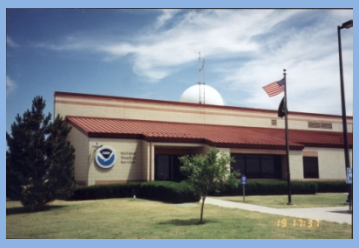

High Plains Wind

(Weather Information News Data)

July 16, 2010
Volume 4 Issue 2

National Weather Service, 920 Armory Road, Goodland, KS 67735
http://www.weather.gov/gld/ w-gld.webmaster@noaa.gov 785-899-7119

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"One of the most frequent questions our office receives during this time of year regards relative humidity."

A Message from the Meteorologist-in-Charge

By Scott A. Mentzer

Decision Support

Weather decision support comes in many different varieties. The National Weather Service (NWS) works closely with emergency managers and first responders during high impact weather events. However, there are other weather impacts that are critical during smaller events. For example, rain during an outdoor wedding may not be hazardous, but it has a huge impact on the bride, groom, and the wedding party.

One of the most frequent questions our office receives during this time of year regards relative humidity. Harvesters need low humidity values to maximize their yields. So, we frequently hear a question like this: "When is the humidity going to drop below 50% during the next several days? Oh, and we don't need any rain either." Although we encourage folks to give us a call, there is also a tool available on the internet that can produce valuable information that may be useful to answer requests like this. It is known as the Weather Activity Planner tool.

To access the tool, go to the Goodland NWS web site (http://weather.gov/gld) and select Activity Planner on the left side menu. To see what this looks like turn to page eight.

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Ever Wonder?

By David Thede, Lead Forecaster and David L. Floyd, WCM

Have you ever wondered or been curious about where the weather observations you hear on NOAA All Hazards radio or various media outlets come from? We'll feature a different weather station in each newsletter.

Goodland Renner Field ASOS

On June 24, 1992 Goodland Renner Field's ASOS (Automatic Surface Observing System) became the official means of collecting and reporting weather data for weather related activities, aviation and climate research. ASOS works non-stop updating observations every minute, 24 hours a day, 365 days a year. Hourly observations are sent with special observations being transmitted when significant changes are detected.

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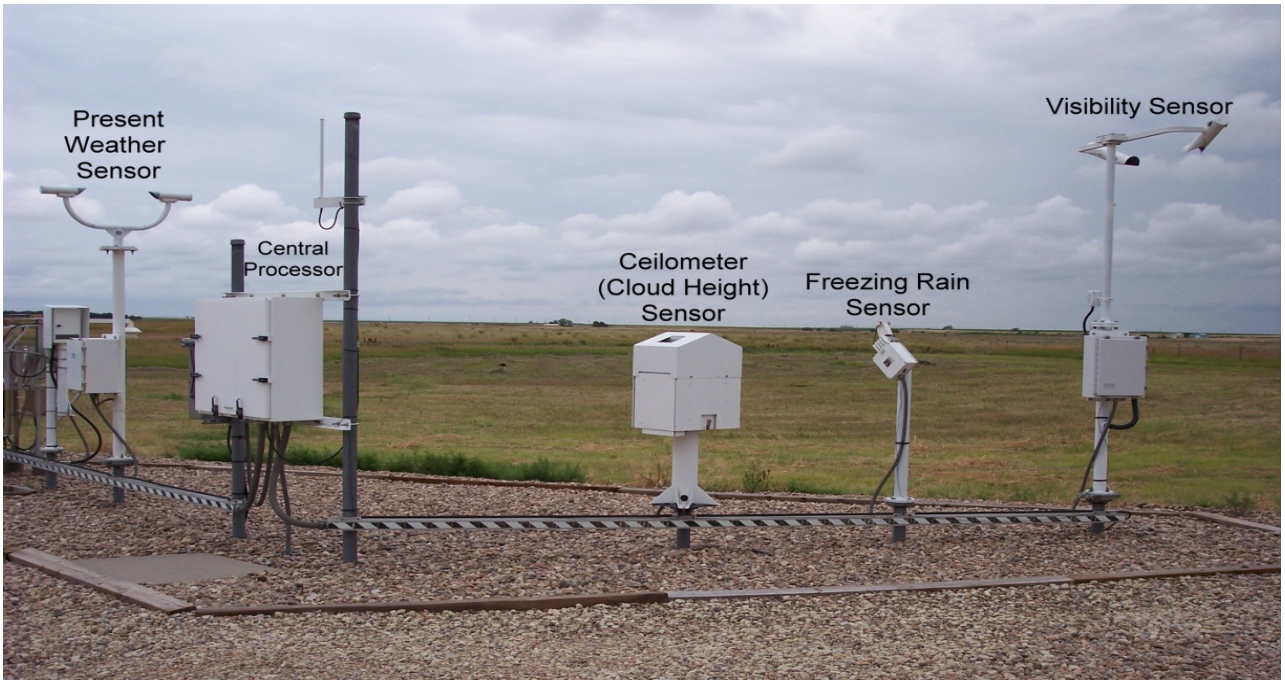

ASOS data includes a ceilometer (measures cloud height and amount up to 12,000 feet), visibility sensor (up to 10 statute miles), present weather sensor (type and intensity for rain and snow), obstructions to vision (haze and fog), pressure (both sea level pressure and altimeter), ambient temperature and dew point temperature, ice free wind sensor (direction, speed and character…gusts or squalls), AWPAG (all-weather precipitation accumulation gauge – see page 10 for more information about this) which measures precipitation accumulation both rain and snow, and a freezing rain sensor.

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In the 18 years since ASOS has been commissioned in Goodland the following weather extremes have been measured:

Highest maximum temperature - 109F July 20, 2005
Lowest minimum temperature - -19F February 3, 1996
Daily record precipitation - 3.10 inches August 12, 1993
3 day consecutive record precipitation - 4.41 inches June 10-12, 1999
7 day consecutive record precipitation - 4.91 inches August 17-23, 1993
Highest sea level pressure - 30.89 inches March 21, 2002 and Jan 2, 2008
Lowest sea level pressure - 28.94 inches April 11, 2001
Highest peak wind gust - 96 mph May 24, 1994
Highest daily average wind speed - 36.6 mph Oct 5, 1995

Did you know you can find us on Facebook?

Follow us at:

http://www.facebook.com/US.National.Weather.Service.gov

DualPol Coming to a Radar Near You...

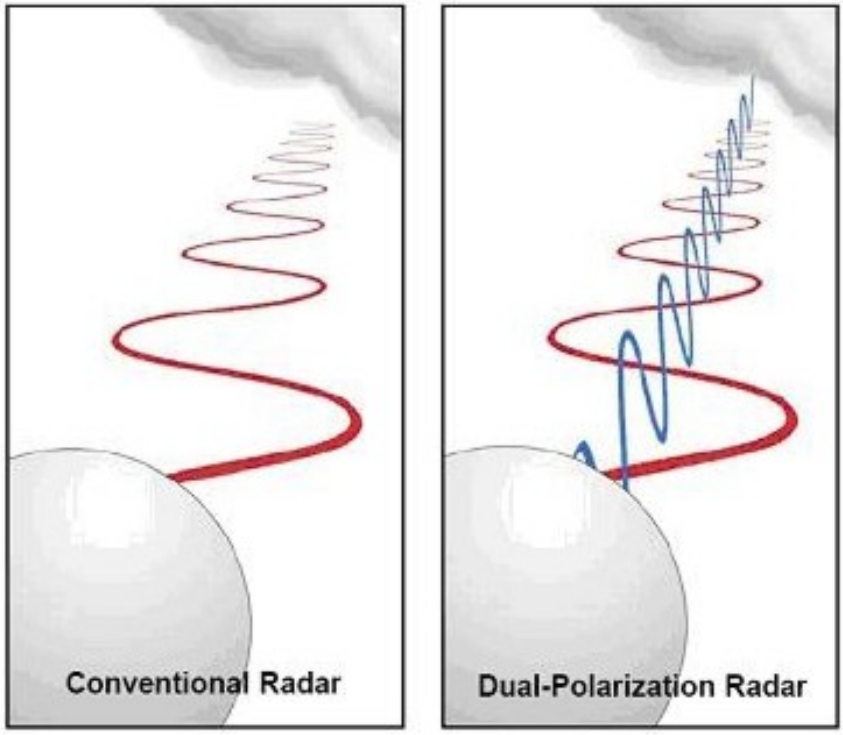
Dual Polarization

By Mickey McGuire, Senior Forecaster

The most effective tool to detect precipitation is radar. Radar, which stands for **RA**dio **D**etection **A**nd **R**anging, has been utilized to detect precipitation, and especially thunderstorms, since the 1940's. Radar enhancements have enabled NWS forecasters to examine storms with more precision.

The radar used by the National Weather Service is called the WSR-88D, which stands for Weather Surveillance Radar - 1988 Doppler (the prototype radar was built in 1988). As its name suggests, the WSR-88D is a Doppler radar, meaning it can detect motions toward or away from the radar as well as the location of precipitation areas.

There are 155 WSR-88D Doppler radar in the nation, including the U.S. Territory of Guam and the Commonwealth of Puerto Rico, operated by the National Weather Service and the Department of Defense.



Dual-Polarization Radar transmits both horizontal and vertical pulses. This technique gives meteorologists better information regarding the size, shape, and density of rain droplets.

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Starting in early 2011, the National Weather Service will begin to upgrade existing NEXRAD Doppler radars to dual-polarimetric (dualpol) capabilities. The current WSR-88Ds transmit horizontal radio waves called pulses that bounce off precipitation and other objects in the atmosphere.

Dual-polarization radars transmit and receive pulses with both horizontal and vertical orientations. This ability gives greater information on the size and shape of droplets in the atmosphere, as well as the density of these drops. This not only will help to improve precipitation estimates, it will also help discriminate between liquid and frozen precipitation.

The original testing for dualpol began in Norman, Oklahoma in 2003 and continues today. After many years of successful testing, WSR-88Ds across the country are scheduled to be upgraded beginning in 2011. The National Weather service in Goodland is expected to receive the upgrade in November 2011. The upgrade takes approximately 2 weeks to install and configure.

The following benefits have been documented with initial testing of dual-pol radars:

- Improved accuracy of precipitation estimates.
- Discrimination between heavy rain and hail, improving flash flood detection.
- Discrimination between different types of precipitation, whether frozen or liquid.
- Improved detection of aviation hazards such as birds.
- Detection of aircraft icing conditions.
- Increase in confidence in radar data, contributing to increased lead times in flash flood and winter weather warnings.

We need your feedback – please take our survey!

https://svy.cfigroup.com/cgi-bin/qwebcorporate.dll?idx=3XRBCG

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) is committed to serving the needs of all of its customers. The NWS is undertaking research on how satisfied users are and would appreciate your feedback. The purpose of this research, conducted in partnership with the federal government as part of the American Customer Satisfaction Index, is to help the NWS improve its services for you and others like you.

Decision Support

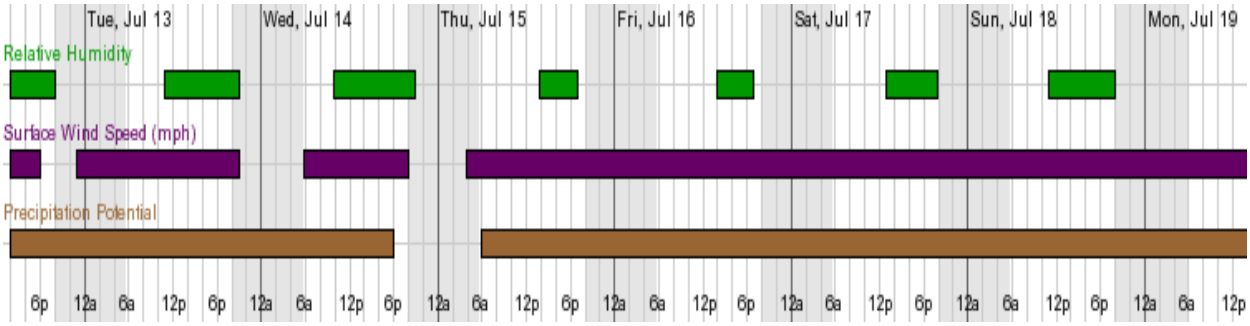
continued from page 1

This will take you to a page with a menu that looks like this:

Element	Min		Max	Element	Min		Max
Temperature (°F)		to		Surface Wind Speed (mph)		to	
Relative Humidity	0	to	40	Sky Cover		to	
Surface Wind Speed (mph)	0	to	10	Precipitation Potential	0	to	20

Complete the form with the data you want. The above example is requesting a forecast where the relative humidity will be less than 40%, the winds are less than 10 mph, and the chance of rain is less than 20%.

Of course, you can use any value you want. After setting the thresholds, click on the map for the location you desire. This will then provide you with a graph that meets all the values you need (see below).



Now, just look at the graph and note when all the color bars are filled. In the above example, the thresholds are all met on Tuesday, July 13, from 11 AM to 9 PM MDT. These forecasts are available for seven days. There are a number of other parameters you can specify including cloud cover, heat index, wind chill, and wind direction.

Whether you are planning for a wedding, making harvest decisions, or going to an autumn football game, the Weather Activity Planner can assist you make better decisions to minimize the impact of weather on your event.

Our Office's Newest Employees

Recent additions to the National Weather Service Goodland staff are pictured below. Chris and Pam recently accepted Meteorologist Intern positions. Dan is our newest General Forecaster and Jessica is volunteering at our office this summer. You may be seeing them soon at outreach events, or talk with them when you call our office.

Chris Schaffer received his Bachelor of Science and Master of Science degrees in Meteorology from Iowa State University in 2008 and 2010, respectively. While earning his degrees, he became especially interested in expressing forecast statistics which could better inform the industry and general public. His Master's degree research involved finding new approaches for determining probabilities of precipitation (POPs) that could outperform the approaches traditionally used. In his free time, Chris enjoys his involvement in the National Weather Association and American Meteorological Society, reading, and watching TV (especially "House"!). He is very excited to be a part of WFO Goodland, and would like to continue testing probabilistic forecasting approaches by using the precipitation forecasts and observations for the area.

Pamela Murray grew up in Centennial, Colorado and attended Metropolitan State College of Denver, graduating in 2003 with a B.S. in Meteorology. After graduation, Pam moved to rural northwest Missouri and commuted to Omaha, Nebraska to attend graduate school at Creighton University, completing her M.S. degree in 2008. In 2007, Pam began working for the University Corporation for Atmospheric Research (UCAR) as a contractor for the Air Force Weather Agency (AFWA) at Offutt AFB, Nebraska.

In her free time, Pam enjoys many outdoor activities including hiking, camping, dirt bike riding, and skiing/snowboarding. She also enjoys ballroom dancing and has recently been introduced to the lively sport of Ultimate Frisbee. Pam is excited to be in Goodland, Kansas as an employee for National Weather Service.

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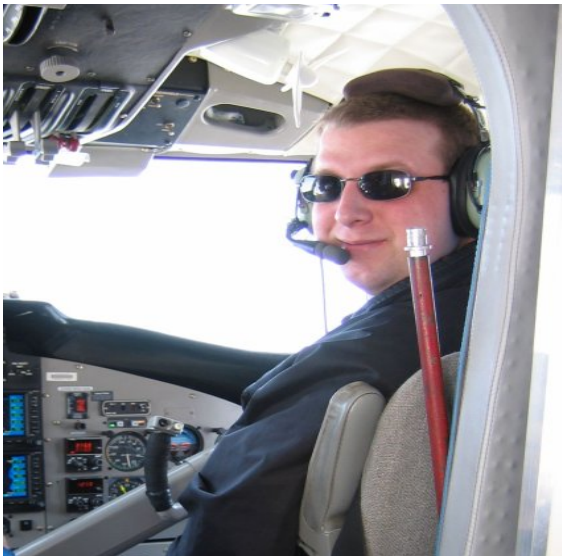

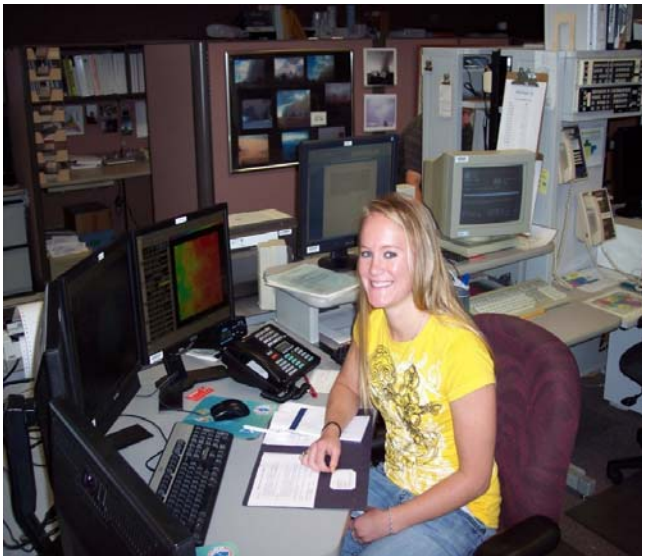

Daniel Robinson, our newest General Forecaster, came to our office from Fairbanks, Alaska where he had been serving as a Meteorologist Intern. He grew up in Washington, Missouri and attended the University of Missouri-Columbia (Mizzou). Dan began his NWS career at the Springfield, Missouri office where he was a volunteer. His first paid position with the NWS was in Nome, Alaska. He has been at our office since December of 2009. When Dan has free time he enjoys reading, watching movies and documentaries, sports, star gazing, weather watching, and hiking. He has a huge interest in history and visiting historical sites across the country.

Jessica Jacobsen is volunteering at our office this summer. She is currently a student at the University of Northern Colorado and will be a junior in the fall. Jessica is a Meteorology Major with a Minor in Computer Information Systems. To gain experience she hopes will lead to advancement in her future career, she decided to work at our office on a volunteer basis during her summer break. This worked out well for her since she lives in Burlington, Colorado with her parents during the summer. She hopes to qualify for a SCEP (Student Career Experience Program) position in the future with one of the National Weather Service offices in the area. Jessica says, "People always ask me if they're going to be seeing me on TV doing the weather, and I always respond the same way. Nope I want to do the forecasting with the NWS."

What is AWPAG?

By Grady Bonsall, ESA

What is AWPAG? **All Weather Precipitation Accumulation Gauge (AWPAG)**. Now that you know what the acronym stands for, let me explain what it is and does.

Typically the Automated Surface Observing System (ASOS) sites have a precipitation accumulation gauge to measure the amount of precipitation during an event. The traditional gauge is known as a Heating Tipping Bucket Rain Gauge (HTBRG). The HTBRG accurately measures liquid precipitation in most rain events except during excessively heavy rain events when the tipping bucket cannot tip fast enough and keep up. For freezing or frozen precipitation (e.g., freezing rain, snow, etc.) the HTBRG uses a heated collar and funnel to melt snow and ice so they can be collected by the funnel and measured by the tipping bucket. However, the heated funnel sometimes excessively melts snow resulting in significant losses and consequent under reporting of liquid equivalent precipitation accumulation. At other times, the heating is insufficient to prevent snow from building up, bridging over the gauge orifice, and forming a cap which prevents any further precipitation from falling into the gauge and being measured. This results in an under reporting of precipitation accumulation during the precipitation event and a false surge report when the cap melts at a later time. For this reason, NWS ASOS Planned Product Improvement (PPI) Program has identified an alternate technology precipitation gauge to replace the HTBRG at NWS sponsored ASOS sites. The ASOS All Weather Precipitation Accumulation Gauge (AWPAG) is designed to provide accurate measurement of all types of precipitation. In contrast to earlier weighing gauge designs, the AWPAG does not use oil to prevent evaporation. The AWPAG measures precipitation by weighing total accumulation and uses environmentally friendly antifreeze to liquefy the collected snow. The AWPAG also compensates for evaporation and wind-induced vibration effects via an internal algorithm.

HTBRG without wind screen

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AWPAG with new 8 foot wind screen

The AWPAG is currently being modified with an 8 foot diameter wind screen to help capture precipitation during wind driven snow events. Most precipitation gauges suffer from this problem because the orifice must be elevated above ground level with wind being deflected around and over the orifice. Turbulence deflects falling hydrometeors, with the greatest effect being on lighter, slow falling, and snow particles. One attempt at solving the under-catch problem is to add shielding to the gauge to reduce the wind speed and turbulence near the gauge orifice and thereby increase the snow that falls into the gauge. While many shields have been developed, there is a practical limit to the size and resulting cost in installing large and expensive wind shields. Over the last three years, the NWS has worked with the AWPAG manufacturer to improve the catch efficiency by attaching an eight foot diameter Alter style shield to their standard Tretyakov style shield. This has been proven to significantly improve catch of blowing precipitation.

The NWS is continuously working on more advanced methodologies to help gather climate data to improve the forecasts so we can provide accurate information to the public. One example is the AWPAG.

References:

https://www.fbo.gov/index?s=opportunity&mode=form&id=3ee9eef1e97f332f88db857faf0b56b8&tab=core&_cview=0

https://www.fbo.gov/index?print_preview=1&s=opportunity&mode=form&id=47222a856d909dbee1e0f69003a89b9e&tab=core&tabmode=list

http://www.nws.noaa.gov/ops2/Surface/documents/awpagimplan.pdf

Don't forget to tune to NOAA Weather Radio for the latest updates on weather in your area this summer!

Cooperative Observer News

by Mike Lammers, OPL, and Christina Henderson, HMT

Daryl Kopriva and Marcia Roemer were presented 10-year awards on June 7, 2010. They are the observers for the Cooperative Observer Station at Gove located four miles west of Gove, Kansas

Photo taken June 7, 2010 by Mike Lammers, OPL.

Daryl and Marcia will soon be featured in the National Cooperative Observer Newsletter. To view the latest issue click here: http://www.nws.noaa.gov/om/coop/newsletters/10spring-coop.pdf

See other recent award winners, and learn more about the Cooperative Observer program

.

Do You Remember The June 15, 1990 Tornado That Moved Across Southwest Nebraska?

On Friday, June 15, 1990 a tornado that was rated F4 on the Fujita Scale formed in Hitchcock County, Nebraska at 7 pm CDT and moved into Red Willow County before lifting at 7:45 pm CDT.

A description of the Fujita Scale ranking can be found at this website: http://www.spc.noaa.gov/faq/tornado/ef-scale.html

Damage from the Tornado

Hitchcock County

- 35 rural homes were damaged or destroyed in Hitchcock County along with numerous outbuildings, vehicles, trees, and power poles. Damage was estimated over $632,000.
- Crop damage in Hitchcock County was estimated at $1,240,000 with $600,000 to wheat, $500,000 to corn, $115,000 to milo, and $25,000 to pasture land.
- There was 1 injury in the county which was a shoulder injury of an elderly woman on a farm.

Red Willow County

- 4 farm houses and outbuildings, 4 mobile homes, and major high voltage power lines were damaged or destroyed.

Other Facts

- All communication in Hitchcock County was lost for about 4 hours and all highways into the county were closed to aid clean-up efforts.
- The tornado picked up water from Swanson Lake as dried mud 1 to 2 inches thick caked the southwest sides of the buildings, trees, and poles that were left standing in central Hitchcock County.

For more information contact **Christina Henderson, HMT** or check out the webpage she created at:
http://www.crh.noaa.gov/gld/?n=15june1990tornado

Lightning is one of the leading thunderstorm-related killers. Please keep these facts in mind as you enjoy outdoor activities this summer!

Lightning: What You Need to Know

- ***NO PLACE*** outside is safe when thunderstorms are in the area!!
- If you hear thunder, lightning is close enough to strike you.
- When you hear thunder, *immediately* move to safe shelter.
- Safe shelter is a substantial building or inside an enclosed, metal-topped vehicle.
- Stay in safe shelter at least 30 minutes after you hear the last clap of thunder.

Indoor Lightning Safety Tips

- Stay off corded phones, computers and other electrical equipment that put you in direct contact with electricity.
- Avoid plumbing, including sinks, baths, and faucets.
- Stay away from windows and doors, and stay off porches.
- Do not lie on concrete floors, and do not lean against concrete walls.

Last Resort Outdoor Risk Reduction Tips

NO PLACE outside is safe when lightning is in the area, but if you are caught outside ***with no safe shelter anywhere nearby*** the following actions *may* reduce your risk:

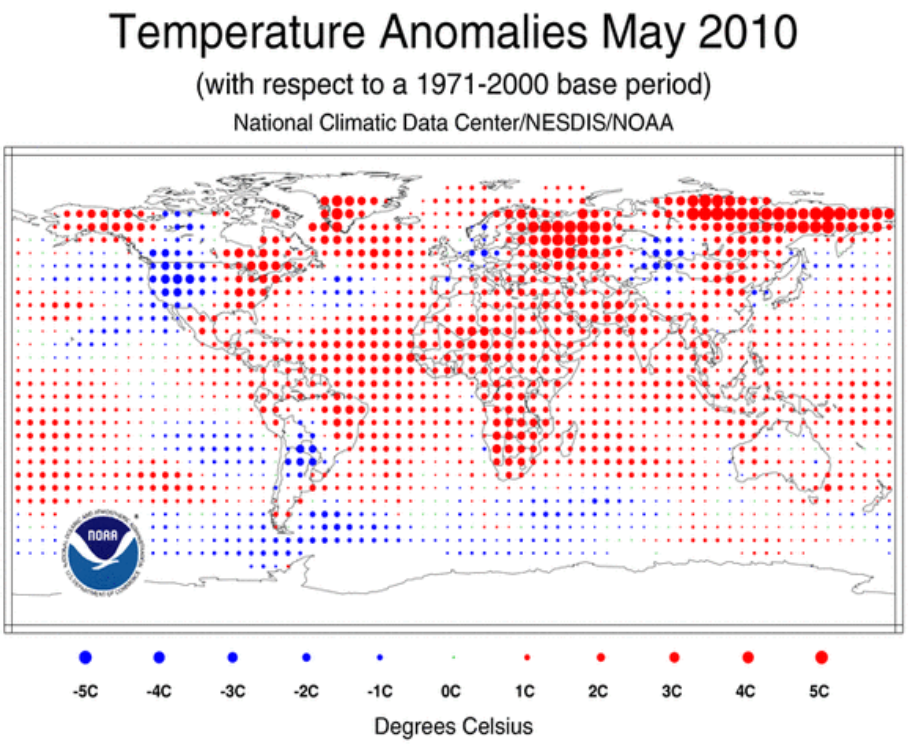
- Immediately get off elevated areas such as hills, mountain ridges or peaks
- NEVER lie flat on the ground
- NEVER use a tree for shelter
- NEVER use a cliff or rocky overhang for shelter
- Immediately get out and away from ponds, lakes and other bodies of water
- Stay away from objects that conduct electricity (barbed wire fences, power lines, windmills, etc.)
- UNDER NO CIRCUMSTANCES should ANY of the above actions be taken if a building or an all-metal vehicle is nearby

If Someone Is Struck

- Victims do not carry an electrical charge and may need immediate medical attention.
- Monitor the victim and begin CPR or AED, if necessary.
- Call 911 for help.

May Global Temperature is Warmest on Record

Spring and January-May also post record breaking temperatures



The combined global land and ocean surface temperature was the warmest on record for May, March-May (Northern Hemisphere spring-Southern Hemisphere autumn), and the period January-May according to NOAA. Worldwide average land surface temperature for May and March-May was the warmest on record while the global ocean surface temperatures for both May and March-May were second warmest on record, behind 1998.

The monthly analysis from NOAA's National Climatic Data Center, which is based on records going back to 1880, is part of the suite of climate services NOAA provides government, business and community leaders so they can make informed decisions.

Learn more at: http://www.noaanews.noaa.gov/stories2010/20100615_globalstats.html

Would you like to schedule a tour at our office? Give us a call at the number listed on page one. We will look forward to seeing you!

1935 Flood Presentations & High Water Marks

Commemorating the 75th Anniversary of the Flood on the Republican River

Arapahoe, Nebraska was presented a 1935 Flood High Water Mark sign from Joy Hayden on April 25, 2010. The sign will be at the old Arapahoe Light Plant owned by Doug and Cheryl Schutz.

Dr. Bob Butz, President of the Phelps County Historical Society accepted a sign at the Nebraska Prairie Museum on May 4, 2010. The sign will be placed in Alma, Nebraska at the site of their High Water Mark.

Gary Rogers accepted a High Water Mark sign for the City of St. Francis, Kansas, from David Floyd, WCM on May 22, 2010

Benkelman, Nebraska hosted a large crowd to hear about the 1935 Flood on May 27, 2010

Scott Mentzer, MIC, presented a High Water Mark sign to the community of Bartley, Nebraska.
May 29, 2010

Virginia Roberts accepted a sign on behalf of the city of Cambridge, Nebraska. Cambridge has two High Water Marks in their community.
May 29, 2010

Scott Mentzer presented a sign to the village of Haigler, Nebraska at a presentation at their community center.
June 2, 2010

A large crowd assembled in Burlington, Colorado at Old Town on June 3, 2010. Many survivors of the flood were there to share their personal experiences during the flood.

The Norton Library was the site of a recent presentation. Joining us in presenting the program was Marlene Wilmot, author of the Bluff to Bluff book series.

Additional sign presentations and programs are scheduled in the coming months in Trenton and Indianola, Nebraska, and Idalia and Beecher Island, Colorado. If you are interested in attending a program, or hosting a program in your community, please contact our office!

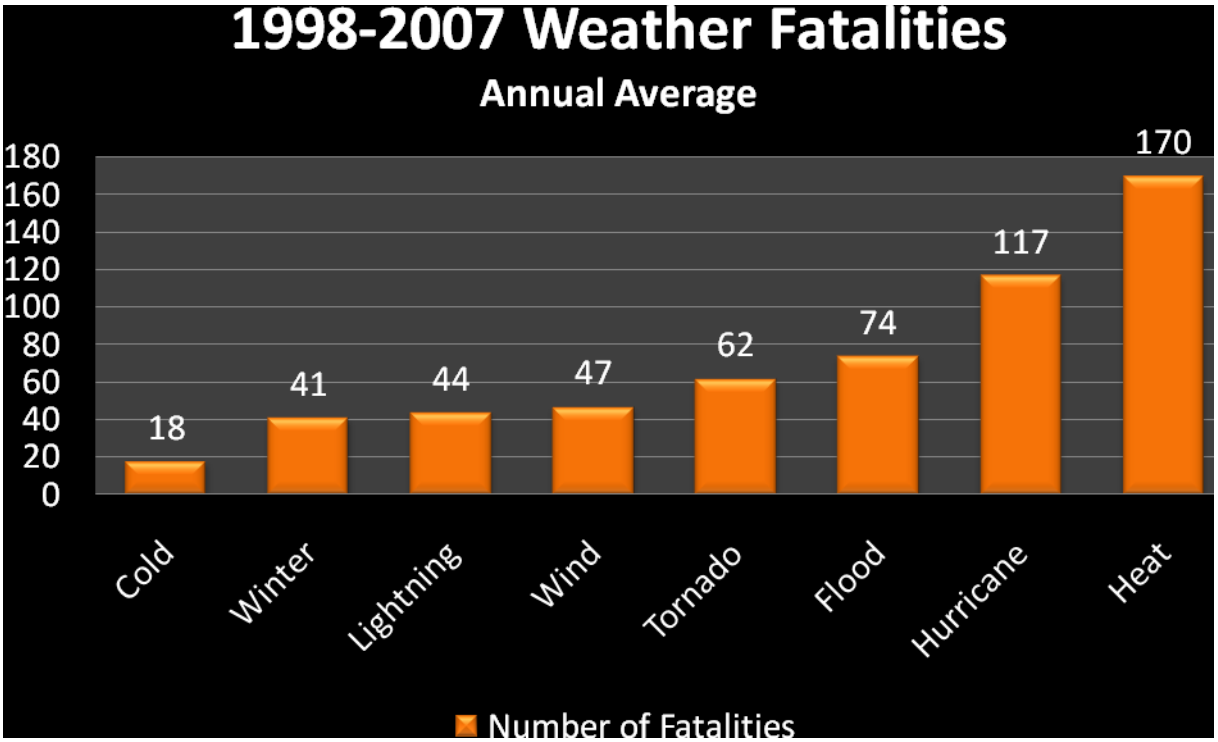
Check out the website at:

http://www.crh.noaa.gov/gld/?n=1935flood

Summer Heat Upon Us Once Again…

-Chris Foltz, General Forecaster

Hot summer days are inevitable across the central High Plains. As we move into the heart of the summer season, it's a good time to be reminded of just how quickly heat can adversely impact those living in the Tri-State region. Across the United States on an annual basis, deaths from heat related causes rank at the top of all weather related fatalities, claiming an average of 170 lives each year.



Your National Weather Service office in Goodland will issue a Heat Advisory when heat index values are expected to be near 105°F for any length of time. An Excessive Heat Warning is issued when heat index values are expected to approach 110°F for two or more consecutive days. The heat index value is calculated by a formula which takes into consideration the air temperature and dew point. Be sure to take time to check on friends and neighbors, especially the elderly, to ensure they are staying cool. Take a few moments to review the safety tips listed below to ensure you don't become a statistic.

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Heat Wave Safety Tips **-**
(*http://www.nws.noaa.gov/os/brochures/heat_wave.shtml*)

Slow down**.** Strenuous activities should be reduced, eliminated, or rescheduled to the coolest time of the day. Individuals at risk should stay in the coolest available place, not necessarily indoors.

Dress for summer**.** Lightweight light-colored clothing reflects heat and sunlight, and helps your body maintain normal temperatures.

Stay hydrated**.** Drink plenty of water or other non-alcohol fluids. Your body needs water to keep cool. Drink plenty of fluids even if you don't feel thirsty.

Do not drink alcoholic beverages**.**

Do not take salt tablets unless specified by a physician.

Spend more time in air-conditioned places**.** Air conditioning in homes and other buildings markedly reduces danger from the heat. If you cannot afford an air conditioner, spending some time each day (during hot weather) in an air conditioned environment affords some protection.

Don't get too much sun**.** Sunburn makes the job of heat dissipation that much more difficult.

Tornado 23 miles northeast of Hoxie, June 11, 2010
Photo courtesy of John P. Scott

National Weather Service
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785-899-7119

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785-899-3501

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w-gld.webmaster@noaa.gov

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.