Topeka News

Volume 2, Issue 1 February, 2008

Special points of interest:

- Tornado Event from a Chaser's Perspective
- Ice Storm, Dec 2007
- Spotter Talks Begin Soon
- Winter was Wet, with Near Normal Temperatures. What does Spring hold?
- CoCoRaHS– The Volunteer Rain/Snow/Hail Observer Network.

Inside this issue:

December 10-11th Ice Storm

A significant ice storm left much of northeast Kansas coated with between a glaze of ice, up to one and a half inches of ice accumulation between December 10th and 11th. Preliminary estimates indicate at least $170 million in damages occurred in Kansas as a result of the storm, much of this at the expense of local electric companies. These companies struggled to replace thousands of downed power lines for homes and businesses, and the estimated 180,000 people who lost electricity for at least a portion of the storm. Damaged power lines and trees littered the streets and yards of citizens across northeast Kansas after the event. How did this happen?

December 10th, a broad region of high pressure settled over mid-America in the wake of a cold front that passed across the plains states December 8th. This front brought an initial blast of freezing rain and light snow to northeast Kansas. A near surface, shallow, and cold, arctic air mass settled over the plains states. This brought near surface temperatures across northeast Kansas **down into the middle to upper twenties**. An upper level low pressure system lifted from Baja California northeastward through the Central Plains beginning the morning of December 10th. Cyclogenesis in the lee of the Rockies helped to draw an exceptionally warm (**above freezing**) and moist air mass between 3,000 and 8,000 feet northward. The air mass lifted up and over a baroclinic zone...

(continued on Page 3)…

A tree outside the National Weather Service in Topeka was coated with nearly half an inch of ice. Photo by MIC Ken Harding.

June 15, 1992 Storm Chase

By: Bill Gargan, Lead Forecaster

On June 14, 1992 my friend Dr. David Gold and I were out storm chasing across the Texas Panhandle. The cap (a layer of warm air just above the surface that prevents moist parcels of air from rising), was too strong, which prevented storms from developing along the dry line that afternoon and evening. Surprisingly, we were both happy that no convection had developed during the late afternoon or evening—since we both knew that the main upper level trough would move out into the plains the next day. Had thunderstorms developed over the Texas Panhandle that evening, they may have evolved into a large complex of storms that gobbled up all the deep moisture and instability in place across the southern plains that evening. As a result, the atmosphere across central Kansas the next day may not have had sufficient moisture or

Developing Supercell 15 miles SE. © Gene Rhoden

...(continued on Page 4)…

Severe Weather Season is Just Around the Corner!

The National Weather Service in Topeka is the number one resource for severe weather information. Whether you visit us on the web at www.weather.gov/topeka, listen to your NOAA Weather Radio, or observe severe weather and call us on our severe weather line at 1-800-432-3929, you'll always receive the most up to date information from our staff of meteorologists. For more information severe weather information, take a look at the following websites. You'll be glad you did.

NWS-Topeka Storm Spotter Training Schedule: http://www.crh.noaa.gov/top/?n=talks

2008 Severe Weather Information Packet: http://www.crh.noaa.gov/images/top/2008swaw.pdf

Local NOAA Weather Radio Information: http://www.crh.noaa.gov/top/?n=nwr

Severe Weather Preparedness: http://www.crh.noaa.gov/top/?n=wxprep

Reporting Severe Weather By: Matt Wolters, Lead Forecaster

Even though winter's grip has firmly encased Kansas, spring is just around the corner and now is the time to prepare for another severe weather season. Reporting severe weather events to the National Weather Service is an important part of the warning process. Severe weather reports from spotters in the field provide critical information to the warning process that can only be obtained by people on the ground looking at the storm. And the accuracy of those reports is very important too. Some common sources for errors in storm reports include inaccuracies in the time an event occurred or the magnitude of that event. Errors even occur during the communication process when reports are relayed through multiple links. Information can be altered or misunderstood when it passes from one person to another. Steps can be taken to minimize these errors. First be as accurate as possible with your report. Take the time of an event from your cell phone, which regularly updates to a standard clock and is less likely to be off. When hail has stopped falling, grab a ruler and measure the largest stones rather than comparing them to common objects. If you have a GPS unit, report the location of the event in Latitude and Longitude. And most importantly be clear and concise when reporting severe weather to officials, and when possible call the National Weather Service directly. For more information on reporting severe weather, go to **http://www.wdtb.noaa.gov/modules/spotters/player.html**
Over the next few weeks, NWS Meteorologists will be traveling to local communities providing training on how to safely spot storms, and the different types of severe weather thunderstorms produce. Check the latest schedule for when we will be in a town near you. We hope to see you there.

"Severe weather reports from spotters in the field provide critical information to the warning process that can only be obtained by people on the ground looking at the storm."

Severe Weather Summary Page

The Northeast Kansas Severe Weather Summary Page linked from the NWS-Topeka homepage is a one stop roundup of the most important severe weather information available. From detailed weather discussion, storm reports, and radar data, to flood outlooks and river forecasts, to a graphical view and quick glimpse list of all current watch and warning products in effect, the summary page has it all. To access the page, first visit our homepage at **www.weather.gov/topeka.** Click on the "Watches/Warnings" link under the Current Hazards header for the latest in severe weather information.

SKYWARN

Ice Storm, December 10-11th Continued…

...*Continued From Page 1*...(region between two distinct air masses, such as a warm and cold air mass) between 925mb and 850mb stretching from central Missouri back through central Oklahoma—with the cold air mass north of this line. Above 8,000 ft, temperatures were again **below** 32 degrees. Ice crystals formed around 15,000ft . The crystals fell through the deep warm layer and melted (Figure 1, red shading). Then, these liquid droplets fell through the shallow sub-freezing layer below 3,000ft (Figure 1, blue shading). The now super-cooled liquid droplets hit surface structures and the ground and froze on contact. Trees, their limbs, and power lines were particularly susceptible to ice accumulations. Large scale lift provided by the upper level low, and smaller scale lift provided by mid-level frontogenetic circulations provided the forcing to sustain the storms. The prolonged dynamics of this atmospheric set-up established the environment for a prolific freezing rain event across the state.

Freezing rain began around 4pm CST Dec. 10th in east central Kansas, and overspread north central and northeast portions of the state over the next few hours. Light to moderate freezing rain fell for several hours, before ending during the late morning across north central Kansas, and the early afternoon across east central and northeast Kansas. Forecast models indicated precipitable water values between 1 and 1 ½ inches through the event. These totals were realized in some of the hardest hit areas where up to 1-1/2 inches of ice accumulated on trees, power lines and power poles, as well as other structures. The morning of the 12th, 76,000 Kansas were reported to be without power. Additional power outages were reported through the day of the 12th, when stressed trees and power lines gave way. Brisk northwesterly winds began to blow during the afternoon, and continued through the evening hours, which made matters worse. The morning of the 13th, 130,000 Kansans were without power. 180,000 Kansans were without power at some point during or following the storm. Storm shelters were opened across northeast Kansas to take in residents without electricity. Vehicle accidents were reported throughout the region, but for the most part, it seemed Kansans heeded local warnings and stayed home during the worst of the event. One known casualty was reported as a result of the adverse weather conditions, and several injuries were also reported—most of which were a result of car accidents, with a small number due to downed power lines or accidents associated with the clean-up process. Total storm costs estimated at the end of January were more than $170 million dollars. Forecasters at NWS-Topeka issued a Winter Storm Watch during the afternoon of December 8th, and an Ice Storm Warning as early as the morning of the 10th. This gave northeast Kansas residents two days to prepare for the storm. Thanks to the tireless work of local law enforcement and fire officials, emergency managers, and local media, the impact of the event was made as tolerable as possible, despite the severe and significant hazardous conditions. The rebuilding and replanting process is sure to continue through the spring and summer months.

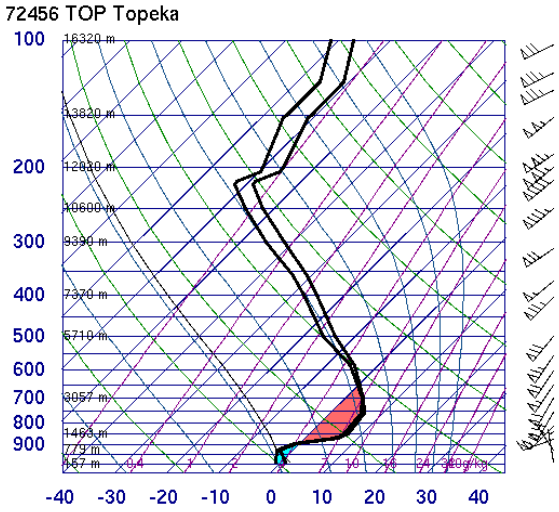


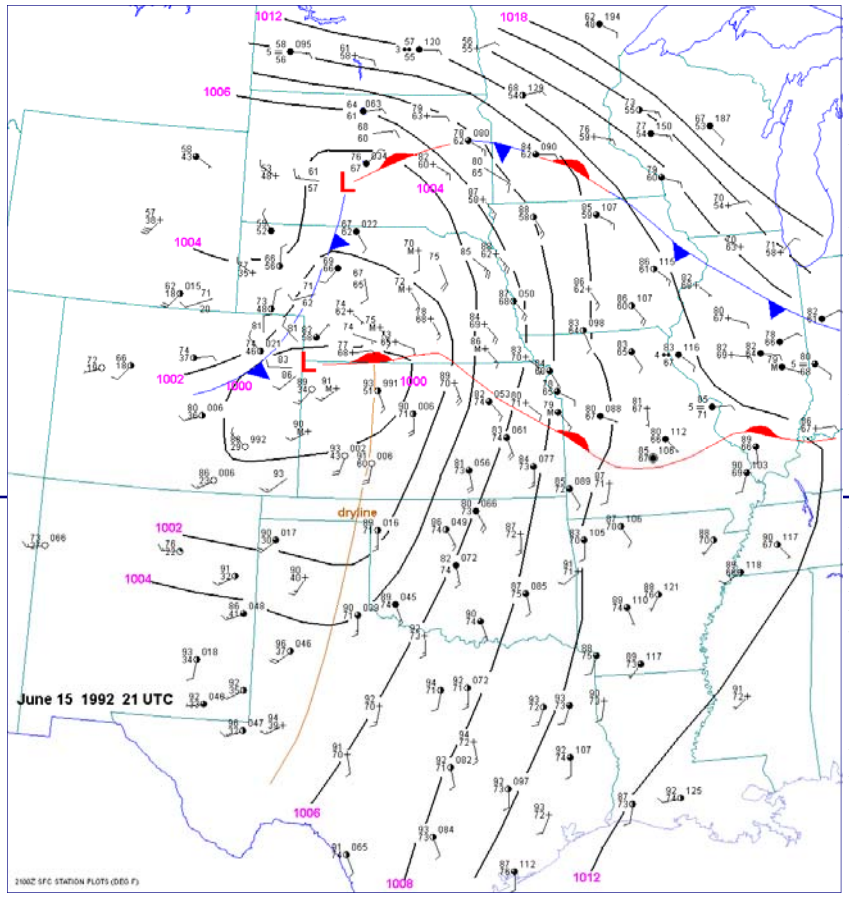
Figure 1: December 11th, 6am sounding profile at Topeka. Note the warm layer between 700mb and 900mb, and the cool layer near the surface indicative of freezing rain.

A tree in Sabetha, KS breaks in response to the heavy ice accumulation. Up to one and a quarter inch of ice accumulated in Nemaha County.

Heavy ice accumulation was incredibly detrimental to the structural integrity of trees and power lines.

June 15th, 1992 Chase Continued…

…*(continued From Page 1)*…instability for deep moist convection. Once we got back home to Norman, OK we looked at the 00Z MRF, Eta and NGM (the limited number of computer models that were available in 1992) in the University of Oklahoma map room. Surprisingly, all three models showed the strong upper level trough over the southwest US lifting northeast into the western high plains. The Gulf of Mexico was wide open and deep moisture was already in place over central and northern Kansas. We analyzed all the 00z soundings and found quite a bit of instability and deep moisture across most of the southern plains. We were excited about the environment across north central and central Kansas on June 15th, where strong vertical wind shear and high instability would occur across much of central KS along and ahead of the dry line. Rotating storms and tornadoes were certainly possible. Our initial target area for June 15th was Russell, KS along the dry line. We were excited about a potential big chase day and got very little sleep. We woke up at 5 AM, hoping a large complex of thunderstorms had not developed over the southern plains overnight. The cap had held, and the only storms were across central NE, moving northeast. We first drove up to the National Severe Storm Laboratory where David Gold worked at the time. There we met friend and fellow weather enthusiast Gene Rhoden who also worked at the Lab. Gene had the rest of the day off and decided to join us on our chase. Gene also had a video camera. At noon we ate lunch in Russell and called back to the OU map room, asking if any of the students could read us some noon surface observations. Luckily one student agreed and dictated the temperatures, dew points, wind directions and surface pressure for several locations across western and central KS. In 1992, we didn't have laptop computers to download data or WIFI connectivity, so we depended on OU students for information on any issued watches and for updated observations. Forecasting from the noon surface observations, we expected the dry line and warm front intersection to be east of Oberlin by 3 PM, so we headed northwest to Norton, KS. We sat around Norton from 4 to 5 PM and watched as shallow cumulus clouds popped up and dissipated. Visually, it looked as if a very strong cap was in place, and we assumed only a few storms would develop. We finally spotted some cumulus clouds that were beginning to develop vertically off to the southeast.—tall enough to be classified as "Towering Cumulus Clouds (TCU)"—and they looked to be working on breaking the cap. Eventually, enough TCU started growing and tilting eastward as the mid level winds increased. During the next half hour, one dominate cumulonimbus cloud formed. The convection took on a classic cauliflower appearance. Gene Rhoden took time lapse video of the first cumulus that develop into this rather intense storm. We initially thought the storm was about 20 miles to our southeast. But, after watching the main tower develop we determined we were about 50 miles from the developing storm and had to quickly drive southeast to intercept this new supercell. We listened to the AM radio and heard that the National Weather Service had issued a severe thunderstorm warning Ellis County, and that the storm was northwest of Hayes, nearly 60 miles to our southeast. We realized we would have been in much better position had we stayed in Russell, where we stopped for lunch earlier in the day. While driving east on Hwy 36 toward Phillipsburg, KS, we noticed that our supercell had split and that the left moving piece was racing to the north-northeast. We observed a 50 to 60 mph wind gust and quarter size hail as the left mover passed over us west of Phillipsburg. The gusts blew a wall of dust across the road, and visibilities dropped to near zero. We slowed the car down to under 25 MPH for a few moments. Once we reached Phillipsburg, we turned south on to US- 183 and headed



Surface Analysis: 7pm, June 15th
© Jonathan Finch

June 15th, 1992 Chase Continued…

for Plainville. At the same time, we heard reports on the radio of a tornado warning issued for Rooks County for the right moving supercell. Minutes later, we entered northern Rooks County and could see the bell shape updraft base to our south. A report on the radio stated that a tornado had struck the community of Plainville. We moved south to the east side of Plainville, but did not see much in the way of damage. By the time we reached the town, the storm was already to our northeast. We turned right on state Hwy 18 and eventually got east of the tornadic storm. At the town of Luray, we turned north onto US Hwy 281 and traveled fifteen miles where we ran into the tornado warned storm. The storm base had become completely rain-wrapped—if there was a tornado it was not visible to us. We stopped south of the storm and watched it move east-northeast across the road . There was golf ball to baseball size hail wrapping around the storm base as well as heavy rain. We knew this was a high precipitation (HP) supercell, and were able to see striations in the thunderstorm tower, and scud clouds rotating around the base of the thunderstorm. We were not too thrilled to be observing an HP storm since we expected the vertical wind shear to be strong enough to keep supercells in more of the classic mode, and leave the precipitation northeast or north of the thunderstorm updrafts. We sat south of the storm, and watched as it crossed the highway. Several motorists attempted to drive northward into the storm. We blinked our lights and honked our horn to alert them of the possible danger for large hail, severe winds and possibly a rain wrapped tornado. We had our target storm in sight and we wanted to keep east of it, so we dropped back south on Hwy 281, then turned east on Hwy 18 before heading north on a county road that led to Tipton. Once we got back east of our HP storm we noticed that a new updraft had developed east of our HP storm. The new storm developed a low hanging wall cloud as we drove north on the county road toward Tipton. The rain was all well north and northeast of the base of the storm—thus we could clearly see the wall cloud. We stopped about 5 miles south of Tipton

Second Tornado Near Waconda Lake
© Gene Rhoden

Second Tornado Maxing Out
©Gene Rhoden

near the town of Hunter since the county road went west two miles before turning north again, and we did not want to get caught behind the new storm or close to the HP storm. As we watched the new storm to our north the wall cloud got bigger and started developing toward the ground. Suddenly, a funnel cloud dropped toward the surface. A moment later, we could see dirt being kicked up at the surface and we yelled out "Tornado!" There was no way to call in the report to the NWS as we did not have a shortwave radio, nor a cell phone. The tornado grew wider and soon became a large cylinder, what storm chasers call a stove pipe tornado. The contrast from our position got very bad, so we followed the storm due north. Evidently, this new classic supercell was slowly being drawn into the monster HP storm just to the northwest. We took Hwy 181 north to Tipton, then took a small county road that curved east about 5 miles south of Waconda Lake. A third updraft developed right over the lake. The entire storm tower was rotating, and a rotating wall cloud was rapidly developing. Suddenly, a tornado formed with a big debris fan developed. We were within a couple miles of this tornado but noticed that it was getting absorbed into the inflow of the huge HP supercell to our west where the first and second supercells had congealed into one monster storm complex. Our nice classic tornado grew into a rather large tornado that quickly became engulfed in precipitation as the storm was absorbed into the big HP to the west. This complex of several supercell updrafts that had congealed over time resulted in the largest supercell thunderstorm I have ever witnessed in my 17 years of chasing. We drove east and southeast to avoid

View of Large Supercell Complex
© Gene Rhoden

the large hail core moving towards us. We decided to set up east of the supercell complex. The inflow winds of this massive storm picked up to 60 mph with gusts to near 70 mph. It was very difficult to stand outside of the car without being blown down. As the storm approached us a nice tapered cone tornado sank down from the south side of the supercell complex. The back lighting made for great contrast as the tornado touched down in an empty wheat field about one mile west of our position.

...(continued On Page 8)…

CoCoRaHS

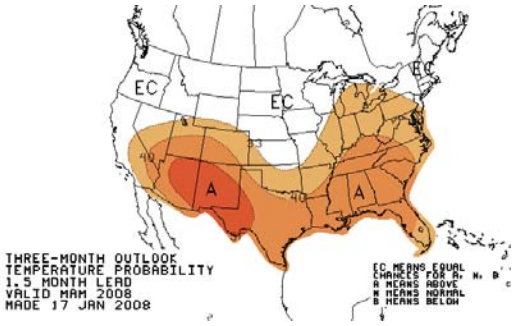
The Community Collaborative Rain, Hail, and Snow (CoCoRaHS) Network was founded at the Colorado Climate Center at Colorado State University in 1998. Since, more than 6,500 men and women in 26 states across the US have signed on to take daily rain, snow, and hail measurements at their homes, then upload the data to a community website that plots their observations. Anyone is able to join the CoCoRaHS community and is encouraged to do so, especially those who are enthusiastic about the weather. Teachers and schools who join the program also get to enrich their own curriculums, and bring weather related activities into the classroom setting. There are only four requirements for observers to get started. First, individuals need to have internet access in order to post their precipitation observations. Second, individuals must be equipped with a high capacity 4-inch diameter rain gauge. These can be ordered online, or through local CoCoRaHS coordinators. Third, individuals must be willing to take an observation at the same time every morning. Finally, each potential observer is expected to go through a brief training slide show available online. Volunteers are then asked to post their report on the CoCoRaHS website. Users, including the National Weather Service in Topeka, are then able to view and download reports from across the county. Locally, these reports help meteorologists assess weather systems that have passed across the plains, verify forecasts, and prepare hydrologic forecasts. Volunteers are invited to participate in other CoCoRaHS activities as well, including training sessions, picnics, and contests.

For more information, visit **www.cocorahs.org** and click on the state of Kansas. You may also contact State Climatologist Mary Knapp by email at **mknapp@ksu.edu,** or the National Weather Service in Topeka at **w-top.webmaster@noaa.gov** for details.

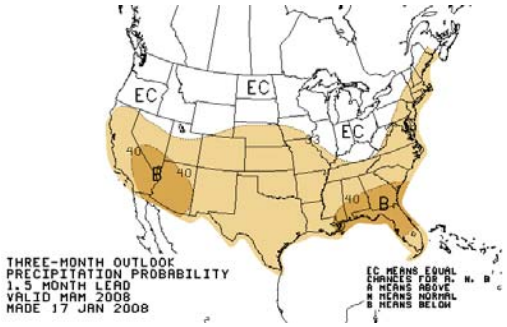
Winter Climate Review, Spring Outlook

The second highest monthly snow total for Topeka was recorded in December—16.5 inches—thanks to several winter storm systems. A potent system struck nearly every weekend of the month. The single greatest total came on December 22, when a skinny band of heavy snow stretching from Brown County southwestward to Shawnee County dropped 9 inches of snow. In Topeka, this tied the December record for a snowfall in a single day. The ice storm of December 10th and 11th was also one for the record books—please refer to the lead story of the newsletter for more information. Large daily temperature swings highlighted January, when several strong cold fronts brought an end to a few brief periods of above normal temperatures. A 40 degree temperature swing in daily highs occurred between the 28th and 29th. Nevertheless, the average temperature for the month was near normal.

The Climate Prediction Center has forecast for the March-April-May 2008 period equal chances for above, below, or near normal temperatures. Similarly, there is an equal chance for above, below, or near normal precipitation during the spring. The average high temperature during the month of February in Topeka is 43,8 degrees, and the low 23,0, The month of March has an average daily high temperature of 55.5 degrees, and a low of 32,9 degrees. April's average daily high temperature is 66.1 degrees, and the low 42.9 degrees. An "Equal Chance" means that the average monthly temperature or precipitation total has an equal chance of coming in above, below, or near normal. Variations in both the daily temperature and precipitation are likely, but the monthly forecast is the focus of the Climate Prediction Center.



March-April-May Temperature Outlook
Equal Chances for Temperatures At, Above or Below Normal.



March-April-May Precipitation Outlook
Equal Chances for Temperatures At, Above or Below Normal.

Local Events– MLK Jr. Scholars Day

Every year, National Weather Service Offices across the United States host a "Martin Luther King Jr. Scholars Day" for area students. The event began right here at the National Weather Service in Topeka back in the mid-1980s. The event was started in an effort to encourage students to pursue careers in the sciences. This year, eight students from the Williams Magnet School in Topeka came for a visit to the National Weather Service Office. The students learned about satellite imagery and the local WSR-88d Doppler Radar, the operations and broadcast cycle of the NOAA Weather Radio (and even recorded a few products for the broadcast!), the computer systems and models meteorologists use to produce the forecast everyday, A winter storm system was on the verge of entering the central plains states, and the students were lucky enough to participate in a special noon weather balloon release.

DAPM Bill Newman shows the students a radiosonde used during daily weather balloon launches.

Local Events- Storm Spotter Talks Underway!

The Spring season ushers in the chance for severe weather across northeast Kansas. Meteorologists from the National Weather Service in Topeka take the time each March and April to travel across northeast Kansas and hold Storm Spotter Training classes. These classes are intended to introduce new volunteer spotters to storm characteristics, proper reporting techniques, and the severe weather forecast process. Experience spotters may attend to brush up on their skills. Anyone who would like to become a storm spotter, or those with a general interest in weather—especially severe weather—is encouraged to attend. Classes typically last one to one and a half hours. At least one class is held in each county across Northeast Kansas. If you are unable to attend the class for your county, feel free to attend one elsewhere. For a listing of all storm spotter class that will be held this spring, visit::

http://www.crh.noaa.gov/top/?n=talks

Retirements/New Hires

The National Weather Service in Topeka experienced several staff changes over the past few months. One member of the forecast staff, and one member of the electronics staff retired in January after long periods of government service. Their dedication to service and positive demeanors were certainly appreciated by the rest of the office. Both went above and beyond the call of duty, and will be missed greatly. One new member of the forecast staff started during the middle of January, and an intern promoted to a forecaster position in the middle of February. Congratulations to all!

For information on all job openings in the Federal Government, visit **www.usajobs.com**.

Retirements

Paul Franz– Journeyman Forecaster
Michael Sherer– Electronics Technician

New Hires

Josh Boustead– Lead Forecaster
Beth Konop– Journeyman Forecaster

National Weather Service
1116 NE Strait Avenue
Topeka, KS 66616

Phone: 785-234-2592
Spotter Hotline: 1-800-432-3929
E-mail:
w-top.webmaster@noaa.gov

Topeka News

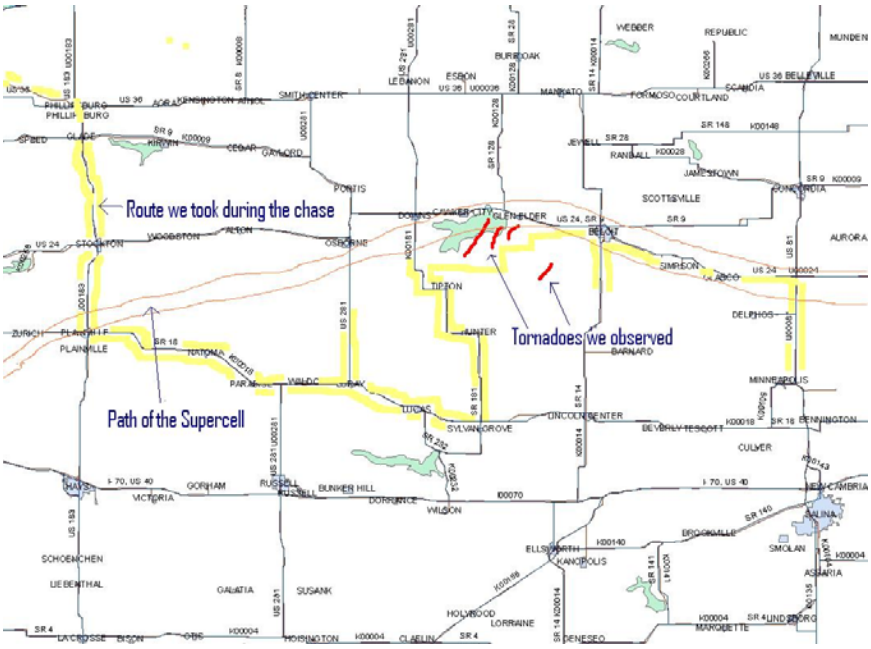
Do you and your family have a NOAA Weather Radio? The National Weather Service in Topeka is responsible for all local broadcasts on the five transmitters that serve counties across northeast Kansas. The minute a product is issued by the office, it is immediately broadcast on the NOAA Weather Radio. Severe thunderstorm winds have already caused damage in east central Kansas this year—which should remind everyone that it is never to early in the year for severe weather! The radio your first source for watch and warning information during both winter weather and severe weather events, but also broadcasts current weather information, river and flooding information, daily climate summaries, and other significant weather information. The radio also was recently upgraded to broadcast civil emergency messages and Amber Alerts. For more information, call your local National Weather Service Office, or visit one of the following links.

http://www.crh.noaa.gov/top/?n=nwr

http://www.nws.noaa.gov/nwr/

June 15th, 1992 Chase Continued…

...(continued From Page 5)…The tornado moved northeast passing about a mile to our north. We started to get more precipitation so we dropped southeast on Hwy 24 from Beloit. It grew dark, yet we kept just east of the massive supercell complex. A large tornado was reported on the ground (via radio report) west of Beloit at dusk. We had been in Beloit several minutes ago and didn't realize how anyone could have seen a tornado wrapped up by rain and hail. We got to Hwy 81 in southern Cloud County, and had to go south a few miles to east of Delphos, since the big supercell complex was beginning to move a bit to the southeast. We set up to watch the storm pass about 5 miles to our northwest and north. The lightning was incredibly vivid, and we had spectacular views of the storm structure. We were even able to see the wall cloud under the base of the storm. The lightning with this storm was very intense and frequent, yet we could not really tell if a tornado was on the ground moving across Hwy 81. On the radio we heard reports of a tornado crossing Highway 81 north of Delphos but could not see the tornado from our vantage point. After watching the storm for another 20 minutes or so we decided to head back for the long drive to Norman. While driving south of I-135 we ran across the damage path of a strong tornado that moved across the interstate north of McPherson. We had noticed a distant supercell to our south and southeast earlier in the evening. We were wondering if this storm had produced a tornado, and evidently it had.



Map of Chase and Observed Tornadoes