Topeka News

Volume 3, Issue 2 May, 2009

Special points of interest:

- Recent upgrades to system that tracks daily weather balloon flights.
- Heat Safety this Summer—an important guide to review.
- Spotlight on Northeast Kansas Fire Weather

Inside this issue:

Mid February—Mid May Weather Summary...

February: The lone convective event of the month occurred during the morning of the 9th. Low topped supercells developed ahead of a cold front. Wind gusts up to 70mph were observed with the stronger storms, and minor damage to road signs, power lines, and outbuildings was noted. Once the convection and front had pushed through by the afternoon hours of the 9th, strong pressure gradient winds with sustained speeds of 30-40 mph, gusted to between 55 and 65 mph at times during the afternoon! Telephone and power poles across the eastern half of the county warning area were reported to have been damaged—especially those that still showed signs of damage from significant ice storms that have occurred the past few years. Otherwise, weather in Topeka for the month was warmer and drier than normal, most notable during the first half of the month when the region sat beneath an upper level ridge of high pressure.

Low-level storm structure, several minutes after the second of two May 15, 2009 Coffey County tornadoes touched down. Photo by meteorologist Scott Blair, used with permission.

March: The first bout of severe weather to affect the area in March arrived during the afternoon hours of the 7th. Several supercell thunderstorms developed along a nearly stationary cold front draped across northeast Kansas. Hail was the primary hazard associated with these thunderstorms, and stones up to the size of a golf ball (1.75" in diameter) were reported to the National Weather Service in Topeka. The 23rd of the month, a strong upper level storm system tracked across the central plains states. Strong pressure gradient winds again picked up across the region, and managed to rustle around traffic signals, billboards, and tree branches. Few unsecured garbage cans and pieces of lawn furniture made it through the day undisturbed. Near 3:30pm, a surface cold front began to lift through northeast Kansas, and robust thunderstorm development overspread the region. Strong thunderstorm winds—up to a whopping 97mph measured on the Kansas State University campus in Manhattan!—were measured at

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Updated Upper Air Technology at WFO-TOP! by Shawn Byrne, Meteorologist

NWS-WFO Topeka officially said good-bye to the Automatic Radio Theodolite (MicroARTs) instrument tracking system at the end of March, 2009. The last balloon flight using the MicroARTs system was launched on March 26, 2009 at 6 a.m.. The MicroARTs system had a long history at Topeka as the site was chosen as an early test bed in mid 1980's with nationwide deployment not occurring to the late 1980's. The first flight using MicroArts (see photo) was launched on April 6, 1984 at Billard Airport. Time and wear required the MicroARTs system to be replaced. In fact, the system was still using an old IBM XT computer with 5 ¼" floppy discs until decommission.

Advancements in GPS satellite technology lead to the development of the Radiosonde Replacement System (RRS). Instead of using radio signals to triangulate a position in order to determine wind speed and direction in the upper atmosphere as MicroARTs had, the RRS uses GPS satellite technology to determine its exact location and height in the atmosphere. This results in higher resolution of wind information since the GPS receiver keeps constant track of the radiosonde's position and height at all times.

April 4, 1984 inaugural official release of the weather balloon tracked by the MicroART system. The release shelter (at right in the above photograph) is still used today to prepare the weather balloon two (00 and 12 UTC) or potentially more times each day

Some things may never change however as the RRS still transmits pressure, temperature and humidity information via radio signal, but data resolution has increased nearly 3 times over that of MicroArts! The increased resolution greatly enhances weather prediction model output used to prepare forecasts, identifying aviation hazards with greater accuracy such as low level wind shear, and helps in identifying mesoscale features to better anticipate where and when severe weather may threaten.

Installation of the RRS began at the Topeka WFO in late March. The first official flight was April 6, 2009 which was exactly 25 years after the first official MicroARTs flight.

Meteorologist Shawn Byrne prepares for the balloon launch using the new system.

Weather Review Continued...

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several locations. Large hail up to the size of a half dollar piece (1.25" in diameter) when measured was also observed at several locations. A lone tornado occurred in Nemaha—the first of the year within the National Weather Service in Topeka's County Warning Area. The tornado was rated an EF-1 (winds speeds of 86-109mph). The first damage noted occurred three miles west of Oneida at 6:33pm, where a power pole was broken, and the roof was torn off a large hog confinement building. The tornado then damaged numerous homes and buildings along it's eight and a half mile path before lifting at 6:45pm, five miles northeast of Bern, just before crossing into Nebraska. A final significant weather event capped off the month—but not in the form of thunderstorms Instead, a winter storm walloped portions of the state. South central Kansas saw up to 18 inches of snow—while closer to home rain, freezing rain, sleet, and snow were observed. A challenging forecast scenario took shape over northeast Kansas, where a midlevel wedge of warm air continually streamed northward through the event, which kept midlevel temperatures above freezing. This warm layer melted ice crystals/snowflakes as they fell, allowing for the mixy precipitation to fall. Nevertheless, ice accumulation on trees and road-

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Heat Wave: A Potentially Deadly Hazard by Matt Wolters, Lead Forecaster

You may be thinking, now that spring is on the down swing and summer is arriving, the risk for hazardous weather is not as serious. Thoughts are usually on the pool, going to the lake, and enjoying the outdoors rather than severe weather and tornados. Unfortunately, summer is not the time to let ones guard down. On average 170 people die from excessive heat each summer across the country, which is more than any other hazard including tornados, floods, lightning and hurricanes (for more info, visit http://www.nws.noaa.gov/om/hazstats.shtml).

Heat related illnesses occur when the body is unable to cool itself down, often when the relative humidity is high with temperatures in the mid 90s and into the triple digits. When the weather is "hot and humid" it is harder for perspiration to evaporate into the air which is the primary way the body cools itself. The table below shows heat indices and when dangerous conditions can exist.

However a single heat index reading may not fully convey the dangers of the heat, especially when there are consecutive days of hot and humid conditions producing stress on the body. Three or four days in a row with heat indices around 100 degrees can present a hazard. Urban areas pose a special hazard as well where the air could become stagnant and trap pollutants in the city. Children and the elderly are most susceptible to heat stress. Heat related illnesses include sunburns, heat cramps, heat exhaustion, and heat stroke that could lead to death.

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

Since each person may react to the heat differently, it is important to pay attention to signs the body is giving due to heat stress. Some of the first signs of a heat disorder include heavy sweating, feeling weak, and having cold, pale or clammy skin. If you begin experiencing these symptoms, get out of the sun and find some shade or air conditioning. Use a cool wet towel and a fan to help cool down. If there is persistent vomiting or someone becomes unconscious, seek immediate medical help.

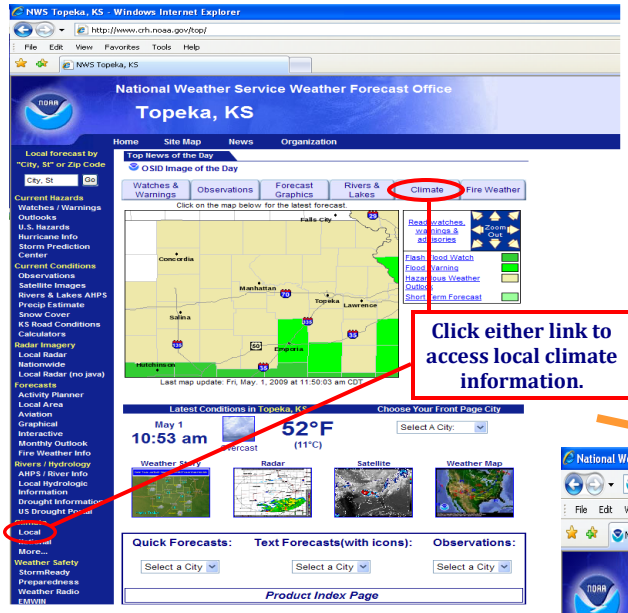
The National Weather Service in Topeka issues Heat Advisories when the heat index is expected to be around 105 degrees with actual air temperatures of 100 degrees or higher. An Excessive Heat Warning is issued if the heat index will be around 105 for 4 consecutive days or if the heat index is expected to reach 110 on any day. If there is a Heat Advisory or Warning in effect, people should take steps to minimize time spent out doors, make sure they have plenty of non-alcoholic fluids, and find a cool place to spend the afternoon if there is no access to air conditioning.

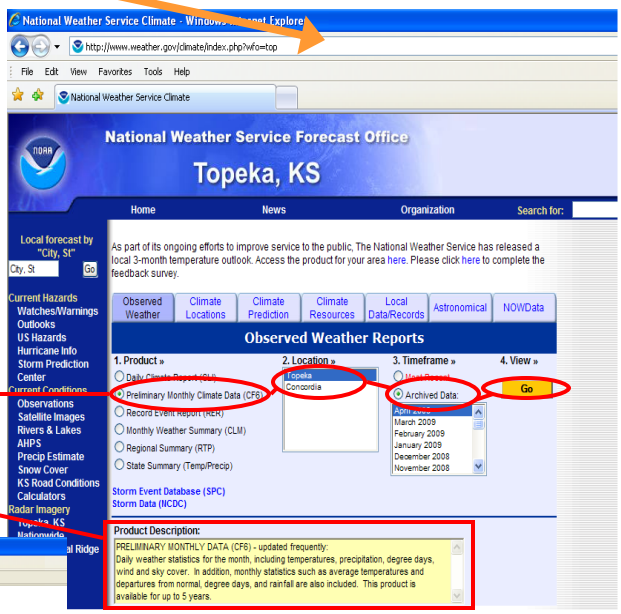
When you are putting on the sun screen and grabbing the beach towel this summer, don't forget to take precautions from the heat. Also be sure to plan any outdoor work for the morning or evening hours when it will be slightly cooler.

Climate Page Tour by Jared Leighton, Meteorologist

Archived climate data at www.weather.gov/topeka

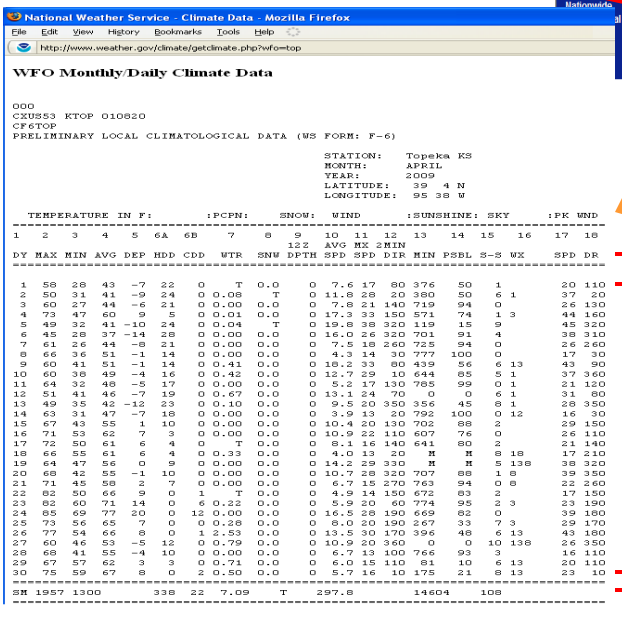
National Weather Service archive data is useful for collecting weather information from previous years. By following these instructions anyone can access many useful weather measurements from home 24 hours a day.





1. Select the product of interest
2. Select the city of interest
3. Select "Archive Data" and select the timeframe of interest
4. Click "Go"

Provides a description of each product and the amount of archive data available to the user



Weather Conditions

Daily Values

Monthly Totals

Fire Weather—Did You Know? by Kris Craven, Lead Forecaster

Did you know that the National Weather Service in Topeka also produces forecasts specialized for the fire community? The NWS works with partner agencies such as the Bureau of Indian Affairs, the Forest Service, area National Wildlife Refuges, as well as state and federal officials, to assist with their fire weather needs. Every day of the year, NWS Topeka issues a Fire Weather Planning forecast that can be used to determine how weather conditions will impact fire behavior on any given day for the upcoming week. These forecasts include information such as relative humidity, wind speed and direction, high temperatures and smoke dispersal to name a few. Often, these partner agencies need forecasts for planned burns (also known as prescribed burning), and can also request these 'spot' forecasts for wildfires.

Spot requests are frequent in the spring and fall, when prescribed burning is at its peak. These are the times of the year when the grasses are typically dead and cured, and burn more readily than when green. The weather conditions at these times of year are also more suitable to burning, with enough wind to push fires, yet not as much wind and heat as to make fires unmanageable.

Burning is also conducted by local land owners, sometimes as required by some CRP (conservation reserve program) lands, or simply to maintain their own pastures. Burning is often done to rid lands or invasive species such as the eastern red cedar, and brings new green growth to rangelands for grazing. The fire weather forecasts issued by the NWS in Topeka are available for all of north central, northeast and east central Kansas, and can be used by anyone with an interest in fire weather. There are also many publications available about the prescribed burning process, available through your county extension office or through the state climatology office.

New Staff Members at WFO-TOP by Ken Harding, Meteorologist in Charge

File photo of the National Weather Service office in Topeka, Kansas

The past few months, several members of the NWS-Topeka staff have moved onto bigger opportunities.

Jennifer Stark, former Warning Coordination Meteorologist, was promoted to Meteorologist in Charge at the National Weather Service in Pueblo, Colorado. **Chad Omitt** has been hired to fill her position. Chad has spent the past 3 years at the National Weather Service in Indianapolis as a senior forecaster. The previous 5 years he worked as a general forecaster at the National Weather Service in Wichita, Kansas. Chad and his family should arrive in the Topeka area after the 4th of July holiday.

The staff also said goodbye to **Josh Boustead**. He was hired as a senior forecaster at the National Weather Service office in Omaha, Nebraska. In his place, **Sally Pavlow** has been selected at a new senior forecaster in Topeka. Sally also hails from Indianapolis where she worked a general forecaster for nearly 10 years. Sally will arrive in Topeka early in June.

Dennis Cavanaugh, who worked as both an intern and general forecaster in Topeka, was promoted to a senior forecaster position in Dallas/Fort Worth, Texas. We hope to have a replacement named for the general forecaster position the first week of June.

Jesse Lundquist, our student intern, recently received his degree in meteorology from the University of Kansas. He will be moving to an intern meteorologist position at the National Weather Service in Cheyenne, Wyoming this July.

Although the faces change, our dedication to science and service remains. We look forward to the arrival of our new hires and the opportunity to continue to serve you.

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ways did become problematic across portions of Osage County and at several other location. The month was otherwise characterized by slightly above normal temperatures, and much higher than normal precipitation at Topeka. Portions of north central Kansas fared a bit differently, with below normal precipitation.

April: A relatively active weather pattern through the month brought the state, which provided a focus for a somewhat prolonged period of wet weather as the pieces of upper level energy moved through. Hail was the primary severe weather event these few days, but the copious amount of rain led to both flash flooding and some river flooding across the area. Temperature-wise, Topeka averaged close to the climatological normal. But, precipitation at Topeka was the sixth highest April total in the 1887 to 2009 period—with a monthly total of 7.09" recorded. Concordia on the other hand, received only 3.83" of precipitation—but still an above normal about of liquid.

A piece of debris impaled the roof of a house as a result of strong winds associated with a weak tornado in Nemaha County the evening of March 23rd. Photo by Ken Harding, used with permission.

May: Heavy rain fell on the 8th across portions of east central Kansas. Large hail and heavy rain associated with severe thunderstorms struck during the late afternoon and evening of the 13th as a strong cold front moved through the region. Two brief tornadoes (each rated EF-0) were also reported on this day, both of which occurred in Coffey County—bringing the yearly total for the National Weather Service in Topeka's County Warning Area to three. The 15th was characterized heavy rain and large hail as a warm front lifted through the region. Reports of hailstones up to the size of baseballs were received at the National Weather Service! Relatively quiet weather settled in for the remainder of the month as a strong upper level ridge took hold of the weather pattern over the central plains states. Warm temperatures with little more than a handful of afternoon showers were noted to have occurred—very atypical for the month of May.

several rounds of severe weather to the region , but the most widespread event was confined to the period between the 25th and 27th of the month. Leading up to the event, a good amount of moisture from the Gulf of Mexico streamed northward, and into the central plains states. An upper level trough moved through the western U.S., and into the plains. The northern stream portion of the trough remained progressive, and continued a push eastward. Some of the southern stream energy hung up over the southwestern U.S., before being kicked through by another piece of energy early the 27th. A cold front coincidently dropped into the region, and stalled along an east/west axis over