

MANAGING DROUGHT

IN THE SOUTHERN PLAINS

Webinar Topic: Water Resources
December 1, 2011

Regional Drought Summary

Brian Fuchs, National Drought Mitigation Center

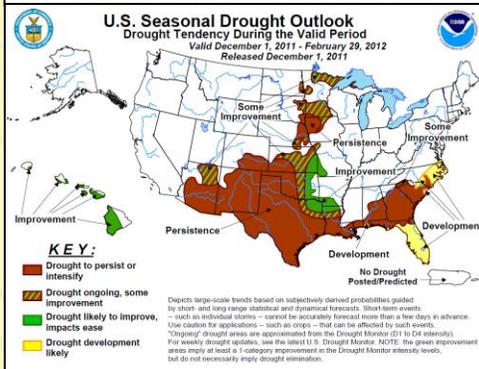
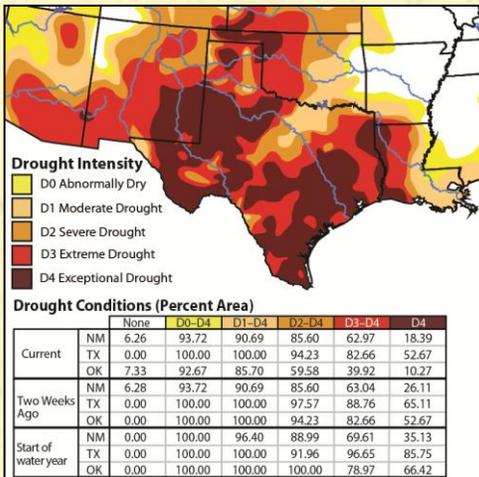
Significant changes occurred in eastern Oklahoma, northeast Texas and southeast Kansas with the biggest rain events in the last year. Several stations in southeast Kansas reported all-time daily rainfall records. Slowly but surely the continued rainfall in that part of the region is putting a dent in the drought. Some of the D3 and D4 areas have lessened in the last month, with overall drought intensity decreasing. Further west, there were some improvements in Arizona and New Mexico in response to rainfall and early-season snowfall in parts of those states. Concern remains in the wheat belt area of Kansas, Oklahoma and north Texas. Some areas received as much rainfall in the past month as they had in the preceding 90 days, but without continued rain is needed to keep the ground moist to avoid winter kill.

Another abundant precipitation-producing system is expected to move across the region in the next several days. The [Climate Prediction Center](#) shows an area of east Texas, Oklahoma, Arkansas and Missouri as favorable locations for above-normal precipitation within the next month. However, the rainfall is not expected to extend to south Texas, where exceptional drought conditions are likely to continue. Beyond the next 30 days, the seasonal outlook shows a warm, dry pattern returning across the region in response to the strengthening La Nina. While short-term drought improvement is likely to continue in the eastern portions of the region, by late winter those same areas could become dry again.

Did You Know?

The NIDIS drought portal, www.drought.gov, contains links to many water supply tools. You can find these under the Current Drought heading on the top menu bar.

- Watermonitor.gov (linked in the menu) includes average stream flow conditions from the past day to the past month. It also includes information on reservoir status, groundwater, snow and forecasts
- USGS Water Watch shows which streams are in drought and which are in flood. Areas where runoff is high may be susceptible to flooding, whereas if runoff is low, drought is likely to continue.



Is drought properly classified in your region? If not, let us know by:

- Adding to the [Impact Reporter](#)
- Contacting your State Climatologist
- E-mailing the Drought Monitor Authors at: droughtmonitor@unl.edu

Resources

U.S. Drought Portal
<http://www.drought.gov>

Drought Impact Reporter
<http://droughtreporter.unl.edu>

State Climatologists
<http://www.stateclimate.org>

Past webinars, summaries, and Federal/State Assistance
http://www.drought.gov/portal/server.pt/community/southern_plains

National Drought Mitigation Center
<http://drought.unl.edu>

Southern Climate Impacts Planning Program (SCIPP)
<http://www.southernclimate.org>

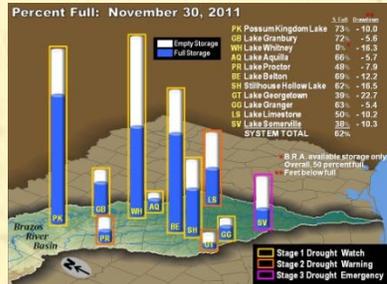
Climate Assessment for the Southwest (CLIMAS)
<http://www.climas.arizona.edu>

Water Resources

The exceptional drought conditions prevalent across eastern New Mexico, Texas and western Oklahoma have taken their toll on river systems. Along the Rio Grande, fairly dismal conditions during the winter of 2010-2011 set the stage for record low flows this past summer. Poor snow conditions in New Mexico, and not much better conditions in the headwaters of southern Colorado, contributed little runoff during the spring. Mid-to-late season snowfall failed to materialize. The first 9 months of the year in New Mexico was their 2nd driest January-October of any period on record. Taken together, this has depleted soil moisture in southeastern New Mexico and west Texas and has been particularly harsh on the Pecos River Basin. November has been a bit more favorable, especially in southwestern and northwestern New Mexico, but most of the basin experienced yet another month of below-normal precipitation. With very little soil moisture in New Mexico, it is anticipated that much of the spring snowmelt will be absorbed by soils and shallow aquifers rather than feeding streams. There is hope for improvement in the mountain snowpack in coming days as another storm system traverses the region.

Presenters:

Greg Story, NWS West Gulf River Forecast Center
 Aaron Abel, Brazos River Authority
 Bob Rose, Lower Colorado River Authority
 Jim Crosston, U.S. Army Corps of Engineers – Tulsa



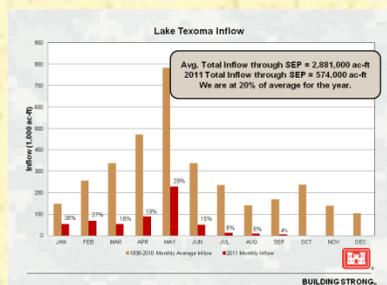
The Brazos River spans from the Texas Caprock near Lubbock to the Gulf of Mexico near Houston. The Brazos River Authority manages 11 reservoirs along the way. Municipal users, steam-electric power generation facilities and industrial users place the greatest demands on the reservoir system. Releases from the larger reservoirs provide much of the stream flow needed to meet downstream demands during droughts. Smaller reservoirs are primarily used for local supply.

Currently most reservoirs range from 40-75% full. Recent rains provided about 2 months of additional supply, although runoff remains minimal throughout the basin. Even with the basin receiving some rainfall this past year, the cumulative inflow since September 2010 is the lowest on record, more than 100,000 acre-feet below the previous record (set in 1917) and only 16% of the median inflow of about 2.5 million acre-feet. If exceptional drought conditions continue, projections for September 2012 are for reserves to drop from a current 62% of capacity to near 35% of capacity, with reservoirs 10-50 feet below normal. Mandatory restrictions and curtailment of contracts are possible if these projections materialize.

The Lower Colorado River is much the same story. Unlike its northern sibling, water use along the Lower Colorado goes primarily to agriculture, with about 1/3 of water releases going to industrial use and power generation. Six dams and lakes dot the 180,000 square mile watershed; of these only two are used for water storage. Rainfall across much of the basin during October 2010-September 2011 was 20 inches or more below normal. About 3/4 of the basin remains in exceptional drought, with recent rains either missing the basin or yielding little runoff. Beginning in March, inflows along the four major tributaries fell below 2009, which was the driest recent period, and is on pace to record the lowest-ever annual inflow. Reservoirs are only averaging 37% full, the third lowest elevations on record. Evaporation rates during the summer were 13% higher than during the 2009 drought. Even if precipitation over the next six months followed the pace of the wettest such period on record, reservoirs would still remain less than 70% full and interruptible supplies would remain curtailed. If inflows continue on the current pace, reservoirs would hold only about 600,000 acre-feet with even firm supplies and environmental flows curtailed. The low flows also cause severe downstream salinity problems at Matagorda Bay where seawater is able to intrude upstream.



Further north, in the Arkansas-Red Rivers basin, the picture is not nearly as bleak. Heavy rainfall in October and November filled many reservoirs in eastern Oklahoma, although reservoirs across western and central Oklahoma remain near record lows. Lake Texoma, along the Red River, has had only 20% of normal inflow during 2011, impacting recreation, hydropower and water supply. Several reservoirs had reached Level 3 drought contingency, in which interagency coordination committees are assembled to navigate the complex relationships between competing water demands.



Impacts in the region included water curtailment, extreme evaporation rates, proliferation of blue-green algae, challenges with endangered species, and fisheries. One lake, in eastern Oklahoma, was projected to be completely depleted by Christmas before heavy rains caused rapid recovery. Had that occurred, a major industrial user would have had to furlough hundreds of people. Evaporation rates exceeded planning criteria by 18%, on top of a 40% increase projected during severe drought. These new values will go into future contingency plans. Lack of inflow, stagnant pools, and high temperatures caused high concentrations of blue-green algae, a toxin, forcing closure of several lakes during peak recreation periods. Other lessons learned included the need for calculating environmental flows needed to maintain endangered species and maintaining flow to keep fish hatcheries viable, especially for non-native species like trout that are stocked in many Oklahoma lakes.