



2019 KANSAS SEVERE WEATHER AWARENESS

Information Packet

**SEVERE WEATHER
AWARENESS WEEK**

March 4-8, 2019

TORNADO SAFETY DRILL

Tuesday, March 5, 2019

10am CST/9am MST

Backup Date:
March 7, 2019

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2018 Kansas Tornado Overview

<u>Tornadoes:</u>	45	17 below the 1950-2018 average of 62 50 below the past 30 year average of 95 48 below the past 10 year average of 93
<u>Fatalities:</u>	0	<u>Injuries:</u> 8
<u>Longest track:</u>	15.78 miles (Saline to Ottawa, May 1, EF3)	
<u>Strongest:</u>	EF3 (Saline to Ottawa, May 1; Greenwood, June 26)	
<u>Most in a county:</u>	9 (Cowley).	
<u>Tornado days:</u>	14 (Days with 1 or more tornadoes)	
<u>Most in one day:</u>	9 (May 2, May 14)	
<u>Most in one month:</u>	34 (May)	
<u>First tornado of the year:</u>	May 1 (Republic Co., 4:44 pm CST, EF0 5.29 mile length, 125 yard width)	
<u>Last tornado of the year:</u>	October 8 (Brown Co., 3:39pm CST, EF0, 3.12 mile length, 75 yard width)	
<u>Length of tornado season:</u>	160 days (Days between first and last tornado)	

2018 Monthly Tornado Totals

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
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	1	0	0	0	0	0	0	2	4.4%
EF2	0	0	0	0	1	0	0	0	0	0	0	0	1	2.2%
EF1	0	0	0	0	5	0	0	0	0	0	0	0	5	11.1%
EF0	0	0	0	0	27	4	2	3	0	1	0	0	37	82.2%
Total	0	0	0	0	34	5	2	3	0	1	0	0	45	100%
Per- cent	0%	0%	0%	0%	75.6%	11.1%	4.4%	6.7%	0%	2.2%	0%	0%		

*Violent (EF4—EF5) in red, Strong (EF2-EF3) in yellow, Weak (EF0-EF1) in green.
Monthly totals in gray. (Percent values may not add to 100% due to rounding)*

Annual Highlights: A total of 45 tornadoes occurred in Kansas in 2018 which is below the long term average (records beginning in 1950). This is well below the 10 year and 30 year average number of tornadoes. No violent tornadoes occurred in Kansas last year, and no tornado related fatalities were reported. On June 26th, an EF3 tornado tracked across 9.15 miles in Greenwood County resulting in eight injuries.

May was the most active month of 2018 with 34 tornadoes. This is 93 tornadoes below the one month record of 127 tornadoes reported in May 2008.

The costliest tornado of 2018 was the EF3 tornado that went through Greenwood County. Damage was estimated to be \$13,690,000.

Kansas Tornado Statistics

by County

1950 - 2018

TORNADOES, FATALITIES, AND INJURIES

Legend: Tor = Tornado | Fat = Fatalities | Inj = Injuries

County	Tor	Fat	Inj	County	Tor	Fat	Inj	County	Tor	Fat	Inj
Allen	27	0	4	Greenwood	44	0	18	Pawnee	52	0	1
Anderson	15	3	12	Hamilton	30	0	1	Phillips	41	0	1
Atchison	15	0	11	Harper	62	0	1	Pottawatomie	34	1	5
Barber	40	0	2	Harvey	49	1	63	Pratt	73	3	10
Barton	102	2	40	Haskell	32	0	10	Rawlins	47	0	4
Bourbon	19	0	7	Hodgeman	55	0	4	Reno	81	0	22
Brown	46	0	5	Jackson	31	4	17	Republic	62	0	3
Butler	84	28	225	Jefferson	41	0	101	Rice	47	0	6
Chase	41	0	2	Jewell	43	0	2	Riley	29	0	51
Chautauqua	20	0	0	Johnson	44	0	12	Rooks	52	0	6
Cherokee	37	4	66	Kearny	45	0	0	Rush	52	0	8
Cheyenne	43	0	0	Kingman	67	0	1	Russell	78	1	7
Clark	40	0	0	Kiowa	59	11	74	Saline	46	0	66
Clay	45	1	31	Labette	42	1	29	Scott	58	1	1
Cloud	52	1	8	Lane	47	0	2	Sedgwick	89	13	360
Coffey	24	0	5	Leavenworth	30	2	30	Seward	38	0	15
Comanche	42	0	2	Lincoln	33	0	2	Shawnee	55	18	528
Cowley	82	77	293	Linn	14	0	3	Sheridan	41	0	0
Crawford	35	4	43	Logan	29	0	0	Sherman	110	0	0
Decatur	47	0	5	Lyon	48	7	222	Smith	45	0	2
Dickinson	38	1	17	Marion	47	1	2	Stafford	72	3	5
Doniphan	19	0	2	Marshall	34	0	1	Stanton	22	0	0
Douglas	40	1	48	McPherson	55	1	16	Stevens	25	1	5
Edwards	50	0	7	Meade	51	0	0	Sumner	85	5	14
Elk	24	2	8	Miami	20	4	10	Thomas	46	0	1
Ellis	62	0	6	Mitchell	49	0	5	Trego	63	5	101
Ellsworth	51	0	0	Montgomery	36	1	1	Wabaunsee	38	1	26
Finney	98	1	41	Morris	34	0	7	Wallace	35	0	4
Ford	101	0	2	Morton	20	1	2	Washington	40	2	12
Franklin	30	3	34	Nemaha	37	0	3	Wichita	35	0	4
Geary	19	0	3	Neosho	31	0	4	Wilson	16	0	0
Gove	58	0	3	Ness	53	0	4	Woodson	12	0	8
Graham	42	0	0	Norton	30	0	0	Wyandotte	10	2	36
Grant	25	0	9	Osage	45	17	6				
Gray	51	0	3	Osborne	45	0	13				
Greeley	39	0	0	Ottawa	35	2	12	Total	4699	237	2924

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Kansas Tornadoes 2018

Cheyenne	Rawlins	Decatur	Norton	Phillips	Smith	Jewell	Republic	Washington	Marshall	Nemaha	Brown	Doniphan	Leavenworth	Wyandotte
							2		2		1			
Sherman	Thomas	Sheriden	Graham	Rooks	Osborne	Mitchell	Cloud	Clay	Pottawatomie	Jackson	Atchison	Jefferson		
1		1	1			1	2	2				1		
Wallace	Logan	Gove	Trego	Ellis	Russell	Lincoln	Ottawa	Dickinson	Geary	Wabaunsee	Shawnee	Douglas	Johnson	
							2						1	
Greeley	Wichita	Scott	Lane	Ness	Rush	Barton	Ellsworth	Saline	Morris	Lyon	Osage	Franklin	Miami	
						1	1	1		1	1			
Hamilton	Kearny	Finney	Hodgeman	Pawnee	Stafford	Rice	McPherson	Marion	Chase	Coffey	Anderson	Linn		
		1					1			1				
Stanton	Grant	Haskell	Gray	Ford	Edwards	Reno	Harvey	Butler	Greenwood	Woodson	Allen	Bourbon		
			1	1				4	1					
Morton	Stevens	Seward	Meade	Clark	Comanche	Barber	Harper	Sumner	Cowley	Chautauqua	Montgomery	Labette	Cherokee	
								1	9	1	1			

45 tornadoes (3 county crossers)

Kansas Tornado Facts

Days with more than 20 tornadoes

Date	#Tornadoes
05/23/08	70
04/14/12	43
06/15/92	39
05/05/07	36
05/24/16	34
06/04/55	33
05/29/04	28
10/26/06	28
05/25/97	25
06/09/05	25
05/15/91	24
07/07/04	23
05/06/15	22
04/26/91	21
06/15/09	21

Kansas Tornado Count by Decade

1950s:	560
1960s:	457
1970s:	303
1980s:	339
1990s:	789
2000s:	1192
2010s:	679 (through 2018)

Most Tornadoes in One Episode

May 23, 2008	70 Tornadoes
April 14, 2012	43 Tornadoes
June 15-16, 1992	41 Tornadoes

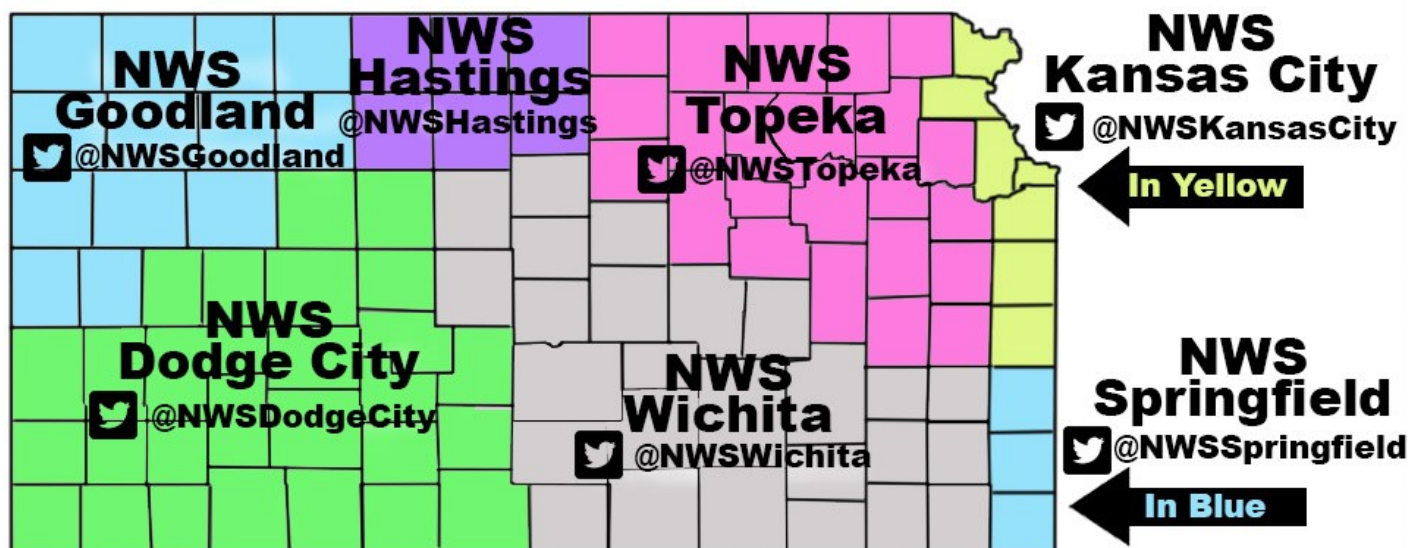
Did you know...

There are seven National Weather Service offices that serve portions of Kansas!

National Weather Service (NWS) offices in Kansas are located in Goodland; Dodge City; Wichita; Topeka; Hastings, Nebraska; Pleasant Hill (Kansas City), Missouri; and Springfield, Missouri. Each office is staffed by a team of highly trained meteorologists, technicians, electronics technicians, information technology specialists, hydrologists, and administrative assistants. The NWS offices are staffed 24 hours a day, seven days a week, 365 days a year.

Contact the NWS office in your area to learn more about weather, weather safety, NOAA Weather Radio, office tours, or to learn more about careers in meteorology in the NWS or in NOAA.

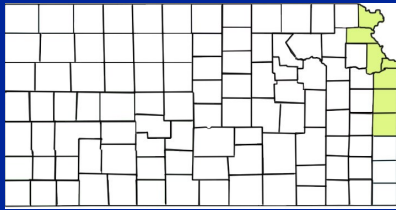
We are here to serve you!



The following pages contain 2018 severe weather summaries for each NWS office. Here is severe weather terminology you may encounter.

- **Severe Thunderstorm** – The National Weather Service issues severe thunderstorm warnings for storms that are currently or are capable of producing winds of 58 mph or stronger and/or hail one inch in diameter or larger. Severe thunderstorms are often much stronger than this minimum criteria, so it is a good idea to take severe thunderstorm warnings seriously.
- **Tornado** – A tornado is a violently rotating column of air in contact with the ground either as a pendant from a cumuliform cloud or underneath a cumuliform cloud, and it is often (but not always) visible as a funnel cloud. A funnel cloud is a condensation cloud typically funnel-shaped and extending outward from a cumuliform cloud and is associated with a rotating column of air.
- **Flash Flood** – A flash flood is flooding that occurs very rapidly and usually within 6 hours of heavy rainfall. Flash flooding may occur along creeks, rivers or streams. It can also occur in low lying or urban areas where drainage is poor. Water levels can rise very quickly during flash flooding including locations that did not receive the heavy rainfall but are located downstream from areas that received an extreme amount of rainfall. Flash flooding can occur in the winter months when rain falls on existing snowpack and causes it to melt rapidly. Flooding is the number one severe weather killer in the U.S.

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2018 Severe Weather Summary Extreme East Central and Northeast Kansas National Weather Service - Pleasant Hill, MO

2018 Far Northeast Kansas Severe Weather Stats By The Numbers

**Number of Severe Wind,
Hail, Flooding Reports:**
63 (2017: 163)

**Tornado: 1 (EF-1) May 2,
2018**

Largest Hail:
2.00" (Johnson County)
April 13, 2018

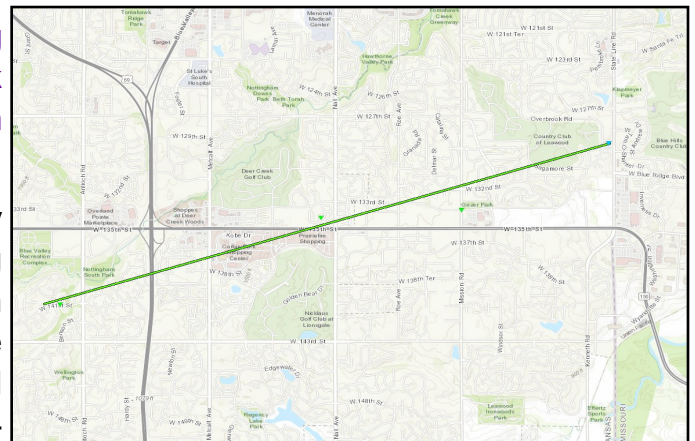
**Strongest Wind: 82 mph
(Linn County) May 2, 2018
(measured)**

Most reports received:
Johnson County (28)

While 2018 was generally pretty quiet across far northeast Kansas from a severe weather standpoint, there were several notable events that impacted the region. The lone tornado to occur in the far northeastern seven Kansas counties occurred on May 2 when an EF-1 tornado produced a four to five mile stretch of damage in Overland Park, KS. Extreme to exceptional drought impacted the agricultural community through the summer months after an incredibly dry late spring and summer. The drought was broken by an increase in rainfall through the late summer and ultimately a mid-autumn extreme rainfall event. On October 6-9, most of northeast Kansas received between six and ten inches of rain. These rains produced scattered flooding which caused a fatality in Miami County.

May 2, 2018 - Strong Storms and Weak Tornado in Johnson County

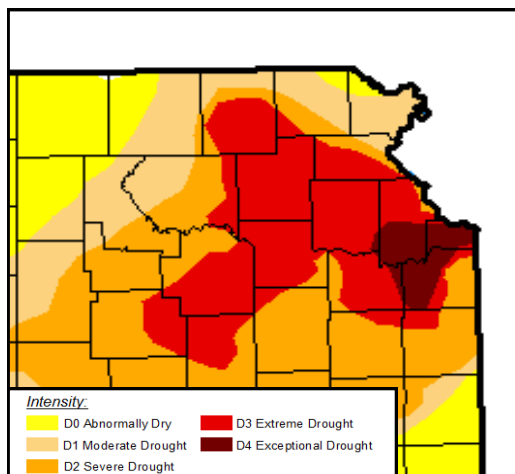
On the evening of May 2, 2018 a line of strong storms moved through eastern Kansas. While strong storms occurred across the entire eastern part of the state, the strongest impacts were felt within the Kansas City Metro area. An EF-1 tornado formed in Overland Park causing a fair amount of damage in the form of widespread tree damage and some structure damage to local schools; numerous power lines and power poles were destroyed. The line of storms continued into western Missouri where they went on to produce more tornadoes and scattered wind damage.



The tornado on May 2, 2018 formed near 143rd and Antioch doing damage to trees in residential neighborhoods in that area. The tornado then did damage to Overland Trail Middle School blowing out over 20 windows at Mission and 133rd. There were several power poles down, and the tornado likely dissipated near the Kansas Missouri state line near 130th Street.

Exceptional Drought June through October

Starting at the very end of May and going into June, the U.S. Drought



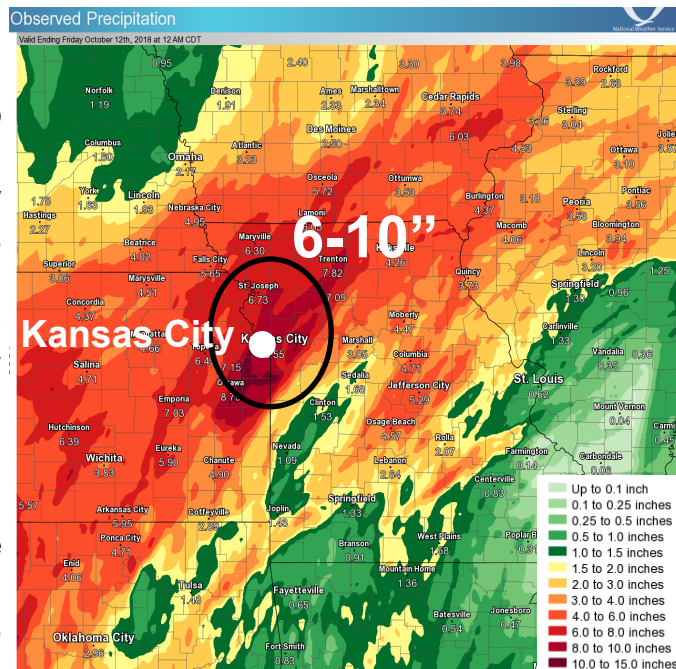
UNL Drought Monitor for Northeast Kansas at the height of the 2018 drought showed widespread D4 (Exceptional Drought) for much of the region.

Monitor at the University of Nebraska declared portions of eastern Kansas in a severe (D2; see left image) or worse drought. The anomalously dry period that plagued the region during the summer of 2018 continued into and through July, with most areas coming up about two inches short of normal precipitation for the month. Precipitation picked up during August especially in some of the hardest hit drought areas, but in a lot of cases the damage had already been done. While the rains did pick back up, the ground soil was so parched that it made hardly a dent in the drought across northeast Kansas. Much of the area saw some relief from the drought; however, many counties remained in severe to exceptional (D2-D4) status through the month of September. While the full scope of drought impacts are unknown, many farmers took losses on their hay and corn opting to bale it for livestock or knock it down. Things changed in October when widespread heavy rain ended that drought. Widespread six to nine inches of rain fell with some locations receiving over a foot of rain over the four day stretch from October 6 through October 9.

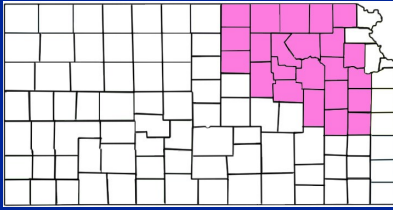
October 6-9 Heavy Rain With 6-10 Inches in the KC Metro

On the 6th of October a cold front pushed into the area and stalled in southern Missouri and Kansas. Moisture continued to stream into the area bringing several rounds of moderate to heavy rain. The heaviest rain occurred Saturday and Sunday (October 6-7). By Tuesday night (October 9th) more than 11 inches of rain fell in and around the Kansas City Metro. Local drought conditions were still in the “Extreme” to “Exceptional” category going into the event, so flash flooding was relatively low impact and relegated mostly to several road closures. The bigger impact from this prolonged rainfall event came from local river and stream flooding. Several streams entered the moderate to major flooding category. The only known fatality from these heavy rains occurred in Miami County when a lady, who was missing for several days, was found in her car when the flood waters subsided.

The four day event spanning Oct 6-9 resulted in the greatest four day rain total in recorded Kansas City history. At Kansas City International Airport, just across the river from northeast Kansas, 9.79 inches were recorded for the Oct 6-9 time period. The 9.79" contributed to an October precipitation total reaching 10.76" which put October 2018 as the second wettest October in Kansas City history behind October 1941 (11.94").



Observed precipitation between Oct 6 and Oct 9 totaled between 6 and 10 inches of rain across NE Kansas which effectively ended the ongoing extreme drought conditions.



2018 Severe Weather Summary Northeast and East Central Kansas National Weather Service - Topeka, KS

2018 Northeast and East Central Kansas Severe Weather Stats By The Numbers

Number of Severe Wind, Hail, Flooding Reports: 353 (2017: 309)

Tornadoes: 15; Strongest (EF-3) Ottawa Co., May 1, 2018

Largest Hail: 4.00" (Ottawa County) May 1, 2018 (estimated)

Strongest Wind: 89 mph (Douglas County) July 19, 2018 (measured)

Most reports received: Shawnee County (34)

The weather events in 2018 that had the most impact across northeast Kansas included the destructive flash flooding around Manhattan over Labor Day, and damaging thunderstorm winds not associated with tornadoes on July 19th. The year will also be remembered for the first November blizzard in recorded history to strike the northeast portion of the state on November 25th.

May 1st Strong Tornado in Ottawa County

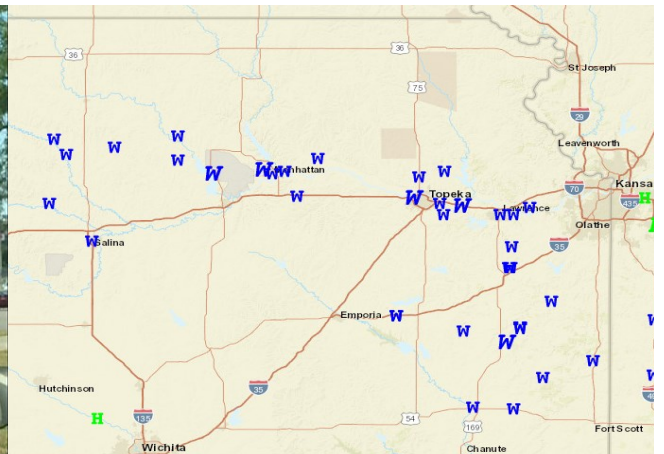


A strong tornado developed in northwestern Saline County and moved into Ottawa County doing damage to several structures including a single family home. The tornado was well documented by many chasers and became a wide torna-

do with multiple vortices. Thankfully the tornado tracked through primarily rural areas so damage was limited and the tornado dissipated several miles southwest of the city of Minneapolis Kansas. The tornado was rated as an EF3.

July 19th Damaging Thunderstorm Winds

A cluster of thunderstorms developed across north central Kansas late

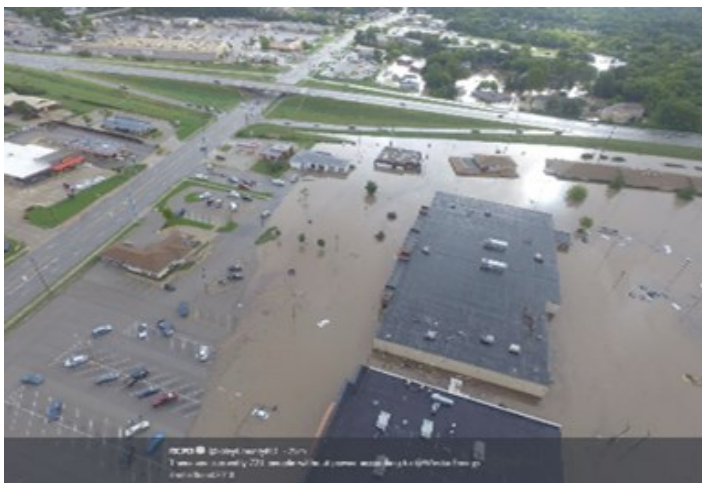


Storm Reports July 19th.
w=60-80 mph W>80mph

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in the morning on July 19th. This cluster of storms began to form into a line then accelerate south-east and within just a few hours caused millions of dollars in damage across the area due to widespread 60-90 mph winds. The winds knocked out power to over 30,000 customers many of those in the Topeka area. Some of the worst damage was reported around the city of Topeka (images below) where numerous businesses sustained structural damage, and widespread tree damage was reported between 3 and 4 pm. As is often the case in Kansas, the widespread damage was not caused by a tornado but by strong straight line winds associated with a line of storms.

Sept 3rd Manhattan Wildcat Creek Flooding



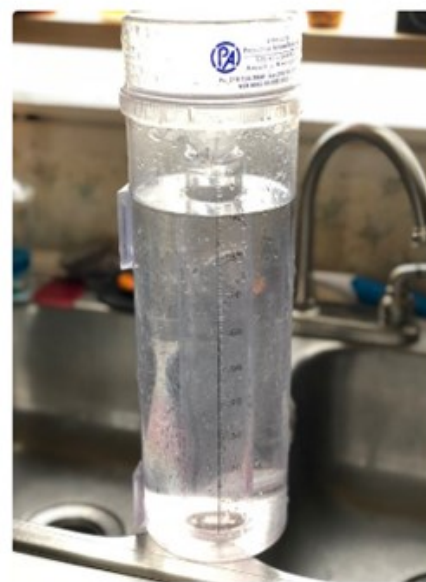
Thunderstorms were nearly constant across the area just northwest of Manhattan during the overnight hours of Sept. 3rd. By sunrise many areas just northwest of the city had received five to ten inches of rain and much of that fell into the small area that fed into the infamous Wildcat Creek. In less than three hours, the creek in western parts of the city went from docile to destructive with flash flooding of many areas in the vicinity of the creek.

According to the city manager, the flooding caused over 17 million dollars in structural damages in the city. Over 300 people were forced to evacuate their homes due to the flooding with around 20 evacuated by boat. It is believed that the crest was a record around 28 feet at the Scenic Drive gage on Wildcat Creek from this flash flood event.

November 25th Blizzard

For the first time since records began over 100 years ago, a blizzard struck northeast Kansas in November with winds of 40-50 mph and heavy snow that closed Interstate 70 from Topeka west for a time as well as snarling traffic on the Kansas Turnpike and I-35. The snow began to fall around sunrise and ended by sundown; however, in that time many areas

Replying to @NWSTopeka
9.16" in my @CoCoRaHS gauge
this morning, at 0800 report time.
KS-RL-27



Q: Has there been a blizzard warning for the Topeka forecast area in November since records began?



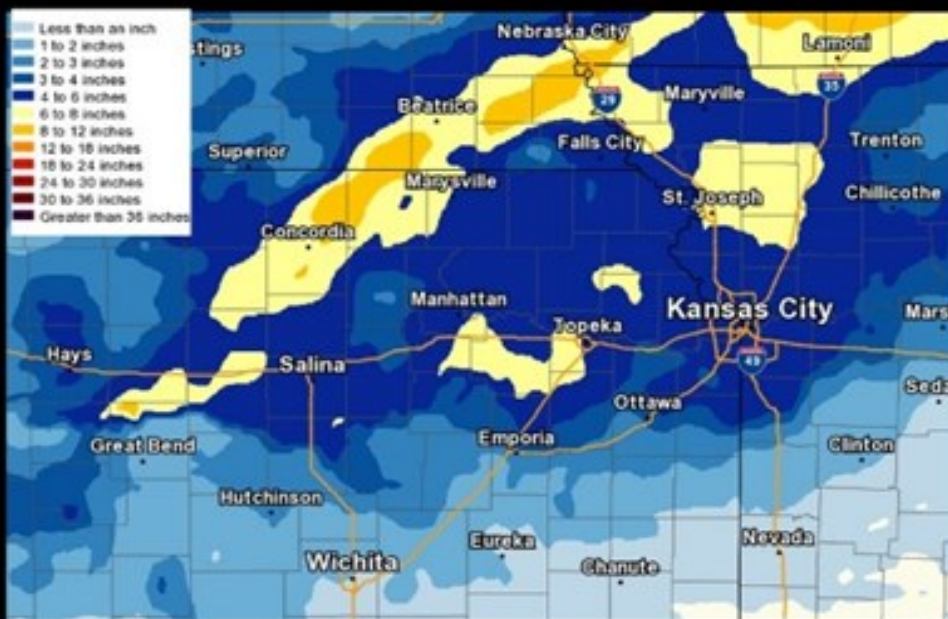
A: No. So, this is a historical event!
The last impactful blizzard events have come in December of 2009 and March of 1998

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received 4 to as much as 12 inches of snow. Thunder snow was reported in some areas including Topeka at the height of the storm in the early afternoon. Many areas had near zero visibilities due to the heavy falling snow and blowing snow. The heavy snow impacts were felt for days afterwards with many schools closed for a day or two after the storm had ended.



Snowfall from the Sunday, Nov 25 Blizzard



UPDATED: 11:30am Nov 26
with New Reports!

Strong winds of 45 to 55 mph made snowfall measuring difficult. Drifts over four feet high were reported in some locations.

Travel was severely impacted throughout the region, even in areas that saw lesser snow amounts.

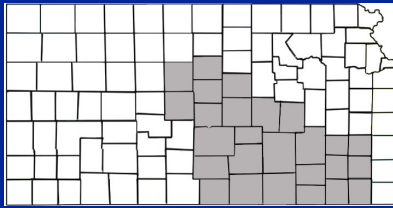


Check out a storm spotter and weather safety training presentation near you this spring!

Each spring, the National Weather Service offices that serve the state of Kansas conduct storm spotter and weather safety training sessions in most counties in the state. The sessions are free and open to the public. You are not required to become a storm spotter nor will you have to take a test; however, the presentations provide a great deal of information on severe weather in Kansas. They cover severe weather safety and ways to get weather information from the National Weather Service. You can also meet a meteorologist from your local National Weather Service office.

The schedule for storm spotter training sessions varies in each community, please check out www.weather.gov and click on your location for more information on a training session in your area.

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2018 Severe Weather Summary Central, South Central & Southeast Kansas National Weather Service - Wichita, KS

2018 Central, South Central and Southeast Kansas Severe Weather Stats By The Numbers

**Number of Severe Wind,
Hail, Flooding Reports:**
297 (2017: 406)

Tornadoes: 20 (Average
19); Strongest (EF-3)
Greenwood Co., June 26,
2018

Largest Hail:
4.00" (Barton County) May
1, 2018

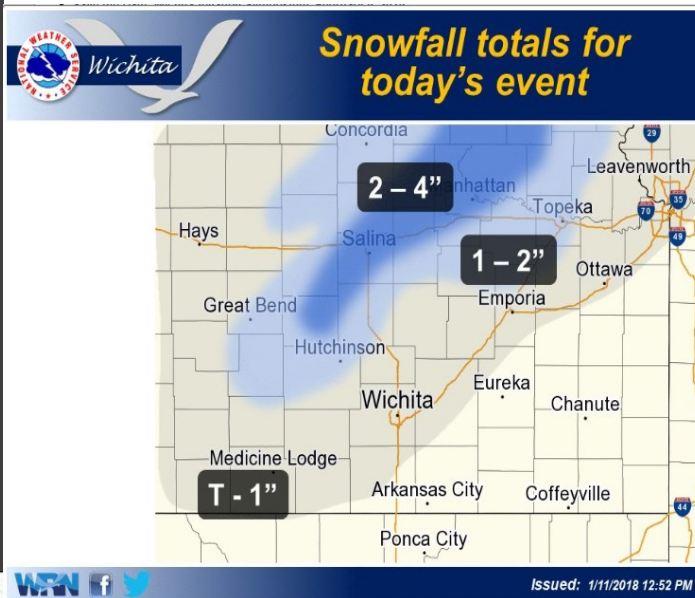
Strongest Wind: 87 mph
(Rice
County)
July 29,
2018
measured)

**Most
reports
received:**
Cowley
County &
Sedgwick
county (34)

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; 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 with rapidly flowing water moving over the roadway.

January 11th Snow and Wind Event

A very early first snow of the winter season came in 2018 when



much central and northeast Kansas picked up between three and six inches of snow. For much of the area it was the snowiest start to a winter season since 1951. 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.

May 1st Tescott Tornado

After one of the slowest starts to a 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

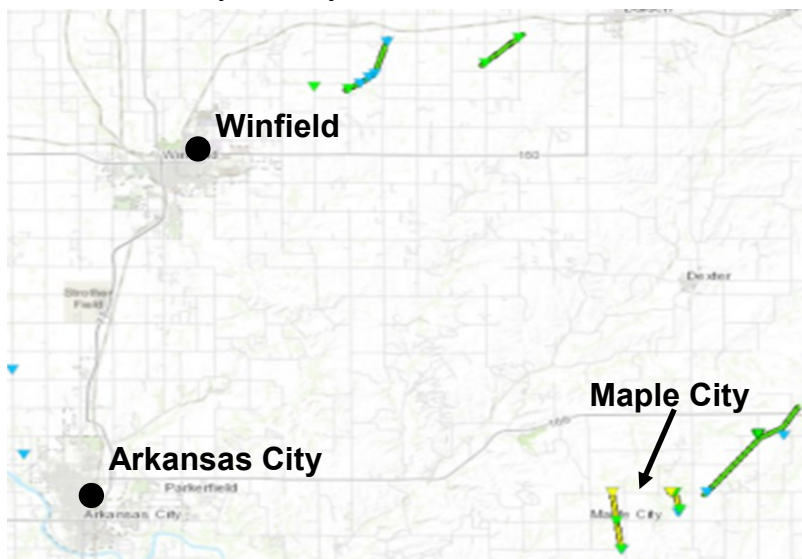


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Saline County and tracked north into Ottawa County. This large tornado became known as the Tescott tornado. Several reports of large hail were also noted as the storms tracked across the area.

May 14th Maple City Tornadoes

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.



June 26th Eureka Tornado

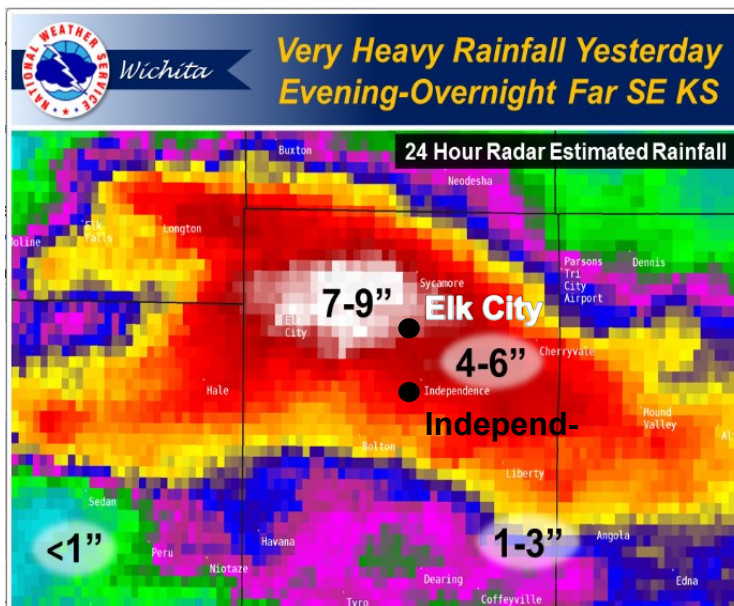
Shortly after 7 pm on June 26th, the most destructive tornado to affect the area in 2018 struck the community of Eureka, Kansas. The tornado first touched down just southwest of town and caused considerable damage as it tracked northeast through Eureka. As it moved into town, most of the initial damage was to tree tops and roofs. However, as it continued to move to the northeast, it intensified significantly in the middle portions of town causing 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 and was the second tornado to strike the town in the last 3 years.

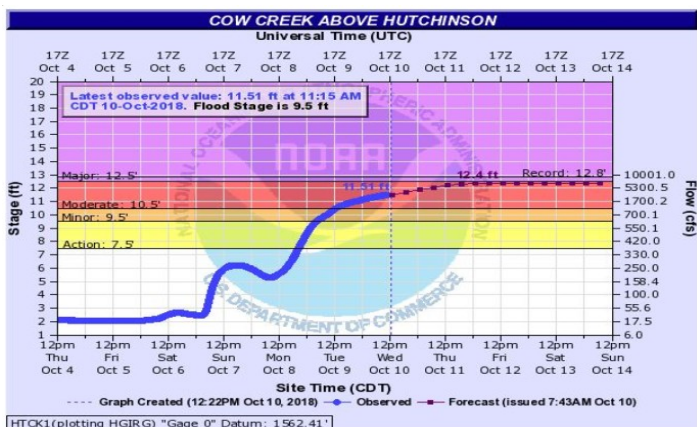
August 14th Flash Flooding

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 in Independence was 8.37 inches. Unfortunately this caused flash flooding along Racket Creek about one mile north of Elk City Lake; a vehicle was swept off of the road killing two individuals. The flooding occurred during the late evening hours and continued through the night.



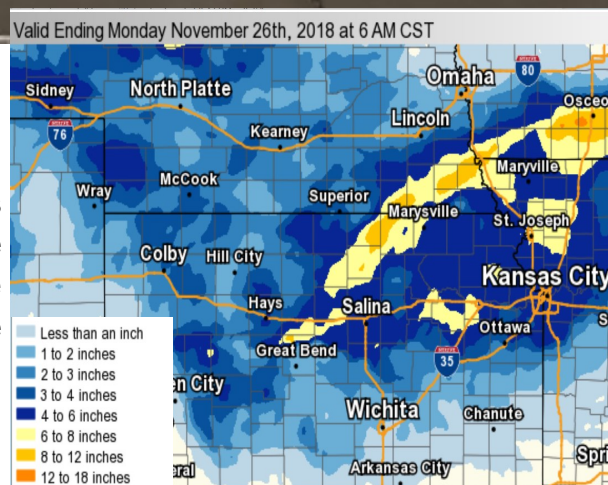
Early October Flooding

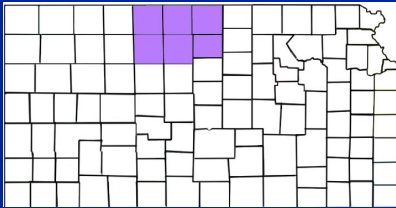
The most widespread flooding event of 2018 took place during a five day stretch in October. From October 5th to the 9th, much of south central & southeast KS picked up between seven and ten inches of rain which caused widespread river flooding. At one point, NWS Wichita had river flood warnings for 35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



November 25th Blizzard

On November 25th, 50 to 60 mph winds combined with three to six inches of snow producing 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 Severe Weather Summary North Central Kansas National Weather Service - Hastings, NE

2018 North Central Kansas Severe Weather Stats By The Numbers

**Number of Severe Wind,
Hail, Flooding Reports:**
353 (2017: 309)

Tornado: 1; Strongest
(EF-0) Mitchell Co.,
May 1, 2018

Largest Hail:
2.50" (Osborne County)
September 1, 2018

**Strongest
Wind:** 68
mph (Jewell
County)
September 1,
2018
(measured)

**Most reports
received:**
Phillips
County (20)

It was a relatively quiet year for Severe Weather across north central Kansas. Some notable events included one tornado in rural Mitchell County and some large damaging wind and hail across Mitchell and Osborne counties. Additionally warm season rainfall helped eliminate drought conditions by the end of Summer.

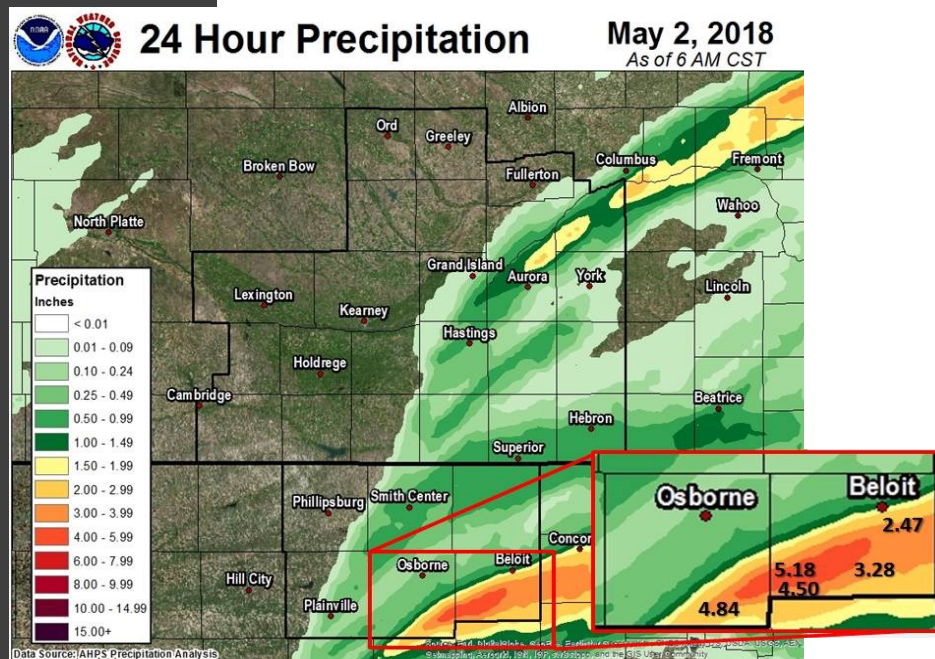
Typically severe weather emerges across north central Kansas in March, and 2018 was no different. In the midst of a chilly spring, March 23rd brought a combination of 60+ mph winds and quarter to ping-pong ball sized hail to Smith and Phillips counties.

It would be over a month until severe weather returned and brought the only reported tornado in 2018 to this area. On May 1st, an EF-0 rated tornado was seen in open country in southern Mitchell County and lasted only a short time. The area also experienced large hail, high winds and flooding. Reported storm damage was generally confined to Osborne County with minor damage reported to outbuildings and farm machinery. As much as six inches of rain fell resulting in flooding in Mitchell and Osborne counties.

The final week of May was active across the area including more heavy rain. May 28th-29th was the most active with three to five inches of rain followed by 60+ mph winds and hail causing localized damage to the wheat crop. Rainfall up to 10 inches upstream in Graham County resulted in flooding on the South Fork of the Solomon River

and the Bow Creek; additionally a significant amount of water was deposited into Webster and Kirwin Reservoirs.

The summer months brought more rainfall to the area and sporadic reports of hail and strong winds. One notable event was on



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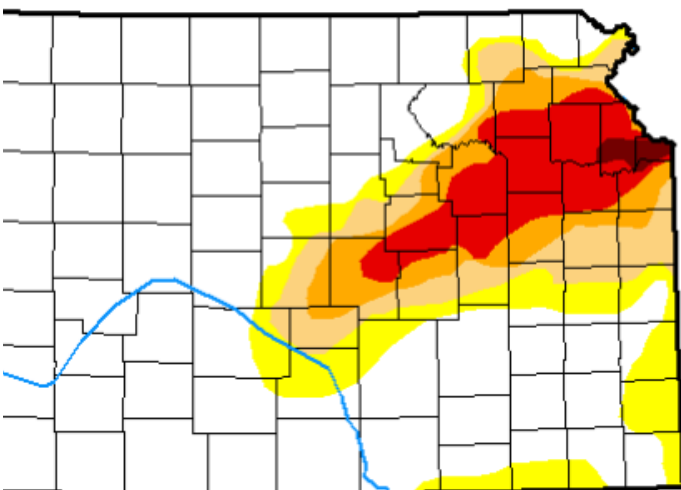
June 9th around 4:45 AM when isolated wind damage occurred in the Beloit area including some power poles and roof damage in town. The airport wind sensor reported a 44 mph wind gust, but winds in town were estimated over 60 mph. On June 19th-20th, another round of heavy rain cause some minor flooding on the White Rock Creek east of Burr Oak. Nearly five inches of rain fell in the area.

Baseball size hail measured by Mike Jordan southwest of Beloit on May 1st.

July followed June with only a handful of severe weather reports after which August recorded no severe weather. The next round of severe weather was on September 1st when high winds and hail rolled across Osborne, Jewell and Mitchell counties. A measured wind gust of 66 mph was reported west of Beloit while a 78 mph wind gust was measured in Jewell. Spotty damage was reported in the Lovewell State Park area.

Though the severe weather events of 2018 may not last long in one's memory, rainfall during the warm season did provide beneficial drought relief to north central Kansas. Entering the season, north central Kansas was considered abnormally dry or in moderate drought (D1) while a large part of southern Kansas was considered in extreme drought (D3) or worse. Going into the fall, a majority of the state was considered drought free with only the northern Flint Hills and northeast Kansas considered to be experiencing drought conditions.

**End of Summer Drought Conditions
Courtesy of U.S. Drought Monitor**

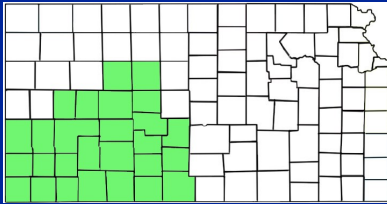


Intensity:

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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

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2018 Severe Weather Summary Southwest Kansas National Weather Service - Dodge City, KS

2018 Southwest Kansas Severe Weather Stats By The Numbers

**Number of Severe Wind,
Hail, Flooding Reports:**
509 (2017: 527)

Tornadoes: 6; Strongest
(EF-0) Average: 28

Largest Hail: 4.00" (Ford
County) May 29, 2018

Strongest Wind: 87 mph
(Stanton County)
July 29, 2018
(measured)

**Most
reports
received:**
Ford County
(59)

Southwest Kansas experienced many weather extremes throughout 2018. The year started with severe to extreme drought conditions which were quickly erased as very wet weather developed. Several flooding events occurred throughout the spring, summer and fall. In addition, temperatures were highly variable with several extreme events observed.

Although monthly average winds were above normal only three times this year, there were many high wind events associated with cold fronts, thunderstorms, and strong low pressure systems. In fact, Dodge City had a record number of days with wind gusts over 50 mph in 2018!

The following are the highlights for the year.

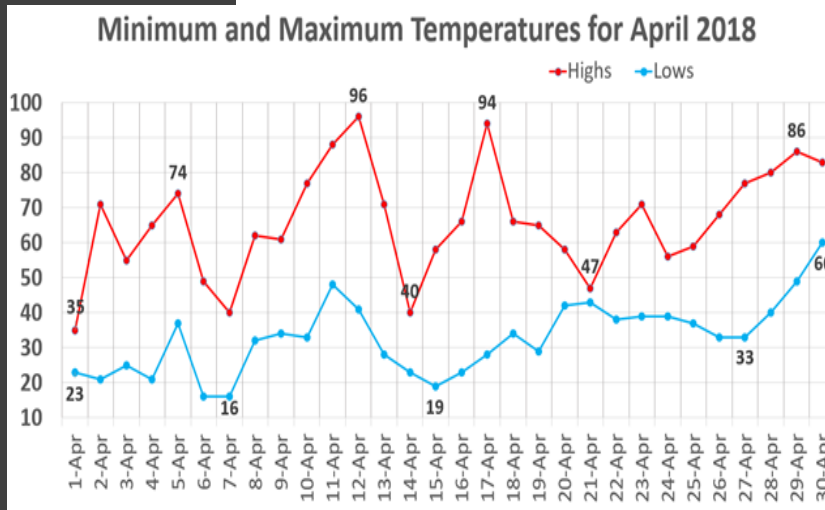
Temperature Extremes

Frigid Arctic air invaded Kansas in late December 2017 but persisted through January 2nd. In Dodge City, the lowest temperature of 2018 was 9 below zero on New Year's Day which was the coldest temperature observed since December 18, 2016. There were four days, all in January, with minimum temperatures of zero or below.

April featured extreme daily and hourly temperature variability (Fig 1). On April 17th alone, the temperature rose from 28 to 94 degrees in a period of about 10 hours between sunrise and mid-afternoon at Dodge City. This 66 degree temperature swing inside of one calendar day was only exceeded

by a 67 degree swing on February 8, 1909 when the low and high were 2 and 69 degrees respectively.

May was the warmest on record dating back to 1875 with an average high of 87 at Dodge City which was 11 degrees above average. The only May months that even came close to May 2018



**Fig 1. April had extreme swings in
temperatures**

in terms of maximum temperature were May 1962 and May 2012 when the averages were 84.9 and 85.2 degrees respectively.

The warmest reading of the year at Dodge City was 104 degrees which occurred on June 10th. Highs reached 100 degrees (or more) on six days in June. However, temperatures averaged below climatology for most of the summer and reached 100 degrees on only two days in July and one day in August. October and November were colder than normal.

The first major intrusion of cool fall air was on September 28th when the high was only 56; and the final occurrence of 90+ degree readings was on October 3rd when the temperature reached 96.

The first freeze in Dodge City occurred on October 14th with a low of 29 and was accompanied by a half inch of snow. The coldest air of the fall season arrived on December 28th with a low of 12 degrees and a high of 25.

Record Wind

Even though the monthly average wind at Dodge City was above normal only 3 times (February, April and June), wind gusts reached 50 mph during each month in 2018! In addition, wind gusts reached or exceeded 50 mph on 39 separate days in 2018. This was more than had been observed for any year for which reliable records were available. Only two other years had 20(+) days of 50 mph wind gusts, the highest was 2008 having 26 separate days. High thunderstorm winds occurred several times over the summer. However, high winds also accompanied two snow events in November and December with wind gusts as high as 70 mph.

2018 Precipitation

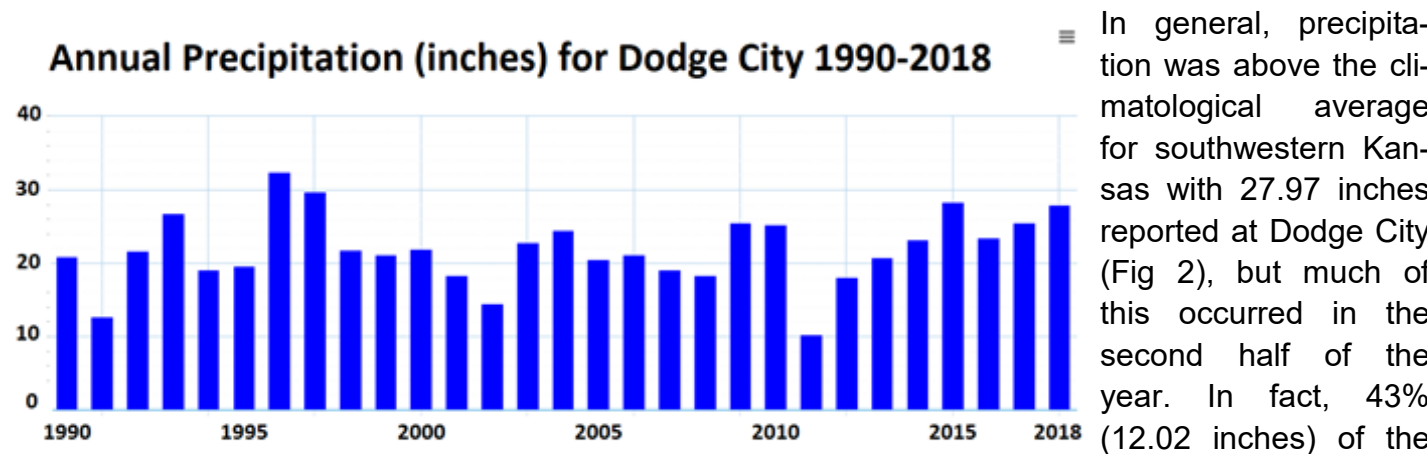


Fig 2. Cycles of wet and dry periods with the past five years generally wet

January through February was one of the driest on record. Total precipitation for January and February combined at Dodge City was only 0.15 inches. March did have a few precipitation events. But from January through March, Dodge City only recorded 1.21 inches of precipitation. Central and

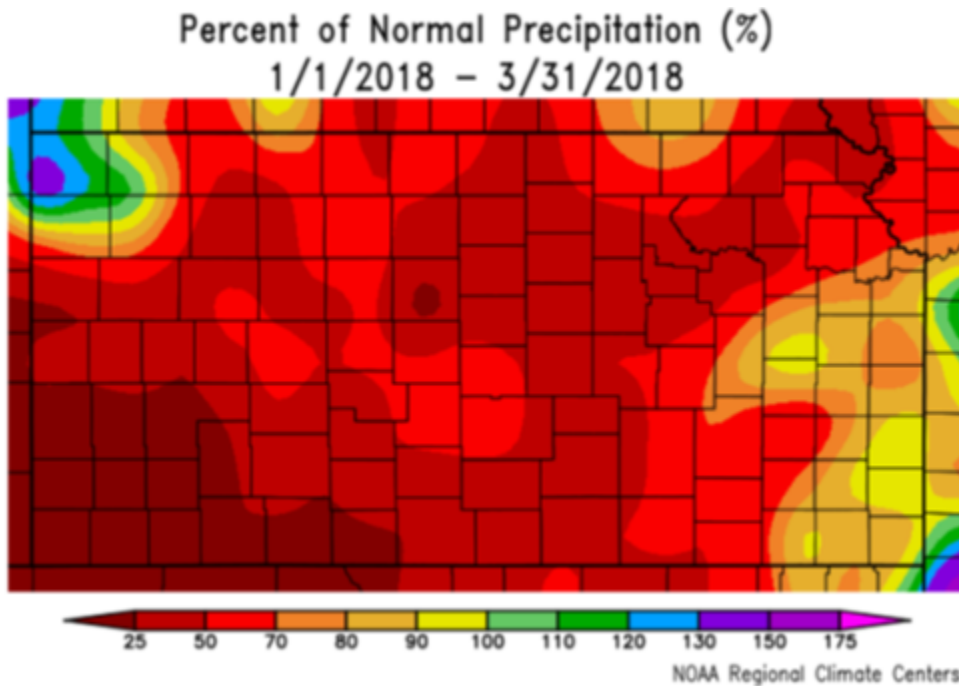


Fig 3. Precipitation percent of normal from January 1 through March 31

western Kansas received 25 to 50% of their climatological average rainfall for this three month period (Fig 3). The spigot was finally opened later in the spring and summer. Precipitation totals were well above average in the July-October period, and the total rainfall at Dodge City for that four-month period was the third highest on record back to 1874. A total of 6.68 inches of rain fell in Dodge City in August including 3.84 inches overnight on 18-19 August. This was the fifth wettest August on record. October also was extremely wet

with 6.45 inches of rain breaking the old record of 5.0 inches established in 2008. None of southwest Kansas was in a drought category on the U.S Drought Monitor by 2 October although the year started with a sizable area of southwest Kansas in extreme drought.

Seasonal Snowfall

Total snowfall in Dodge City for the 2017-2018 season was only 3.6 inches (Fig 4) which was much below the long term average of approximately 21 inches and the 3rd lowest total on record! For many locations across western Kansas there was below normal snowfall.

Seasonal Snowfall for Dodge City 1989-90 to 2017-18

(seasonal snowfall in inches)

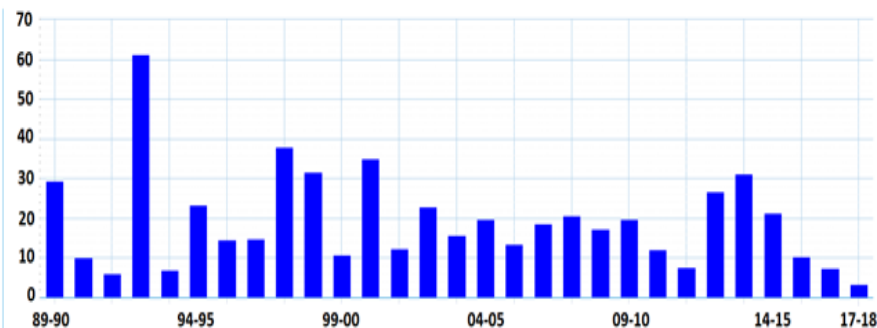


Fig 4. Seasonal snowfall that has occurred at Dodge City.

but recovered to 94 behind a dry line in the afternoon with southwest winds gusting to near 50 mph and relative humidity values as low as 6%. A cold front moved through western Kansas in the evening followed by north winds gusting in excess of 60 mph, and local visibilities dropped to near zero due to blowing dust. A prairie fire (Fig 5) began in eastern Colorado in the afternoon and spread rap-

Extreme Fire Weather Event

The high winds and dry weather the first part of the year provided a favorable environment for wildfires, but Kansas largely was spared from huge fires such as occurred in 2016 and 2017.

One of the most extreme days for fire weather was April 17th. The temperature fell to 28 degrees around sunrise



Fig 5. Wildfire moving into Stanton and Morton counties on April 17, 2018.

idly into Stanton and northern Morton counties in the evening. Nearly 50,000 acres and a number of structures were burned.

Severe Thunderstorm Events

There were only six tornado reports in southwest Kansas in 2018, and most of these were weak. The climatological average is 28 tornadoes. In this part of the state, the first tornado of the year was on May 18th, and the last tornado was on July 13th. The most prominent tornado occurred near Ensign on May 29th which was visible from the NWS office in Dodge City located about 15 miles away (Fig 6). The tornado

developed northwest of Ensign in Gray County and moved east-northeast dissipating just inside Ford County (Fig 7). The tornado managed to miss structures that could have been damaged. Scouring of muddy fields was observed to be eight inches deep in spots.



Fig 6. May 29 tornado as observed from Dodge City

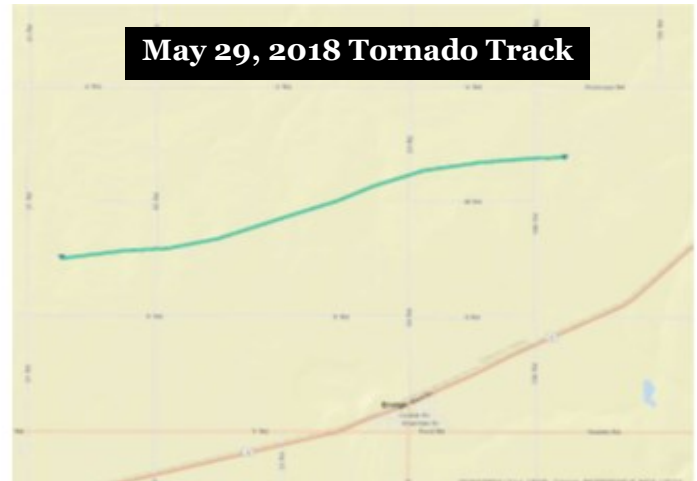


Fig 7. Track of the May 29 tornado

Several episodes of very large hail occurred across western Kansas in 2018. On May 17th, the most notable storm developed in Colorado and moved across Scott, Lane, Ness, Hodgeman and north-eastern Ford counties. Winds up to 80 mph and hail as large as baseballs tore off siding and dented cars. Crops across parts of Scott County were destroyed. Most of the houses in Dighton suffered broken windows and roof damage. This storm left a hail swath 10 to 15 miles wide (Fig 8).



There were three consecutive days from June 22 to June 24 where severe wind gusts were

Fig 8. Path of the hail on 14 May and locations of reports (green H)



Credit KWCH

Fig 9. The dramatic leading edge of a storm that produced straight-line winds on June 22.

observed at the NWS office in Dodge City (80, 70 and 59 mph wind gusts respectively) as lines of storms moved eastward and southeastward each day across western Kansas. The photo (Fig 9) shows the leading edge of the storm line on 22 June.

Extreme Rainfall Events

A total of 6.68 inches of rain fell in Dodge City in August (Fig 10) including 3.84 inches overnight on August 18th-19th when a weak tropical upper level trough rotated around an anticyclone in Texas and approached the Central Plains. Up to 5 inches of rain fell in less than four hours on the northwestern edge of Dodge City where there were reports of basement flooding.

Another rainfall event occurred on September 3rd when six to eight inches of rain fell in a large area in south central Kansas producing devastating flooding on the Ninnescah River in Pratt County (Fig11). Some of the worst damage was done at the Pratt Fish Hatchery operated by the Kansas Department of Wildlife and Parks. The Ninnescah overtopped dams of around 87 ponds used to rear fish to stock many lakes in Kansas, and all of the young fish and the breeding stock were washed downstream. A rainfall amount of 8.47 inches was reported in the south part of Pratt (Fig 12).

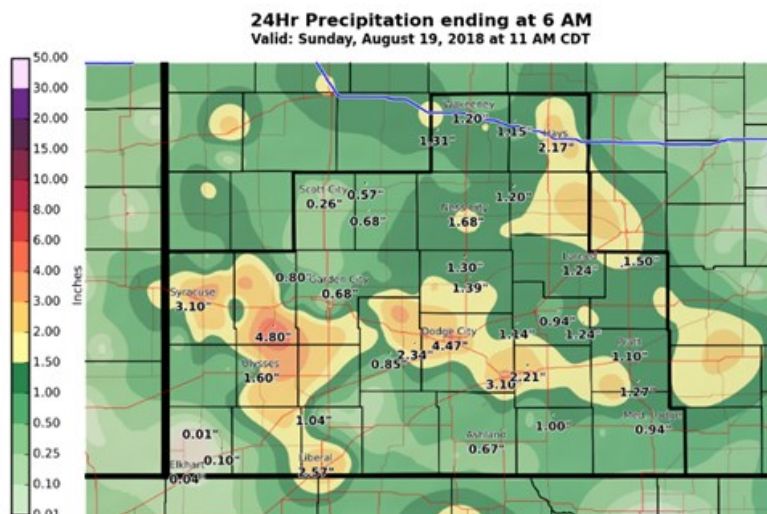


Fig 10. 24 hour rainfall amounts ending at 6 AM August 19, 2018



Image from Pratt Tribune

Fig 11. Severe flooding in Pratt.

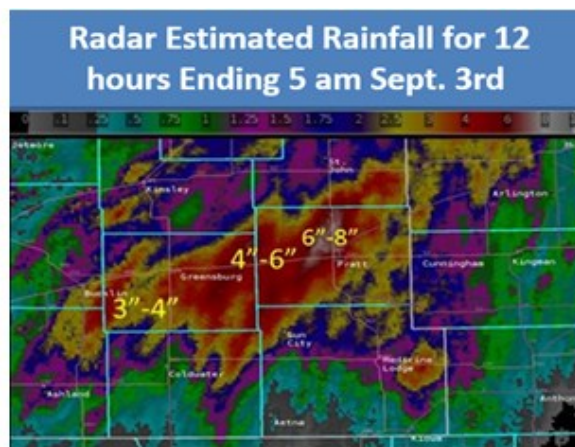


Fig 12. Radar estimated rainfall for Sept 3rd.

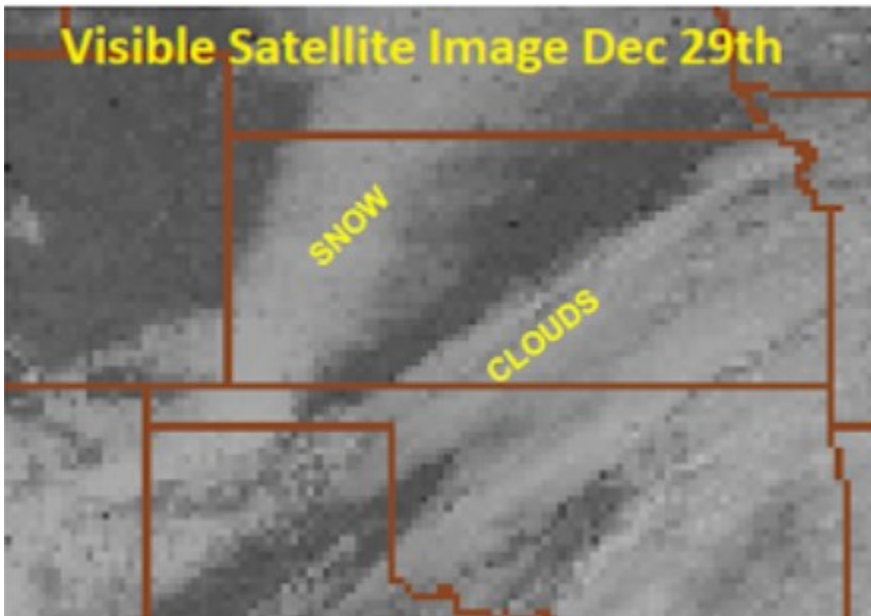
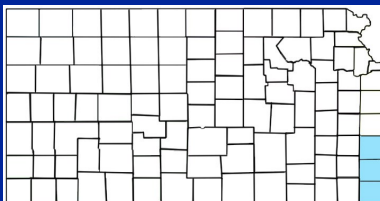


Fig 13. Satellite image showing snow cover.

Extreme Winter Weather

Blizzard to near blizzard conditions occurred on 25 November, but the most notable blizzard event of the year occurred on December 27th. The highest reported snow amounts were west of a line from Liberal to Wakeeney which can be seen on visible satellite imagery (Fig 13) from December 29th. The largest amount that was reported to NWS Dodge City was 12" in Richfield. Johnson City, Garden City and Scott City received 10", 6", and 8" respectively. It is likely based on the lingering snow cover in the visible satellite imagery for 8 January (12 days after the event) that higher

amounts (10 to 12 inches or more) occurred in southwestern Grant, eastern Stanton, extreme northwestern Stevens as well as central and northern Scott counties. Snowfall was very difficult if not impossible to measure with a high degree of accuracy due to the horizontal fall of the snow and drifting. Winds reached over 60 mph in some places causing considerable drifting and whiteout conditions. While slowly shrinking day by day, the snow cover affected temperatures for two weeks with much cooler readings across the snow packed areas.



2018 Severe Weather Summary Southeast Kansas National Weather Service - Springfield, MO

2018 Southeast Kansas Severe Weather Stats By The Numbers

**Number of Severe Wind, Hail,
Flooding Reports:** 34 (2017: 65)

Tornadoes: 0

Largest Hail: 2.00" (Bourbon County)
June 26, 2018

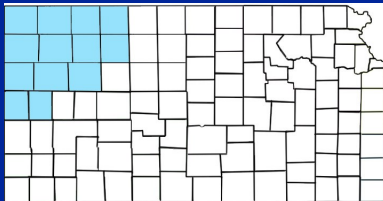
Strongest Wind: 69 mph (Cherokee
County)
July 12, 2018
(estimated)

**Most reports
received:** Bourbon & Cherokee (12)

Hazardous weather across Bourbon, Crawford and Cherokee counties was extremely minimal in 2018.

While no tornadoes were reported, there were a limited number of severe storms which produced marginal severe winds and hail. The most notable was hail to the size of tennis balls near Uniontown on June 26th. Another storm producing hail to the size of golf balls in Girard on May 19th.

Even flooding, which is normally more common, was limited to minor events in which several roads were impassible during the last two weeks in August. No damages were reported.



2018 Severe Weather Summary Northwest Kansas National Weather Service - Goodland, KS

2018 Northwest Kansas Severe Weather Stats By The Numbers

**Number of Severe Wind,
Hail, Flooding Reports:**
279 (2017: 252)

Tornadoes: 3; Strongest
(EF-0)

Largest Hail:
3.25" (Logan County)
June 19, 2018

**Strongest
Wind:** 110
mph (Sherman
County)
July 26, 2018
(estimated)

**Most
reports
received:**
Sherman
County (48)

Northwest Kansas experienced a relatively quiet severe weather season when it came to tornado activity. Only three tornadoes were reported in 2018 which is the lowest tornado count since 2012 (two tornadoes) and the second lowest amount since 1989. Weather related damage and disruptions were mainly due to wind, hail, flooding and winter weather.

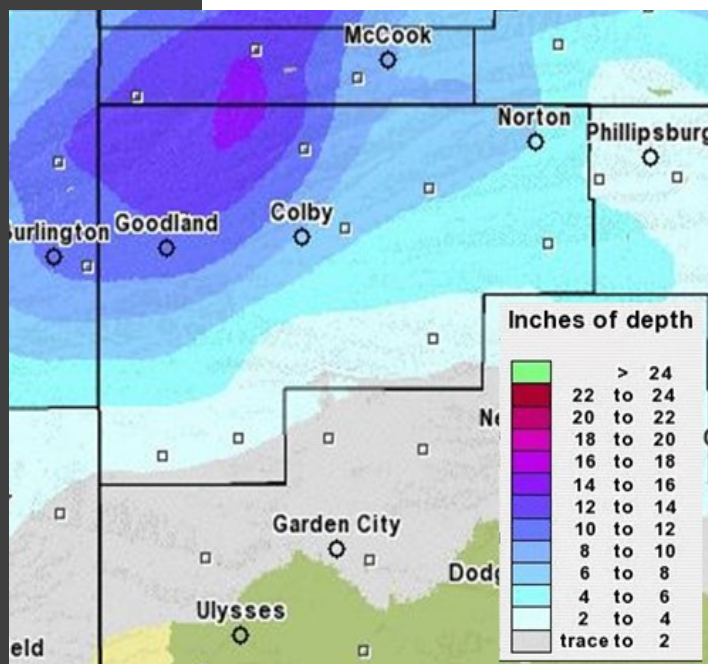
Damaging Winter Weather Events

The first significant winter weather event of 2018 occurred January 21st and 22nd bringing ice and snow to northwest Kansas. Freezing drizzle began on the morning of January 21st and continued through the mid-afternoon when it transitioned over to snow. Snow continued through the afternoon, evening and overnight hours before pushing east out of the area on the morning of January 22nd.

Total ice accumulations of a trace to



*Snow drifts west of Colby.
Image Courtesy: Dustin &
Brittany Kibel*



*Observed 24 hour snowfall January 21st.
Image Courtesy: NOAA*

thirty-eight hundredths of an inch were reported in the Tri-State region. Higher ice accumulations were reported in Cheyenne County at one quarter of an inch to thirty-eight hundredths of an inch.

A moderate to heavy band of snow developed in eastern Colorado on the morning of the 21st and moved east into Kansas by mid-afternoon. The first band gradually ended overnight. A second band developed and moved east. Wind gusts typically ranged from 20-40 mph with



Dust storm in downtown Goodland on 4/17. Image Courtesy: Mike Hopper

some higher gusts reported. Strong winds combined with moderate to heavy snowfall and near zero visibility resulted in blizzard-like conditions across several counties in northwest Kansas.

Hazardous road conditions in Logan County prompted the closure of Highway 40 and Highway 83. At least one motorist was stranded on Highway 40, and several motorists were stranded in Oakley. A semi was reported to be blocking Highway 83. The strong winds and snow resulted in power outages for approximately 400 people in Logan County.

Storm total snowfall amounted to around 11 inches of snow in Rawlins and Cheyenne counties and 13 inches in northwest Sherman County. Snow amounts decreased further east with six inches reported in Thomas County.

Severe Weather

The first severe hail report occurred on March 23rd in Decatur County where quarter sized hail was reported just west of Norcatour. A line of severe storms moved through Decatur, Norton and Graham counties producing large hail and strong wind gusts. The largest hail reported from this storm was in Norton, Kansas where golf ball sized hail occurred.

Summer convective weather can cause injuries and damage; however, they are not the only weather events that can cause destruction. On April 17th, a dust storm caused several accidents and injuries. A strong cold front moving through northwest Kansas brought wind gusts of 60 to 80 miles per hour to the area. Widespread blowing dust resulted in visibility less than one quarter of a mile in Cheyenne, Sherman, Gove and Rawlins counties and near zero visibility in Logan, Wallace and Wichita counties.

A two vehicle accident was reported on I-70 near Grainfield in Gove County due to blowing dust. Several accounts of near zero visibility were reported across Thomas County. Five people were injured in a three vehicle accident that occurred on Highway 24 in Thomas County.

Strong winds brought down power lines in Wallace County which sparked a wildfire north of the town of Weskan. The fire grew to approximately three quarters of a mile wide at times and traveled southeast seven miles. Fire departments from neighboring counties were called to assist with the fire; however, widespread, near zero visibility made it difficult for firefighters to respond. Numerous power poles and two structures were lost as a result of the fire. Railroad and railroad bridge damage was also noted by a NWS employee a few days after the fire.



Wildfire aftermath near Weskan-4/17. Image Courtesy: Brandon Vincent

May started out slow in terms of severe weather with a dust storm reported in Logan County early in the month. The second half of the month was more active beginning with a large hail event in Logan, Wallace, and Wichita counties on May 14th. A supercell with a history of producing significant hail in Colorado crossed into Kansas. As the storm moved to the southeast, hail sizes continued to grow reaching tea cup size at Weskan. Baseball sized hail in Logan County resulted in broken windows on a vehicle and a house as well as damage to siding on a house. Broken windows and a depth of two inches of hail were reported in Wallace County.

The first severe weather outbreak of May occurred on May 18th. Scattered strong to severe thunderstorms formed during the late afternoon and evening hours over northwest Kansas with the strongest storms near an old outflow boundary.

Several rounds of heavy rain moving through Rawlins and Gove counties resulted in flash flooding. Numerous streets were reported to be underwater in Quinter. Eight to ten inches of water covered the bottom of the ramp off of I-70 at exit 107. The fire department reported that a building in Herndon had water flowing through it with a depth of four inches.



Golf ball sized hail near Oberlin-5/18
Image Courtesy: Nathan Jurgensen

During the development of a thunderstorm, a weak EF0 tornado formed south of Tasco in Sheridan County. This was the first tornado of the year for northwest Kansas. No damage was reported as a result of the tornado. This storm later went on to produce baseball sized hail in Gove County near Quinter.

Rawlins County also received baseball sized hail and had estimated wind gusts of 70 mph which broke three to four inch diameter tree limbs. This was in the same area where the baseball sized hail was reported. Severe hail ranging in size from quarters to golf balls was reported in

Decatur, Thomas and Logan counties.

The largest severe weather event occurred on May 28th. Storms kicked off in the morning and spread west across northwest Kansas. Heavy rain began in Gove and Graham counties in the morning and continued until late evening. One foot of water was reported near Highway 283 in Graham County, and over one foot of water from Plum Creek was observed running over the C.R. Castle Rock in Gove County.

Deep flood waters in Graham County resulted in water rescues at a trailer park next to Highway 283. Highway 283 was closed from Hill City to WaKeeney due to flood waters over the road. Highway 18 from Bogue to Damar was also closed due to flooding. Four farmhouses were flooded and 20 cattle drowned where the Sand Creek and the South Fork of the Solomon River meet.

A tornado was reported in Graham County near Hill City. No damage was reported. Golf ball sized hail was reported in several counties. Strong winds in Thomas County blew down large tree limbs and power lines. Straight-line winds destroyed an empty grain bin and tore off part of a barn roof. A second barn collapsed due to the winds; however, the structural integrity of the barn prior to its collapse is unknown.

Storm activity picked up in June with multiple severe weather events. Two rounds of thunderstorms moved into northwestern Kansas during the afternoon and evening of June 19th. A cold front swung through northwest Kansas with a group of storms behind it. Thunderstorms produced wind gusts of over 70 mph in Cheyenne, Sherman, and Wallace counties.

Large cottonwood trees were blown down in Sherman County. A supercell moving through Cheyenne County brought significant damage from straight-line winds and wind-driven hail. Windows were reported broken in a house. The Cheyenne County Emergency Manager reported a large tree uprooted and blocking the road.

A National Weather Service storm survey found widespread damage due to large hail and significant straight line winds in western Cheyenne County between Highway 27 and the Kansas-Colorado state line. Straight-line winds estimated at 90 mph flattened a barn in western Cheyenne County. Miles of fields were destroyed, and farm animals killed. Many homes in the area received hail damage resulting in broken windows and damage to siding and roofs. Several trees lost branches measuring more than six inches in diameter. Several power poles were snapped due to the winds.



Straight-line wind damage in Cheyenne County.

Image Courtesy: NWS Survey Team



Downed tree limbs in Sharon Springs-7/26.

Image Courtesy: Brittany Newman

In Wallace County, thunderstorm winds blew an empty grain bin off of its foundation and into another bin. Hen egg sized hail and larger was reported in Logan County with the largest hailstones falling in Oakley.

The first two-thirds of July were quieter before several days of severe weather beginning on the 22nd. On July 26th, a group of thunderstorms moved into northwest Kansas behind a cold front. Estimated wind gusts of over 70 mph were reported in Decatur, Greeley, Sherman and Wallace counties.

Power poles were blown down and numerous trees of eight inches or larger snapped in Sherman County. Power outages resulted. Four semis were blown over on Interstate 70. Two irrigation pivots were flipped onto their sides south of I-70 near mile marker 5.

In Wallace County, an estimated wind gust of 90 mph brought down several six to ten inch diameter tree limbs. A machine shed received major roof damage resulting in part of the roof being removed.

Despite the low number of tornadoes (3) in northwest Kansas in 2018, the area still received a considerable amount of severe weather. Flooding events, large hail and damaging winds accounted for most of the summer convective weather.

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Hot Spot Fire Notifications



National Weather Service (NWS) offices in Kansas will be issuing text notifications to our partners when we observe hotspots or wildfires using GOES satellite and dual polarization radar imagery this upcoming fire season which typically peaks between February to April. 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. Each NWS office in Kansas will issue hotspot notifications on those days when elevated fire weather conditions are anticipated in 2019.

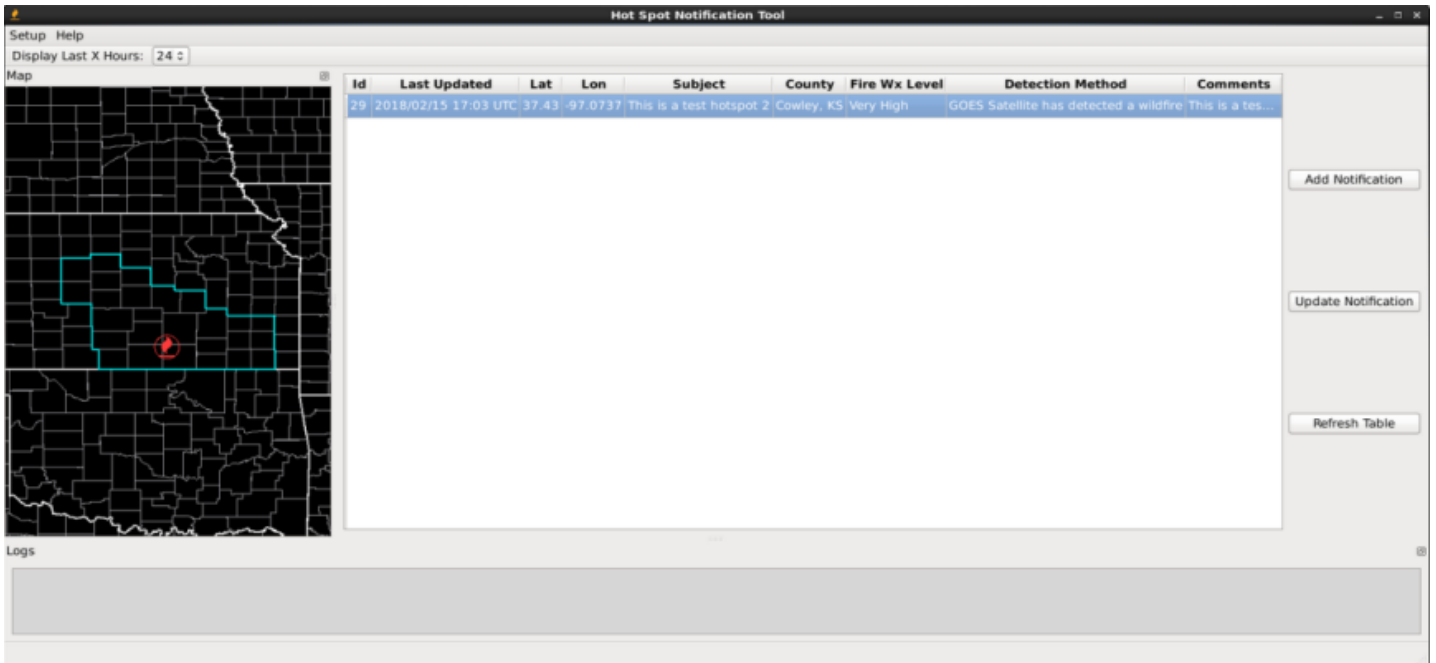
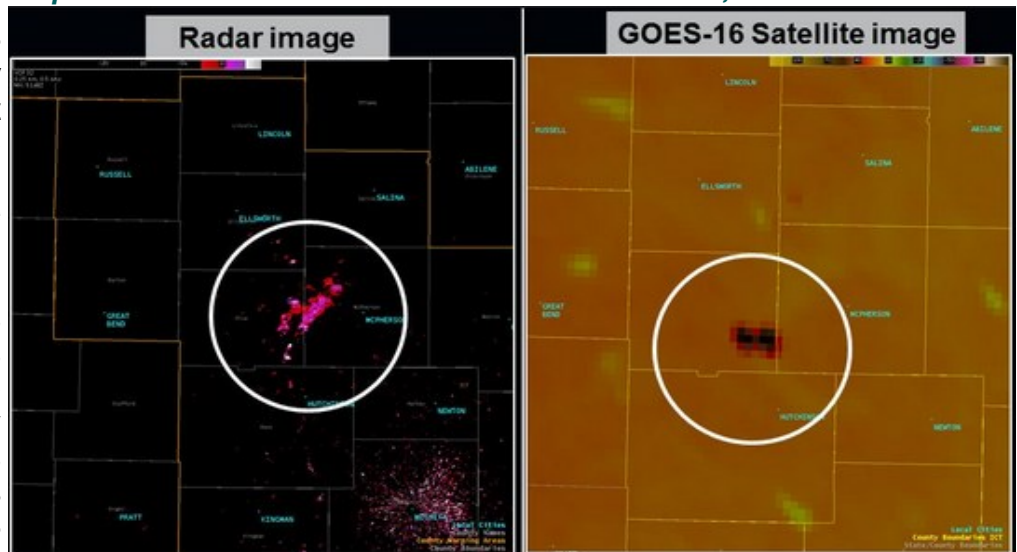


Image of the Hotspot Notification Tool used at the NWS in Wichita, KS

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 accelerating first responders' preparations in order to keep wildfires under



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

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control and minimize their destructive reach.

After the initial test period, users were asked how much lead time on average they observed prior to the first call to 911. Of those surveyed, 85% 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. Another question on the survey to partners was whether or not we should continue issuing hotspot notifications in the future. Of those surveyed, 100% said yes that they wanted us to continue issuing hotspot notifications for wildfires.



Example of a hotspot text message sent to our partners

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 White-water, 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](tel:1-800-367-5736)

Be a Force of Nature

Help Build a Weather-Ready Nation™

Do you know what to do in a severe weather emergency? Each year, people in this country are killed or seriously injured by all types of extreme weather, despite advance warning.

NOAA's Weather-Ready Nation (WRN) initiative is about helping our nation become more resilient to increasing extreme weather, water and climate events. NOAA is working to keep these threats from becoming disasters with greater accuracy in forecasts and warnings, evolving services to community decision makers, and better ways to communicate risk to stakeholders and the public.

As part of the WRN initiative, NOAA partners with emergency management officials, businesses, and the media to motivate individuals and communities to prepare for a potential weather disaster. And these actions can save lives – at home, in schools, and in the workplace.

What Does a Weather-Ready Nation Look Like?



A Weather-Ready Nation takes well-informed communities, businesses and individuals that are ready, responsive and resilient to extreme events. Key actions include:

- **Know your risk** by discovering the weather risks where you live and closely following National Weather Service forecasts and warnings.



- **Take action** by creating a family emergency plan and kit, and making sure you can receive emergency messages (e.g., NOAA Weather Radio, wireless emergency alerts).
- **Be an example** by using social media to share important hazard information.

How Your Organization Can Help Build a Weather-Ready Nation

Building a WRN requires the participation and commitment of a vast nationwide network of “Ambassadors” – organizations contributing in the best ways they can:

- Broadcasters advocating preparedness on-air
- Schools/universities teaching about the risks associated with severe weather and resiliency best practices
- Companies within the weather enterprise building the technological infrastructure for weather information and alerts
- Insurance companies providing discount incentives to policyholders who meet certain mitigation criteria

By becoming a **WRN Ambassador**, your organization can serve a pivotal role in affecting societal change by:

- Promoting Weather-Ready Nation messages
- Collaborating with NOAA
- Sharing your success stories
- Serving as an example



Enroll Here to Become an Ambassador
www.weather.gov/wrn/amb-tou

KANSAS SEVERE WEATHER AWARENESS WEEK
MARCH 4-8, 2019

Watch Vs. Warning

Forecast

STAY UP-TO-DATE

Check weather.gov and other resources to see what weather is expected at your location.

Watch

BE PREPARED!

Conditions are favorable for severe weather. Stay informed and prepare to act if a warning is issued.

Warning

TAKE ACTION!

Severe Weather is occurring or is imminent at your location. Take proper shelter immediately.

Lightning Safety

If you hear thunder, you are within striking distance. Seek safe shelter IMMEDIATELY!



- **Outdoor Activities:** Minimize the risk of being struck by moving indoors or to the inside of a vehicle
- **Inside Activities:** Things to avoid
 - Corded phones
 - Computers
 - Other electrical equipment
 - Indoor pools
 - Tubs and showers & other things connected to metal plumbing