

# Storm Fury on the Plains

Fall Spotter Newsletter

November 2010

## Inside this issue:

Record Setting Hail, Strong Winds, and Tornadoes 1

Wichita's Newest Lead Forecaster 3

Join CoCoRaHS today. 3

National Weather Service helps Wichita Habitat for Humanity 5

Wichita's Newest General Forecaster 7

2010 Severe Weather Summary 7

Summer 2010 was one for the Record Books. 11

## Record Setting Hail, Strong Winds, and Tornadoes impact South central and Southeastern Kansas

By: *Stephanie Dunten and NWS Wichita*

A hailstone that fell in West Wichita on September 15th, 2010 officially broke the Coffeyville hailstone record from 1970. The record hailstone fell near Pawnee and 119<sup>th</sup> street when a severe thunderstorm dropped giant hail from Goddard to Udall. Hail at times reached 4 to nearly 8 inches in diameter! The giant hail punched holes in roofs, shattered windows, heavily damaged siding and thousands of vehicles. This particular record hailstone measured 7.75 inches in diameter shortly after the stone fell. However, the official weight and circumference were not able to be obtained until 15 hours after the stone had fallen. At that time, the stone weighed 1.1 pounds and had a circumference of 15.5 inches. “This has

**National  
Record  
hailstone**

**8 inch  
diameter**

**18.625 inch  
circumference**

**1.9375 pounds**



7.75 inch hail fell near Pawnee and 119th Street. Picture from Melissa McCarter.

been quite a summer for large hail,” said Jim Keeney, weather program manager at National Weather Service Central Region Headquarters in Kansas City. “We had a national record hail stone recovered in South Dakota earlier and another is being examined as a possible state record in Oklahoma. These hailstones are significant recoveries, but they are records we wish we didn’t see.” Final verification of the hailstone’s record status came from NOAA’s National

Climatic Data Center through the State Climate Extremes Committee.

Besides the large hail, several tornadoes were reported with this storm system. September is part of Kansas’s second peak of severe weather. Although Kansans focus more on the spring being the severe weather season, the sunflower state also has a second season in the fall. On this particular day, the combination of surface bounda-

**State of Kansas  
Record Hail Stone**

**Wichita, KS; 2010**

**Diameter: 7.75 in**

**Circ: 15.5 in**

**(15 hrs later)**

**Weight: 1.1 lbs**

**(15 hrs later)**

**Previous Record**

**Coffeyville, KS; 1970**

**Diameter: 5.7 in**

**Circ: 17.6 in**

**Weight: 1.65 lbs**

*Note: 2010 record is for diameter only.*

ries including a cold front associated with a surface low pressure aided in creating an area of convergence which helped to initiate thunderstorms. The high dewpoint and surface temperatures were ripe conditions for explosive and intense thunderstorm development which first began to develop in Reno County just before 4 pm. Overall, eight tornadoes touched down across southern Sedgwick, Cowley, and Greenwood Counties.

The supercell thunderstorm in Sedgwick County moved on a southeasterly track and passed near Haysville, Derby, and eventually traveled just to the northeast of Winfield. This particular supercell thunderstorm dropped 6 tornadoes all measuring EF0 in intensity. Along with tornadoes, 70-80 mph winds were reported across Sumner and Cowley counties. Another supercell thunderstorm developed near El Dorado, which also became severe. This supercell continued to track southeast across Greenwood and into Elk Counties. A funnel cloud was first spotted in southwestern Greenwood County and touch downed twice near the town of Severy. As the evening went on, the storm transitioned into a bow echo, a line of storms, that produced 65 to 75 mph winds as well as wide spread damage across parts of Wilson, Montgomery, and Labette Counties.



**Damage to the green at Auburn Hills Golf Course in Wichita, KS. Picture courtesy of Frank Kotsch.**



**Debris from a Church hits a SUV in Winfield, KS. Damage is caused by straight line winds. Courtesy Alicia Speer and Lance Ferguson**



**Picture of a Tornado taken by Jim Reed south of Wichita.**

## Robb Lawson: Wichita's Newest Lead Forecaster



**Welcome  
Robb  
Lawson!**

Our newest Lead Forecaster, Robb Lawson began in Mid-August. Robb is originally from Omaha, Nebraska where he was born and raised. In addition he graduated from Creighton University, located in the heart of Omaha. Robb's first experience in the NWS was through a volunteer program at the Omaha office prior to his junior year at

Creighton. It was after this experience that Robb was sold on a career in the NWS. Several months before graduation Robb was hired as a SCEP (Student Career Education Program) at the NWS Office in Valley, NE. Shortly after graduation Robb quickly shoved off to Eastern Kentucky where he started as a meteorologist intern at the Jackson NWS Office. After spending a year and a half in the foothills of the Appalachians, Robb was hired as a general forecaster at the NWS in Wichita, Kansas where he started in November of 2001. Since arriving at the Wichita NWS Office, Robb has been involved in numerous outreach endeavors which include conducting spotter training, overseeing

the local NOAA Weather Radio along with being actively involved in enhancing the NWS Wichita Webpage.

A couple years before Robb was born a large tornado came within a block of his home and in that same year a historic snowstorm struck Omaha. It was family stories and pictures from these two events that first sparked Robb's interest in weather.

Robb is an avid football and college basketball fan who spends much of the fall on the road watching his beloved Huskers. When off work in the spring and summer Robb enjoys fishing along with spotting and photographing severe storms. Robb and his wife Christine like to spend much of the summer traveling to see friends and family.

## Reporting Winter Weather

*By: Chance Hayes, WCM*

The National Weather Service needs your reports. Winter precipitation in the form of snow and ice is just as important as large hail, damaging winds, and tornadoes. It would be safe to say that winter precipitation indirectly produces more damage, injuries, and fatalities each year than those produced by thunderstorms. For this reason, it is extremely important for you to call our office to tell us how much snow has fallen or if the roads have become covered with ice. Your information will help us in our process of notifying the public where the hazards are located. The more people we can keep off of the roads in a winter event, the safer it will be. So the next time you have snow or ice fall at your home, give us a call to let us know how much you received.



## Helping your community by taking rainfall reports via CoCoRaHS



We at the National Weather Service office in Wichita, KS would like to offer you an opportunity to provide more weather information for your location. CoCoRaHS is an acronym for the Community Collaborative Rain, Hail and Snow network. ([www.cocorahs.org](http://www.cocorahs.org)) CoCoRaHS is a unique, non-profit, community-based network of volunteers of all ages and backgrounds working together to measure and map precipitation (rain, hail and snow). The focus for this program is to provide the highest quality data for natural resource, education, and research applications. One of the main goals

is to increase the density of precipitation data available throughout the country by encouraging volunteer weather observing.



The network originated with the Colorado Climate Center at Colorado State University in 1998. In the years since, CoCoRaHS has expanded rapidly with over 2,500 observers in twelve states. This is a community project. Everyone can help, young, old, and in-between. The only requirements are an enthusiasm for watching and reporting weather conditions and access to the internet.

The CoCoRaHS volunteers take measurements of precipitation from as many locations as possible. These precipitation reports are then recorded on the Web site [www.cocorahs.org](http://www.cocorahs.org). The data are then displayed and organized for many end users to analyze and apply to daily situations ranging from water resource analysis and severe storm warnings to neighbors comparing how much rain fell in their backyards. The National Weather Service, other meteorologists, hydrologists, emergency managers, city utilities (water supply, water conservation, storm water), insurance adjusters, USDA, engineers, mosquito control, ranchers and farmers, outdoor & recreation interests, teachers, students, and neighbors in the community are just some examples of those who use this data.

“...volunteers can help to fill in a piece of the weather puzzle...”

By providing daily observations, volunteers can help to fill in a piece of the weather puzzle that affects many across your area in one way or another. If you are willing and able to help and are interested in joining, you can go to the CoCoRaHS website <http://www.cocorahs.org> and click on the Join CoCoRaHS link.

## Winter weather Safety at Home and Work, Part 1

*By: Chance Hayes, WCM*

### Plan ahead for winter storms by having these in hand:

- **Flashlight** and extra **batteries**
- **Battery-powered NOAA weather Radio**
- **Extra food and water** - high energy food such as dried fruit, nuts and granola bars **can opener**
- **Extra medicine and baby supplies**
  - **First aid kit**
  - **Heating fuel**
- **Emergency heat source**
- **Fire extinguisher**
- **Smoke alarm**



Make sure **pets** have plenty of food, water, and shelter



“Muscles not needed for weather forecasting got a workout...”

## National Weather Service Staff Lend a Helping Hand to Wichita’s Habitat for Humanity

*By: Public Affairs Specialist for Central Region Pat Slattery.*

Several members of the WFO Wichita forecast staff gave a little back to the community on July 22, 2010, shifting gears from meteorology to construction to lend a hand to Habitat for Humanity.

MIC Dick Elder gave a free organizational hand to Meteorologist Intern Stephanie Dunten, who is a monthly volunteer at Habitat for Humanity. Stephanie led the planning for the day with members of the WFO’s Local Enrichment Team (LET), a subset of the NWS Central Region Leadership, Enrichment and Development (LEAD) Program.

The 11-person team arrived on the job site early in the morning to put in a full day’s work. After getting some instructions from Habitat for Humanity site coaches, the crew dove right into individual assignments. The group was soon engrossed putting together the roof frame, building a carport and putting up windows and Tyvek.

Muscles not needed for weather forecasting got a workout swinging hammers, sawing lumber, and plying themselves at all construction tasks. As the temperature reached 99 degrees and the heat index topped above 100 degrees, the volunteers found nail guns and hammer drills getting heavier by the minute. A few of the team members had previous construction jobs or were experienced in home improvement, but most of the staff was completely new to the work. Still, everyone put in a full day, making progress that pleased Habitat for Humanity supervisors and impressing Mr. Elder. “I’ve seen the Wichita forecast staff come together time and again



NWS Employees: Stephanie Dunten, Paul Howerton, Jerilyn Billings, Bonita and Andy Kliensasser, Jason Howard, Diane and Dick Elder, Vanessa Pearce and Rich Fallen



to ensure accurate and timely products and services got to the customers during high impact weather events. Seeing this same level of teamwork to help others in need truly shows how service minded our Weather Service family really is,” Dick said.

## Winter weather Safety at Home and Work, Part 2

If you are already **indoors** during hazardous winter weather:

- **Stay inside!**
  - When using alternate heat from a fireplace, wood stove, space heater, etc., **use fire safeguards and properly ventilate**
  - **Close off** unneeded rooms
  - **Stuff** towels or rags in **cracks** under doors
  - **Cover windows** at night
- **Eat and drink** - food provides the body with energy for producing its own heat
- **Wear layers** of loose-fitting, lightweight, warm clothing

Everyone is potentially at risk during winter storms. Most fatalities are indirectly related to the storm. People die from traffic accidents on icy roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to cold.

Winter  
weather  
safety  
starts with  
you!

The Facebook logo, consisting of the word "facebook" in white lowercase letters on a blue rectangular background.

Be sure to find  
**Wichita, KS Skywarn**  
on facebook

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

## Jerilyn Billings: Wichita's Newest General Meteorologist



Welcome  
Jerilyn  
Billings.

Our newest General Forecaster started her position in Mid-October. Jerilyn grew up in Kearney, Nebraska in the south central portion of the state. Jerilyn's interest in weather came during her 8<sup>th</sup> grade earth science class. Weather was a brief topic towards the end of the year, but something clicked. She decided at that time to pursue a career in Meteorology. After high school Jerilyn traveled south to the University of Oklahoma to get her Bachelor's Degree and then out east to get a Master's Degree at North Carolina State University. While at the University of Oklahoma, Jerilyn took part in an exchange program and studied Meteorology at the University of Reading in Reading England.

During her time in school, Jerilyn volunteered at three different National Weather Service (NWS) offices; Hastings, NE, Norman, OK, and Raleigh, NC. It wasn't long into volunteering that she knew she wanted to be a meteorologist for the NWS. Upon graduation from North Carolina State University she was hired as a Meteorologist Intern at the NWS in Wichita Kansas. She was very excited to return to the Plains, which is "home". While growing up in south central Nebraska, Jerilyn experienced all types of weather but really enjoyed the summertime storms the most. However, in 1996 a blizzard crippled her hometown and stranded students in the middle school, this winter storm was extremely memorable. Jerilyn enjoys forecasting and working convective events and she enjoys the fact that Wichita gets much less snow and cold weather than south central Nebraska.

Outside of work Jerilyn enjoys traveling and is always planning her next trip. Some of her favorite locations to visit are England, Germany, and other countries of Western Europe. She also enjoys driving home to Nebraska and to north central Kansas to see her nieces and nephews. Jerilyn is also involved in a couple different handbell choirs at her church and playing the flute in the local community band. When she finds time at home, she enjoys catching up on her numerous favorite TV shows and movies.

### 2010 Severe Weather Summary

*By: Chance Hayes, WCM*

#### **Longest tornado drought for Kansas in 24 years!**

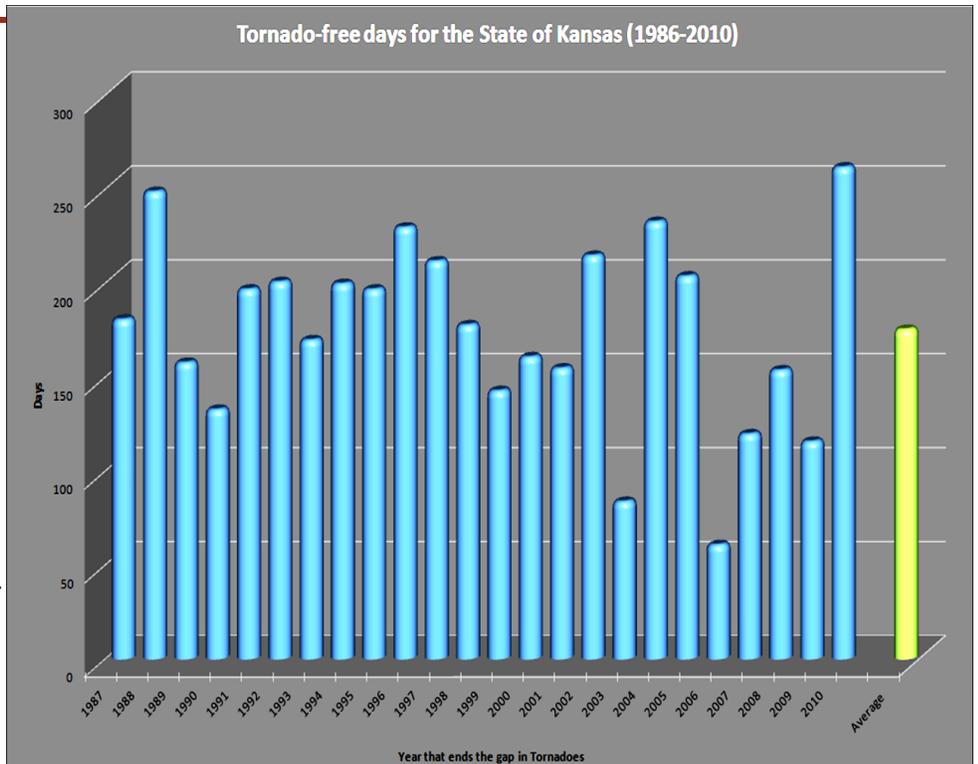
On Thursday April 22nd, 2010 a tornado was reported in Western Kansas. This was the first tornado reported in Kansas for 2010. Prior to this tornado, the last tornado reported in Kansas was back on August 2nd 2009. This resulted in 262 days in which Kansas did not report a tornado, which in turn is the longest tornado drought in 24 years. The graph on the next page shows how many tornado-free days each year between 1986 and 2010.

#### **Severe Weather hits south central and southeast Kansas on May 10<sup>th</sup>, 2010**

A strong surface low pressure system tracked across southern Kansas on Monday, May 10th. Rich moisture from the Gulf of Mexico surged northward making it into southern Kansas by late afternoon. A dryline developed across western Oklahoma and extended into south central Kansas, and a warm front stretched from the center of the low in southwest Kansas into south central Oklahoma. Very high levels of instability

and shear allowed supercell thunderstorms to develop along and ahead of the dryline, and these storms moved quickly northeastward during the late afternoon and evening hours.

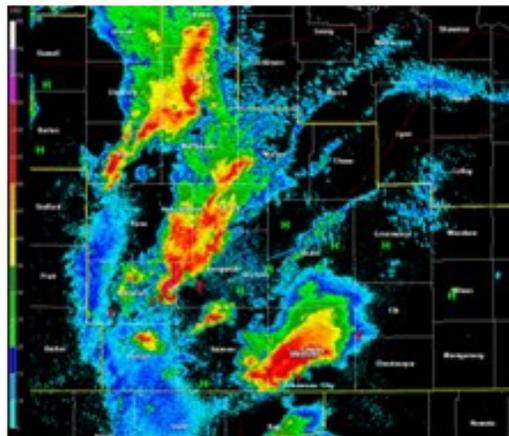
Tornadoes, hail up to 4.25" diameter (between grapefruit and softball size), and damaging winds were reported with many of these supercell storms, including several tornadoes in western and central Oklahoma. There were a few reports of tornadoes across south central and southeast Kansas as well. These supercell storms eventually developed into a line of storms that produced large hail and damaging wind through southeast Kansas and into Missouri and Arkansas.



Graph shows how many tornado free days have occurred each day between 1986 and 2010. The average number of days is shown by the green column at the far right. You can see that the column above 2010 has the most tornado free days since 1986.

### Tornadoes and large hail batter central and southeast Kansas on May 12<sup>th</sup>, 2010

A strong low pressure system tracked through eastern Kansas on Wednesday, May 12th. A warm front moved north into Kansas, while a dryline and cold front stretched southward from the low through western



Radar Image from KICT Radar at 4:44pm Showing the Supercells over Kingman and Cowley Counties on May 10th, 2010.

Oklahoma. As warm moist air ahead of the dryline and south of the warm front increased, supercell thunderstorms rapidly developed along the cold front across central and south central Kansas. Eventually three distinct supercell storms developed with two of these spawning tornadoes. Later in the evening, these supercell storms weakened, but severe thunderstorms continued. These storms occasionally produced large hail and damaging winds.

There were several reports of golf ball sized hail with a few larger hail reports. There were also some reports of tornadoes through the afternoon and early evening. The largest

hail reported to the National Weather Service was baseball size near Cedar Vale at 1:30am with 65 mph winds reported as well.



Tornado damage rated EF2 10 miles southeast of Kingman, KS

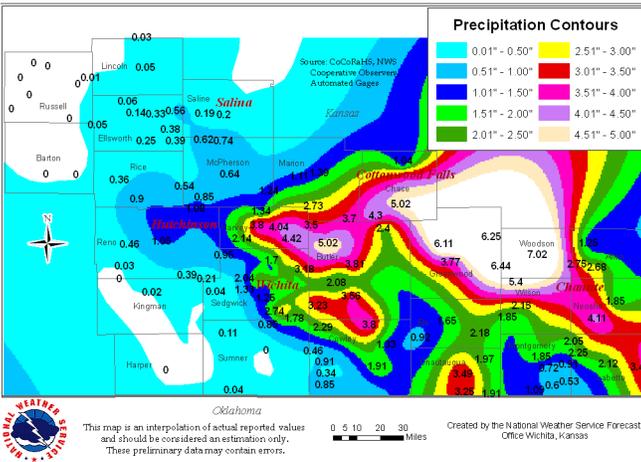
### Severe storms and flooding on June 8<sup>th</sup> and 9<sup>th</sup>, 2010

Storms first developed late Tuesday afternoon (June 8th) along a cold front that was pushing southward.

Additional storms formed north of the cold front as the overnight hours progressed providing several rounds of storms for locations generally along and southeast of the Kansas turnpike. Many of these storms quickly became severe with strong winds being the main severe threat. With an extremely moist air mass in place all of the storms produced very high rainfall rates that caused widespread flooding across



Storm Total Precipitation as of 7 AM on June 9th 2010



(Above) Precipitation map from June 8-9th, 2010.  
(Below) Wind damage at Marion Lake on August 13th, 2010. Image courtesy Marion County Emergency Management.



Accident on May 12th, 2010 along the Kansas Turnpike which was initiated by power lines being blown across the Turnpike due to severe straight line winds. Image courtesy of Butler County Emergency Management.

portions of South central and especially Southeast Kansas.

**Powerful storm plows through southeast Kansas on July 12<sup>th</sup>, 2010**

Stronger than normal upper level winds from an associated weather system moved across Kansas on July 12th



Straight line Wind Damage on July 12th, 2010 across Cherryvale. Picture by M. Dennis.

2010. The combination of the stronger winds aloft and unstable July air set the stage for significant severe weather. A powerful thunderstorm developed over Southeast Kansas around 7pm and marched southeast across Montgomery and Labette counties producing widespread wind damage with winds speeds of 60 to 75 mph from Cherryvale to Oswego. Several very large tree limbs and power line poles were knocked down.

**Damaging winds across central Kansas on August 13<sup>th</sup>, 2010**

Severe storms developed late in the afternoon on Friday August 13th along a cold front that pushed through central and south central Kansas. Extremely hot temperatures along and south of a cold front set the stage for any storm that developed to produce severe downburst winds. Around 4:30 pm a storm quickly developed over McPherson County and produced extensive damage in the town of McPherson. Between 7:00 and 7:30 pm a severe storm tracked over Marion Lake producing winds that overturned RVs and trailers and downed numerous trees. This storm also injured 10 people in the carnage.

## Winter weather Safety at Home and Work, Part 3

By: *Chance Hayes, WCM*

### Before starting out in a vehicle:

- Plan your travel
- Check the weather
- Have road condition phone numbers handy
- Carry a Winter Storm Survival Kit



- Keep the gas tank near full to avoid ice in the tank and fuel lines
  - Avoid traveling alone

Let someone know your timetable and route

If you are stranded in your vehicle during hazardous winter weather:

- Stay with your vehicle
- Take turns sleeping
- Run the motor every hour for 10 minutes to keep warm
- Keep windows open a little to prevent carbon monoxide buildup
  - Make sure the exhaust pipe is not blocked
  - Tie a bright cloth to the antenna
- Exercise periodically by vigorously moving your arms, legs, toes and fingers
- Turn on the dome light while the engine is running to aid rescuers at night

After the snow stops falling, raise the car hood to indicate you need help.

A good automobile Winter Safety Kit includes: cell phone and charger, blankets, flashlight and extra batteries, first-aid kit, knife, high-calorie non-perishable food, extra clothing to keep dry, large empty can to use as emergency toilet, tissues and paper towels, small can and waterproof matches to melt snow for drinking water, sack of sand or cat litter for traction, shovel, windshield scraper and brush, tool kit, tow rope, battery booster cables, water container, compass, and road maps.



“Before starting out, Plan your Travel and Check the Weather and Road Conditions”

### Summer 2010 was one for the Record Books

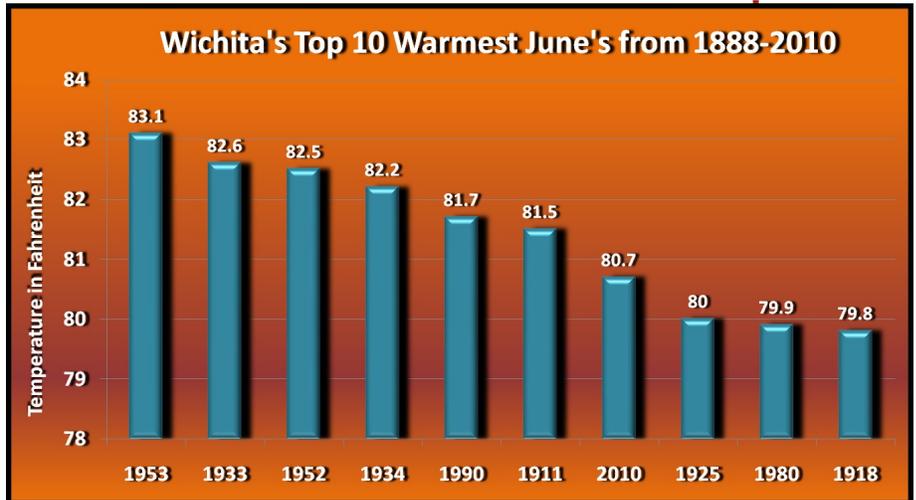
By: Eric Schminke, General Meteorologist and Chance Hayes, WCM

Like many of its predecessors, the summer of 2010 will be remembered for its share of reasons, but the chief among them will likely be – **heat**. Since all summers are hot, the focus obviously shifts toward the magnitude of the heat, for it was obviously intense this past summer.

Astronomically speaking, summer 2010 officially arrived in Central and Eastern Kansas on June 21<sup>st</sup> at 628 AM CDT. For the few who didn't know, the term "solstice" is derived from the Latin words meaning "sun" and "stand still".

For the residents of Central and Eastern Kansas, it definitely appeared that the sun had stood still for a long time. In June, afternoon temperatures frequently reached the mid and upper 90s and on a few occasions, the highs reached the "coveted" 100-degree mark. These high temperatures were on average 7-10 degrees above normal. No doubt such heat had air conditioners working overtime. As is often the case when temperatures are this much above normal, rainfall trends in the opposite direction, and June 2010 was no exception, especially from the 16<sup>th</sup> onward. During that time many lawns started to develop tans which

"...the summer of 2010 will be remembered for...the heat"



This graph shows the top 10 warmest average temperatures for June in Wichita, KS from 1888-2010. Wichita came in with the 7th hottest June's on record. (Image courtesy of Andy Kleinsasser)

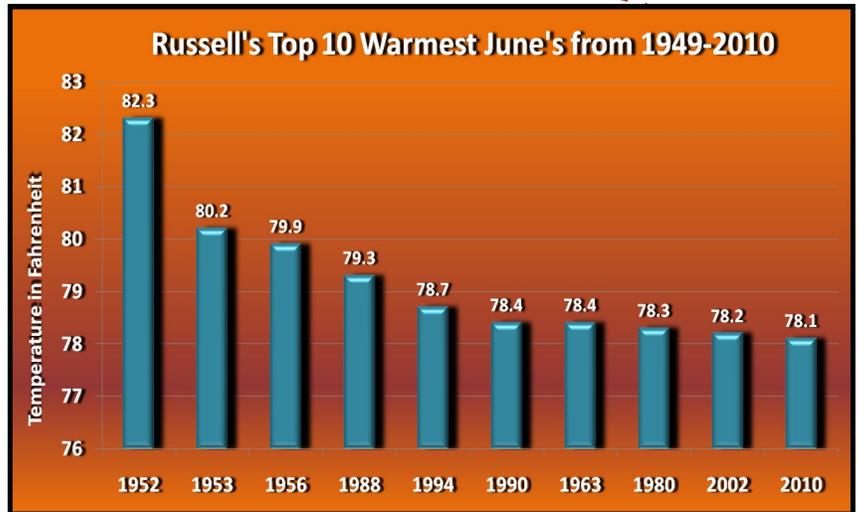


This graph shows the top 10 warmest average temperatures for June in Chanute, KS from 1888-2010. Chanute came in with the 9th warmest June on record. (Image courtesy of Andy Kleinsasser)

forced homeowners to 'spring' their irrigation systems into action.

In June, Wichita, Salina and Chanute averaged around 80 degrees, 4-5 degrees above normal. Since only one record high temperature was set in June, (on the 4<sup>th</sup> when Russell reached 99 degrees) the common theme was *consistency* and *very warm nights*. Daily averages were frequently in the mid 80s

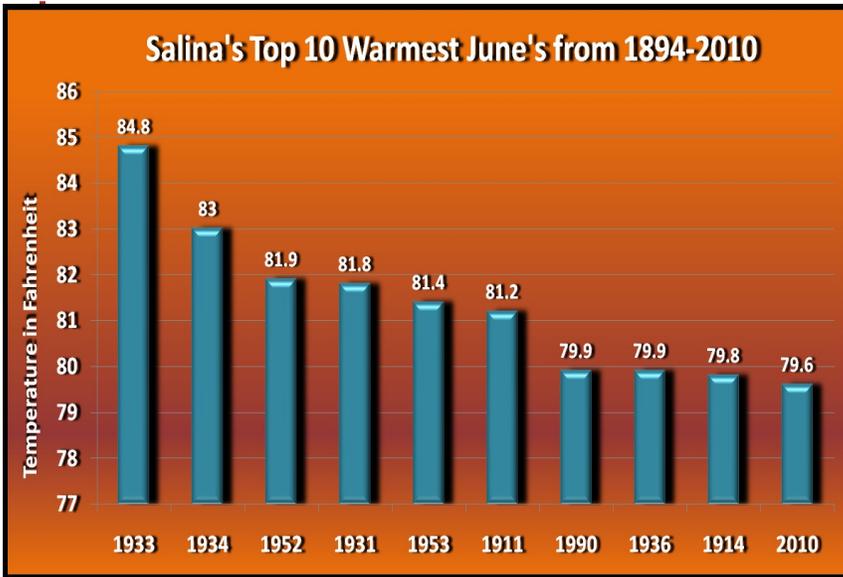
which were often 6-8 degrees above normal. Such warmth was enhanced by nighttime temperatures that were frequently in the lower to mid 70s; also some 6-8 degrees above normal. On several occasions the *overnight temperatures were 10-12 degrees above normal*. In fact, Chanute's low of 77 degrees on the 22<sup>nd</sup> tied the record for the date set the previous year. The June average of 80.7 degrees made 2010 the 7<sup>th</sup> warmest June on record for Wichita, while the 78.9 degree monthly average tied 2010 with 1980 for 8<sup>th</sup> warmest on record for Chanute.



This graph shows the top 10 warmest average temperatures for June for Russell, KS from 1888-2010. Russell came in with the 9th warmest June on record. (Image courtesy of Andy Kleinsasser).

**SOME LIKE IT HOT...BUT THE HUMIDITY?**

When it came to heat, July was also a real gem. This time the heat was really “juicy” especially in south central and southeast Kansas where the remnants of “Alex” provided plenty of moisture. Early in the month, afternoon highs were only in the 80s, but the relative humidity more than compensated as dewpoints in the mid-upper 70s would attest. By the 17<sup>th</sup>, highs were in the mid-to-upper 90s, and with dewpoints still in the mid 70s heat indices reached around 110 degrees. Such intense heat would pester these areas to the end of the month, thus prompting the issuances of prolonged Excessive Heat Warnings for most of these periods.

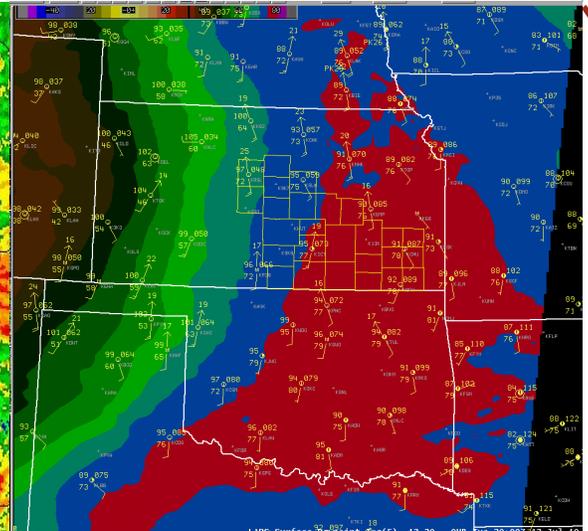
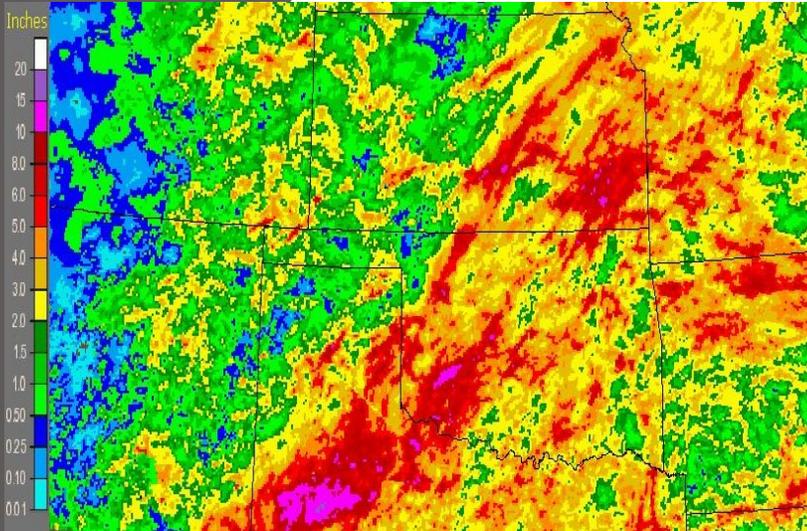


This graph shows the top 10 warmest average temperatures for June in Salina, KS from 1888-2010. Salina came in with the 9th warmest June on record. (Image courtesy of Andy Kleinsasser).

The nighttime offered no relief with dew points remaining in the mid 70s, the relative humidity was oppressive. In most areas, the July average monthly temperature was only 1-2 degrees above normal, but the humidity was hideous.

The phrase “Hotter than Hades in the middle of August” could have easily been applied to the 2010 edition. Up to the 14<sup>th</sup>, Wichita was on pace to experience their 2<sup>nd</sup> hottest August on record with an average of 89.2 degrees. This was exceeded only by 1934

mid-upper 90s and dewpoints in the mid 70s, heat indices would reach around 110 degrees.



The image above shows the observed rainfall during the beginning of July across the central and southern Plains (red shading indicates rainfall over 5 inches, with purple over 10 inches). (Both Images above courtesy of Kevin Darmofal)

The image above shows the high dew point temperatures across the Plains on Tuesday afternoon (red shading denotes values in the upper 70s to lower 80s).

The areas that are shaded yellow/red/purple in the left image correspond to the values that are shaded red in the right image. The heavy rains at the beginning of July aided in the high humidity across southeastern Kansas during the middle of July.

(when the Dust Bowl hit full stride) when the average temperature was a nasty **91.6 degrees**. (Remember, in those days there was no central air conditioning.) Over this same 14-day period, Salina and Chanute averaged 86.6 degrees which ranked 2<sup>nd</sup> and 6<sup>th</sup> respectively. (A significant note: During the horrific heat wave of 1934, Salina's average temperature from August 1<sup>st</sup> to August 14<sup>th</sup> was a ghastly 94.3 degrees.)

During the red-hot start in August, Wichita set record highs on the 2<sup>nd</sup> and 3<sup>rd</sup>. On the 2<sup>nd</sup>, the Air Capital wilted in 108 degree heat which eclipsed the 106 degree high set in 1970. On the 3<sup>rd</sup>, Wichita reached 109 degrees which "shaded" the record of 108 degrees set in 1964. Surprisingly, the only other record high set in August was on the 12<sup>th</sup> when Russell's high of 104 degrees edged the very old record of 103 degrees set for the date in 1956. Once again, the common theme was **consistency** and **very warm humid nights**. For most of this 14-day period, highs reached 100-109 while lows were only in the mid 70s. Overall, these temperatures were around 10 degrees above normal with greatest departures from normal occurring from the 8<sup>th</sup> to the 14<sup>th</sup> during which the daily averages were **10-13 degrees above normal**.

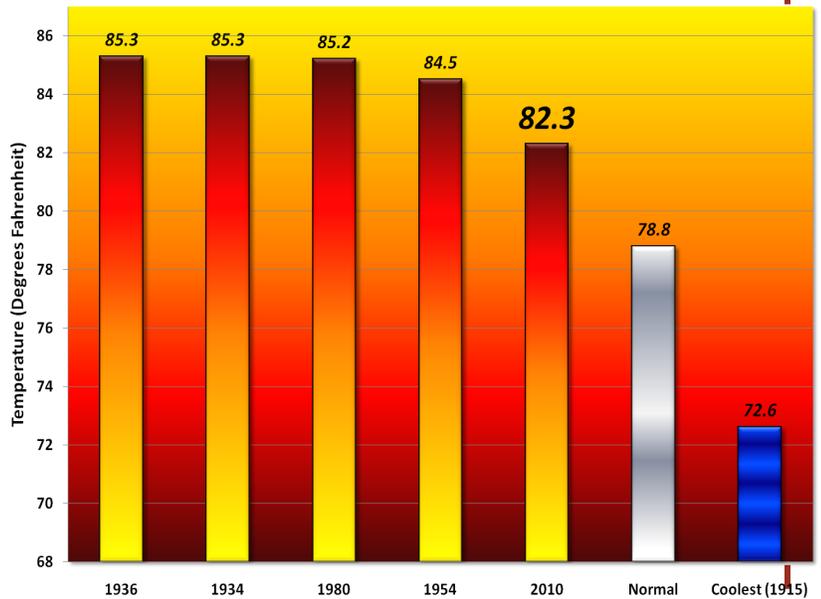
The reason for August 14<sup>th</sup> being used as a break-point is that the triple-digit heat wave ended that afternoon. That night, a slow southeast-moving cold front crossed Kansas sparking numerous thunderstorms over south central and southeast Kansas. While a profound cooling trend ensued, it wasn't soon enough to prevent 2010 from gaining admission into the "10 Hottest Summers on Record" fraternity. From June 1<sup>st</sup>

Wichita set record highs on the 2nd and 3rd of August...108 and 109, respectively.

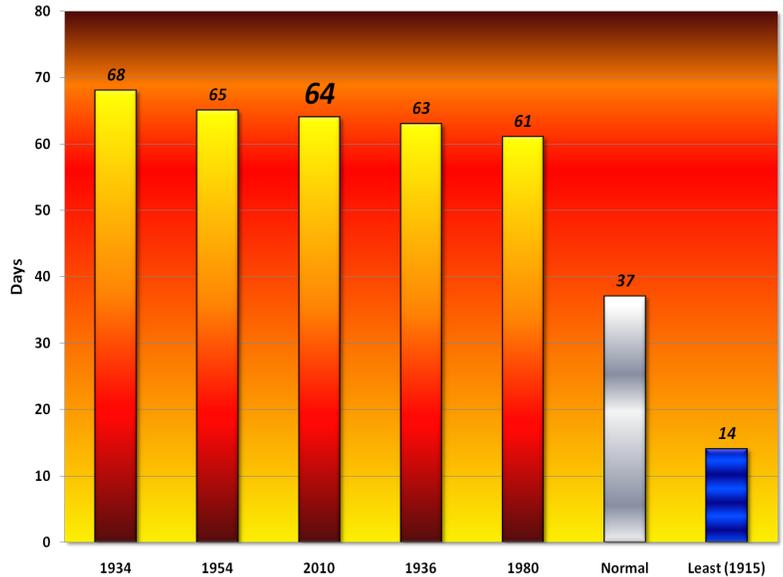
The summer of 2010 came in at #5 for the warmest summer's in Wichita since 1888.

-August 31<sup>st</sup>, which is considered meteorological summer, Wichita averaged **82.3 degrees**, making 2010 the 5<sup>th</sup> hottest summer on record for the Air Capital. This was 3.5 degrees above normal (1971 to 2000 official climatological normal). This top 5 breaking average was in part to the fact that seventeen days this summer recorded high temperatures 100 degrees or above. While this is about 4 days above normal, it is certainly not earth-shattering when compared to the summers of 1980 and 1936 when the century mark was reached or exceeded on 44 and 47 days respectively. The other culprit that contributed to this warm summer was the abnormally warm overnight lows. Sixty-four days during the summer of 2010 recorded overnight lows greater than or equal to 70 degrees, well above the typical 37 days. 2010 will be a summer for the history books.

**Wichita's Warmest Summers Since 1888**



**Wichita June-August Overnight Low  $\geq$  70 Degrees Since 1888**



Overnight low temperatures were also above normal through out meteorological summer (June-August). Wichita recorded 63 days where temperatures didn't not drop below 70 degrees. This is the 3rd longest string of days where this has occurred since 1888.

**...NATURE DID OCCASIONALLY ‘SHOWER’ US WITH ATTENTION...**

It was stated earlier that when temperatures heat up, rainfall often trends in the opposite direction and that June 2010 was no exception. While this was certainly true, there were still periods that were marked by heavy rain-producing thunderstorms, a few of which were severe with 1 inch hail and 60 to 70 mph winds.

There were generally 2 periods during which prolonged very heavy rains occurred: June 7th - 9th and June 13th - 15th. In the first case, the thunderstorms targeted South central and Southeast Kansas as a cold front pushed south across these areas. The front encountered a very moist environment and with the front decelerating, thunderstorms continued to redevelop along and north of the boundary. The heaviest rains occurred over most of Southeast Kansas where 4-7 inch rainfalls overwhelmed most of Butler, Chase, Greenwood, Elk and Woodson counties. Torrential rainfall on June 13th caused widespread flooding in south central Kansas where many locations measured 2-4 inch rainfalls. In a few cases, 1-2 inches occurred in 1-2 hours. Daily rainfall records were set in Wichita, where the 2.94 inches broke the record of 2.64 inches set in 2000; and Salina, where the 2.15 inch total inundated the record 1.44 inches set in 1977. Through the 16th, it had appeared that 2010 might crack the 10 wettest Junes on record for Wichita, Salina, and Chanute, but then nature turned off the faucet, and turned up the furnace.

As mentioned earlier, the July heat was “really juicy”, due primarily to the remnants of Hurricane Alex that provided abundant moisture over south central and southeastern Kansas. This was especially true in Southeast Kansas from July 3rd - 8th. During this 6-day period, Chanute was soaked by 9.47 inches of rain which was 92% of their July total. On three of the six dates, records were set with 2.91 inches on the 5th, 3.29 inches on the 6th, and 2.61 inches on the 8th. In fact, just from the 4th to the 8th, most of Southeast Kansas was drenched by 6-10 inches of rain. In South central Kansas, staggering 6-10

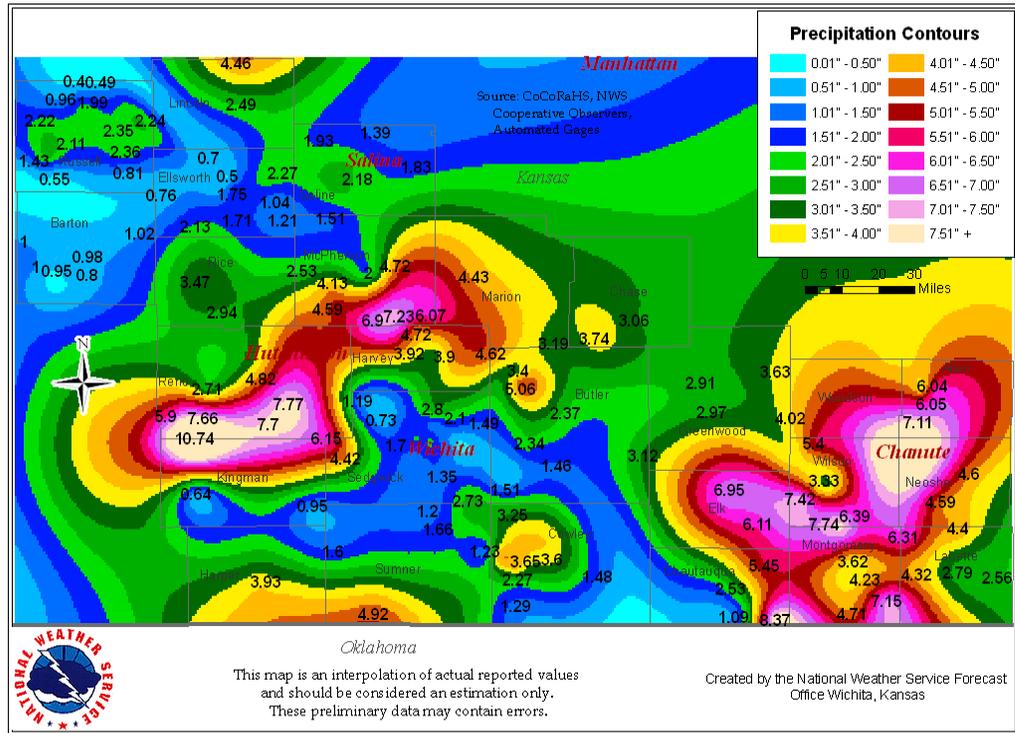
**A staggering 9.47 inches of rain fell in 6 days in early July at Chanute, KS**



**Flooding due to the heavy rains at the beginning of July along the Elk River near Oak Valley in Elk county.**

**Picture courtesy of Mark Payne.**

### 4-Day Storm Total Precipitation ending at 7am on July 7th, 2010



inch rainfalls inundated southern parts of Reno and McPherson counties. Such copious amounts of rainfall obviously caused serious flooding and caused many rivers to 'rise to the occasion' and in the case of the heavy rains of July 4<sup>th</sup>, resulted in some soggy fireworks.

After the 8<sup>th</sup>, Chanute measured only an additional 0.82" of rain for the month of July. After receiving a trace on the 16<sup>th</sup>, Chanute wouldn't see a drop of rain the rest of July, but by then, 2010 had become the 6<sup>th</sup> wettest July on record for Chanute bringing their monthly total to 10.29 inches. Nearby, Parsons was soaked by 7.51 inches while Coffeyville measured 7.46 inches.

On the 12<sup>th</sup> of July severe thunderstorms invaded South central and Southeast Kansas. In Southeast Kansas, the severe thunderstorms produced very heavy rains that drenched Parsons with 2.5 inches which accounted for one third of their monthly total. During the evening and overnight hours of the 15<sup>th</sup> and 16<sup>th</sup>, strong to severe thunderstorms produced generally .75 to 1 inch of rain over parts of South central Kansas.

Even though the very heavy rains had eased considerably during the latter half of July, the copious residual moisture resulting from the hefty rainfalls figured greatly in the humidity that plagued so many areas during these periods as was discussed earlier (see figure on page 13).

Also, as stated earlier, August was noted primarily for marking the end to the oppressive heat and humidity that had plagued the region this summer. On the night of the 14<sup>th</sup>, a slow southeast-moving cold front ventured across Kansas, but before ushering in cooler air, the cold front sparked numerous thunderstorms on the 13<sup>th</sup> and 14<sup>th</sup>, many of which were severe.

**When the remnants of Hurricane Alex moved across the southern Plains it brought an abundant amount of moisture. During the 6 days that ended on July 7th, rainfall totals of 7 to 10 inches were recorded. Areas of south central and southeastern Kansas were hit the hardest.**

**Temperatures cooled by mid-August when a cold front barreled through the region.**

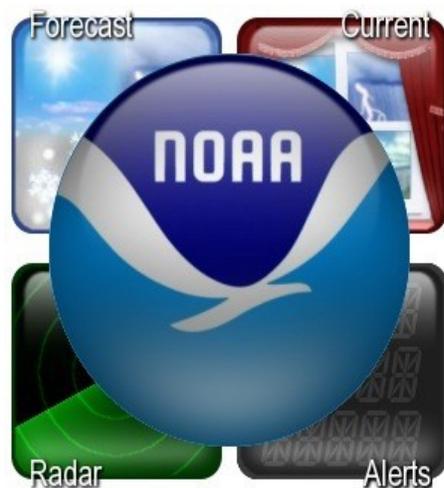
While early August temperatures set the month towards breaking the top 10 hottest August on record...the cool weather during the end of August knocked it out of the running.

After the cold frontal passage, temperatures really cooled, especially in Central Kansas as strong high pressure settled southeast toward Kansas. On the 17<sup>th</sup>, Salina set a coolest high temperature record when the high only reached 72 degrees. This broke the record of 74 degrees set for the date just one year earlier. On the 25<sup>th</sup>, even cooler air spread south across Kansas as nighttime temperatures plunged into the 50s in most areas. Russell's low of 53 degrees on the 25<sup>th</sup> edged the previous record of 54 set in 1985. In fact, the weather was outstanding the last 7 days of August with highs in the 80s and lows in the 50s.



The prolonged period of much cooler weather had such a profound effect on average monthly temperatures that by the 30<sup>th</sup>, the 2010 edition had dropped out of the top 10 hottest Augusts on record for central, south central, and southeast Kansas. For central and south central Kansas, the stellar weather continued as August handed off the baton to September, as persistent high pressure enabled much drier air to remain encamped over the state. In fact, the Labor Day Weekend was outstanding with sun-drenched days and crystal clear nights, but then on the September 15<sup>th</sup>, all 'hail' broke loose (see front page story).

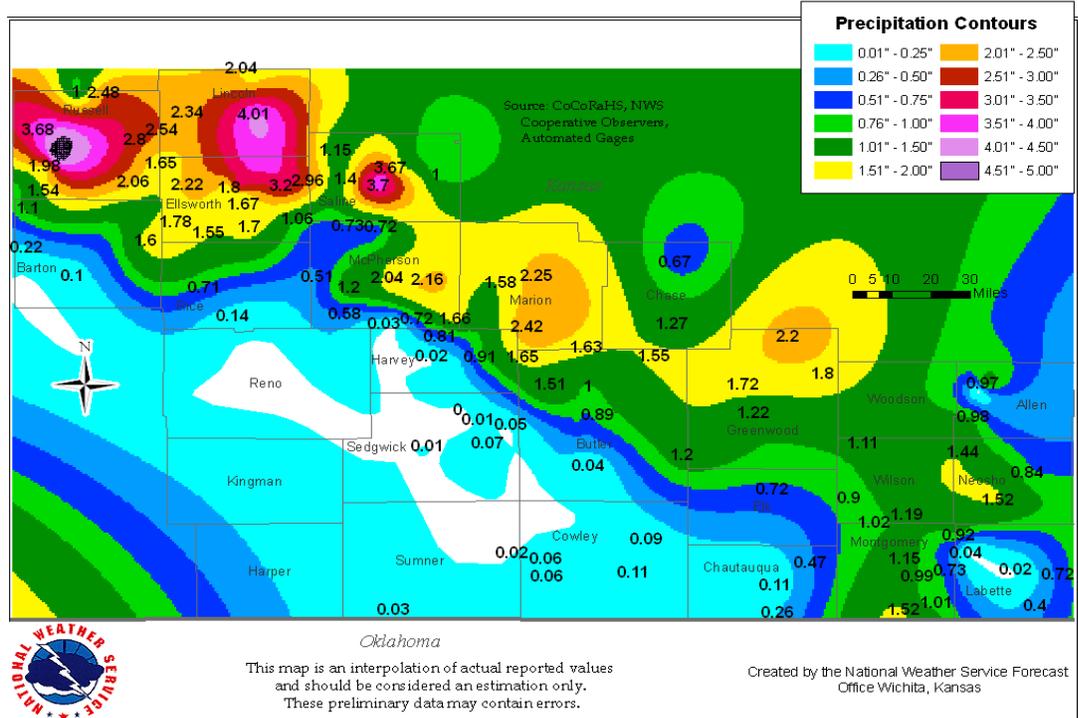
When September arrived, there was some concern that southeast Kansas was getting abnormally dry. That changed in a hurry. Thunderstorms with very heavy rains soaked many areas on the 1<sup>st</sup> and 2<sup>nd</sup>. During this 2-day period, Chanute measured 2.65 inches while Coffeyville measured 2.97 inches. Just 5 days later, Southeast Kansas would get rained on every day from the 7<sup>th</sup> to the 15<sup>th</sup>. During this 8-day period, Chanute measured 5.40 inches and Coffeyville checked in with 3.47 inches. These areas received rain on the 23<sup>rd</sup> and 24<sup>th</sup> and although copious rainfalls didn't occur, it was enough to keep 2010 on pace to gain admission into the "Ten Wettest Septembers" on record. Through the 24<sup>th</sup>, Chanute had measured 8.48 inches and the Coffeyville Water Plant 7.73 inches. But then, Nature turned off the faucet, and 2010 dropped to 12<sup>th</sup> on Chanute's all-time wettest September's list.



For Central Kansas, the only volatile period oc-

Thunderstorms during the early morning hours on September 15th caused flooding and flash flooding in portions of Rus-

### 48 - Hour Precipitation as of 7am on September 15th, 2010



occurred from September 13<sup>th</sup> to the 15<sup>th</sup> when thunderstorms, a few of which were severe with very heavy rains, invaded the area. The torrential rains garnered the greater attention. Salina set calendar day rainfall records on the 13<sup>th</sup> and 15<sup>th</sup> with 1.58 and 1.67 inches respectively. However, Nature really ‘poured it on’ in Russell, where 5.42 inches were measured. Of this total, **4.46 inches** swamped the town early on the morning of the 15<sup>th</sup> to set a record for the date. A nearby weather lab measured **4.92 inches**. No doubt the flooding and flash flooding that resulted was major and resulted in the closures of many roads and highways in and around Russell.

Autumn officially arrived on September 22<sup>nd</sup> at 1013 PM CDT and while the “Super Harvest Moon” made an appearance that night for the first time since 1991, the cloudy skies over Kansas didn’t cooperate. However, the skies did clear for the following weekend after a strong cold front surged southeast across the state. This brought the coldest temperatures so far this fall to spread across the region. Lows tumbled into the mid and upper 40s in most of Central and South central Kansas the morning of the 26<sup>th</sup> with all areas in the lower to mid 40s the following morning. September signed off in stellar fall fashion with sun-drenched skies, moonlit nights, and crisp temperatures. It was quite a departure from the oppressive heat and humidity that had plagued the region for so much of the summer.



## National Weather Service

2142 S. Tyler Rd.  
Wichita, KS 67209  
Phone: 316-942-8483 ext. 726  
Email: chance.hayes@noaa.gov

Newsletter Editor:  
Jerilyn Billings, General Meteorologist  
Email: Jerilyn.Billings@noaa.gov

“The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information, database and infrastructure which can be used by other government agencies, the private sector, the public, and the global community.”



**Online: [www.weather.gov/Wichita](http://www.weather.gov/Wichita)**

### National Weather Service Offices NWS Wichita, KS

A list of the all of the National Weather Service Offices in the Central Plains and the Midwest

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| O | N | D | D | O | O | H | T | U | L | U | D | D | W | E | S | R | S | U | Y | O |
| G | O | O | D | L | A | N | D | F | I | N | T | A | A | K | A | E | E | N | A | R |
| A | B | E | R | D | E | E | N | X | N | E | D | S | R | P | Q | V | P | O | E | O |
| C | L | D | . | T | S | I | J | A | C | K | S | O | N | U | I | N | U | T | S | P |
| I | R | A | Y | K | H | A | F | R | O | N | F | Y | A | B | N | E | E | R | G | K |
| H | N | L | C | C | S | P | S | G | L | D | N | D | K | C | I | D | B | E | M | E |
| C | L | S | B | R | I | R | L | E | N | M | C | Q | N | N | U | M | L | V | P | M |
| R | I | P | I | A | O | M | A | A | A | I | Y | O | A | P | A | L | O | I | A | A |
| B | A | N | O | M | U | S | R | P | T | D | R | T | T | T | I | A | B | R | D | T |
| R | O | D | D | S | X | G | S | I | I | T | S | P | I | V | H | S | Q | X | U | O |
| O | Y | E | A | I | F | O | E | E | H | D | E | H | S | C | R | U | A | P | C | V |
| W | V | T | K | B | A | S | T | W | I | N | C | I | T | I | E | S | K | S | A | G |
| A | G | R | I | R | L | N | E | P | C | I | U | I | H | T | E | G | C | I | H | E |
| N | H | O | O | C | L | B | A | E | W | O | G | A | T | I | K | C | D | U | E | J |
| N | L | I | S | B | S | R | E | P | L | I | S | E | G | Y | U | H | E | O | T | D |
| L | N | T | E | T | D | A | M | D | O | T | I | S | E | H | A | E | P | L | D | C |
| Y | G | N | E | N | L | K | S | B | I | L | T | R | D | O | W | Y | B | . | L | W |
| S | G | R | A | N | D | J | U | N | C | T | I | O | N | R | L | E | G | T | V | A |
| S | D | R | O | L | Y | A | G | H | A | D | E | S | M | O | I | N | E | S | O | R |
| N | G | E | V | L | H | S | T | C | A | K | E | P | O | T | M | N | H | I | O | T |
| A | H | A | M | O | Q | T | H | A | H | I | S | S | M | U | V | E | E | E | G | A |

# NWS Wichita Word Search



Aberdeen  
Des Moines  
Goodland  
Hastings  
Lincoln  
North Webster  
Rapid City  
Topeka

Bismarck  
Detroit  
Grand Forks  
Indianapolis  
Louisville  
Omaha  
Riverton  
Twin Cities

Cheyenne  
Dodge City  
Grand Junction  
Jackson  
Marquette  
Paducah  
Sioux Falls  
Wichita

Chicago  
Duluth  
Grand Rapids  
Kansas City  
Milwaukee  
Pueblo  
Springfield

Denver  
Gaylord  
Green Bay  
La Crosse  
North Platte  
Quad Cities  
St. Louis