2012 KANSAS

SEVERE WEATHER AWARENESS WEEK

MARCH 12-16, 2012

TORNADO SAFETY DRILL TUESDAY, MARCH 13th

1:30 PM CDT

INFORMATION PACKET

National Weather Service

Table of Contents

2011 Kansas Tornado Facts

Tornadoes: 68 (**8** above the 1950-2010 average of 60)
(**10** above the past 30 year average of 78)
(**44** below the past 10 year average of 112)

Fatalities: 3 **Injuries: 7**

Longest Track: **8.4 miles** (Stafford County, May 24, EF2)

Strongest: **EF3** (Lyon, Graham, Norton Counties)

Most in a county: **8** (Norton - June 20)

Days of occurrence: **17** (Days with 1 or more tornadoes)

Most in one day: **16** (June 20)

Most in one month: **31** (May)

Rope tornado near Reager, Kansas on June 20, 2011. Photo courtesy Darrell Skrdlant.

First tornado of the year: **February 27** (Cowley County, 6:23 pm CST, EF0, 1.1 mile length, 75 yard width)

Last tornado of the year: **October 8** (Haskell County, 4:50 am CDT, EF1, 2.8 mile length, 75 yard width)

2011 Monthly Tornado Totals

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
Total	0	2	0	6	31	24	1	0	0	4	0	0	68	100%
Percent	0	3	0	9	46	35	1	0	0	6	0	0		
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	3	0	0	0	0	0	0	4	6%
EF2	0	0	0	0	1	1	0	0	0	0	0	0	2	3%
EF1	0	0	0	0	4	4	0	0	0	3	0	0	11	16%
EF0	0	2	0	6	25	16	1	0	0	1	0	0	51	75%

Weak (EF0, EF1) tornadoes in green, strong (EF2, EF3) in yellow, violent (EF4, EF5) in red, month totals in blue.
Percent values may not add to 100% due to rounding.

Yearly Summary: 2011 is the third consecutive year in which no violent tornadoes occurred in the state. The strongest tornadoes in 2011 were rated EF3, with one occurring on May 21st and three on June 20th. The 68 tornadoes reported in Kansas last year, while slightly above the long term average, is the lowest in over a decade. The year 2011 is tied for 21st in the historical database in terms of numbers of tornadoes, and was well short of the record 187 tornadoes which occurred in 2008. Unfortunately, there was one tornado fatality in Kansas on May 21st and two on May 24th.

The 2011 "tornado season" in Kansas was essentially compressed into a five-week period, starting May 19th and ending June 20th. The number of tornadoes occurring during this period represents 80% of the state total.

KANSAS TORNADO STATISTICS

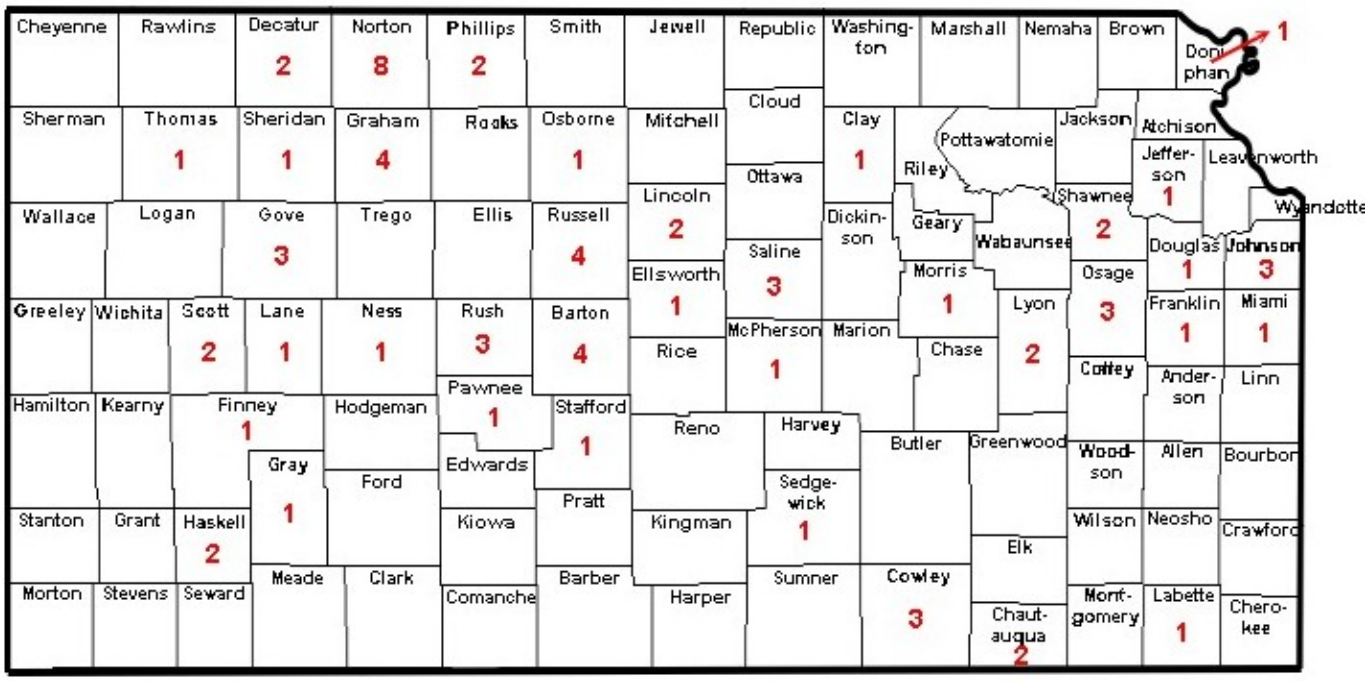
by County

1950 - 2011

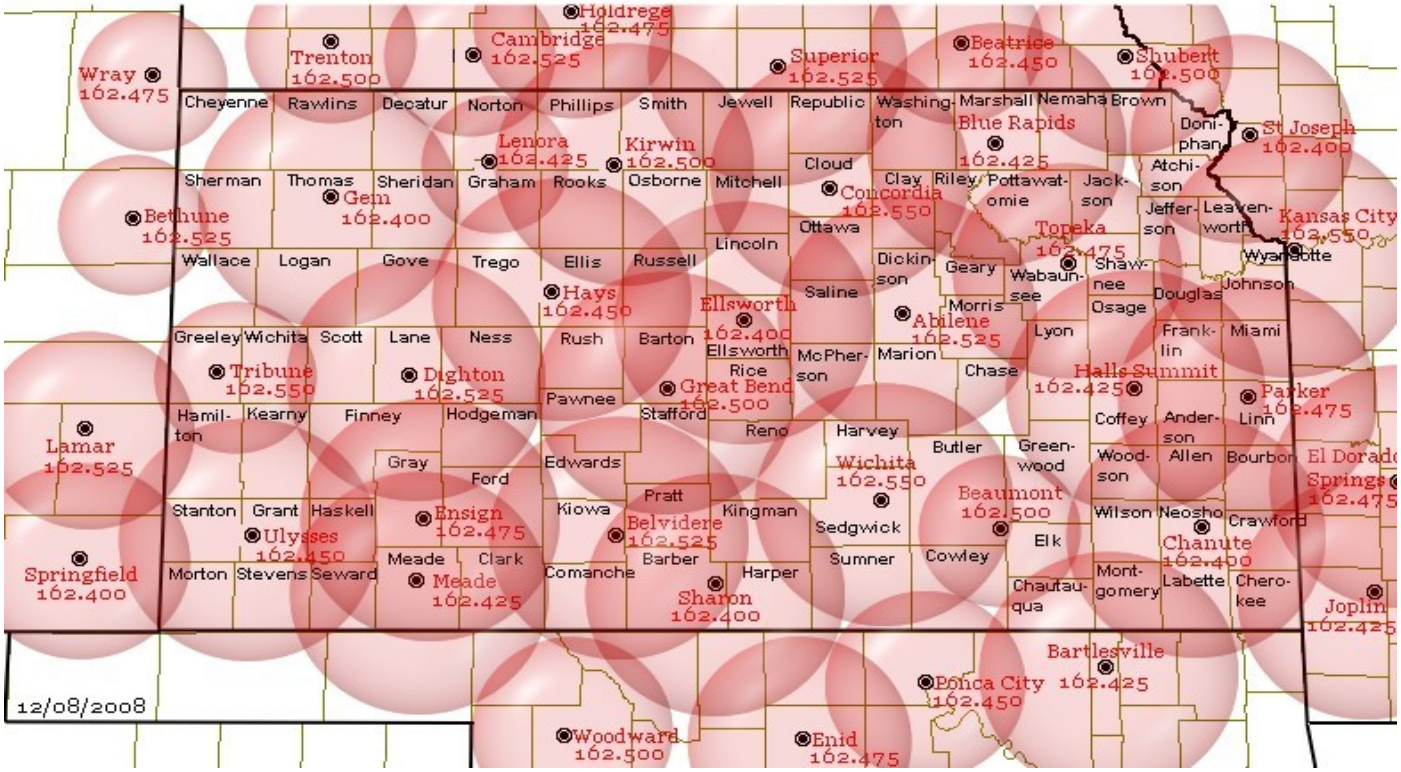
TORNADOES, FATALITIES, AND INJURIES

County	Tor	Fat	Inj
Allen	27	0	4
Anderson	15	3	12
Atchison	15	0	11
Barber	32	0	2
Barton	93	2	38
Bourbon	17	0	7
Brown	43	0	5
Butler	73	28	225
Chase	38	0	2
Chautauqua	17	0	0
Cherokee	35	4	41
Cheyenne	39	0	0
Clark	37	0	0
Clay	37	1	31
Cloud	45	1	8
Coffey	23	0	5
Comanche	36	0	2
Cowley	65	77	293
Crawford	33	4	43
Decatur	45	0	5
Dickinson	34	1	12
Doniphan	19	0	2
Douglas	38	1	48
Edwards	43	0	7
Elk	24	2	8
Ellis	52	0	6
Ellsworth	47	0	0
Finney	88	1	41
Ford	80	0	0
Franklin	28	3	34
Geary	17	0	3
Gove	46	0	3
Graham	38	0	0
Grant	24	0	9
Gray	39	0	3
Greeley	33	0	0
Greenwood	38	0	10
Hamilton	21	0	1
Harper	57	0	1
Harvey	47	1	63
Haskell	29	0	10
Hodgeman	43	0	4
Jackson	30	4	17
Jefferson	40	0	101
Jewell	35	0	1
Johnson	38	0	12
Kearny	34	0	0
Kingman	51	0	1
Kiowa	51	11	74
Labette	35	1	29
Lane	32	0	2
Leavenworth	30	2	30
Lincoln	31	0	2
Linn	13	0	3
Logan	24	0	0
Lyon	42	7	222
McPherson	47	1	16
Marion	45	1	2
Marshall	31	0	1
Meade	44	0	0
Miami	19	4	9
Mitchell	46	0	5
Montgomery	31	1	1
Morris	29	0	7
Morton	18	1	2
Nemaha	33	0	1
Neosho	31	0	4
Ness	43	0	4
Norton	27	0	0
Osage	42	17	6
Osborne	41	0	13
Ottawa	24	2	9
Pawnee	44	0	1
Phillips	39	0	1
Pottawatomie	31	1	5
Pratt	66	3	10
Rawlins	46	0	4
Reno	74	0	22
Republic	49	0	1
Rice	41	0	6
Riley	27	0	51
Rooks	48	0	6
Rush	36	0	8
Russell	67	1	7
Saline	34	0	66
Scott	44	1	1
Sedgwick	83	13	321
Seward	34	0	15
Shawnee	48	18	528
Sheridan	38	0	0
Sherman	99	0	0
Smith	40	0	1
Stafford	64	3	5
Stanton	19	0	0
Stevens	24	1	5
Sumner	77	5	14
Thomas	44	0	1
Trego	58	5	101
Wabaunsee	31	0	14
Wallace	35	0	4
Washington	34	2	12
Wichita	25	0	4
Wilson	15	0	0
Woodson	12	0	8
Wyandotte	10	2	36
Total	**4123**	**236**	**2831**

Kansas Tornadoes 2011



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 each county. 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 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
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: 156 (through 2011)

Most Tornadoes in One Episode

May 23, 2008	70 Tornadoes
June 15-16, 1992	41 Tornadoes

2011 Severe Weather Summary
Extreme East Central and Northeast Kansas
National Weather Service Pleasant Hill, MO

In far eastern Kansas, 2011 went into the books as a year of unlikely extremes as blizzards, drought and record flooding occur.

After a quiet start to the winter 2010-2011 season things really ramped up from late January through February. Snowfall of 5-8 inches fell across the area in late January, before a relatively rare blizzard struck the region on the February 1st. The blizzard produced 9-12 inches of snow and was blown about by 35 to 45 mph winds which reduced visibilities to near zero and produced lots of drifting. Traffic came to a grinding halt and schools were closed for several days. One last winter storm occurred on February 24 and 25th, bringing a mix of freezing rain, sleet, and up to 9 inches of snow.

Just two days later, thunderstorms produced a small amount of early season severe weather as hail up to the size of golf balls were reported in Miami County with smaller hail reported in Linn and Johnson Counties. There was a few other spotter severe thunderstorm reports in March before a more prolific hail producing thunderstorm on April 3rd moved through the area, the most intense of which tracked through Johnson County.

Severe weather remained relatively quiet across far eastern Kansas until the last 10 days of May. Severe thunderstorms brought repeated small to severe sized hail damaging straight-line winds from May 21 to 24, before a series of small and brief tornadoes struck the region on May 25th. The first reported tornado that day tossed a truck in Louisburg and damaged a building. As the storm moved north it produced three more brief and weak tornadoes in Johnson County, all before 11 AM. Damage was sparse and minor.

There were a few more typical severe weather outbreaks in June and July, before an intense hot and dry period set in which would dominate the rest of the summer.

Despite the dry weather and developing drought conditions, the Missouri River set flood records at numerous locations as the US Army Corp of Engineers scrambled to release record runoff from reservoirs far upstream due to excessive winter snowfall in the northern Rocky Mountains and excessive late spring rainfall in the Dakotas. The record releases produced significant flooding by mid-June and kept river towns like Elwood, Atchison and Leavenworth on edge as levees failed or were near overtopping for much of the summer. By early fall releases were cut back and the Mighty Mo gradually returned to its banks leaving countless damaged roads, property and levees in its wake. By comparison, the rest of 2011 was unusually quiet with mild fall weather transitioning to a quiet early winter.

2011 Severe Weather Summary
Northeast and North Central Kansas
National Weather Service-Topeka, KS

The 2011 severe weather year kicked off in early April when a series of supercells formed across northeast Kansas. One of these supercells created a long-lasting, damaging gustnado and affected portions of Shawnee and Jefferson Counties. Throughout the severe weather year a total of 12 tornadoes formed in northeast Kansas, eight EF-0, three EF-1, and one EF-3 tornadoes. The worst of these tornadoes occurred on May 21st, and caused significant damage and one fatality in the city of Reading, KS. The following is a summary of the notable severe weather events that affected northeast Kansas in 2011:

April 3rd - During the day, temperatures warmed to record highs across northeast Kansas before a powerful storm system moved through that afternoon and evening. A string of discreet supercells initiated late in the day behind a sharp cold front, and before long these storms were producing large hail and strong, damaging winds. Several locations across northeast Kansas reported hail up to 2 inches in diameter and winds of 70-80 mph, with a few reports of structural damage due to straight line winds. Aside from the widespread hail and strong winds, the storms caused a few gustnadoes to form near the leading edge of the cold front. The most intense of these gustnadoes formed near the town of Williamstown, where an NWS survey crew identified areas of enhanced wind damage. Two center-pivot irrigators were flipped over and a large outdoor shed and several trees were destroyed.

May 21st – In perhaps northeast Kansas' most significant severe weather event of 2011, at least seven tornadoes touched down across Lyon, Osage, Shawnee, Franklin, Douglas, and Jefferson Counties; the strongest of these was an EF3 tornado that destroyed parts of Reading, Kansas. A single story home in Reading was swept off its foundation, and several other two story homes suffered significant damage or complete loss of the second story. Later in the night, another tornado developed near Quenemo, and touched down on the west side of town destroying a couple structures. Aside from the numerous tornadoes, these supercells also produced giant hail in Topeka, Kansas. Across the city baseball-sized hail did damage to property and vehicles. The largest reported hailstone was a 5.25 inch stone, which fell in southwest Topeka.

An intense gustnado formed near Williamstown, KS causing some significant damage to outbuildings and agricultural equipment. Photo courtesy Scott Blair

June 1st - On the afternoon of June 1, another round of severe thunderstorms formed across northeast Kansas. Many of these storms produced severe hail up to the size of golf balls, but the strongest storms produced hail up to the size of baseballs. One of the strongest storms formed over Marion County and moved northward into Dickinson County. This storm produced a large amount of baseball-sized hail and even some softball-sized stones in Abilene, Kan-

sas. Some of the storms had strong rotation, and one even produced a funnel cloud near Agenda. Aside from the significant hail and brief funnels, these storms were slow moving and brought torrential rain, flooding many communities. The storms dropped between 6 and 9 inches of rain over a 6 hour period in Clay, Riley, Pottawatomie, and Dickinson Counties. In Manhattan the Red Bud Estates was completely inundated with running water from Wildcat Creek. Rock Creek in Louisville rose out of its banks and flooded some residences along Highway 99. Substantial flooding also occurred in the town of Morganville in Clay County and Ogden in Riley County.

On May 21, a significant tornado formed northeast of Emporia (top), and moved through Reading, KS causing major damage to the town (lower).

June 20th - Supercell storms developed in central Kansas during the late afternoon and early evening hours of June 20. Hail up to the size of 2 inches in diameter was reported with these storms across portions of Ottawa and Cloud Counties. As the storms moved eastward they gradually weakened and formed into a squall line, producing strong, damaging winds with numerous reports of minor damage across Riley, Morris, Marshall, Washington, and Lyon Counties.

August 19th - The late evening hours of Friday, August 19th brought a swath of significant damage to parts of northeast Kansas, particularly Jackson, Atchison, Jefferson, and Leavenworth counties. This storm originated in southeast Nebraska, where it produced isolated hail up to the size of quarters, and then weakened slightly as it crossed parts of Nemaha and Brown Counties in Kansas where very heavy rainfall and isolated pea size hail occurred. However, the storm rapidly intensified as it moved into far southern Brown and northern Jackson counties. At this time, very large hail of 4.5 inches in diameter (larger than a softball!) developed and fell over the next hour or so. Incredible wind speeds of 90 to 100 mph were reported from this storm as it tracked from Jackson County southeastward until it weakened slightly in the Kansas City metro area. While the storm was relatively isolated, those in the path of the storm sustained significant property and crop damage, with some fields being completely shredded to a total loss, and windows and siding broken to pieces.

This outbuilding near Whiting, KS was destroyed by the August 19th wind storm. Photo courtesy of Luca Cochren

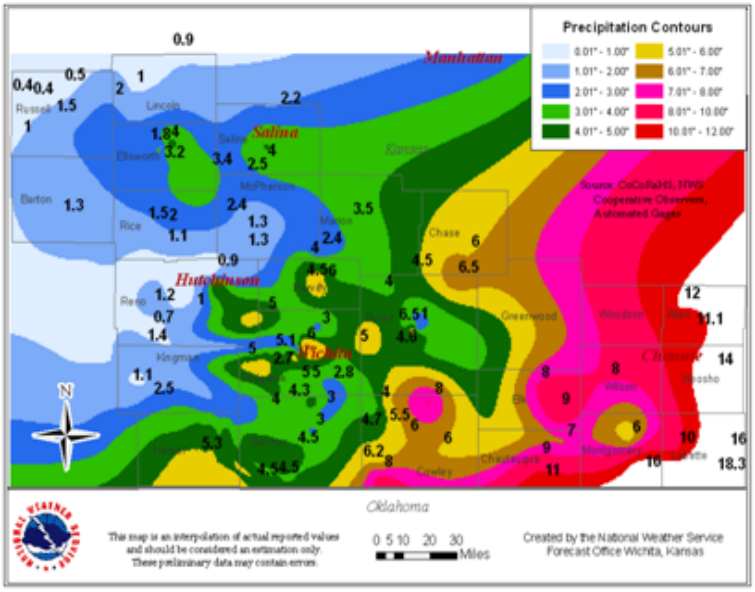
2011 Severe Weather Summary
Portions of Central, South Central and Southeast Kansas
National Weather Service - Wichita, KS

The weather for the area served by the NWS Wichita, KS office was not typical this past year, as we experienced the first blizzard in more years than anyone can recall, fewer tornadoes, dreadful heat, and exceptional drought conditions for some. Though the one that got the most national attention may have been the heat burst that affected portions of south central Kansas.

The Monster Blizzard of 2011
Impacting South Central and Southeastern Kansas
National Weather Service - Wichita, KS and Springfield, MO
January 31st - February 1st, 2011

An extremely potent winter storm moved into the Southern and Central Plains from New Mexico. As this storm approached the southwestern United States, south winds ahead of the storm allowed moisture to stream northward. Meanwhile a shallow arctic airmass dove south over the Northern and Central Plains. As this system pushed northeast, the resulting instability produced thunderstorms in the warmer air to the south, as well as thunder sleet and thunder snow across Oklahoma, Missouri, and Illinois. The greatest snow totals occurred where this instability was located with the colder air. South central and southeastern Kansas were just north of this instability, but extreme moisture allowed intense snowfall rates across this region. Accumulations up to 18 inches were reported in southeast Kansas, with smaller amounts to the west. Ultimately, this storm system will have impacted much of the country from the Southern Plains northeast to New York City. The combination of heavy snow and very strong winds caused blizzard conditions. Visibilities were reduced to near zero, and significant drifting occurred.

Storm Snow Totals as of 7am on February 2nd, 2011



Earliest 100 degree temperature on record for Wichita

The temperature at the Wichita Mid-Continent Airport soared to 100 degrees on May 9th, 2011. This was the earliest the temperature has reached 100 degrees in Wichita. Below are the top 5 earliest 100 degree readings:

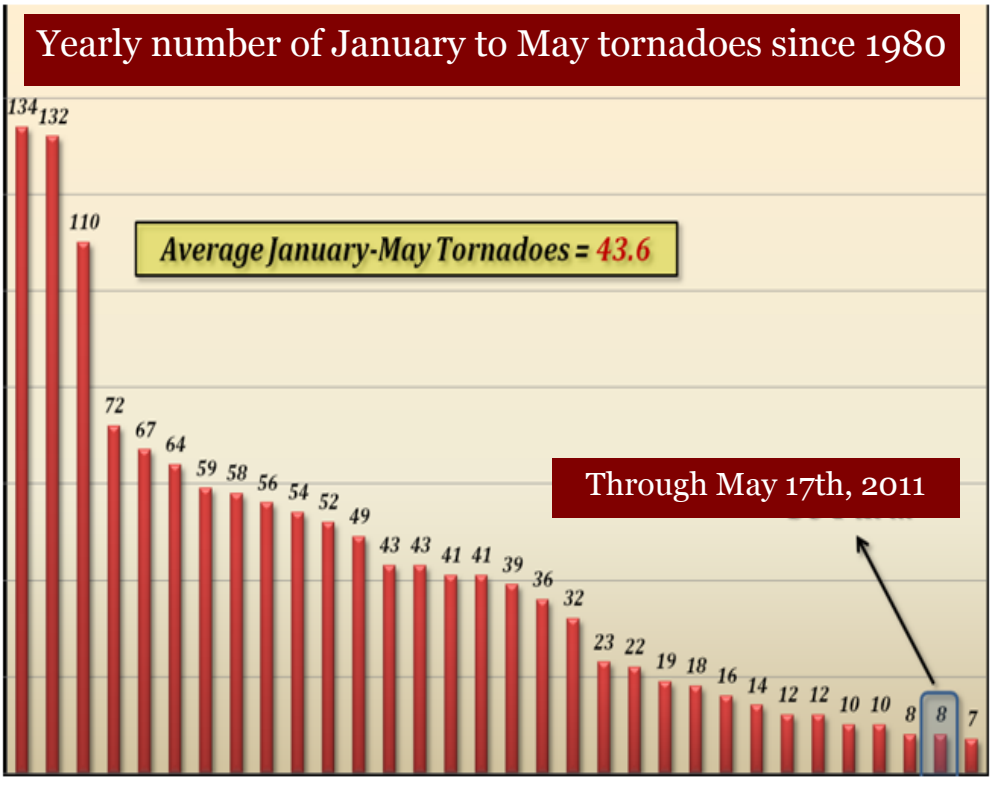
1.	**May 9th**	**2011**
2.	**May 10th**	**1967**
3.	**May 23rd**	**1996**
4.	**May 25th**	**1962**
5.	**May 29th**	**1913**

Kansas began the year with the fewest Tornadoes Since 1984

Despite one of the most active starts to tornado season nationwide since 1954, Kansas experienced not only a rainfall drought, but a tornado drought as well. Only eight tornadoes were reported across Kansas from January 1st through May 17th 2011: two in February and six in April. The majority of 2011 tornadoes across the Nation occurred during the month of April, and especially the last week of April across the southern and southeast USA.

May into June is climatologically the most active period tornado-wise across the central and southern plains. Since 1980, May 1st-17th typically boasts about 15 tornadoes across Kansas. Also since 1980, there has never been a May in Kansas that has been completely tornado-free, although 1994 and 1984 were close with only 2 reported each May. Since 1980, the month of May typically boasts about 30 tornadoes across the state.

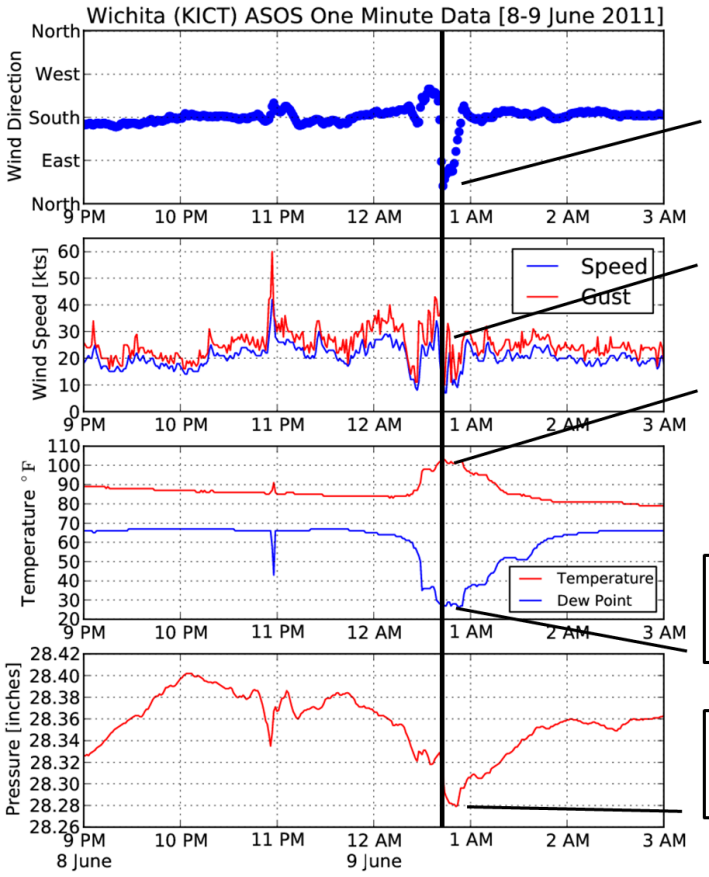
The number of twisters reported across Kansas since 1950 (over 3,500) surpasses all other states except Texas (nearly 7,800).



Strong Heat Burst Felt Across Wichita Metro and Surrounding Areas

An unusual heat burst occurred shortly after midnight on June 9, 2011, across the Wichita area. The temperature jumped some 15 to 20 degrees in a matter of 15 to 20 minutes, rising from the low to mid 80s to around 102 degrees. The sudden rise in the thermometer was accompanied by a downburst of winds that gusted to near 60 mph in some locations.

The heat burst was first noted on the west side of the city around 12:30 am. The temperature rose from 85 degrees at 12:22 am at the Mid-Continent airport to 102 degrees at 12:42 am. Winds gusted to around 45 mph. Several other observations across the west side showed a temperature jump into the mid to upper 90s. The heat burst shifted to the east side of the city after 1 am. A similar jump in the temperature was noted at both Jabara airport and McConnell Air Force Base rising to near 100 degrees shortly after 1 am. The hot burst of air was also very dry...with dew point temperatures dropping from the 60s into the 20s and 30s.



Winds switch direction

Wind Gusts

Peak In Temperature

Decrease In Dewpoint

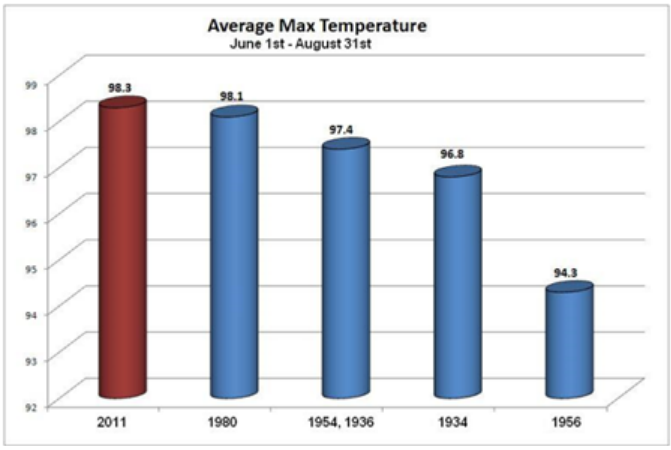
Decrease in Pressure

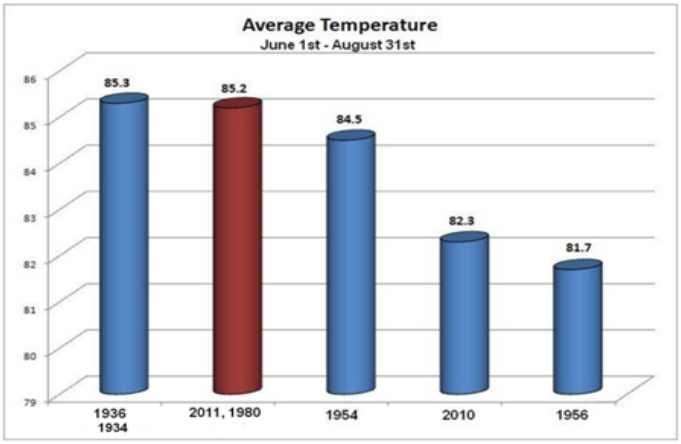
The burst of hot air in the middle of the night was likely the result of showers and storms which dissipated about 30 to 60 minutes prior to the heat burst being felt. The rainfall evaporated as high level air descended from the dying storms. This air compressed and warmed significantly as it descended...resulting in a hot blast of air at the ground. Environmental conditions with the presence of dry air aloft have to be just right to produce the rare occurrence of a heat burst.

The Summer of 2011 will go down as one of the hottest

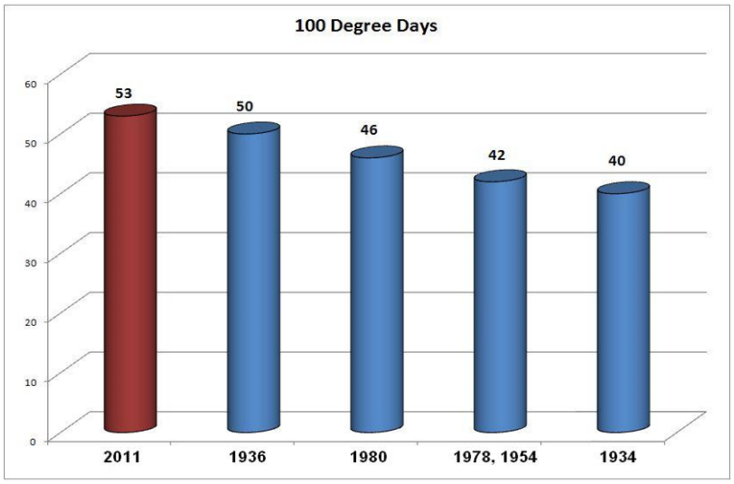
The average June through August 2011 temperature (average of each daily high and low temperature) recorded at Wichita Mid-Continent Airport was 85.2 degrees. While 2011 did not go down as the hottest summer on record, it was very close. The graphs on the next page show how the summer of 2011 compared to some of the hottest summers on record for Wichita.

Averaging the daily maximum temperatures for June through August yields even warmer results. The average June through August 2011 high temperature recorded at Mid-Continent Airport was 98.3 degrees, making summer 2011 the hottest summer on record when averaging just the daily high temperatures. The graphs on the next page show how the average high temperature for the summer of 2011 compared to other hot summers.





2011 surpassed 1936 for the most 100 degree days in Wichita



The 2011 Water Year and how dry it has been

The water year is defined as the period between October 1 of one year through September 30th of the next in the Northern Hemisphere and July 1 through June 30 in the Southern Hemisphere. This interval is often used by Hydrologists because hydrological systems are typically near their lowest levels at the beginning of the period. According to the AMS Glossary of Meteorology, it commences with the start of the season of soil moisture recharge, includes the season of maximum runoff (or season of maximum groundwater recharge), if any, and concludes with the completion of the season of maximum evapotranspiration (or season of maximum soil moisture utilization). For Wichita, the 2011 Water Year ranks as 9th driest since records began in 1888 or the driest in the past 21 years.

Rank	Value	Ending Date
1	13.84	09/30/1966
2	14.97	09/30/1956
3	15.63	09/30/1913
4	16.31	09/30/1953
5	17.09	09/30/1990
6	17.61	09/30/1946
7	17.81	09/30/1954
8	18.62	09/30/1936
9	**19.08**	**09/30/2011**
10	19.51	09/30/1988

2011 Severe Weather Summary
North Central Kansas
National Weather Service - Hastings, NE

A look back at the 2011 severe weather season across north central Kansas showed an early start in the Spring followed by an active Summer period. Severe weather began in late March with quarter to ping-pong ball size hail Mitchell County in the Tipton and Beloit areas. A more widespread hail event occurred on April 14th. This time the largest hail was half-dollar in size with its impacts felt across 4 of 6 counties in the area. The hail covered the ground in the Esbon and Athol areas.

A 3" diameter hail stone, which is slightly larger than a baseball, from the Zurich area in August 2011.

About a month later in mid-May, severe weather on May 11 began active stretch of several weeks. After some hail and strong winds on the 11th, the first tornado of the season set down near Natoma and caused minor damage. The tornado was rated EF0 on the Enhanced Fujita (EF) Scale. This event also brought widespread a 2 to 4 inch rainfall across the region. At Portis, the North Fork of the Solomon River crested over 5 feet above flood stage. This would turn out to be a harbinger of things to come.

After scattered severe wind and hail reports on the 21st, another round of heavy rain, this time 3-5 inches, fell across the four county confluence of Jewell, Osborne, Smith and Mitchell counties. Water crept on Highway 24 near Bloomington. Over 4 inches of rain fell at Lebanon. Once again at Portis, the North Fork of the Solomon River was out of its banks, this time cresting 6.6 feet above flood stage. The White Rock Creek near Burr Oak also crested over 6 feet above flood stage.

May wasn't finished yet, as the Memorial Day weekend turned active. Strong winds and hail up to 2 inches in diameter pounded holiday campers on the 29th at Glen Elder State Park. Several awnings were blown off RVs at the park. Memorial Day itself brought strong winds from thunderstorms rumbling southeast from Nebraska. Gusts of 60-70 mph were common. A home weather station near Webber measured a wind gust of 72 mph, while a 58 mph wind was recorded at the Phillipsburg Airport. Damage reports were limited, but that was minor tree and power line damage.

June picked up where May left off with several episodes of severe weather to start the month. Another EF0 tornado was confirmed, this time in far northern Phillips County. No damage was reported. The main story was another drenching of heavy, flooding rains for the 3rd time in about 2 weeks. This time the flooding was concentrated along the Oak Creek in southeast Smith County. The creek eventually flows in the Waconda Lake. The weather observer in Ionia reported 4.59" of rain, giving them nearly 10" of rain in the previous 9 days. The Limestone, Oak and White Rock Creeks all flooded, with evacuations necessary northeast of Downs. River gauges at Portis, Glend Elder and Beloit all exceeded flood stage, with the Solomon River at Glen Elder cresting nearly 6 feet above flood stage.

On June 16, isolated wind gusts over 80 mph caused damage in the Osborne area where 1 to 2 feet diameter trees were snapped and a metal building blown approximately 100 yards. On the 20th, another tornado occurred, this time the tornado moved into northwest Phillips County about 5 miles west of Long Island. The tornado was rated an EF1 and damaged a few farm buildings before the supercell moved into southern Nebraska.

As July and August set in, severe weather episodes became less frequent and less intense, which is not uncommon for the "Dog-days" of Summer. In July, there were a few strong wind events, one of which produced 60+ mph winds near Webber and damaged a modular home. During the last week of the month, thunderstorms produced winds of 50 to 80 mph at various locations. On the 27th, an 81 mph wind gusts occurred at Phillipsburg, producing some minor damage and power outages. In August, tennis ball size hail fell in Rooks county on the 9th, breaking windows and windshields. High winds with the hail resulted in downed tree limbs, power lines and battered siding on houses. This particular storm system caused well over one million dollars in the damage in the Rooks County area.

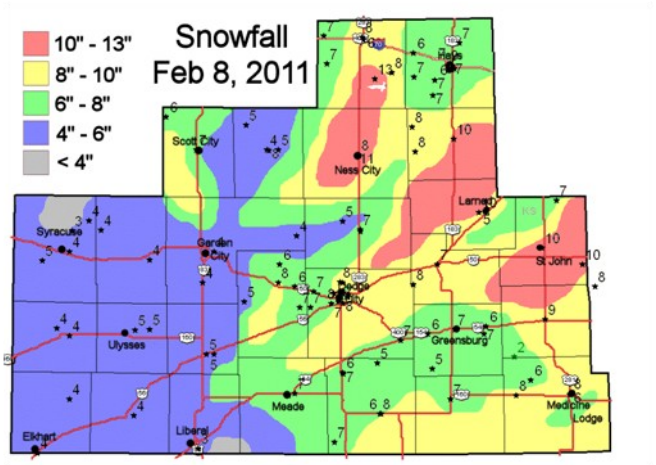
Flood waters start to undermine a culvert and wash away a county road near Ionia in June.

Though hard to believe, August 9th was the last severe report until October 8th, when penny size hail fell 3 miles east of Osborne. Not damage was reported.

In terms of severe weather, 2011 won't go down in the record books necessarily, but won't be forgotten anytime soon either. In fact, the season was a good reminder of the variety of hazards in the region, including brining a prolonged period of extensive and high impactful flooding to the region.

2011 Severe Weather Summary
Southwest Kansas
National Weather Service - Dodge City

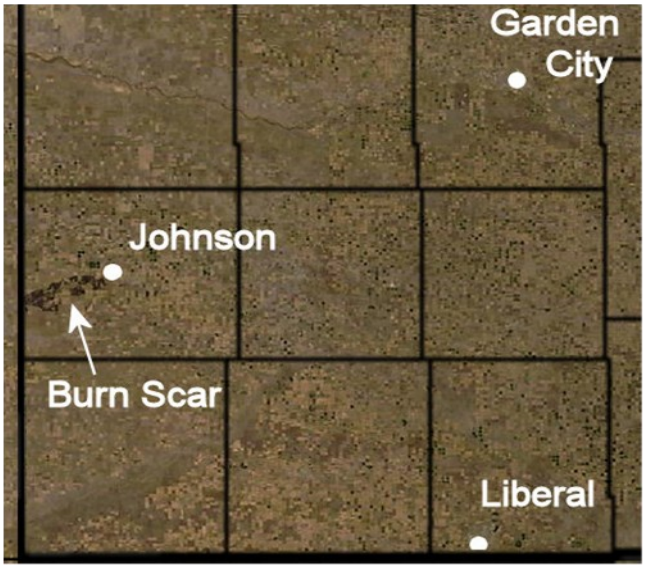
Early in the start of the new year of 2011, a minor winter storm brought snowfall of 3 to 7 inches to part of the area and then this was followed up by a more substantial storm on February 8th where 10 to 13 inches fell in the Ness City, Larned and St. John areas. Unfortunately, the storm did little to help the ongoing drought that was intensifying in the southwest part of our area.



Dry, windy and mild conditions occurred in March and increased the wildfire danger. Indeed there were several very large and costly fires. One such fire in March came perilously close to Johnson City in Stanton county. The "burn scar" from this fire was easily detected on high resolution satellite images as seen below. Other large fires during the spring were observed as well.

Strong winds in April behind several fronts produced damage across the region. One of the events occurred on April 15th. The highest gust recorded that day and relayed to the National Weather Service was 74 MPH on the north side of Dodge City. There was quite a bit of damage across southwest Kansas with numerous reports of shingle damage, street signs and street lights down, fences and large tree branches broken.

The most extreme damage was reported in Kinsley (Edwards Co) where high winds removed the roof of the former Ford dealership (photo to the bottom right).



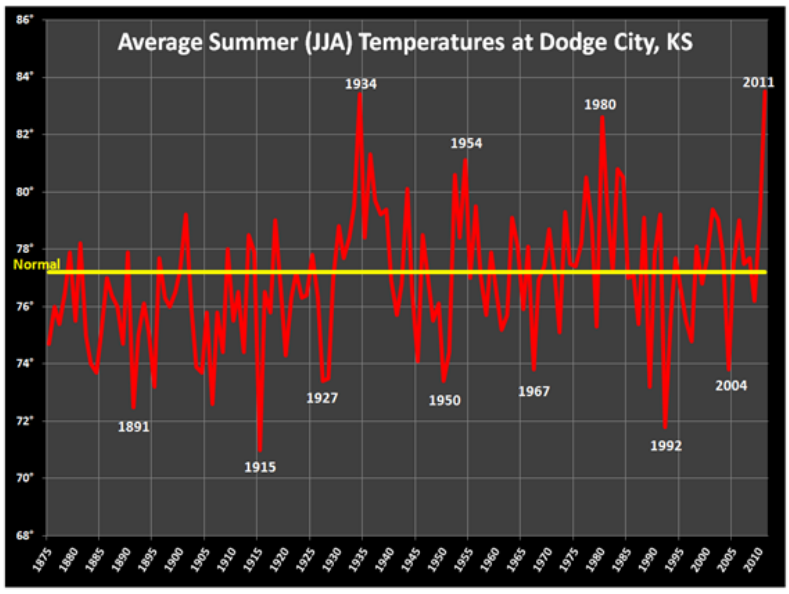
Severe weather finally arrived in western Kansas in May. On May 24th, there was an outbreak of severe storms accompanied by giant hail (6 inch diameter hail fell near Timken) and tornadoes. Tragically, a tornado in Stafford county claimed the lives of a mother and her teenage son who had sought refuge in their car behind trees as the tornado approached. The woman's 21 year old daughter was in the backseat of the vehicle and survived but sustained critical injuries. The tornado moved north/northwest and caused EF2 damage with approximately 120 MPH winds. Unfortunately, the tornado uprooted a very large tree and the tree subsequently fell on the vehicle that had been sitting in the driveway near Highway 281. The house, just to the east of the vehicle, was severely damaged.

Other damage was done to another home nearby, and also to trees, oil tanks, pivot sprinklers and to out buildings.

The largest tornado of the day passed through a sparsely populated area and did marginal damage.
(photo the left)

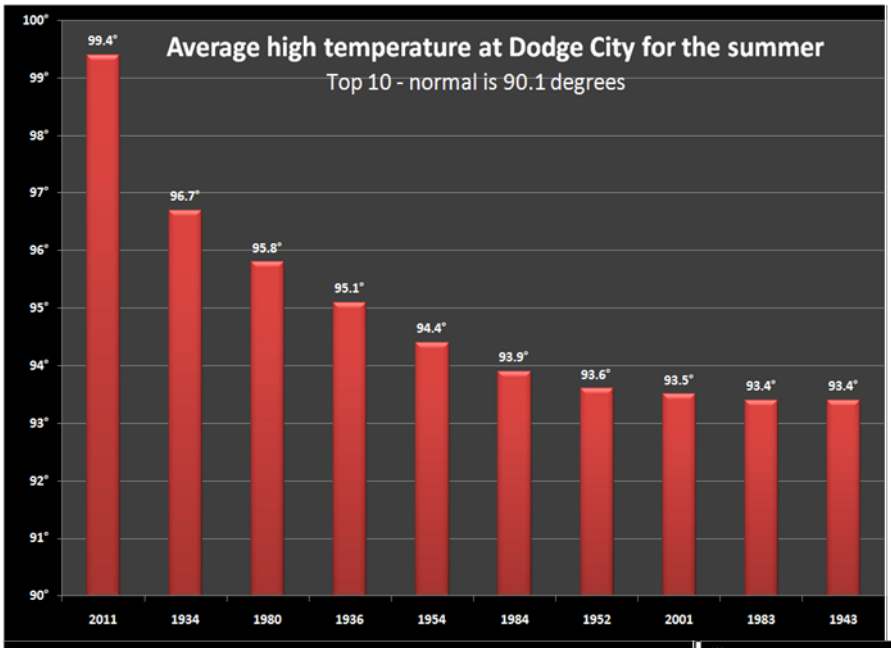
There were a few other small and brief tornadoes in October but all-in-all it was a quiet year for tornadoes in southwest Kansas. For 2011 there were 12 tornadoes reported, a little below the "normal" of 15 and much less than the 26 tornadoes that occurred in 2010.

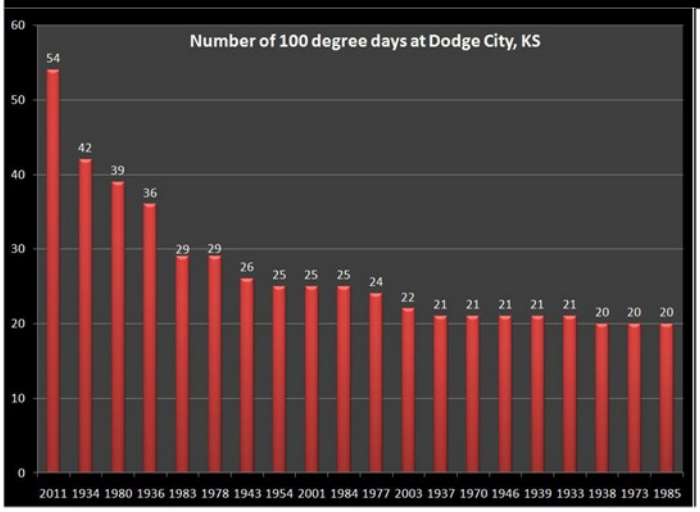
Probably the biggest weather story of the year was the intense heat and the exceptional drought conditions that intensified. Like much of western and south central Kansas, the extreme drought continued as the meteorological summer ended at Dodge City. In addition, the extreme heat experienced during the summer did not let up even into September. Meteorological summer includes June, July and August. For these three months, daily high temperature records at the Dodge City airport were broken 14 times and tied 7 times. There were 9 daily high temperature records broken or tied in August alone. Since January 1st, daily high temperature records were broken or tied 27 times! The average daily temperature for the summer at Dodge City was 83.5 degrees and this is the hottest on record (since 1875), well above the normal of 77.2 degrees.

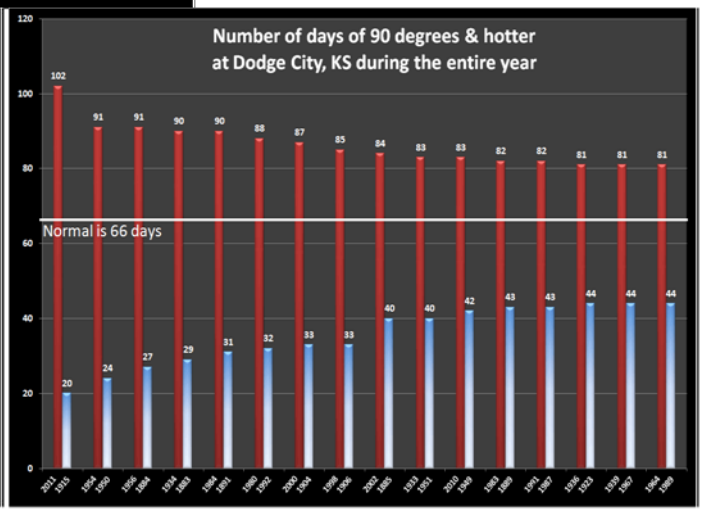


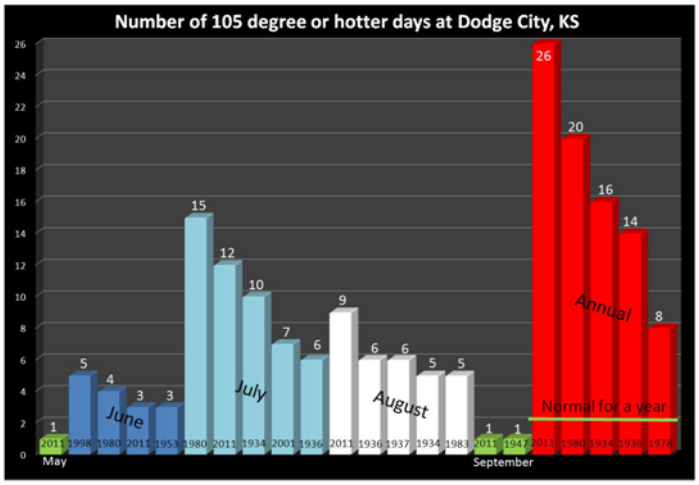
At Dodge City, the average high temperature for the summer was an astonishing 99.4 degrees, well above the previous record of 96.7 degrees set in 1934. The normal high temperature averaged throughout the summer is 90.1 degrees. Normally during the summer we can expect 13 or 14 days with highs of 100 degrees or hotter at Dodge City. However, this year Dodge City reached 100 degrees or higher on 54 days which obliterates the previous number of 42 set in 1934! Another record that fell was the number of 90 degree days – not only for the summer, but also for the year. By the end of the fall 102 days during 2011 were 90 degrees or hotter.

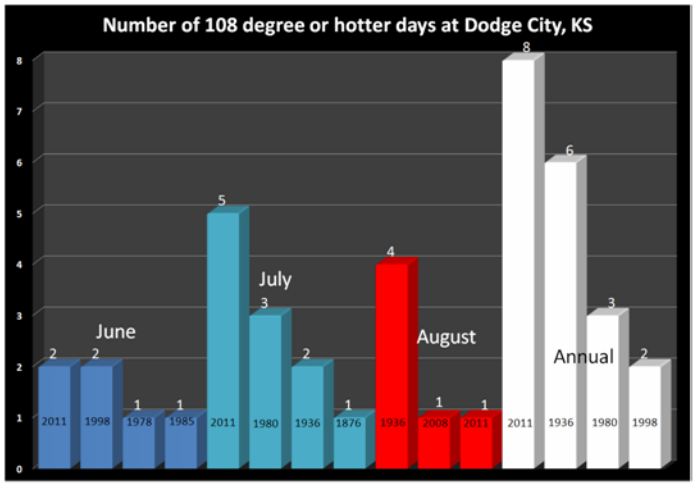
Another astonishing fact about the heat was the number of 105 & 108 days.

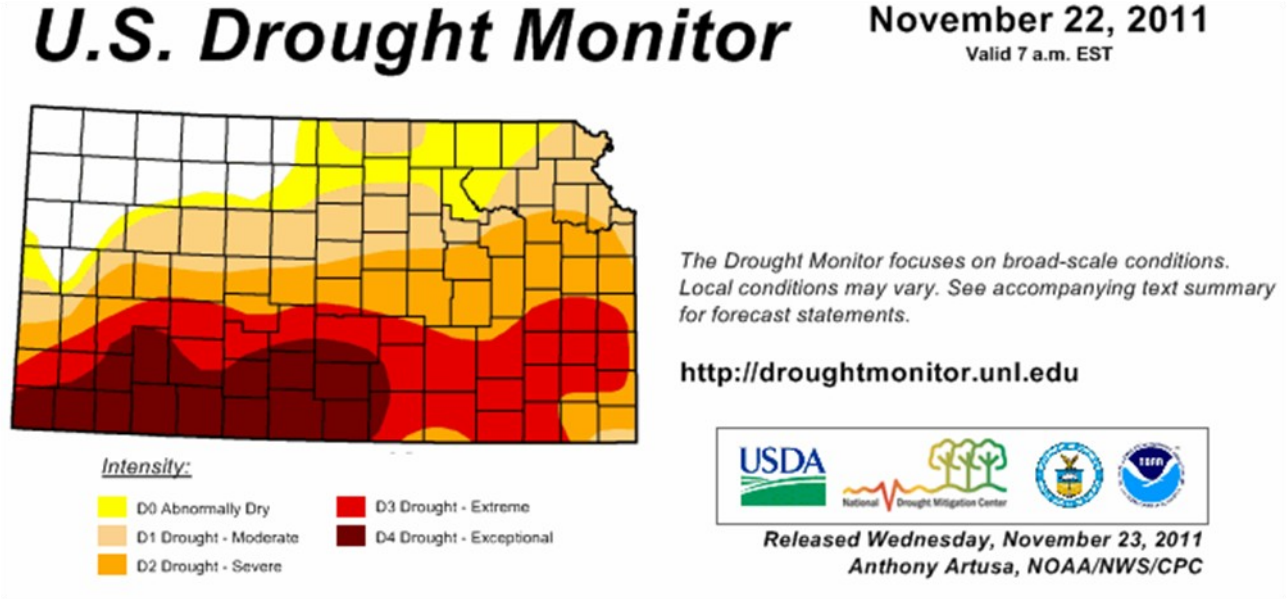








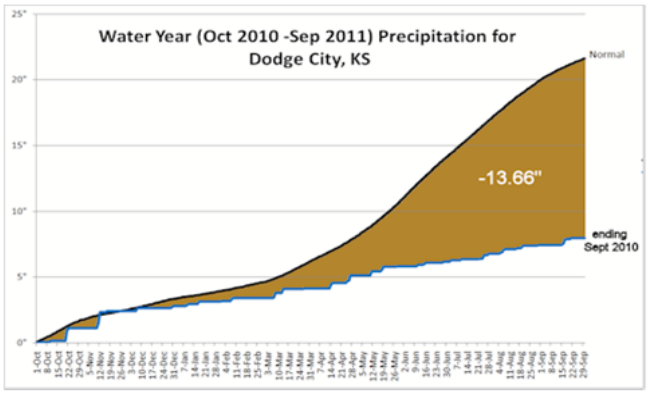




The heat wasn't the only story for the summer. The drought across much of the area reached the exceptional category. As of late fall the map below showed where the drought was occurring.

An even more impressive story on the dryness extended back to the fall of 2010 and is summarized in water year data (Oct-Sep). From October 1, 2010 through September 30, 2011 there was only 4.49" of precipitation measured at the observing site 7 miles west-southwest of Sublette. In fact many locations had much less than 10 inches of precipitation. For Dodge City the deficit during the water year was 13.66".

Finally during late November and December a number of storms developed in the southwest U.S. and brought much needed moisture to southwest Kansas in the form of heavy rain and snow. However, the region remained in a severe drought despite the much welcome moisture. It will take some time before the precipitation deficits are erased.

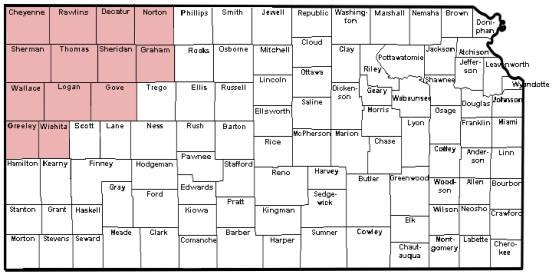


Precipitation for the water year ending September 30, 2011

2011	Oct10_Sep11	2011	Oct10_Sep11
SUBLETTE 7 WSW	4.49	RANSOM 2 NE	11.97
ELKHART	6.00	COLDWATER	12.08
MONTEZUMA	6.52	MEDICINE LODGE	12.29
KALVESTA 1 W	6.93	MEADE	12.36
ULYSSES 3 NE	7.50	TROUSDALE 1NE	12.62
GCK Airport	7.52	CEDAR BLUFF	12.63
DODGE CITY Airport	7.53	SYRACUSE	12.68
RICHFIELD 10 WSW	7.59	KINSLEY 1 SE	12.99
RICHFIELD	7.67	GREENSBURG	13.20
KALVESTA 13 NW	7.80	SCOTT CITY	13.31
CIMARRON	7.89	SUN CITY	13.72
DODGE CITY NWS	7.97	HUDSON	13.76
JOHNSON	8.21	MCCRACKEN	13.77
BIG BOW 4 WSW	8.61	OFFERLE 5 S	14.52
Dodge City - 2.5 NW	9.80	SUN CITY 6 S	14.86
LIBERAL	9.99	HEALY	15.05
GCK Exp. Station	10.11	LARNED	15.35
HUGOTON	10.55	HAYS 1 S	15.45
BELLEFONT 3 SW	10.63	UTICA	15.57
WILMORE 16 SE	10.67	KIOWA	15.78
LAKIN	10.87	PRATT	15.98
NESS CITY	11.07	ALEXANDER	16.08
BUCKLIN	11.10	WAKEENEY	16.29
BURDETT 1 NW	11.17	HAYS Water Plant	16.54
COLLYER 10 S	11.40	ELLIS	18.54
SANFORD 1 NW	11.63	BISON 3 NW	20.38
ASHLAND	11.71	LORETTA	21.64
JETMORE 8 NNW	11.86		

2011 Severe Weather Summary
Northwest Kansas
National Weather Service - Goodland, KS

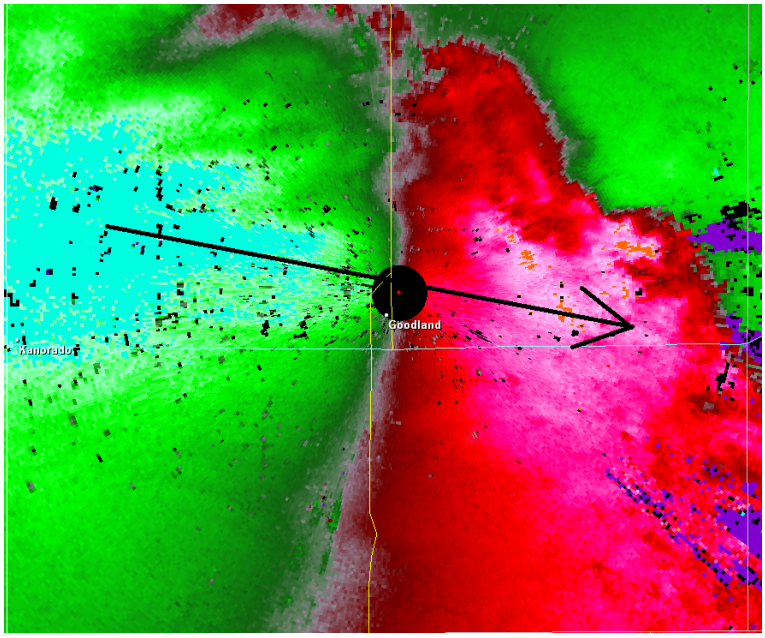
Kansas Counties Served By WFO Goodland



The first significant winter storm of 2011 occurred January 9-11. Six inches of snow fell in the Hoxie, Hill City and Norton areas, followed by a strong surge of arctic air. As the snow diminished, the combination of bitter cold temperatures and strong winds pushed wind chill readings down to -30 F. The next significant winter storm occurred about a month later. A large swath of four to eight inches of snow fell along and south of a Goodland to Oberlin line on February 8th. Highest snowfall amounts occurred near Wallace, Gove and Hoxie. Once again, arctic air was right on the heels of the snow, dropping wind chills to minus 30 F.

There were two additional winter events of note before the severe weather season got underway.
The first was an early March storm which dropped a band of four to eight inches of snow mostly along and south of Interstate 70. Numerous traffic accidents occurred, with one fatality and one injury. Finally, on April 14th, a large, slow-moving storm system brought a variety of severe weather, including the first hail reports (up to quarter size) of the season and widespread wind gusts to 65 mph. As colder air was ingested into the system, rain turned to snow. The combination of three to six inches of snow and wind gusts to 50 mph brought blizzard conditions, road closures and power outages across the western two tiers of counties.

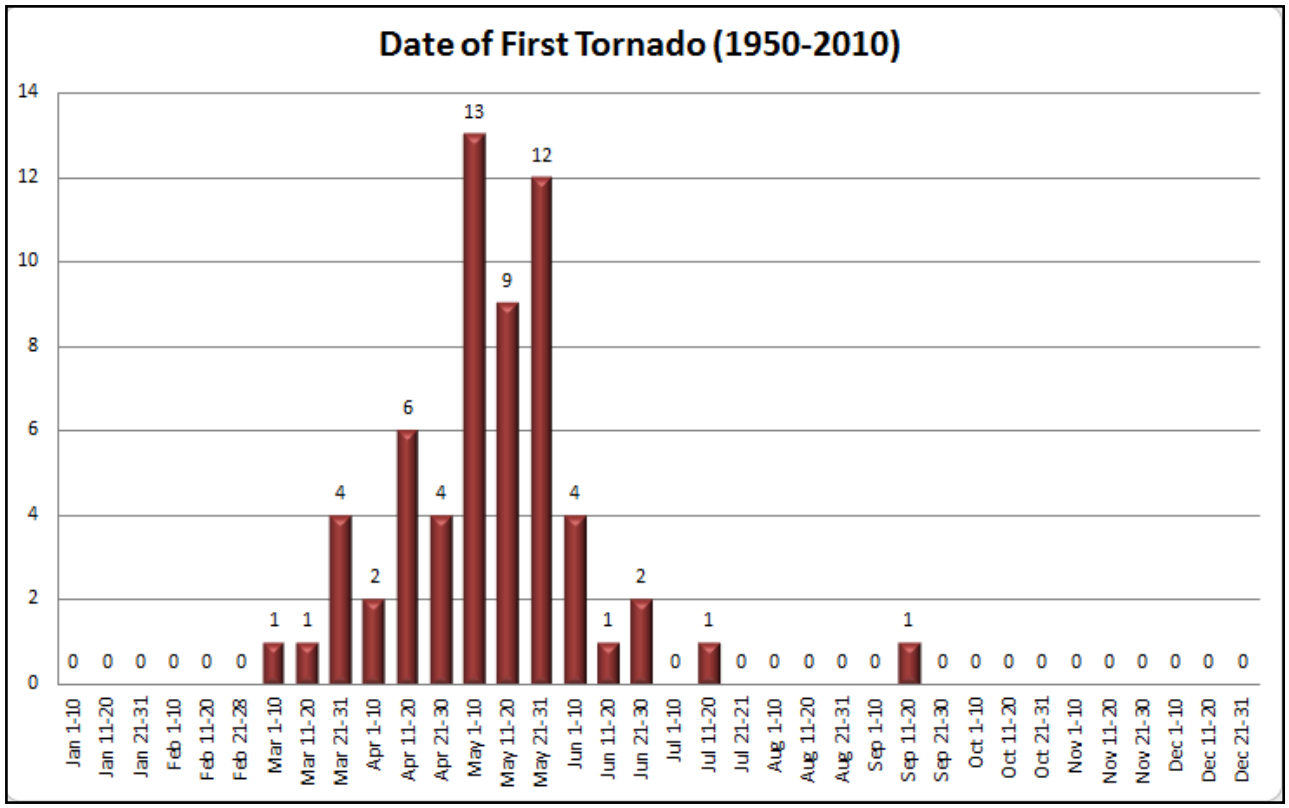
The severe convective weather season in northwest Kansas got off to a late start in 2011. Except for a few relatively minor severe events, it really wasn't until May 24th when a large, weather system moved over the region, bringing with it a round of hail and damaging wind. Gusts to 80 mph roared east across Sherman County (Goodland) as well as Logan County (Oakley) during the late afternoon, overturning pivots, downing utility poles and damaging trees and fences. A close up image of radar at the time (right image) showed strong inbound velocities (light blue shades) west of Goodland, shifting to strong outbound velocities (pink shades) east of Goodland as storm outflow moved across the county.



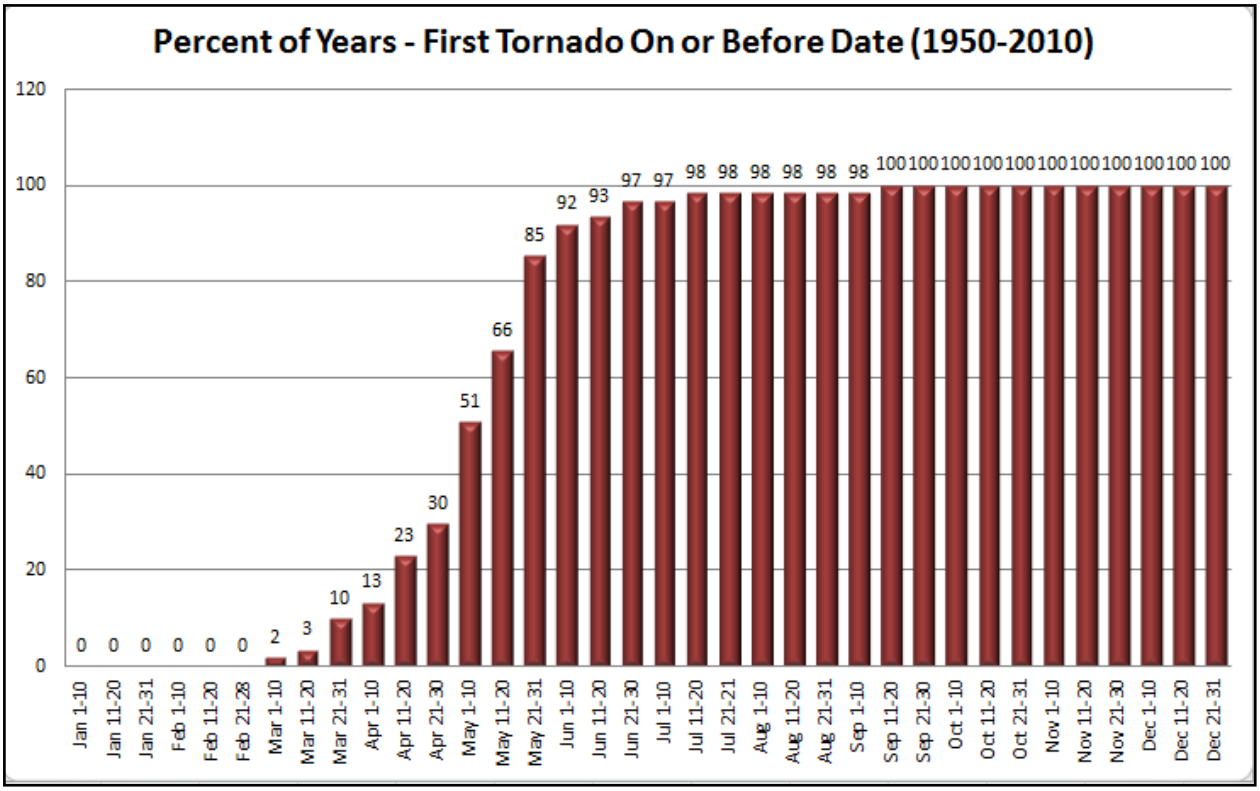
A week later, an intense low pressure system passed north of the area and generated strong southwest surface winds. Wind gusts reaching 65 mph resulted in reduced visibility in blowing dirt, several large trees uprooted and one irrigation pivot overturned. Most of the strong wind and minor damage were reported along and north of Interstate 70.

The severe weather season really took off during the month of June with severe events occurring on 12 days. On June 1st, thunderstorms continued to regenerate across Graham and Norton counties during the afternoon and evening hours, resulting in numerous reports of golf ball to hen egg hail.

The first tornadoes of the season in the Goodland County Warning Area developed on June 18th. Two weak tornadoes developed in Cheyenne County Colorado in the afternoon, and a few hours later another tornado developed in Gove County Kansas. It was a brief tornado that remained over open fields and was rated EF0. It is unusual for the first tornado of the season to occur so late in the year in NW Kansas. The chart below shows when the first tornado of the season developed for the years 1950-2010 (61 years). Each month is divided into three ten-day periods. For example, looking at April 11-20, six of the 61 years had the first tornado of the year occur within that time frame. In contrast, 13 of the 61 years had the first tornado occur in the May 1-10 time frame. Now compare 2011 when the first tornado occurred on June 18th. The chart below shows that during most years, a tornado has already occurred by that date.



Looking at this another way, consider the chart below, which gives the percent of years having the first tornado **during or before** each ten-day period. For example, looking at April 11-20 again, 23% of the years in the 61 year tornado record have had a tornado on or before this time. In contrast, 85% of the years have had a tornado by the end of May (May 21-31). Prior to 2011, 93% of the years already had their first tornado before June 20.



The Goodland 19 County Warning Area has experienced at least one tornado every year since modern records began in 1950, but one year almost broke the mold. In 1976, tornadoes occurred on only one day of the year, September 12...which happens to be the latest date for the first tornado occurrence in any year for our area.

The single most noteworthy severe weather day in 2011 was June 20th. A strong, slow-moving weather system started off the day by producing a small cluster of thunderstorms which tracked from SW of Sharon Springs to NE of Wallace. Between 5 and 6 am, baseball hail and winds to 100 mph raced across the county, overturning 25 pivots, breaking utility poles, damaging grain bins and outbuildings, overturning one semi-truck and causing broken windows.

Round two on this day began just after noon when two tornadoes developed near Quinter, Kansas (see photo right). This would be the start of a significant tornado day with 16 tornadoes developing by the end of the afternoon, tying the Goodland record set in March of 2007.

Photo near Quinter, KS on June 20. Courtesy Jim Blackwill.

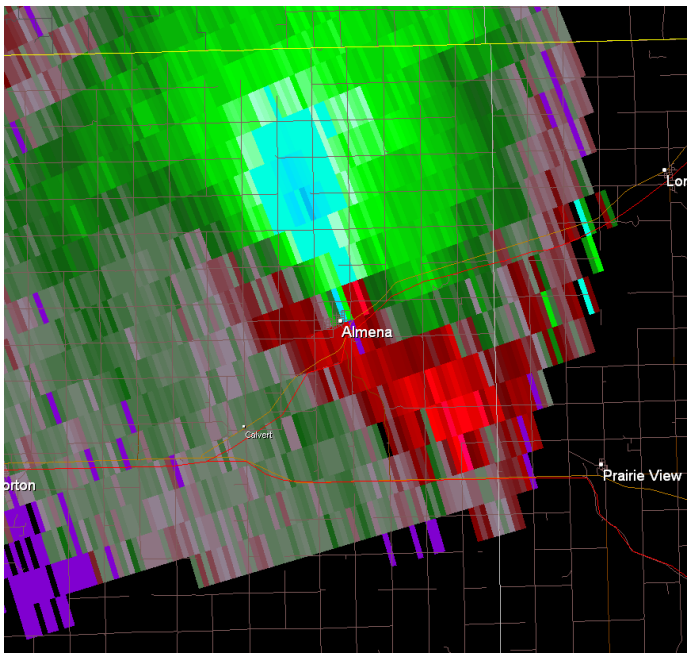
Here is a summary of the tornadoes occurring June 20th. Note that one tornado crossed from Graham into Norton counties, which is therefore counted twice in the list below.

County	Total Tornadoes	Tornado Strength
Decatur	2	2 EF0
Gove	2	2 EF0
Graham	4	1 EF0, 2 EF1, 1 EF3
Norton	8	3 EF0, 1 EF1, 2 EF2, 2 EF3
Sheridan	1	1 EF0

Three EF3 tornadoes were documented in damage surveys in Norton and Graham counties. Fortunately, except for some minor bumps and scrapes, no fatalities or serious injuries occurred. This is especially amazing looking at the photo to the left. Five people were huddled in the basement of this 100-year old farmhouse near Almena, KS when the EF3 tornado struck their home. Note the size of debris in the basement, including a propane tank, air conditioner condenser and furnace. The occupants remained safe by crawling underneath a table which partially shielded them from the falling debris. Photo taken during NWS damage survey.

The image to the right shows the strong rotational signature seen on Doppler radar at the time the Almena tornado was developing. This tornado developed just northeast of Almena in Norton County and traveled 5 miles before dissipating.

Photo near Calvert, KS on June 20. Courtesy Cindy Voss



On July 2nd, a cluster of severe storms moved east across NW Kansas, producing flash flooding, hail and **wind gusts near 90 mph**. Damage occurred to utility poles, awnings, carports and trees. Approximately 20 cemetery headstones were pushed over and power was out in some locations for a day or two. The photos at right and below show some of the damage occurring across Decatur county, photos courtesy of Decatur county emergency management.

Numerous other wind and hail events were reported during July and August before the severe season began to wind down.

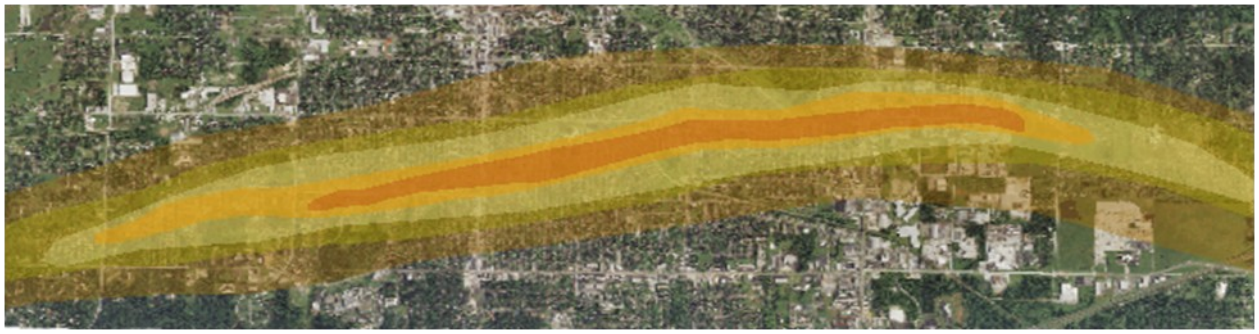
The last tornado of the year in NW Kansas occurred on October 6th when a fast moving supercell raced north across western Thomas county, producing a tornado just east of Brewster. EF1 damage occurred to a farmstead, utility poles and outbuildings in western Thomas county.

The year 2011 decided to go out with a bang. On December 31st, a strong upper level low pressure area wrapped a strong belt of winds around its southern flank as it passed over NW Kansas. These strong winds aloft were mixed down to the surface around midday, resulting in wind gusts to 77 mph at Goodland, 76 mph at Burlington, Colorado, 73 mph at a mesonet station west of Goodland, and 70 mph at Oakley. Blowing dirt locally reduced visibility to near zero. As the dirt moved across Interstate 70, a multi-vehicle accident occurred, sending a half dozen people to the hospital and causing road closures on a number of highways for about two hours until visibility improved and winds subsided. A semi-trailer was also blown over as winds hit the vehicle broadside. One home experienced roof damage in Goodland (photo right) about the time of the 77 mph wind gust. Several large trees were also blown down in town.

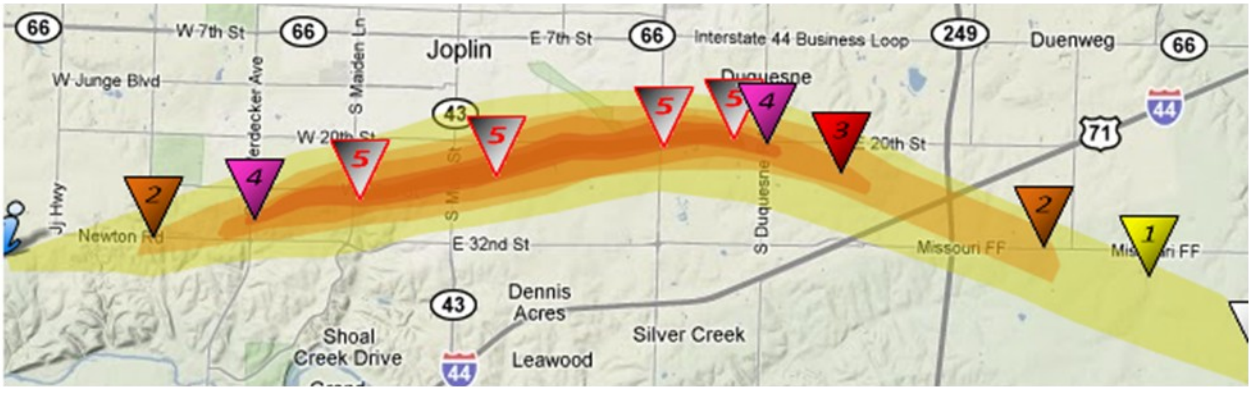
Joplin Tornado & Severe/Hydro Event
22 May 2011
By
National Weather Service Springfield, Missouri

An EF-5 tornado struck Joplin, Missouri on the afternoon of May 22nd causing incredible devastation and loss of life. This EF-5 tornado is the deadliest single tornado in the modern era with 158 fatalities and over 1100 injuries. Three additional tornadoes occurred across southwest Missouri on the evening of May 22nd, two of which were spawned by the same parent supercell that produced the deadly EF-5 tornado in Joplin. A series of severe weather and flooding events then followed this tragedy through May 25th.

Aerial Imagery of Joplin Tornado Path



Estimated EF Rating Damage Path (above), Map Depicting Track and EF-Scale Path (below)



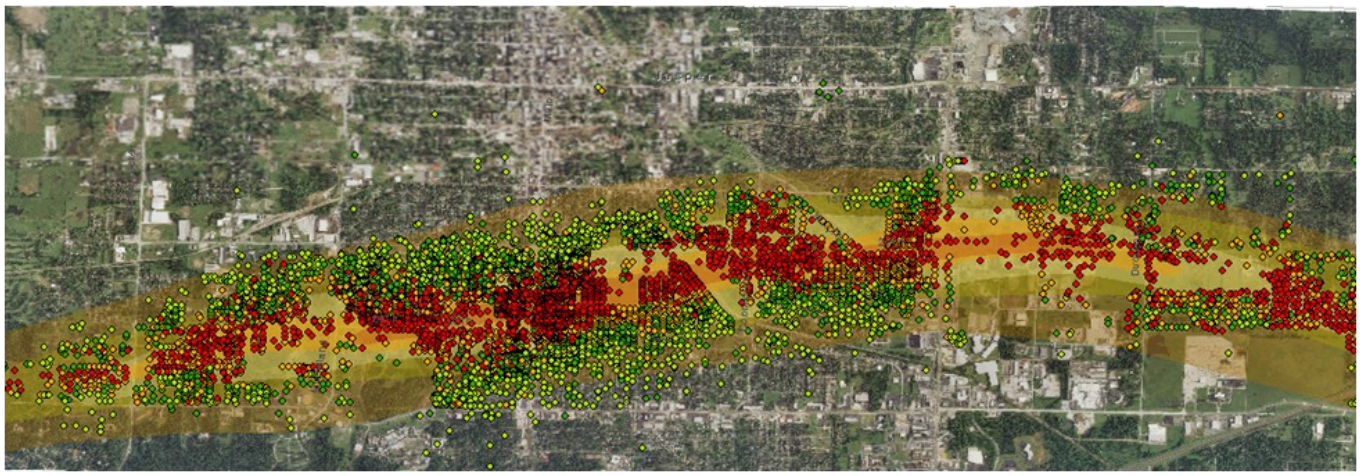
Damage Summary:
National Weather Service survey teams rated the tornado that tracked across the southwest through east central portion of Joplin, Missouri, as an EF5 tornado. Maximum winds were estimated to have exceeded 200 miles per hour. The tornado had a maximum width of one mile and an overall path length of nearly 21.6 miles, nearly nine miles of which occurred in Jasper County.
The tornado killed 158 directly, three indirectly, and injured over 1150 people. Sadly, on May 24 a police officer who was volunteering from another department, was struck by lightning while serving in the response efforts and later died. Equally, a 56 year old man who had been included as a direct fatality was later determined to have died of a heart attack. Over 10,200 people filed for disaster assistance following the tornado.

The EF-5 rating (greater than 200 mph wind speeds) was mainly arrived at by the total destruction of vehicles, including some vehicles tossed several blocks and semi trucks thrown a quarter of a mile. Parking stops weighing over 300 pounds and re-barred into asphalt were uprooted and tossed. Other factors in the rating included damage to reinforced concrete structures, and that St. John's Hospital building structure was compromised.

Seven thousand homes were severely damaged or destroyed and another 900 damaged. Other substantial buildings damaged or destroyed included the Joplin High School and Technical Center along with five other city schools. Numerous retailers including Home Depot, Sports Academy, Dillons, and Walmart were also destroyed. The most substantial building impacted was St John's hospital which will be razed due to the tornado. It was calculated that 2 million cubic yards of debris is attributable to the storm across its relatively short length on the ground.

The tornado initially touched down one half mile southwest of the intersection of JJ Highway and Newton Road in Newton County where several large trees were toppled.

The tornado rapidly intensified as it moved toward the intersection of Country Club Drive and 32nd Street where it crossed into Jasper County. Damage became more widespread as the tornado crossed Maiden Lane, breaking nearly all windows on three sides of St. Johns Hospital as well as damage to the roof and exterior walls on several floors. Two patients on oxygen were indirectly suffocated when the generator and a backup generator were damaged after power was cut off. Three additional patients may have succumbed similarly though sufficient data as to the cause of death was not available. An additional indirect fatality occurred due to psychological trauma.



Damaged Structures

The tornado further intensified as it destroyed homes and businesses to the immediate east and north of the hospital. A church school was completely destroyed with the exception of a portion of the sanctuary. Significant damage to the Greenbriar Nursing Home resulted in the death of 20 mostly elderly patients. The tornado continued to destroy hundreds of frame homes between 32nd and 20th Streets, leading to nearly a fifth of the deaths. Three story apartment complexes had the top two floors removed; other two story complexes were partially leveled. Fourteen deaths occurred in apartments along the track. Eleven additional deaths occurred in churches along this path. There were two fatalities in a mobile home (Joplin has a city ordinance prohibiting mobile home parks).

Well built structures that were heavily damaged or destroyed along this area included the Joplin High School, Franklin Technical Center and Irving Elementary, all of which were free of students due to the weekend. The tornado also damaged three additional elementary schools. A bank was totally destroyed with the exception of the vault. A large grocery store was also destroyed.

The tornado crossed Rangeline Road near 20th Street. Damage included significant to complete damage to several restaurants and large long-span retail buildings; including Home Depot, Sports Academy and Walmart in this area. Twenty deaths occurred indoors or in the parking lots of these structures. Semi trucks on the back side of Walmart were thrown more than a quarter mile.

The tornado continued to move eastward along and south of 20th Street destroying numerous warehouse style facilities, a portion of Joplin East Middle School, and residences through Duquesne Road.
The tornado continued destroying numerous homes as it began weakening. It turned southeast toward Interstate 44 where it threw several semi trucks as it crossed the interstate and moved into Newton County at 32nd Street just west of Kodiak Road.
For more information see http://www.crh.noaa.gov/sgf/?n=event_2011may22_summary

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 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.

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:

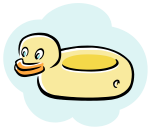
- Develop a plan of action
- Have frequent drills
- Have a NOAA Weather Radio with a warning alarm tone
- Listen to radio and television for information
- If planning a trip outdoors, listen to forecasts

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!

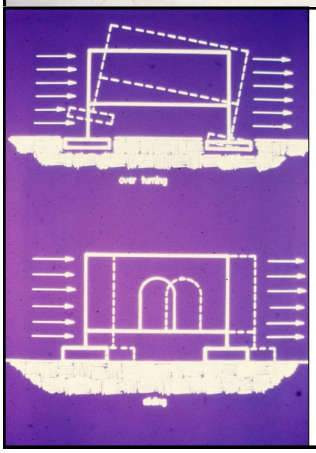
- Tune to the NOAA Weather Radio, or your favorite news source for all flood and any other weather related information.
- Leave areas subject to flooding, such as dips, low spots and underpasses.
- Do not attempt to cross flowing streams, you don't know how deep the water could be.
- Never drive through 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:

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

BE PREPARED

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

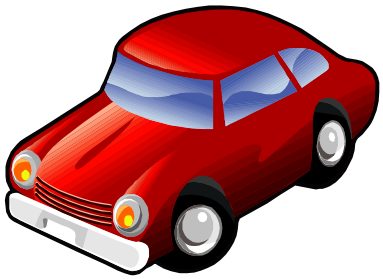
Winter Disaster Kit

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 put their lives on the line 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.

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.