THE RADAR POST

NWS GOODLAND'S NEWSLETTER SINCE 2017

Volume 4, Issue 1 March 2021

Message from the MIC

After the extreme cold temperatures in the middle of February, we were back to normal temperatures by the end of the month. As spring begins later in March, our dedicated staff is ready to confront whatever weather awaits us and assist the people in our region.

Starting March 2nd, our office will be providing virtual spotter talks. Trained spotters are some one of the most important people that can assist our office. We have the tools, training and technology to assist us in the warning process. However, trained spotters can assist our office with providing ground truth. If you want to help your local community, become a trained spotter today. Training is free of charge and you may repeat it as often as you wish.

As our office provides a continuous weather watch, we will also find more ways to communicate the potential impacts that weather has in our communities. Effective communication will assist those where weather impacts them on a daily basis. At the end of this newsletter is a Weather-Ready Nation (WRN) Ambassdor newsletter. We will be adding this as a feature in future newsletters to spread the word about this unique program. Organizations that want to learn more or join the program should contact our office.

As your MIC, I promise that our office will continue to improve and provide the best services possible to our communities.

Ed Holicky, Meteorologist-In-Charge

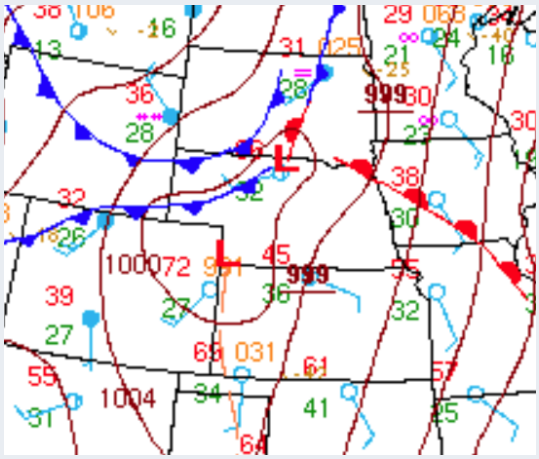
INSIDE THIS ISSUE

WRN Ambassador Newsletter *NEW* * Virtual Spotter Talks * Spanish Resources * WSSI * Blizzards

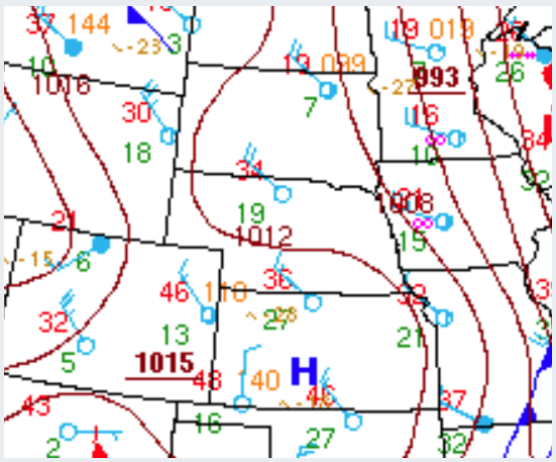
Photo by Ed Holicky

It Was a Cold One

It only seemed like last issue when we were talking about a record breaking early snowfall for the Tri-State area. Well February, not wanting to be left out of the party, decided to give us another event for the history books. The middle of February brought us an event where we observed record stretches of days below 32°F, record low maximum temperatures and plenty of record low temperatures. But before we dive into those records, let's take a look at the setup for the event.

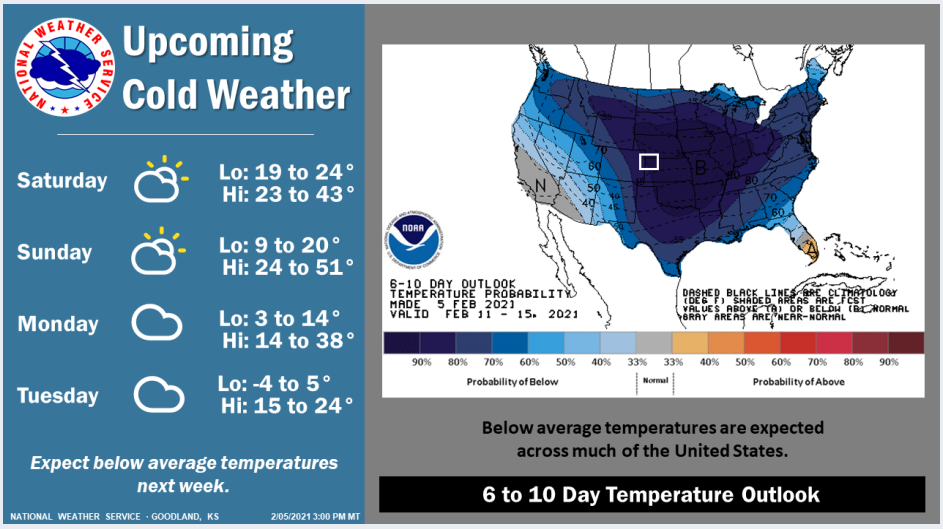


Wednesday February 3rd



Thursday February 4th

On February 3rd the area was experiencing a day with well above average temperatures with highs in the 60's and 70's. However, a cold front was moving south toward the area (it looks like 2 on the map but it was actually just one boundary). It's not uncommon for this time of year to go from warm to cold with the passing of a cold front and it actually brought the area closer to average in the 40's for Feb. 4th. Cold air moved in behind the front along with surface high pressure and another typical system passed. This would be the first of multiple fronts and the beginning of a takeover of cooler air. As a graphic we posted on Feb. 5th highlighted, the cold air was expected to last through at least the next 10 days.



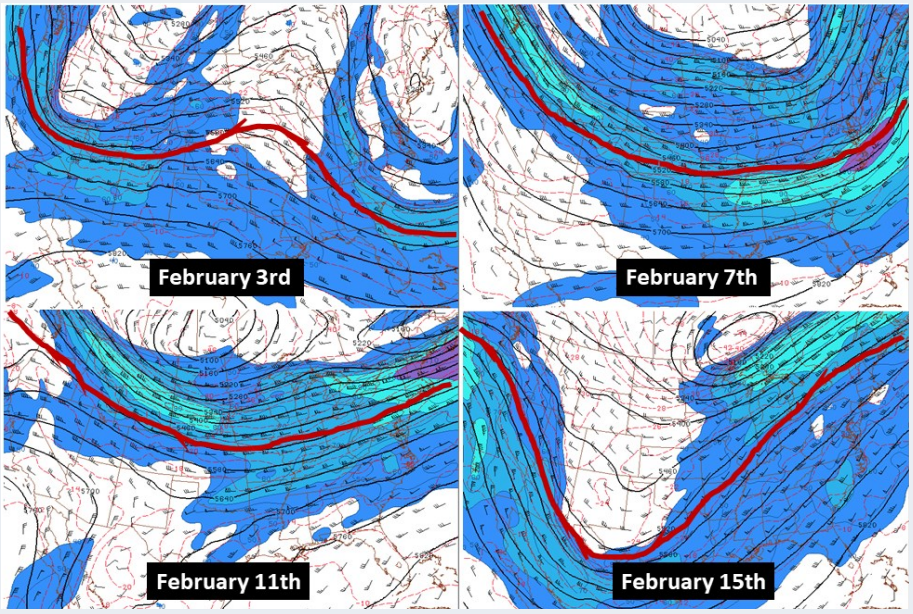
A graphic posted on February 5th highlighting the upcoming cold.

Continued next page...

Record cold, cont.

And last, the cold temperatures did. After Feb. 6th, Goodland did not get above freezing for 13 days as a broad trough aloft set up over the continental United States. For those unfamiliar, a trough aloft is a U shaped feature on a 500mb plot of heights (example pictured right).

What this often means is that heights are decreasing. This decrease in heights is due to colder air moving in and contracting the column of air since cold condenses air and heat expands it. However, the trough was not the only feature that set up over the area.

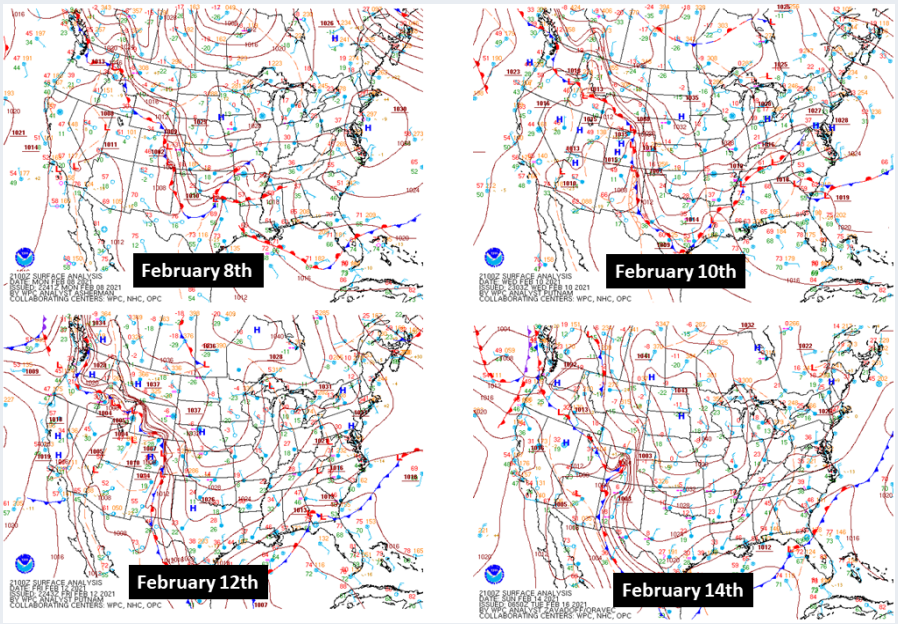


500mb maps showing the trough, red line is a guide for the general pattern.

We looked at the pattern higher up in the atmosphere, and it lined up perfectly with what you would expect from an arctic air mass. An area of high pressure set up and dominated over the center part of the nation, remaining in place through the cold weather, as seen in the graphic below. The colder air is more dense and as a result, increases the pressure at the surface.

This was an historic event. As alluded to earlier, quite a few records fell during this time period.

For Goodland, from Feb. 12th to Feb. 15th the record low maximum temperature was broken each day. A high temperature of -1°F was observed on Feb. 14th. Record lows were set as well on the 14th and 15th with the low of -24°F on the 15th breaking the record for lowest temperature ever observed in the month of February at Goodland. This is on top of wind chills getting down into the -30's.



Surface maps from February 8th to February 14th.

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Record cold, cont.

Just a week after this event wrapped up, temperatures warmed into the 70's, which brought a couple of places within 6°F of a record high. The warm up between the morning of February 15th and the afternoon of the 23rd resulted in extreme temperature changes ranging from 83°F to 98°F warmer.

These extreme temperatures in the Tri-State area could be on the record books for many years to come.

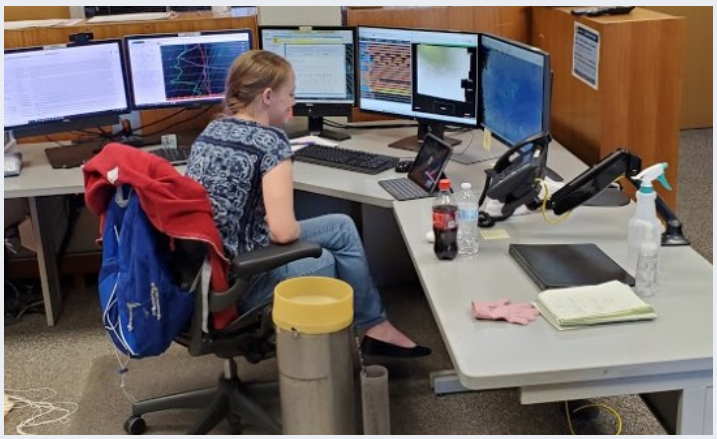
What A Difference a Week Makes

Location	Morning Low February 15th	Afternoon High February 23rd	Temperature Change
Kit Carson, CO	-29°F	69°F	+98°F
Burlington, CO	-24°F	70°F	+94°F
Goodland, KS	-24°F	69°F	+93°F
McCook, NE	-22°F	66°F	+88°F
Colby, KS	-26°F	72°F	+96°F
Gove, KS	-22°F	72°F	+94°F
Tribune, KS	-25°F	72°F	+97°F
Hill City, KS	-20°F	75°F	+95°F
Yuma, CO	-21°F	62°F	+83°F

NWS Goodland Goes Virtual

In a day and age where the world has come to rely on virtual meetings to stay connected, forecasters at the National Weather Service office are turning to virtual means to continue to provide office tours and school talks.

October was a busy month for virtual trainings, tours and school presentations. At the start of the month, NWS Goodland unveiled four winter spotter training videos talking about various topics including winter weather safety and measuring winter weather.



Meteorologist Amanda Wekesser giving our first virtual tour.

On October 12th, NWS Goodland hosted its first virtual office tour. Utilizing Google Hangouts, meteorologist Amanda Wekesser led the tour which highlighted forecasting tools such as satellite, how National Weather Service forecasters put together the forecast, issuing warnings during inclement weather events and the importance of spotter reports.

"Radar can give us a good idea of what a storm is doing, but spotter reports fill in the finer details of what is happening," said Wekesser.

The tour ended with an explanation of several tools meteorologists use to measure weather such as a weather balloon and a rain gauge.

If you are interested in participating in a virtual office tour or a school weather talk, please contact our office.

Kids Korner: Make a Spinning Beaufort Scale

The Beaufort scale was one of the first scales to estimate wind speeds using visual observations. This scale has been adapted over the centuries to estimate winds over water and land on a scale of 0-12. Use the attached chart and follow the directions below to make your own Beaufort scale!

What you will need:

2 sheets of heavyweight paper
Small circular plate (for tracing)
Ruler
Markers, crayons, or colored pencils
Scissors
1 paper fastener

Instructions:

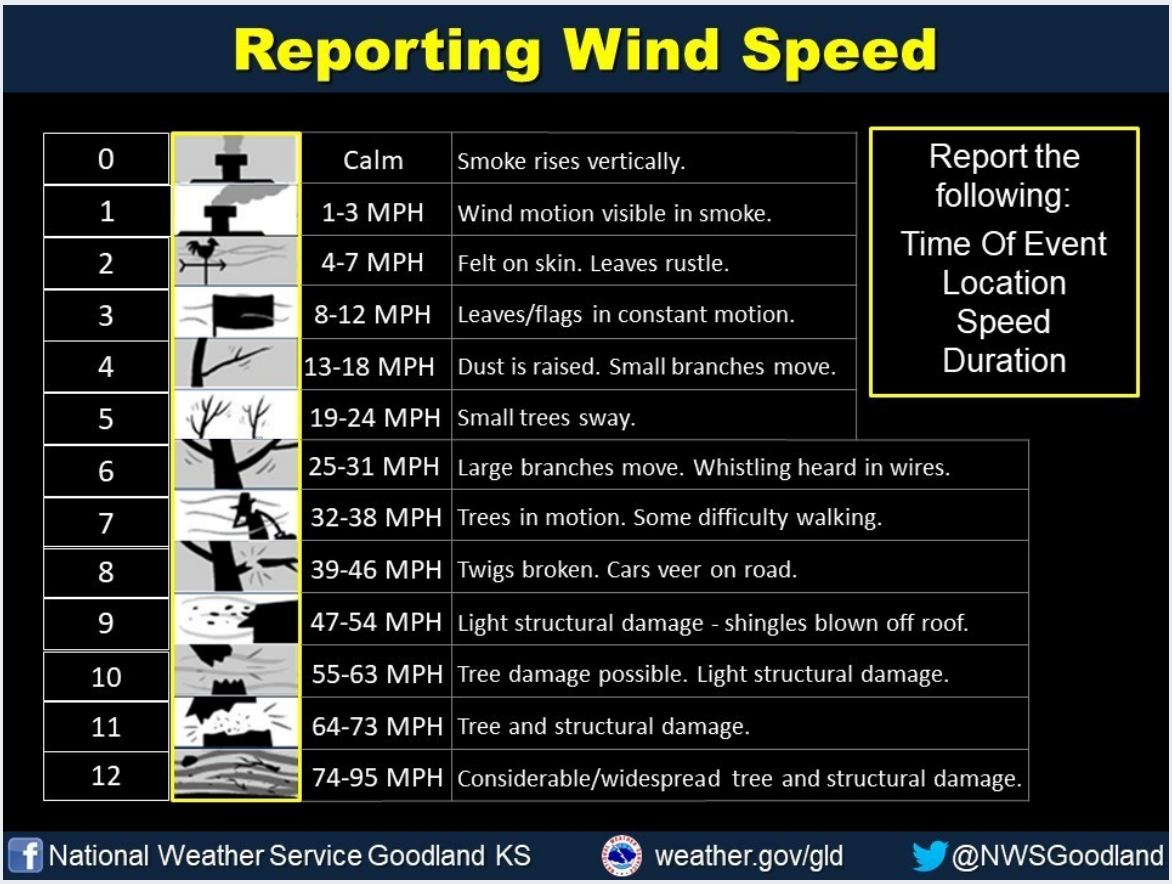
1. Using one sheet of paper and the small plate, trace the outline of the plate onto the paper.
2. Using a ruler, divide the circle into 12 even segments.
3. Looking at the chart on the next page, draw and color 12 simple pictures to visualize the wind speed with the 0 and 1 ratings combined into one segment (see example above). Below each drawing write the scale ratings, the wind speed in mph, and a short description.
4. Cut out the circle and set aside.
5. Using the second sheet of paper, trace or draw a smaller circle. This circle should be large enough to cover the words on your scale, but not the picture.
6. Cut a V-shape into the smaller circle that is the size of one segment in the larger circle. Be careful to stop cutting before you reach the center of the circle.

Place the smaller circle over the large one and join together using a paper fastener.

How to use the scale:

Now that you have a better way to see how strong the winds are, you can use the scale every day! When storms occur, you can safely be indoors while matching what you see happening outside with the pictures on your scale to get an estimated wind speed. If you notice strong winds, use this scale to find a wind speed range and have an adult contact your local National Weather Service office!

Kids' Korner, cont.



More fun activities!

Do you like playing computer games and learning more about weather?

We have just the thing for you! Visit the website SciJinks. SciJinks offers a ton of fun simulations and games that cover everything from creating your own tornado and exploring how the temperature of the ocean influences hurricane strength to how to protect satellites from bad space weather.

Looking for more games, weather information, and other fun activities?

The National Weather Service has their own Outreach Activities and Materials webpage. This webpage has some great resources for young aspiring meteorologists, including:

Hot Seat: You be the Forecaster! - warning simulator

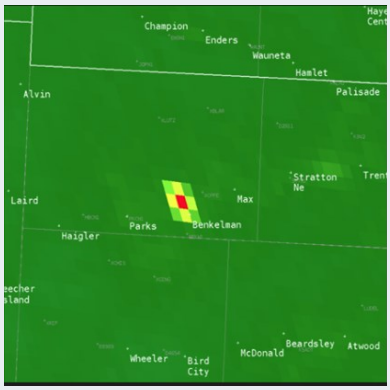
Owlie SKYWARN Storms Ahead coloring book

Resources for all ages on topics ranging from weather safety to space weather

Real Stories of NWS Goodland in Action

Benkelman, Nebraska Evacuation

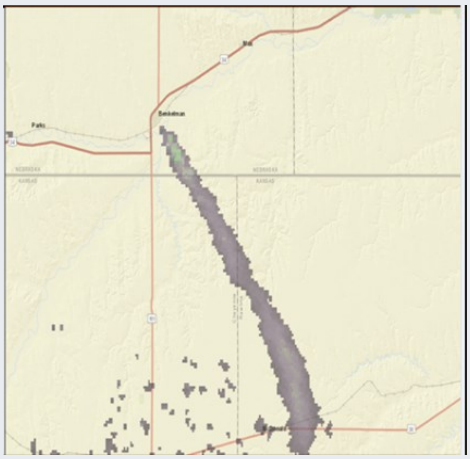
On January 15th, 2021 a large wildfire broke out near Benkelman, Nebraska. Nearly the entire High Plains was under a High Wind Warning that started the day before where wind gusts of 60-70+ mph occurred. During the night the wind combined with the drought conditions which led to a favorable environment for wildfires. There also happened to be other wildfires in Red Willow County Nebraska and southeast Rawlins County Kansas that were reported to the office that same night.



"Hot Spot" seen on satellite.

Around midnight on January 15th, on duty meteorologists noticed a "Hot Spot" appear on satellite just to the northwest of Benkleman. A call to Dundy County dispatch confirmed that first responders were working a "large" wildfire. NWS meteorologists also contacted the assistant emergency manager to ensure she was aware of the fire, and to ask if we could render any assistance.

National Weather Service (NWS) Goodland meteorologists continued to monitor the area on satellite as a smoke plume was then able to be seen on radar.



Smoke plume seen on NWS Goodland radar.

Around 3AM the Assistant Emergency Manager for Dundy County contacted the office and requested for an evacuation order to be issued for the residents of Benkelman as the wildfire was headed for town. Residents were asked to evacuate toward the east or west on Highway 34, and to use caution as smoke was causing near zero visibility along the highway.

The NWS Goodland office sent out a Civil Emergency Message at the request of the assistant emergency manager to evacuate the town on Benkelman. This was the first time an evacuation order had been sent out in the history of the Goodland office. The meteorologists on duty sent out multiple social media graphics and updates highlighting the evacuation order. The intention was to increase residents' awareness of the evacuation order including the location of the fire and event updates sent to the NWS by the assistant emergency manager. Throughout the early morning hours the NWS stayed in contact with the assistant emergency manager and provided any additional weather updates, including a forecast specifically tailored to the area of the fire, as the high wind event was still in progress with gusts of 50-60 MPH blowing the fire toward Benkelman. The fire was eventually contained around 7am very near the Skyline Grill in Benkelman on the edge of Highway 34. The evacuation order was lifted by the assistant emergency manager shortly afterward.

As this fire was ongoing, another hot spot was detected on satellite imagery in southeast Rawlins County during the overnight hours. An alert was issued to first responders about the potential fire. A call was also

Evacuation, cont.

made to the emergency manager of Rawlins County to inform him of the fire and to ask if any other assistance was needed. A forecast for the area of the fire was requested by the emergency manager, which was sent out a few minutes later. The emergency manager later informed the office the forecast information for the fire helped responders save at least one structure from burning.

Social media post regarding the evacuation seen by nearly 55,000 people.

The Benkelman Fire was a great example of how NWS offices work with local leaders and emergency personnel to help better protect life and property when significant events arise. The use of social media during this event was critical, even at three in the morning, as close to 55,000 people saw the original Facebook post regarding the evacuation order. Using social media is a great way to stay informed of breaking information, so make sure to follow, or continue following us on Facebook and Twitter.

Overall this was a rare occurrence and a multitude of lessons were learned by the meteorologists on duty which were passed along to others in the office to help us be prepared for similar events in the future.

True or False?

**The radar at Goodland, KS spends most of its time "listening", or waiting for the signal it sends out to return back?

The answer is ɐnɹʇ.

The time to send out a signal from the radar is infinitesimal compared to how long the radar waits for the signal to return back to it.

**A car will not protect you from being struck by lightning.

The answer is ɐsɐlɟ.

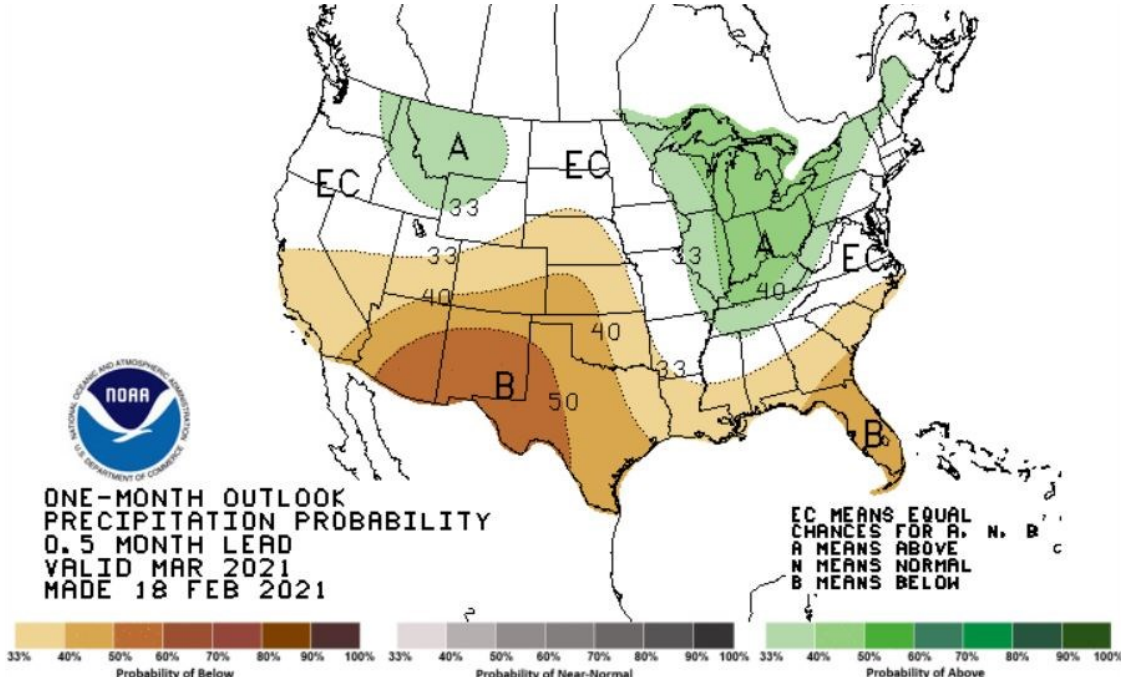
The metal frame of a car will direct the lightning around you and into the ground because metal is a conductor of electricity. However don't try this with a convertible!

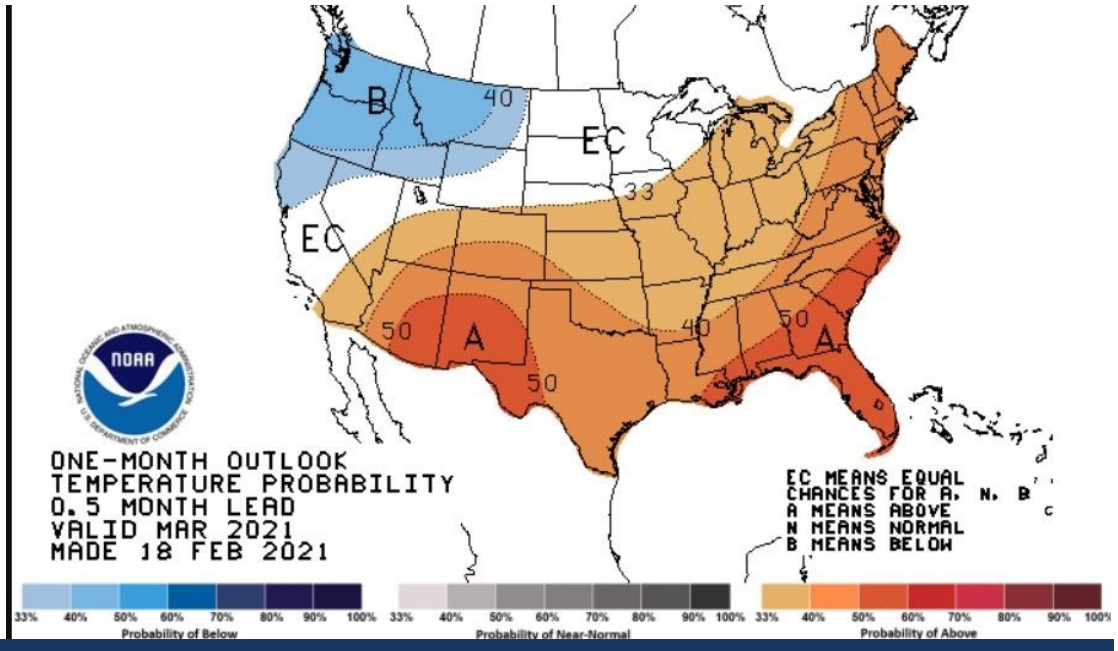
**Tornadoes do not occur in the mountains.

The answer is ɐsɐlɟ.

July 21st, 1987 a tornado caused a damage swath of 24 miles long and 1.5 miles wide at elevations ranging from 8,500 - 10,000ft in the Teton Wilderness and Yellowstone Park. The tornado was rated an F4.

Climate Corner

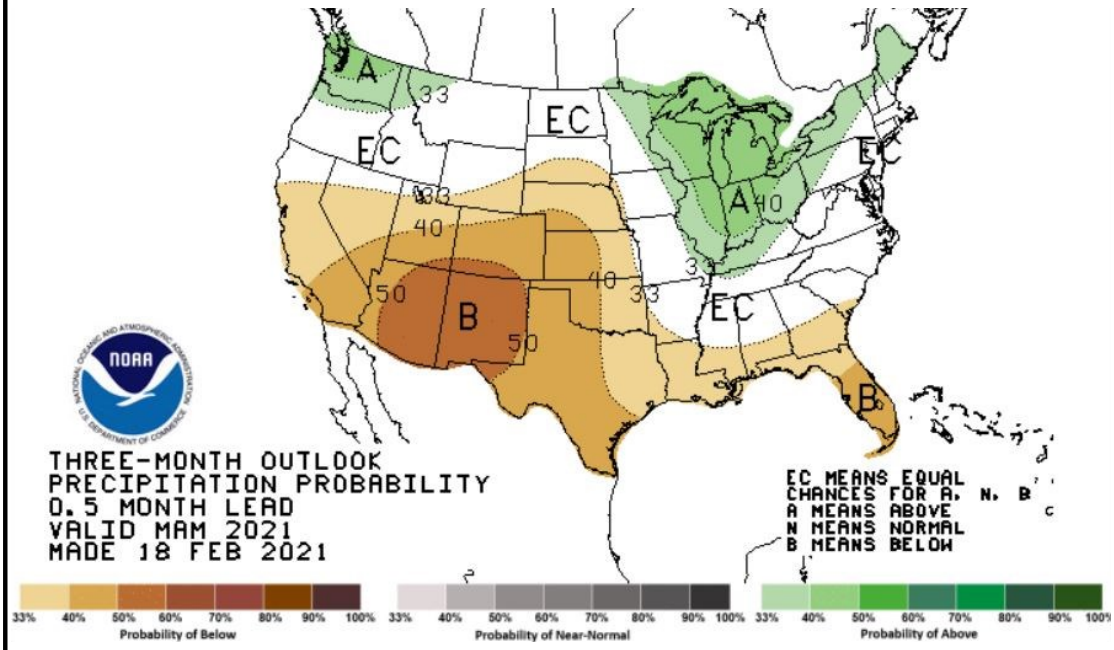


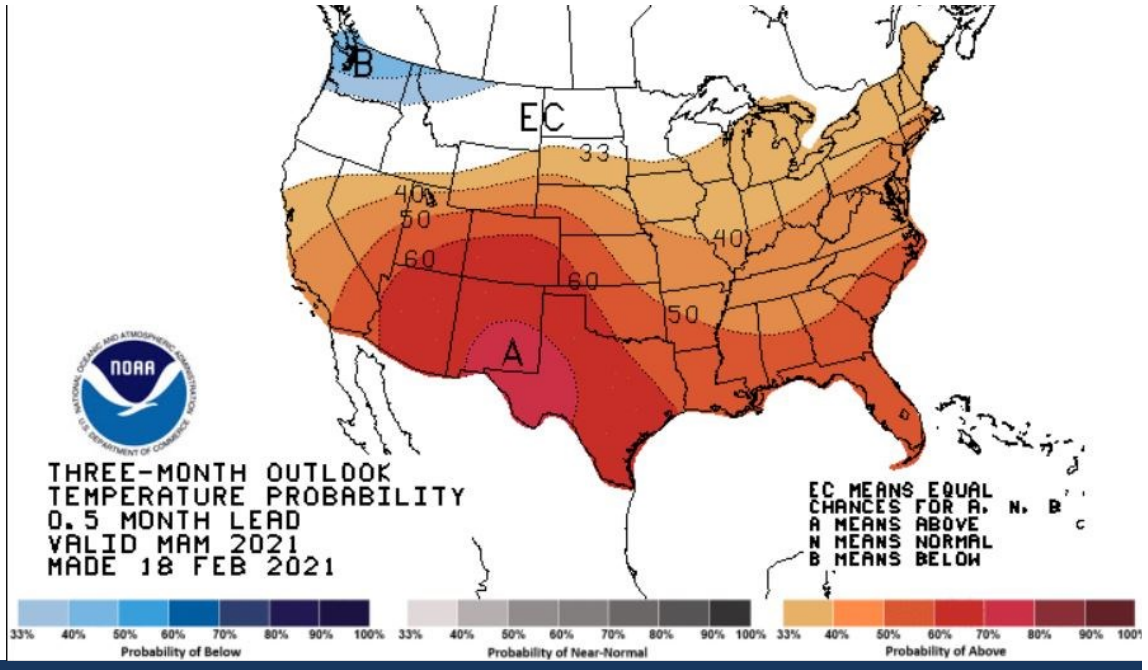


<u>One Month Summary</u>

The one-month outlook shows the possibility of above normal temperatures and below normal precipitation.

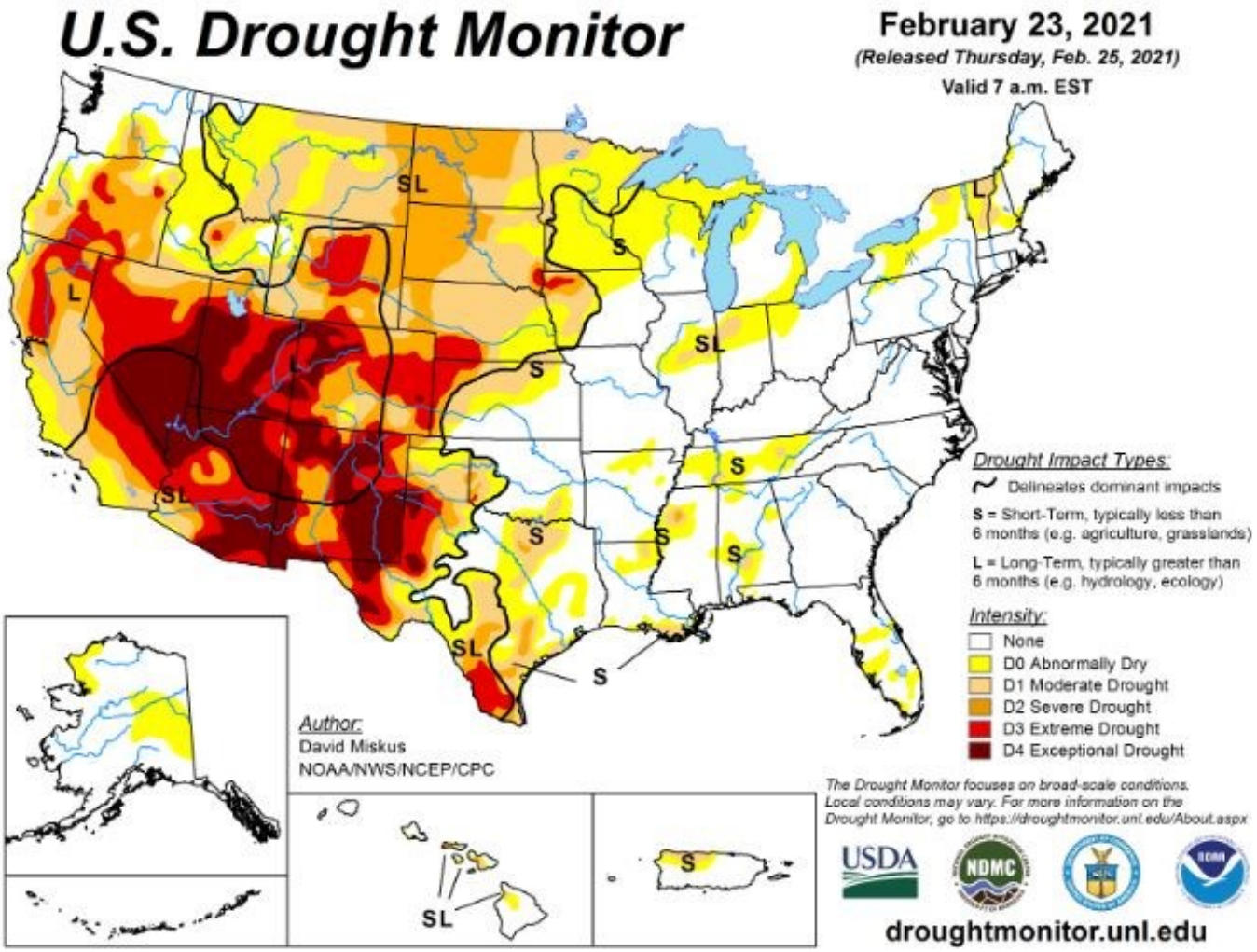
Climate Corner





Three Month Summary

The three-month outlook shows the possibility of above normal temperatures and below normal precipitation.



City**	Year to Date precip (in.)	Normal Year to Date (in.)	Departure From Normal (in.)
Goodland	0.76	0.83	-0.07
Burlington	0.40	0.76	-0.36
McCook	0.59	1.08	-0.49
Hill City	0.56	0.93	-0.37

***Data as of February 26, 2021*

Useful Links

· Storm Prediction Center
- www.spc.noaa.gov
· Weather Prediction Center
- www.wpc.ncep.noaa.gov
· Climate Prediction Center
- www.cpc.ncep.noaa.gov
· Climate Data
- www.ncei.noaa.gov
· CoCoRaHS
- www.cocorahs.com
· Weather Models
- www.ncep.noaa.gov
· Space Weather
- www.swpc.noaa.gov

SciJinks
-scijinks.gov/

Contact Us

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

NWS Goodland Presents

WRN Ambassador News

AMBASSADOR™
WRN
WEATHER-READY NATION

In this issue:

A Message to Our Ambassadors

After a record-setting winter, the Tri-State area is finally entering spring. Over the next several weeks, your communities and yourself will continue preparations for the severe weather season. While completing your preparations, don't forget that our area is subject to winter weather - particularly blizzards through early spring. Whether you are facing the last vestiges of winter or gearing up for spring, the NWS provides a wide variety of resources to share and spread the word about weather safety.

As a part of our efforts, the WFO Goodland WRN team will add a section specifically for our WRN Ambassadors to the office's quarterly newsletter. We appreciate all you do to amplify our weather safety messaging and continual efforts to build a Weather Ready Nation.

If we can be of any assistance, please don't hesitate to contact the Goodland office or our new WRN Ambassador Focal Point, Kalitta Kauffman.

Winter Storm Severity Index

The Winter Storm Severity Index, or WSSI, is a new tool from the National Weather Service that forecasts the potential impacts of winter storms throughout the continental United States.

The WSSI can keep you informed on potential winter storm impacts in your community, including tree damage, property damage, transportation impacts, and disruptions to daily life.

POTENTIAL IMPACTS SCALE

- **No Impacts**
- **Limited Impacts**
- **Minor Impacts**
- **Moderate Impacts**
- **Major Impacts**
- **Extreme Impacts**

The WSSI is designed to help you prepare before the storm. Expected winter storms are given an 'impact ranking' in 6 categories, ranging from 'No Impacts' to 'Extreme Impacts'.

The WSSI impact scale will help you quickly and easily know what to expect from a winter storm.

The WSSI is measured by analyzing the potential impacts of:

- **Snow amount:** impacts due to the total amount of snow or the accumulation rate.
- **Snow load:** infrastructure impacts due to the weight of the snow.
- **Ice accumulation:** infrastructure impacts due to the effects and severity of ice and wind.
- **Flash freeze:** potential for quick-forming ice from rapid temperature drops during or after precipitation.
- **Blowing snow:** disruption due to blowing and drifting snow.
- **Ground blizzards:** travel-related impacts of strong winds interacting with pre-existing snow.

The WSSI allows the user to make informed decisions based on the potential for significant weather-related impacts.

BLIZZARDS

Blizzard:

* Sustained winds or frequent wind gusts of at least 35 mph, and
* Blowing or falling snow which reduces visibility to 1/4 mile or less
* For at least three hours

March 1st is the official start of Meteorological Spring. Despite the anticipation of warmer temperatures and days getting "longer", blizzards remain a concern through early springtime across the Central High Plains.

A Blizzard Warning is issued when blizzard or ground blizzard conditions are expected. Due to potential for poor driving conditions, it is recommended that motorists delay travel, not only for their own safety but also for the protection of emergency responders and road crews.

For those unable to avoid travel, preparing a vehicle emergency kit may not protect you from the weather, but it can make you a little more comfortable in the chance you get stranded. Common items to include in your kit are: jumper cables, sand or kitty litter, a charged phone, warm clothes, blankets, water, snacks, a flashlight and a bright colored object to attract help.

DID YOU KNOW?

The amount of snow a storm produces does not affect whether a storm is considered a blizzard or

What to Report:

-Your Location

-Time of Event

-Snow/ice accumulation

-Reductions to visibility

We Need Your Help!

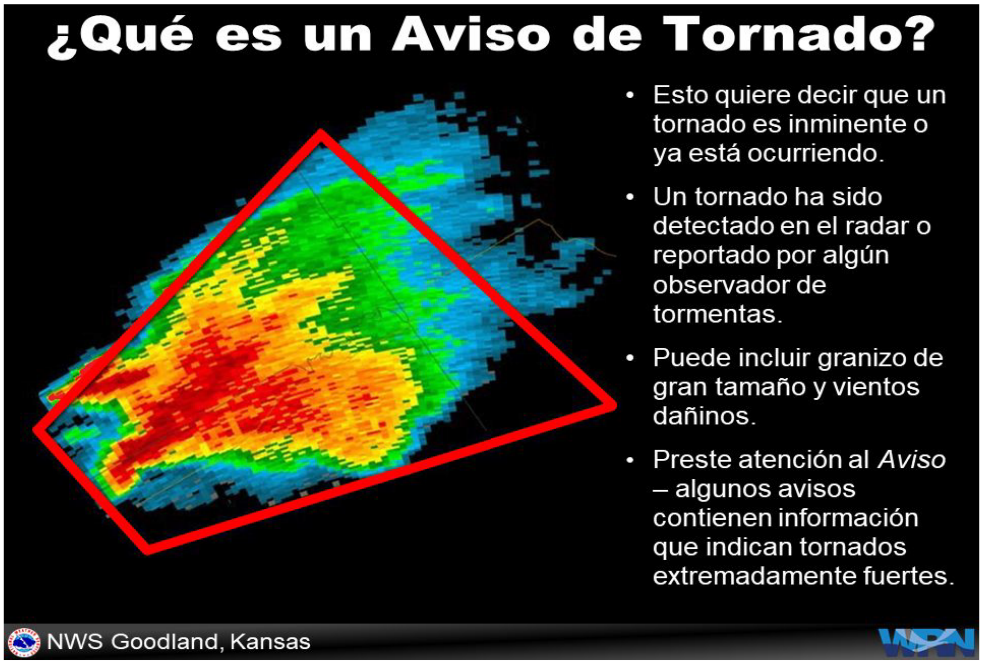
Your reports, photos and videos provide meteorologists with ground truth to what is happening with a storm. This information aides us in making warning decisions and can also be used for verification purposes. To send us a report, give us a call or send us a message on Facebook or Twitter.

For more winter safety information, visit our website:

https://www.weather.gov/gld/TriStateWinter

Recursos en Español

Spanish Language Resources



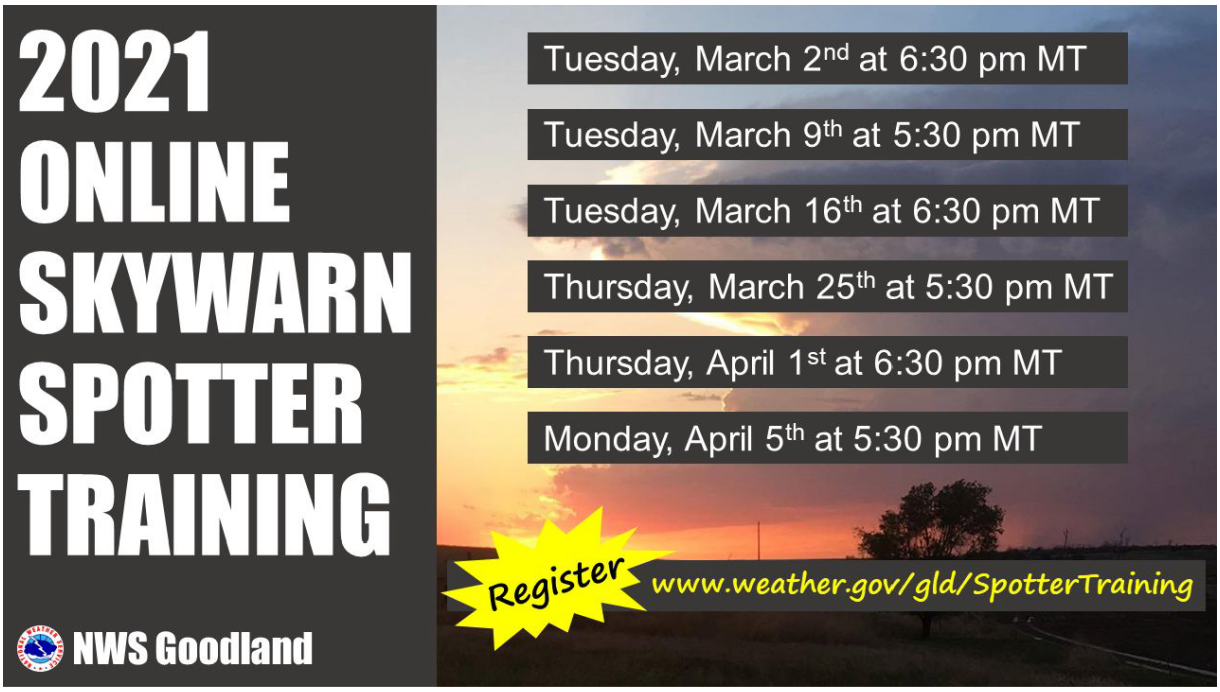
www.weather.gov/gld/safetygraphics

www.weather.gov/wrn/spanish

¿Sabe cómo prepararse para la temporada de tiempo severo? Las páginas web mencionadas arriba están diseñadas para proporcionar recursos e información de seguridad para las comunidades antes y durante condiciones del tiempo peligrosas. Si sabe qué hacer antes, durante y después de un evento meteorológico peligroso, tendrá más posibilidades de mantenerse a salvo usted y su familia. Las páginas web contienen información importante sobre cómo preparar un equipo de emergencia, encontrar un refugio seguro y evitar situaciones que pongan en peligro la vida. Consulte y comparta esta información. ¡Podría salvar una vida!

Do you know how to prepare for severe weather season? The webpages above are designed to provide resources and safety information for communities ahead of and during times of hazardous weather. If you know what to do before, during, and after a dangerous weather event, you have a better chance of keeping yourself and your family safe. The webpages have important facts on how to build an emergency kit, find safe shelter, and avoid life-threatening situations. Please view and share this information. It could save a life!

2021 Storm Spotter Training



Weather spotters are our eyes in the field during severe weather. This year we have virtual spotter training you can participate in from your own home! The first training session is March 2nd.

For more information about spotter training, and to register for one of the weekly sessions, go to weather.gov/spottertraining.

Contact Us!

WRN Ambassador Focal Point
Kalitta Kauffman
kalitta.Kauffman@noaa.gov

NWS Goodland Office
785-899-7119
weather.gov/gld

Are you doing amazing things in your community with weather safety outreach?

Let us know! We would love to highlight you in future editions!