2006 KANSAS
SEVERE WEATHER AWARENESS WEEK
MARCH 13 - 17

TORNADO SAFETY DRILL MARCH 14
1:30 PM

INFORMATION PACKET
National Weather Service

American Red Cross
Together, we can save a life

County Emergency Management Official/Director,

The National Weather Service, American Red Cross and the Kansas Emergency Management agency, again request your participation in "**Kansas Severe Weather Awareness Week"** activities from **March 13 - 17, 2006.**

The annual **statewide tornado drill** will take place **during the day, Tuesday**, **March 14 at 1:30 pm CST**, with a backup date of Thursday, March 16.

Enclosed is tornado and severe weather information that can be used by you and your staff for preparedness endeavors in the local jurisdiction. **Feel free to duplicate and distribute as necessary.**

2005 was another year of records. The total number of tornadoes (135) was the highest annual total in Kansas since 1950, and far exceeds the normal of 55. Another record occurred when 19 tornadoes touched down in November, the most in any November since 1950. One more interesting item is that the number of tornadoes occurring in April (37) and June (49) were the third highest totals for those months since 1950.

Other Kansas Tornado Facts: There were two days in 2005 with 20 or more tornadoes reported in a single day. June 9th recorded 25, while 20 occurred on April 10th. Since 1950, there have been only 16 days with 20 or more tornadoes reported in a single day. There were no violent tornadoes (F4, F5) in 2005. Five significant tornadoes (F2, F3) were reported, with 130 weak (F0, F1) tornadoes. The best news is that no fatalities or injuries occurred in a year when the number of tornadoes was well above average.

What will 2006 bring in the way of severe weather and tornadoes to Kansas? The answer is unknown, but we do know that we must be ready and prepared.

As always, we look forward to working with you in our annual severe weather preparedness partnership program. Please make contact if you have any questions or comments.

Cheney Lake

Near Hill City

Near Hiawatha

KANSAS SEVERE WEATHER AWARENESS WEEK
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2005 Kansas Tornado Facts

Tornadoes: **135** (80 above normal)

Deaths: **Zero** **Injuries**: **Zero**

Longest Track: **20.0 miles** (Morris, Geary Counties-Nov 27)

Strongest: **F3** (Neosho County-April 21, Trego County-June 9)

Most in a county: **16** (Trego County)

Days of occurrence: **23** **Most in one day:** **25** (June 9)

Most in one month: **50 (June)** – (3rd highest June total since 1950)

Monthly record: **19 (November)** – (Highest November total since 1950)

First tornado of the year: **March 21** (Comanche county, 1:26 pm CST)

Last touchdown of the year: **November 27** (Allen county, 4:22 pm CST)

---------- **2005 Monthly Tornado Totals** ----------

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
Total	0	0	3	37	9	50	6	6	4	2	19	0	135	100%
F5	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
F4	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
F3	0	0	0	1	0	1	0	0	0	0	0	0	2	1%
F2	0	0	0	0	1	2	0	0	0	0	0	0	3	2%
F1	0	0	0	6	0	16	1	1	0	0	3	0	27	20%
F0	0	0	3	30	8	30	5	5	4	2	16	0	103	76%

Note: Numbers in percentage column at far right may not add to 100% due to rounding.

Yearly Summary ... 2005 was another year of records. The total number of tornadoes (135) was the highest annual total in Kansas since 1950, and far exceeds the normal of 55. Another record occurred when 19 tornadoes touched down in November, the most in any November since 1950. One more interesting item is that the number of tornadoes occurring in April (37) and June (50) were the third highest totals for those months since 1950.

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KANSAS SEVERE WEATHER AWARENESS WEEK
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KANSAS TORNADO STATISTICS

by County

1950 - 2005

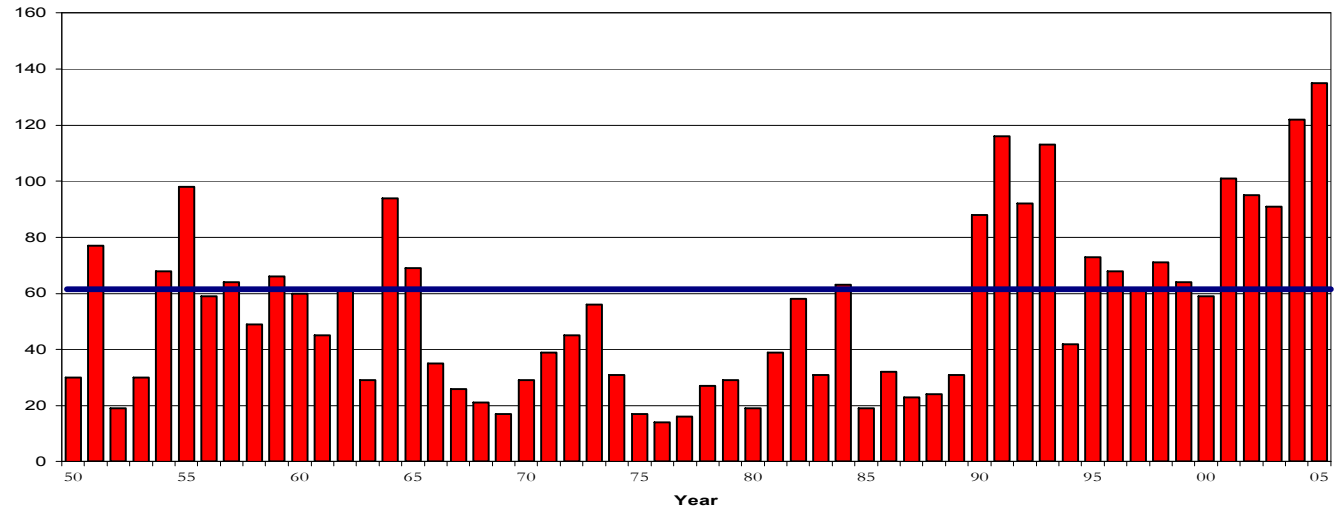
TORNADOES, FATALITIES, AND INJURIES

County	Tor	Fat	Inj
Allen	21	0	4
Anderson	11	3	12
Atchison	14	0	11
Barber	22	0	2
Barton	64	2	37
Bourbon	15	0	7
Brown	36	0	5
Butler	60	28	225
Chase	33	0	2
Chautauqua	15	0	0
Cherokee	31	4	41
Cheyenne	33	0	0
Clark	16	0	0
Clay	29	1	31
Cloud	42	1	8
Coffey	19	0	5
Comanche	22	0	2
Cowley	50	77	291
Crawford	32	4	43
Decatur	39	0	5
Dickinson	31	0	9
Doniphan	15	0	2
Douglas	33	1	48
Edwards	25	0	5
Elk	21	2	8
Ellis	43	0	5
Ellsworth	38	0	0
Finney	71	1	39
Ford	58	0	0
Franklin	25	3	34
Geary	14	0	3
Gove	23	0	1
Graham	31	0	0
Grant	16	0	9
Gray	25	0	3
Greeley	25	0	0
Greenwood	34	0	10
Hamilton	19	0	1
Harper	54	0	1

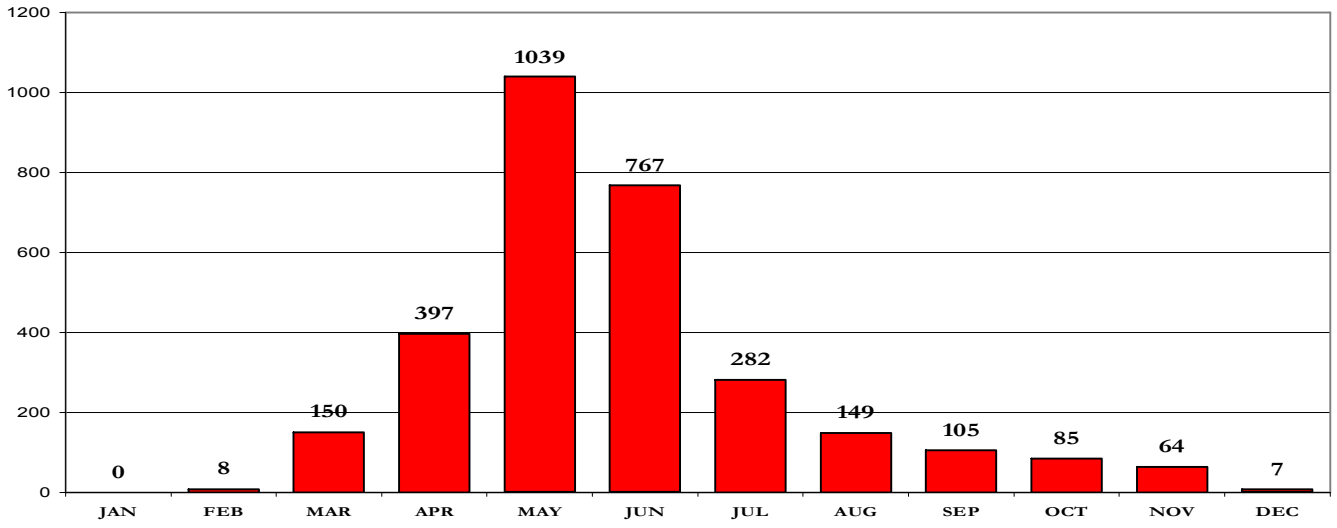
County	Tor	Fat	Inj
Harvey	45	1	63
Haskell	19	0	10
Hodgeman	39	0	4
Jackson	27	3	17
Jefferson	39	0	101
Jewell	30	0	1
Johnson	31	4	12
Kearny	30	0	0
Kingman	44	0	1
Kiowa	24	0	11
Labette	30	1	29
Lane	18	0	2
Leavenworth	25	2	30
Lincoln	24	0	2
Linn	10	0	3
Logan	17	0	0
Lyon	39	6	217
McPherson	41	1	16
Marion	42	1	2
Marshall	28	0	1
Meade	35	0	0
Miami	18	0	9
Mitchell	39	0	5
Montgomery	30	1	1
Morris	26	0	7
Morton	18	1	2
Nemaha	28	0	1
Neosho	28	0	4
Ness	31	0	4
Norton	18	0	0
Osage	36	17	6
Osborne	36	0	2
Ottawa	18	1	4
Pawnee	40	0	1
Phillips	35	0	1
Pottawatomi	28	0	5
Pratt	50	0	7
Rawlins	43	0	4
Reno	57	0	20

County	Tor	Fat	Inj
Republic	47	0	1
Rice	35	0	6
Riley	24	0	51
Rooks	40	0	6
Rush	28	0	8
Russell	60	1	7
Saline	26	0	66
Scott	35	1	1
Sedgwick	75	13	321
Seward	31	0	15
Shawnee	44	18	528
Sheridan	18	0	0
Sherman	81	0	0
Smith	38	0	1
Stafford	42	0	3
Stanton	18	0	0
Stevens	23	1	5
Sumner	70	5	14
Thomas	36	0	1
Trego	44	5	101
Wabaunsee	28	0	14
Wallace	24	0	4
Washington	28	2	12
Wichita	21	3	4
Wilson	11	0	0
Woodson	10	0	8
Wyandotte	8	2	36
Total	3370	217	2727

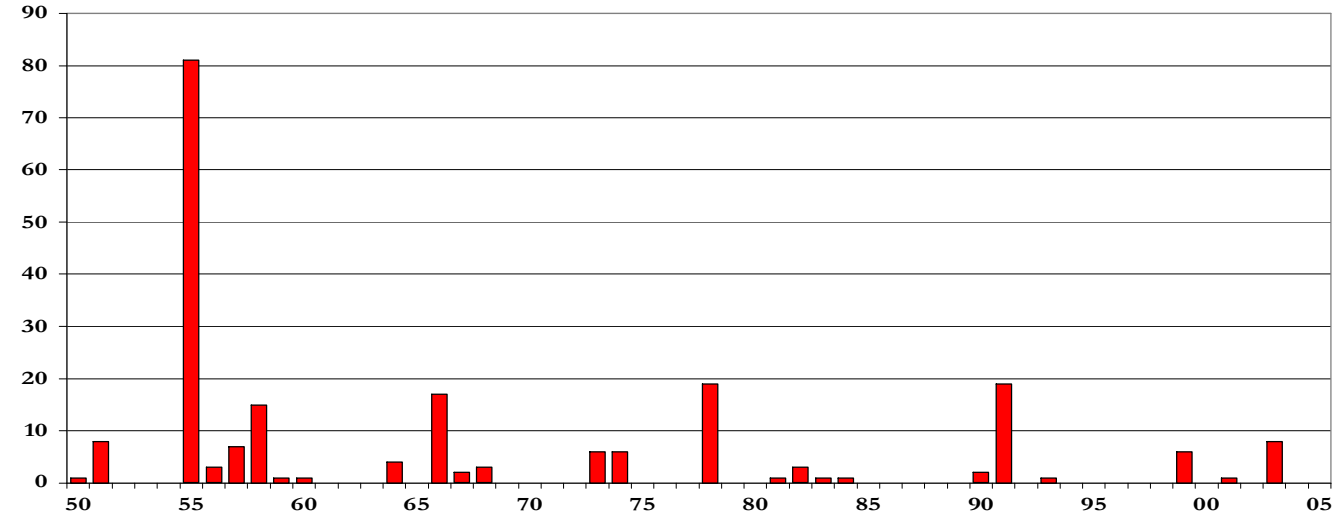
Kansas Tornadoes



Kansas Tornadoes



Kansas Tornado Deaths



The 40th Anniversary of the Topeka Tornado
June 8, 1966

Courtesy of the Topeka Capitol Journal

June 8th, 2006 will mark the 40th anniversary of the tornado that struck Topeka, Kansas. The tornado traveled a 22 mile long path through the heart of the capitol city. At times, the tornado was a half mile wide. Death, injuries, and devastation were left in the tornado's wake. Sixteen people lost their lives to this deadly tornado, over 400 people were injured, and 4500 were left homeless.

In 1966, the damage was reported at $100 million dollars. After adjusting for inflation, the current value of $494 million would rank it as the 5th costliest tornado in this country. On the campus of Washburn University, all of the major structures were damaged and several were declared a total loss. Luckily, school was not in session, otherwise the toll on human lives could have been much higher.

The tornado formed about 7 pm west of Auburn in southwest Shawnee County, it then moved through the Auburn/Dover area at 7:11 pm and moved northeast across Burnett's Mound at 7:15 pm. The tornado cut a path through the city from the 29th and Gage area, to Washburn University, to downtown Topeka at 11th and Kansas, through Oakland and finally to the Municipal (now known as Billard) Airport before dissipating.

About 800 homes were completely destroyed within an 8 block area in the heart of the city. Three thousand homes and downtown buildings were damaged and even the state capitol sustained damage from the flying debris. The intense destruction classified the tornado as an F5, the top of the Fujita intensity scale, with winds estimated at over 250 mph. Power, phone service and other utilities were down for several weeks in the affected areas.

Excellent watch, warning and storm spotter activation prior to the development of the tornado helped keep the death and injury toll relatively low considering the storm's path through a populous area. Pre-planning and training of law enforcement, spotters, city and county officials as well as local media resulted in fewer casualties and injuries.

Damaging tornadoes are a reality for Kansans. The National Weather Service continues to study severe thunderstorms and improve technology to provide better severe weather warnings and forecasts. Still, trained spotters are needed to relay real-time ground truth reports to Meteorologists. Please report tornadoes, flooding, large hail or high winds to Emergency Officials and the National Weather Service, so that timely warnings can be issued to protect others in your community.

KANSAS SEVERE WEATHER AWARENESS WEEK
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South Central and Southeast Kansas
Weather Summary – 2005
National Weather Service Wichita, KS

For the 2nd consecutive year, the atmosphere put on a 4th of July weekend fireworks display that overshadowed any of the man-made variant. During the afternoon and evening of the July 3rd, severe thunderstorms broke out across Central and South-Central Kansas, unleashing 75-100 mph winds and hail as large as softballs.

The convective barrage started when a severe thunderstorm dropped nickel-sized hail on south Hutchinson at 2:10 pm. The event quickly escalated when super-cellular severe thunderstorms erupted over Barton, Rice, Reno, and McPherson counties between 3:30 and 5:30 pm. During this time, 2-4 inch diameter hail bombed parts of southwest McPherson County at 4:00 pm. Most of this hail, pummeled rural areas 4 miles northwest of Inman, and 6 miles south-southwest of McPherson. No damage was ever reported.

Between 6:00 and 7:00 pm, one of the super-cellular severe storms in Reno County unleashed its power and caused disastrous and tragic results. The storm produced 80-100 mph winds on its southern end which raked south and southeast Reno County. This storm then took aim at Cheney Lake and State Park. The damage at the state park was *major*, and included the marina, around 125 boats, 35 campers, and an unspecified number of mobile homes. One mobile home was leveled. Total damage estimated around 12.5 million dollars. Six people were injured, all of whom required transport to Wichita hospitals. One man was killed when his fishing boat was overturned.

On June 30th, severe thunderstorms also proved how deserving they are of one's respect, when Southeast Kansas was hit by incredibly destructive winds and hail that reached the size of baseballs. The baseball-sized hail hit parts of Woodson County around 7:35 pm, causing an estimated $415,000 damage to crops. As the evening progressed, the severe thunderstorms, evolved into squall lines that unleashed 80-100 mph winds. Hardest hit was Neosho County. In Chanute, large trees were uprooted with many falling onto homes and businesses. Other homes and businesses were completely unroofed. Numerous barns and sheds were destroyed. The towns of Erie and St. Paul experienced nearly identical fates. In Erie, one home was destroyed. In St. Paul, a church steeple was completely removed. Obviously, many power lines and power poles were blown down, severing power to all three towns. This round of atmospheric mayhem was responsible for $2.873 million damage to crops and property.

Severe thunderstorms are not to be taken likely. As has been stated many times at severe storm spotter talks, severe thunderstorm winds can cause considerably greater damage than many tornadoes. The events of June 30th and July 3rd proved this point in dramatic fashion.

Another product of severe convection that drew considerable attention in 2005 was the flash flood. The first major event occurred June 8th and 9th., from around 8:00 pm the evening of the 8th thru the early afternoon of the 9th. Hardest hit were Butler, Harvey and Sedgwick counties.

In Butler County, two families required rescues from their homes 4 miles north of Whitewater. Numerous streets were barricaded in and around El Dorado, and creeks overflowed. The most notable occurred 2 miles northeast of Elbing, where Henry Creek overflowed, closing 150th Street as well as the 150th Street Bridge. In Harvey County, widespread 12-15 inch rainfalls in approximately 10 hours resulted in evacuations in Newton, where most streets were barricaded. Perhaps the worst flooding in this event occurred in Sedgwick, where an estimated 147,515 acres of farmland were inundated totaling an estimated $1.5 million damage.

In Sedgwick County, 19 homes were flooded, of which 12 were mobile. These homes were completely surrounded by flooding; which isolated their occupants from the outside world. In Mt. Hope, people required rescue from their homes. Many streets and highways were barricaded, especially across Northern Sedgwick County, where flash floods reached 6 foot depths. The flooding inundated around 75,000 acres of farmland. Total property damage was estimated at $150,000.

Nearly rivaling the June 8th-9th flash flood event was one that occurred on August 25th, when slow-moving thunderstorms drenched much of South-Central and Southeast Kansas with 6-10 inch rains in a 12-hour period. The higher amounts occurred in Butler, Wilson, and Woodson counties.

In Butler County, the most serious flash flooding occurred in El Dorado, where much of the town required evacuation with many others requiring rescues from stranded vehicles. In Wilson County, all roads and highways leading into Coyville (located in Northwest Wilson County) were flooded, preventing all access into or out of town. In Woodson County, 10 miles south of Yates Center, the flash flooding caused 9 horses to disappear. Two families required rescues from nearby homes.

Relatively speaking, it was a quiet year from a tornado standpoint. As of December 12th, 40 tornadoes occurred in the Wichita County Warning Area. Of this total, the strongest was an F3 which occurred on April 21st. This tornado possessed a lifespan of 11 minutes from 5:54-6:05 pm, rotational velocities of 160-220 mph, a path 5 miles long and around 200 yards wide. The tornado touched down in Neosho County, 3 miles south of Galesburg. The tornado destroyed two mobile homes, two barns, two out-buildings, one garage, one shed, unroofed one home (collapsing two walls in the process), and dislodged one home from it's foundation. The tornado caused an estimated $200,000 damage.

North Central, Northeast and East Central Kansas
Weather Summary – 2005
National Weather Service – Topeka, KS

A total of 16 tornadoes occurred in Topeka's County Warning Area this year. Of those, only 4 occurred during the typical convective season. The remaining 12 developed with a potent storm system that moved across Kansas on November 27th. There were many other severe weather events throughout the year that produced large hail, damaging wind, and flooding.

The first tornado of the season was a brief, weak tornado that touched down in Nemaha County on April 21 as a large supercell moved eastward across southeast Nemaha and northern Jackson counties. The remaining 3 tornadoes occurred in June. On the afternoon of the 4th, a large, picturesque F2 tornado struck Brown County south of Hiawatha. Considerable property damage occurred to three farmsteads. A hubcap from a salvage yard became airborne and was embedded in the living room wall of a nearby home. An F1 tornado occurred on June 4 in Pottawatomie County. There were many reports of property damage in the small community of Lake Elbo, east of Manhattan. The fourth tornado (F0) of the season occurred late in the afternoon of the 8th in Jefferson County. It passed over open country producing only minor property damage. This tornado was broadcast live as a helicopter from a Kansas City television station flew around Jefferson County.

Strong straight line winds of at least 75 mph, derailed 24 empty train boxcars and blew a semi-truck off Interstate 35 in Osage County on May 18. Extensive damage occurred at a farmstead near the railroad tracks. Hail the size of baseballs was reported in Marshall County on the evening of June 4. Severe thunderstorms on July 3 caused widespread wind and hail damage along and south of Interstate 70. Winds gusted up to 75 mph with some of the storms. The governor declared a state disaster due to the storm damage in Douglas, Osage and Shawnee Counties.

Heavy rain kept Meteorologists busy this year beginning in mid May with flooding in rural areas of Shawnee County and the Neosho River basin in Lyon County. On June 3, a man in Dickinson County was killed when he exited his stranded truck and was swept away by fast moving water. Heavy rains in May and June brought the Herrington Reservoir to all time high levels. June 30th was one of the busiest severe weather days of the year, as areas along and south of Interstate 70 saw several rounds of hail and strong winds, along with flash flooding. On September 23, flooding occurred over parts of Shawnee, Jefferson and Wabaunsee counties. Water up to six feet deep northwest of Topeka floated cars and many occupants had to be rescued by emergency personnel. The 5.61 inches of rain recorded on the 23rd at the NWS office in Topeka set an all time one day record for rainfall. Thunderstorms produced up to a foot of rainfall over portions of Jackson, Jefferson, Shawnee and Douglas counties during the late evening of October 1st. There was significant flooding along Cross Creek and Soldier Creek as a result of the heavy rain. The city of Rossville was one of the hardest hit locations. Soldier Creek in Topeka reported a record high crest of 34.67 feet on October 2.

A strong low pressure system moved across Kansas on November 27th and produced 12 tornadoes that afternoon. One F0 tornado touched down in Dickinson County, three F0 tornadoes in Morris County and one F1 tornado that tracked into southwest Geary County, damaging and destroying several barns and outbuildings along its 20 mile long track. One F0 tornado in southeast Lyon County, two F0 tornadoes in Geary County and one F1 tornado that hit the cemetery at Fort Riley and moved across the Riley County line and damaged military base housing, and 3 additional F0 tornadoes in Riley County. Despite the unusual time of year, no injuries were reported.

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North-Central Kansas

Weather Summary – 2005

National Weather Service Hastings, NE

The severe weather season started during the afternoon of April 5th. A thunderstorm near Alton produced a brief tornado west of town. This storm moved to the northwest and produced another twister just northeast of Stockton. No damage was reported from these tornadoes. The storm moved on into Phillips county where it dumped 2 to 4 inches of rain, which flooded many of the roads throughout the county. A couple of hail storms in the month of April produced hail to the size of golf balls. On the 11th, large hail fell in Jewell county near Mankato. On the 20th, large hail was reported near Asherville in Mitchell county.

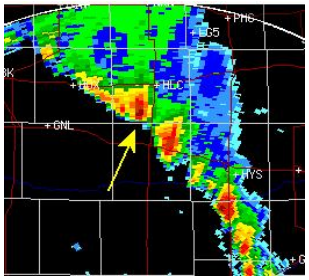
May introduced quiet weather across North-Central Kansas, but that changed on June 9th. A large supercell thunderstorm developed near Hill City and moved east into Rooks county where it produced 4 tornadoes. The first tornado touched down north of Palco and remained in open country. The second and third twisters were actually on the ground at the same time for awhile. The twisters hit two farmsteads, destroyed a barn and other outbuildings. An electrical substation was destroyed southwest of Stockton. The last tornado began west of Stockton and skipped across the northern portion of the town. Most damage was to trees. Large hail returned to Rooks county on the 15th of June when a storm produced golf ball sized hail near Palco. On the next night, hail the size of baseballs fell just north of Beloit. On the 27th, severe thunderstorms rumbled across the region and produced hail up to 2 inches in diameter. The largest hail occurred in Phillipsburg where stones from 1 ½ to 2 inches were reported.

The last tornado event occurred on June 29th, when a tornado briefly touched down south of Beloit in rural Mitchell county. The twister damaged trees, a wind mill and a few metal sheds. On this night, the town of Simpson was hit with 80 mph winds that toppled trees, damaged outbuildings, and snapped power poles. Hail to the size of golf balls was reported in various locations in Mitchell county.

Severe thunderstorms rolled across the region the evening of July 27th. These storms produced winds of 60 to 75 mph. The strongest winds were north of Osborne where gusts of nearly 90 mph were recorded.

Northwest Kansas
Weather Summary – 2005
National Weather Service Goodland, KS

The 2005 severe weather season began in earnest during the month of April. On the 5th, heavy rainfall from thunderstorms produced in flash floods across Wichita, Sheridan and Norton counties in northwest Kansas. Fortunately no damage or injuries occurred. On the heels of this event, a strong low pressure system intensified on April 10th. The result was blizzard conditions just west of the Kansas-Colorado border, and two tornadoes in Graham County, KS (south of Hill City). The F0 and F1 tornadoes touched down around 5 pm CDT. A calving shed was damaged and 1500# hay bales were dislodged. Doppler radar displayed a NW-SE line of severe storms (yellow arrow denotes one of the tornadic storms).



May brought very active weather in NW Kansas, which is fairly typical when looking at the record books. There were 7 severe weather days, producing 67 severe events, including one weak tornado near McDonald in Rawlins County on the 28th. Winds were estimated at 90 mph in Cheyenne and Rawlins counties on the 24th, along with hail the size of golf balls.

June outpaced May in terms of severe reports. There were 12 severe weather days during the month, including baseball hail in Rawlins County (Atwood) on the 6th, and 75 mph winds in Wallace County (Sharon Springs) on the 15th. The most significant weather day of June, and indeed the entire year, occurred on June 9th when seven tornadoes touched down, including an F2 tornado just south of Hill City. This tornado damaged two homesteads, numerous outbuildings, dozens of power poles and resulted in widespread tree and vegetation damage. The photo (above-right) shows the large wall cloud and tornado south of Hill City, and is courtesy of Scott Blair, now employed at the Goodland National Weather Service office.

The months of July and August continued active in terms of the numbers of reports received from spotters and law enforcement, including an intense microburst which destroyed this large barn in Decatur County (photo at left).

The last tornado of the year in NW Kansas, an F0, occurred on September 5th south of Sharon Springs over open fields. The last severe weather report of the season occurred on October 29th, as marginally severe hail fell in Gove county.

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Extreme Southeast Kansas

Weather Summary – 2005

National Weather Service Springfield, MO

Weather across extreme southeast Kansas became active early in 2005. Saturated and frozen soils along with little vegetation common for the winter season contributed to widespread flooding as several periods of heavy rain impacted the region. Numerous roads and low lying areas were inundated and impassable by motorists. The flooding began on the afternoon of January 5th and continued into the afternoon of the 6th. No injuries or deaths occurred with the flooding.

As usual for the time of year, little to no severe and unusual weather occurred from mid January through March. A couple of severe weather episodes occurred in April as large hail impacted Cherokee, Crawford, and Bourbon counties, while two F-0 tornadoes briefly touched down in rural sections of western Crawford and southwest Cherokee counties.

The month of May was unusually quiet with only a couple of severe weather events occurring in the area. On the night of June 30th, a derecho proceeded by an initial squall line impacted the region bringing a swath of 80 mph winds across Crawford and Cherokee counties. Two weak tornadoes briefly touched down in rural areas of Cherokee County. Two injuries occurred from this derecho as a mobile home in southern Crawford County was destroyed. One woman was critically injured when she was scalped by flying debris while she was seeking shelter in the mobile home. Overall storm damage added up to $1,360,000 from this one episode. Most of this damage was to agriculture assets in Crawford County.

A few summertime pulse thunderstorms caused downburst winds in July and August. Most of the damage was to trees, while a couple of mobile home roofs in Cherokee County experienced minor damage from this activity.

On September 13th, a supercell thunderstorm produced intermittent brief tornado touchdowns across northwest and central Crawford County. Most of the tornado touch downs were in open fields, with only minor tree damage observed. One barn sustained major damage in Cherokee County on the same day that was associated with a different storm.

Overall there were five tornadoes that occurred across Crawford, and Cherokee counties in the year 2005, all of which were documented as F-0 tornadoes. No tornadoes occurred in Bourbon County. Monetary losses from severe weather in 2005 added up to be $1,389,000.

One interesting fact about the year 2005, no winter storms impacted extreme southeast Kansas.

Extreme East Central and Northeast Kansas

Weather Summary – 2005

National Weather Service Pleasant Hill, MO

The 2005 hazardous weather season in extreme east central and northeast Kansas can generally be characterized for being unusually quiet overall. Little in the way of significant winter weather was noted early in the year, and there were just a handful of days that featured significant severe convective storms.

A winter storm struck portions of the region early in January. Atchison and Doniphan Counties reported winter storm conditions, with ¼" to ¾" of ice followed by 2 to 5 inches of snow from the 3rd to the 5th. Anywhere from ¼" to 1" of ice was noted further south across the remainder of eastern Kansas. Quickly on the heels of this burst of winter weather, snow melt and locally excessive rainfall produced river flooding along the Marais Des Cygne River in Linn and Miami Counties. On January 31st, a very localized band of heavy snow occurred across Miami County, with six inches of snow reported in Louisburg.

February was a fairly quiet month. An additional burst of 3 to 4 inches of snow fell on February 8th across eastern Kansas. While the snowfall was not that particularly heavy, the snow fell in a two-hour time frame, right before the evening rush hour, across Leavenworth, Wyandotte and Johnson Counties. This led to numerous accidents and delays of nearly four hours during the evening commute!

Very little significant weather was noted in March, with a penny size hail report near Paola the only report of significance. Things quickly changed though by April. Active severe weather was noted on April 11th, with numerous reports of penny to quarter size hail. April 21st was the most active day of the month. Two inch diameter hail was observed in Effingham, and brief tornado touchdowns were also noted by storm spotters or chasers west of Atchison and also along the Atchison/Leavenworth County line. No damage was noted from these two F0 twisters, but extensive property damage was common in western Atchison County and northwest Leavenworth County from the hail.

May also remained relatively quiet by Kansas standards. A period of severe weather was observed from the 11th to the 13th. Hail up to golf ball size fell on the 11th in Leavenworth, just west of Easton and in Lansing. These storms also produced flash flooding in Leavenworth, Atchison, Doniphan and Wyandotte Counties. Stranger Creek near Easton also flooded on the 13th.

June was the most active month for severe weather and flooding across extreme east central and northeast Kansas. Significant severe storms developed on the 4th, but their impact just grazed Kansas as they focused their wrath further east into Missouri. Flash flooding was noted across portions of Johnson, Leavenworth, Atchison and Miami Counties, while hail to golf ball size and damaging thunderstorm winds occurred with a developing supercell across Doniphan and northern Atchison Counties. This supercell did produce a brief tornado touchdown just west of the Missouri River in extreme eastern Doniphan County. This was the last of the three tornadoes to strike extreme eastern and northeast Kansas for the 2005 storm season. Flooding and flash flooding were quite common from the 4th to the 9th , especially along Stranger Creek and the Marais Des Cygne River. Other rounds of severe storms brought rain as large as golf ball size on the 7th and 8th. More river flooding was noted from the 12th to the 19th, with a final round of marginal severe weather noted across Miami and Linn Counties on the 30th.

July shaped up as a hot and relatively dry month. A few thunderstorms late on the evening of July 3rd brought damaging winds to portions of Johnson and Miami Counties. Excessive heat built in by the latter half of the month though, and the first heat related fatality in many years was noted in Bonner Springs on July 23rd.

Our weather pattern turned wetter as we headed into August. Thunderstorms brought damaging winds and flash flooding to the entire area on the 18th and 19th. Lightning struck a residence at Fort Leavenworth on the 20th, causing around $30,000 in damage. In September, damaging thunderstorm winds were noted during the late afternoon hours of the 13th in Linn and Miami Counties.

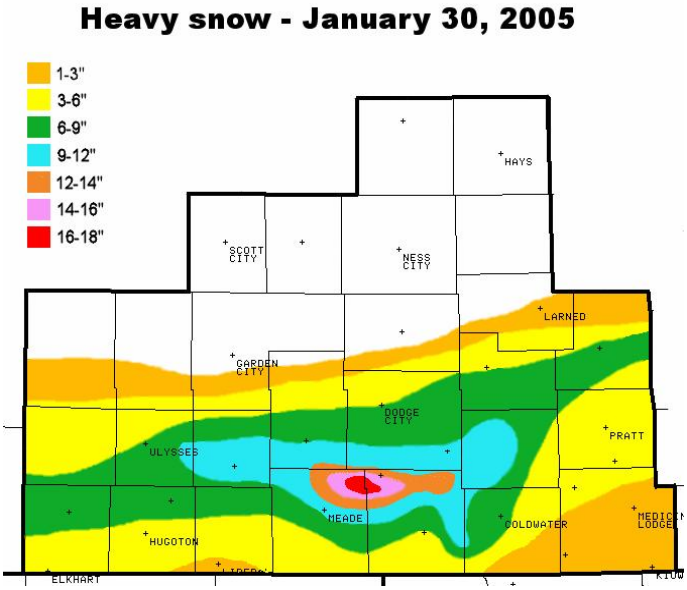
October certainly gave a dramatic ending to the 2005 severe weather season. Catastrophic flash flooding occurred on the 2nd in the Stranger Creek basin covering western Atchison and Leavenworth Counties. The Stranger Creek near Easton set a new record crest of 26 feet the afternoon of October 2nd. Damage estimates of public and private properties were near $5 million, and evacuations were needed in Easton during the day on October 2nd. This flooding was caused by anywhere from 6 inches to 12 inches of rain that fell during the early morning hours of October 2nd.

Southwest Kansas

Weather Summary – 2005

National Weather Service Dodge City, KS

A major ice storm swept across most of southwest Kansas during the first week in January on the 4th and 5th. This storm left a thick layer of ice over most of the area followed by periods of sleet, and then a blanket of snow. Over 3/4ths of an inch of ice accumulated in the Medicine Lodge and Sublette areas while up to two inches of sleet accumulated in the LaCrosse area. Widespread tree limb damage, extended power outages, and numerous school closings were reported, as well as numerous accidents. The power outages were so widespread, mainly from fallen limbs and downed power lines, that Aquilla Power Company set up an 800 number to report outages. Nearly all of the area received an inch or two of snow, with the highest amount of 4 inches reported near Schoenchen in Ellis County. Another strong winter storm moved through the area on the 27th and 28th. A 20 mile wide band of at least 6 inches of snow had fallen from central Comanche county to southwestern Clark County to southeastern Meade County. Very heavy snow fell in the southern part of the area on the 30th and 31st. At least 6 inches of snow had fallen in this area. The highest amounts were from 12 to 16 inches in a 30 mile wide band from northwestern Meade county to northeastern Clark county. Seventeen inches of snow was reported near Minneola in Clark County. One aspect that was unusual with this storm is that there was very little wind. There were reports of six inches of snow piled on top of barb wire fences! For the month of January, Dodge City ended up with 10.7 inches of snow which was the 7th highest January on record for snowfall. Dodge City also had the 5th wettest January on record with 1.70 inches of precipitation.



Some snow, freezing drizzle and sleet fell during the early part of February in parts of Southwest Kansas, but snowfall amounts were less than 5 inches. Dodge City only received a tenth of an inch of snow for the entire month. Temperatures during the month were relatively mild as Dodge City was 3.9 degrees above normal. Just about all of the precipitation (0.89 inches) for February was in the form of rain.

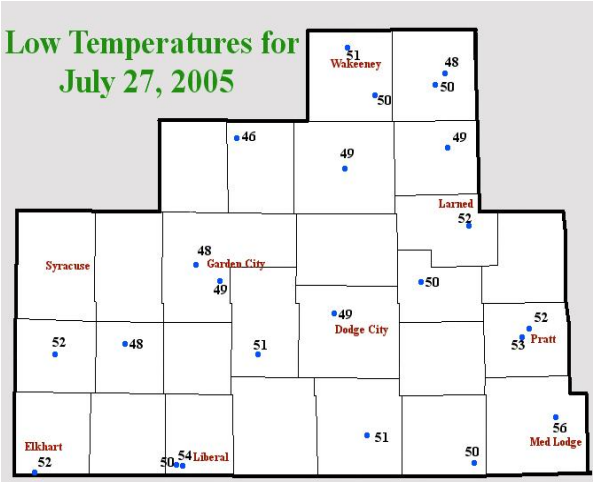
March was a pretty quiet month for weather. Thunderstorms produced hail on the 20th from Ness and Rush counties southward to Comanche county. The first tornadoes of the year developed in Comanche county on the 21st, but they did not do any damage. There was some snow on the 26th in the southwest corner with one to four inches reported. Dodge City only reported a trace of snow for the month.

The month of April saw three very active days of severe weather and they were on the 5th, 10th and 20th. On the 5th there were several reports of tornadoes from Seward County to Haskell and Gray Counties. Only one tornado did any damage and that was in Seward County west-northwest of Kismet. A roof was blown off a barn, windows were blown out of a vehicle and power lines were taken down. Tornadoes were also reported on the 10th in Scott, Trego, Ellis and Rush counties.

Damage was reported in Trego and Ellis counties. Severe thunderstorms developed on the 20th from near Ashland over into the Kinsley and Pratt areas. There were numerous reports of large hail that day. Hail that was just over 4 inches in diameter was reported 6 miles north of Englewood.

During the month of May there was an outbreak of severe weather on the 11th, 12th and 23rd. There was an F2 tornado that developed on the 11th just northeast of Ulysses. Part of a barn was blown off and a large tree was uprooted two miles northeast of Ulysses. Several horses were slightly injured. As the tornado moved northeast, an abandoned mobile home was destroyed along with several grain bins, pivot sprinklers, power poles and large trees. This tornado moved into southern Kearny County before roping out. Estimated damage was 350,000 dollars. The storms on the 12th were mainly hail producers, and the storms on the 23rd were wind producers and lasted into the early morning hours of the 24th. Winds gusts were estimated as high as 60 to 70 mph with the strongest storms.

June saw even more severe weather. There were 14 days of at least one severe report. The most active day was on the 16th when there were 70 reports. On the 9th, an F3 tornado did significant damage near Trego Center. Several farms, outbuildings and trees were damaged. One 1500 pound heifer was thrown one quarter of a mile. The tornado actually made a loop traveling back west, south then back to the north and dissipated rapidly. Some of the structures were protected in a ravine but still sustained major damage. Several cottonwood trees with six foot diameter trunks were pulled out of the ground. There were a few other tornadoes that also developed that day. Hail did lots of crop damage on the 12th in Ford, Grant, Haskell and Stanton counties. A tornado touched down in Haskell County and moved into Seward County on the 16th and did damage to mainly sprinkler systems.



Most of the severe weather for the month of July was during the first five days of the month. Severe thunderstorms also developed on the 25th with several reports of wind gusts in excess of 60 mph in Ellis, Finney and Gray Counties. Dodge City reported its first 100 degree day of the summer on the 20th with a reading of 103 degrees. There were five more straight days of 100 degree temperatures before it cooled off. Record low temperatures were set at Dodge City on the 27th, 28th and 29th as readings fell into the upper 40s to mid 50s. Rainfall at Dodge City was also nearly two (1.88) inches below normal for the month.

Triple digit temperatures returned to Dodge City on the last day of July and continued until the 3rd of August. A temperature of 100 degrees was also reached on August 19th and September 21st bringing the total to 12. Most of the severe weather for August occurred during the second half of the month with the typical large hail and high winds. There was very little damage reported.

The weather in September was relatively quiet. Thunderstorms produced very heavy rain in southwestern Grant County on the evening of the 6th and the early morning hours of the 7th. As much as 7.5 inches of rain was reported 11 miles southwest of Ulysses. There were several reports of large hail in southwest Kansas from the 11th to the14th. No severe weather developed the rest of the month. The average September temperature for Dodge City was well above normal at 74.1 degrees, which was 4.8 degrees above normal. This was the 7th warmest September on record.

October saw a few days of severe weather mainly during the second half of the month. The most active day was on the 19th when there were 35 reports of mostly large hail. There were 2 tornadoes reported that day, one in Meade County and the other in Gray County. Neither did any damage. The first freeze at Dodge City occurred on the 23rd as the temperature got down to 30 degrees.

Hardly any snow fell in November until the 27th when a cold front blasted southward across the area. This system brought very strong north winds that were sustained in the 40 to 50 mph range for almost a 24 hour period. The wind combined with the blowing snow reduced visibility to less than one mile at times. The highest snowfall amount was just over 4 inches south of Offerle in Ford County. Earlier in the month, another strong cold front brought strong north winds in the 30 to 40 mph range to the area on the 15th. There were a few gusts to 60 mph. Temperatures for November were very mild for this time of year before cold air settled into southwest Kansas the last three days of the month.

An unbelievable number of tornadoes occurred in the 27 county area during 2005. Fifty-two were reported, which is likely a record for any year. However, there were **no injuries or fatalities**!!

Turn Around, Don't Drown:
Flash Flooding and Flood Safety

While we work and prepare most for tornadoes, the combination of flash floods and river floods have accounted for 14 deaths and over $115 million in damage over the past decade! These numbers compare very close to the number of tornadoes deaths (15) and tornado damage ($208 million) across Kansas during the same time period. During that time, your National Weather Service issued well over 1,500 warnings for flash flooding alone, alerting the public of the flood threat to life and property. When these warnings are issued for your area, or the moment you realize that a flash flood is imminent, act quickly to save yourself. **YOU MAY ONLY HAVE SECONDS!**

How do flash floods occur?
Several factors contribute to flash flooding. The two key elements are rainfall intensity and duration. Intensity is the rate of rainfall, and duration is how long the rain lasts. Topography, soil conditions, and ground cover, also play an important role.

Most flash floods are caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area.

When a Flood or Flash Flood **WATCH** is issued, be alert to signs of flash flooding and be ready to evacuate on a moment's notice. When a Flash Flood **WARNING** is issued for your area, or the moment you realize that a flash flood is imminent, act quickly to save yourself.

How can a foot or two of water cost you your life?
Water weighs 62.4 lbs. per cubic foot and typically flows downstream at 6 to 12 miles an hour. When a vehicle stalls in the water, the water's momentum is transferred to the car. For each foot the water rises, 500 lbs. of lateral force are applied to the car.

However, the biggest factor is buoyancy. For each foot the water rises up the side of the car, the car displaces 1,500 lbs. of water. In effect, the car weighs 1,500 lbs. less for each foot the water rises. Thus, two feet of water will carry away most automobiles.

Immediately:

- Get out of areas subject to flooding. This includes dips, low spots, low water crossings, etc.
- Do not attempt to walk across flowing streams. Water moving swiftly, even water 6 inches deep, can sweep you off your feet.
- If driving, be aware that the road bed may not be intact underestimate flood waters. Remember: **Turn Around, Don't Drown!** Go another way. NEVER drive through flooded roads or low water crossings! If your vehicle stalls, leave it immediately and seek higher ground.
- Be cautious at night when flooding is hard to recognize.
- Choose camp sites along waterways with care. Remember that storms that are miles away may bring raging water your way.

Critical NWS Flood Products

During periods of torrential rainfall, listen to NOAA Weather Radio, local media, or cable media such as the Weather Channel for the latest information from the National Weather Service and local emergency officials. Critical flood products include:

- Hydrologic Outlook: This product alerts the public when flood producing rainfall is expected in 36 to 72 hours. During the months of February and March, this product also contains information on the potential for flooding from the spring snow melt.

- Flood Watch: A flood or flash flood watch is issued when conditions are favorable for flooding or flash flooding to develop.

- Flash Flood Warning: A warning is issued when flooding is imminent. Flash floods usually develop within six hours of a heavy rainfall event.

- Urban/Small Stream Flood Advisory (**issued as a Flood Statement)**: These statements are issued when minor flooding problems are expected, namely in flood prone urban areas or near small streams that may rise quickly out of their banks. Even minor flooding can cause huge problems though, if proper precautions are not taken.

- Flood Warning: These warnings are issued for river floods and in the case of longer periods of rain which result in slower rises in flood waters, or for a prolonged flood event.

Know your area's flood risk. For information, call your local National Weather Service office, Red Cross chapter, or local emergency management agency. Also, check your homeowner or renter's insurance as these policies normally do not cover flooding. Contact your insurance agent to find out more about the inexpensive opportunities provided by the National Flood Insurance Program.

For more information on flooding check out:

Turn Around, Don't Drown toolkit: http://tadd.weather.gov/
National Flood Safety Awareness: http://www.floodsafety.noaa.gov
Free historic flood pictures: www.photolib.noaa.gov/historic/nws

Also, for more information on enhancing your knowledge of hazardous weather and to better prepare your community, be sure to take the Anticipating Hazardous Weather and Community Risk course at: http://meted.ucar.edu/hazwx/frameset.htm

2006 Severe Weather Awareness Quiz

By National Weather Service Offices in Kansas

1. The least active months for severe thunderstorms in Kansas are:

A. July-August
B. May-June
C. September-October
D. December-January

2. Due to the Coriolis Force, tornadoes cannot move westward in KS.

A. True
B. False

3. In Kansas, tornadoes have never occurred in November.

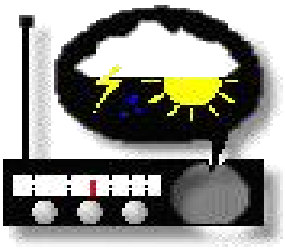
A. True
B. False

4. Vehicles with airbags make excellent shelters from a tornado.

A. True
B. False

5. A severe thunderstorm "watch" means that severe weather is imminent at your location.

A. True
B. False



6. A tornado warning and tornado watch mean the same.

A. True
B. False

7. Intense cloud to ground lightning strikes only occurs directly underneath a thunderstorm.

A. True
B. False

8. If a person is playing golf and a thunderstorm develops, the person will be safe if he/she raises his/her golf club into the air acting as a lightning rod.

A. True
B. False

9. During a local youth baseball game, you notice distant lightning flashes and hear low rumbles of the thunder. You should:

A. Head to the concession stand before it gets busy.
B. Get your umbrella ready in case it rains.
C. Bring it to the referees attention, and get in your car or a nearby building.
D. Stand under a tree to keep dry in case it rains.

10. If you notice your hair standing straight up then you may be about to be struck by lightning.

A. True
B. False

Continued>>>>>>>>>>>>

11. If you see a flash of lightning and the next clap of thunder is 5 seconds later, how far away is the thunderstorm?
A. 15 miles, B. 10 miles, C. 5 miles, D. 1 mile

12. The number one cause of death associated with thunderstorms in Kansas since 1950 is:
A. Tornadoes
B. Lightning
C. Flash floods and floods
D. Hail

13. Six inches of fast moving water can knock you off your feet.
A. True
B. False

14. A hailstone the size of a baseball weighs about:
A. a quarter of a pound
B. a half a pound
C. one pound
D. 2 pounds

15. The largest hailstone officially recorded fell in Aurora, Nebraska on June 22nd in 2003. The diameter/circumference was measured as:
A. 5 inches/8 inches
B. 8 inches/12 inches
C. 7 inches/18.5 inches
D. 20 inches/45 inches

16. How many tornadoes occurred in Kansas in 2004?
A. 1744
B. 52
C. 122
D. 97

…….. **QUIZ ANSWERS** ……..

1. D (Dec-Jan), **2. B** (False), **3. B** (False), **4. B** (False), **5. B** (False),
6. B (False), **7. B** (False), **8. B** (False), **9. C** (Attention and Shelter),
10. A (True), **11. D** (1 mile), **12. A** (Tornadoes), **13. A** (True), **14.C** (1 pound),
15. C (7 inches/18.5 in), **16. C**. 122 (a yearly record for KS)