



Nebraska Severe Weather Awareness Week

March 23 - 27, 2020



2020 – A Year We Should All Be Better Prepared

It's hard to believe it's been a year since one of the worst natural disasters in Nebraska's history devastated many parts of the state. For some, the process of "a storm, followed by storm damage, then clean-up" was repeated several times deep into the summer months, resulting in hundreds of millions of dollars in losses statewide. Unfortunately, Nebraska also recorded five fatalities related to rising flood waters (compared to only four fatalities in the previous eight years combined).

The good news is last year is behind us and 2020 gives us all a renewed opportunity to capitalize on the lessons learned in 2019 and become "Weather-Ready" at home, at work or at play. This information packet will dive into a variety of topics to help achieve that goal. A few highlights include:

Safety: Understanding the basics of severe weather safety may be the key to survival in extreme cases. It is always good to have a reminder of what to do, how to do it and why it matters. Flood safety is emphasized, as the NWS knows the majority of flood-related driving deaths are by people who actually drive into the flood (and often around safety barriers).

Outlooks: The state isn't out of the woods yet from increased flood potential. Take a look at the spring outlooks for flooding, temperatures and precipitation to gain a feel for what the area may expect this spring.

Hazard Monitoring and Notification: The NWS offers many ways to analyze and receive weather information. Check out the updated Graphical Hazardous Weather Outlook page, information about impact-based Flash Flood Warnings, and learn about some changes to the Wireless Emergency Alert notifications.

Statistics and Summaries: Was 2019 an average year for tornadoes? What month was the most active? Those facts and plenty more are covered in detail throughout the packet. You never know what you might learn.

All of us at the NWS want you to be ready in case threatening weather approaches or disaster strikes. There is no better time to prepare than now.

Statewide Tornado Safety Drill

CANCELLED

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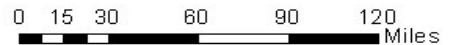
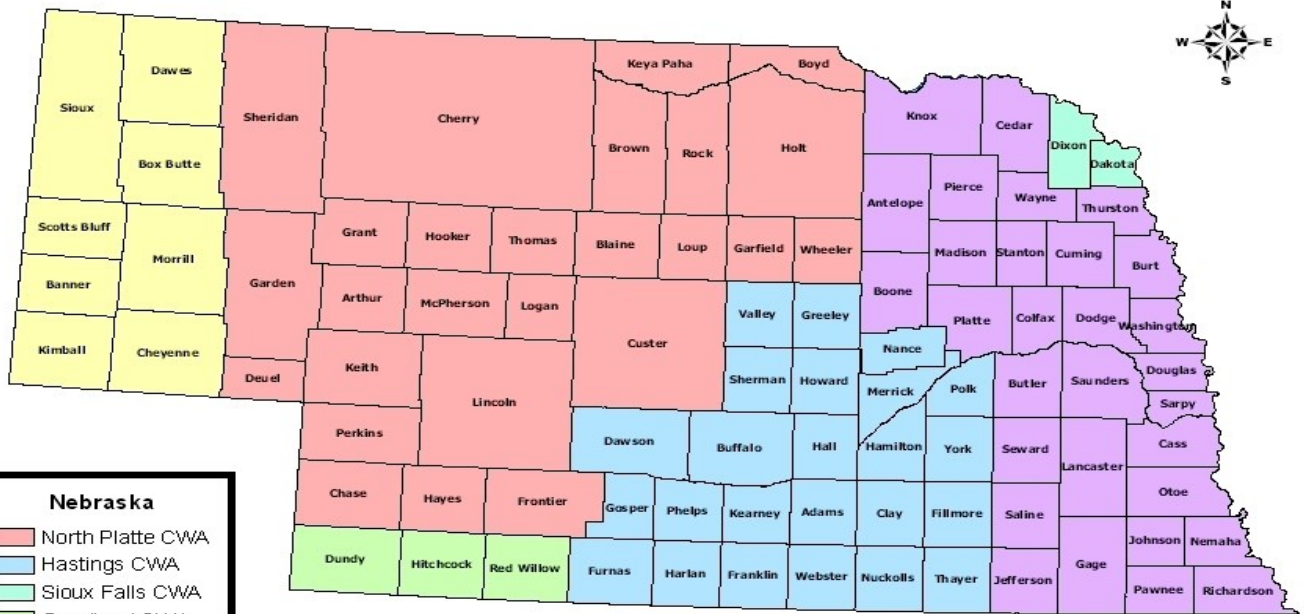


National Weather Service Offices Serving Nebraska

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National Weather Service Coverage Area



Panhandle **Cheyenne, WY**

1301 Airport Parkway
Cheyenne, WY 82001

(307) 772-2468

www.weather.gov/cheyenne

South Central **Hastings**

6365 N. Osborne Drive West
Hastings, NE 68901

(402) 462-4287

www.weather.gov/hastings

West and North Central **North Platte**

5250 E. Lee Bird Drive
North Platte, NE 69101

(308) 532-4936

www.weather.gov/northplatte

East **Omaha/Valley**

6707 N. 288th Street
Valley, NE 68064

(402) 359-9443

www.weather.gov/omaha

Extreme Southwest **Goodland, KS**

920 Armory Road
Goodland, KS 67735

(785) 899-7119

www.weather.gov/goodland

Extreme Northeast **Sioux Falls, SD**

26 Weather Lane
Sioux Falls, SD 57104

(605) 330-4247

www.weather.gov/siouxfalls



2019 Nebraska Tornado/Severe Weather Facts

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Tornadoes: 35 (7 less than the 70 year average of 42 & 18 less than the 30 year average of 53)

Deaths: 0 **Injuries:** 0

Longest track: 10.25 mi (September 20th - Rural Southwestern Box Butte County)

Greatest width: 600 yards / 0.3 mi (May 17th - Near Cozad in Dawson County)

Strongest: EF3 (May 17th - Northeast of Stockville in Frontier County)

Most in a county: 8 (Frontier County)

Days with 1+ confirmed tornadoes: 12

Most in one day: 15 (May 17th)

Most in one month: 25 (May)

First tornado of 2019: May 5th (2 - EF2 & EFU in Lancaster County)

Last tornado of 2019: September 20th (EFU - Rural Southwestern Box Butte County)

Note: EFU = EF Scale Unknown

2019 Monthly Tornado Totals

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
Total	0	0	0	0	25	1	4	4	1	0	0	0	35	100%
EF5	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
EF4	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
EF3	0	0	0	0	1	0	0	0	0	0	0	0	1	3%
EF2	0	0	0	0	3	0	0	0	0	0	0	0	3	8%
EF1	0	0	0	0	5	0	0	1	0	0	0	0	6	17%
EF0	0	0	0	0	12	0	2	2	0	0	0	0	16	46%
EFU	0	0	0	0	4	1	2	1	1	0	0	0	9	26%



2019 Season Peak...

Hail Size: 3.0" on May 17th (Hitchcock County) - May 27th (Chase County) - June 25th (Adams County)

Wind Gust: Estimated: 105 MPH on August 29th - Near Palisade (Hitchcock County)

Measured: 105 MPH on May 5th - Near Pleasant Dale (Lancaster County)

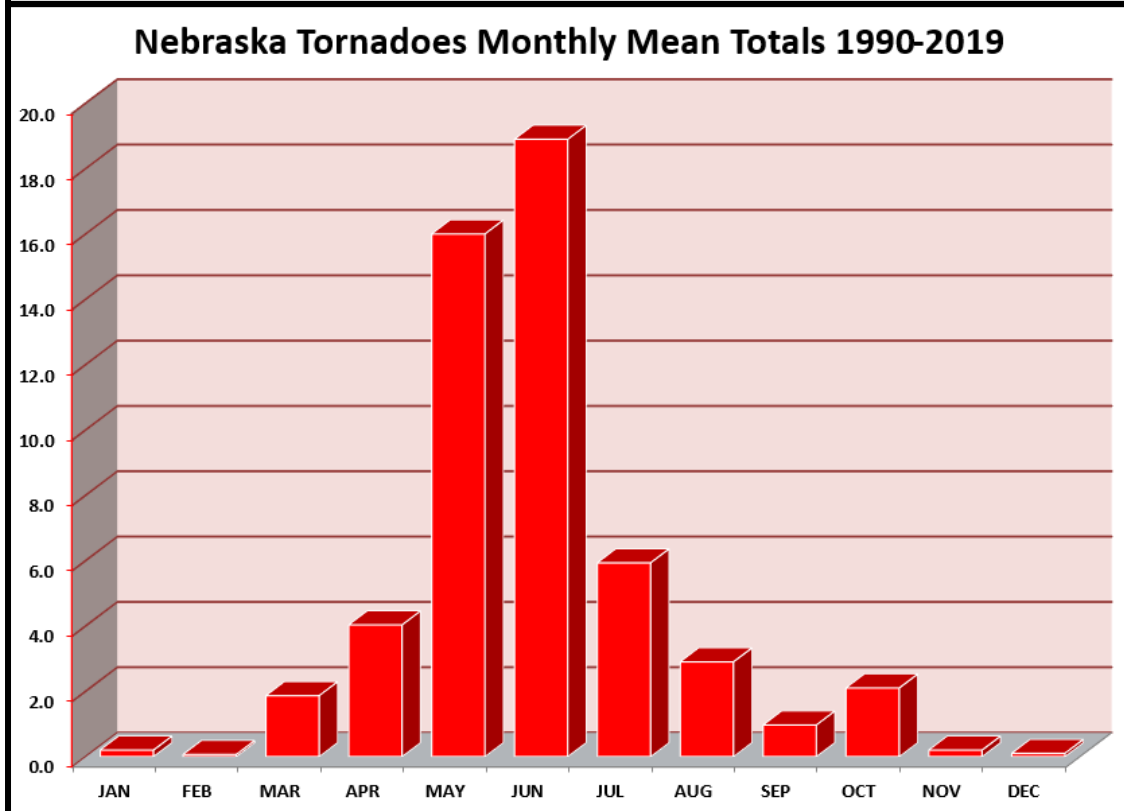
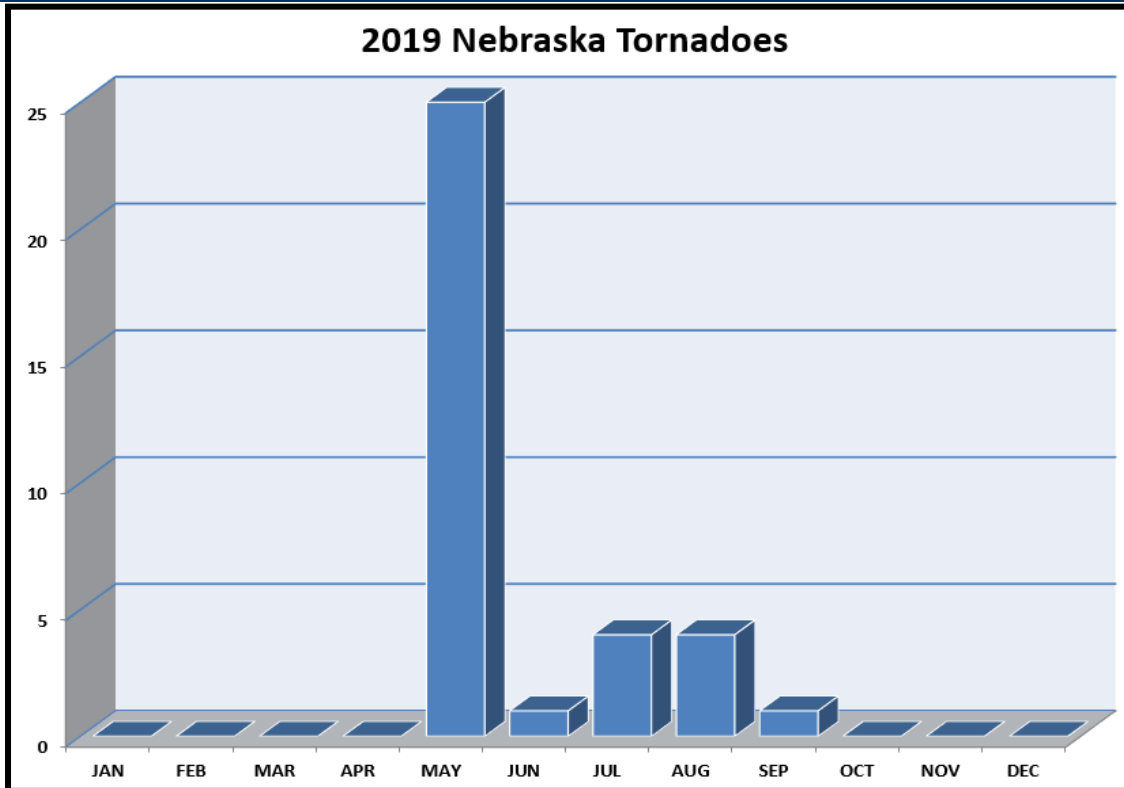




Nebraska Tornado Facts



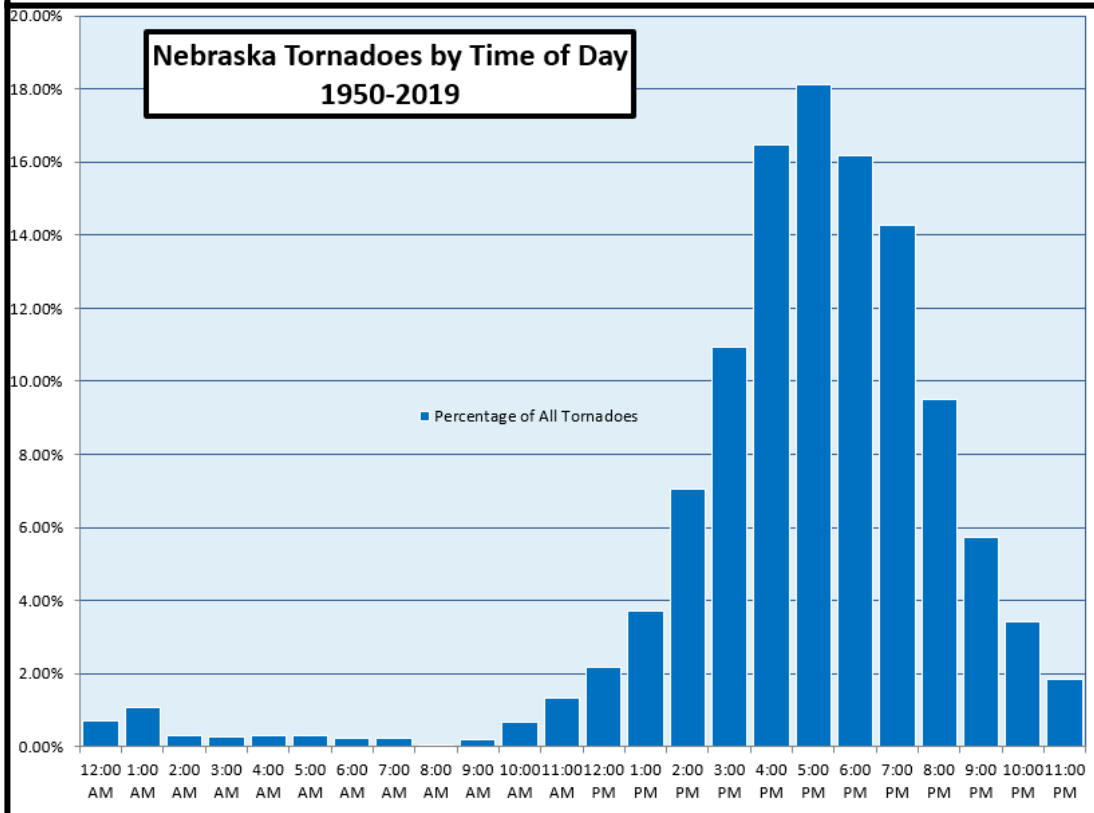
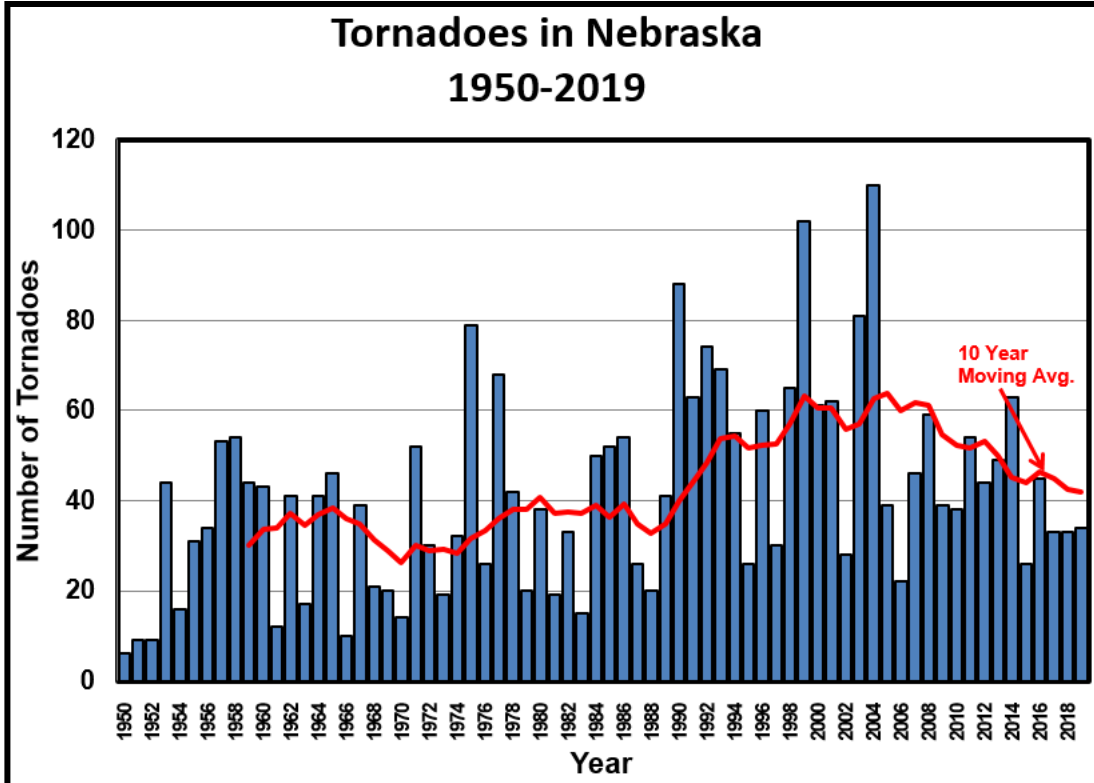
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Nebraska Tornado Facts

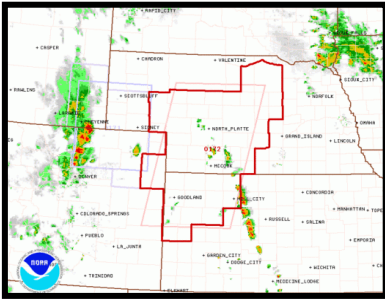
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Severe Weather Terminology

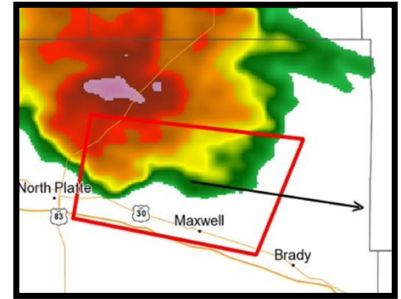
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WATCH

Be Prepared!

- Issued by the Storm Prediction Center.
- Timeframe: Hours ahead. Be Alert!
- Watch areas are typically large, covering numerous counties & even states.
- Check for forecast updates.
- Monitor sky conditions.
- Know where to take shelter.



WARNING

Take Action!

- Issued by the local NWS forecast offices.
- Timeframe: Severe weather in the area is imminent. Take shelter!
- Warning areas are small, perhaps a handful of counties at most.
- Continue to check for forecast updates, as conditions can change rapidly.



Severe Thunderstorm

A thunderstorm is considered “severe” when it produces:

- Quarter size hail (1”) or larger
- Wind of 58 MPH or higher
- A tornado



Flash Flood

A rapid water rise that occurs with little to no advanced warning.

Usually the result of intense rainfall in a short time.

Can also be caused by dam/levee failures or ice jams.



Funnel Cloud

A funnel shaped appendage extending from a cloud.

Associated with a violently rotating column of air.

It **IS NOT** in contact with the ground.



Tornado

A violently rotating column of air from a cloud that **IS** in contact with the ground.

Be cautious!
The tornado may not be visible until it has picked up dirt and debris.



Tornado Safety

www.weather.gov/safety



A tornado is a violently rotating column of air extending from the base of a thunderstorm down to the ground. Tornadoes are capable of completely destroying well-made structures, uprooting trees, and hurling objects through the air like deadly missiles. Tornadoes can occur at any time of day or night and at any time of the year. Although tornadoes are most common in the Central Plains and the southeastern United States, they have been reported in all 50 states. Are you prepared?

BEFORE

Be Weather-Ready: Know the risk in your area. Have a NOAA Weather Radio and be sure to stay up to date with the latest weather information.

Have A Plan: Create a family plan with contact information and an emergency meeting place. Practice your plan!

Shelter: Pick a safe room in your home such as a basement, cellar or an interior room on the lowest floor with no windows. If you live in a mobile home, identify a nearby shelter you can get to quickly. Practice with your family by having regular drills. Prepare an Emergency Kit.

Warnings: Know how your community sends warnings. Some have outdoor sirens, others depend on media and smart phones to alert residents. Have multiple ways to receive warnings!



DURING

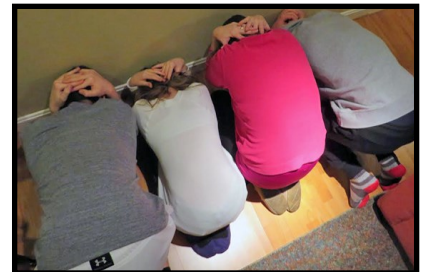
Stay Weather-Ready: Continue to listen NOAA Weather Radio and local news to stay updated about severe weather watches and warnings.

At Your House: If you are in a tornado warning, go to your basement, safe room, or an interior room away from windows. Don't forget pets if time allows.

At Your Workplace or School: Follow your tornado drill and proceed to your tornado shelter location quickly and calmly. Stay away from windows and do not go to large open rooms such as cafeterias, gymnasiums, or auditoriums.

Outside: Seek shelter inside a sturdy building immediately. Sheds and storage facilities are not safe, neither is a mobile home or tent. If you have time, get to a safe building.

In a vehicle: Being in a vehicle during a tornado is not safe. The best course of action is to drive to the closest shelter. If you are unable to make it to a safe shelter, either get down in your car and cover your head, or abandon your car and seek shelter in a low lying area such as a ditch or ravine.



AFTER

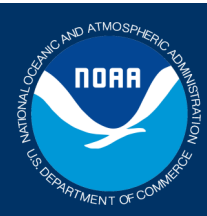
Stay Informed: Continue to listen to NOAA Weather Radio and local news for the latest. Multiple rounds of severe thunderstorms are possible during severe weather outbreaks. Follow instructions of local authorities!

Contact Loved Ones: Let them know you're okay. Text messages or social media can be a more reliable than phone calls.

Assess the Damage: After the threat has ended, check for damage. If possible, wear long pants, a long-sleeved shirt, and sturdy shoes. Stay out of damaged buildings.

Help Your Neighbor: If you come across people that are injured and you are properly trained, provide first aid to victims if needed until emergency response teams arrive.





Flood Safety

www.weather.gov/safety



Flooding is a coast-to-coast threat to the United States every year. If you know what to do when flooding occurs, you can increase your chances of survival. Sometimes floods develop slowly and can be anticipated. More often, flash floods can occur within minutes and sometimes without any advance warning. Being properly prepared can save your life and give you peace of mind. Never underestimated the power of water.

Before a flood is the time to prepare!

NOW is the time to make a plan. Important questions to consider:

- What is my flood risk?
- Are we located in a floodplain?
- Where is water likely to collect?
- Where do I go if there is a flood?

Create a communications plan to follow in the event of a disaster and be sure to assemble an emergency kit.



During a Flood...

- **Stay Informed!** Monitor NOAA Weather Radio, local radio/television and the internet or social media for the latest information and updates.
- **Get To Higher Ground!** Get out of areas that are subject to flooding and move to a safe area before access is cut off by flood waters. If told to evacuate, do so immediately!
- **DO NOT** drive into flooded roadways or around a barricade, as 12-18 inches of water can carry away most vehicles. The depth of the water may not be obvious and the roadway may no longer be intact. If your vehicle stalls, leave it and move to higher ground before water sweeps you and your vehicle away.
- **DO NOT** walk, swim, or play in flood water. You likely cannot determine how quickly the water is flowing or if there are holes or submerged debris. You may be swept away! If water is moving swiftly, as little as 6 inches of water can knock you off of your feet. There is also a danger of hazardous materials polluting the water. Also remember that water is an electrical conductor, if there are power lines down, there is a threat of electrocution.
- **DO NOT** go into any room if water is covering electrical outlets or cords. If you see sparks or hear buzzing, crackling, snapping or popping noises - Get Out! Do not go into flooded basements, the structures may be compromised.



After a Flood - Now What?

- Avoid flood waters and disaster areas. Obey road closures and other instructions.
- Stay informed! Tune into local news for updated information. Ensure water is safe before using or consuming. Check with utility companies about outages. Never use a portable generator indoors, carbon monoxide poisoning kills!
- Let your family and friends know you are okay.



Lightning Safety

www.weather.gov/safety



Lightning is fascinating to watch but is also extremely dangerous. In the United States, there are approximately 25 million lightning strikes every year. Each of those flashes is a potential killer. While lightning fatalities have decreased over the past 30 years, it remains a threat that needs to be taken seriously. Too many people wait far too long to get to safe shelter when thunderstorms approach. These delayed actions lead to many of the lightning deaths and injuries reported each year.

Though lightning strikes peak in summer, people are struck year round. In the U.S., an average of 47 people are killed each year by lightning and hundreds more are injured. Some survivors suffer lifelong health problems.

Don't become a statistic - Be Prepared!

Outdoor Safety

- There is **NO** safe place outdoors when thunderstorms are in the area!
- Plan ahead before going outdoors. Have a way to get the latest weather information. Know what to do and where to go if storms develop.
- When you hear thunder, immediately move to safe shelter: a building or an enclosed, metal-topped vehicle with windows up. Do NOT seek shelter in dugouts, under a picnic shelter or other non-sturdy shelter.
- Wait at least 30 minutes after the last rumble of thunder before heading back outdoors!



Outdoors - But Safe Shelter Is Not Nearby

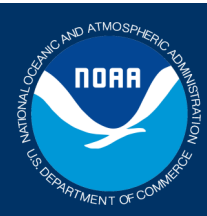
If you absolutely cannot get to safety, you can slightly lessen the threat of being struck. But don't kid yourself, you are NOT safe outdoors! Before you head out, know the latest forecast.

- Avoid open fields and elevated areas such as hills, mountain ridges or peaks. Stay away from tall and isolated objects.
- If camping in an open area, head for a valley, ravine or other low area. Tents offer NO protection!
- If you are in a group, spread out to avoid the current traveling between members.
- Immediately get out of and away from water and wet items. Stay away from any object that conducts electricity (barbed wire fences, power lines, windmills, etc.).



Indoor Safety

- Avoid anything that puts you in direct contact with electricity (plugged into a wall).
- Avoid plumbing. Do not wash your hands, bathe or wash dishes.
- Stay away from windows and doors and stay off porches.
- Do not lie on concrete floors and do not lean against concrete walls.
- Protect your pets! Dog houses are not safe. Don't leave pets chained up outside.



New In 2020 - Impact Based Flash Flood Warnings

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Users of Flash Flood Warnings will see some minor changes to the product this spring. The format of Flash Flood Warnings will become “Impact-Based” and will mirror the format of Tornado and Severe Thunderstorm Warnings. Impact-based warnings contain specific hazard, source and impact information, and additional damage threat tags (at the end of the product). This impact-based information will be provided in addition to other storm related and safety related information in the Flash Flood Warning itself. An example of the impact based warning message follows:

HAZARD...Life-threatening flood flooding caused by thunderstorms

SOURCE...Emergency management

IMPACT...Widespread life-threatening flooding will continue and perhaps worsen.

In addition, damage threat “tags” will be included in Flash Flood warnings. The tags are designed to provide a quick assessment of the flood potential by assigning a “Base (no tag)”, “Considerable” tag or “Catastrophic” tag. Of the three, most Flash Flood Warnings will be assigned a “base” flood tag. In rare cases, if urgent notification is needed, the “considerable” tag can be used. In exceedingly rare situations, such as a Flash Flood Emergency, the “catastrophic” tag can be used.

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The National Weather Service in Green Bay has issued a

* Flash Flood Warning for...
Northwestern Portage County in central Wisconsin...
South central Marathon County in central Wisconsin...

* Until 1030 AM CDT

* At 729 AM CDT, flash flooding is already occurring. Local officials
report Interstate Highway 90 is closed. A thunderstorm producing
heavy rain across the warned area.

HAZARD...Life threatening flash flooding caused by heavy rain.

SOURCE...County officials and radar estimates.

IMPACT...Unusual and life threatening flash flooding of creeks and
streams, urban areas, highways, streets and underpasses.

* Some locations that will experience flooding include...
Stevens Point, Whiting, Plover, Stockton, Knowlton, Jordan, Park
Ridge, Custer, Ellis, Dewey Marsh Wildlife Area, Shantytown,
Polonia, Rocky Corners, Arnott, Dancy and North Star.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

This is an extremely dangerous and life-threatening situation. Do not
attempt to travel unless you are fleeing an area subject to flooding.

&&

LAT...LON 4472 8939 4444 8940 4444 8966 4472 8980

FLASH FLOOD...OBSERVED
FLASH FLOOD DAMAGE THREAT...CONSIDERABLE
HEAVY RAIN...1-2 INCHES PER HOUR

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Flash Flood Damage Threat Tag	Explanation
“Base” (No Tag)	Used most of the time. Flash flood damage possible.
“Considerable”	Used rarely, when there are indications flooding capable of unusual severity of impact is imminent or ongoing, and urgent action is needed to protect lives and property.
“Catastrophic”	Used exceedingly rarely, when a threat to life and catastrophic damage is occurring or imminent, and water has risen or will rise to levels rarely, if ever, seen.

The tags also play a critical role in disseminating Flash Flood Warnings through the Wireless Emergency Alerts (WEA) on capable cell phones. In the past, every Flash Flood Warning would trigger a notification on a phone for people in or near a warned area. Going forward, only warnings with “considerable” or “catastrophic” tag will trigger a WEA message to be sent to phones in or near the warned area. This will limit the number of flash flood notifications people will receive in general, but will insure the most important and potentially lifesaving messages requiring urgent action are sent (i.e., a considerable or catastrophic flood situation).

For more information on the impact-based flood warnings, go to www.weather.gov/safety/flood

For more information on WEA, go to www.weather.gov/wm/wea



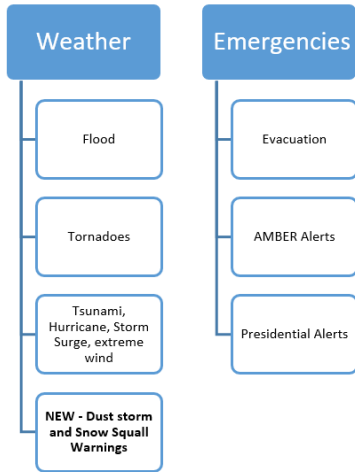
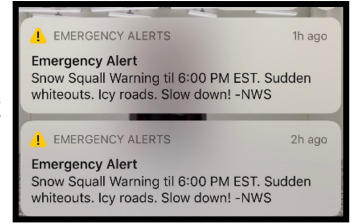


Changes To Wireless Emergency Alerts

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Providing life-saving warnings to the public is at the core of the mission statement of the NWS. An integral tool for the dissemination of the warnings is the use of Wireless Emergency Alerts (WEA). WEA is a collaborative effort between the Federal Communications Commission (FCC), the Federal Emergency Management Agency, and the wireless industry that allows emergency alerting authorities to geographically target emergency messages to mobile devices. The NWS will provide messages to WEA for hazards believed to be life-threatening and that have consequences that can be mitigated or minimized by immediate action.



WEA messages are relevant to your geographic location – you will only receive WEA messages when you and your cell phone are in the area of the emergency. If you are traveling through other areas, you will only receive alerts for the location you are traveling through and not your home location.

Recent Changes and Enhancements to WEA:

- WEA alerts are available for Dust Storm and Snow Squall Warnings.
- Beginning on or after February 18, 2020, the NWS will issue WEA messages for Flash Flood Warnings (FFW) based on damage threat tags. WEAs will only be sent for FFWs with a damage threat tag of either “considerable” or “catastrophic.” FFWs labeled with these tags are life-threatening and require urgent action. The frequency of FFWs with “considerable” or “catastrophic” labels is relatively rare, which will limit the number of FFWs WEAs.
- Recent FCC rule changes allow for the expansion of WEA from the existing maximum of 90 characters to a maximum of 360 characters. Additionally, the rule changes allow for transmission of Spanish language WEA messages. The NWS now has more flexibility to provide wireless customers more detailed and actionable information for weather related hazards believed to be life-threatening and that have consequences that can be mitigated or minimized by immediate action. The implementation date of the 360 character WEAs has yet to be finalized.

National Weather Service: TORNADO WARNING in this area until 12:15PM CST. Take shelter now in a basement or an interior room on the lowest floor of a sturdy building. If you are outdoors, in a mobile home, or in a vehicle, move to the closest substantial shelter and protect yourself from flying debris. Check media.

SNM: EMERGENCIA DE TORNADO hasta las 10:45PM MDT. Un tornado ha sido detectado en esta area. Su vida esta en peligro. Busque refugio en un sotano o en el interior de un cuarto del nivel mas bajo de un edificio seguro. Si esta al aire libre, en una casa movil, o en un vehiculo, debe ir al edificio seguro mas cercano y protegerse de proyectiles.

WEA Success Story from Connecticut

- A tornado warning from the National Weather Service triggered a Wireless Emergency Alert (WEA) which saved as many as 34 lives in East Windsor, Connecticut. Five adults and 29 children were in the Sports World Complex soccer dome when the manager received the WEA on her iPhone. She immediately evacuated everyone to an adjoining building. Within two minutes of receiving the WEA, a tornado hit the dome, sending it flying across the interstate. The children and adults were safe, thanks to the warning issued by the National Weather Service Weather Forecast Office at Taunton, Massachusetts.



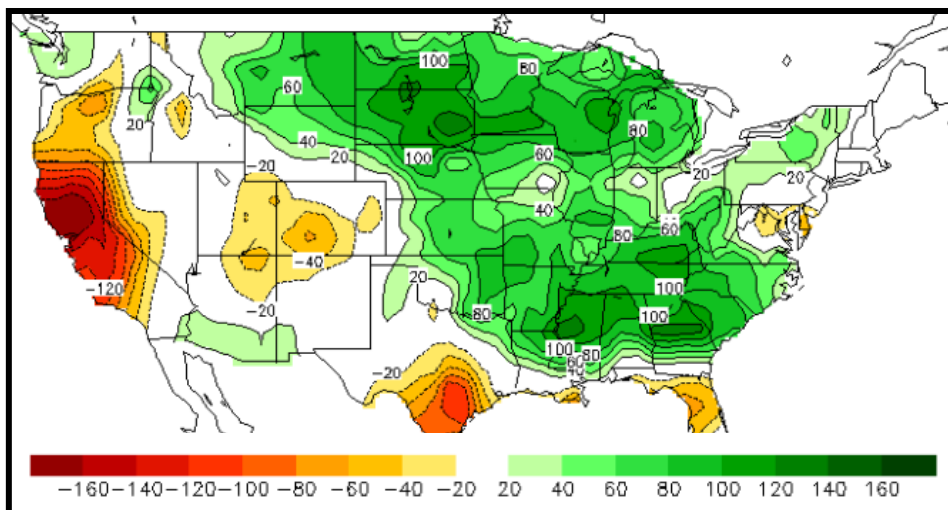
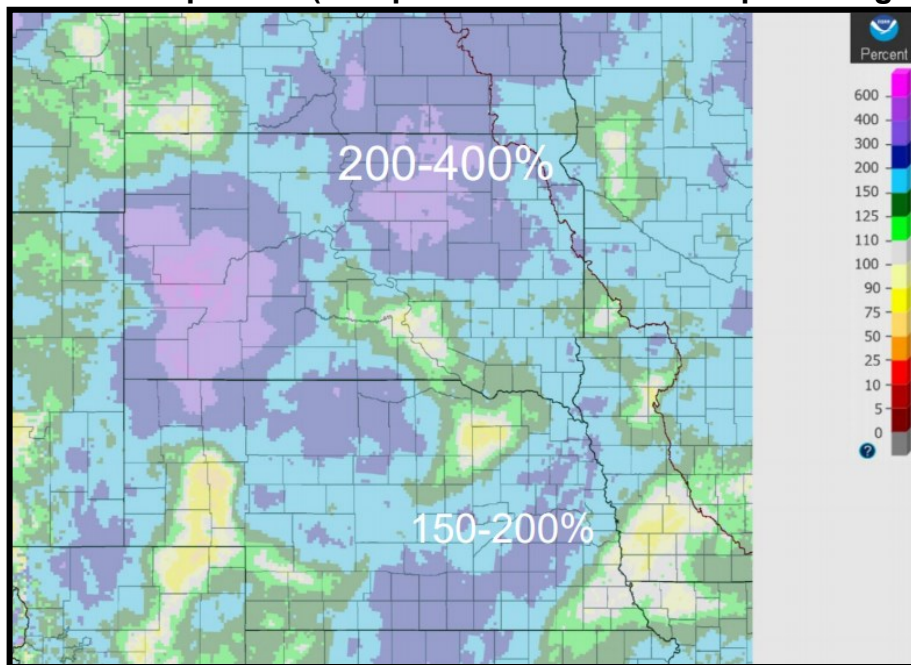
2020 Nebraska Spring Flood Outlook



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Each spring the NWS provides an assessment of the flooding potential across the state. For this spring, the overall flooding threat is considered generally near-normal for the southwestern portions of the state and above-normal across the remainder of the state. This increased flood risk for most of Nebraska is due primarily to the elevated soil moisture conditions and above normal streamflows that both stem from above normal precipitation over the past year. This has allowed much of the state to go into winter with higher-than-normal soil moisture and elevated river levels. These two factors alone stack the deck for an above-normal flood risk for portions of the state. Specifically the rivers that have the highest risk for flooding were: the Missouri River downstream of Plattsmouth, the Blue River downstream of Surprise, the North Fork of the Elkhorn River, and portions of the Platte River. The severity of spring flooding in 2020 will be largely dependent on the location and intensity of additional precipitation and thunderstorms.

Winter Precipitation (Compared to a normal as a percentage)

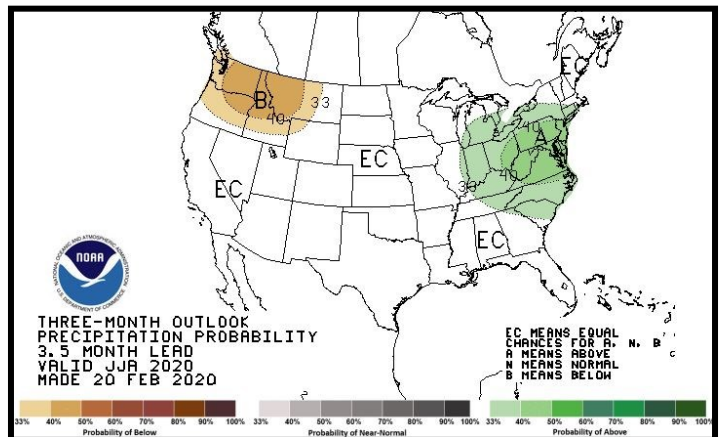
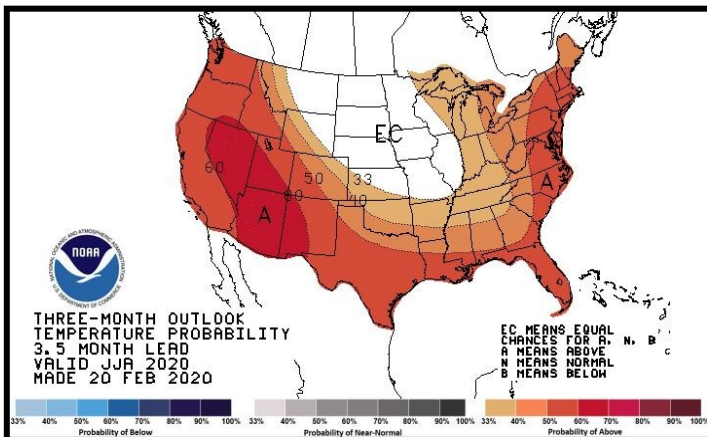
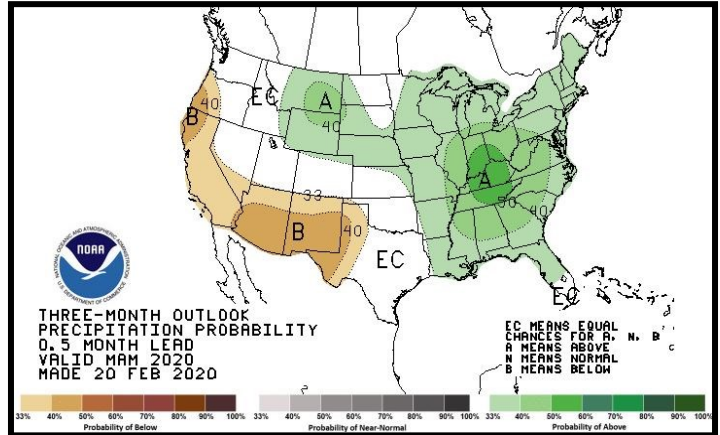
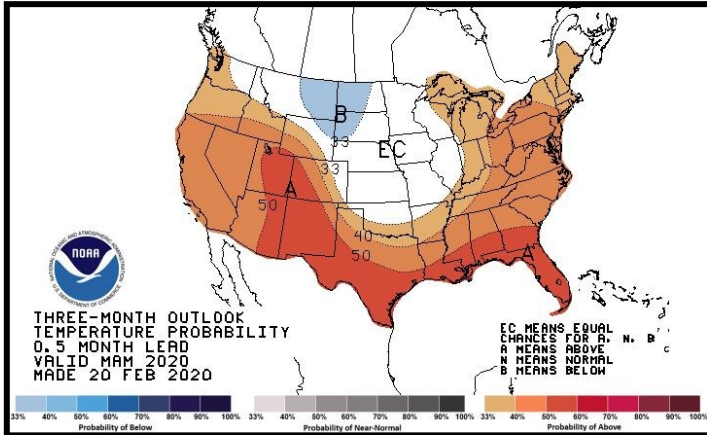


Soil moisture values are elevated for a large portion of Nebraska. Values are even higher into the Dakotas, which further elevates the flood threat for the Missouri River.



2020 Spring / Summer Climate Outlooks

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Ocean temperatures and circulation patterns play a significant role when it comes to climate forecasts across the globe. For the past several months, and likely through the upcoming summer, ENSO neutral (El Niño Southern Oscillation, the whole ocean/atmosphere El Niño/La Niña system) conditions have prevailed across the tropical Pacific. When ENSO conditions are neutral, climate forecasts tend to become less predictable, as ENSO is the strongest and most understood driver of the global climate.

Thanks in part to what is known as antecedent moisture existing across the plains from above normal precipitation over the fall and winter months, wetter than normal conditions are currently favored through the spring months across the local area. Temperatures have a weaker signal, however, and what is known as equal chances for below-near-or above normal temperatures are forecast locally. As we head towards summer, precipitation patterns are less certain, and equal chances for below-near-or above normal precipitation is forecast.

For more information, visit the Climate Prediction Center at <https://www.cpc.ncep.noaa.gov/>

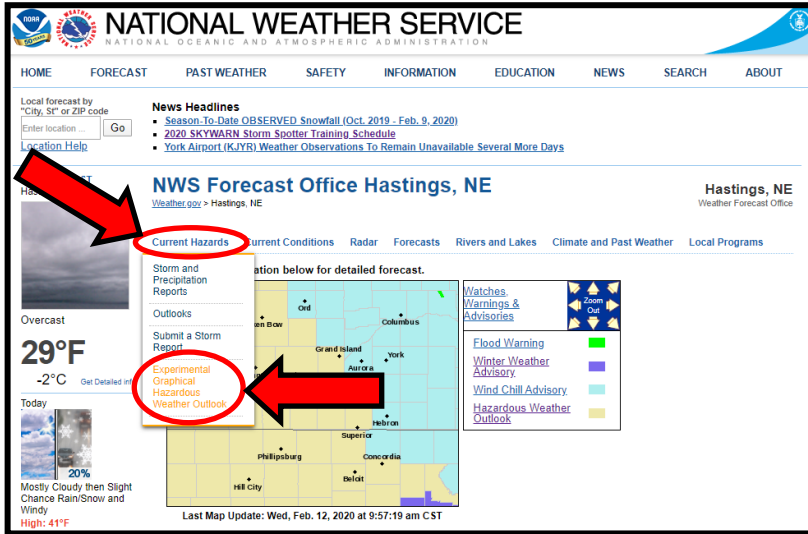


Experimental Graphical Hazardous Weather Outlook

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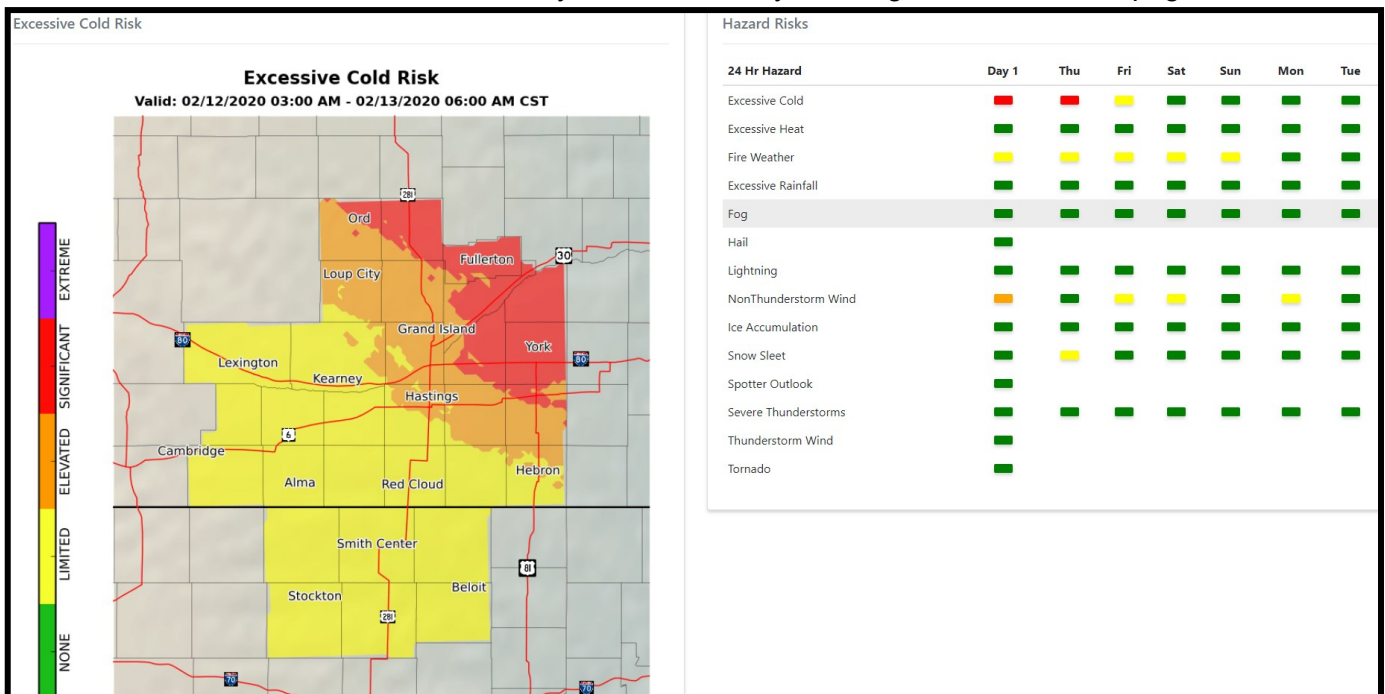


The Experimental Graphical Hazardous Weather Outlook is a service provided by the NWS Central Region offices that is comprised of a five-level weather hazard system displayed within a color-coded alert matrix and graphical map depiction. This service supports user decisions by providing weather hazard alert levels and potential impacts for multiple weather hazards out to seven days.



To find these graphics, start by going to www.weather.gov and clicking on your area of interest. Once on that office's home page, click on the "Current Hazards" tab and at the bottom you will see "Experimental Graphical Hazardous Weather Outlook", click that link.

Clicking the link will take you to a map of that NWS office's county warning area (below). On the right side of the page will be each weather hazard listed vertically, with each day listed horizontally at the top. The colored boxes shown will give you a quick look at what days may have the potential for hazardous weather. Any box colored green shows that no impacts are currently forecast, going all the way up to the color purple, which shows there is the potential for historic or rare impacts. More information on what each color means for each specific hazard and additional links for weather safety can be found by scrolling further down the page.





Nebraska Historical Severe Weather Events

Severe Weather Awareness Week | March 23 - 27, 2020

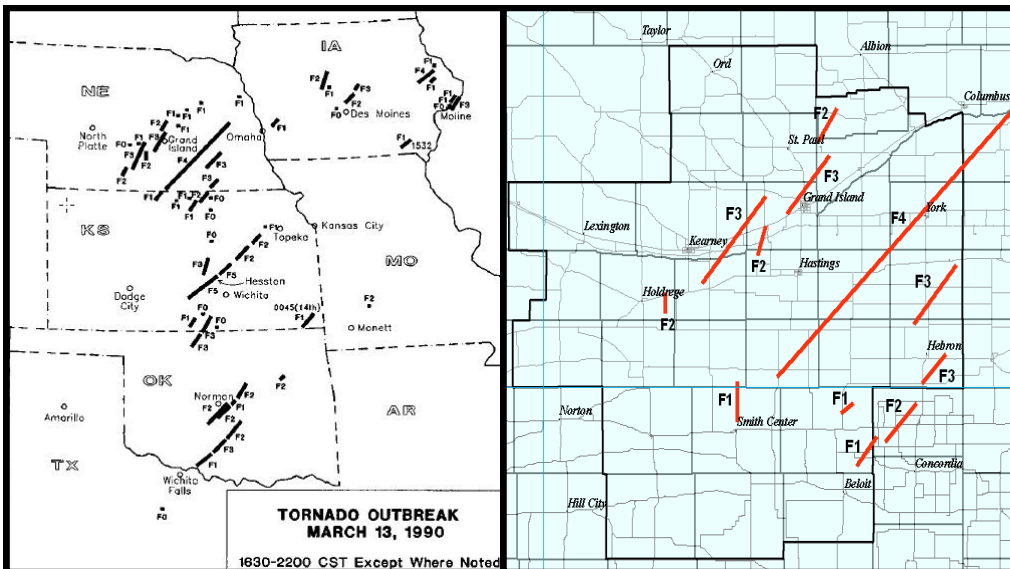


30 Years Ago - March 13, 1990: Central U.S. Tornado Outbreak

On March 13th, 1990, an early season outbreak of tornadoes ripped across the interior United States. A total of 59 tornado touchdowns impacted the states of Iowa, Kansas, Missouri, Nebraska, Oklahoma and Texas. Of the 59 tornadoes, 44 of the tornadoes occurred in Nebraska and Kansas. The more well known tornadoes include the Hesston, KS F5 tornado & the Lawrence, NE F4 tornado.

The Lawrence, NE tornadic complex tracked northeast for 124 miles, setting a record for the longest track tornado in the state of Nebraska, starting 3 miles south of Red Cloud & lifting 3 miles of Schuyler. Incredibly, there were no fatalities, though 9 people were injured. This F4 tornado had an estimated width of 1200 yards, or about 1/4 mile. There were 4 tornadoes rated as F3, which affected portions of Hall, Buffalo, Kearney, Fillmore & Thayer counties.

Much more about this event can be found here: www.weather.gov/gid/48406



Left: These images show the paths of the tornadoes from the outbreak on March 13th.

The left image shows the paths across the central U.S., the right image is zoomed in on the NWS Hastings, NE coverage area of south central NE & north central KS.

Right: A screen capture of video taken by Robert Schroeder. His location was 5 and 1/2 miles southwest of Lawrence in eastern Webster County, looking to the southwest. This F4 tornado passed within 1/2 mile of the Schroeder residence.





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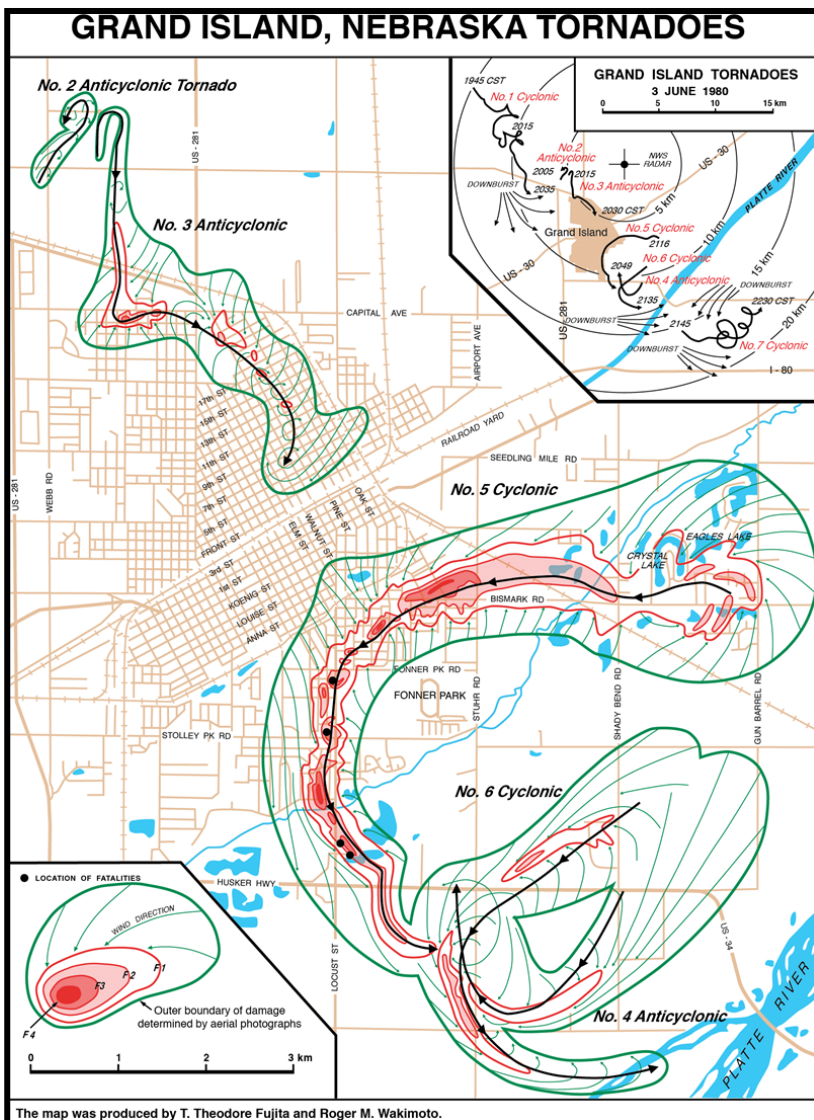


40 Years Ago - June 3, 1980: Night Of The Twisters

On June 3rd, 1980, a massive supercell thunderstorm complex developed just north of Grand Island, NE, during the early evening. This complex moved slowly south-southeast through the city at around 8 MPH. This tornado outbreak provided the basis for a book & television movie, as well as tornado & engineering research. Over a period of less than 3 hours, this storm complex produced 7 tornadoes in & around Grand Island. There was one tornado rated an F4 and 3 others that were rated F3.

Five people were killed, about 200 injured, 475 living units & 49 businesses were destroyed. Total damage was nearly 300 million dollars. Notably, 3 of the 7 tornadoes rotated anti-cyclonically (clockwise), a rare occasion in the northern hemisphere, where over 99% of tornadoes rotate cyclonically (counter-clockwise).

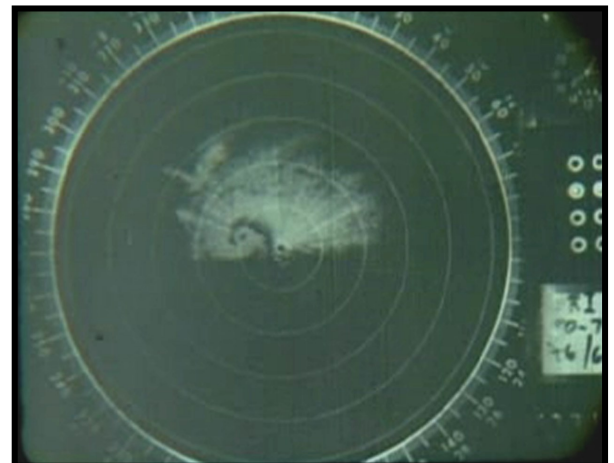
Much more about this event can be found here: www.weather.gov/gid/53032



Above: Unfortunately, very few photos exist of the tornadoes. Photo by Rod Gartner.

Left: Map showing each tornado path.

Below: The Grand Island radar shows one tornado's well defined hook echoes (just left of center).





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85 Years Ago - May 30, 1935: The Great Republican River Flood

On May 30th, 1935, a historic flood swept through the Republican River, creating devastation along its path. On this day, as much as 18-24 inches of rain fell in eastern Colorado & southwestern Nebraska. By early morning of the 31st, the usually peaceful Republican River was running bluff-to-bluff along its upper reaches. With all the water that roared through the Republican Valley Basin, everything in the water's path, including buildings, livestock, trees, snakes, and people, were washed down the river. There are many stories of people clinging to trees until they could be rescued. Towns close to the river, including Parks, Benkelman, Culbertson & Cambridge, were flooded. Cambridge, the most affected, had nearly three-fourths of its homes flooded.

Ninety-four people were killed, 341 miles of highway were damaged & 307 bridges were damaged/destroyed. The total damage from this event was estimated at \$26 million (\$440 million in 2013 dollars).

In addition to the flood, severe weather impacted the already flood ravaged area on the afternoon of May 31st. A tornado touched down near McCook, killing 5 people and injuring 35. These storms created more havoc as they moved northeast, killing two more people east of Lexington. As if this wasn't enough, a dust storm originating from Oklahoma came through McCook at the peak of the flood.

Much more about this event can be found here: www.weather.gov/gld/1935flood



Top Left: The McCook Power Plant before destruction by the flooding.

Top Right: A hand line & cable car had been brought in to the men trapped on the roof on a rope. Two men were rescued this way before the supporting poles were washed away.



Bottom Left: The 25,000 gallon water tank & the roof both collapsed from the flooding.



May 9, 2015 Tornado Outbreak A Broadcaster's Perspective

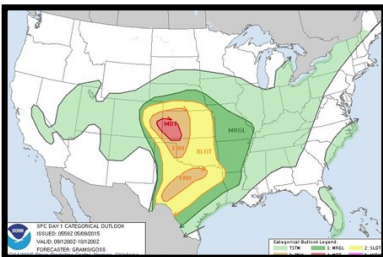


Amanda Wekesser - Meteorologist, NWS Goodland, KS

Weather events have a way of changing your outlook on life...or at least make you pause and reflect on them. As meteorologists, I'm sure we'll all have a couple of weather events in our lifetime that will always have a place in the back of our memories. Events such as the 2004 Hallam Tornado, the 1997 October Snowstorm, or the extreme flooding across the Central and Eastern parts of Nebraska in 2019 are just a few of the more memorable events that have occurred in the past 25 years.

One event that I will not soon forget is the severe weather outbreak that occurred in Eastern Colorado, Northwest Kansas, and extreme Southwest Nebraska on May 9, 2015. The events of this outbreak stick out to me because the area was very fortunate. For hours, NWS Goodland received multiple reports of large, long tracking tornadoes from storm chasers, broadcast media, spotters, law enforcement, and the public. Multiple rounds of heavy rain fell across the region resulting in flash flooding.

This was the first large scale outbreak I worked as a broadcast meteorologist. I had been on the air for a little over a month at the time of the outbreak. My first thought was being thankful that I was not scheduled to be on air that night, instead working in the production booth as the audio operator as our weekend meteorologist did a great job providing the on-air weather cut-ins.



The Storm Prediction Center's Day 1 Convective Outlook put the entire Tri-State area under a slight, enhanced, or moderate risk for severe weather (left). As of the time of the outlook's issuance, the Storm Prediction Center anticipated the greatest potential for tornadoes and large hail across portions of the Goodland County Warning Area including Cheyenne County in Colorado and Gove County in Kansas.

The first storm report of the afternoon for the area was a tornado report from Cheyenne County, Colorado. A supercell thunderstorm had moved north from Kiowa County into Southern Cheyenne County. A storm spotter reported a large

tornado which remained over open country and did not produce any damage. The tornado's path was 6.88 miles. Over the next hour, trained storm spotters reported two additional intermittent tornadoes in the county. Thankfully, these tornadoes also remained over open country and did not produce damage. We were able to get through the first of our two evening shows without any problems. The thunderstorms in Yuma County had our attention and we kept a close eye on those storms as they moved toward the state line.

Several rounds of thunderstorms moving through Eastern Colorado, extreme Southwest Nebraska, and Northwest Kansas produced multiple rounds of heavy rain. As a result of the rainfall, flash flooding occurred across Dundy County in Nebraska. Several roads in the county were covered with water in addition to the Dundy County Fairgrounds in Benkelman.

Elsewhere in the Tri-State region, a lone supercell thunderstorm developed in Lane County Kansas and quickly strengthened as it moved north through Gove, Sheridan, Decatur, and Red Willow counties. At 6:55 p.m. CST, several reports from storm spotters, broadcast media, and local dispatch came in of a tornado in Graham County. Around 7:00 p.m. CST, a storm chaser reported a large tornado in Gove County. No damage was reported from the tornado which was the first of six reported from this one supercell over the next four hours.

A second tornado was reported near the town of Grinnell in Gove County. The tornado caused some minor roof damage and overturned sections of irrigation pivots. The supercell continued to move north into Sheridan County where it produced two more tornadoes. A storm chaser reported a large tornado moving north. The tornado was later rated as an EF0 with a path length of 13.8 miles. The second tornado was the strongest one reported from this event in the Goodland coverage area with an EF2 rating. Traveling over nine miles through Sheridan County, it left tree and roof damage in addition to destroying a barn. The tornado then crossed the county line into Decatur County, where it traveled an additional 9.56 miles.



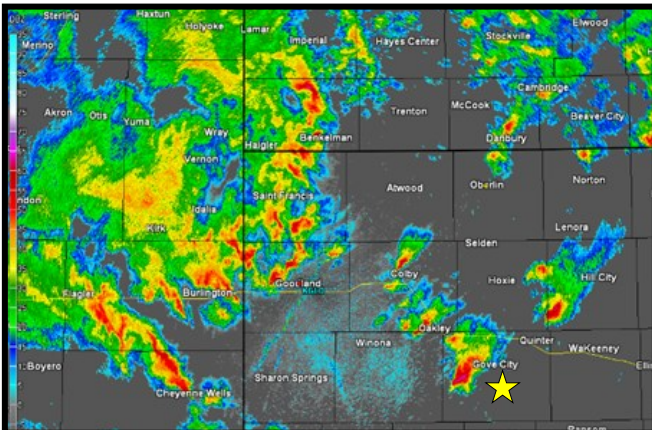
Large tornado in Cheyenne County, CO.
Photo by Phil Knudsen.



May 9, 2015 Tornado Outbreak A Broadcaster's Perspective



Amanda Wekesser - Meteorologist, NWS Goodland, KS



Radar imagery showing a lone supercell in Gove County, KS.

When the first tornado warning came for Decatur County, there was a sense of urgency through part of the building. I had been monitoring the storm's progress as it moved north across Gove County, Sheridan County, and into the southern part of Decatur County. Up to that point in time, we had not heard of much in terms of damage and the tornadoes had stayed over mainly open areas. One of the concerning things with this storm was that rotation continued to show up on radar and the storm did not show any signs of dying.

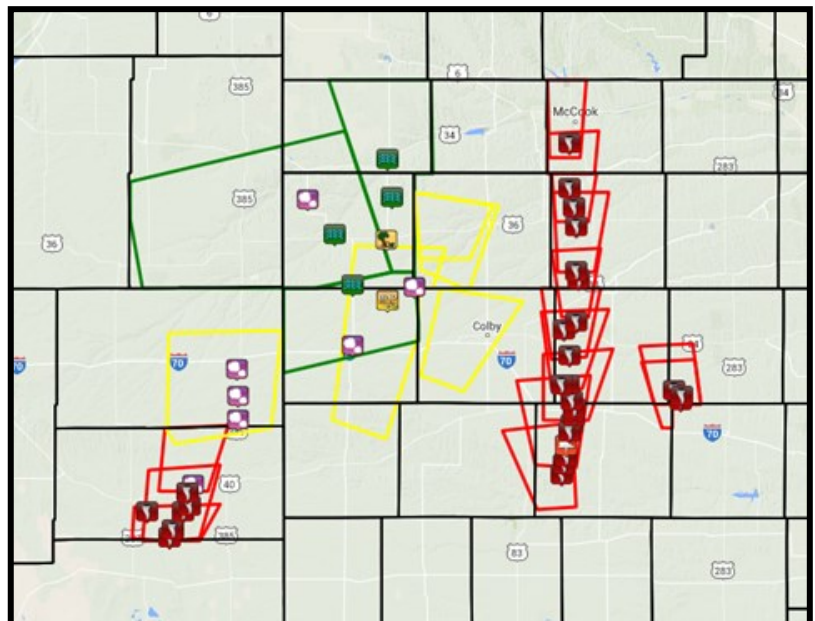
Our morning meteorologist had come in by this time to provide assistance behind the scenes. There was a growing sense of concern and unease as the storm deviated little from its northerly track. While it was still an entire county and a half away, the storm was on a direct path toward McCook, a town of around 7,500 people and one of the larger towns around!

As the storm continued to move through Decatur County, I felt my heart sinking. This storm with a history of producing several large and long-lived tornadoes, remained on an intercept course for McCook. Rotation remained consistent on radar. There were people out keeping an eye on the storm; however, the sun had gone down by this time which made spotting much more difficult as spotters would have to rely on lightning flashes to be able to see any tornadoes.

The NWS in Goodland, KS received a report from law enforcement of a confirmed, intermittent tornado in Red Willow County, south of McCook. The environment in both the production booth and the studio was very heavy and electrified with a sense of urgency and dread. My heart sank as the storm reached the outskirts of town. We had not at this point received an update as to whether the tornado was still on the ground or if another was forming. I remember feeling helpless as I watched the storm pass over the town. We had done all that we could to prepare people for the possibility of a direct hit, but we couldn't prevent it from occurring. Fortunately for everyone, the tornado lifted before arriving, resulting in the town being spared.

Thankfully, there were no reported injuries or fatalities in the NWS Goodland, KS County Warning Area during this outbreak. Very few reports of damage were received thanks to the tornadoes staying over mainly open fields. This event could have turned out much worse if the tornado had not lifted prior to reaching McCook, or a slight deviation in the storm track would have brought the storm closer to Grinnell.

The events of the May 9, 2015 outbreak should serve as a reminder to have your emergency plan in place before severe weather occurs. Have your emergency kit stocked and in your storm shelter or an easily accessible place. Also, make sure you have multiple ways to receive weather information in case you lose power. You never know when that disaster you've planned for will finally strike, changing your life forever.



Summary of weather reports received and warnings issued. Red boxes show the tornado warnings issued, yellow boxes show the severe thunderstorm warnings, and green boxes show the flash flood warnings.

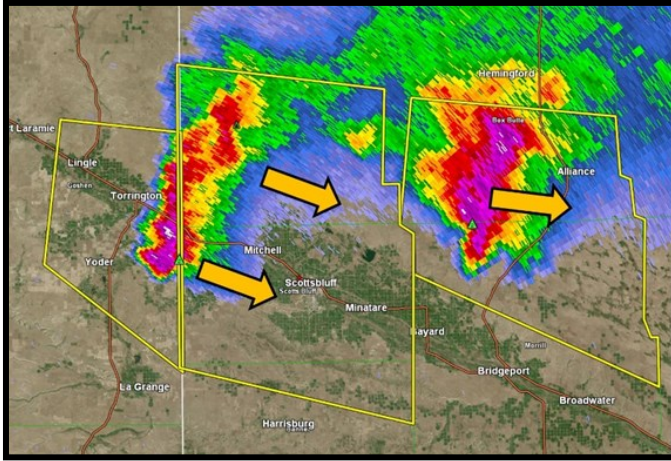


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Nebraska Panhandle - NWS Cheyenne, WY



Scottsbluff Pummeled:

On **August 15th-16th**, Scottsbluff was struck twice over the course of 10 hours with golf ball/baseball sized hail. Significant building, vehicle, irrigation, and crop damage occurred as both storms crossed over the area. Insured losses were likely over \$1 million dollars across all impacted sectors.

NWS Cheyenne provided a 25-minute lead time for Scottsbluff for the first storm and a 44-minute lead time with very strong warning wording as the next storm rolled through at 1:45 AM. Multiple calls and emergency notifications were coordinated ahead of the impacts with first responders. Several individuals report being alerted by their weather radio and got to a safe place.



Sioux County Tornado:

July 18th: The unrated tornado produced damage to trees and farm equipment of local residents in a rural area northwest of Harrison, NE. Hail occurred with the associated supercell up to half-dollar size as the convection moved east. NWS Cheyenne provided a 19-minute lead time from the tornado warning issuance until the initial touchdown of the tornado on the ground.

Sidney Tornado:

July 12th: A tornado briefly touched down approximately 5 miles north of Sidney. Several reports from social media were received and videos showed the unrated tornado to be on the ground for only 6 to 7 minutes in totality. Structural damage was not reported regarding the tornado, thus it was not rated on the E-F Scale. NWS Cheyenne provided a 4-minute lead time from the tornado warning issuance until the initial touchdown of the tornado on the ground. The associated supercell also had Ping Pong/Walnut sized hail in Cheyenne County.





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Extreme Southwestern Nebraska - NWS Goodland, KS

Annual Precipitation

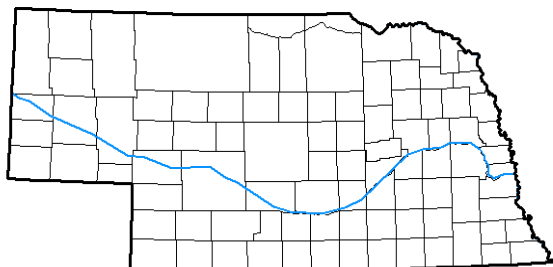
Extreme Southwestern Nebraska started out the year with drought-free conditions and below normal precipitation. Despite slightly above normal precipitation in March, below normal rainfall in April and the first part of May resulted in abnormally dry conditions returning to Dundy County. Conditions improved later in the month as several rain events brought above normal precipitation to the region. Trenton Dam recorded 5.76" of rainfall which was over 2.5" above normal! The moisture eradicated the dry conditions throughout the southwestern part of the state.

Modest rainfall through the summer months kept the southwestern portion of the state drought-free. Conditions began to dry out again in September with McCook and Trenton Dam recording below normal precipitation through the remainder of the year. As a result, abnormally dry conditions returned to the region. The two sites ended up with below normal precipitation for the year. Trenton Dam was nearly one inch below normal while McCook was over 3.75" below normal.

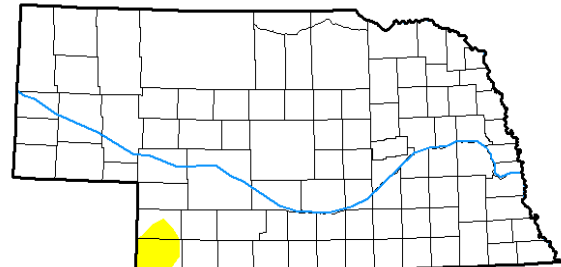
Station	2019 Precip	Normal	Percent
Trenton Dam	20.55	21.52	95
Culbertson	24.9	22.35	111
McCook	18.75	22.53	83

U.S. Drought Monitor

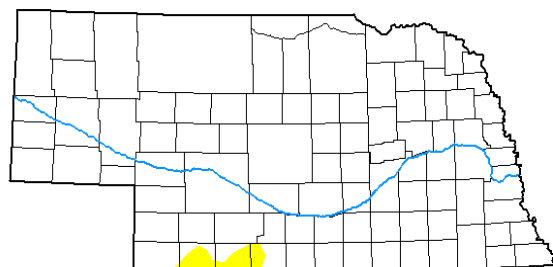
January 1, 2019



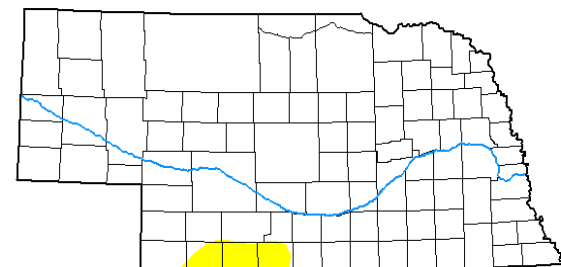
May 7, 2019



October 22, 2019



December 31, 2019



Intensity

D0 Abnormally Dry
 D1 Moderate Drought
 D2 Severe Drought
 D3 Extreme Drought
 D4 Exceptional Drought



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Extreme Southwestern Nebraska - NWS Goodland, KS Continued...



Photo courtesy of Greg Johnson.

The severe weather season started off slow for Extreme Southwestern Nebraska. Only 15 storm reports were received in May, which is normally one of the peak months for severe weather for Goodland's coverage area. Most of those reports were received on **May 17th**, as severe thunderstorms produced hail ranging in size from nickels to three inches across Dundy, Hitchcock, and Red Willow counties. The storms spawned three tornadoes, two of which were rated as EF-U. The EF-U (unknown) rating is assigned when there is no damage to indicate the tornado's wind speed.

The third tornado touched down south of Highway 34, near the Hitchcock and Red Willow county line. The tornado crossed the highway and traveled approximately six miles to the north-northeast, where it struck a farm located northwest of McCook. Numerous outbuildings and grain bins were destroyed and a house sustained significant damage. This tornado was rated an EF-2.

June and **July** were fairly quiet in terms of severe weather for Extreme Southwestern Nebraska, with Northwestern Kansas and Eastern Colorado receiving the bulk of the active weather. July's lone severe weather day for extreme Southwestern Nebraska came on the first. Thunderstorms moving through Red Willow County produced hail ranging in size from quarters to ping pong balls.

August brought an uptick in severe weather reports for the region. On **August 13th**, severe thunderstorms produced severe hail and localized flash flooding across Hitchcock County. A CO-OP observer reported 1.15" of rainfall in Culbertson. This was the second report of over one inch of rain for the location in less than five days and accounted for over one-third of the precipitation received for the month. Culbertson ended the month at 3.31" above normal. Law enforcement reported water covering portions of Highway 25 between Beverly and Trenton. Hail sizes ranged from quarters to tennis balls. Southwestern Nebraska was fortunate to miss out on the largest hail of the afternoon, a 4.83" stone which set a Colorado state record!

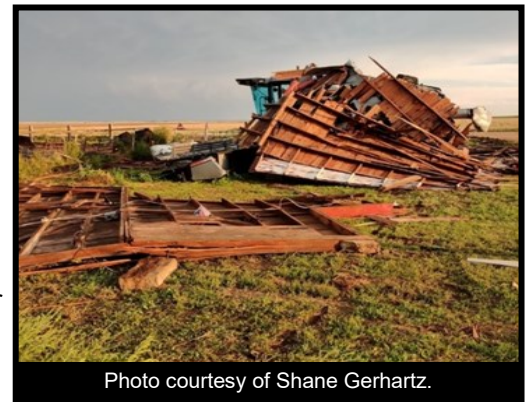
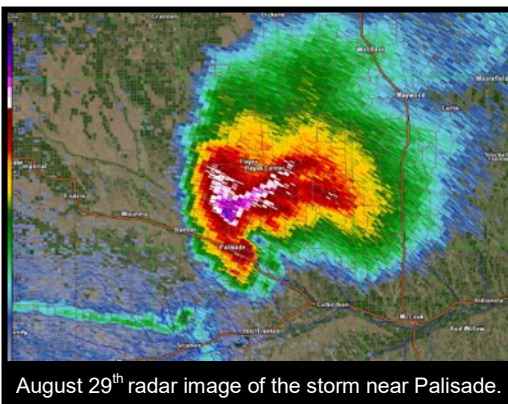


Photo courtesy of Shane Gerhartz.

Another significant event for the area was a wind event on **August 29th**. Straight line winds caused damage to a barn, power poles, and crops southwest of Palisade, in Hitchcock County. A National Weather Service Storm Survey destimated winds from the event to be around 91 MPH.



August 29th radar image of the storm near Palisade.

Other reports from the county included an overturned irrigation pivot, downed trees and branches, and a road sign that had been ripped from the ground. This was the last widespread severe weather event for Extreme Southwestern Nebraska for 2019.

The remainder of the season remained quiet with below normal precipitation reported at McCook and Trenton Dam.



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Western & North Central Nebraska - NWS North Platte, NE

The severe weather season got off to a slow start across western and north central Nebraska in 2019. In fact, no severe weather occurred until the end of **April**. The severe season came to an end on the last day of **September**. Heavy rain, large hail, strong winds and tornadoes were all reported in 2019. A total of 16 tornadoes were reported, with the largest hail and thunderstorm wind gusts being 3 inches in diameter and 82 MPH respectively. With the exception of far southwestern Nebraska, most locations had rainfall totals anywhere from 5 to 10" above normal for the year. The heavy rain, and persistent high water table in the Sandhills, led to several road closures which continued into the fall.

The month of **April** was relatively benign across western and north central Nebraska. The first reports of severe weather occurred on **April 28th** across far southwestern Nebraska. Severe storms tracked across Chase County with thunderstorm wind gusts up to 70 MPH reported near Imperial.

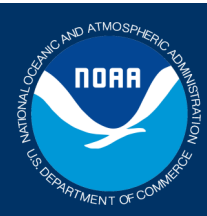
The first two weeks of **May** were quiet across western and north central Nebraska. That all changed on **May 17th**. Severe storms developed over southwestern Nebraska, as well as the Nebraska Sandhills. Across southwestern into portions of central Nebraska, a total of 7 tornadoes were reported from Frontier into southern Custer County. Four tornadoes were rated EF0, one EF1, one EF2 and one EF3. The EF3 tornado touched down 8 miles northeast of Stockville and tracked northeast 2 miles striking a farmstead. Two buildings were completely destroyed and there was extensive damage to multiple structures at this farmstead. In addition to the tornadoes, hail up to 2 inches in diameter was reported in Frontier, Lincoln, and Custer counties. Ten days later, on **May 27th**, thunderstorms developed across northeastern Colorado in the vicinity of a stalled out front. As the thunderstorms moved into southwestern Nebraska, they became severe. Hail up to 3 inches in diameter occurred, with golf ball or larger sized hail reported in Deuel, Chase, Keith, Perkins and Lincoln counties. In addition to hail, a total of three tornadoes were reported that day. Two tornados were EF0 and one was an EF1 tornado. All three tornadoes were reported in Chase County north and northwest of Imperial. The EF1 tornado overturned several irrigation pivots as it tracked northwest of Imperial.



EF3 Tornado Damage northeast of Stockville on May 17th.
Photo from NWS Storm Survey.

EF1 Tornado Damage northwest of Imperial on May 17th.
Photo from NWS Storm Survey.

June started out with an active weather pattern across western and north central Nebraska. Severe storms impacted northern Nebraska on **June 2nd** with quarter sized hail being reported in Cherry County. On **June 4th**, an isolated supercell thunderstorm developed in the eastern Nebraska Panhandle and tracked southeast into Keith and Lincoln counties. Thunderstorm wind gusts of 70 MPH were reported at the Ogallala Airport and golf ball sized hail fell near Dickens in Lincoln County. A larger outbreak of severe thunderstorms occurred across the southern Sandhills and southwestern Nebraska on **June 8th**. Golf ball sized hail was reported in Chase and Lincoln counties. Another round of severe storms occurred on the **19th** and **20th** of June in portions of central Nebraska and the northeastern Nebraska Panhandle. On the **19th**, hail up to



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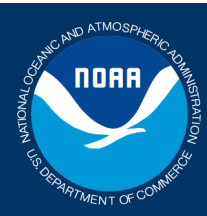
Western & North Central Nebraska - NWS North Platte, NE Continued...

golf ball size was reported in Blaine county. Severe storms were reported in northwestern Nebraska on **June 20th**, then over Thomas and Custer counties on **June 24th**.

The first week of **July** was active across western and north central Nebraska. Severe storms impacted the southeastern Nebraska Panhandle on **July 1st** and northern Cherry County on **July 2nd**. On **July 4th**, severe storms developed over the northeastern Nebraska Panhandle and tracked across north central Nebraska. Hail up to 2.5 inches in diameter occurred in western Cherry and Sheridan counties. Thunderstorm wind gusts of 80 MPH were reported in west central Cherry County and numerous reports of golf ball sized hail occurred around Merritt Reservoir in Cherry County. On **July 8th**, thunderstorms produced up to 8" of rain near Eustis. This resulted in numerous reports of flash flooding around Eustis, and Medicine Creek near Stockville rose 9 feet in one hour. On **July 12th**, a line of thunderstorms developed in the western Sandhills and tracked into the central Sandhills and portions of southwest Nebraska. Numerous straight line wind gusts of 60 to 70 MPH were reported in Keith, Lincoln, Thomas, Blaine and Custer counties. Multiple trees were reported down in Sutherland and downed power lines were reported south of North Platte. Two consecutive nights of severe storms occurred on **July 14th** and **July 15th** across Sheridan and Cherry counties. On the **14th**, golf ball sized hail was reported near Antioch and on the **15th**, 70 MPH winds were reported near Rushville. The next round of severe storms impacted the eastern Nebraska Panhandle and Cherry County on **July 26th**. Wind gusts up to 70 MPH were reported northeast of Oshkosh with a center pivot irrigation system overturned. Storms impacted Boyd County on **July 28th** with half dollar hail and an EF0 tornado east of Butte.

Continued active weather began in early **August** with 80 MPH winds reported on the **4th** in Arthur and Keith counties. Outbuildings were reported damaged southwest of Arthur. On the **6th and 7th** of August, severe storms impacted portions of north central Nebraska. Hail up to 2.5 inches in diameter was reported north of Stuart in Holt County and thunderstorm wind gusts to 70 MPH hit south of Burwell. Active weather continued on the **8th, 9th and 10th** of August. On the **8th**, heavy rain produced some street flooding in North Platte. On the **9th**, thunderstorm wind gusts to 70 MPH were reported at the Ainsworth airport. On the **10th**, heavy rain developed over Hayes County, which led to flash flooding. Roads were reported washed out west of Hayes Center and near Hamlet. On the **13th**, thunderstorms developed during the morning hours in the eastern Nebraska Panhandle. This activity then tracked southeast into southwestern Nebraska. Thunderstorm wind gusts to 70 MPH were reported near Oshkosh. Further southeast, 2.5 inch hail was reported near Lemoyne and Big Springs. Near Lemoyne, hail lasted for 30 minutes damaging vehicles and crops. As the storms tracked into Perkins and Chase counties, numerous golf ball sized hail reports occurred and 80 MPH winds were reported near Madrid. On the **29th** of August, an isolated supercell thunderstorm developed across eastern Keith and Perkins counties. As this activity tracked southeast, two EF0 and one EF1 tornado touched down west and southwest of Hayes Center.

The beginning of **September** was fairly benign across western and north central Nebraska. Three consecutive nights of severe storms impacted the area on the **10th** and the **11th**. On the **10th**, thunderstorms tracked across Cherry County. A thunderstorm wind gust of 82 MPH was reported at the Valentine airport. As this activity tracked east overnight, heavy rain led to flash flooding in Holt County. Water was reported over Highway 20 near Wood Lake. On the **11th**, a strong upper level trough of low pressure forced a cold front through the area. Thunderstorms developed in the eastern Nebraska Panhandle and moved east and southeast. Thunderstorm wind gusts to 80 MPH flipped three semi trailers in Chase and Hayes counties. Heavy rain fell in Brown, Rock and Holt counties. Flash flooding was reported with water over Highways 20, 7, and 183. In Ainsworth, a motorist had to be rescued from a washed out road. Flooding was reported along the Elkhorn river near Atkinson. Another round of severe storms impacted SW Nebraska on the **30th**. Hail up to 2 inches in diameter, damaged several vehicles around North Platte.



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South Central Nebraska - NWS Hastings, NE

After an unforgettable March, comprised of heavy rainfall, rapid snow/ice melt & record flooding, the severe weather season had plenty of events worth remembering.



Tornado Near Farnam on May 17th.
Photo by John Homenuk.

While April was more active than recent years with 5 different severe weather events scattered throughout the month, the month of May really started the “serious” severe weather. On **May 17th**, an EF1 rated tornado crossed in southwest Dawson County near Farnam and caused minor damage on its 4.5 mile path. Forty minutes later, another EF1 tornado formed, this time just east of Cozad. This tornado moved northeast for almost 10 miles with max winds estimated to be 100 MPH, damaging outbuildings, trees & farm machinery along its way. One more brief, EF0 rated tornado was observed by a storm chaser crossing Highway 21. Tornadoes also impacted parts of Franklin & Nuckolls counties. On **May 26th**, an EF1 rated tornado set down north of Macon. This fast moving tornado was only on the ground for 2 miles, but managed to destroy a detached garage, flip an irrigation pivot & cause minor damage to a home. On **May 27th**, a brief tornado occurred in Superior, damaging a garage. The tornado was rated EF0 with max winds around 80 MPH.

The month of May wasn't just about tornadoes. **May 5th** started the month with near 30 reports of hail and high winds. Tennis ball sized hail was reported in Hamilton County west of Stockham. On **May 23rd**, lightning struck a dry fertilizer storage facility on the east side of Hastings shortly after 10 PM. The ensuing multi-alarm fire (right) razed the facility to the ground resulting in an estimated monetary loss of \$19 million. **May 27th** brought the reemergence of widespread flooding. Several creeks and rivers flooded, including the Little Blue River, Republican River, Prairie Dog Creek, Spring Creek, Buffalo and Mud Creek. The Buffalo and Spring Creeks in Dawson County reached the 2nd and 3rd crests on record respectively. Unfortunately, this event was harbinger of more flooding to come for the area.



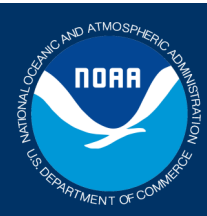
May 23rd Fire East of Hastings.
Photo by the Hastings Police Department.

The month of June had no less than nine days on which severe weather was reported in some part of south central Nebraska. On **June 8th**, high winds swept across Furnas, Harlan and Phelps counties. The city of Holdrege lost power for a time as a section of a large power line was taken out south of town. On that same night, lightning struck the Home Goods Store in Grand Island and damaged a section of the roof allowing water into the building. **June 14th** brought flash flooding to Nuckolls County with culverts washed out and water flowing over part of U.S. Highway 136 east of Guide Rock. Hail and high winds caused crop and property damage on **June 20th-21st** across several counties. In Furnas County, drifts of hail still existed the next morning after hail and wind pummeled local crops. In general, 70-95 MPH winds blew through Furnas, Harlan, Phelps, Kearney, Buffalo and Adams counties. Power lines were down across U.S. Highway 6/34 around Minden and widespread tree damage was reported in the Hastings area. On this same night, lightning struck the Farwell Fire Hall in Howard County causing major damage. As the night wore on, the high winds spread further east with 80 MPH wind gusts reported in western Hamilton County upsetting pivots and damaging trees. Finally, on **June 25th**, hail, high winds and heavy pelted the area again. The Ord Airport reported a 74 MPH wind gust while golf ball to 3



Large Hail Near Holstein on June 25th.
Photo by Amanda Dettwiller.

inch diameter hail fell in the Holstein area. In northern Polk County, the Clear Creek crested just over flood stage on the **27th** thanks to a widespread 3" rainfall on already saturated ground.



2019 Nebraska Severe Weather Summary

Severe Weather Awareness Week | March 23 - 27, 2020



South Central Nebraska - NWS Hastings, NE Continued...

July was an interesting month as there were seven days of severe weather in the first two weeks of the month, but none after the 14th. The most significant event was widespread flooding on **July 8-9th**. Over 10" of rain fell in western Buffalo & eastern Dawson counties, mostly in the Turkey Creek basin. Statistically, the odds of this much rain falling at any one time is about 1 in 1000, making it extremely rare. Gibbon, Kearney, Odessa, Elm Creek & Lexington were all severely impacted. Water in the basin traversed east into Kearney. The water rose rapidly mid-morning on the south side of Kearney, quickly covering roads & parking lots, eventually into many businesses on the south side of town. Around 400 homes were damaged & many hotels were unable to operate for weeks due to damage. Water rescues were common as crews carried people out of the flooding in airboats & the buckets of payloaders. The water even reached part of Interstate 80 near exit 272. Water was 3' deep at an Odessa truck stop, trapping motorists who had pulled in to avoid the torrential downpours. In Lexington, flood water interrupted utility services. Elm Creek had widespread flooding as the Elm Creek itself rose 8' in 2 hours. In Gibbon, at least 30 homes were inundated with water from the Wood River. This was the second major flood in Gibbon in 2019. Amtrak service across southern Nebraska was halted. Flood damage estimates were easily in the tens of millions of dollars. There was 1 fatality due to the heavy rainfall, when a 46-year old died from injuries sustained in an automobile accident south of Cozad.



Yaney Park - Kearney.
Photo by the Kearney Hub.

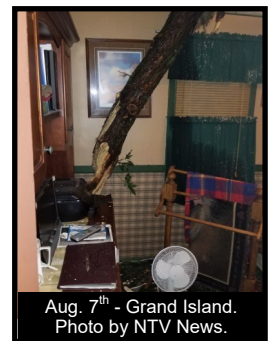


Areal View of Southern Kearney.
Photo by KRVN Radio.



Kearney Flooding.
Photo by NTV News.

August started with a bucket load of water as up to 7" of rain fell in Valley County on **August 2nd**. The Turtle Creek flooded again, with locals noting the worse conditions than the record March flooding. Some rural roads washed out in Valley County. On **August 7th**, a wind gust of 87 MPH was measured at the Grand Island airport. This was one of several 70+ MPH wind gusts reported across the region that night. Trees were snapped on the west side of Hastings & buildings were damaged in Glenvil & Fairfield. Several irrigation pivots were upset to go along with considerable crop damage. On **August 11th**, an 81 MPH wind gust in Cozad damaged the school roof, resulting in water flowing into the library. On **August 23rd**, a viscous hail & high wind plowed a narrow path of destruction across Adams County. Half dollar size hail & 80 MPH stripped trees, blew out windows, destroyed siding & mowed late season crops to the ground resulting in millions of dollars of damage.



Aug. 7th - Grand Island.
Photo by NTV News.

Amidst the hail & wind barrage, copious amounts of rain kept falling in some locations. Parts of Hall, Howard and Sherman counties received over 15" of rain for the month. Grand Island experienced the wettest-August on record, and 3rd wettest-calendar month since 1895. Flooding was widespread as were the impacts. Rising ground water in the Platte Valley west of Doniphan caused local sand pit lakes to rise rapidly & water to flow into area homes. Almost 17" of rain fell in the Doniphan area in August. The heavy rainfall also impacted the Nebraska State Fair in Grand Island. Most of the parking had to be shifted off property due to the condition of the parking grounds, with shuttles staged across the city. Drainage issues also caused temporary flooding across the fairgrounds, delaying the opening on at least one day. Overall attendance was down about 30,000 patrons because of the wet, cool weather. August turned out to be a fitting summer wrap-up to an already extremely wet 2019. Thankfully, September brought much needed drier & warmer weather in anticipation of fall harvest.



2019 Nebraska Severe Weather Summary



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Eastern Nebraska - NWS Omaha/Valley, NE

Eastern Nebraska was devastated by the flooding from rapid snowmelt, frozen ground, and heavy rainfall in Mid-March. Luckily, the tornado and severe weather season was not as significant in 2020.

The first severe weather event occurred on **March 28th**, when ping pong ball to golfball size hail fell near Barneston and some grain bins were destroyed by damaging winds near Ellis.

April was also a quiet severe weather month with only a few reports of severe weather, the most significant events were storms that produced up to 1 ½ inch size hail on **April 10th** in Gage and Lancaster counties.



Dairy Sweet ice cream shop in Lincoln was destroyed by the tornado on May 5th. Photo by NWS Storm Survey.

May in eastern Nebraska and southwest Iowa started busy. On **May 5th** a series of severe thunderstorms moved southeast across southeast Nebraska. Lincoln was particularly hard hit with damaging winds and two tornadoes. The first tornado was reported by a storm chaser in a field northwest of Lincoln. The second tornado, rated a minimal EF2 in strength, carved a narrow path in southwest Lincoln, damaging roofs of homes, blowing down trees, slamming into a small ice cream shop and passing near the parking lot of Lee’s Chicken across the street. Intense damaging winds also blew part of the roof off the Harley Davidson dealership. The wind gusted to 87 MPH at Lincoln Airport, which caused some small trees to get blown over and a private jet to be moved. A car wash on the south side of Lincoln had its roof blown off. The storm complex moved east into Otoe County where 60 MPH winds were estimated by storm spotters.

The middle of May was quiet, weather-wise until the **21st**. A series of mini Supercells developed over northeast Kansas and moved into southeast Nebraska and southwest Iowa. Two tornadoes occurred south of Dawson in Richardson County. The first tornado was a brief touchdown. The second tornado was very photogenic with photos and videos from storm chasers and law enforcement. This tornado occurred in a middle of a field and there was no damage noted from the twister. Tree limb damage occurred from a brief tornado touchdown in Nemaha County. A funnel cloud was reported near Hepburn and trees were blown down near Clarinda, both locations in Page County, IA.



May 21st tornado south of Dawson. Photo by NE State Patrol Trooper Clint Zost.



2019 Nebraska Severe Weather Summary

Severe Weather Awareness Week | March 23 - 27, 2020



Eastern Nebraska - NWS Omaha/Valley, NE Continued...

Nocturnal thunderstorms moved through during the early morning hours of **May 24th**. Thunderstorms produced 24-hour rainfall amounts ranging from 2 to 8.75", with the highest amounts in southwest Iowa. River flooding developed on local streams, including the West Nishnabotna River, the Nishnabotna River, the Nodaway River, the Little Nemaha River, Weeping Water Creek, and the Big Blue River.

Nocturnal thunderstorms moved across the region north of a stalled frontal boundary that set up across the Nebraska and Kansas border on **May 28th**. The Omaha metro was especially hit hard with storms with quite a bit of wind damage, hail up to golf ball size, and hail that was several inches deep on roads which had to be removed with snow plows. State Farm insurance alone had reported 2000 claims from hail and wind damage. Flash flooding also occurred in both the Omaha and Lincoln metro areas.

June was relatively quiet with the most active severe weather on **June 21st**. Thunderstorms occurred during the early morning hours and the evening. Large hail, winds of 50 to 60 MPH, and flash flooding occurred over southeast Nebraska. More isolated severe storms struck southeast Nebraska on the **26th and 28th of June**.

Isolated events of severe weather occurred during the early and middle parts of July in Eastern Nebraska and Southwest Iowa. The most significant severe weather event was on **July 26th** when golf ball hail fell northwest of Bloomfield in Knox County.

On **August 7th**, an isolated Supercell moved into Knox County out of South Dakota and produced 60 MPH winds that blew down power lines and trees near Santee and golf ball to tennis ball size hail east of Lindy. Severe thunderstorms moved through southeast Nebraska during the early morning hours on **August 21st**. Winds gusts up to 60 MPH, and some minor tree damage was reported. Locally heavy rain also occurred, with rain amounts of 2 to 4" reported. On **August 26th**, severe storms struck southeast Nebraska and produced hail up to golfball size near Diller in Jefferson County.

September was a more active severe weather month than in the past. Thunderstorms with damaging winds and hail were reported across eastern Nebraska on the **4th and 9th**. An area of severe thunderstorms moving southeast across east central Nebraska and western Iowa produced hail up to golfball size across Washington, Colfax, and Cuming counties in Nebraska and Pottawattamie County, Iowa during the morning of **September 14th**. An isolated severe storm produced hail up to golfball size near Eagle in Cass County. Thunderstorms with heavy rain created flash flooding across Thurston, Stanton, and Cuming counties on **September 19th**. Isolated severe thunderstorms produced large hail and damaging winds across southeast Nebraska and western Iowa on evening of **September 21st**. Ping pong ball to golf ball fell across areas of Saunders County. On **September 24th** a slow moving cold front triggered an area of severe thunderstorms across western Iowa and eastern Nebraska. Two tornadoes made brief touchdowns near Woodbine, IA. Hail up to golf ball size was reported near Avoca, IA. Golf ball hail fell near Tekamah and tennis ball size hail was reported near Craig, both in Burt County.

The final severe weather episode in eastern Nebraska and southwest Iowa was on **October 1st** when thunderstorms dropped two brief tornadoes near Red Oak, IA and Shenandoah, IA. In Nebraska, thunderstorms dumped 3 to 4" of rain across Jefferson and Saline Counties resulting in flash flooding across several state highways.