2015 KANSAS

SEVERE WEATHER AWARENESS WEEK

MARCH 2 - 6, 2015

TORNADO SAFETY DRILL
TUESDAY, MARCH 3rd

1:30 PM CST

INFORMATION PACKET

National Weather Service

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2014 Kansas Tornado Facts

Tornadoes: **40** (20 below the 1950-2014 average of 60)
(40 below the past 30 year average of 80)
(60 below the past 10 year average of 100)

Fatalities: **0** **Injuries**: **27**

Longest track: **16.1 miles** (Bourbon-Linn County, April 27, EF2)

Strongest: **EF3** (Nemaha County, June 3)

Most in a county: **4** (Kearny)

Tornado days: **17** (Days with 1 or more tornadoes)

Most in one day: **9** (May 11)

Most in one month: **16** (June)

First tornado of the year: **April 2** (Barber County, 6:55 pm CDT, EF0 0.26 mile length, 40 yard width)

Last tornado of the year: **December 14** (Harper County, 5:38 pm CST, EF0 5.3 mile length, 100 yard width)

Length of tornado season: **257 days** (Days between first and last tornado)

2014 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	0	1	0	0	0	0	0	0	1	3%
EF2	0	0	0	2	0	0	0	0	0	0	0	0	2	5%
EF1	0	0	0	0	1	4	0	1	1	0	0	0	7	18%
EF0	0	0	0	4	9	11	0	4	1	0	0	1	30	75%
Total	0	0	0	6	10	16	0	5	2	0	0	1	40	100%
Percent	0	0	0	15	25	40	0	13	5	0	0	3		

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

Annual Highlights: In terms of tornado count, 2014 was the quietest season since 1989 (31 reported that year) and it ranked 41st in the 65 year record beginning in 1950. Yet 2014 was still well above the record low tornado count, which occurred in 1976 when only 14 tornadoes were reported.

There were no violent tornadoes in Kansas in 2014, and fortunately only three strong tornadoes. The strongest tornado (EF3) developed at 10:30 pm on June 3rd in Nemaha County, lasted about 13 minutes and resulted in 2 injuries. This tornado also produced the widest damage path estimated at 1000 yards. Another noteworthy tornado was an EF2 in Cherokee County on April 27th, which resulted in $10 million in damage and 25 injuries.

May is typically the most active month for tornadoes in Kansas, with a monthly average of 22 tornadoes normally accounting for 36% of the annual total. Tornadoes in May 2014 were confined to two successive days when one tornado developed on the 10th, followed by nine on the 11th.

KANSAS TORNADO STATISTICS

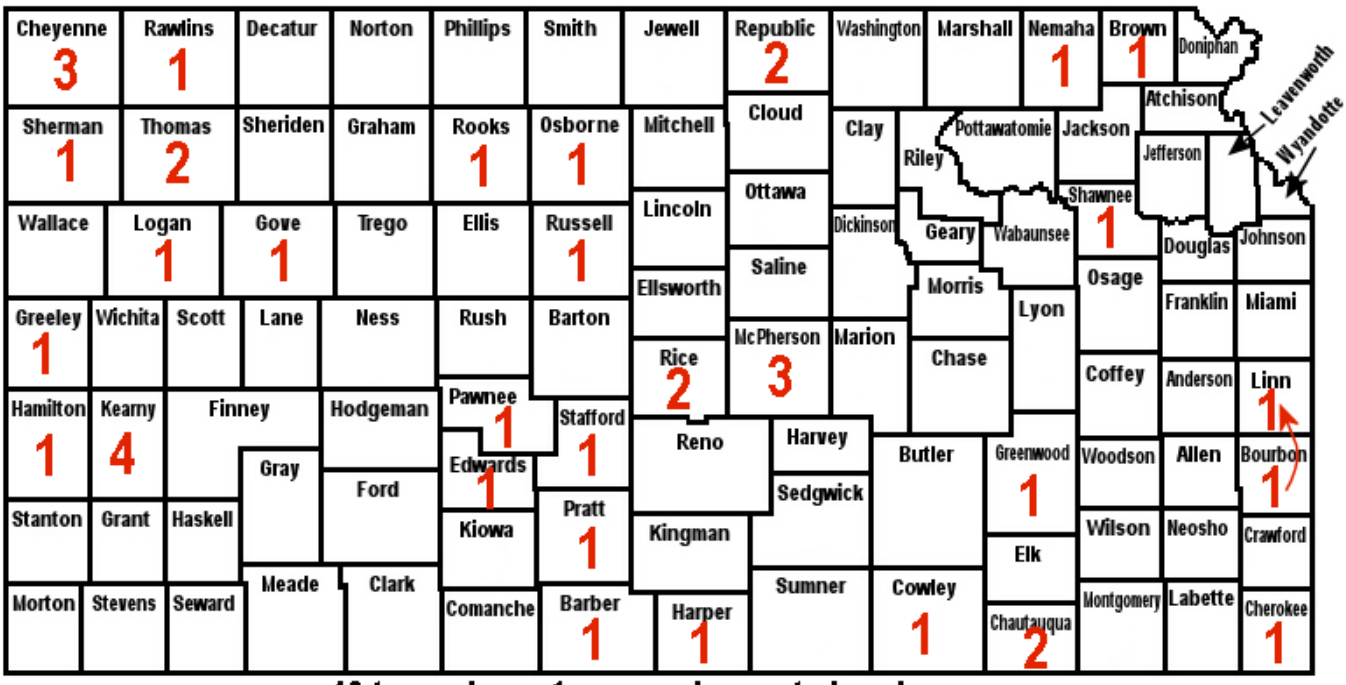
by County

1950 - 2014

TORNADOES, FATALITIES, AND INJURIES

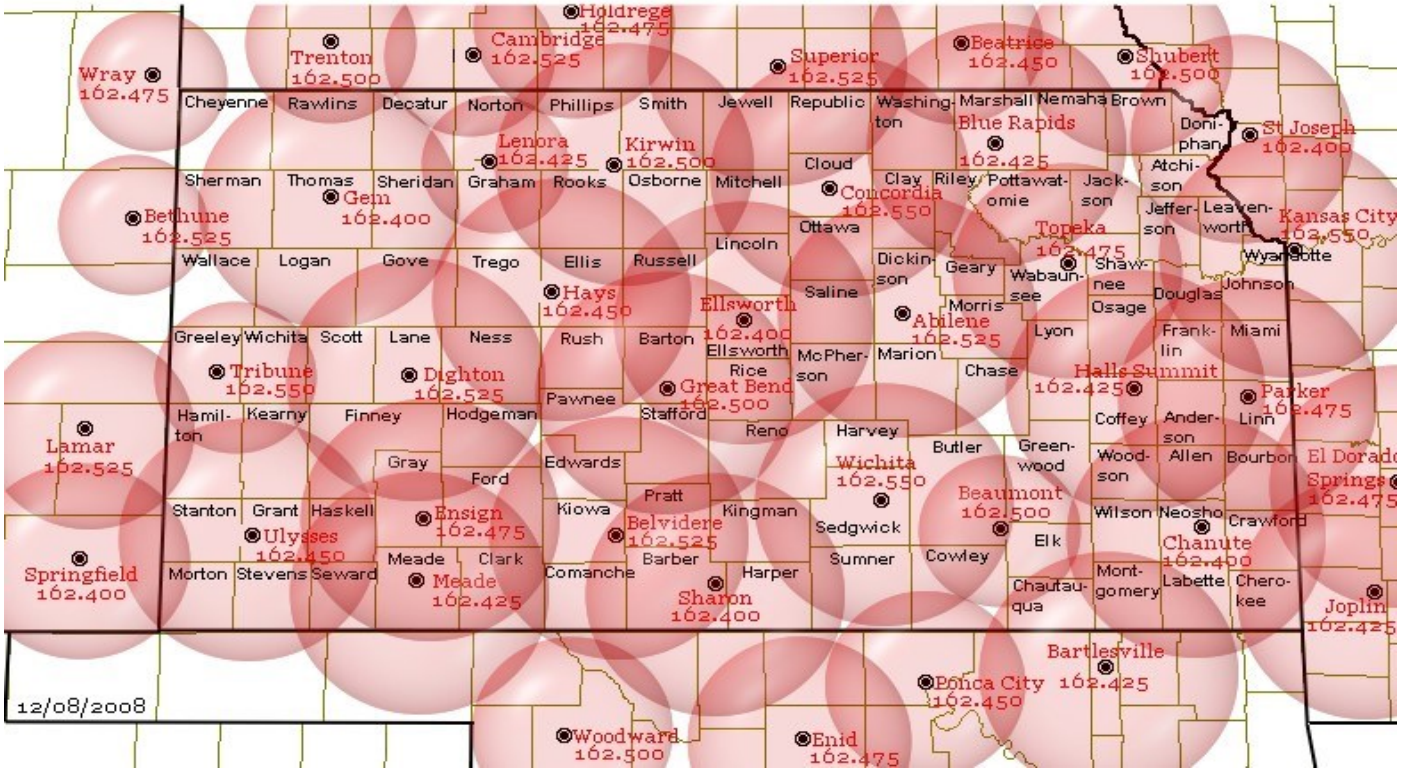
County	Tor	Fat	Inj
Allen	27	0	4
Anderson	15	3	12
Atchison	15	0	11
Barber	34	0	2
Barton	95	2	38
Bourbon	19	0	7
Brown	44	0	5
Butler	77	28	225
Chase	38	0	2
Chautauqua	19	0	0
Cherokee	36	4	66
Cheyenne	42	0	0
Clark	39	0	0
Clay	38	1	31
Cloud	47	1	8
Coffey	23	0	5
Comanche	38	0	2
Cowley	69	77	293
Crawford	33	4	43
Decatur	45	0	5
Dickinson	37	1	12
Doniphan	19	0	2
Douglas	39	1	48
Edwards	47	0	7
Elk	24	2	8
Ellis	57	0	6
Ellsworth	49	0	0
Finney	88	1	41
Ford	82	0	0
Franklin	29	3	34
Geary	17	0	3
Gove	48	0	3
Graham	38	0	0
Grant	24	0	9
Gray	39	0	3
Greeley	34	0	0
Greenwood	41	0	10
Hamilton	23	0	1
Harper	61	0	1
Harvey	47	1	63
Haskell	29	0	10
Hodgeman	46	0	4
Jackson	30	4	17
Jefferson	40	0	101
Jewell	38	0	1
Johnson	40	0	12
Kearny	42	0	0
Kingman	62	0	1
Kiowa	57	11	74
Labette	35	1	29
Lane	33	0	2
Leavenworth	30	2	30
Lincoln	31	0	2
Linn	14	0	3
Logan	26	0	0
Lyon	45	7	222
Marion	47	1	2
Marshall	32	0	1
McPherson	54	1	16
Meade	44	0	0
Miami	19	4	9
Mitchell	47	0	5
Montgomery	33	1	1
Morris	31	0	7
Morton	18	1	2
Nemaha	37	0	3
Neosho	31	0	4
Ness	45	0	4
Norton	27	0	0
Osage	43	17	6
Osborne	42	0	13
Ottawa	27	2	9
Pawnee	50	0	1
Phillips	41	0	1
Pottawatomie	31	1	5
Pratt	70	3	10
Rawlins	47	0	4
Reno	77	0	22
Republic	52	0	1
Rice	45	0	6
Riley	27	0	51
Rooks	49	0	6
Rush	49	0	8
Russell	77	1	7
Saline	38	0	66
Scott	44	1	1
Sedgwick	86	13	359
Seward	34	0	15
Shawnee	50	18	528
Sheridan	38	0	0
Sherman	104	0	0
Smith	43	0	2
Stafford	70	3	5
Stanton	22	0	0
Stevens	24	1	5
Sumner	83	5	14
Thomas	46	0	1
Trego	59	5	101
Wabaunsee	32	1	26
Wallace	35	0	4
Washington	36	2	12
Wichita	25	0	4
Wilson	15	0	0
Woodson	12	0	8
Wyandotte	10	2	36
Total	**4332**	**237**	**2909**

Kansas Tornadoes 2014



40 tornadoes, 1 crossed county borders

Kansas Area NOAA All-Hazards Weather Radio Stations



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, ways to get weather information from the National Weather Service, and you can 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.

Did you know that there are seven National Weather Service offices that serve portions of Kansas?

The NWS offices are located in Goodland; Dodge City; Wichita; Topeka; Hastings, Nebraska; Pleasant Hill, 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, for office tours, or to learn more about careers in meteorology in the NWS or in NOAA. We are here to serve you!

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
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
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: 346 (through 2014)

Most Tornadoes in One Episode

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

2014 Severe Weather Summary
Extreme East Central and Northeast Kansas
National Weather Service Pleasant Hill, MO

2014 started out with a blanket of fresh snow, followed by unusually cold weather over eastern Kansas. Two to four inches of snow fell across far eastern Kansas the night of January 4th into the morning of January 5th, setting the perfect stage for arctic air to slide into the area the following night. On the morning of January 6th, air temperatures bottomed out between -10 °F and -13 °F, with wind chill values dropped to around -30 ° F.

Early January's snowpack gradually diminished by mid-month, then returned with vigor as a major winter storm plowed through the central Plains in early February. More than ten inches of snow was measured from February 4-5 across far eastern Kansas, including 11.0" in Atchison, 11.7" in Leavenworth, and 11.9" in Overland Park.

One final brush with winter came in early March, when light freezing rain, sleet, and several inches of snow blanketed the area. The long duration of the event created travel issues from March 1st through March 3rd, then winter gave way to a fairly active severe weather season.

Several rounds of severe storms moved through eastern Kansas from late March through late April, dropping up to baseball sized hail (Goodrich, KS; April 2nd) and producing very strong thunderstorm winds.

On April 27th, two rounds of severe storms impacted portions of eastern Kansas. The second round of storms occurred during the mid to late afternoon, and fueled a supercell which produced an EF2 tornado from north of Fort Scott to Pleasanton. Trees, several vehicles, and an historic church were destroyed along this strong tornado's 16.1 mile track through rural Kansas.

Fort Scott – Pleasanton Tornado, © Kory Hartman

The severe weather season continued through the remainder of the spring and into summer, bringing up to 2" hail on May 10th, flash flooding in early June, and several rounds of damaging straight line winds from June through August. One notable wind event occurred in early June when a line of strong thunderstorms moved through the region the night of June 4th, then a wake low developed on the back side of the storms, resulting in 60+ mph winds during the morning hours of June 5th.

Although the severe weather season was on the downswing by early fall, a few flooding events impacted parts of eastern KS in September and early October. Heavy rain fell across eastern KS on September 3rd, October 2nd, and October 9th, all resulting in isolated flash flood events.

Comparatively benign conditions rounded out the late fall and early winter, and although November temperatures were well below normal throughout the region, dry conditions prevented any notable wintry precipitation.

2014 Severe Weather Summary
Northeast and North Central Kansas
National Weather Service-Topeka, KS

Fun Facts: The month of May had no tornadoes, which is rare for northeast Kansas. In fact, northeast Kansas went without a tornado for just over one year. The last tornado in 2013 was on May 28th and the first tornado in 2014 was on June 1st.

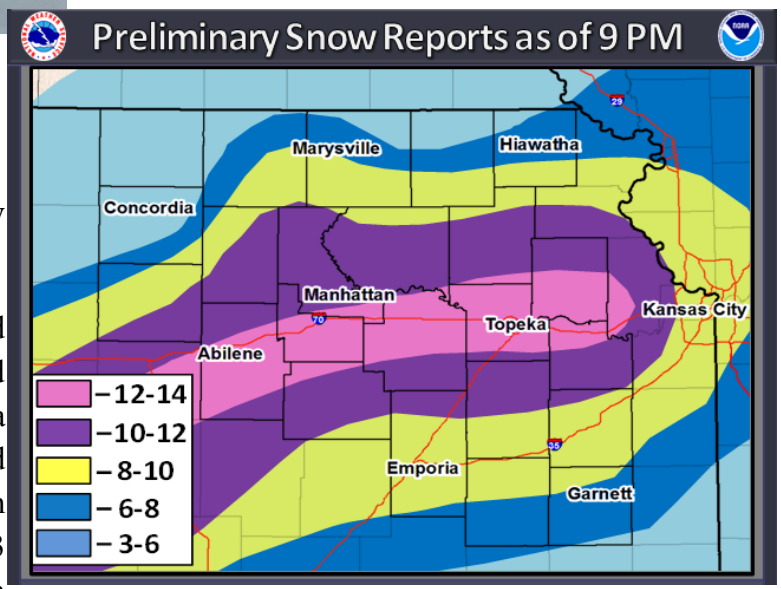
February 4th Major Winter Storm

A large winter storm dumped anywhere from 6 to as much as 14 inches of snow across much of northeastern Kansas on the 4th of February. The bulk of the snow fell during the day on the fourth and was heavy at times. The snow ended from west to east after sunset on the 4th and lingered just past midnight on the 5th across extreme eastern Kansas. The heaviest snow band fell roughly along I-70 from Salina east to Manhattan through Topeka and into western Kansas City.

Above: Picture taken Feb 5th at the National Weather Service office in Topeka, KS. Snow drifts up to 3 ft were common around the building

The highest snow totals ranged from 10-14 inches. The 24 hour snow totals were so impressive they ranked in the top 5 at many locations. The National Weather Service office in Topeka measured 13.0 inches which was the 3rd highest 24-hour snowfall recorded.

The immense amount of snow and strong north winds caused blowing and drifting snow to greatly impact travel across the region.



Snow totals from February 4, 2014

June 3rd Nemaha and Brown County Tornadoes

On the evening of June 3rd, a tornado touched down near the intersection of Highways 71 and 63, 4 miles west of Bern in Northern Nemaha County at 1030 pm CDT and was on the ground for 13 minutes. The tornado moved southeast with a damage path that was 1000 yards wide and 6.3 miles long. The tornado was rated an EF3 with winds to around 140 mph. Unfortunately several

homes were in the path of this storm and sustained substantial damage with one being destroyed. The worst damage occurred to a slab home that was attached to the foundation by anchor bolts installed with nuts and washers every 12-18 inches. All exterior and interior walls were destroyed, however, instead of the debris being thrown away from the home, it was primarily laid back on top of the slab with some debris blown to the south. The two residents of the home took shelter in a tub and survived with minor injuries. However, their tub was no where to be found, and it is suspected to have been blown into a lake near the home.

Roof and exterior damage to a residence near Bern, KS. No injuries occurred at the residence. June 3, 2014

A second tornado touched down later that night (June 3rd) in Brown County 2 miles east of Willis at 1124 pm. This tornado also traveled southeast for 2.6 miles and was 200 yards wide and was on the ground for 6 minutes. The tornado damaged two homes along a path and was rated an EF1 with winds around 100 mph.

July 7th Damaging Wind Event

On the evening of July 7th a strong line of strong thunderstorms developed across southern Nebraska and moved southeastward through northeast Kansas. These storms produced damaging winds and some small hail. Individual storm cells within the line produced localized downbursts across Osage and Douglas Counties. These downbursts produced wind speeds in excess of 90 mph which were responsible for localized tree and structural damage.

A large tree uprooted in Lyndon in Osage county. July 7, 2014. Photo courtesy of Doug Watson

Several trees uprooted in west Lawrence in Douglas county. July 7, 2014. Photo courtesy of Arin Peters

2014 Severe Weather Summary

Portions of Central, South Central and Southeast Kansas
National Weather Service - Wichita, KS

2014 was a rather benign year when it came to significant weather across central and southeast Kansas. The main topic of conversation at the water fountain was the lack of tornadoes across the state of Kansas. A total of 40 tornadoes were recorded this past year which was well below the annual average for the state. The 26 county area served by our office was only affected by 11 tornadoes this year. This was well below the 3 year average of 22.7 tornadoes, the 5 year average of 23.4, and the 10 year average of 28.8.

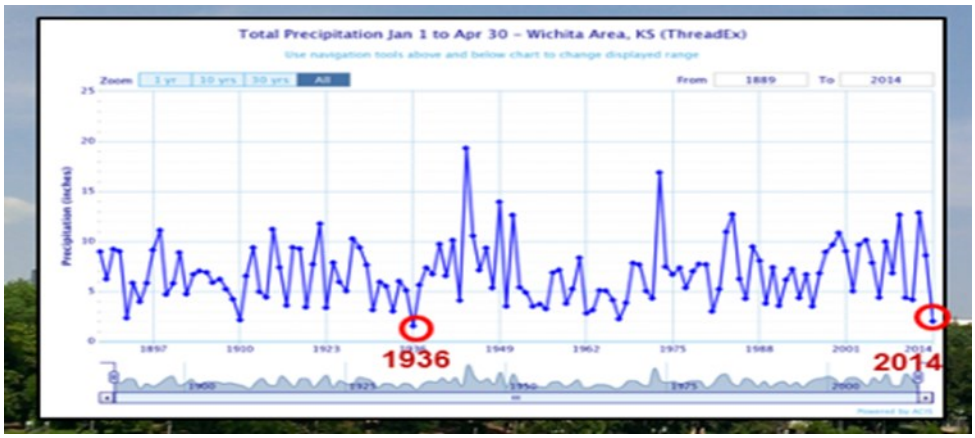
The year ended wildly in December with a rare EF0 tornado near Harper, KS. The tornado was on the ground for almost 5.5 miles and had a 100 yard wide track at its widest point. Fortunately, the tornado remained over open country and only damaged some trees and round hay bales. The last December tornado to affect the forecast area was in 1956, and the last one to affect the state was in Cherokee County in 2002.

Courtesy Jim Crombie

Courtesy Keith Jeffers

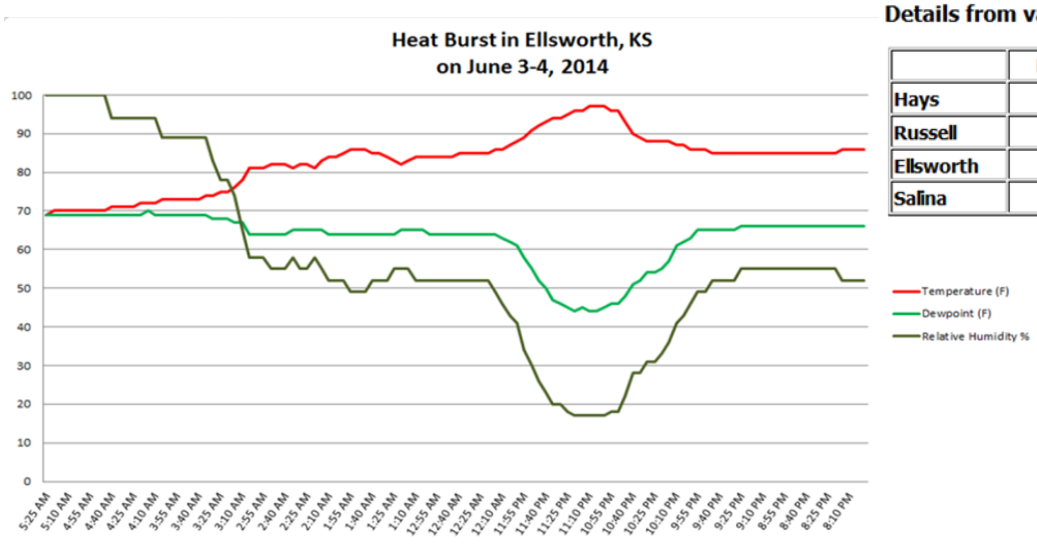
The first weather event of the year that drew some attention was a snow event on February 4th that affected much of central Kansas along and north of the Kansas Turnpike. Several locations received snow amounts ranging between 8 and 12 inches with the greatest totals along a corridor from Hutchinson to Salina. In Wichita, the 8.7 inch total tied for 10th on the top ten daily snow fall record list.

Even with the snowfall amounts to start the year, the dry weather still continued to keep much of the area parched for the first half of the year. In fact, 2014 was the driest start to a year since the dust bowl. Wichita only received 2.01 inches of rain during the first four months of the year which was 5.28 inches below normal or 28% of normal.



May 10th and 11th proved to be eventful across central and south central KS with a couple rounds of strong storms that produced a few tornadoes and several large hail reports. The tornadoes, thankfully, did not produce much in the form of damage. The hail reports were primarily around the size of a quarter, but several locations were pelted with golf ball sized stones.

Another odd phenomenon burst into central KS around midnight on the 4th of June. Many locations from Hays to Salina recorded a heat burst on their automated weather equipment. Temperatures across the area rose 5 to 15 degrees as a result of the heat burst and winds gusted to 40-50 mph. At Ellsworth, 5-minute observations depicting the heat burst were available (Chart below). A heat burst is signified by a rise in the temperature, a drop in the dew point (and associated relative humidity) and strong gusty winds.



Details from various central Kansas locations

	Peak Temperature	Peak Wind
Hays	99	61 mph
Russell	94	58 mph
Ellsworth	97	57 mph
Salina	96	43 mph

The last significant event to affect central and southeast KS during the typical severe weather season was on the 5th of June. Hail stones up to 3 inches in diameter occurred along with damaging winds up to 70 mph. The strong winds damaged roofs in Lindsborg and toppled trees in McPherson, Wichita, and Ellsworth. Many roads were also flooded due to the extremely heavy rains that fell over a very short time span.

Finally the last hoorah for severe weather, other than the December tornado mentioned above, was on September 1st. During this late season event the full brunt of severe weather prevailed with very large hail, hurricane force winds, and two tornadoes occurring. The most significant damage occurred along the KS/OK state line in the town of Elgin. The citizens in and around Elgin in Chautauqua County were blasted by straight line winds in excess of 90 mph. This caused a significant amount of tree damage in the community and some minor structural damage. Elgin sets in a valley amongst the Flint Hills which I surmise spared the community from much more damage. A bit further to the northeast, a couple of tornadoes touched down near Dexter in Cowley, County (EF0) and another near Cedarvale in Chautauqua County (EF1).

Courtesy Brandon Ivey

Did you know that there is a secondary severe weather season that begins in September and runs through mid October?

2014 Severe Weather Summary
North Central Kansas
National Weather Service - Hastings, NE

It was a busy 2014 for severe weather across north central Kansas. Although the season stretched out to six months in length, there were a few events in particular which are worth noting.

Severe weather was expected on June 14th and Mother Nature did not disappoint. Supercell thunderstorms in the early evening were followed by a late evening line of thunderstorms producing 80+ mph winds. There was one tornado, an EF1 rated tornado 10 miles northwest of Stockton in Rooks County. This well sighted tornado was on the ground for about seven minutes and caused minimal damage. This storm also produced a string of quarter to golf ball size hail reports along State Highway 9 from near Kirwin to southwest of Smith Center.

An EF1 rated tornado spins on the other side of Webster Reservoir on June 14, 2014. Photo courtesy of Jessica Billings

Later that same day, after the hubbub from the tornado had passed, the entire six county region was plowed by 60-90 mph winds, heavy rain and hail. Instruments at the Phillipsburg Airport measured an 86 mph wind gust, with 77 mph winds measured near Webster and a 71 mph wind gust measured at Smith Center. Several RVs were overturned and destroyed at Webster State Park. Fortunately, everyone escaped serious injury.

The next major round of severe weather came on August 17th, when 60-80 mph winds and quarter size hail pounded areas along U.S. Highway 36 only to be followed the next night by 70 mph winds downing trees in Rooks County. The lone tornado of the month occurred 6 miles northeast of Natoma. This EF0 rated tornado was very brief and caused little if any damage. August came to a close with ping pong ball size hail and high winds, which damaged vehicles and buildings across Mitchell County.

The aftermath of high winds which passed through Webster State Park on June 14, 2014. Photo from NWS Hastings storm survey

One of the more impressive severe events of the year actually "wrapped up" the season. On October 2nd around 6:00 am, a wicked wind and hail storm pounded parts of Mitchell County. Most of the destruction was in an area from about 5 miles south of Beloit to 4 miles east of Beloit. This combination of hail and wind struck with such fury, it stripped trees bare, totaled vehicles, shattered windows and absolutely devastated any crop in its path. One local observer measured a 73 mph wind gust 5 miles west of Scottsville.

This corn field was about to be harvested before being completely destroyed by the October 2, 2014 wind and hail storm. Photo from NWS Hastings storm survey

A remains of a minivan totaled by wind and hail on October 2, 2014 southeast of Beloit. Photo from NWS Hastings storm survey.

A survey of the damage suggested wind gusts up to 90 mph may have occurred. Corn crops ready to be harvested were unrecognizable after the storm passed. Locals described an eerie winter like scene once the storm passed, as the hail-covered ground cooled the air and fog blanketed the area. Property damage likely exceeded one million dollars and crop damage was in the tens of millions.

Some Severe Weather Stats from 2014

- Number of tornadoes in the six county area: two (Rooks and Osborne Counties)
- Highest tornado rating: EF1 on 6/14/14 near Webster State Park (Rooks County)
- Largest Hail reported: 4.25" diameter hail (softball size) on 8/17/14, 1 mile south of Agra (Phillips County)
- Highest wind gust (measured): 86 mph at Phillipsburg Airport (Phillips County) on 6/14/14 and on 8/17/14 near Jewell (Jewell County)
- Most rainfall reported: 5.00" on 8/9-10/14 southwest of Scottsville (Mitchell County)

Severe Weather Terminology

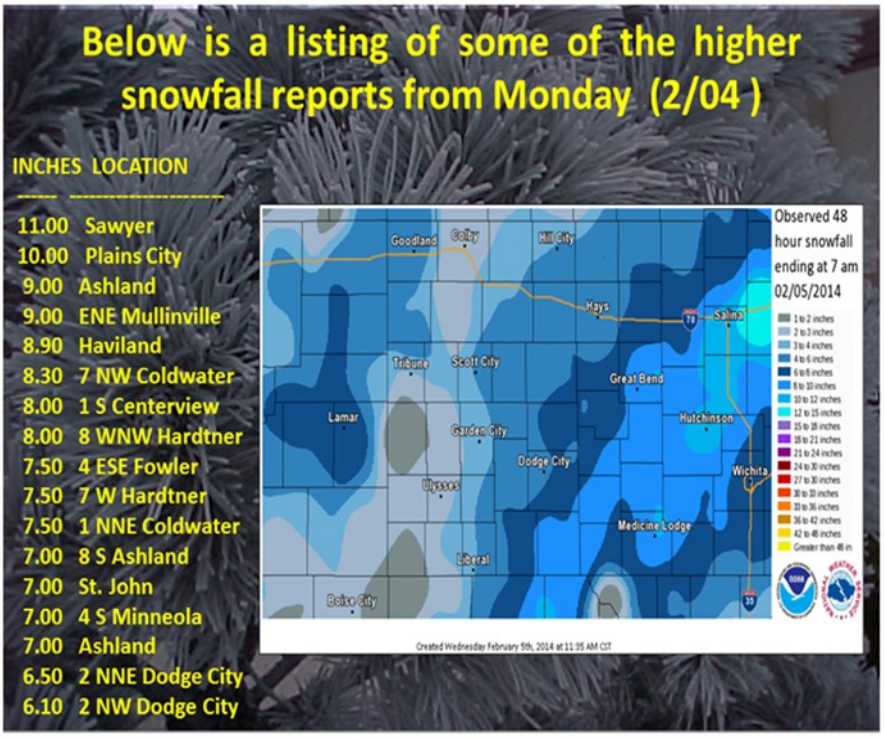
- **Severe Thunderstorm** – The National Weather Service issues severe thunderstorm warnings for thunderstorms that are currently producing or are capable of producing winds of 58 mph or stronger and/or hail one inch in diameter or larger. Severe thunderstorms often may be much stronger than this minimum 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 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, associated with a rotating column of air.
- **Flash Flood** – A flash flood is flooding that occurs very rapidly, 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.

2014 Severe Weather Summary

Southwest Kansas

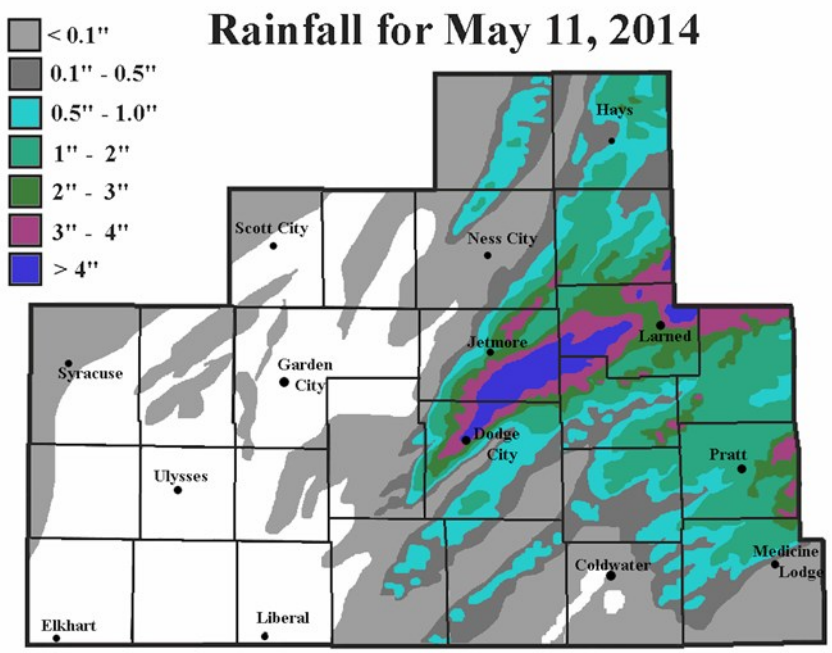
National Weather Service - Dodge City

Overall it was a relatively quiet year for much of southwest Kansas. The first significant weather event of the year occurred in early February when a winter storm progressed across the area on the 4th. The heaviest snow was primarily limited to locations south and east of Dodge City. Sawyer picked up 11 inches and Plains had 10 inches.



A second storm on the 10th of February brought a small area of 5 to 7 inch snow amounts with most areas receiving considerably less snow.

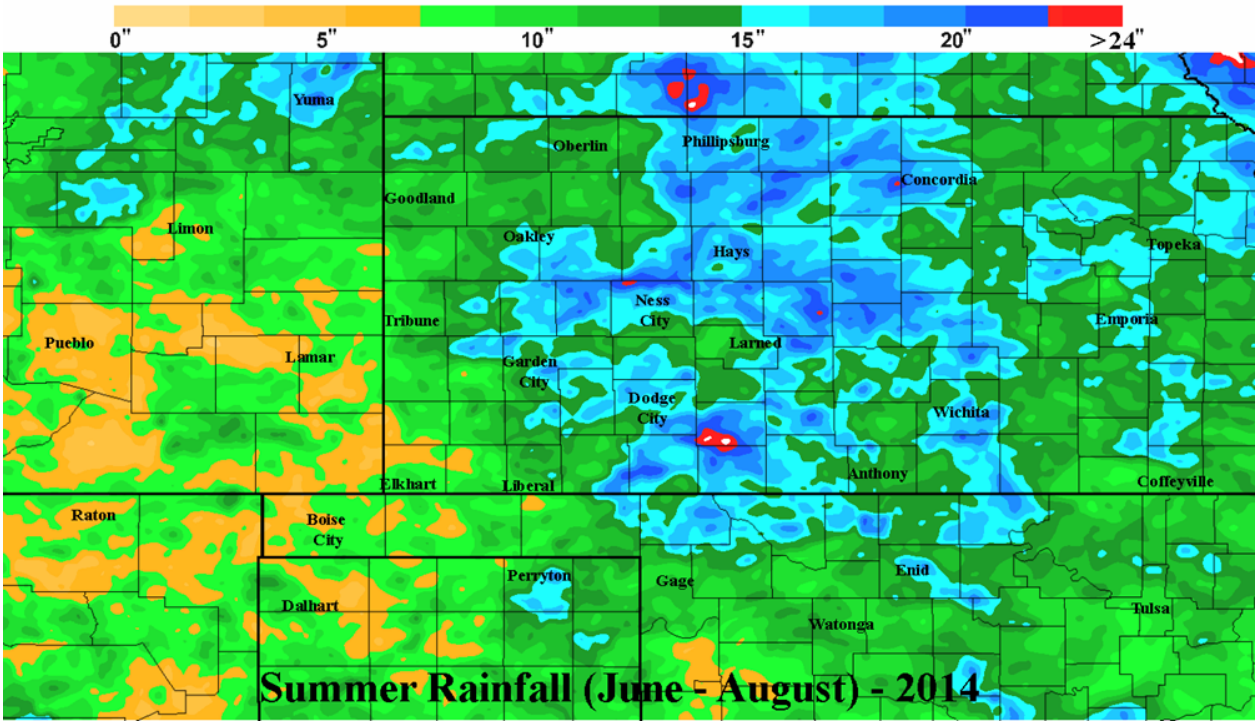
Other than occasional days of high winds producing some blowing dust and a couple of minor severe weather events in April, it was rather uneventful until Mother's Day.



On the 11th of May a line of severe thunderstorms developed and impacted much of Dodge City and areas northeast towards Larned. There were 4 weak tornadoes along with torrential rains. Several locations had over 5 inches of rain. In addition, almost every storm that trained across the same area produced damaging hail.

By June, Mother Nature turned on the faucet. For some locations across western Kansas the month had record or near record breaking precipitation. At the Dodge City airport there was

9.09 inches of rain making this June the second wettest on record. There were many locations that had 12 to 16 inches for the month!



For the summer months rainfall was abundant at many locations, with the only exception being across the far southwest counties.

In July a significant and record setting cold airmass moved across western Kansas. At the Dodge City airport there was a consecutive 3 day stretch where the average high temperature was only 66.0 degrees. This is the coldest three day stretch for July at the airport – and records go back to 1874! The average daily temperature was only 60.7 degrees and this was also a record.

Otherwise, the weather was generally quiet until the middle part of November when an Arctic airmass plowed into Kansas. The generally mild fall was abruptly halted when the mercury plummeted to below zero at many locations. After that spell of cold there was limited storm activity the remainder of 2014.

For 2014 there were only 10 tornadoes across the 27 counties in Dodge City's forecast area. All of those were weak and only a few produced minor damage.

Be sure to find your local NWS office on facebook

NWSDodgeCity
NWSGoodland
NWSHastings
NWSKansasCity
NWSSpringfield
NWSTopeka
NWSWichita

Also be sure to check if your county Emergency Manager has a facebook page for your county.

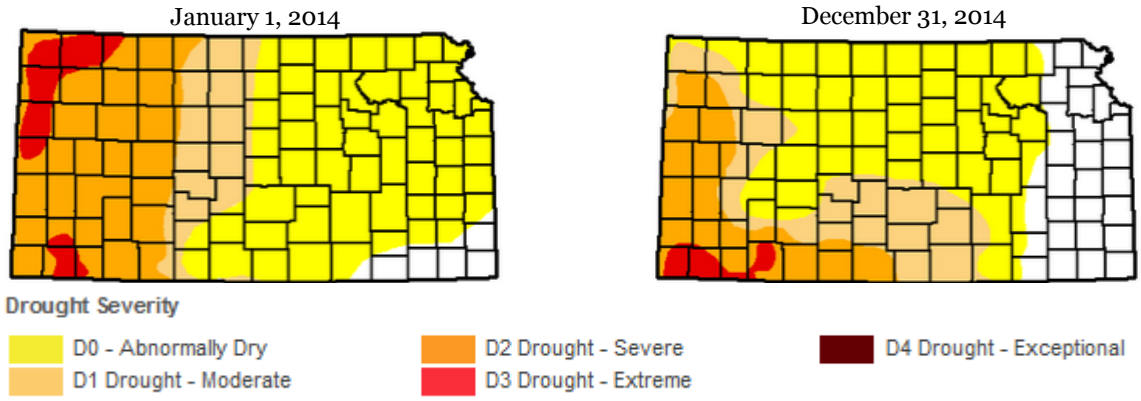
2014 Severe Weather Summary

Northwest Kansas

National Weather Service - Goodland, KS

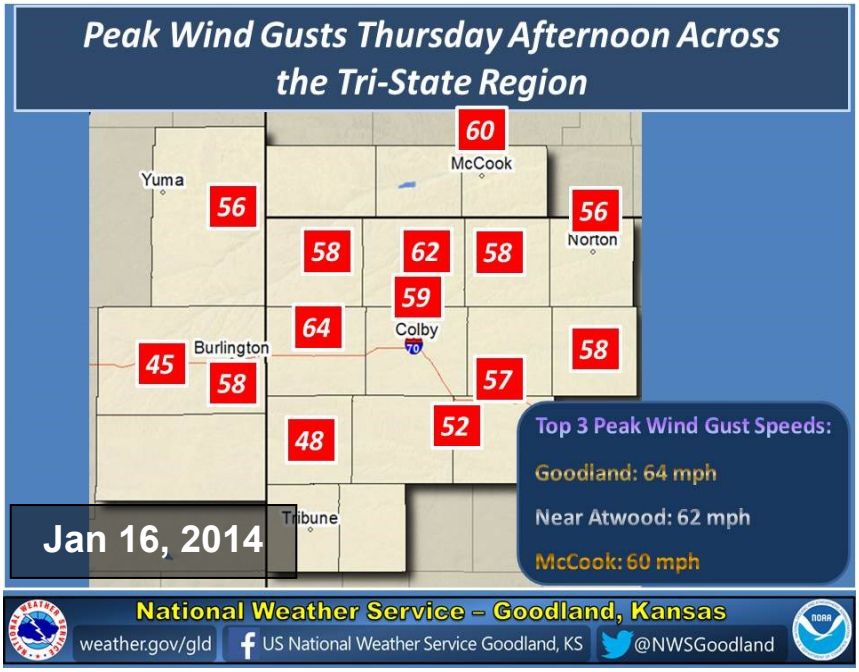
Drought

Severe to extreme drought remained entrenched across northwest Kansas as the year began, thanks to below normal precipitation in 2012 and 2013. Even though moisture came up short again in 2014, there was some improvement in the drought rating for the area by year's end. Across the state as a whole there was general improvement in the drought rating, with the only exception being the far southwest counties where D3 (Extreme Drought) conditions prevailed by year's end.



Dust Storms

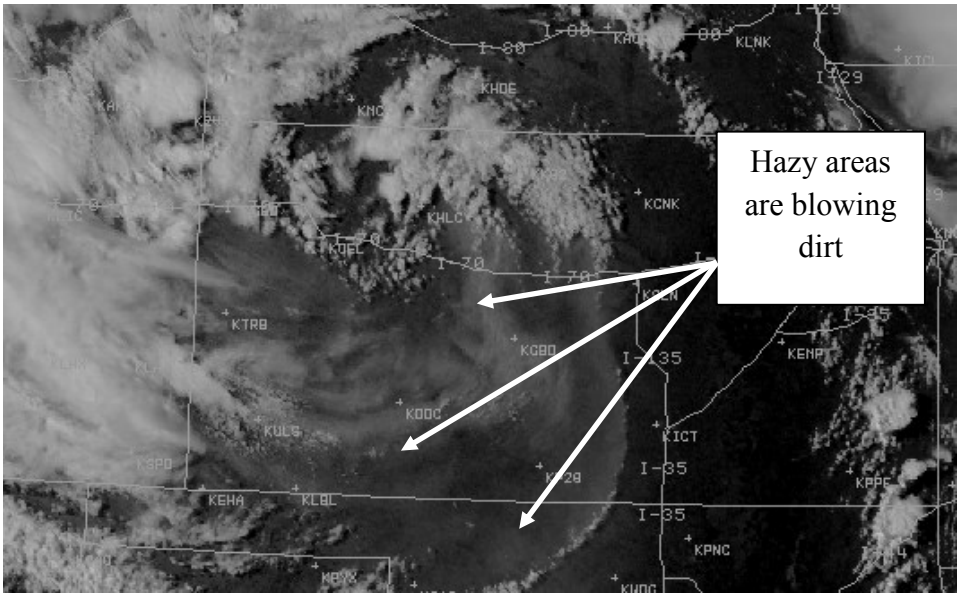
January 16th brought high winds to northwest Kansas starting in the late morning hours. Gusts of 50 to 60 mph were common by afternoon. Local visibility was reduced to near zero in blowing dirt adjacent to some farm fields. A multiple fatality accident occurred near Rexford as a result of a localized dust storm there. The map at right shows peak wind gusts, with the strongest gust reported at Goodland with 64 mph.



A strong cold front pushed across northwest Kansas on March 31st, producing a wind gust of 66 mph near Atwood in Rawlins County. Other wind gusts of 55 to 60 mph were common during the day. The strong winds produced plumes of blowing dirt which affected mainly Sheridan, Decatur and Rawlins Counties where near zero visibility resulted in some road closures.

In late April, an intense slow-moving storm system brought three consecutive days of high wind to northwest Kansas. Wind gusts of 55 to 65 mph were common from April 27th to 29th. Dust storm conditions

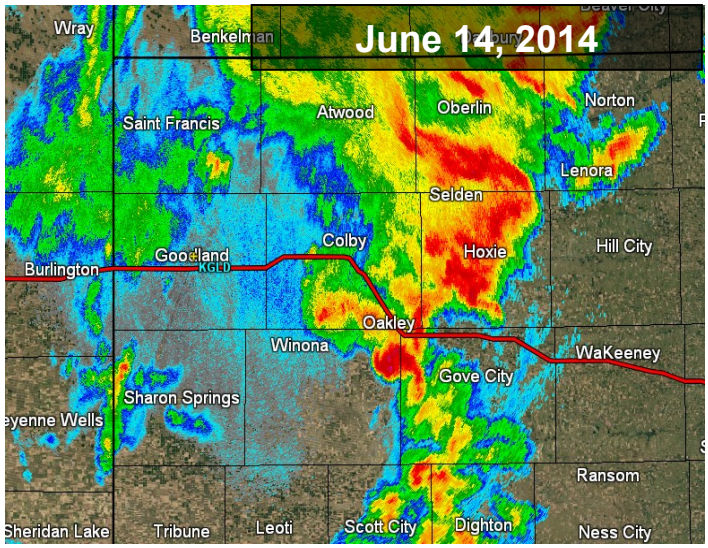
(visibility below ¼ mile) were reported across Cheyenne, Sherman, Thomas, Wallace and Logan Counties on the 27th. The satellite image below shows the extent of the blowing dirt.



Severe Weather

Two "landspout" tornadoes ignited the 2014 severe weather season in northwest Kansas. On April 20th two weak tornadoes developed in the afternoon, one near Colby and the other southwest of Atwood. These tornadoes formed on a surface wind shift line as thunderstorms developed overhead. Both tornadoes lasted 2 minutes, remaining over open fields with no known damage.

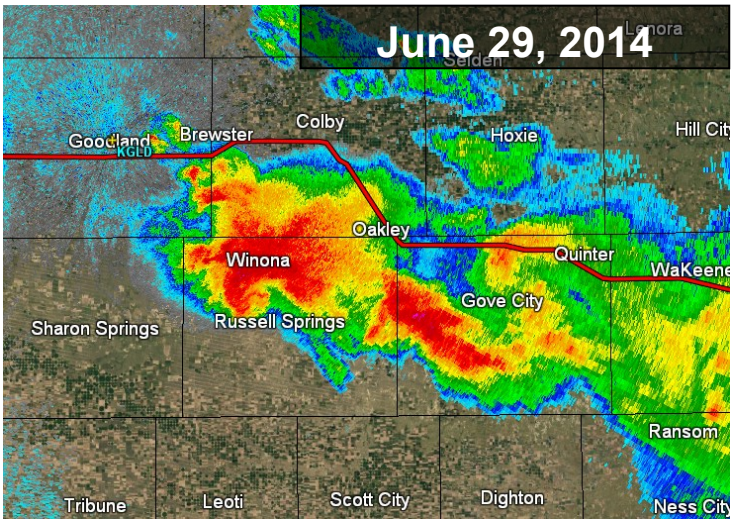
On June 11th storms forming along a cold front affected areas south of Interstate 70 and produced two tornadoes, wind gusts to 75 mph and half dollar size hail. A storm spotter reported a rope tornado south of Tribune during the afternoon. The tornado was rated an EF0 with no known damage. A second tornado was reported by the Logan County emergency manager north of Selkirk. This tornado produced EF1 damage and destroyed a garage and barn. Fortunately no injuries occurred.



The biggest severe weather day in 2014 was June 14th when severe thunderstorms roared across western Kansas during the late afternoon and evening hours. Over 80 reports of large hail and wind damage were received. Hailstones the size of baseballs to nearly softballs fell, with peak wind gusts estimated at 80 to 90 mph. Widespread power outages occurred from Cheyenne east to Norton County as well as across Sheridan and Graham Counties. The radar image at right shows the storms during their damaging wind phase, which brought down trees, grain bins and dozens of utility poles.

An unusual early morning tornado and flash flooding made June 29th noteworthy in the severe weather logs. Thunderstorms developed around midnight along Interstate 70 and moved southeast overnight. A tornado developed at 605 am CDT and damaged a farmstead in Gove County producing EF1 damage. Training of

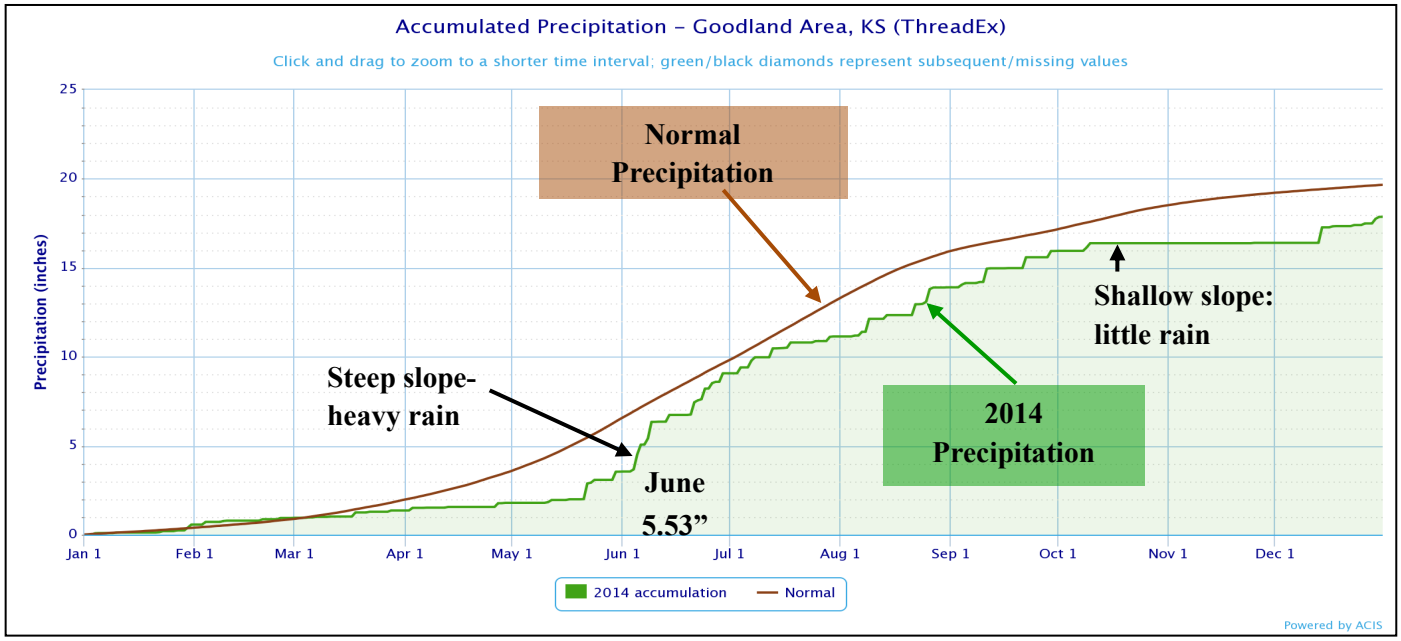
thunderstorms also resulted in extremely heavy rainfall with many creeks over flowing their banks. Union Pacific Railroad tracks were washed out between Winona and Page City in Logan County.



Precipitation (2014 vs Normal)

The chart below is a timeline of precipitation for Goodland. The smooth brown line shows normal precipitation; the jagged green line shows 2014 precipitation. Time of year increases from left (January) to right (December) on the bottom axis. When the green line is below the brown line, precipitation is below normal. Shallow slopes indicate precipitation accumulating slowly with time while steep slopes indicate precipitation accumulating rapidly with time.

Looking at December 31st on the right, the brown line indicates Goodland should have received 19.66" of moisture, but the green line indicates Goodland actually received 17.87", a deficit of 1.79".



Be sure to find your local NWS office on YouTube

NWS Dodge City, KS at www.youtube/user/NWSDodgeCity
NWS Goodland, Kansas at www.youtube/user/NWSGoodland
NWS Hastings, Nebraska at www.youtube/user/NWSHastings
NWS Kansas City, Missouri at www.youtube/user/NWSKansasCity
NWS Springfield, Missouri at www.youtube/user/NWSSpringfield
NWS Topeka, Kansas at www.youtube/user/NWSTopekaKS
NWS Wichita, Kansas at www.youtube/user/NWSWichita

2014 Severe Weather Summary

Southeast Kansas

National Weather Service - Springfield, MO

The 2014 severe weather season in southeast Kansas was somewhat quiet compared to past years. Factors contributing to a less active season were a longer lasting winter season, a persistent northwest flow in the upper levels, and the lack of deep Gulf of Mexico moisture. This minimized severe weather and tornado activity for much of the area.

But it only takes one tornado to make it a bad year for some people. Residents in the town of Baxter Springs in Cherokee County were not so lucky this past year. An EF2 tornado touched down on April 27th and did significant damage. This tornado tore a path right through the center of town with winds estimated between 120 and 130 mph. The path was approximately 150 yards wide which destroyed approximately 90 homes and 11 businesses. An additional 85 homes and 7 businesses suffered damage. There were approximately 25 injuries reported but no fatalities. The total damage was estimated up to $10 million.

Picture of the Baxter Springs, KS Tornado captured near Riverton, KS .

Another EF1 tornado began that day near Hammond in Bourbon County before it moved into Linn County. This tornado destroyed several grain bins and derailed several train cars. The tornado also destroyed several outbuildings and caused significant tree damage. The winds were estimated between 100 to 110 mph and the path was approximately 200 yards wide. It caused about half a million dollars in damage.

Throughout the year, there were a handful of reports of damaging winds and large hail up to the size of golf balls. There were a few isolated reports of flash flooding as well.

Be sure to find your local NWS office on Twitter

NWS Dodge City, Kansas at @NWSDodgeCity
NWS Goodland, Kansas at @NWSGoodland
NWS Hastings, Nebraska at @NWSHastings
NWS Kansas City, Missouri at @NWSKansasCity
NWS Springfield, Missouri at @NWSSpringfield
NWS Topeka, Kansas at @NWSTopeka
NWS Wichita, Kansas at @NWSWichita

Also be sure to check if your county Emergency Manager has a twitter account for your county.

National Weather Service

Weather Safety

Kansas

Have you ever sat down with your family to discuss and plan what you would do in case of an immediate weather threat? If you haven't, now would be an excellent time to sit down with your family and devise a plan. Finding the time to do this can be difficult, but taking the 15 minutes to develop and practice a plan could save the lives of ones you love. Please remember these tips when planning and carrying out your actions.

Tornado Safety Tips

Before the storm:

- Develop a plan of action
- Have frequent drills
- Have a NOAA Weather Radio with a warning alarm tone
- Listen to radio and television for information
- If planning a trip outdoors, listen to forecasts

In Homes or Small Buildings:

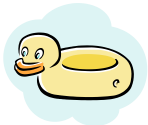
Go to the basement or to an interior room on the lowest floor (e.g. closet or bathroom). Upper floors are unsafe. If there is no time to descend, go to a closet, a small room with strong walls or an inside hallway. Wrap yourself in overcoats or blankets to protect yourself from flying debris.

In Schools, Hospitals, Factories, or Shopping Centers:

Go to interior rooms and halls on the lowest floor. Stay away from glass enclosed places or areas with wide span roofs such as auditoriums and warehouses. Crouch down and cover your head. Don't take shelter in halls that open to the south or the west. Centrally-located stairwells are good shelter.

If a warning is issued or threatening weather approaches

- Always remember **"DUCK"**



- Stay away from windows
- Get out of automobiles and get into a sturdy structure or ditch.
- Or, buckle your seat belt and get below window level of your vehicle.

"DUCK"

Down to the lowest level
Under something sturdy
Cover your head
Keep in the shelter until the storm has passed

In High-Rise Buildings:

Go to interior small rooms or halls. Stay away from exterior walls or areas with glass.

In Mobile Homes:

ABANDON THEM IMMEDIATELY!!!

Many deaths occur in mobile homes. If you are in a mobile home when severe weather approaches, leave it immediately and go to a substantial structure or designated tornado shelter. Determine your shelter ahead of time so you don't have to think about it when weather strikes.

If no Suitable Structure is Nearby:

Lie flat in the nearest ditch or depression and use your hands to cover your head. Be alert for flash floods.

Tornadoes and Overpass Safety

Many people mistakenly think that a highway overpass provides safety from a tornado. In reality, an overpass may be one of the worst places to seek shelter from a tornado. Seeking shelter under an overpass puts you at greater risk of being killed or seriously injured by flying debris from the powerful tornadic winds.

Tornadic winds can make the most benign item a dangerous missile. In addition to the debris that can injure you, the winds under an overpass are channeled and could easily blow you or carry you out from under the overpass and throw you 100s of yards.

As a last resort, lie flat in a ditch, ravine or below grade culvert to protect yourself from flying debris. If no ditch is available, you may remain in your vehicle, put on your seatbelt, lower yourself below window level, and cover your head with your hands or a blanket.

Lightning Safety

- Watch for developing thunderstorms and be ready to act when thunder is heard.
- Lightning can strike as far as 10 miles from an area where it is raining. That's about the distance you can hear thunder.

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

- Outdoor Activities: Minimize the risk of being struck by moving indoors or to vehicles at the first roar of thunder.
- Inside Activities: Things to avoid
  - Corded phones
  - Computers
  - Other electrical equipment
  - Indoor/Outdoor pools
  - Tubs and showers and other things connected to metal plumbing

  Wait 30 minutes after the last roar of thunder before going outside again.
- Help a Lightning Victim: Call 911 and get help immediately. You are in no danger when helping a lightning victim. The charge will not affect you.

When Thunder Roars, Go Indoors!

Flood Safety

- Floods, especially Flash Floods kill more people each year than any other weather phenomenon.
- As little as 6 inches of fast moving water can sweep you off of your feet.
- As little as 18-24 inches of water is enough to float a car and carry it away.
- If you see a road barrier across a flooded roadway....

TURN AROUND. DON'T DROWN!

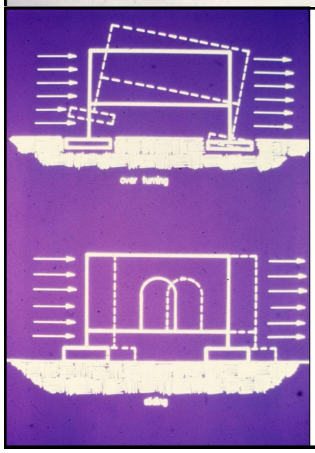
- Tune to the NOAA Weather Radio, or your favorite news source for all flood and any other weather related information.
- Leave areas subject to flooding, such as dips, low spots and underpasses.
- Do not attempt to cross flowing streams, you don't know how deep the water could be.
- Never drive through flooded roadways.
- If your vehicle is suddenly caught in rising water, leave it immediately and seek higher ground.
- Report any flooding to your local authorities or to the National Weather Service.

Turn Around. Don't Drown!

Mobile Home Safety

- The average annual death rate in mobile homes due to tornadoes is **20 times** higher than in permanent homes
- Mobile homes were the most common location for **tornado fatalities (44%)** from 1985 to 2005, followed by permanent homes (25.3%) and vehicles (9.9%). This disparity is more striking when considering that mobile homes accounted for a mere 5%–8% of U.S. housing units during this period.
- The National Weather Service (NWS) considers mobile homes unsafe during a tornado.
- Mobile home residents should go to the nearest sturdy building or storm shelter. Do NOT seek shelter inside your mobile home!
- In many cases, your car can be a safer sheltering option than staying in your mobile home.

Rolled mobile home – stopped by tree 70 mph



Mobile homes:

- **overturn or slide between 70 and 100 mph**
- **Are completely blown away at 110-137 MPH EF2**

Truck stays - M. Home flipped

Picher, OK 2008

Remember!

1) Participate in a tornado drill in your mobile home community. If you don't have one, then organize a tornado drill!

2) Understand the definition of a tornado warning*

3) Have an emergency response plan for seeking shelter **away** from your mobile home.

By following these 3 points you can lower the risk to you and your family from the hazards posed by tornadoes in Kansas.

***A Tornado Warning means:** there is immediate danger for the warned area. All in a tornado warning are urged to seek shelter immediately, as it can be a life-threatening situation. For our residents who live in mobile homes, this means evacuating the mobile home and seeking shelter in the nearest sturdy building or storm shelter.

National Weather Service
Kansas

Disaster Kit

www.weather.gov

Are you ready?

When disaster strikes, it pays to be prepared. Having a disaster kit prepared will save you time and could save your life. A disaster kit should be in your *designated shelter* and it would also be helpful to have a *smaller version in a small backpack or other containers that are easily carried if you need to evacuate your home*. Disaster kits should be reviewed annually to be kept up-to-date with your family's needs. Items in your kit should include, but are not limited to:

BE PREPARED

Staple Items

- □ 3 day supply of water (1 gallon per person per day)
- □ 3 day supply of nonperishable, ready to eat food items and manual can opener
  - □ high energy foods, e.g. peanut butter
  - □ juices, dried milk
  - □ sugar, salt, pepper
- □ First Aid Kit (see list for individual items)
- □ Flashlight and extra batteries, or ones that generate their own energy by shaking them
- □ Battery operated or Hand Crank radio
  - □ NOAA All-Hazard Weather Radio
- □ Clothing— Think about the climate: warm and/or cool season clothes
- □ Shoes
- □ Sanitation and hygiene items (such as hand sanitizer, moist towelettes, and toilet paper)
- □ Matches in waterproof container
- □ Whistle
- □ Blankets
- □ Other tools (e.g. hammer, pliers)
- □ Cash and coins
- □ Photocopies of important documents, personal ID's and credit cards
- □ Baby needs
- □ Special Needs
  - □ Prescription medications, eye glasses,
  - □ Contact lens solution, etc.
- □ Games to pass the time (e.g. cards)
- □ Pet food and extra water

First Aid Kit

- □ Sterile adhesive bandages in assorted sizes
- □ 2-inch and 4-inch sterile gauze pads
- □ Hypoallergenic adhesive tape
- □ Triangular bandages
- □ Scissors & tweezers
- □ 2-inch and 3-inch sterile roll bandages
- □ Waterless alcohol-based hand sanitizer
- □ Antiseptic wipes
- □ Petroleum jelly or other lubricant
- □ Latex gloves
- □ Anti-bacterial ointment
- □ Aspirin or non-aspirin pain reliever
- □ Antacid (for upset stomach)
- □ Cold pack
- □ CPR breathing barrier, such as a face shield
- □ Assorted sizes of safety pins

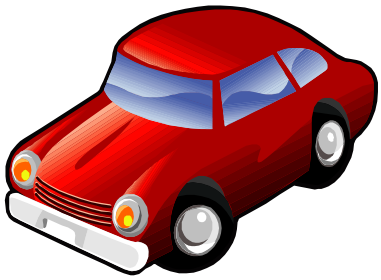
Winter Disaster Kit

Winterizing your Disaster Kit

If you live in a cold climate, you must think about warmth. It is possible that you will not have heat during or after a disaster. Think about your clothing and bedding needs. Be sure to include one set of the following for each person to add to your Disaster Kit.

- ☐ Jacket or Coat
- ☐ Long pants and long sleeve shirt
- ☐ Sturdy Shoes
- ☐ Hat, Mittens, and Scarf
- ☐ Sleeping Bag or Warm Blanket
- ☐ Extra Blankets
- ☐ Lantern or Flashlight

A Disaster Kit for your Vehicle



You may be in your vehicle when disaster strikes, or possibly stuck in your vehicle in a summer/winter environment. Below are a few items that you should keep in your car as part of your Vehicle Disaster Kit.

- ☐ Flashlight and extra batteries
- ☐ Maps
- ☐ Small First Aid Kit
- ☐ White Distress Flag
- ☐ Tire Repair kit
- ☐ Booster/Jumper cables
- ☐ Air pump
- ☐ Flares
- ☐ Bottled water
- ☐ Non-perishable foods such as granola bars

<u>Winter supplies</u>

- ☐ Blanket or Sleeping Bag
- ☐ Hat and Mittens
- ☐ Shovel
- ☐ Sand Bags
- ☐ Tire Chains
- ☐ Windshield Scraper
- ☐ Florescent Distress Flag

<u>Summer Supplies</u>

- ☐ Sunscreen
- ☐ Shade Item (umbrella or wide brimmed hat)
- ☐ Bug spray

Sirens Are An Outdoor Warning System

Every year the National Weather Service and the emergency management communities get together and provide severe weather information for the public. Each year we emphasize the fact that the outdoor sirens are just that…an Outdoor Warning System. Every year we get a multitude of calls telling us that the sirens can't be heard while in the house.

Severe weather season usually begins in the early spring in Kansas. We all need to be prepared for severe weather at any time of the day or night and at any time of year. The National Weather Service, emergency management, law enforcement, the 9-1-1 center, and the fire department cannot notify every individual of the possibility of severe weather in their town. The local media outlets and All Hazards NOAA Weather Radio are your best sources for information concerning severe weather watches and warnings. Do not wait for the sirens to be your warning system at home. Sirens may not be working if the power is out and oftentimes cannot be heard indoors. Sirens may not be activated for other severe threats such as damaging straight line winds in excess of 60 mph, large hail, and flooding. Monitor NOAA Weather Radio and local media then take the appropriate action for the severe weather threat. If it appears that a severe thunderstorm is approaching your location, do not wait for the outdoor sirens, take immediate action to protect your life and the lives of others in your home.

Hundreds of volunteer storm spotters, amateur radio operators, and first responders provide the first line of defense every time there is severe weather in the local area. They do this because they care about the people in their communities and want to make sure those people are given the best chance at survival. The storm spotters, emergency managers, law enforcement and other volunteers immediately relay severe weather reports to the National Weather Service. The National Weather Service in turn disseminates that information to the media and public through warnings, statements, and local storm reports. Getting the word out to the public in a timely manner may save lives. When severe weather threatens at night while most people sleep, it can be especially dangerous. Oftentimes in the heat of the spring and summer, we cannot hear outdoor sirens over running air conditioners. A NOAA Weather Radio with a back-up battery can make the difference for you and your family.

Take responsibility…listen to the media….take protective action….survive to enjoy the wonderful warm sunny days that also come this time of year.

Weather Safety Handout In Spanish

El Servicio Nacional de Meteorología

Medidas de seguridad en clima severo

¿Tiene un plan familiar en caso de que se presente una emergencia? Si no, entonces ahora es un tiempo perfecto para hacer lo. Sólo le llevará 15 minutos hacer y practicar su plan. Tome en cuenta los siguientes consejos .

Consejos de seguridad en caso de tornados

Antes de la tormenta:

- Tenga un plan de acción
- Practique frecuentemente los procedimientos a seguir
- Compre un radio del tiempo NOAA para que tener una alarma
- Escuche el radio y la televisión para tener más información
- Si está planeando una actividad al aire libre primero investigue el pronóstico del tiempo

Si se emite una alarma

- Evite las ventanas
- Abandone los autos y busque un refugio en una zanja o una cuneta (drenaje vial).

Está en una casa o en un edificio pequeño:

Busque un refugio en el sótano, en una habitación o en el pasillo del nivel más bajo del edificio. Si no le da tiempo de bajar busque refugio en un ropero, un cuarto dentro de la casa que tenga paredes resistentes. Cúbrase con unas cobijas o una bolsa de dormir para protegerse de los escombros que salgan volando.

Está la escuela, hospital, una fábrica o en un centro comercial:

Busque refugio en un cuarto interior o un pasillo del nivel más bajo. Evite las ventanas o las áreas abiertas como un almacén o un auditorio. Las escaleras en el centro son un buen refugio.

Está en un edificio de muchos pisos:

Busque refugio en un cuarto interior o un pasillo. Evite las ventanas y las paredes exteriores.

Está en una casa prefabricada o un auto:

¡¡¡Abandónelo Inmediatamente!!!

La mayoría de las muertes ocurren en casas prefabricadas o en autos. Si está en una casa prefabricada o un auto entonces abandónelo inmediatamente y busque refugio en un edificio con una estructura fuerte. Planee y determine su refugio antes que el clima severo ocurra.

Si no hay edificio cerca:

Busque un refugio en una cuneta y cobra su cabeza o zanja y cubra su cabeza con sus manos. Esté alerta por si hay una inundación.

Tornados y Seguridad en Puentes

Muchas personas piensan, equivocadamente, que los puentes o pasos a desnivel en las carreteras son lugares seguros para protegerse de un tornado. En realidad, esos puentes son los peores lugares para buscar refugio de un tornado. Buscar protegerse debajo de un puente le pone en mayor riesgo de muerte o de ser fuertemente herido debido a los escombros que los fuertes vientos del tornado arrastran.

Los vientos del tornado pueden convertir los objetos menos peligrosos en armas de muerte. Además del peligro de los escombros, los vientos debajo del puente son más intensos y pueden fácilmente sacarlo de ahí y aventarlo cientos de millas.

Como último recurso, acuéstese boca abajo en una zanja a lado de la carretera, o entre en un tubo de drenaje para protegerse de ser arrastrado. Si no hay ninguna zanja o tubo quédese en su carro con su cinturón de seguridad puesto y póngase debajo del nivel de la ventana. Cubra su cabeza con sus manos o con una sábana.

Aléjese de los Relámpagos

- Esté al pendiente de saber si habrá tormentas eléctricas y alístese para actuar.
- Los rayos pueden caer hasta 10 millas de distancia de donde está lloviendo. Esa es la distancia aproximada de donde se puede escuchar un trueno.

Si puede escuchar el trueno, significa que está en un área peligrosa donde puede caerle un rayo ¡Aléjese y busque refugio!

- Actividades al aire libre: Para evitar ser tocado por un rayo mejor realice las actividades en un lugar techado o entre en su carro cuando escuche el primer trueno.
- Actividades Interiores: Cosas a evitar
  - Teléfonos conectados a la electricidad
  - Computadoras
  - Cualquier equipo eléctrico
  - Albercas techadas o al aire libre
  - Tuberías, regaderas y cualquier otra cosa que esté conectada a la tubería

Después de escuchar el último trueno espere 30 minutos antes de salir.

Para ayudar una victima de un rayo: Llame al 9-1-1 o a su servicio local de ambulancia. Y pida ayuda inmediatamente. Usted no corre peligro al ayudar a una víctima de un rayo. La energía que esa persona recibió no le afectará a usted.

¡Cuando escuche un trueno, ir a dentro es bueno!

Seguridad de Las Inundaciones

- Las inundaciones, particularmente las riadas, cada año provocan la muerte de muchas personas más que cualquier otro evento asociado con clima severo .
- Aguas de 6 pulgadas de profundidad que se muevan rápidamente pueden arrastrar a casi cualquier persona.
- Su auto, camión o SUV puede empezar a flotar en agua de menos de 2 pies de profundidad y que se están moviendo rápidamente.
- Cuando vea una calle inundada...

  ¡ES MEJOR REGRESARSE, QUE AHOGARSE!
- Escuche el radio de NOAA o su noticiero local para más información de las inundaciones.
- Salga de las áreas que son susceptibles a la inundación por ejemplo sótanos y valles.
- No trate de cruzar los riachuelos.
- Nunca conduzca en caminos inundados.
- Si su auto está en un lugar donde el nivel del agua sube rápidamente, abandónelo y busque refugio en un lugar alto.
- Llame a las autoridades locales o su Servicio Nacional de Meteorología para informar de la inundación

¡ES MEJOR REGRESARSE, QUE AHOGARSE!

Americans live in the most severe weather-prone country on Earth, and the state of Kansas is no exception. Each year a startling 10,000 thunderstorms, 2,500 floods, 1,000 tornadoes, and 10 hurricanes impact the United States. Potentially deadly severe weather impacts every American. Communities can rely on the National Weather Service's StormReady program to help them guard against the ravages of Mother Nature.

What is StormReady?

Ninety percent of all presidentially declared disasters are weather related. Through the StormReady program, NOAA's National Weather Service gives communities the skills and education needed to survive severe weather – before and during the event. StormReady helps community leaders and emergency managers strengthen their local hazardous weather operations.

StormReady Does Not Mean Storm Proof

StormReady communities are better prepared to save lives from the onslaught of severe weather through better planning, education and awareness. Communities have fewer fatalities and property damage if they plan before dangerous weather arrives. No community is storm proof, but StormReady can help communities save lives.

How Can My Community Become StormReady?

The entire community – from the mayor and emergency managers, to business leaders and civic groups – can take the lead on becoming StormReady. Local National Weather Service forecast offices work with communities to complete an application and review process. To be recognized as StormReady, a community must:

- ✔ Establish a 24-hour warning point and emergency operations center.
- ✔ Have more than one way to receive severe weather warnings and forecasts and to alert the public.
- ✔ Create a system that monitors local weather conditions.
- ✔ Promote the importance of public readiness through community seminars.
- ✔ Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

Go to http://www.stormready.noaa.gov for more information.

Weather-Ready Nation

National Oceanic and Atmospheric Administration

The Weather-Ready Nation Ambassador™ initiative is the National Oceanic and Atmospheric Administration's (NOAA) effort to formally recognize NOAA partners who are improving the nation's readiness, responsiveness, and overall resilience against extreme weather, water, and climate events.

As a WRN Ambassador, partners commit to working with NOAA and other Ambassadors to strengthen national resilience against extreme weather. In effect, the WRN Ambassador initiative helps unify the efforts across government, non-profits, academia, and private industry toward making the nation more ready, responsive, and resilient against extreme environmental hazards.

WRN Ambassadors serve a pivotal role in affecting societal change — helping to build a nation that is ready, responsive, and resilient to the impacts of extreme weather and water events.
To be officially recognized as a WRN Ambassador, an organization must commit to:

- Promoting Weather-Ready Nation messages and themes to their stakeholders;
- Engaging with NOAA personnel on potential collaboration opportunities;
- Sharing their success stories of preparedness and resiliency;
- Serving as an example by educating employees on workplace preparedness

As a WRN Ambassador, you will serve as a change agent and leader in your community. You will inspire others to be better informed and prepared, helping to minimize or even avoid the impacts of these natural disasters. To support your efforts, NOAA can:

- Provide outreach content about creating a Weather-Ready Nation;
- Explore innovative approaches for collaboration with your organization;
- Assist with StormReady® opportunities for communities;
- Recognize your organization as a WRN Ambassador; and
- Share the WRN Ambassador logo for your use.

Together we will inform and empower communities, businesses, and people to make pre-event decisions that can be life-saving and prevent or limit devastating economic losses. We are a nation of many communities, and it is only through connected communities that we will achieve this goal.

Any organization across all levels of government, businesses large and small, non-profit and non-governmental organizations, and academia can become a WRN Ambassador. The WRN Ambassador initiative is intended for organizations and designed to help serve the public by strengthening our national resilience against extreme weather events.

http://www.nws.noaa.gov/com/weatherreadynation/amb_tou.html