High Plains Wind

(Weather Information News Data)

November 30, 2015
Volume 9 Issue 2

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Photo by Clarence Heckens

A Message from the Acting Meteorologist-in-Charge

El Nino

By David L. Floyd

When the Climate Prediction Center (http://www.cpc.noaa.gov/) issued the 2015-2016 Winter Outlook (see page 21 for the U.S. Winter Outlook maps), it was stated the forecast was influenced by the intensifying El Nino conditions in the tropical Pacific Ocean. So what exactly is an El Nino and how can the Pacific Ocean influence weather over the Central High Plains?

In a nutshell, research occurring over the last 3 decades led to the discovery that variations in sea surface temperatures in the tropical Pacific Ocean can have a profound influence on the circulation of the atmosphere. Ships and data buoys routinely collect the temperature of the sea surface, as well as the temperature at various depths. There is a recurring pattern of temperature swings in the ocean from colder than normal to warmer than normal that typically repeats every 3-5 years. When the sea surface temperatures are warmer than normal, it is called an El Nino or warm episode, and when water temperatures are colder than normal, the term La Nina, or cold episode is used.

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Preparing Your Vehicle for Winter

By Jesse Lundquist

Despite the warm temperatures the tri-state area receives from time to time during the fall and winter months, the cold feel of winter is now upon us. Now is the time to start preparing your vehicle to be ready for the winter months, instead of waiting until you start to see snowflakes from a winter storm. Below is a quick list of things to ensure you and your vehicle will be ready for the cold of winter. A few extra additions to the trunk now may help you make it to your destination on a cold, blustery winter day. In addition to the tips below, remember to drive according to the road conditions to help minimize the chance of a slide-off or a wreck.

Vehicle Winter Check

- Make sure the vehicle battery is not too old so it will be able to start the engine in cold temperatures.
- Make sure the windshield wipers are in good shape and the washer fluid reservoir is filled.
- Check the radiator fluid to make sure it will remain liquid to at least -40^{o} F.
- Make sure your vehicle is in good working order.

Winter Survival Kit

- At least one blanket or a sleeping bag
- A flashlight with extra batteries and possibly a radio
- Bright red or orange cloth
- Cat litter or a small bag of gravel for traction
- Jumper cables
- A chain or nylon tow rope

For more winter weather preparedness tips, please visit http://www.ready.gov/winter-weather.

Don't wait until this happens to you! Prepare before a vehicle emergency presents itself!

Useful Information for the Upcoming Winter Season

By Jason Neilson

When making a forecast, meteorologists typically refer to winds in knots (kts) and the temperature in degrees Celsius (°C). Weather forecasters consistently convert back-and-forth between the meteorological systems of measurement to the imperial systems (U.S.) of measurement. As we come upon the Winter Season for the Tri-State Region, the National Weather Service in Goodland would like to make everyone aware of various tools and information that could be useful over the next several months. First, the conversion charts for temperature between Fahrenheit and Celsius could help you convert to Fahrenheit if the temperature is reported in Celsius.

F	C	F	C	F	C	F	C	F	C
111	43.9	80	26.7	49	9.4	18	-7.8	-13	-25
110	43.3	79	26.1	48	8.9	17	-8.3	-14	-25.6
109	42.8	78	25.6	47	8.3	16	-8.9	-15	-26.1
108	42.2	77	25	46	7.8	15	-9.4	-16	-26.7
107	41.7	76	24.4	45	7.2	14	-10	-17	-27.2
106	41.1	75	23.9	44	6.7	13	-10.6	-18	-27.8
105	40.6	74	23.3	43	6.1	12	-11.1	-19	-28.3
104	40	73	22.8	42	5.6	11	-11.7	-20	-28.9
103	39.4	72	22.2	41	5	10	-12.2	-21	-29.4
102	38.9	71	21.7	40	4.4	9	-12.8	-22	-30
101	38.3	70	21.1	39	3.9	8	-13.3	-23	-30.6
100	37.8	69	20.6	38	3.3	7	-13.9	-24	-31.1
99	37.2	68	20	37	2.8	6	-14.4	-25	-31.7
98	36.7	67	19.4	36	2.2	5	-15	-26	-32.2
97	36.1	66	18.9	35	1.7	4	-15.6	-27	-32.8
96	35.6	65	18.3	34	1.1	3	-16.1	-28	-33.3
95	35	64	17.8	33	0.6	2	-16.7	-29	-33.9
94	34.4	63	17.2	32	0	1	-17.2	-30	-34.4
93	33.9	62	16.7	31	-0.6	0	-17.8	-31	-35
92	33.3	61	16.1	30	-1.1	-1	-18.3	-32	-35.6
91	32.8	60	15.6	29	-1.7	-2	-18.9	-33	-36.1
90	32.2	59	15	28	-2.2	-3	-19.4	-34	-36.7
89	31.7	58	14.4	27	-2.8	-4	-20	-35	-37.2
88	31.1	57	13.9	26	-3.3	-5	-20.6	-36	-37.8
87	30.6	56	13.3	25	-3.9	-6	-21.1	-37	-38.3
86	30	55	12.8	24	-4.4	-7	-21.7	-38	-38.9
85	29.4	54	12.2	23	-5	-8	-22.2	-39	-39.4
84	28.9	53	11.7	22	-5.6	-9	-22.8	-40	-40
83	28.3	52	11.1	21	-6.1	-10	-23.3	-41	-40.6
82	27.8	51	10.6	20	-6.7	-11	-23.9	-42	-41.1
81	27.2	50	10	19	-7.2	-12	-24.4	-43	-41.7

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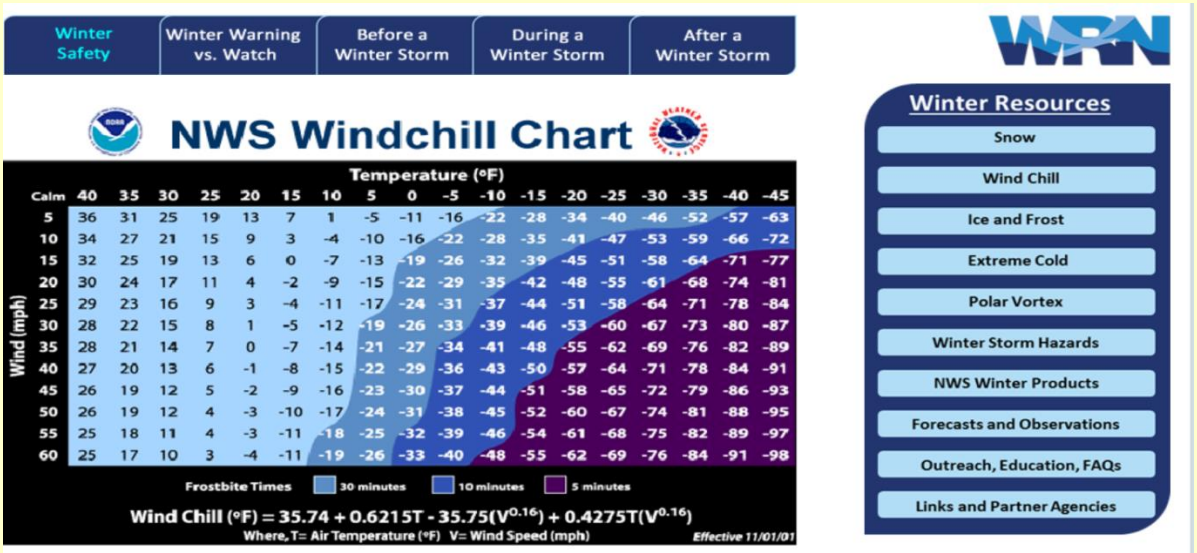
Another chart shown here is for converting between miles per hour (MPH) and knots.

MPH	KNOTS	MPH	KNOTS	MPH	KNOTS	MPH	KNOTS
100	86.9	75	65.2	50	43.4	25	21.7
99	86.0	74	64.3	49	42.6	24	20.9
98	85.2	73	63.4	48	41.7	23	20.0
97	84.3	72	62.6	47	40.8	22	19.1
96	83.4	71	61.7	46	40.0	21	18.2
95	82.6	70	60.8	45	39.1	20	17.4
94	81.7	69	60.0	44	38.2	19	16.5
93	80.8	68	59.1	43	37.4	18	15.6
92	79.9	67	58.2	42	36.5	17	14.8
91	79.1	66	57.4	41	35.6	16	13.9
90	78.2	65	56.5	40	34.8	15	13.0
89	77.3	64	55.6	39	33.9	14	12.2
88	76.5	63	54.7	38	33.0	13	11.3
87	75.6	62	53.9	37	32.2	12	10.4
86	74.7	61	53.0	36	31.3	11	9.6
85	73.9	60	52.1	35	30.4	10	8.7
84	73.0	59	51.3	34	29.5	9	7.8
83	72.1	58	50.4	33	28.7	8	7.0
82	71.3	57	49.5	32	27.8	7	6.1
81	70.4	56	48.7	31	26.9	6	5.2
80	69.5	55	47.8	30	26.1	5	4.3
79	68.6	54	46.9	29	25.2	4	3.5
78	67.8	53	46.1	28	24.3	3	2.6
77	66.9	52	45.2	27	23.5	2	1.7
76	66.0	51	44.3	26	22.6	1	0.9
						0	

The second set of useful information for the upcoming Winter Season will be a wind chill chart. Wind chill is defined as a quantity that expresses the effective lowering of the air temperature caused by the wind, especially as affecting the rate of heat loss



Wind chill forecast chart (for more information, please visit http://www.nws.noaa.gov/om/winter/windchill.shtml)

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from an object, human body, or as perceived by an exposed person. In other words, it is how cold it "feels" because of wind increasing the rate at which the body loses heat. Wind chill, therefore, is dependent on the outdoor temperature and the wind speed.

Another common question we receive is in regard to the differences between a winter advisory, watch, and warning. For explanations about these and other winter weather statements the National Weather Service issues, you can visit http://www.nws.noaa.gov/om/winter/ww.shtml. Below is a snapshot from the page about understanding Winter Weather statements:

Understand Winter Weather Alerts

Winter weather related Warnings, Watches and Advisories are issued by your local National Weather Service Office. Each office knows the local area and will issue Warnings, Watches or Advisories based on local criteria. For example, the amount of snow that triggers a "Winter Storm Warning" in the northern plains is typically much higher than the amount needed to trigger a "Winter Storm Warning" in the southeast.

Warnings: Take Action!

- **Blizzard Warnings** are issued for frequent gusts greater than or equal to 35 mph accompanied by falling and/or blowing snow, frequently reducing visibility to less than 1/4 mile for three hours or more. A Blizzard Warning means severe winter weather conditions are expected or occurring. Falling and blowing snow with strong winds and poor visibilities are likely, leading to whiteout conditions making travel extremely difficult. Do not travel. If you must travel, have a winter survival kit with you. If you get stranded, stay with your vehicle and wait for help to arrive.
- **Winter Storm Warnings** are issued for a significant Winter weather event including snow, ice, sleet or blowing snow or a combination of these hazards. Travel will become difficult and impossible in some situations. Delay your travel plans until conditions improve.
- **Ice Storm Warnings** are usually issued for ice accumulation of around 1/4 inch or more. This amount of ice accumulation will make travel dangerous or impossible and likely lead to snapped power lines and falling tree branches. Travel is strongly discouraged.
- **Wind Chill Warning** are issued for a combination of very cold air and strong winds which will create dangerously low wind chill values. This will result in frostbite and lead to hypothermia if precautions are not taken. Avoid going outdoors and wear warm protective clothing if you must venture outside. See the NWS Wind Chill Chart.
- **Lake Effect Snow Warnings** are issued when widespread or localized lake induced snow squalls or heavy showers are expected to produce significant snowfall accumulation. Lake Effect Snow usually develops in narrow bands and impacts a limited area. These bands can produce very heavy snow with sudden restrictions in visibility. Driving conditions may become hazardous at times.

Watches: Be Prepared

- **Blizzard Watches** are issued when there is a potential for falling and/or blowing snow with strong winds and extremely poor visibilities. This can lead to whiteout conditions and make travel very dangerous.
- Winter Storm Watches are issued when conditions are favorable for a significant winter storm event (Heavy Sleet, Heavy Snow, Ice Storm, Heavy Snow and Blowing Snow or a combination of events.)
- **Wind Chill Watches** are issued when there is the potential for a combination of very cold air and strong winds to create dangerously low wind chill values. See the NWS Wind Chill Chart.
- **Lake Effect Snow Watches** are issued when conditions are favorable for a lake effect snow event. A potential exists for heavy accumulation of lake-effect snow. Travel and commerce may be significantly affected.

Advisories: Be Aware

- **Winter Weather Advisories** are be issued when snow, snow and blowing snow, snow and ice, snow and sleet, or snow, ice and sleet is expected but should not meet warning criteria. Be prepared for winter driving conditions and possible travel difficulties. Use caution when driving.
- **Freezing Rain Advisories** are be issued when light ice accumulation (freezing rain and / or freezing drizzle) is expected but will not reach warning criteria. Expect a glaze on roads resulting in hazardous travel. Slow down and use caution while driving because even trace amounts of ice on roads can be dangerous.
- Wind Chill Advisories are issued when low wind chill temperatures are expected but will not reach local warning criteria. Very cold air and strong winds will combine to generate low wind chill readings. If you must venture outdoors, take precautions against frostbite and hypothermia. See the NWS Wind Chill Chart.
- Lake Effect Snow Advisory - A Lake Effect Snow Advisory will be issued for widespread or localized lake effect snowfall accumulation (and blowing snow) remaining below warning criteria. Lake effect snow showers will be expected and travel will be difficult in some areas. Some localized snow bands will be intense enough to produce several inches in a few areas with sudden restrictions in visibility.

Here are some more key terms to understand:

- **Freezing Rain:** Rain that freezes when it hits the ground; creating a coating of ice on roads, walkways, trees and power lines.
- **Sleet:** Rain that turns to ice pellets before reaching the ground. Sleet also causes moisture on roads to freeze and become slippery.
- **Wind Chill**: A measure of how cold people feel due to the combined effect of wind and cold temperatures; the Wind Chill Index is based on the rate of heat loss from exposed skin. Both cold temperatures and wind remove heat from the body; as the wind speed increases during cold conditions, a body loses heat more quickly. Eventually, the internal body temperature also falls and hypothermia can develop. Animals also feel the effects of wind chill; but inanimate objects, such as vehicles and buildings, do not. They will only cool to the actual air temperature, although much faster during windy conditions. Read how the Wind Chill Index was developed.

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Other useful links for weather and road conditions are here:

Kansas Travel information

Kansas Department of Transportation (KDOT): http://www.ksdot.org/index.asp Home Page
http://www.ksdot.org/bureaus/offTransInfo/511Info/511traffictravel.asp Traffic/Travel Info
http://511.ksdot.org/Default.aspx?BrowserDetect=Yes Driving Conditions/Closed Roads
http://kdotapp.ksdot.org/WelcomeContact/contact.aspx Contact Information

Colorado Travel Information

Colorado Department of Transportation (CDOT): https://www.codot.gov/ Home Page
http://www.cotrip.org/home.htm Travel Alerts/Road Conditions
https://www.codot.gov/topcontent/contact-cdot Contact Information

Nebraska Travel Information

Nebraska Department of Transportation: http://www.transportation.nebraska.gov/ Home Page
http://www.511.nebraska.gov/ Travel/Road Conditions

Useful Weather Information

http://www.weather.gov/ Home Page
http://www.weather.gov/Radar National Radar Page
http://radar.weather.gov/Conus/uppermissvly.php Regional Radar Page
http://radar.weather.gov/radar.php?rid=gld&product=N0R&overlay=11101111&loop=no
Local/NWS Goodland Radar Page
http://www.weather.gov/gld/ NWS Goodland Homepage
http://w2.weather.gov/climate/index.php?wfo=gld Climate Section on NWS Goodland website to access Temperatures/Snowfall this Winter
http://www.spc.noaa.gov/ Storm Prediction Center
http://www.goes.noaa.gov/ Satellite page link

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The origin of these terms goes back to the initial discovery that the fishing industry (primarily anchovies) off the west coast of South America was occasionally disrupted by the presence of unusually warm water just off the coast. Since this tended to occur around Christmas, the term El Nino (The Christ Child) was coined.

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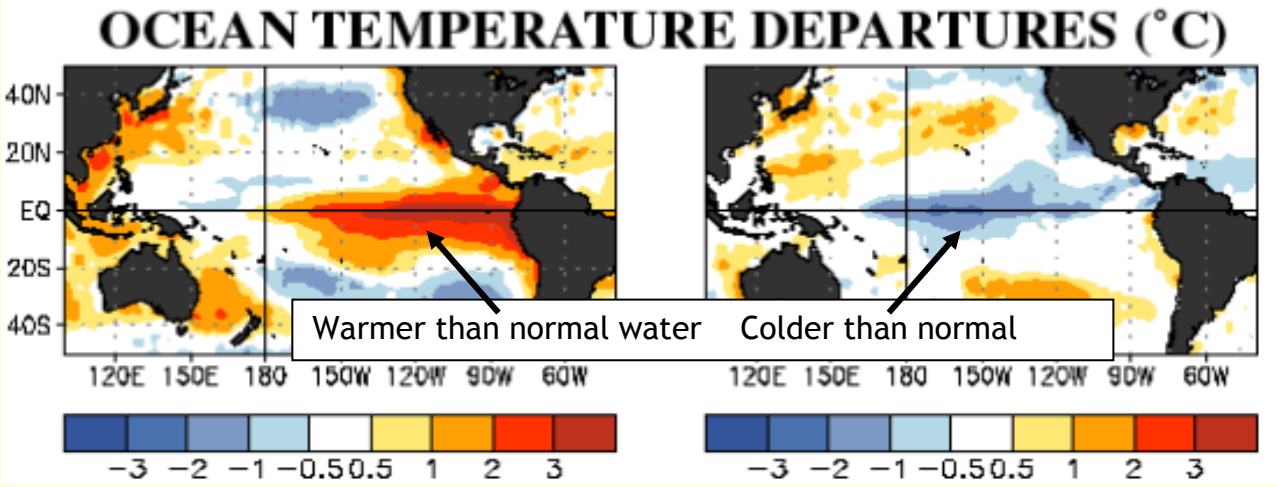
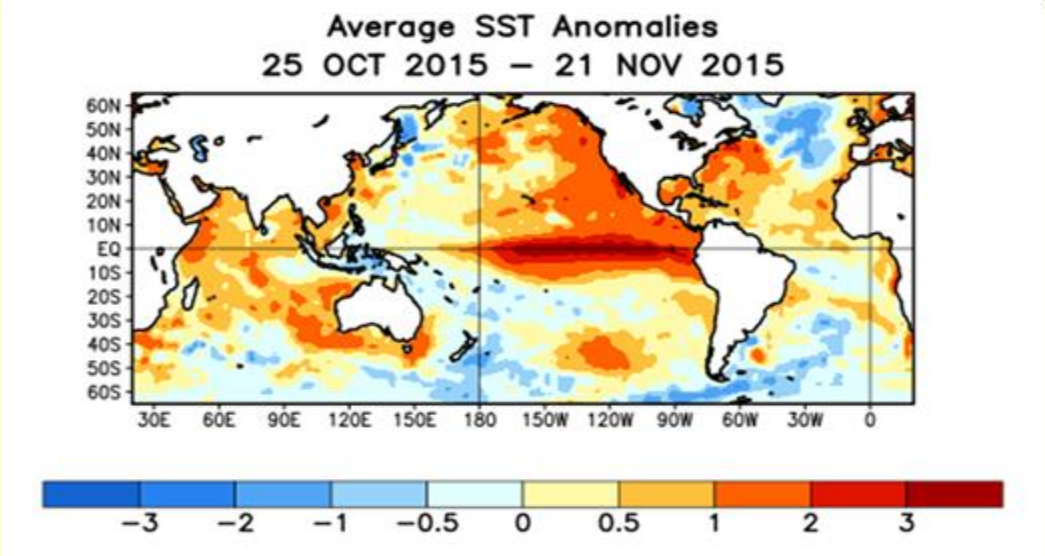
The map below gives some idea of what we are talking about. On the left are typical El Nino conditions, where the orange and red shades indicate warmer than normal sea surface temperatures. The map on the right is a typical La Nina pattern, where the blue shades indicate colder than normal sea surface temperatures.



What is the current state of ocean temperatures in the tropical Pacific Ocean right now? The map below shows the average temperature anomaly along the equator for the past month. The various shades of orange indicate that sea surface temperatures are above normal by as much as 3-4 degrees Celsius, or 5-7 degrees Fahrenheit. If that doesn't sound like much, realize that this is occurring across thousands of miles.



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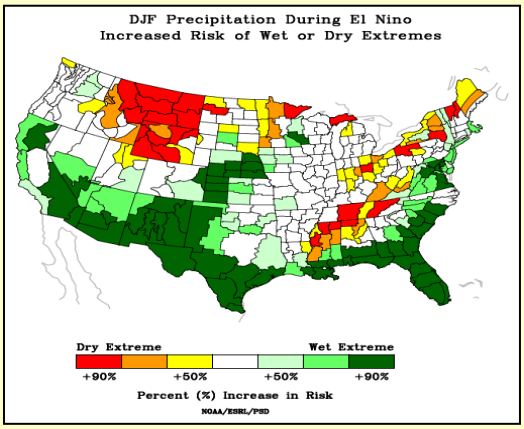
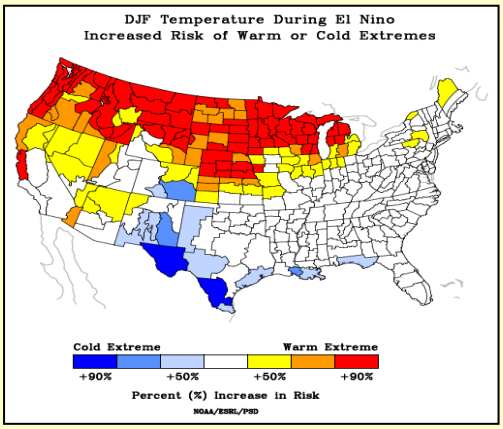
Variations in sea surface temperature occurring on a scale this large will influence the location, persistence and intensity of thunderstorms over the Pacific Ocean, which in turn has big implications not only for ocean currents, but for atmospheric pressure and wind patterns as well. During El Nino years, the jet stream is often very persistent across the southern United States, which then provides more opportunities for organized weather systems to affect the southern and central parts of the country. So looking at the winter season overall we can associate El Nino with a tendency for above or below normal precipitation, but we cannot link El Nino to any one specific snow or ice event.

In a typical El Nino pattern, the downstream effects on North America during the winter months can be summarized by the graphics below. The map on the right shows temperature anomalies during past El Ninos for the December-February time frame. Temperatures trend warmer than normal across the northern states (orange/red shading) and cooler than normal across parts of Texas and the deep South (blue shading). The map on the left shows precipitation anomalies during past El Ninos for the same months. Below normal precipitation tends to occur across the northern Rockies and parts of the Ohio and Tennessee Valleys with above normal moisture across much of the South as well as the Central Plains.





If we compare the maps immediately above with the winter outlook maps on page 21, we notice many similarities, meaning that the Climate Prediction Center is putting a lot of emphasis on the persistence and intensity of the current El Nino episode in this winter's seasonal outlook.

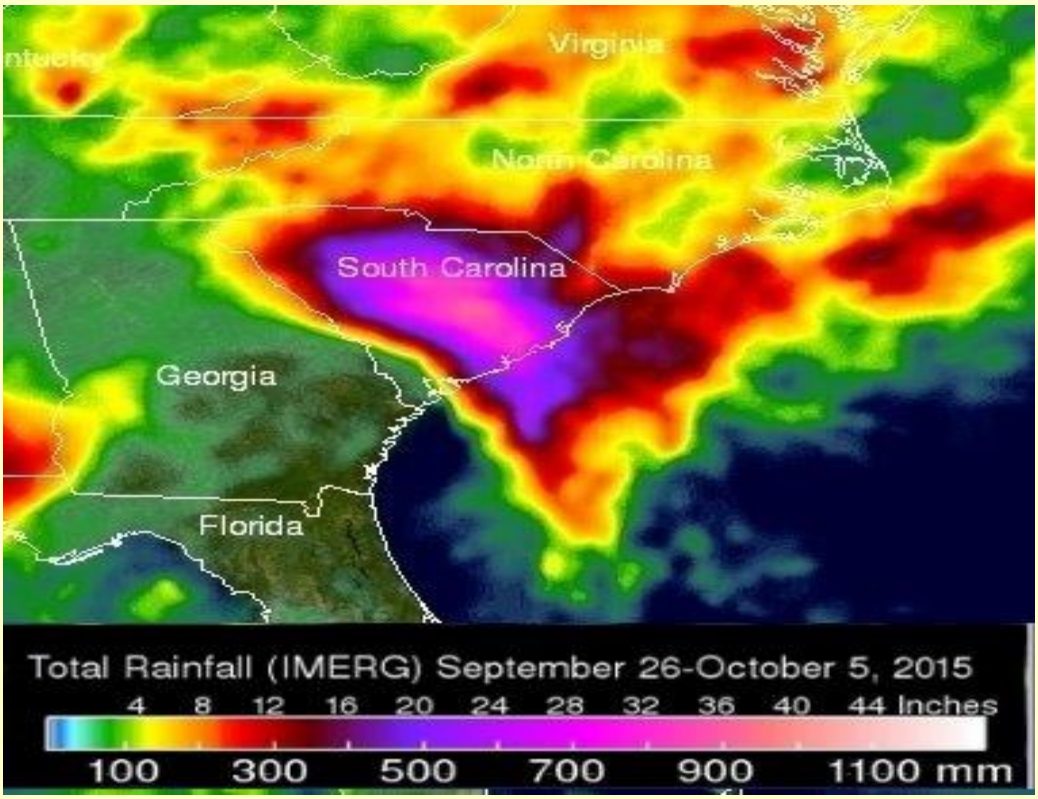
Ever Wonder?

By David Thede

Ever wonder what rainfall amounts of up to nearly 27 inches over a four day period would do to area streams and rivers in the Tri-state area? I did, so with the help of David Floyd (NWS Goodland Warning and Coordination meteorologist) I took a map of observed rainfall amounts across parts of North Carolina, South Carolina and Georgia from the October 1-5 2015 heavy rainfall event and transferred it to our part of the world to give you an idea of just how widespread the heavy rainfall was. The map would have likely been even more impressive if the event took place entirely over land and not impacted by the Atlantic Ocean, where of course, we have no rainfall measurements.

Here is a brief summary taken from the National Weather Service in Charleston, SC webpage:

A historic flooding event affected the Carolinas from October 1-5, 2015. A stalled front offshore combined with deep tropical moisture streaming northwest into the area ahead of a strong upper level low pressure system to the west and Hurricane Joaquin well to the east. This led to historic rainfall with widespread amounts of 15-20 inches and localized amounts over 25 inches, mainly in the Charleston tri-county area. Flash flooding was prevalent and led to significant damage to numerous properties and roads and many people having to be rescued by emergency personnel. In addition, tides were high due to the recent perigean spring tide and persistent onshore winds, exacerbating the flooding along the coast, especially in downtown Charleston.



This map shows satellite derived rainfall amounts from October 1-5 2015 for both land and ocean.

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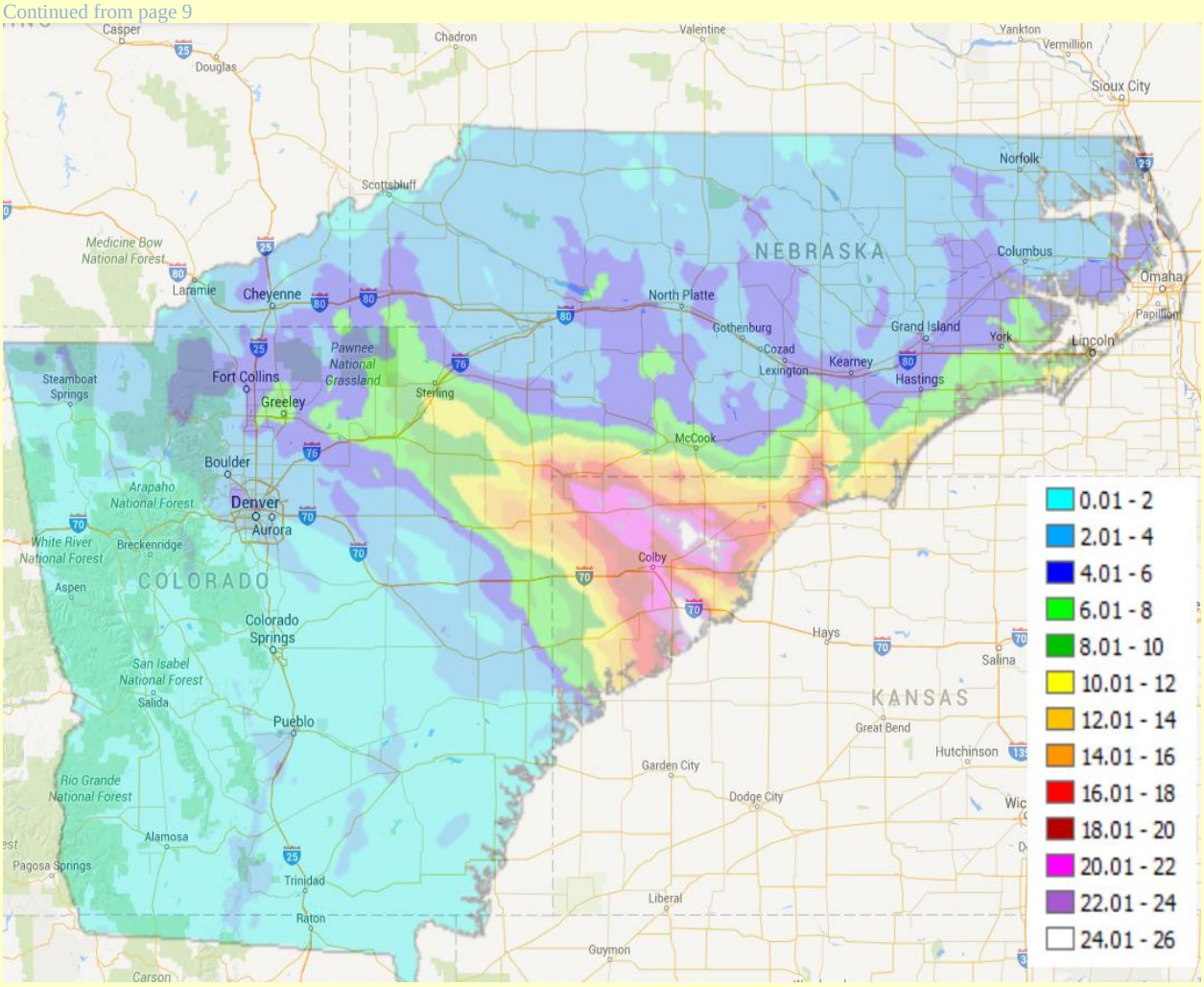

This map shows observed rainfall amounts from October 1-5 2015, transferred to our area to as close as true scale as possible. Notice how large the areal coverage of rainfall amounts over 10 inches covers the area.

I wondered how this much rainfall would impact area rivers and whether it would generate record river stage heights. Coordinating with our hydrology team leader we selected three river gages. These gages would show the true impact of the event where little (if any) rainfall would go to retaining ponds, drain into other river basins or go into any lakes. The three locations are the Smokey Hill river at Oakley, KS, the Beaver Creek at Cedar Bluffs, KS and the Sappa Creek at Oberlin, KS. The graphs were generated using the observed 6 hourly precipitation amounts from the Charleston International Airport in Charleston, South Carolina, where 17.35 inches were received. Thank you to the MBRFC (Missouri Basin River Forecast Center) in Kansas City for assistance in generating the hydrographs.

In summary, a prolonged four day heavy rain event with rainfall amounts of one to two feet with locally higher amounts would produce historic river stage heights and flooding never seen before over such a large area in the high plains. This thousand year deluge (https://www.climate.gov/news-features/event-tracker/thousand-year-deluge-south-carolina) would not likely be confined to the river gages mentioned, but would also include every gage across the tri-state area that would be either under the heavy rainfall or downstream from it.

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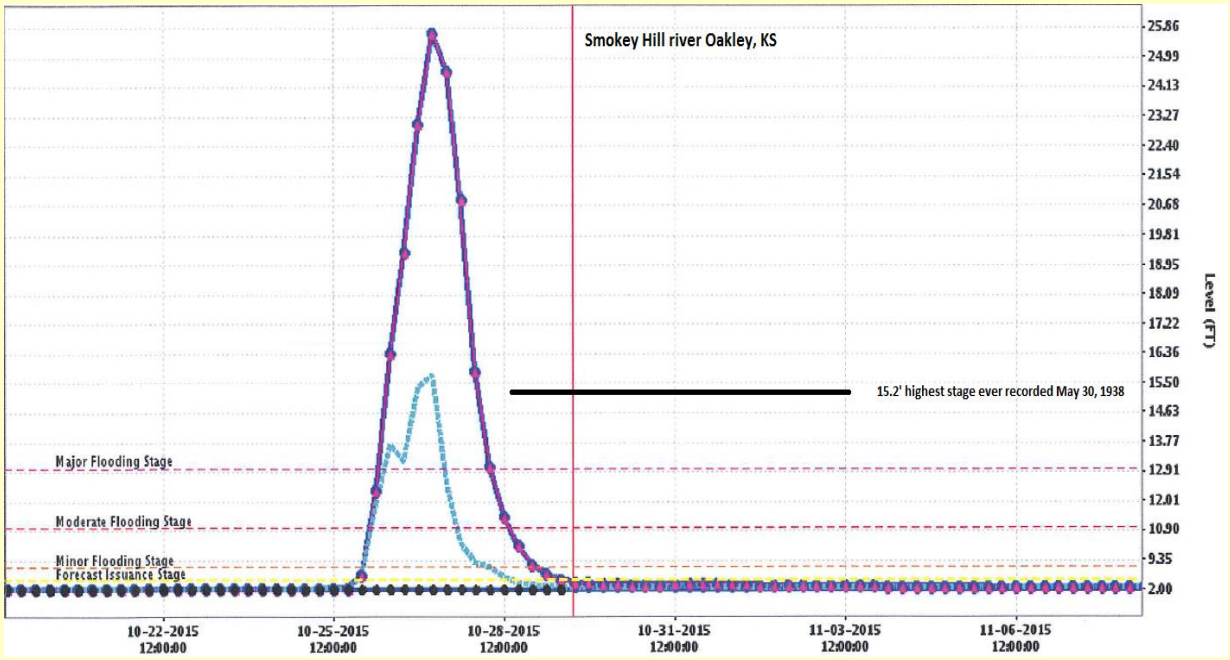
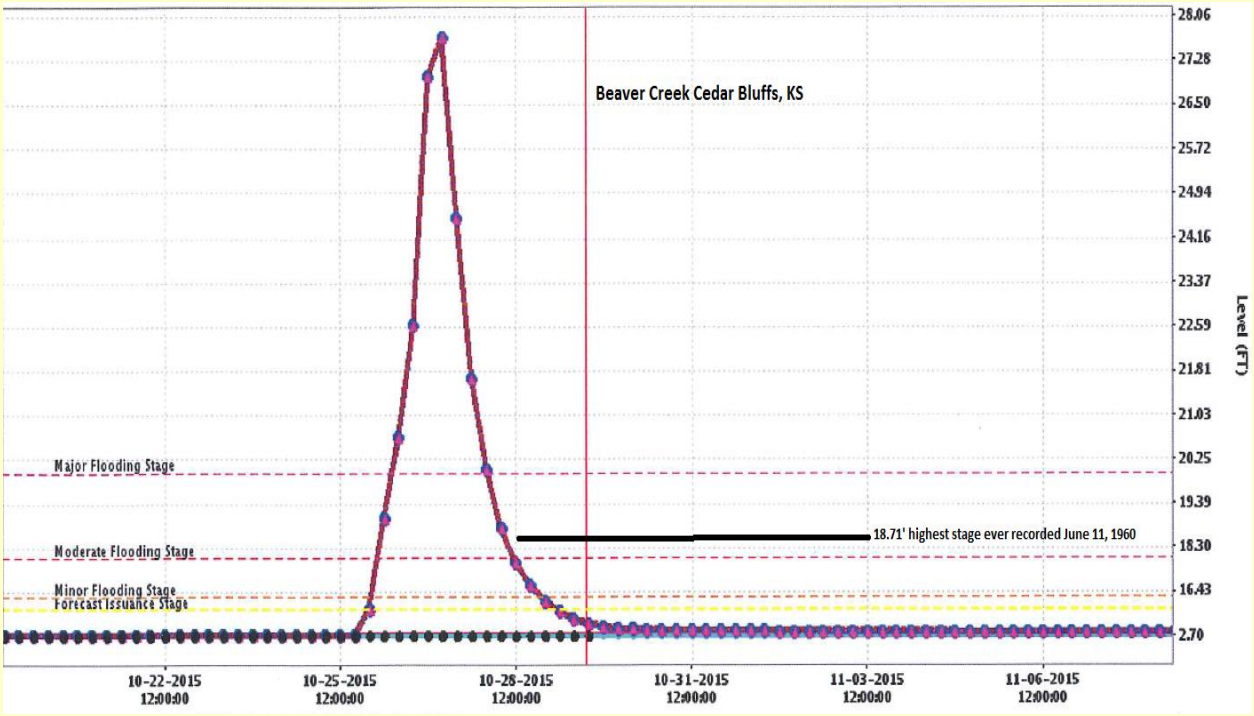


Above is a hydrograph for the Smokey Hill river at Oakley, KS. Notice that the stage would rise to nearly 26 feet within a six hour period and create major flooding.



This hydrograph above is for the Beaver Creek at Cedar Bluffs, KS. It would crest to near 28 feet within a six hour period, which would easily create major flooding.

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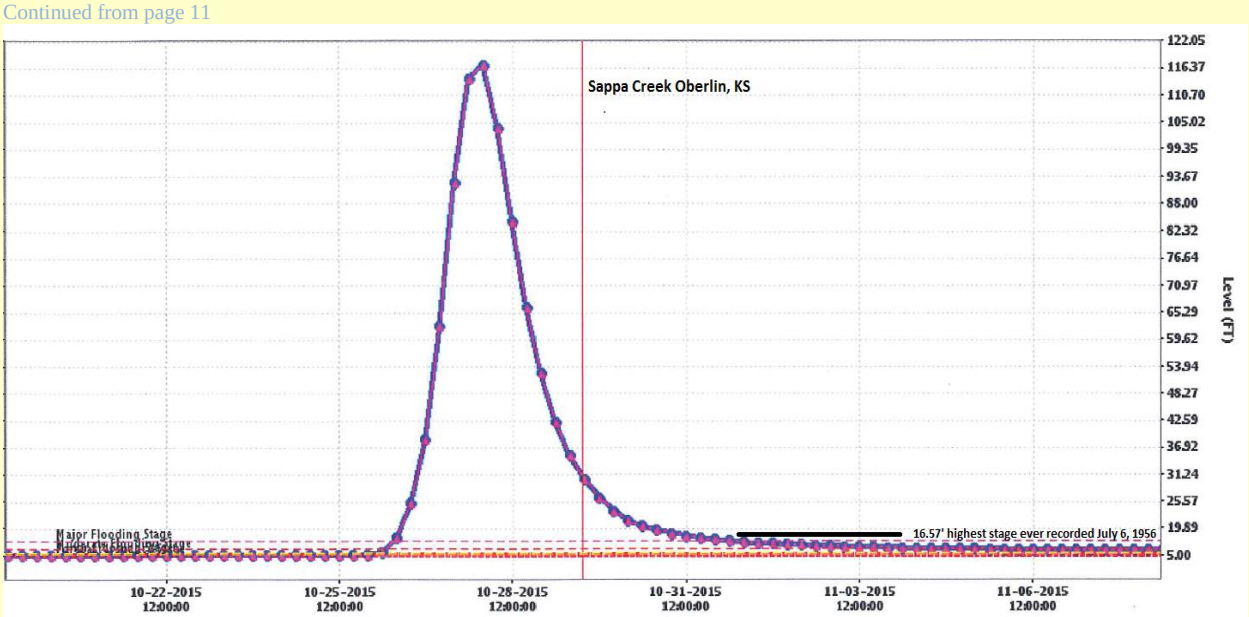
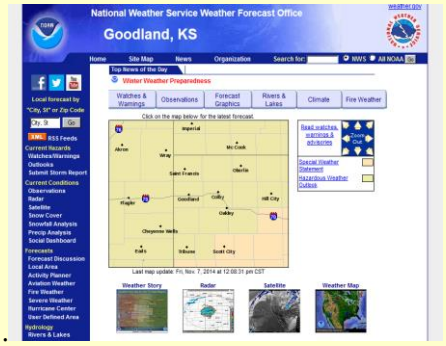


Finally, the hydrograph above is for the Sappa Creek near Oberlin, KS. This one is quite impressive but also questionable as to whether or not a river stage of 116 feet is possible. The highest stage ever recorded is 16.51 feet July 6, 1956. At 27.5 feet, overflow of US Highway 83 on the south approach of the bridge begins. The depth of the channel is unknown, but it is approximately 27.5 feet. So, extensive flooding many feet deep would spread across a very large area as the river would not be able to contain all the runoff.



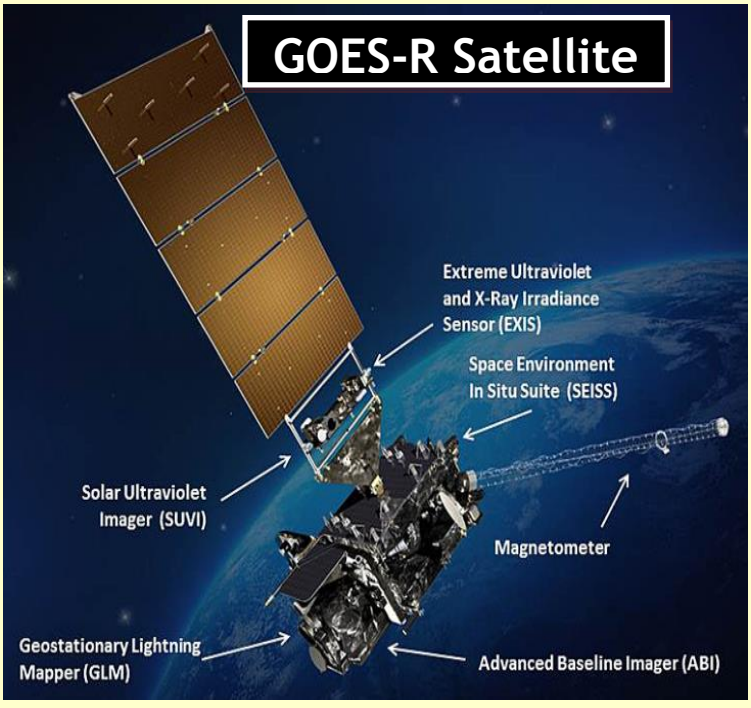
Check out our website for more information or catch up with us on Facebook or Twitter!

The Operational Proving Ground: Experiencing the Newest Satellite Technology

By Ryan Husted

In February 2015, I had the opportunity to represent NWS Goodland during a GOES-R satellite imagery testbed at the Operations Proving Ground in Kansas City, Missouri. Another forecaster, Mike Kochasic here at Goodland, was also able to attend this program in May 2015. Both of us were responsible for testing the new GOES-R satellite imagery in an operational setting. The testbed I participated in covered weather simulations, including severe thunderstorms in Nebraska, Kansas and Missouri, flooding in Arizona and California, wildfire growth in California and stratus and fog in the San Francisco Bay area. On the contrary, Mike participated in live severe weather warning simulations in which warning products were issued in a testing, non-public environment.

After all this talk about GOES-R, you may be asking "what exactly is GOES-R?" GOES-R stands for Geostationary Operational Environmental Satellite - R series. Basically, this is the next generation of geostationary weather satellites produced by the United States. The first GOES-R satellite is scheduled to launch in 2016. The purpose of this new satellite is to provide "continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring to provide critical atmospheric, hydrologic, oceanic,



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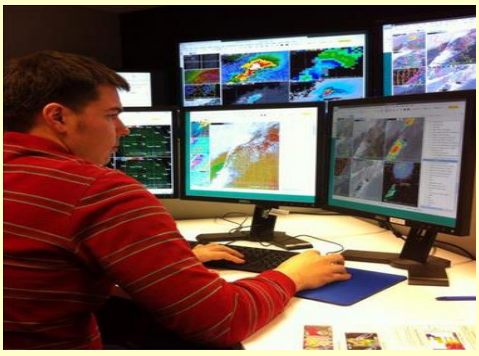
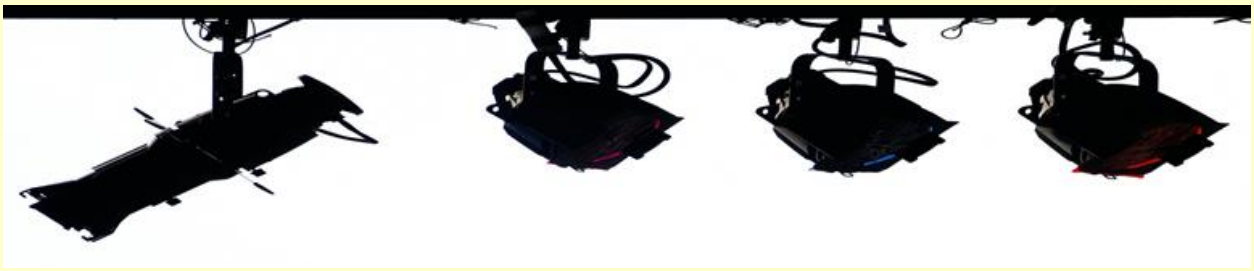
climatic and space data." In essence, this satellite is responsible for providing information useful for the advanced warning of atmospheric and solar events, particularly weather events and solar storms.

The biggest improvement expected from the GOES-R satellite, compared to our current GOES satellites, is its capability of producing new images as frequently as one minute for local, regional and national office use, including those of us here at NWS Goodland. One minute imagery is a drastic improvement compared to what we currently receive when "rapid scan operations" are called, which produces new images as frequent as five minutes. Further, the new GOES-R satellite is able to produce a continental United States image every five minutes compared to the current 15 minute GOES scan. To put this into perspective, the Goodland WSR-88D radar produces a new full radar scan/image every five minutes. In fact, as soon as a storm begins to build, the new satellite imagery will capture the process of cloud development well before the radar first detects precipitation from these storms. The new imagery from GOES-R will help us provide increased lead time in our warnings and forecasts for events such as initial development of severe thunderstorms, beginnings of a dust storm or a better understanding on current and anticipated atmospheric parameters.

In the end, the GOES-R satellite will provide many significant benefits to our operations in the National Weather Service. The new GOES-R imagery provided will be vastly superior to what we receive now from the current GOES satellites. We eagerly await the arrival of the new imagery this spring or summer!



Forecaster Ryan Husted evaluating the new GOES-R satellite technology at the Operational Proving Ground in Kansas City.



Employee Spotlight: NWS Goodland Welcomes New Meteorologist

This past May, the National Weather Service Forecast Office in Goodland had the privilege of hiring Camellia Tipton to join our team of talented meteorologists. Recently, she had the chance to answer a few questions about her career journey and impressions about her new position.

Q: How did you become interested in meteorology?

A: I first remember being interested in meteorology back in high school, and weather was already a part of my family with Ken Graham (National Weather Service Meteorologist-in-Charge, Slidell, LA) being a second cousin of mine. However, meteorology was actually not my first adventure of study in college. In high school I was preparing to study engineering, and then I changed to study business management. Ken was always a mentor of mine, and the love of weather and forecasting found me in college. I switched my major area of study to meteorology, and my love for weather continued on from there.

Q: What educational background helped you get a position in the National Weather Service?

A: I attended Arizona State University in Tucson, AZ and obtained my Bachelor of Science degree in Geography with a concentration in Meteorology and Climatology. I chose to continue my education in graduate school at Mississippi State University, and I graduated with a Master's Degree in Geosciences with a focus on Professional Meteorology.

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Q: What have you enjoyed most about becoming a meteorologist in the National Weather Service?

A: There are numerous aspects that I enjoy, but what comes to mind first is helping and working with people. Besides working with a great team in the office, I enjoy providing weather information to our emergency responders and the general public that call our office. It is amazing how our weather information and forecasts influence the choices of many for travel and agricultural interests. I see the National Weather Service as a whole becoming more involved in providing weather support to those who need it, and I am looking forward to continue working with customers and providing accurate forecasts to them in the years to come.

Q: What are your first impressions of the High Plains?

A: Coming from Arizona and being used to the White Mountains, the entire area is much flatter than from what I am accustomed! I also noticed the wind seems to be consistently gusty on most days, which is also something different for me. A lot of the area is covered with farms and ranches. I am learning a lot about the "farming life" now that I am here in Goodland.

Q: Tell us a fun fact or two about yourself!

A: I am a football fan! I follow America's Team: The Dallas Cowboys! I also stay true to the colleges that I attended by following the Arizona State Sun Devils and the Mississippi State Bulldogs. I have a miniature Dachshund at home, and his name is Weenie. I also really enjoy getting away to the mountains of Colorado to hike in my spare time.

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Q: Do you have any advice to give to those interested in a career in meteorology?

A: The first thing is to go to college and get a degree in meteorology. Before you graduate, give some thought as to where you would like to work because there are different avenues to pursue in the meteorology field (National Weather Service, Broadcast TV, Military, and other private companies). I also feel that it is important to get involved by volunteering and getting your name out there. It helps to make contacts so that people know who you are. That being said, it is also important to find a mentor within the specific company where you want to work. A mentor is crucial to finding out the "in's and out's" of any career, including providing advice when you need help. The job market is tough out there in meteorology, so you must have determination and don't give up! And remember to have fun!

Twenty inches of snow fell during the Northwest Kansas Blizzard for some locations on November 18th, 2015. Here is a picture shared via Facebook from Rebecca Vyzourek of Atwood, KS.

Have you heard the news?

Goodland Meteorologist-In-Charge Retires

Scott Mentzer, the Meteorologist-In-Charge (MIC) for the Goodland Weather Forecast Office, retired on August 1, 2015. Scott had been at the Goodland office since 1994. During his time as the Goodland MIC, Scott was instrumental in leading the office through many changes as the National Weather Service evolved during the Modernization and Restructuring during the 1990s. He also ensured many facility improvements over the last 20+ years. Scott was influential in promoting leadership within the National Weather Service, including empowering those with whom he worked. Over 100 people began their career at the Goodland office and have benefited from his leadership in other locations and positions, including management positions within the National Weather Service. Scott's leadership and influence will be missed.

Until a permanent replacement is determined for Scott, Dave Floyd (Warning Coordination Meteorologist) will serve as the Acting Meteorologist-In-Charge for the Goodland office until November 28th. Jeremy Martin (Science & Operations Officer) will take over for the next 120 days until a permanent replacement is selected.

Cooperative Observer News

Measuring & Recording Snowfall

By Brian Warren

The following guidelines pertain to measuring snowfall. For a more complete description, you may request a copy of the full guidelines (NWS Snow Measurement Guidelines) and/or a DVD on measuring snowfall from the National Weather Service Office in Goodland.

Please remember that **Snowfall** is recorded to the nearest tenth of an inch, meaning one decimal place (i.e. 0.5", 8.4" or 15.9"), and rounded to the nearest tenth of an inch in all cases. And **Snow Depth** is recorded to the nearest inch (i.e. 1", 3" or 15").

If you have not already done so, please set up your rain gauge for the winter. Remove the funnel and inner tube from the outer can. This will allow the outer can to catch precipitation of all types and sizes without clogging the funnel.

Place your snowboard in an unrestricted area. The location should be away from buildings, trees, and not in an area where drifting snow would result in higher snow depth amounts.

There are three measurements you will need to take at your observation time:
1. Precipitation (water equivalent of snow).
2. New Snowfall.
3. Total Snow Depth.

To measure and record the precipitation (water equivalent of snow), bring the outer can inside and choose one of the two ways:

1 - Wait for the freezing precipitation to melt.

Put the funnel back over the inner tube and pour the contents of the outer can into the tube. Measure this total with a rain gauge stick and record it.

OR...

2 - Fill part of the inner tube with hot water and measure that amount using the rain gauge stick.

Pour the hot water into the outer can causing the snow to melt.

Once the water has melted put the funnel back over the inner tube and pour the contents of the outer can into the tube. Measure this total with the rain gauge stick.

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Now, subtract the amount of hot water that you poured in from the total amount of water you just measured to get your measurement and record it.

To measure new snowfall amount, use a snow stick to measure the depth of the snow on your snowboard. Then flip over (or clear off) the snowboard to use for the next snow event. ***If possible, try to measure new snow fall when the snow has stopped. This may not be at your observation time***

To measure snow depth, use a snow stick and measure the depth of about 3 to 5 spots around your rain gauge and record the average.

Please contact Brian Warren, Observing Program Leader at the National Weather Service in Goodland, Kansas with any questions at 785-899-7119 or brian.warren@noaa.gov.

CoCoRaHS Corner

Get ready for winter! Copy and paste the link below into your favorite internet browser to learn how to properly measure snow with your CoCoRaHS gauge:

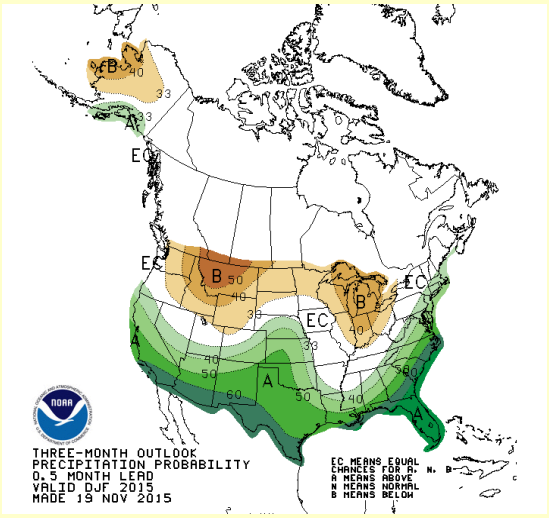
http://cocorahs.org/media/docs/measuringSnow2.1.pdf

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!

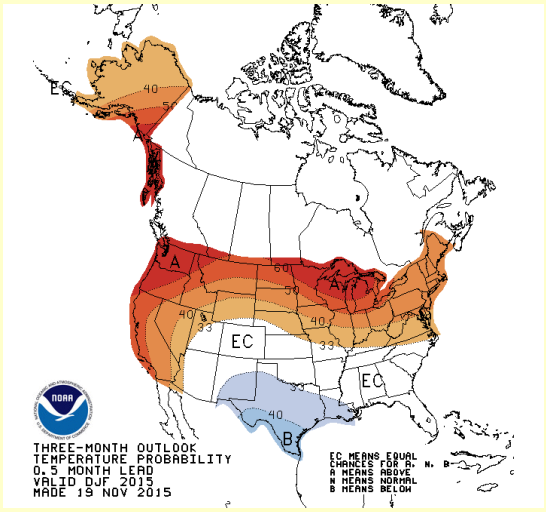
Climate Corner

Current Weather Information for Our Area

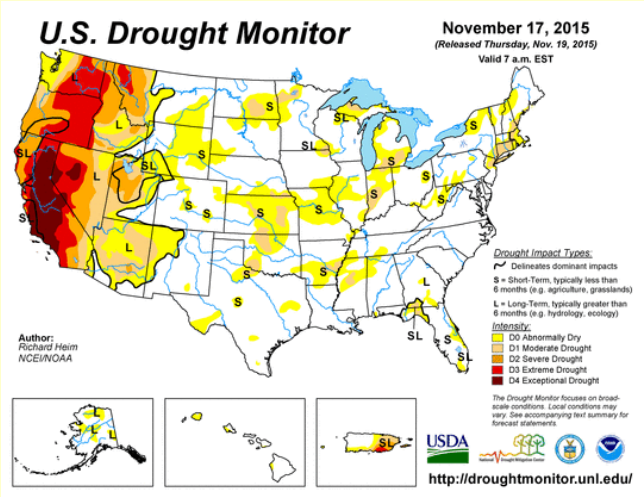
Latest Extended Outlooks



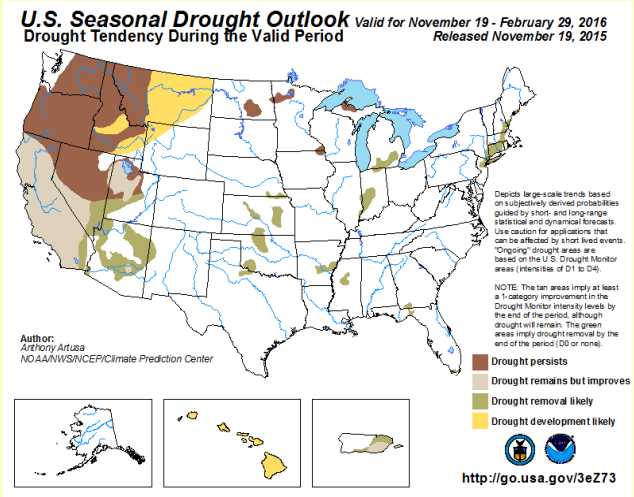
Precipitation Outlook (Dec. 2015 – Feb. 2016)



Temperature Outlook (Dec. 2015 – Feb. 2016)



Current Drought Monitor (as of Nov. 2015)



Drought Outlook (Dec. 2015 –Feb. 2016)

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	23.07	6.07
Goodland	20.28	1.13
Hill City	19.53	-2.64
McCook	20.43	-1.38
	*As of November 27, 2015	

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.