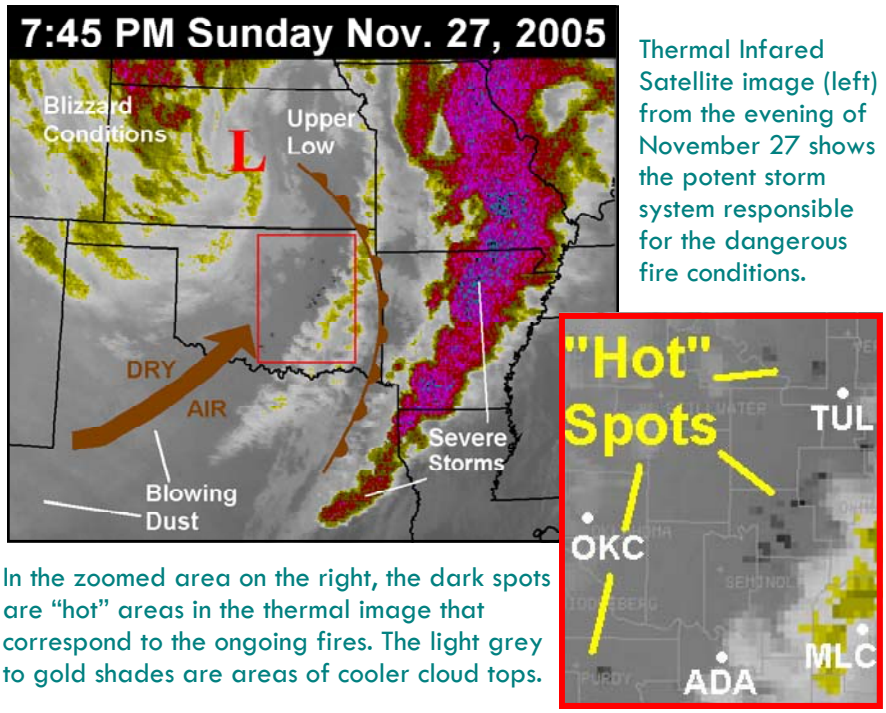
www.srh.noaa.gov/tulsa

Tulsa Tornado Tribune

"Where People Who Know The Weather Get Their Weather"

National Weather Service Tulsa, Oklahoma — Winter, 2005-06

Wildfires Rage Across Northeast Oklahoma



Thermal Infared Satellite image (left) from the evening of November 27 shows the potent storm system responsible for the dangerous fire conditions.

In the zoomed area on the right, the dark spots are "hot" areas in the thermal image that correspond to the ongoing fires. The light grey to gold shades are areas of cooler cloud tops.

As Thanksgiving weekend came to a close, strong gusty winds wreaked havoc across eastern Oklahoma and portions of northwest Arkansas during the late afternoon and evening hours of November 27. A powerful low pressure system moved out of the Rockies across Kansas bringing a wide range of weather to the central United States.

Initial forecasts for this system focused largely on a severe weather outbreak, but there was considerable uncertainty on where the low would track. One thing was clear, this was a very dynamic system. While blizzard conditions made holiday travel miserable across western Kansas and eastern Colorado, severe thunderstorms ripped across Arkansas, Missouri and eastern Kansas. At least 20 tornadoes were reported.

As the event neared eastern Oklahoma, severe weather chances appeared less significant, and the attention began to shift toward fire weather concerns. A Red Flag Warning along with a Wind Advisory were issued by the NWS in Tulsa at 4 am Sunday morning. A

(Continued on page 2)

Drought Worsens

Severe to extreme drought conditions have developed across southeast Oklahoma, where a historic lack of rainfall has left the area with its third lowest year-to-date (Jan. 1-Nov. 30) total on record. Even more significant, the 180 day total from June 1 to November 30 is officially the driest such period on record! Year-to-date rainfall totals are 17 to 20 inches below normal in some spots.

Moderate to Severe drought conditions continue across the remainder of eastern Oklahoma, as well as western Arkansas. While these areas have seen at least a few periods of beneficial rain, southeast Oklahoma has largely missed out. Even the remnants of Hurricane Rita provided

(Continued on page 6)

Editor's Notes

Remember how just a year ago we were wishing for a break in the wet weather? Well, be careful what you ask for! Unless the weather pattern changes drastically over the next month, it appears southeast Oklahoma will finish in the top 5 driest years on record.

Normally, when winter approaches, we think of snow and ice. However, due to the ongoing drought conditions affecting most of the area and recent fire activity, this edition will focus heavily on fire weather.

Craig A. Sullivan - Editor

Inside this issue:

Wildfires

(Continued from page 1)

few severe thunderstorms did develop across extreme northeast Oklahoma and northwest Arkansas, with nickel-size hail reported at Bartlesville, OK and Natural Dam, AR. Trees and power lines were downed in Springdale, AR.

But as the evening progressed, it was becoming clear that a significant fire weather episode was taking shape. The Wind Advisory was upgraded to a High Wind Warning for most of northeast Oklahoma by 3:30 pm, as reports of wind gusts in excess of 60 mph came in from central Oklahoma behind the dry line.

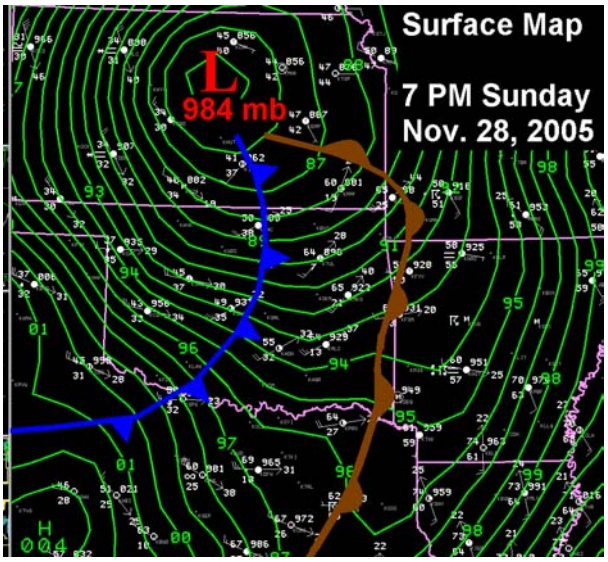
Peak wind gusts reported from the Oklahoma Mesonet		
Haskell	66 mph	5:40 pm
Pryor	65 mph	6:15 pm
Porter	65 mph	5:55 pm
Inola	64 mph	6:10 pm
McAlester	63 mph	6:25 pm
Miami	62 mph	7:05 pm
Vinita	62 mph	5:30 pm
Webbers Falls	61 mph	7:40 pm
Okmulgee	61 mph	5:15 pm
Okemah	61 mph	4:50 pm
Hectorville	61 mph	4:05 pm
Nowata	60 mph	4:45 pm
Bixby	58 mph	4:55 pm

Drought-stricken areas of eastern Oklahoma largely missed out on any rainfall with this system, leaving the dormant vegetation tinder-dry. To make matters worse, the dry line pushed into eastern Oklahoma by early evening, dropping dew points into the teens and even single digits. Winds began to increase in the wake of the dry line, with gusts of 55 to 65 mph common. These factors combined to create the perfect conditions for rapid fire growth.

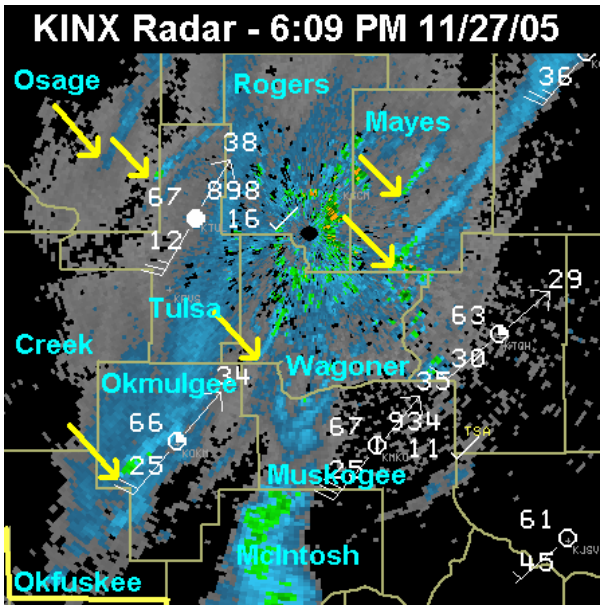
Wild fires occurred in nine counties in eastern Oklahoma including: Cherokee, Mayes, McIntosh, Muskogee, Okfuskee, Osage, Pittsburg, Tulsa, and Wagoner. At least 60 homes were destroyed, with numerous outbuildings also lost. Perhaps hardest hit was Mayes County, where 19 homes were destroyed in the Choteau and Mazie areas, with another 12 destroyed in rural portions of the county. More than 20 families in Mayes County were displaced by the fires. Also hard hit was McIntosh County, where 18 homes were destroyed in the Shady Grove and Central High areas. About 50,000 acres were reported to have burned across Oklahoma between the 27th and 30th of November, including 5,000 acres in Okfuskee County alone.

Wind gusts of 55 to 65 mph created other problems across eastern Oklahoma and portions of northwest Arkansas. Numerous power lines were knocked down as a result of the high winds. During the height of the wind event, more than 50,000 customers were without power with 27,000 of those in the Tulsa metro area. The wind also damaged many roofs and trees across the Tulsa metro area.

During the event, the State Emergency Operations Center was activated as reports of wildfires continued to come in. Oklahoma Governor Brad Henry issued an emergency wildfire declaration to help communities recover and make federal assistance available.



The regional surface analysis from the early evening of November 27 shows a deep (984 mb) surface low over central Kansas. A dry line was located near the Oklahoma/Arkansas border, separating warm, moist Gulf air from very dry air (dew points in single digits and teens) originating from the desert southwest. While it is unusual for a dry line to push this far east during the height of severe weather season, it happens with some frequency during the late fall and early spring.



This image shows a number of smoke plumes (blue and green "streaks") visible on the radar image from Sunday, November 27. The yellow arrows show approximate locations of fires that were underway.

Assessing Fire Weather Danger

When the National Weather Service mentions deteriorating fire weather conditions in the Hazardous Weather Outlook, this means that fires of any origin would have increasing potential to spread. Thus the **Spread Index** is used to asses the threat of fires burning out of control. The Spread Index uses a combination of temperature, humidity, wind, and fine fuel state to calculate a value and is produced in a graphical format. The Spread Index graphic can be found in the Decision Support Page.

The information seen in this graphic is most appropriately used for grass fire potential, as the Index is based on fuels that can dry within 1 hour (grasses). The fuel state is a seasonal input that is based on whether the grasses in the area are green, dormant and dry, or some state in between. A transition from dormant fuels to green fuels happens quickly in early April. A transition from green to mixed and then from mixed to dormant happens from the late summer into the early fall.

The graphic depicts the day-time Spread Index and is prepared at approximately 7am, 11am, 1pm, and 4pm. The Fire Weather Danger for the NWS Tulsa Forecast area is set by the maximum value in the display, and the appropriate "chiclet" color is designated for fire danger. The hour shown in the graphic indicates the approximate time of worst conditions.

Explanation of Spread Index Values:

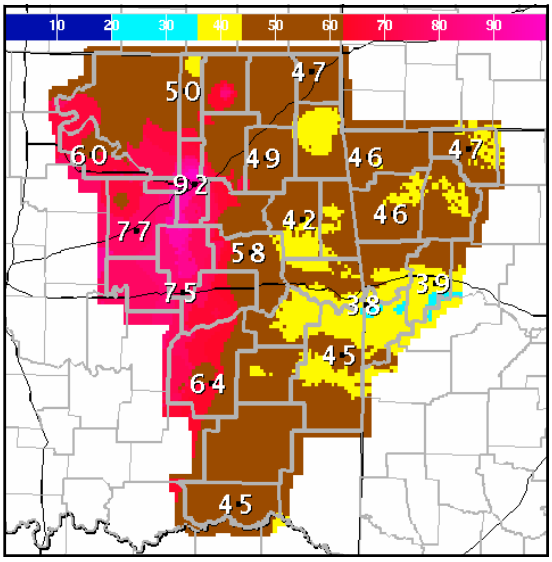
www.srh.noaa.gov/tsa/cgi-bin/decisionmaker.php

0 to 35 - In general, conditions do not favor rapid or sustained fire spread.

36 to 43 - Some potential exists for fires to spread. Care should be taken to monitor any outdoor burning.

44 to 63 - Any fires that start could spread out of control. Fire officials should be ready to respond to the spread of accidental fires. Intentional open-burning should be done with care and with fire control equipment at the ready.

>63 - Rapid and sustained fire spread is likely. Open-burning should be postponed if possible. Fire officials should have staff and equipment ready for a very active grass fire day.



Forecast Spread Index through 6 pm Sunday, November 27 (generated at 4 pm).

Fire Prevention

Until we receive significant precipitation, it is likely we will see more periods of elevated fire risk, even during the colder winter months. When the National Weather Service issues a **Fire Weather Watch**, critical fire weather conditions (strong winds, very low humidity) are forecast in the next 24 to 48 hours. When a **Red Flag Warning** is issued, favorable weather conditions for rapid fire growth and spread are expected. Here are some tips for keeping your property safe from wildfires.

In the event of high fire danger

- Build any fires away from nearby trees or bushes and have a way to extinguish the fire quickly and completely.
- Never leave a fire, even a cigarette, burning unattended.
- If evacuation is advised, **FOLLOW THE INSTRUCTIONS OF LOCAL OFFICIALS**. Be ready to evacuate all family members and pets when fire approaches, or you are instructed to do so.

Outside your home

- Keep grass cut short near your home and clear any combustible vegetation.
- Keep items handy to use as fire tools (e.g. rake, axe, chain saw, bucket, shovels).
- Turn off any propane tanks (e.g. grill).
- Place combustible patio furniture inside.
- Connect garden hoses and ONLY if there is time, wet the roof and any shrubs within 15 feet of the home.

After the fire

- Wait until local emergency personnel announce that it is safe to return home.
- Be careful walking on smoldering surfaces. After a fire, the ground may contain heat that can cause severe injury or spark another fire.
- Stay away from damaged buildings until inspectors have given you the green light.
- If your home has been spared, keep children and pets inside.

Approaching a Milestone

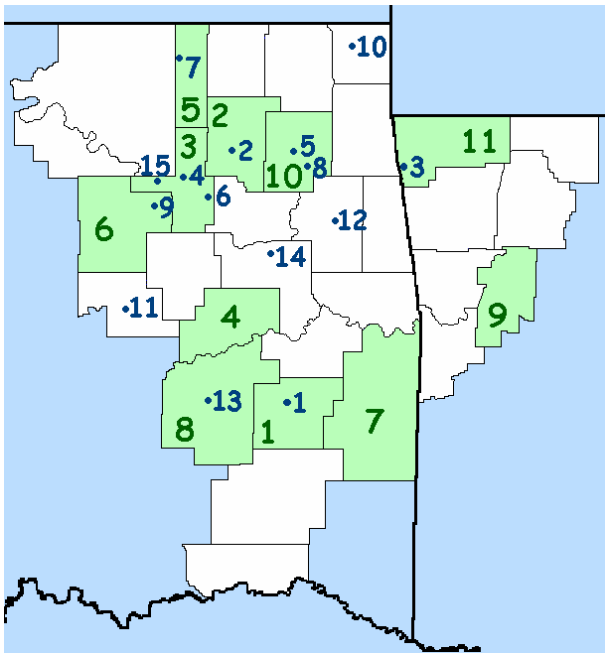
Eight years ago, a revolutionary idea was born at the NWS Tulsa office. The idea became reality in February, 1999, when Latimer County, OK and the town of Wilburton were officially recognized as StormReady. In January, an important milestone will be achieved as Benton County, AR becomes the 1000th StormReady designee.

The StormReady program is a voluntary program developed by the National Weather Service in partnership with the emergency management community to help local emergency managers strengthen their hazardous weather operations. The guidelines are intended to ensure the community has the necessary tools to receive and disseminate life-saving National Weather Service warnings throughout the community. By preparing for potential disasters in advance, StormReady communities are more capable of responding to severe weather threats. Advanced preparation results in fewer fatalities and lower property damage.

Photo by Ed Calienese, NWS Tulsa

NWS Tulsa Meteorologist-in-Charge Steve Piltz (right) presents Sand Springs, OK mayor Bob Walker with a StormReady certificate.

The number of StormReady counties and communities continues to grow. On October 24th, the City of Sand Springs, OK was recognized as StormReady. Sand Springs joins 18 counties and 38 other communities in Oklahoma with that designation. Also recently recognized were Franklin County, AR and Mayes County, OK, both in September of 2005.



StormReady NATIONAL WEATHER SERVICE

	County	Date
1	Latimer	2/99
2	Rogers	6/99
3	Tulsa	6/99
4	McIntosh	3/00
5	Washington	7/01
6	Creek	9/02
7	LeFlore	9/02
8	Pittsburg	9/03
9	Franklin	9/05
10	Mayes	9/05
11	Benton	1/06

	City	Date
1	Wilburton	2/99
2	Claremore	6/99
3	Siloam Springs	6/99
4	Tulsa	6/99
5	Pryor	3/00
6	Broken Arrow	6/00
7	Bartlesville	7/01
8	Locust Grove	7/01
9	Sapulpa	7/02
10	Miami	9/02
11	Okemah	9/02
12	Tahlequah	8/03
13	McAlester	9/03
14	Muskogee	9/04
15	Sand Springs	10/05

Above map shows the counties and communities currently certified as StormReady.

Weather Folklore

Long before the profession of weather forecasting was thought of, people observed weather every day. Over the years, they noticed patterns, and as they discussed them with others, a number of adages developed. The most famous is probably that of the groundhog and his ability to foretell the coming of Spring. Here are a couple that actually have proven to be accurate.

Rings Around the Moon

Folklore has it that a ring around the moon signifies bad weather (i.e. rain or snow) is coming, and in many cases, this may be true. So how is this possible? The ring around the moon is caused by the refraction of moonlight from ice crystals in the upper atmosphere, usually within cirrostratus clouds. These clouds often precede a warm front, which is often accompanied by precipitation. Taking this one step further, some believe the number of stars within the halo indicates the number of days before bad weather arrives.

Cricket Chirps and Air Temperature

Another popular piece of weather folklore says you can tell the current temperature by how fast crickets chirp. If you count the number of times a cricket chirps in 14 seconds, then add forty, you have the current temperature. Studies have actually shown that this is quite accurate (apparently crickets don't chirp at temperatures below 40 degrees).

Final Outlook for Winter 2005-06 Issued

The final outlook for the winter of 2005-06 (December-February), issued on November 17, predicts this winter has an enhanced chance to be warmer than the 30 year normal. Since early 2005, water temperatures in the central-equatorial Pacific Ocean have been near normal (ENSO-neutral). These conditions are expected to continue during this winter. As a result, it is unlikely that El Niño or La Niña will be a factor influencing the winter weather patterns. ENSO-neutral years often feature increased variability and increased occurrence of weather extremes in both temperature and precipitation for much of the country.

Closer to home, the outlook calls for a 50-60 percent chance of above normal temperatures for the winter season across all of eastern Oklahoma and western Arkansas. The updated outlook calls for equal chances of above or below normal precipitation during the period. This is a significant change from the initial winter outlook, which indicated a 60-65 percent chance of above normal precipitation for southeast Oklahoma. This is certainly not the news that the drought-stricken area wanted to hear!

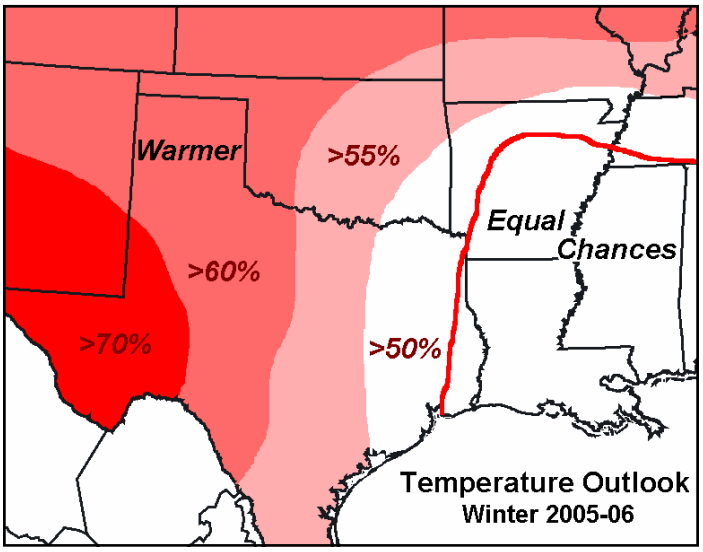
Keep in mind that these are probabilities for the season as a whole, and that a 60 percent chance of above normal also means a 40 percent chance of below normal. An equal chance, either for temperature or precipitation, is predicted when there is no strong or consistent climate signal for either above or below normal conditions during the season. The prediction for areas of "equal chances" means there is a 50 percent chance for either an above-normal or below-normal to occurr.

For more information on the MJO and NAO, please visit the Climate Prediction Center website.

www.cpc.ncep.noaa.gov

With the absence of El Niño and La Niña, shorter term climate fluctuations that are best predicted week-by-week are expected to play the dominant role in weather patterns this winter. The leading climate patterns expected to impact winter weather are: long-term climate trends, the North Atlantic Oscillation (NAO), and the Madden-Julian Oscillation (MJO).

One tool that is used at the NOAA Climate Prediction Center is the average conditions during the last 10 years compared with the long-term average for 1971-2000. Average winter temperature departures from normal for the period 1971-2000 are considerably cooler than those for the most recent 10-year average over much of the nation.



The NAO is a major source of intra-seasonal variability over the United States during the winter. The NAO affects the circulation pattern over the middle and high latitudes and influences the number and intensity of significant weather events affecting the U.S. The positive phase features a northward shift in the jet stream relative to its normal position. Associated with this phase is an increase in the occurrence of relatively warm days over the eastern two-thirds of the U.S. The negative phase features a southward shift of the jet stream and is associated with an increase in cold air outbreaks. Unfortunately, the NAO and its phase are difficult to anticipate more than one to two weeks in advance.

The MJO phenomenon is another factor likely to contribute to increased variability during the winter. The MJO influences the pattern of tropical rainfall and produces ENSO-like features on time scales of approximately 30-60 days. The MJO is most active during ENSO-neutral and weak-ENSO winters and can influence the occurrence of extreme weather events.

Winter Product Changes

A few new winter weather products have been added this season to the current suite of forecast and warning products. A **Wind Chill Watch** will be issued when warning criteria (wind chills ≤-20 degrees) are possible in the next 36 to 72 hours. A **Freezing Fog Advisory** will be issued when fog at temperatures below freezing produces a light glaze on roadways. Finally, a **Dense Smoke Advisory** will be issued for visibility ≤ 1/4 mile in smoke.

SKYWARN Training 2006

Each winter and spring the National Weather Service in Tulsa trains members of police & fire departments, emergency management officials, and amateur radio operators on spotting techniques. Typically the training is coordinated by a local group (such as an emergency management agency), and a NWS meteorologist serves as the guest instructor. The goal of the training is not just to recognize tornadoes, but to have some understanding of storm structure, which in turn better prepares the spotter for the extreme and unusual circumstances. Other topics covered include an update on the latest NWS technology and procedures and ideas for organizing and coordinating spotter groups.

The following sessions have been scheduled for 2006. Please continue to check the calendar on our website, as additional sessions will be scheduled in the coming weeks.

County	City	Date	TIme
Sebastian	Ft. Smith	Jan 6	630 pm
Creek	Bristow	Jan 23	7 pm
Okfuskee	Okemah	Jan 24	7 pm
Franklin	Ozark	Jan 26	7 pm
LeFlore	Poteau	Feb 7	7 pm
Tulsa	Tulsa	Feb 11	TBD
Osage	Pawhuska	Feb 16	7 pm
Benton	Bentonville	Feb 20	7 pm
Mayes	Pryor	Feb 21	7 pm
Benton	Siloam Springs	Feb 23	7 pm
Washington, OK	Bartlesville	Feb 25	9 am
Nowata	Nowata	Mar 2	7 pm
Tulsa	Broken Arrow	Mar 6	7 pm
Cherokee	Tahlequah	Mar 7	7 pm
LeFlore	Talihina	Mar 13	7 pm
Latimer	Wilburton	Mar 14	7 pm
Delaware	Jay	Mar 21	7 pm

For additional information contact:
Ed Calianese, Warning Coordination Meteorologist

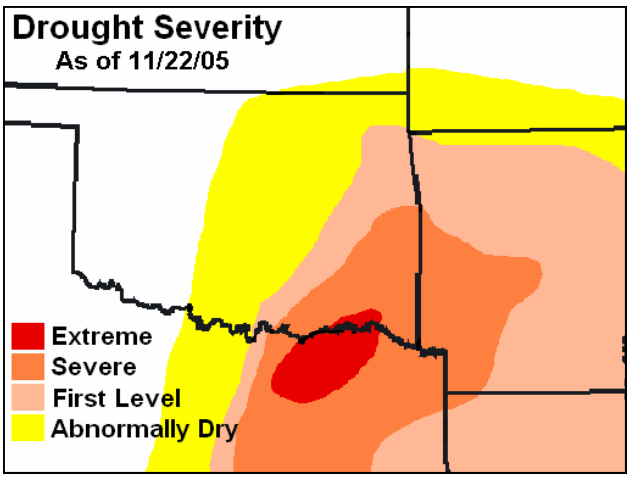
918-832-4133
e-mail:ed.calianese@noaa.gov

Drought

(Continued from page 1)

only a teaser as the heaviest rains fell to the east.

Dry conditions have severely depleted water resources. Many major reservoirs across eastern Oklahoma are well below their normal conservation pool levels. According to the U.S. Army Corps of Engineers, Broken Bow and Hugo Reservoirs were at 58 percent of normal pool, while Grand, Keystone, Wister, Eufaula and Tenkiller Reservoirs were all below 70 percent.



Rivers and streams across southeast Oklahoma are also running at well below normal levels. According to the U.S. Geological Survey, streamflows for some tributaries in the Red River Basin in southeast Oklahoma are in the lowest 10th percentile of record. Anything less than the 25th percentile is considered below normal.

The latest Seasonal Drought Outlook calls for limited improvement through February of 2006, mainly due to a climatological increase in the number of storm systems across the southeastern Great Plains during the period. However, the latest **Winter Outlook** (page 5) calls for equal chances of above or below normal precipitation during the winter season.