

Storm Fury on the Plains

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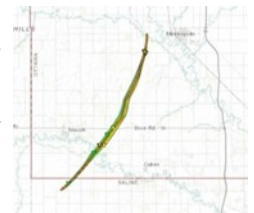
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2018 Weather Season in Review

By Chance Hayes – Warning Coordination Meteorologist

Overall, 2018 was a rather quiet year in regards to significant weather. One exception would be the tornado that moved across Eureka, KS. This storm carved a path northeast across the community and through a part of town that had been hit by an EF-2 tornado only two years prior. Significant flooding also occurred later in the fall with several rivers and creeks reaching well into moderate flooding. Unfortunately, two people lost their lives after driving into an area where a creek had reached levels up to 4 foot deep across the road with rapid flow.

After one of the slowest starts to tornado season on record for both Kansas & Oklahoma, May started off strong. Severe storms affected central & northeast Kansas on May 1st. The most significant tornado developed in extreme northern Saline County and tracked north into Ottawa County. This large tornado became known as the Tescott tornado. Several reports of large hail were also noted as storms tracked across the area.



Storm survey for Tes-
cott tornado



On May 14th a supercell thunderstorm tracked across Sumner County. It produced several brief tornadoes with the most intense producing EF-2 damage near Maple City. The most unique aspect of this storm is that after crossing into Oklahoma, it turned back to the north and produced another tornado in Cowley County.



Top: Storm survey for Cowley
County tornado Bottom: Damage
in Maple City

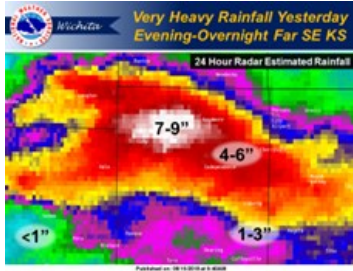


Damage in Eureka, from storm survey

Shortly after 7 PM on June 26th, the most destructive tornado to affect the area in 2018 struck the community of Eureka. The tornado first touched down just southwest of town and caused considerable damage as it tracked northeast through town. Most of the damage initially as it moved into town was to tree tops and roofs. However, as it continued to move to the northeast, it intensified significantly in the middle portions of Eureka and caused more widespread and significant damage. The tornado continued to track northeast and hit the high school producing major damage to the football field and gymnasium before moving out into open country causing sporadic damage. This tornado was given an EF-3 rating & was the second tornado to strike the town in the last three years.



Damage in Eureka, from storm survey



Rainfall totals from August 14th

Slow moving storms dumped copious amounts of rain across northern Montgomery County on August 14th. Between seven to nine inches of rain were reported with most of this falling in only a few hours. The total reported at Independence was 8.37 inches. Unfortunately this caused flash flooding along Racket Creek about one mile north of Elk City Lake which swept a vehicle off the road killing two individuals. The flooding occurred during the late evening hours and continued through the night.



Racket Creek location where fatalities occurred



Increased water output at the Big Ditch in Wichita, KS



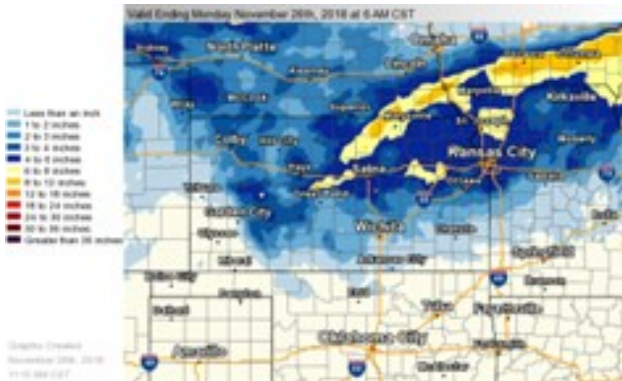
Hydrograph showing flooding at Cow Creek near Hutchinson

The most widespread flooding event of 2018 took place during a 5 day stretch in October. From October 5th to the 9th, much of south central and southeast Kansas picked up between seven to ten inches of rain which caused widespread river flooding. At one point, NWS Wichita had river flood warnings for 35 points along with 20 additional areal flood warnings.



Snowfall totals from 1/11/18

The first snow of the winter season came very early in 2018 when much of central and northeast Kansas picked up between three to six inches of snow. For much of the area it was the snowiest start to a winter season since 1951.



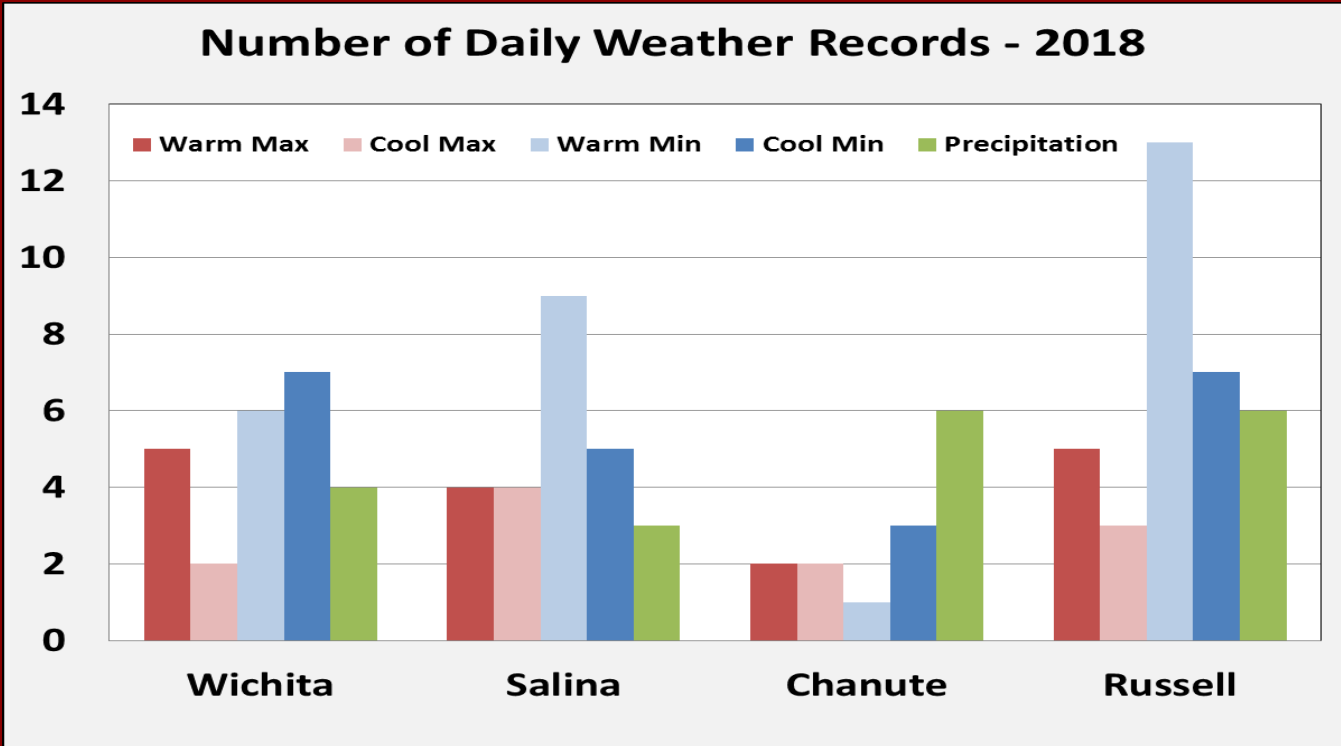
Snowfall totals from 11/25/18

This winter event also caused difficult travel conditions with the transitional freezing rain/sleet/snow mixture. To further complicate the event, the winds gusted at speeds over 45 mph at many locations. In total, over 150 accidents were reported.

On November 25th, 50 to 60 mph winds combined with three to six inches of snow produced blizzard conditions across much of the area. Reduced visibility caused large stretches of I-70 to be shut down. The strong winds were also responsible for minor property damage across the area.

2018 Climate Records

Weather Element	Wichita	Salina	Chanute	Russell
Warmest Temperature	101° on 7/19, 8/31	103° on 6/10, 14, 28	99° on 8/6	103° on 6/10, 28
Coldest Temperature	-2° on 1/1	-5° on 1/1	-3° on 1/1	-7° on 1/1
Highest Daily Precipitation	3.02" on 10/8	2.07" on 8/13	2.62" on 5/14	2.47" on 7/17



Hotspot Notifications

By Mick McGuire – Lead Meteorologist

From Feb 26, 2018 through Apr 30, 2018 the National Weather Service in Wichita, KS began issuing text notifications to our partners when we observed hotspots or wildfires using GOES satellite (see the GOES article following this one for more info) and dual polarization radar imagery. This innovative application to send text messages to our partners was first developed and used successfully at the NWS in Norman, OK during the winter and spring months of 2016.

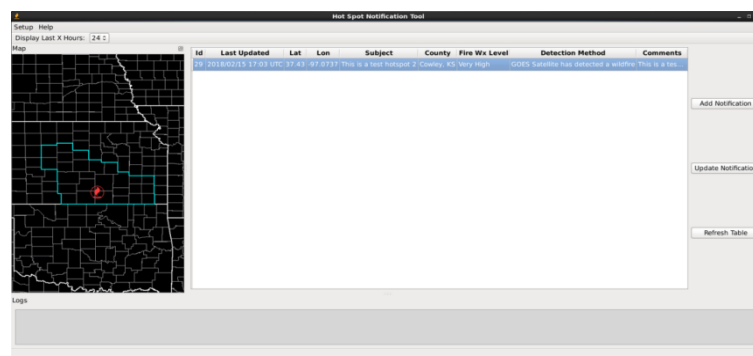
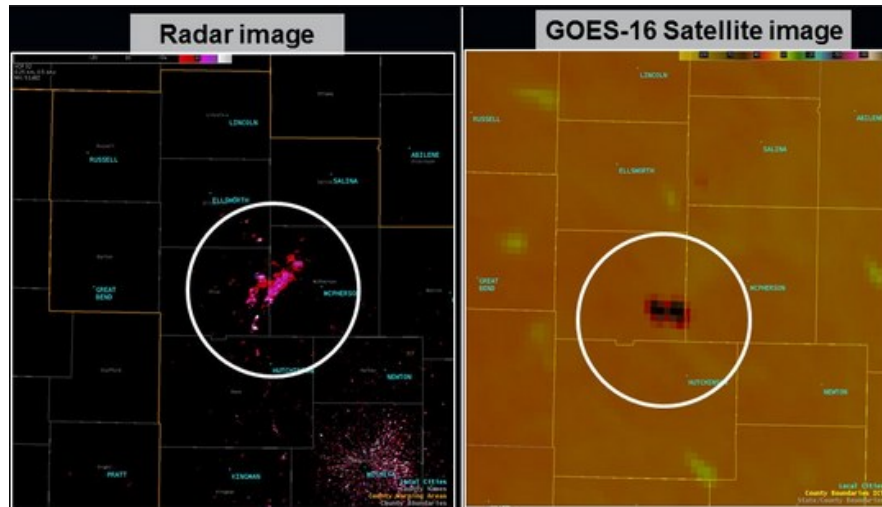


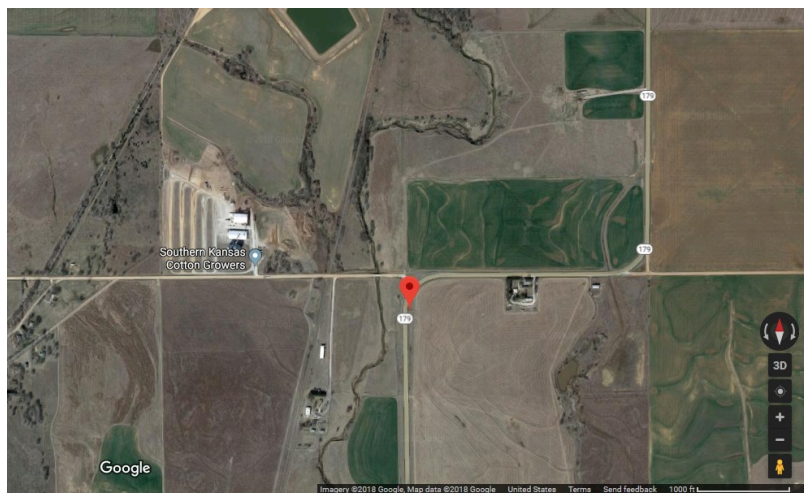
Image of the Hotspot Notification Tool used at the NWS in Wichita, KS

GOES satellite products provide near real-time imagery allowing meteorologists at the National Weather Service to identify new fires much quicker and to relay more detailed tactical information about fire progression and spread to the local officials and decision-makers. Across Kansas, wildfires consume thousands of acres every year. NWS meteorologists can help decision-makers anticipate fire weather conditions which accelerates first responders' preparations in order to keep wildfires under control and minimize their destructive reach.



A large vegetation fire in Rice county evident on both radar and satellite images

From Feb 26, 2018 through Apr 30, 2018 the NWS in Wichita issued 128 text notifications to our partners when we detected hotspots or wildfires on GOES 16 imagery and dual polarization radar. We focused on those days when the Grassland Fire Danger Index (GFDI) was very high, extreme or catastrophic. 87% of the notifications were issued during daylight hours between 9 AM and 6 PM. After the initial test period, we asked our users how much lead time on average they observed prior to the first call to 911. 85% of those surveyed indicated that the text notifications for wildfires were received prior to the first 911 call. Some of the hotspot notifications were received five to nine minutes before anyone called to report the wildfire. There was one fire in McPherson County where the text notification sent by the NWS was the only notification of the wildfire.



Mon Apr 30 2018 15:40 CDT
--Subject: Possible Wildfire
--Lat: 37.899 / 37 53.942 N
--Lon: -97.248 / 97 14.864 W
--Location: 7 miles SW of Whitewater, KS.
--County: Sedgwick, KS
--Grassland Fire Danger Index: Very High
--Detection Method: GOES Satellite has detected a wildfire
--Observation: KEWK T: 81 DpT: 46 RH: 29
WDIR: 190 WSPD: 33 WGST: 38
--Map:
maps.google.com/?q=37.899,-97.248&ll=37.899,-97.248&z=10
NWS Wichita
1-800-367-5736

Example of a hotspot text message sent to our partners

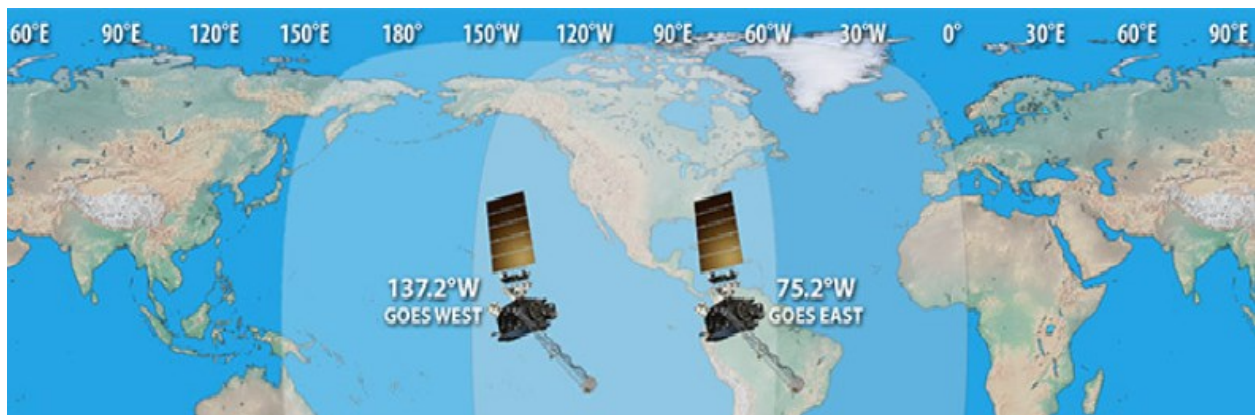
After spring green-up in the spring of 2018 we reached out to our partners and asked them if we should continue issuing hotspot notifications in the future. 100% of those surveyed said yes that they wanted us to continue issuing hotspot notifications for wildfires. For this upcoming fire season which typically peaks between Feb-Apr, the hotspot notifications will be expanded to include all of Kansas. Each NWS office in Kansas will issue hotspot notifications on those days when elevated fire weather conditions are anticipated.

What is GOES?

By Mick McGuire – Lead Meteorologist

NOAA's latest generation of Geostationary Operational Environmental Satellites (GOES), known as the GOES-R and GOES-S Series, are the nation's most advanced fleet of geostationary weather satellites. Geostationary satellites circle the Earth in geosynchronous orbit which means they orbit the Earth's equator at a speed matching the Earth's rotation. This allows them to stay in a fixed position in the sky remaining stationary with respect to a point on the ground. GOES satellites continually view the Western Hemisphere from approximately 22,300 miles above Earth. GOES satellites are designated with a letter prior to launch and renamed with a number once achieving geostationary orbit.

The GOES-R Series is a four-satellite program including GOES-R or GOES 16, GOES-S or GOES 17, GOES-T and GOES-U. The GOES-R Series Program is a collaborative development and acquisition effort between the [National Oceanic and Atmospheric Administration \(NOAA\)](#) and the [National Aeronautics and Space Administration \(NASA\)](#) to develop, launch and operate the satellites.



The image above shows the general locations of the new GOES 16 & GOES 17 Series satellites at 75.2° W and 137.1° W.

BENEFITS of the new GOES-R

- Improved hurricane track and intensity forecasts
- Increased thunderstorm and tornado warning lead time
- Earlier warning of lightning ground strike hazards
- Better detection of heavy rainfall and flash flood risks
- Better monitoring of smoke and dust
- Improved air quality warnings and alerts
- Better fire detection and intensity estimation
- Improved detection of low clouds and fog
- Improved transportation safety and aviation route planning
- Improved warning for communications and navigation disruptions and power blackouts
- More accurate monitoring of energetic particles responsible for radiation hazards

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YouTube: Search [NWS Wichita](#)

NWS Wichita Participates in NWS Week of Service & Salvation Army's Angel Tree Program

The National Weather Service has an annual week of service every fall where offices and individuals are encouraged to help their communities outside of their daily operational and warning functions. NWS Wichita participated in a couple of activities. They collected food throughout the week and donated it to the local homeless shelter the Union Rescue Mission. Additionally they made first aid kits for the shelter to hand out as needed. Another activity a few staff members did was to make cards for a loyal daily caller who lives in a nursing home in the community; he was grateful for the cards. These activities were a great way to reach out to individuals in our community, and we look forward to finding ways to continue such service for the next NWS Week of Service.



Kevin Darmofal (Lead Met) and Rich Fallin (ESA) putting together first aid kits for the homeless.



Donations were collected during the holiday season to sponsor children through the Salvation Army's Angel Tree program. Our staff generously donated enough money for the purchase of bikes for a nine year old girl and ten year old boy. We bought helmets as well to encourage proper safety.

Angel Tree 2018 Donations



Bike & helmet for 10 year old boy

Bike & helmet for 9 year old girl



Meet Our New Meteorologists



Welcome Roger Martin

Roger Martin, a native of the Alabama / Tennessee area, developed a passion for meteorology at a younger age while routinely watching "Weather in the Classroom" on The Weather Channel. His interest in weather only grew stronger after experiencing many higher-impact winter and severe weather events. After graduating high school, he moved to Mobile, AL to attend the University of South Alabama where he graduated in 2009 with a B.S. in Meteorology. After graduation, he worked as a Contract Weather Observer at the Huntsville International Airport for several years before accepting his first operational meteorologist position at a private weather company based out of North Carolina. Roger later

joined the National Weather Service in 2015; he first served at the Great Falls, Montana office. This past summer, Roger joined the WFO Wichita family as a General Forecaster. He is passionate about the science of meteorology and applying that to serving the public and National Weather Service partners. He has a special interest in severe weather and thunderstorms. Roger and his wife live in Wichita with their three young children.

Welcome Kelly Butler

Kelly Butler joined the NWS Wichita team in October 2018. Oddly enough, Kelly's interest in weather started out by being scared of thunderstorms as child instead of staying afraid of storms she decided she would have to learn everything about weather to figure out what exactly she had missed. Curiosity would overcome fear and quickly you would find her staring out windows to the fury of the occasional severe thunderstorm in Central Massachusetts. When her family learned of her weather interest, they shared local storm stories; one of her favorites was when her grandma gave her a newspaper she had kept after the deadly Worcester MA tornado of 1953. The Worcester tornado of 1953 remains on SPC's list of the top 25 deadliest U.S. tornadoes.



Fast forward: After graduating high school at the top of her class, Kelly decided to pursue her interests in weather and attend Lyndon State College (LSC; now Northern Vermont University) where she double majored in Atmospheric Science and Applied Mathematics. She began to delve into tornado research near the conclusion of her junior year when she joined a research team that investigated the relationship between the visual characteristics, damage, and radar signatures produced by tornadoes. Kelly's first trip out to the Great Plains was a lucky one. Her first meaningful deployment she observed the birth of a multi-vortex tornado and watched it develop into what became an EF4 tornado through Shawnee OK on May 19, 2013. Kelly was also fortunate enough to collect data on the historic El Reno, OK tornado on May 31, 2013. You might know that a second historic tornado, the EF 5 Moore OK tornado, occurred between those dates and was a truly humbling experience for Kelly as she toured EF 5 damage for the first time. Kelly and another member of her research team volunteered during a break in their week to help the ravaged community. Her undergraduate research group focused on aerial damage survey analyses of the Moore and El Reno tornadoes and have published their results. Kelly graduated LSC with departmental, academic, and athletic awards.

After taking a year off, Kelly enrolled at Ohio University where she earned her Master of Science in Geography. Her thesis work, under the direction of Dr. Jana Houser, was on *The Effects of Land Cover Type on Tornado Intensity in the Southeast U.S.* The preliminary work has been used to secure funding to support continued research on the topic at Ohio University.

Prior to signing on with the NWS, Kelly spent time working for the National Park Service's Geoscientists-in-the-Parks Internship Program in Sandy Hook, NJ and later Rutgers University. She worked as a geographic information systems researcher analyzing data and conducting field work in coastal geomorphology at Gateway National Recreation Areas in New York, New Jersey, and Delaware. In her spare time Kelly enjoys playing tennis, cooking and cycling. She looks forward to serving the Wichita community and the National Weather Service.

Come Check Out Storm Fury on the Plains!

Meteorologists from the National Weather Service office in Wichita have partnered with your local emergency management office and will be presenting information that will help prepare storm spotters and weather enthusiasts for the upcoming storm season. Our staff will provide an in depth weather presentation that will engage the audience by teaching them about the different types of storms, the individual storm features that help a person to recognize a storms potential severity, how to report hazardous weather, and severe weather safety.

The presentations are hosted by local county emergency management agencies and typically last up to two hours. They are open to anyone that has an interest in weather. There are no fees to attend or no registration; you do not have to sign up to be a spotter. If you are interested in learning more about severe thunderstorms and their hazards, please take the time to come out and join us for a very interesting and enjoyable evening.

For more information please contact your local county emergency manager or NWS.Wichita@noaa.gov.

Return of the Advanced Spotter Talk

By: Robb Lawson - Lead Meteorologist

For only the 3rd time since 2010, NWS Wichita will be giving advanced spotter talks. These talks will cater to those who have a keen interest in the science behind severe storms. Topics will include basic severe storm forecasting, an in-depth look at the 2018 Eureka tornado and a closer look at what can cause an anticipated high end severe weather event to become a bust. The advanced talk will be free and open to the public. See below for dates and locations.



Thursday	4/4/2019	630 pm	Sedgwick Co	Wichita	Wilbur Middle School
Friday	4/5/2019	630 pm	Montgomery Co	Independence	Independence Community College - Auditorium
Tuesday	4/9/2019	630 pm	Saline Co	Salina	Salina South High School



Sign up your organization to be a
Weather Ready Nation Ambassador!

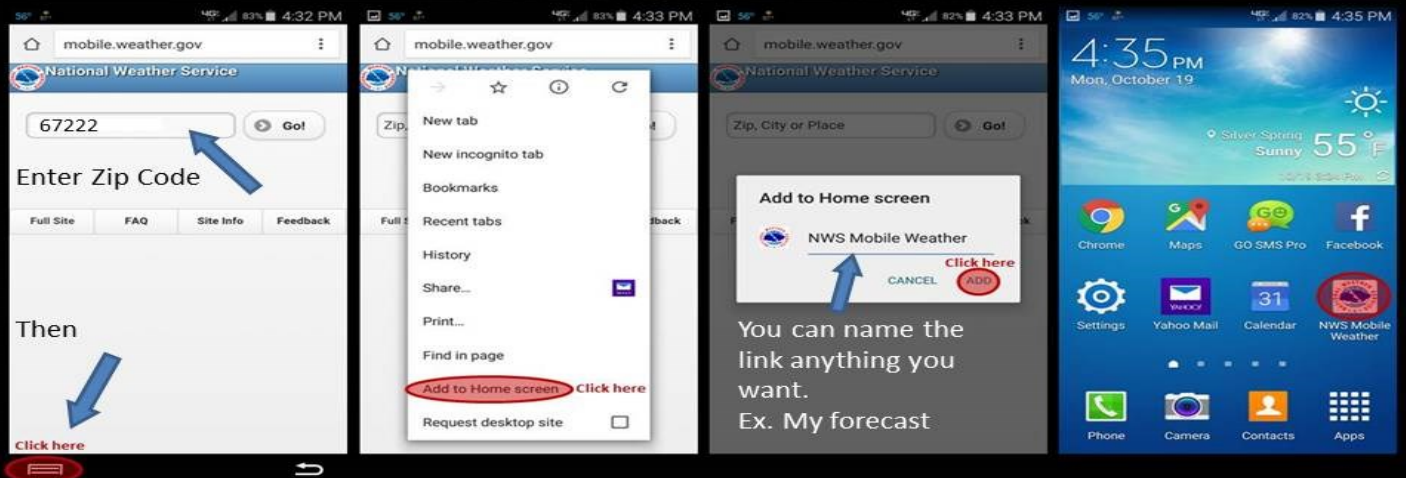
Help the NWS spread the word about weather safety and preparedness.

Go to: weather.gov/wrn/ambassadors

How to get weather.gov on your mobile device

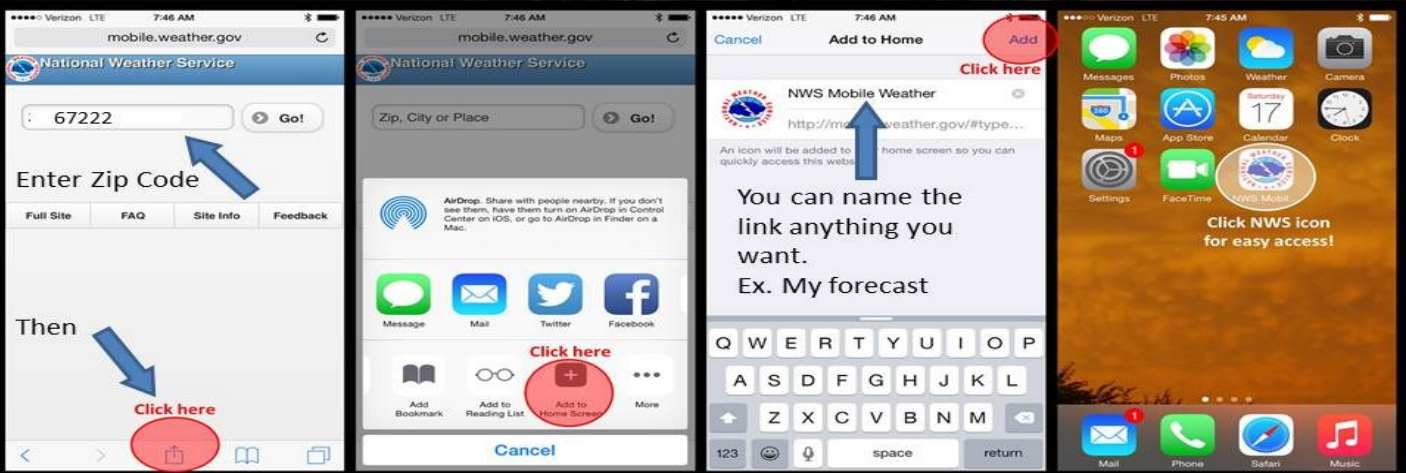
- Visit mobile.weather.gov using Chrome
- Enter Zip code hit go
- Then click the menu button after the forecast loads
- Choose "Add to home screen."
- Change name if desired
- Click Add

Weather.gov on Your Android



- Using Safari on your iPhone.
Go to mobile.weather.gov
Enter your zip code and hit go.
Then click the send button at the bottom.
Choose "Add to Home Screen"
Edit the Name
Click Add

Weather.gov on Your iPhone







Severe Weather Statistics for 2018

- Severe wind, hail and flooding reports: 297 (406 in 2017)
- Number of tornadoes: 20 (Average—18.82)
- Strongest tornado: EF-3 Greenwood County on June 26
- Largest hail stone: 4” - Barton County on May 1st
- Strongest wind: 87 mph - Rice County measured on July 29
- Most reports received: 34 in Sedgwick and Cowley counties

Random Weather Facts

- ◆ The first careful routine weather observations in North America were made in 1644 by a Lutheran minister, the Reverend John Campanius Holm, near what is now Wilmington, Delaware.
- ◆ George Washington was an active weather observer who kept a daily weather diary until December 13, 1799; his weather notations were the last things that he wrote.
- ◆ Thomas Jefferson collected weather information everywhere in the country he could find it. He kept a record of the weather around him every day for 50 years.

 <p>National Weather Service Wichita, Kansas</p> <p>Report</p> <p>Time of Event Event Type Location of the Storm Location of Yourself</p> <p>  @NWSWichita  @NWSWichita #kswx www.weather.gov/wichita </p>		Hail Sizes		Tornadoes		Wind Reports	
		0.75” Penny 1.00” Quarter 1.25” Half Dollar 1.75” Golf Ball 2.00” Egg 2.50” Tennis Ball 2.75” Baseball 4.00” Grapefruit	Damaging Winds Wall Cloud Funnel Cloud Hail Flooding Snow Totals Ice Accumulation	> 58 MPH 58-72 MPH 73-112 MPH 113+ MPH	Twigs & small limbs break off Shingles damaged & large limbs broken Roof damage, windows break, & trees uprooted Roofs tom off & trailer homes destroyed		

Example: "I saw a tornado at 4:43pm approximately 2 miles south of my location, which is 4 miles NW of Winfield."



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“The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information, database and infrastructure which can be used by other government agencies, the private sector, the public, and the global community.”

Got any ideas for articles? Please let us know!

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