bottom of each blue bar marks the date of the first measureable snow of the season, and the top of the blue bar marks the date of the last measureable snow. The average date for the first measureable snow of the winter season is October 31st, and the average date for the last measureable snow is April 11th.

Let's look at the winter of 1995-1996. The first measureable snowfall of the season that winter was Sep 20 (about 6 weeks earlier than average) while the last measureable snow occurred Apr 28 (about two weeks later than average). The length of the season that winter was 220 days, the longest on record for Goodland. Interestingly, snowfall that season was 35.2 inches, about average. So don't equate an early occurrence of snow in the fall, or a long snow season, to above average snowfall for the winter. It doesn't seem to work that way.

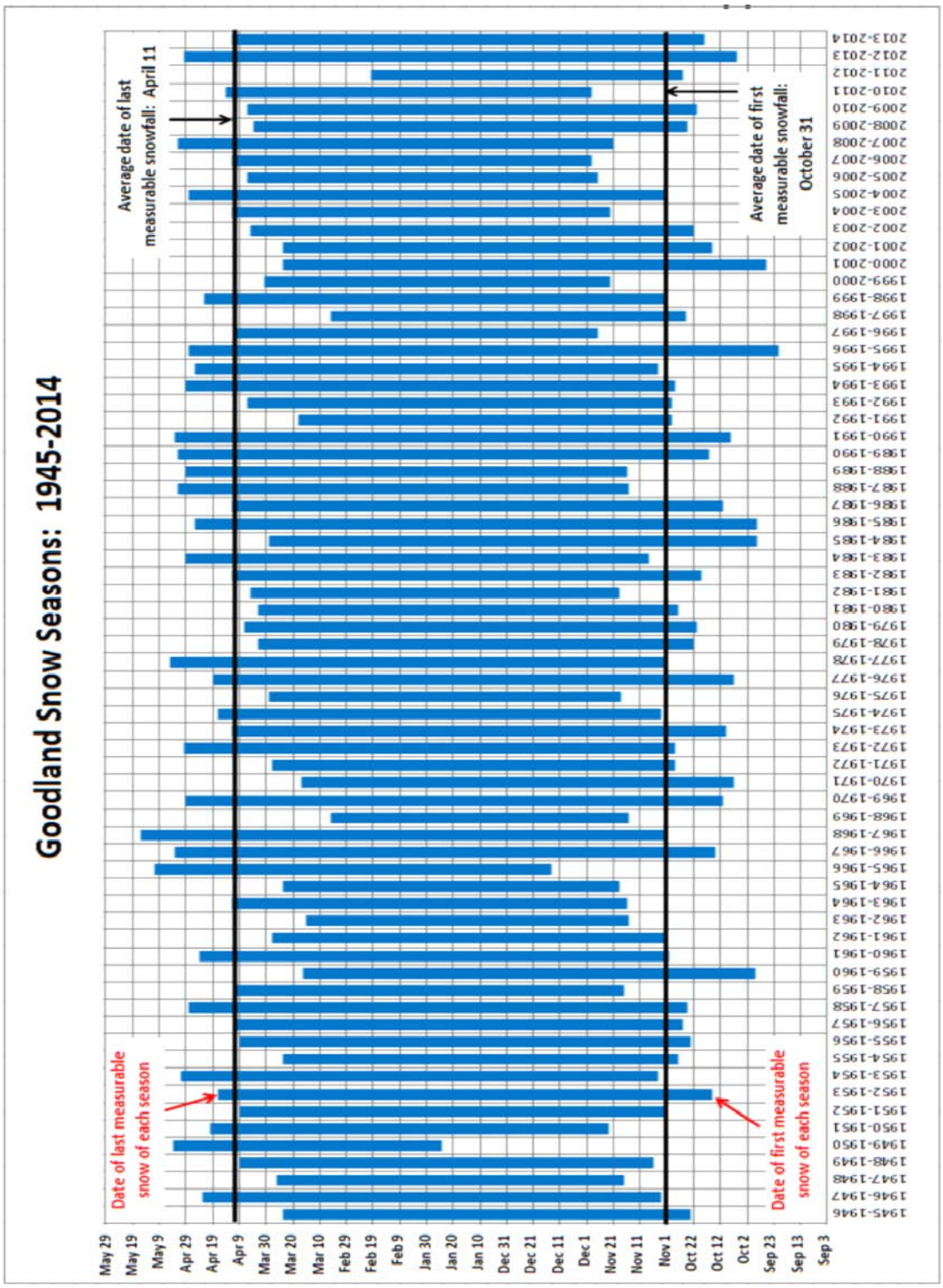
Now look at the winter of 1949-1950, which was unusual in that the first measureable snow of the season did not occur until January 24th! There were a number of trace snow events before that, but nothing considered "measureable". The last snowfall of the season that particular winter occurred on May 5th, definitely later than average. With the snow season lasting only 100 days (shortest on record at Goodland), there were fewer opportunities for significant snowfall. The total snow that winter was only 14.6 inches, well below average. But overall, there is only a small tendency for shorter snow seasons to equate to below average snowfall.

The winter of 1979-1980 is noteworthy in Goodland because snowfall that winter totaled 102.0", the most on record for any season. Compare that to an average snowfall of 34" for all these years...pretty impressive! Looking at the dates of first and last snowfall that season there is nothing out of the ordinary. The first snowfall occurred on October 21st and the last snowfall occurred April 7th. Four years later, the winter was a virtual repeat in terms of snowfall...101.8" for the season. Once again, the length of the snow season and first-last snow dates were fairly typical of other years.

Continued on page 12

Continued from page 11

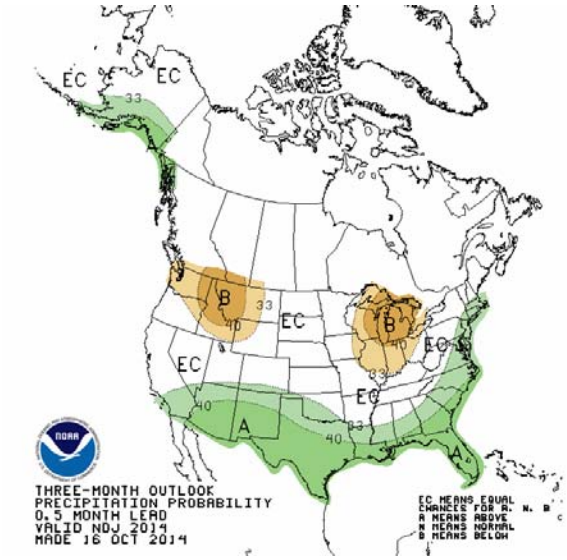
The bottom line is this: the date of the first snowfall of the season really has little to do with how much snow will fall during the upcoming winter. The same goes for the length of the snow season, not much correlation. It really boils down to how the upper air pattern sets up for the winter and its persistence in any one configuration. This ultimately will determine the number of "snow opportunities" we receive from the low pressure systems which affect this area.



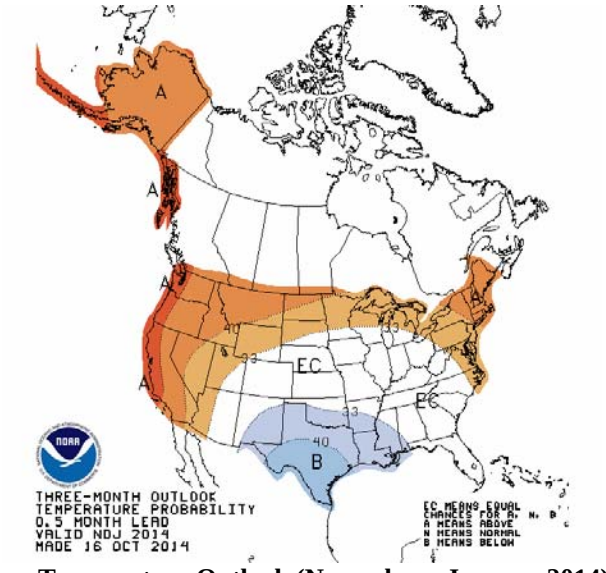
Climate Corner

Current Weather Information for Our Area

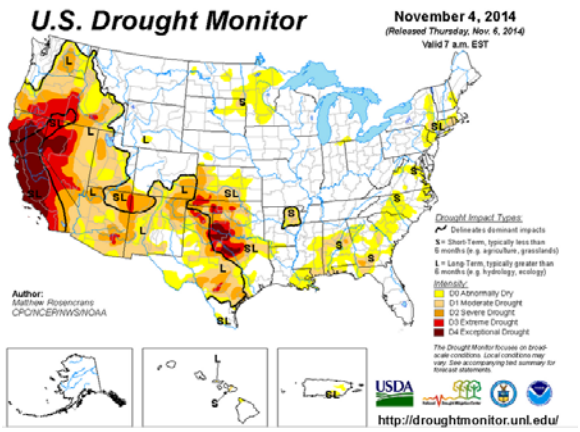
Latest Extended Outlooks



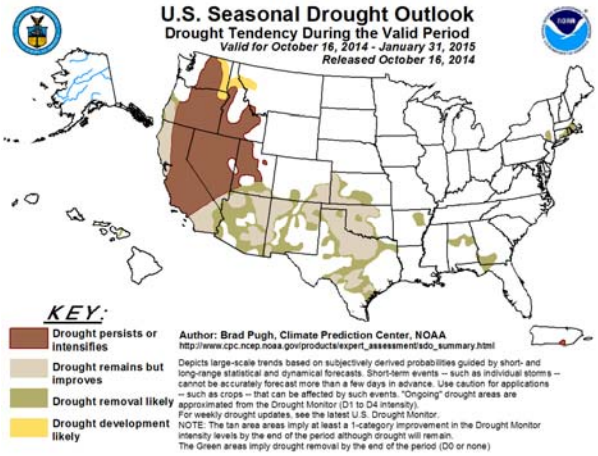
Precipitation Outlook (November - January 2014)



Temperature Outlook (November - January 2014)



Current Drought Monitor



Drought Outlook

Need more information? Check out the Climate Prediction Center website at: http://www.cpc.ncep.noaa.gov/

Site	Year-to-Date Precipitation*	Departure from Normal
Burlington	16.64	-4.98
Goodland	16.39	-2.28
Hill City	21.43	-0.13
McCook	22.90	+1.71

*As of November 7, 2014

National Weather Service
920 Armory Road
Goodland, KS 67735

Phone:
785-899-7119

Fax:
785-899-3501

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

Website:
http://www.weather.gov/gld

Facebook:
http://www.facebook.com/nwsgoodland

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.