

KANSAS DROUGHT REPORT

September 7, 2007

Compiled by the Kansas Water Office from various federal, state, local and academic sources

Hot August; Dry Summer in Southwest

August was much warmer than normal throughout Kansas, with the east central and southeast regions receiving generally less than one-half of normal rainfall. The U.S. Drought Monitor continues to show abnormally dry conditions in southwest and far western Kansas and in several eastern-tier counties as well.

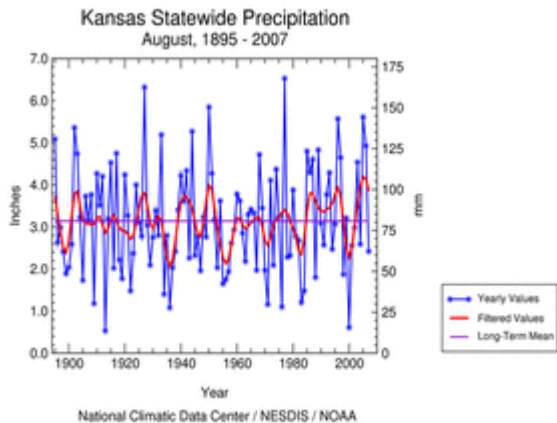
Monthly average temperatures were well above normal at all principal reporting stations (those listed in Table 1), ranging from 77.4 at Goodland to 83.5 at Topeka. Extreme temperatures for the month at principal stations ranged from 104 at Dodge City (August 11th) and Garden City on August 14th and 20th to 55 at Goodland (August 25th) and St. Joseph (August 31st). At Topeka, the month was 6.8 degrees warmer than normal. Maximum temperatures hit 90 or higher on 26 days and the temperature did not fall below 70 until August 24th, the first sub-70 low since July 26th.

Current County Drought Stages

There are currently no county drought stage declarations in effect in Kansas. This table summarizes [historic drought declarations](#) made by the Governor from 2000 through 2007.

Drought Monitoring and Indices

Precipitation



August 2007 ranks as the 36th driest August on record (1895-2007) in Kansas with a statewide average total precipitation of approximately 2.53 inches. This is 82 percent of normal. The graph at the left shows August precipitation in this long-term perspective.

Precipitation across six of the state's nine climate reporting divisions was below normal in August. The east central received only 33 percent of normal and the southeast 43 percent. The northwest division reported 129 percent of normal. As shown in Table 1, August rainfall in Chanute was only 31 percent of normal, while St. Joseph, MO received 176 percent of its normal.

Looking at meteorological summer (June–August), rainfall has generally been well above normal southeast of I-35 with much of Cowley, Elk and Chautauqua counties receiving twice their normal rainfall for this period. Another area of above normal rainfall was concentrated in Marshall and Nemaha counties which were near a persistent August storm track that brought record rainfall and flooding to parts of the upper Midwest. Below normal rainfall during the summer was concentrated in southwest, where less than 50 percent of normal was received in some areas. Another dry area was the Kansas River Corridor in the east central part of the state. As a result of this precipitation pattern, the U.S. Drought Monitor continues to indicate abnormally dry conditions in southwest and far western Kansas and in several eastern-tier counties as shown below.

Annual precipitation totals are generally running above normal in central Kansas and southeast of I-35, with below normal totals concentrated in the southwest and the westernmost tier of counties in the state. So far, 2007 (January–August) ranks as the 21st wettest year on record, statewide. Monthly statewide [moisture status](#) graphs and rankings are available from the National Climatic Data Center.

Radar-based [precipitation estimate maps](#) covering multiple time periods are available from the National Weather Service. These maps are updated daily. Monthly and annual individual station and county average [precipitation data](#) is available from the Weather Data Library at Kansas State University.

Table 1 summarizes August and Year 2007 precipitation received at several major reporting stations in and adjacent to Kansas.

Station	August 2007			Calendar Year 2007		
	Total (inches)	Departure (inches)	Percent of Normal	Total (inches)	Departure (inches)	Percent of Normal
Goodland	3.63	1.14	146	12.15	-4.22	74
Hill City	2.49	-0.27	90	15.52	-2.30	87
Garden City (Airport)	1.46	-1.11	57	12.48	-4.11	75
Dodge City	3.69	0.96	135	15.42	-2.00	89
Russell	1.47	-1.87	44	19.44	-1.16	94
Concordia	2.08	-1.16	64	18.37	-3.41	84
Medicine Lodge	2.18	-0.88	71	26.33	5.34	125
Wichita (International Airport)	3.61	0.67	123	30.28	10.21	151
Topeka (Billard Airport)	2.79	-1.02	73	28.42	3.21	113
St. Joseph, MO	6.69	2.89	176	25.36	0.91	104
Kansas City (International Airport)	1.71	-1.83	48	20.98	-5.09	80
Olathe (New Century Air Center)	2.34	-1.22	66	31.29	4.02	115
Chanute	1.21	-2.75	31	38.59	9.57	133
Joplin, MO	5.31	1.49	139	40.70	10.81	136

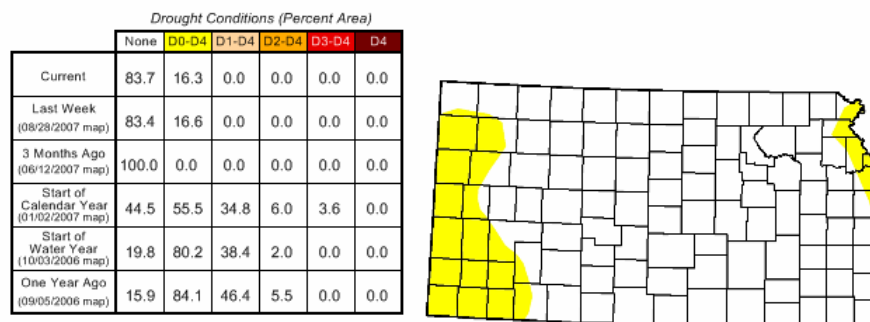
Source: National Weather Service Daily and Monthly Climate Summaries

U.S. Drought Monitor

The Monitor ([current map](#)) is a composite of several observed weather variables and drought indices that is updated weekly. The September 4th map (see below) indicates abnormally dry conditions in far-western Kansas and in parts of the northeast and east central as well. About 16 percent of the state is now classified as abnormally dry, compared with 12 percent on July 31st and none as recently as June 26th. The table accompanying the map compares current conditions with those at several points during the past year

In the Kansas county drought stage scheme, a Drought Watch equates to moderate drought in the U.S. Drought Monitor, while a Drought Warning is the equivalent of severe drought. A Drought Emergency is reserved for extreme or exceptional drought.

U.S. Drought Monitor September 4, 2007 Kansas Valid 7 a.m. EST



Intensity:

<ul style="list-style-type: none"> D0 Abnormally Dry D1 Drought - Moderate D2 Drought - Severe 	<ul style="list-style-type: none"> D3 Drought - Extreme D4 Drought - Exceptional
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The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

<http://drought.unl.edu/dm>



Released Thursday, September 6, 2007
Author: Thomas Heddinghaus, CPC/NOAA

The Palmer Drought Severity Index

The [Palmer Index](#) (PDSI) is an indicator used in the U.S. Drought Monitor. The statewide average PDSI for the week ending September 1st was 2.06 (unusually moist), virtually unchanged from the average one month ago. This compares with a statewide average PDSI of -0.98 (incipient drought) for the week ending September 2, 2006. Current divisional PDSI values range from 3.81 (very moist) in the southwest to -0.26 (near normal) in the east central.

Drought Impacts and Response

Fire

The National Weather Service began providing its full range of fire weather products and services in Kansas beginning in October 2006. Included are the Rangeland Fire Danger Index, Fire Weather Forecasts, Red Flag Watches/Warnings, and Spot Forecasts.

Each NWS office serving Kansas has these products available on its website. These websites may be accessed from this [county warning and forecast area](#) map. Clicking on one of these areas takes you to that NWS Office's home page. Look for "Fire Weather" in the menu on the left margin of the page.

Agriculture

The [Kansas Crop and Weather Report](#) is updated weekly during the growing season. Included is information about crop conditions and progress, soil moisture conditions, range and pasture conditions, hay and pasture supplies and stock water supplies.

The September 2nd Report for the preceding week showed that topsoil moisture was rated 48 percent short – very short, 51 percent adequate and 1 percent surplus, statewide. This contrasts with the 36 percent short – very short reported for the same week in 2006 and a 10-year average value of 55 percent short-very short for this week of the year. Subsoil moisture was rated 45 percent short-very short and 55 percent adequate, statewide, as compared to 67 percent short-very short last year at this time. Hay and forage supplies were rated 14 percent short-very short, 82 percent adequate and 4 percent surplus on September 2nd. Statewide stock water supplies were rated 13 percent short-very short, 85 percent adequate and 2 percent surplus.

Public Water Systems

In June 2007 the Kansas Water Authority approved [2007 Municipal Water Conservation Plan Guidelines](#). The revised guidelines replace previous guidelines dating back to 1990. These guidelines cover drought response in addition to long-term water conservation.

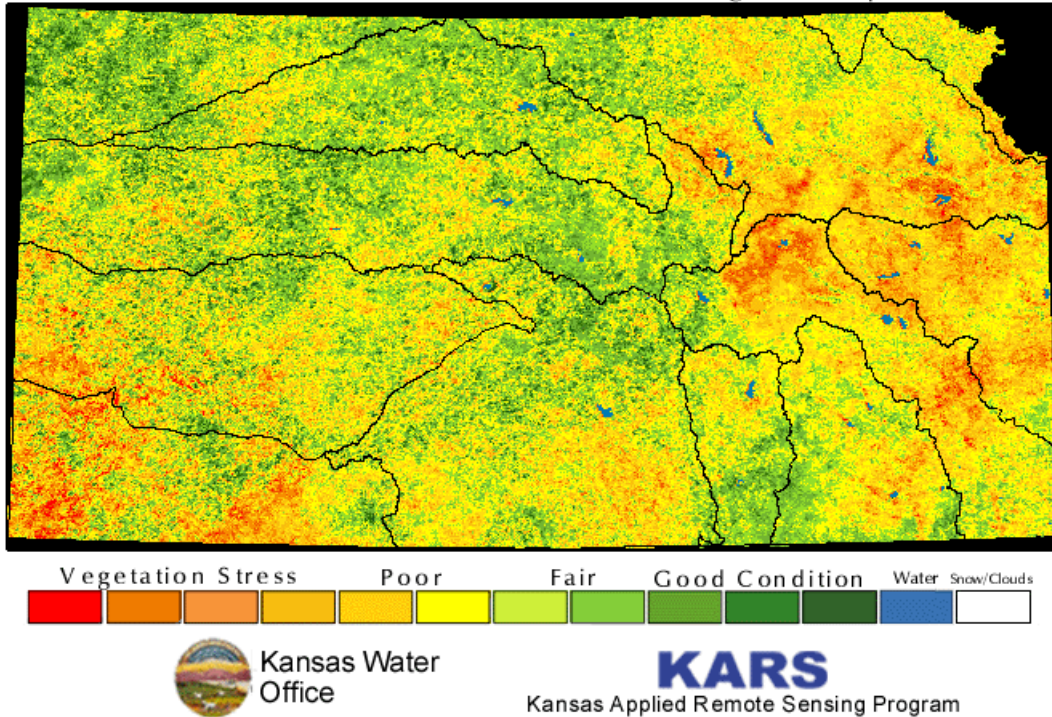
The Kansas Department of Health and Environment and the Kansas Water Office have updated the state's drought vulnerable public water systems list. This list identifies those systems most likely to first be impacted by drought and the reason for their vulnerability. The [Drought Vulnerability Assessment Report](#) includes the list and an explanation of the methodology used in the update.

In August 2006 the Governor's Drought Response Team released [Responding to Drought: A Guide for City, County and Water System Officials](#). This guidance provides an overview of Kansas county drought stages, local planning and coordination, disaster declarations, and available state and federal assistance.

Vegetation Conditions

The Kansas Applied Remote Sensing Program (KARS) at the University of Kansas produces a [Kansas Green Report](#) each week during the growing season. This report consists of a set of five interactive maps derived from satellite and historic data that illustrate vegetation conditions and crop progress across the state.

A Vegetation Condition Index Map, included in the Green Report, illustrates vegetation health and levels of plant stress based on current and historic vegetation greenness and surface temperatures. The most recent map (see below) covers the period August 21 through September 3. Hot, dry conditions in August have greatly increased vegetative stress levels, particularly in east central and southwest Kansas.



Streamflow and Reservoir Conditions

The U.S. Geological Survey [Kansas Drought Watch](#) provides information on 7-day average streamflow conditions at long-term gaging stations and how they compare to normal flows. Most of these gages are located in central and eastern Kansas. A map (click on National Drought Map and then on Kansas) identifies river basins experiencing below normal flows and hydrologic drought.

Seven-day average streamflow was below normal at approximately 12 percent of Kansas' long-term gaging stations on September 5, 2007, as compared with 10 percent below normal on August 1st. Many gages with below normal flows were on the Smoky Hill River or the Kansas River. Normally about 25 percent of gages are below normal at any given time. The percentage of gages with below normal flows has remained under 25 percent since about March 1, 2007.

The Kansas Department of Agriculture, Division of Water Resources has not conducted minimum desirable streamflow (MDS) administration anywhere in the state since June 26, 2007.

Table 2 summarizes federal reservoir pool elevations on September 6, 2007 in terms of departure from the top of the conservation/multipurpose pool and pool elevation change since August 2, 2007. All but two reservoirs (Waconda and Tuttle Creek) exhibited pool-level declines as compared with one month ago. Large declines at reservoirs in the Verdigris River Basin reflect continued release of flood control storage resulting from heavy rains during the last week in June. Pool levels at Norton, Cedar Bluff, Kirwin, and Webster reservoirs remain more than 10 feet below the top of the conservation/multipurpose pool. Webster Lake is currently 21.8 feet down, while Kirwin Lake is 21.2 feet down.

U.S. Seasonal Drought Outlook

The [Seasonal Drought Outlook](#), developed by the NOAA Climate Prediction Center, assesses the likelihood for improvement, persistence or deterioration in drought conditions for areas currently experiencing drought as identified by the U.S. Drought Monitor. The Outlook released September 6th for the period September through November 2007 does not foresee re-development of drought in Kansas even though some areas are now considered abnormally dry. Improvement is expected for those areas of Missouri, including part of the Kansas City Metro, now experiencing drought. The Drought Outlook is updated on the first and third Thursday of each month.

Table 2 Kansas Federal Reservoir Pool Elevation Summary					
Reservoir	Top MP/C Pool	Pool Elevation (Feet MSL)		09/06/07	
		08/02/07	09/06/07	Departure from Top	Change from 08/02/07
Kansas River Basin					
Norton	2304.3	2289.0	2288.4	-15.9	-0.6
Lovewell	1582.6	1581.4	1579.4	-3.2	-2.0
Milford	1144.4	1147.2	1146.4	2.0	-0.8
Cedar Bluff	2144.0	2129.8	2129.2	-14.8	-0.6
Kanopolis	1463.0	1470.6	1467.1	4.1	-3.5
Wilson	1516.0	1513.6	1513.4	-2.6	-0.2
Kirwin	1729.3	1709.7	1708.1	-21.2	-1.6
Webster	1892.5	1871.1	1870.7	-21.8	-0.4
Waconda	1455.6	1447.8	1448.3	-7.3	0.5
Tuttle Creek	1075.0	1075.0	1078.2	3.2	3.2
Perry	891.5	892.3	892.2	0.7	-0.1
Clinton	875.5	877.7	876.9	1.4	-0.8
Pomona	974.0	974.0	973.7	-0.3	-0.3
Melvern	1036.0	1036.3	1035.5	-0.5	-0.8
Hillsdale	917.0	917.8	917.1	0.1	-0.7
Arkansas River Basin					
Cheney	1421.6	1422.7	1421.2	-0.4	-1.5
El Dorado	1339.0	1341.5	1338.8	-0.2	-2.7
Toronto	902.9	916.3	901.9	-1.0	-14.4
Fall River	949.9	967.8	948.4	-1.5	-19.4
Elk City	794.3	808.1	794.3	0.0	-13.8
Big Hill	858.0	858.1	857.4	-0.6	-0.7
Council Grove	1274.0	1274.1	1273.1	-0.9	-1.0
Marion	1350.5	1350.1	1349.4	-1.1	-0.7
J. Redmond	1037.0	1048.3	1036.9	-0.1	-11.4
All values are in feet. Negative departures or changes are shown in red. Source: U.S. Army Corps of Engineers					

Additional Information

The Kansas Water Office web site, [KWO Drought](#), contains additional drought information including links to other agencies with drought information and past issues of the Kansas Drought Report. The Operations Plan for the Governor's Drought Response Team is also available here.

Please contact Tom Lowe at the KWO (785/296-0874) or tlowe@kwo.state.ks.us, should you have any questions.