National Weather Service
Wichita, KS

Storm Fury on the Plains

Spring Spotter Newsletter

April 2009

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The "Haysville Tornado" A Ten Year Anniversary Tribute & Reflection

By: Dick Elder, Meteorologist in Charge

Residents of Wichita and south-central Kansas are no strangers to violent weather. The violent F-5 tornadoes that hit Hesston in 1990 and Andover in 1991, as well as numerous less intense tornadoes and severe thunderstorms have kept memories fresh.

May 3, 1999, began a 3 three-day severe weather event that stretched from the plains of Oklahoma into the Tennessee Valley. By the time it was over, 66 tornadoes had killed 48 people and caused $1.9 billion in property damage. The most notable tornado of this event, was a violent tornado (rated an F-5 on the Fujita Scale) that went through the southern part of the Oklahoma City Metropolitan Area. That tornado killed 36 people and severely damaged or destroyed 8,000 homes.

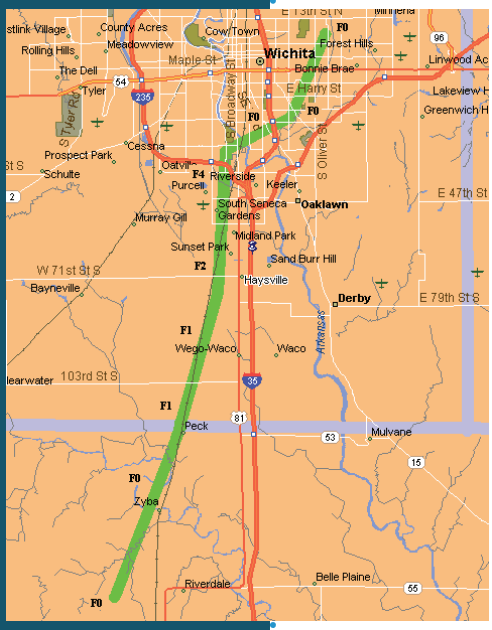
Kansans were also affected by this weather system. Three tornadoes touched down in south-central Kansas the evening of May 3. The strongest of the three initially touched down at 8:13 p.m., 4 miles north of Wellington, in Sumner County. The tornado moved north at more than 30 mph and resulted in $750,000 in damages and three injuries as it moved through northern Sumner County.

An aerial view of the damage at Lakeshore Mobile Homes Resort. Picture by Travis Heying/The Wichita Eagle

At 8:30 p.m., the tornado moved into Sedgwick County as it continued on a total trek of 17 miles. The tornado intensified to F-4 strength as it moved through Haysville. Upon leaving Haysville, the tornado weakened, turned to the northeast and finally dissipated near Linwood Park in east Wichita.

In its wake through Sedgwick County, 1,109 buildings were destroyed and an additional 7,371 were damaged. Damages were estimated at $140 million. Haysville, alone, had 150 homes and 27 businesses damaged or destroyed. Three churches and the city library was also damaged. Six people died as a result of this tornado and another 150 were injured.

As tragic as this event was, it could have been a lot worse. The tornado occurred after



Track of Tornado on May 3, 1999.

" Tornado Track was 17 miles long through Sumner and Sedgwick Counties, and at its peak was an F-4 in intensity."

dark and moved into the most populated city in Kansas. Adding to the drama, the Doppler Radar at the Wichita National Weather Service office broke down early in the event and was out of commission well before evening. All the ingredients for a major disaster were present. Instead of tragedy and massive casualties, however, hundreds of people sought shelter from this deadly tornado because of a few key facts.

First, just eight years earlier, two large tornadoes had touched down in the same general area just three weeks apart. Residents remembered how devastating they were. Also, since the 1991 tornadoes, a great deal of training was conducted by the National Weather Service, Emergency Management Officials and Media Outlets on where to go to be safe during these deadly storms. Many residents heeded the advice to have a NOAA Weather Radio receiver in each home and business.

The Norland Plastic Plant, the largest employer in Haysville at the time, had a Weather Radio. The foreman on the afternoon shift heard the Tornado Warning issued for his area. He heard spotter reports of a tornado on the ground to his south, moving north. He took action and had 140-some employees go to the designated Tornado Shelter. The plant was hit by the tornado and sustained major damage, but everyone working that evening survived.

The tornado moved through Sedgwick County after dark. If people had waited for visual confirmation, it would have been too late to get to shelter. Instead, area residents monitored the situation using a combination of local media, Weather Radio and outdoor warning sirens to know what the threat was and to take proper action.

Timely and accurate warnings broadcast well ahead of time, along with a steady flow of storm spotter information provided critical updates to conditions and location of the storm.

Radar is the Weather Service's primary tool for tracking storms. On the night of May 3, 1999, the radar at the Weather Office in Wichita was out of service. But forecasters at the office were far from blind. By the mid-1990s, the National Weather Service was well on its way to completion of a modernization that brought a new and up-to-date weather radar network. Old radars that had been in use since the 1950s and 1960s were replaced with state-of-the art Doppler radars. These new radars were driven by computer technology that provided a new era of radar imagery and allowed forecasters to view imagery from multiple radar sites. If one radar went down, nearby radars could still be utilized to cover the stricken area. When the Wichita radar went out of commission that evening, Forecasters quickly turned to the Doppler Radar near Enid, Okla., to track the southern Kansas storms.

NOAA's National Weather has continued to incorporate technological improvements to its weather tracking tools. Nearly annual updates allow forecasters to investigate storms at a much finer scale and receive and disseminate data much faster. All at a cost of about $5.00 per year to the American Taxpayer.

We have now reached Severe Weather Season 2009. Deadly tornadoes have already occurred in the Plains. As area residents reflect back on May 3, 1999, the National Weather Service encourages everyone to take stock of severe weather plans and what to do should a similar storm strike

Do you have a way to monitor the weather? Do you know where to go to be safe? Do your family and co-workers know where the shelters are and have you conducted a tornado drill? Now is the time to prepare, not when a tornado is seconds away.

Grassland Fire Danger Index Passes Experimental Period

By: Mary-Beth Schreck, General Forecaster

A grass fire from a prescribed burn at Tallgrass Prairie, KS Photo by Mary-Beth Schreck

After a successful experimental period during the spring and summer of 2008, the Grassland Fire Danger Index (GFDI) became an official product issued by the National Weather Service in Wichita.

This is an index that was developed in Australia and has been used there for several years, and has been adapted for use in the central plains of the US. It uses wind speed, relative humidity, temperature, and a percentage of how cured, or dried, the grasses are across the area. Wind speed and "curing" have the greatest weight in the index, while relative humidity and temperature are weighted less but are still factors. Precipitation, snow cover, and cloud cover are not taken into account in this index.

There is a text and graphical version of the index that is issued at least twice per day, and can help those involved with grassland burning to plan for weather conditions over the next six days. Both versions of the product can be found at http://www.weather.gov/wichita. Click on the Fire Weather tab above the map, and you will see "Grassland Fire Danger Index" and "Fire Weather Graphical Forecasts".

Community Based Spotters Core Values

By: Chance Hayes, WCM

Your duty as a volunteer community Based Spotter is extremely important to us at the NWS. You are basically our eyes in the field. Your reports to the NWS are vital in the hierarchy of communications. It is your report that gets peoples attention, aids the warning forecaster, and helps to save lives and property. So, as we move into this severe weather season I hope that you keep these core values in mind and fulfill your role as a Community Based Spotter.

- **Aware of the Expected Weather**
- **Am Trained at Recognizing Significant Weather**
- **Am Dedicated to Reporting the Significant Weather I Observe**
- **Will Ensure that Those that I am Associated With, as well as Myself, Will Stay Safe**

"As an NWS Spotter you are basically our eyes in the field."

How will you receive your Severe Weather Warning?

Courtesy Butler County Emergency Management

The digital age switched over on February 17th. Many uncertainties remains as to how that is going to affect everyone when severe weather events occur. Looking in from the outside, if you utilize a cable service such as Cox Communications or operate off dish satellite, you should still receive weather broadcasting through your television during severe weather events. However, if you are one who lives out in the country and rely on old faithful "rabbit ears", chances are, even though you have a converter box,

you will not receive weather information. Once the storm interferes with the transmitted signal, the television will go black.

What do you do? How do you adapt?

You should always have a secondary means of receiving information. NOAA Weather Alert radios provide a great source for receiving weather alerts. Albeit, you cannot pull up a screen to watch the radar, but at least you can still receive weather alert information. If your television goes black, your next best option is to tune into a local radio station that transmits live weather coverage.

Make sure you have battery backup for your weather alert radio and whatever device you use to listen in on your local radio station.

After a Wet and Wild 2008, the New Year Arrives Dry and Dormant

By: Eric Schminke, General Forecaster and Climate Focal Point

If any year could actually talk, one statement that 2008 would have likely made to 2009 as it handed off the baton to it's successor would have been, **"I've just set an all-time rainfall record for Wichita. Don't break it!"** In most respects, 2009 has been very "cooperative", but before we provide some vital rainfall statistics let's see just how historic 2008 was.

"When it rains, it pours." In 2008, that ages-old expression was proven in a most dramatic fashion when 53.82 inches of water equivalent precipitation were measured at Wichita's Mid-Continent Airport. This swamped the previous record of 50.48 inches set in 1951 by a staggering *3.34 inches*. By water logging such a colossal amount, it shouldn't be surprising that many records were set last year and there were.

All-time record rainfalls occurred in two months. In May, 13.14 inches inundated the Air Capital, shattering the old record of 11.22 inches set, surprisingly enough, in 1935, when the Dust Bowl had hit full stride. June immediately followed with a 7.42 inch soaking, and although this wasn't enough to enable 2008 to crack "The Top 10 Wettest Junes", the May-June total of 20.56 inches set an all-time record for any 2-month period.

The 3-month total of 18.04 inches from March

"Wichita Mid-Continent Airport received 53.82 inches of precipitation in 2008, breaking the old record by 3.34 inches set in 1951."

Picture from Northwest Wichita of September 12th, 2009. Photo Courtesy of Brad Ketcham

Flooding from Record Rainfall on Sept. 12th, 2009. Photo taken at Tyler and Central.

to May made 2008 the 2nd wettest Spring on record; being surpassed by 19.01 inches measured back in 1944. The 2nd monthly record-setter was September, during which 12.96 inches drenched the Air Capital, leaving the previous record-holder, 1999 with 10.69 inches, in it's wake by *2.27 inches*. Of that 12.96 inch total, an incredible *10.31 inches* occurred on the 12th, obliterating the previous 24-hour record of 7.99 inches, set way back on September 6th & 7th, 1911, by a terrific *2.32 inches*. With rainfalls ranging from 7 to 11 inches, a 6th Great Lake had formed in South-Central Kansas.

"10.31 inches of rain occurred in one day and obliterated the previous 24-hour record"

Then, Nature turned off the faucet. From the 14th through the 30th, only 0.02 inch was measured. In October, Nature marked the 10th Anniversary of the Halloween Flood by taunting residents of South-Central Kansas with 4 to 6 inches of rain. However, much quieter weather arrived with a total of 2.63 inches measured at Mid-Continent Airport in November and December combined. As a result, 2008 was unable to gain admission the "Top 10 Fraternity" of wettest autumns on record.

Until Old Man Winter decided to pull a colossal 'snow job' on March 27th and 28th, the new year had been very quiet. (There'll be more on this later.) Wichita had measured only 1.21 inches at Mid-Continent Airport through March 25th. This was 2.82 inches below normal. January was, by far, the major contributor to such dryness when an anemic 0.08 inch was measured, tying 1903 for 10th driest January on record.

Salina has started off 2009 *very dry*. Through March 25th, Salina had measured a scant 0.55 inch of precipitation with only a trace recorded in January. The 0.55 inch is *only 15% of normal* so far this year. In fact, the trace of precipitation that was recorded in January, tied 1986 for driest January on record. This was immediately followed by a scant 0.26 inch in February. Based on available data, this makes 2009 the 10th driest February on record.

Snow from March 27th-28th, 2009 Blizzard. Photo Courtesy of KSN.

Chanute hasn't fared much better in the water department. The 1.64 inches measured at Martin Johnson Airport through March 25th is only 28% of normal and, like Salina, only a trace was recorded in January, enabling 2009 to tie 1919 for driest January on record. However, if one wanted to really drill deeply for water statistics, he would discover that 1919 still "rains" supreme for one reason: Precipitation occurred on only one date, the 14th, whereas in January, 2009 precipitation occurred on four

dates. However, Chanute started a "rainfall rally" in March; measuring 3.01 inches as of the 28th.

Above: Picture showing 24 inches of snow from the March 27th-28th Blizzard. Photo courtesy of KSN.

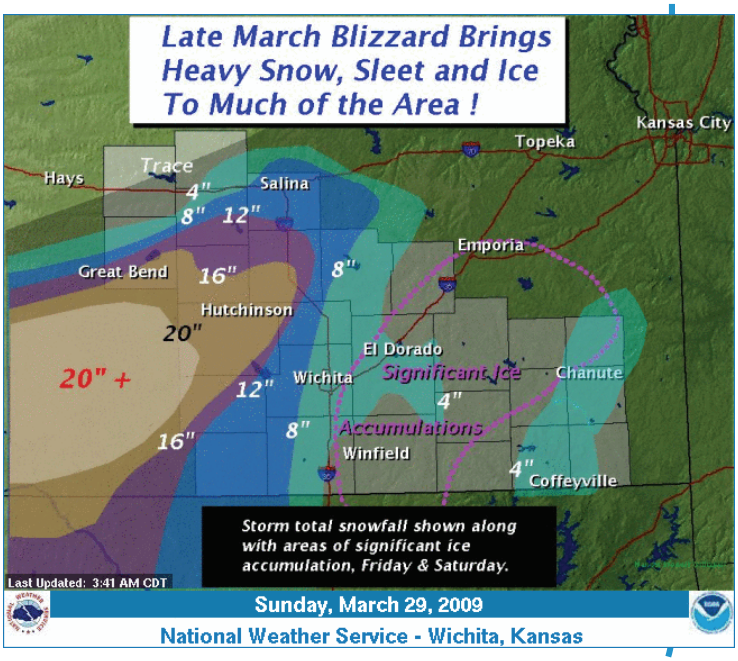
No doubt, the feeble precipitation totals for 2009 have left many areas singing "How Dry I Am!" Two such locations were Russell, where a nifty 0.19 inch had been measured through March 28th; a frightful 5% of normal, and Great Bend, where a "fabulous" 0.14 inch had been recorded through March 27th; a microscopic 4% of normal to that date. However, on the morning of the 28th, the "flood gates broke open" for Great Bend when a late season winter storm doused the town with 1.84 inches of water equivalent. Needless-to-say, the grassland fire danger index had been exceptionally high so far this year for many areas with burn bans in effect on several occasions.

The late season winter storm of March 27th and 28th proved in dramatic fashion that Old Man Winter wasn't about to go into hibernation without pulling what, for many areas, was the biggest 'snow job' on record.

On March 26th, an extremely intense cyclone moved southeast from the Central Rockies to the Texas Panhandle. As this atmospheric beast moved east toward the Red River, it unleashed a barrage of dangerous winter weather that acquired every form imaginable. Very heavy snow, blizzards, freezing rain, and sleet (more properly called ice pellets) pummeled the region. It was truly an atmospheric 'Grand Slam'. Most areas in South-Central Kansas west of I-135 were buried under 10 to 20 inches of wet snow that, with north winds of 30 to 40 MPH, whipped up drifts that reached 4 feet! For these residents, it may have been the 'snow job' of a lifetime.

"South Central Kansas was buried under 10-20 inches of wet snow"

Further east and northeast, dangerous Heinz 57 variety winter weather unleashed freezing rain, sleet, and heavy snows. Occasionally accompanied by thunderstorms, the nasty wintry mix deposited ¼ to ½ inch of ice, 1 to 2 inches of sleet and generally 4 to 8 inches of snow. Driven by north winds that reached 30 to 40 MPH, the sleet stung anyone who dared to venture outdoors. Some areas in South-Central and Southeast Kansas were without power as trees fell onto

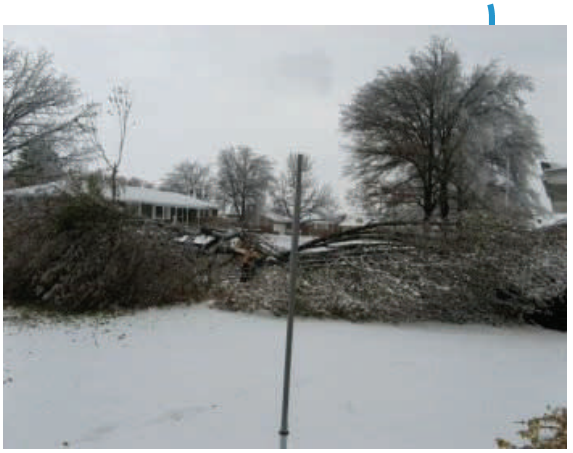


Right: Image showing snowfall accumulations on March 27th-28th, 2009

power lines.

With a warm, and fairly prolonged, start to the New Year (especially in March) it's very doubtful that anyone could have imagined such meteorological chaos occurring as March was about to sign off.

Wichita was a scant 0.3 degree from experiencing their 10th warmest February on record with a monthly average temperature of 42.4 degrees. Salina had experienced their 10th warmest February on record with a monthly average of 38.9 degrees. March had been magnificent with highs frequently in the 60s and 70s and that, on a couple occasions, even reached the 80s. However, meteorological mayhem did occur as March entered its final lap and proved yet again that there's a second type of March Madness; one that can make life quite unpleasant for those affected by it.



Picture from Southeastern Kansas where they had 1/4-1/2 inches of ice.
Photo by Tim Hummel

Severe Weather: Where Does Kansas Rank Nationwide?

By: Andy Kleinsasser, General Meteorologist

The afternoon sun angle is steadily getting higher in the sky; the days are getting increasingly warmer and longer; buds and blossoms are beginning to appear on shrubs and trees; various high school sports such as baseball, softball, golf and track are commencing; winter wheat is maturing. What do all these events and happenings have in common? Yep, you guessed, the spring season has sprung upon us. But every seasoned Kansan knows that another event—one that can be hazardous and life-threatening—was left off that "spring-to-do list"—the ramping up of severe weather season. Severe thunderstorms can occur anytime of the year across the sunshine state. However, March and April typically signify the beginning of a periodically raucous 2-3 month period (March-June) across the Great Plains. In fact, portions of the central and southern plains, stretching from roughly Nebraska and Iowa south through Oklahoma, Texas and Arkansas boasts one of the highest severe

"March and April typically signify the beginning of a periodically raucous 2-3 month period..."

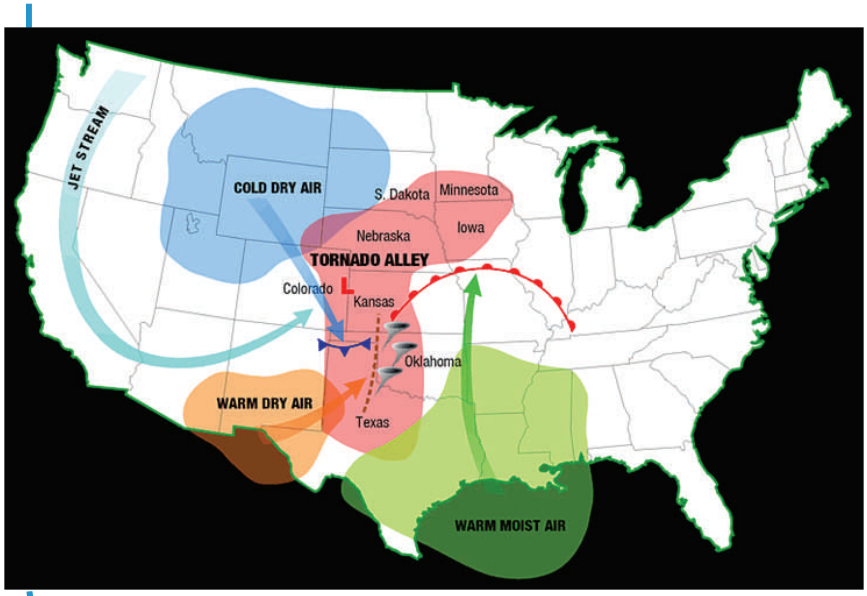


Figure 1. Tornado alley, courtesy of the National Severe Storms Laboratory.

thunderstorm frequencies in the world.

Peak severe weather seasons occur at different times of the year across the continental United States. For instance, the southeast U.S. states typically peak during the late fall through early spring months when the rest of the country is entrenched in cold, winter weather. In contrast, the northern U.S. states typically peak during the summer months when the central and southern states are baking in heat and humidity.

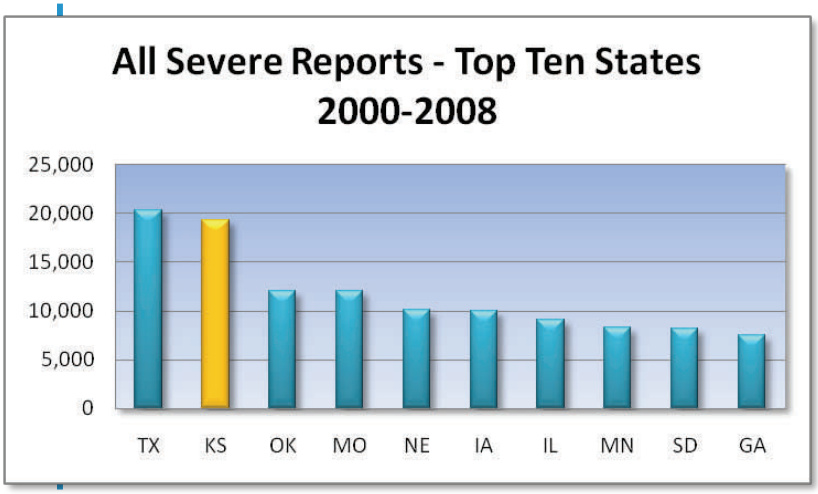


Figure 2. All tornado, large hail and damaging wind reports 2000-2008—top ten states.

Why does Kansas severe weather typically peak during the spring and early summer months? As the sun angle increases across the northern hemisphere during the late winter/spring months, the subtropical jet stream (which typically hugs the gulf coast states during the winter months) begins to shift north over the plains states. Weather disturbances--one ingredient needed to generate thunderstorm outbreaks—ride along on the jet stream. These weather disturbances, located about 4 miles up in the atmosphere, induce low pressure and strengthening southerly winds near ground level across the plains states. The strengthening southerly winds draw warm and moist air north/northwestward from the Gulf of Mexico, another major ingredient needed for thunderstorms. Meanwhile, on the west/northwest side of the low pressure area, dry air originating over the Rocky Mountains surges east, clashing with the warm/moist air over the plains at a frontal zone known as a dryline. Given enough moisture and wind shear (increasing wind speed and direction with height), this dryline is often a triggering mechanism for severe thunderstorms and tornadoes across the plains states. See Figure 1.

"...ten states with the top severe weather ***density...*** Kansas is overwhelmingly ranked 1st"

But where does Kansas rank across the nation with regard to severe weather? Figure 2 indicates Kansas in 2nd place with just under 20,000 reports, slightly under the massive state of #1 Texas. Ranked in a distant 3rd, 4th and 5th is Oklahoma, Missouri and Nebraska, respectively. You'll notice most of the top ten states, including Iowa, Illinois, Minnesota and South Dakota are in or near the heartland of America. The exception is Georgia, ranked 10th.

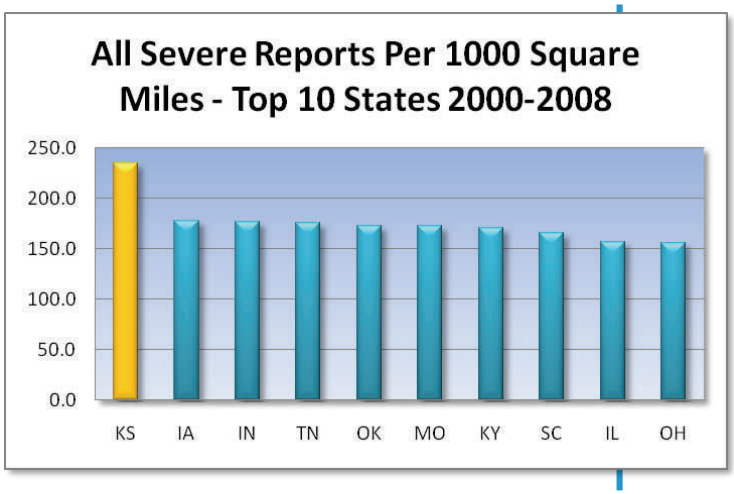


Figure 3. All tornado, large hail and damaging wind report density 2000-2008—top ten states.

But Texas is nearly three times the size of Kansas in area, so one would expect a large state in an active severe weather region would boast the most severe weather reports. However, the story was different when taking into account the size of the states. Figure 3 indicates ten states with the top severe weather ***density*** across the nation, more specifically all severe weather reports (tornadoes, large hail, damaging winds) per 1000 square miles (roughly the size of a county) from 2000-2008. Kansas is overwhelmingly ranked 1st, indicating the overall highest severe weather frequency in the country. Other states ranked 2nd-10th, respectively, include Iowa, Indiana, Tennessee, Oklahoma, Missouri, Kentucky, South Carolina, Illinois and Ohio. At least half of these states are relatively small compared to many other states across the U.S., making it easier to have a high severe thunderstorm density than a larger state such as Texas. The data also shows that a high frequency of severe weather occurs away from the plains as well, including portions of the Midwest, Ohio Valley and southeast states.

National Weather Service Wichita, KS wants to Thank you for your service during Severe Weather Events!

Handy Severe Weather Reporting Reference Card

Weather to Report:

Hail ≥ 0.75" in Diameter
Wind Speeds ≥ 58 mph
Tree and Structural Damage
Rotating Wall Clouds
Funnel Clouds
Tornadoes

Include with Each Report:

Your Name
Your Call Sign (If Applicable)
Your Location
Time and Date of the Event
Location of the Event

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Online: www. weather.gov/Wichita

NWS Wichita Word Search

METEOROLOGY TERMS
NWS WICHITA, KS

Favorite Weather Terms

S	E	L	I	H	H	A	E	D	R	N	A	O	A	E	S	M	N
U	I	A	O	R	W	E	A	T	H	E	R	T	E	Z	O	M	S
N	R	R	L	W	E	L	G	U	N	L	W	M	L	G	I	T	F
W	R	T	E	M	P	E	R	A	T	U	R	E	O	N	N	W	N
A	E	U	T	N	O	R	F	D	L	O	C	F	A	I	I	L	A
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T	L	H	I	H	H	S	Z	I	L	T	L	N	N	A	D	U	R

CLOUDS
FLOODING
HIGH PRESSURE
LOW PRESSURE
SNOW
TORNADO
WIND

COLD FRONT
FOG
HURRICANE
RAIN
TEMPERATURE
WARM FRONT

DRIZZLE
FREEZING RAIN
ICE
RELATIVE HUMIDITY
THUNDER
WEATHER

FLASH FLOOD
HAIL
LIGHTNING
SLEET
THUNDERSTORM
WEATHER RADIO

Answer Below: