

KANSAS CLIMATE SUMMARY AND DROUGHT REPORT

Current Conditions, Drought Impacts and Outlook

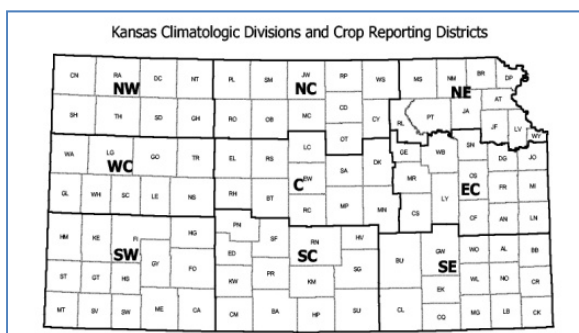
January 2011

Dry January – Drought Conditions Persist

Drought conditions persisted in many parts of Kansas in January. Drought conditions remained similar to December conditions with most of western Kansas in moderate drought and a portion of west central Kansas now considered to be in extreme drought according to the U.S. Drought Monitor. Moderate drought conditions also occurred in much of southeastern and east central parts of Kansas. The percentage of the state in abnormally dry to moderate drought conditions has increased from 82.4 % at the beginning of January to the current 82.5 % on February 8th.

Although all of the state saw some snow or ice in January, the moisture equivalent values for much of the state were lacking. Only the Northeast and the North Central divisions saw above average moisture at 144% and 124% of normal respectively. The South Central division saw the least moisture, with an average of only 0.02 inches or eight percent of Normal.

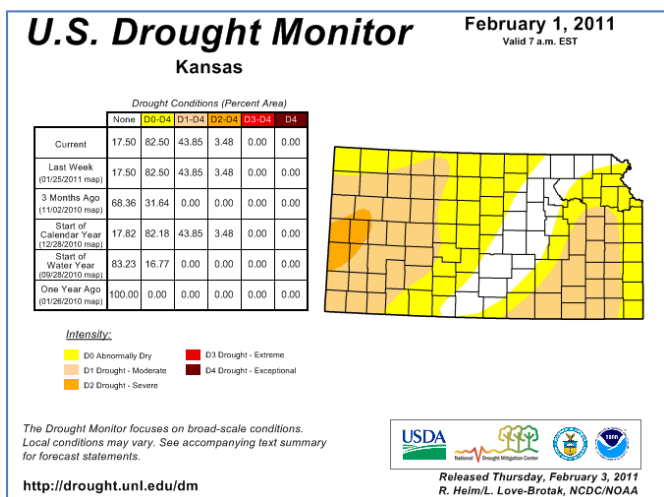
Preliminary statewide average precipitation was 0.50 inches, which was 80% of normal. Only the Southwest division averaged less than a quarter of an inch of precipitation. The southern divisions were the driest, averaging less than half of the normal precipitation. The northern divisions were the wettest, with northwest division averaging 93 percent of normal, the North Central averaging 175 percent of normal, and the Northeast averaging 126 percent of normal. On 17 days, no location in the state reported measurable precipitation, and on an additional 8 days the state-wide average was zero, with only isolated reports of moisture.



While January switched from the warmer than normal trend, it was closer to the middle of the range than previous months, averaging only 2.1 °F cooler than normal. Temperatures in western Kansas topped 70 °F, with the warmest reading being 76 °F at Tribune 14N on the 29th. Daily record highs were set at 20 locations, and tied at 12 others. Three locations set a new record low maximum temperature. Ten record low minimum temperatures were recorded, with five tied. Again, state-wide monthly average temperatures were 2.1 °F cooler than normal, with the warmest areas in the Southwest and West Central divisions which averaged 0.1 °F and 0.2 °F cooler than normal. The coolest division was the Northeast, which averaged 3.6 °F below normal. January was tied with last January for the 34th coldest since 1895.

With the range of precipitation and the cooler than normal temperatures, the latest Drought Monitor hasn't expanded the area of abnormally dry and moderate drought conditions. This leaves only a narrow band from South Central Kansas through Northeastern Kansas remains in the near normal state. The latest Drought Outlook has indicated drought conditions are expected to intensify in the western portions of the state, but improve in the eastern third in the coming months. The La Niña conditions have peaked but are expected to continue through the spring.

DROUGHT MONITORING AND INDICES



The U.S. Drought Monitor ([current map](#)) is a composite of several observed weather variables and drought indices that is updated weekly.

The February 1st map indicates drought or dry conditions in most of the state. The map indicates only a very narrow band of near normal bisecting the state from south central Kansas to northeastern Kansas. The table accompanying the map compares the percentage of the state currently affected by drought conditions with several points during the past year. In the Kansas county drought stage scheme, a Drought Watch equates roughly 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. (1)

Palmer Drought Severity Index (PDSI) is an indicator used in the U.S. Drought Monitor. The statewide average PDSI for the week ending January 29th was -0.06 (near normal). Divisional PDSI values ranged from -1.87, which translates to moderate drought, in the West Central division to 1.02 in North Central division which corresponds to the wet side of near normal. In the West Central division 1.75 inches of precipitation would be needed to bring the conditions back to near normal. The long-term average for February in the area is only 0.60 inches.

CURRENT COUNTY DECLARATIONS

No county drought stage declarations issued by the Governor are presently in effect.

A state receives primary (federal) disaster declaration when the principal disaster occurs within the state. Counties within Kansas and counties in bordering states that are adjacent to them are identified as “contiguous.” Up-to-date information regarding designated counties and assistance available due to these declarations is available through the Federal Emergency Management Agency (FEMA). Assistance is available for varying periods of time after the disaster designation is affirmed. Disaster designations will be dropped from this list as the relief period ends. For additional information regarding these USDA designations, please see: <http://www.fema.gov/dhsusda/index.jsp>.

Presidential major disaster declarations affecting Kansas:

Presidential Major Disaster Declarations in Kansas					
FEMA Disaster ID	Cause	Date	Kansas Centered	Adjoining State Where Disaster is Centered (Kansas Counties affected)	Termination Date
M1945	SS,T,F,SL	09/13/10-09/14/10	No	Nebraska (BR, DP, MS, NM)	06/21/2011
M1934	SS,T,F	6/12/10-7/31/10	No	Missouri (AT, DP, JO, MI, WY)	4/18/2011
M1932	SS,T,F	6/7/10-7/21/10	Yes	45 Primary KS Counties, 27 Contiguous	4/11/2011
M1926	SS,SL,T,F	6/13/10-6/15/10	No	Oklahoma (CA, ME,MT, SW, SV)	3/28/11
M1924	SS, F, T	6/01/10- NA	No	Nebraska (BR, DP, JW, NM, NT, PL, RP, SM)	3/15/11

SWS: severe winter storm; SS: severe storm; T: tornado; F: flood; S: snowstorm; IJ: ice jams; Straight-line Winds: SL

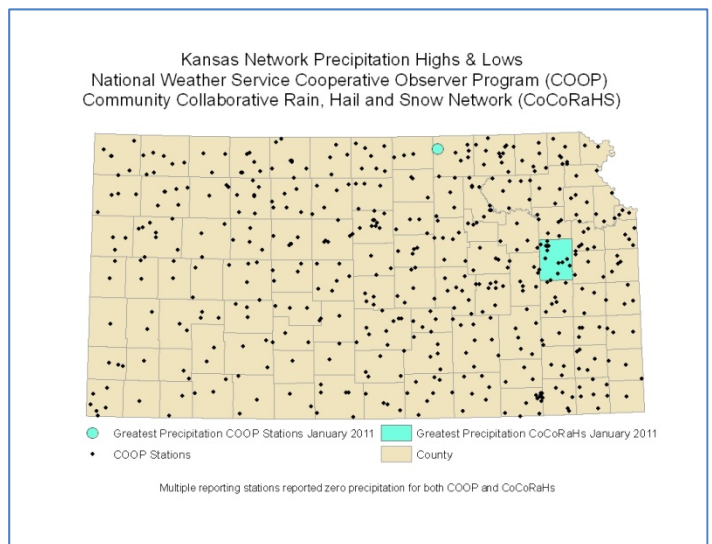
U.S. Secretary of Agriculture Tom Vilsack has made the following Primary Natural Disaster Area designations in Kansas:

Secretarial Major Disaster Declarations in Kansas					
FEMA Disaster ID	Cause	Date	Kansas Centered	Adjoining State Where Disaster is Centered (Kansas Counties affected)	Termination Date
S3098	R, Heat, D	4/23/10-11/01/10	Yes	4 Primary KS Counties, 13 Contiguous	09/26/2011
S3080	D, Heat, W	11/1/09-10-31-10	No	Oklahoma (BA, CA, CM, HP, MT)	08/29/2011
S3061	D, Heat	6/27/10–9/11/10	Yes	1 Primary KS County (RO), 6 Contiguous	7/26/2011
S3054	D	5/01/10 - 9/30/10	No	Missouri (LN, MI)	07/12/2011
S3050	W, H, R, FF	7/10/10 – 7/12/10	Yes	2 Primary KS Counties, 9 Contiguous	07/05/2011
S3041	SS,H, T	6/21/10 - 6/21/10	No	Colorado (CN)	05/31/2011
S3030	R, F, W, H	5/06/10-6/20/10	Yes	2 Primary KS Counties, 8 Contiguous	05/09/2011
S3020	R, FF, F, W	2/1/10-7/15/10	No	Missouri (AT, BB, CR, DP , JO, LV, LN, MI, WY)	4/20/2011
S3019	R, W, H, F, L, T	5/6/10-6/20/10	Yes	9 Primary KS Counties, 25 Contiguous	4/20/2011

SS: severe storm; R: excessive rainfall; FF: flash flooding; F: flooding; W: wind; H: hail; L: lightning; T: tornados; D: drought; FR: frost

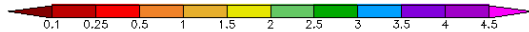
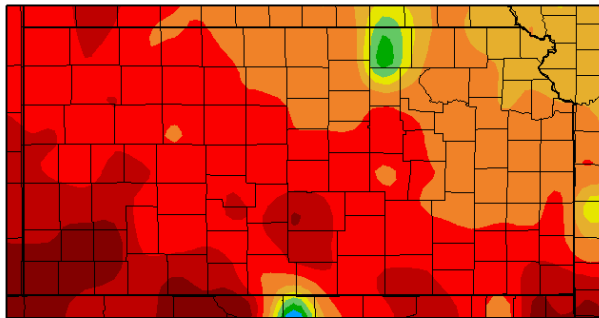
January Precipitation and Climate Conditions

January ranks as the 52nd driest on record (1895-2010) in Kansas with a statewide average total precipitation of 0.50 inches. This is 80 percent of normal. Based on preliminary reports, the greatest total precipitation received in January from the National Weather Service COOP network stations was 2.27 inches at Haddam, Washington County. Greatest for the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) in January was 2.00 inches Burlingame, Osage County. On the low end several NWS reporting stations across the southwestern areas of the state reported zero precipitation. (2)



The maps below show total precipitation received and the percent of normal across the state in January are available at the [High Plains Regional Climate Center](#).

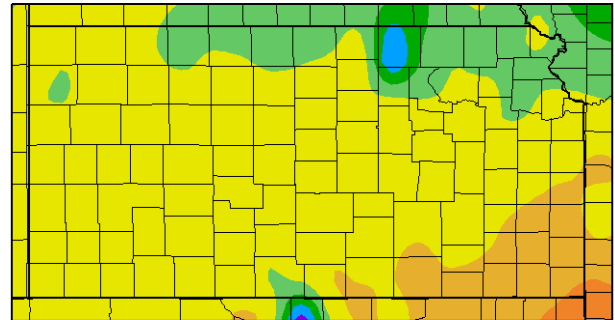
Precipitation (in)
1/1/2011 – 1/31/2011



Generated 2/2/2011 at HPRCC using provisional data.

Regional Climate Centers

Departure from Normal Precipitation (in)
1/1/2011 – 1/31/2011



Generated 2/11/2011 at HPRCC using provisional data.

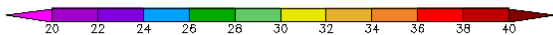
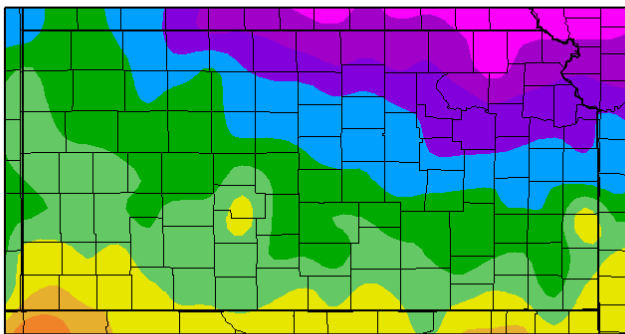
Regional Climate Centers

The statewide average temperature of 25.6 °F was 2.1 degrees below normal. This was the 34th coldest January of record (1895-2010) for Kansas. January 2006 was the warmest with a statewide average temperature of 41.2 °F. January 1940 was the coldest with a statewide average temperature of just 13.9 °F.

Average monthly temperatures at individual reporting locations ranged from 34.1 °F at Elkhart (Morton County) to 18.5 °F at Burr Oak (Jewell County). The highest temperature recorded in Kansas during January was 76 °F at Tribune 14N (Greeley County) on the 29th. The coolest reading observed in the state during January was -16 °F at Brewster (Thomas County).

The following maps show average monthly temperature and the departure from normal across Kansas during January 2011.

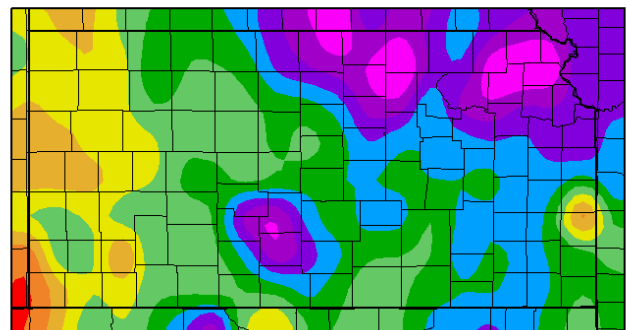
Temperature (F)
1/1/2011 – 1/31/2011



Generated 2/2/2011 at HPRCC using provisional data.

Regional Climate Centers

Departure from Normal Temperature (F)
1/1/2011 – 1/31/2011



Generated 2/11/2011 at HPRCC using provisional data.

Regional Climate Centers

Table 1 summarizes January temperature and precipitation conditions by climate division while Appendix A provides an November summary for principal reporting locations within and adjacent to Kansas. Please note that the data used in compiling Table 1 and Appendix A is preliminary and comes from different sources. This may result in slight differences in the average or extreme values presented.

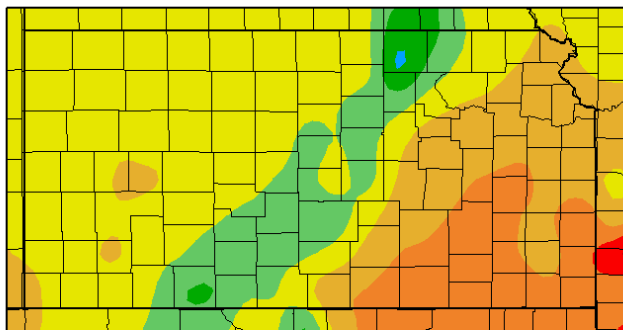
Table 1
January 2011
Kansas Climate Division Summary

Division	Precipitation (inches)						Temperature (°F)			
	January 2011			2011 through January 31			Average	Dep. ¹	Monthly Extremes	
	Total	Dep. ¹	% Norm	Total	Dep. ¹	% Norm			Highest	Lowest
Northwest	0.35	-0.04	93	0.35	-0.04	93	25.5	-1.6	69	-16
West Central	0.30	-0.11	73	0.30	-0.11	73	27.1	-0.7	76	-14
Southwest	0.18	-0.20	45	0.18	-0.20	45	29.9	-0.1	75	-10
North Central	0.93	0.40	175	0.93	0.40	175	21.7	-3.6	67	-12
Central	0.54	-0.08	88	0.54	-0.08	88	25.2	-2.4	72	-9
South Central	0.32	-0.34	49	0.32	-0.34	49	27.4	-2.1	73	-7
Northeast	1.05	0.19	128	1.05	0.19	128	21.7	-3.6	56	-14
East Central	0.64	-0.39	67	0.64	-0.39	67	23.7	-3.4	66	-10
Southeast	0.51	-0.66	44	0.51	-0.66	44	28.2	-1.8	75	-9
STATE	0.50	0.67	80	0.50	0.67	80	25.6	-2.1	76	-16

1. Departure from 1971-2000 normal value
 2. State Highest temperature of 76 °F at Tribune 14N on the 29th.
 3. State Lowest temperature of -16 °F at Brewster (Thomas County) on the 13th.
 4. Greatest 24hr rainfall: 1.02 inches at Bendena 0.2 NNW, Doniphan County (CoCoRaHS).
- Source: KSU Weather Data Library <http://www.ksre.k-state.edu/wdl/>

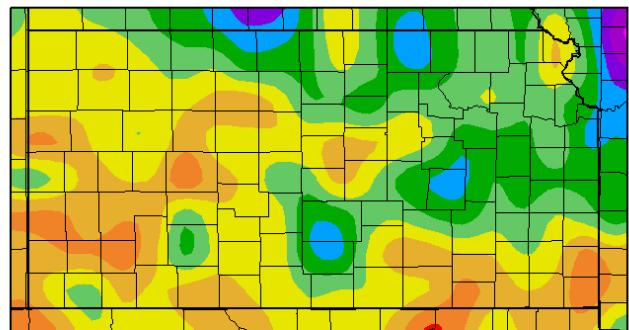
Longer-Term Precipitation Trends - The following two maps show the percentage of normal precipitation received across Kansas during the past three months (November 2010 – January 2011) and during the past 12 months (February 2010 – January 2011).

Departure from Normal Precipitation (in)
11/1/2010 – 1/31/2011



Generated 2/2/2011 at HPRCC using provisional data.

Departure from Normal Precipitation (in)
2/1/2010 – 1/31/2011



Regional Climate Centers Generated 2/2/2011 at HPRCC using provisional data.

Regional Climate Centers

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 county [precipitation data](#) is available from the Weather Data Library at Kansas State University.

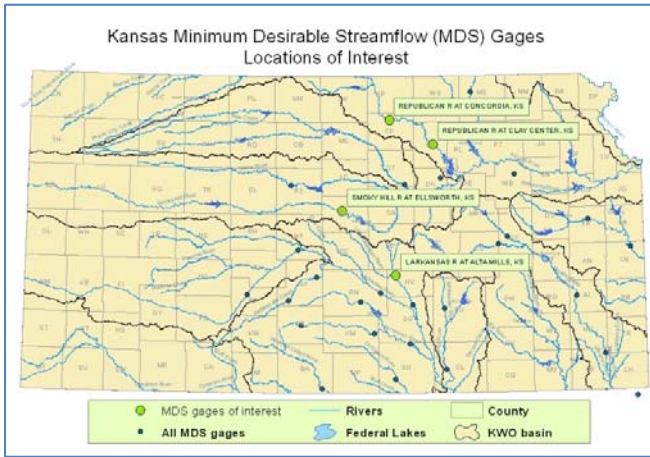
DROUGHT IMPACTS AND RESPONSE

Agriculture

For the month of January 2011, topsoil moisture supplies improved slightly with the limited precipitation and were rated 24 percent very short, 35 percent short, 40 percent adequate, and 1 percent surplus as of January 30th. There was an

average of 13 days suitable for field work during January due to the dry weather and warm temperatures during the month. Concern for the winter wheat crop due to dry soil conditions continues. For more detailed crop information please see the Kansas Department of Agriculture weekly reports. (3)

Kansas Streamflow and Reservoir Levels



No streams were under Minimum Desirable Streamflow (MDS) administration at the end of January. The table below provides flows at gages of interest and MDS information as of January 26, by February 3, all gages were iced up.

Streamflows as of January 26, 2011			
Gaging Station	Current Flow	Jan MDS	Feb MDS
Republican River at Concordia	Ice	100	125
Republican River at Clay Center	Ice	125	150
Smoky Hill River at Ellsworth	Ice	20	20
Little Arkansas River at Alta Mills	10	8	8

Table 2 summarizes federal reservoir pool elevations January 31 (Arkansas River basin) or February 1 (Kansas River basin) in terms of departure from the top of the conservation/multipurpose pool and pool elevation changes since the beginning of December. (5)

Reservoir	Top MP/C Pool ¹	Pool Elevation (Feet MSL)		End of Period	
		12/30/2010	2/01/2011	Departure from Top Beginning of Month ²	Change from Beginning of December
Kansas River Basin					
Norton ³	2304.3	2296.8	2297.07	-7.23	0.27
Harlan County, NE	1946	1946.02	1946.81	0.81	0.79
Lovewell ³	1582.6	1579.46	1579.95	-2.65	0.49
Milford ³	1144.4	1144.76	1142.79	-1.61	-1.97
Cedar Bluff	2144	2129.35	2129.33	-14.67	-0.02
Kanopolis ³	1463	1463.36	1463.6	0.60	0.24
Wilson ³	1516	1515.13	1515.31	-0.69	0.18
Webster ³	1892.5	1888.82	1889.39	-3.11	0.57
Kirwin ³	1729.3	1729.41	1729.4	0.10	-0.01
Waconda ³	1455.6	1453.83	1453.88	-1.72	0.05
Tuttle Creek ³	1075	1072.7	1072.12	-2.88	-0.58
Perry ³	891.5	889.47	889.48	-2.02	0.01
Clinton ³	875.5	874.5	874.42	-1.08	-0.08
Pomona ³	974	1034.97	1034.52	-1.48	-0.45
Melvorn ³	1036	972.49	972.25	-1.75	-0.24
Hillsdale ³	917	916.4	915.8	-1.20	-0.60
Arkansas River Basin (1/31/11)					
Cheney	1421.6	1421.62	1421.73	0.13	0.11
El Dorado	1339	1337.7	1337.55	-1.45	-0.15

Table 2 Kansas Federal Reservoirs End-of-Month Pool Elevation Summary					
		Pool Elevation (Feet MSL)		End of Period	
Reservoir	Top MP/C Pool ¹	12/30/2010	2/01/2011	Departure from Top Beginning of Month ²	Change from Beginning of December
Toronto ³	901.5	899.27	899.57	-1.93	0.30
Fall River ³	948.5	946.65	946.69	-1.81	0.04
Elk City ³	796	795.28	795.23	-0.77	-0.05
Big Hill	858	856.83	856.71	-1.29	-0.12
Council Grove ³	1274	1274.09	1273.18	-0.82	-0.91
Marion ³	1350.5	1348.58	1348.68	-1.82	0.10
John Redmond ³	1039	1038.83	1037.63	-1.37	-1.20

1. Elevations listed are the multi-purpose/conservation pool level. All figures are in comparison to this level, not the seasonal pool operation levels that are in effect at numerous reservoirs. El Dorado has a seasonal pool level.
2. All values are in feet. Negative (-) numbers indicate feet below top. Source: U.S. Army Corps of Engineers
3. Lake level management plan in place

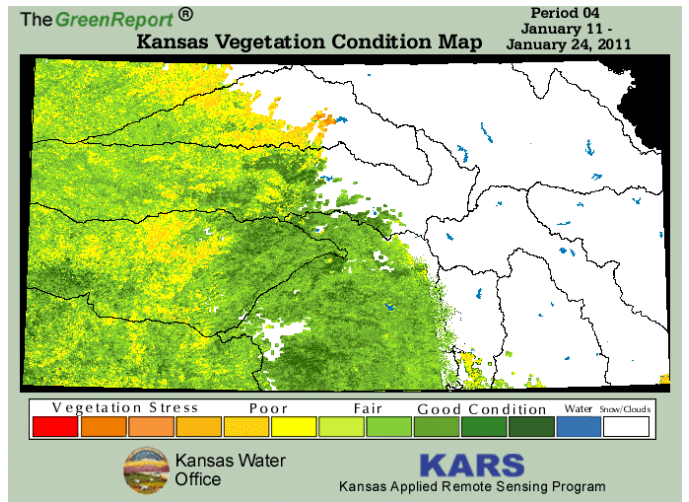
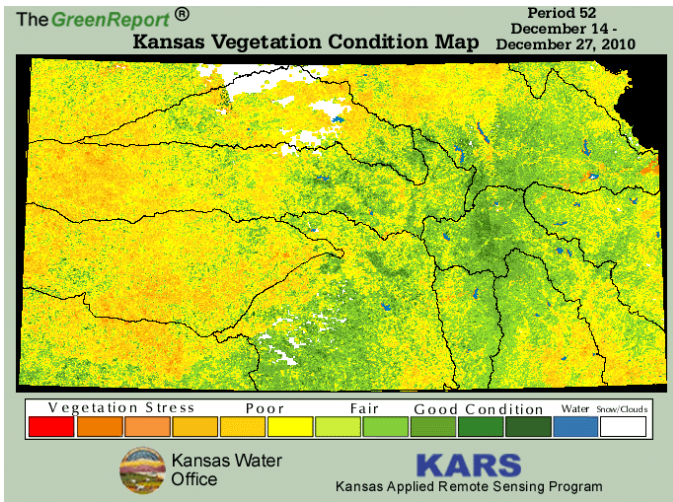
Public Water Systems

No drought-related public water system impacts are currently being reported. (6)

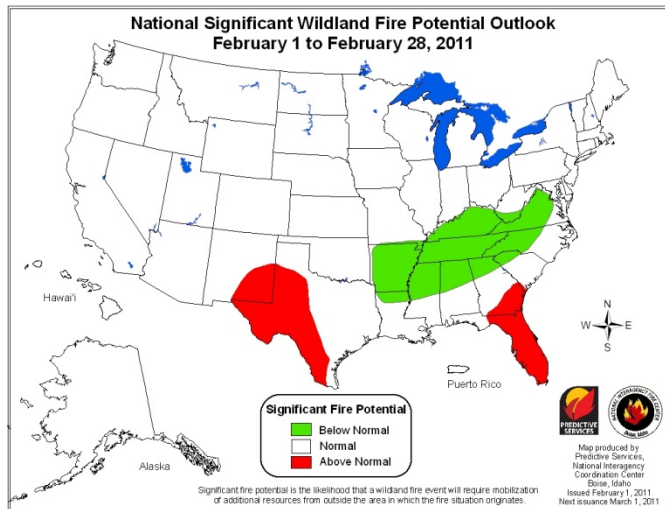
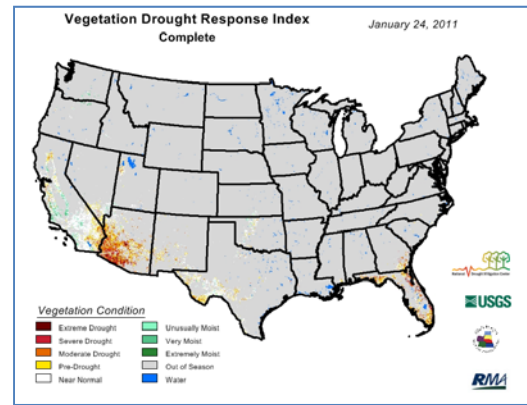
Vegetation Conditions

The 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. (7)

January conditions have the typical winter effects on vegetation, with most natural vegetation and the winter wheat crop dormant at this time.



The Vegetation Drought Response Index ([VegDRI](#)) indicates vegetation conditions across the nation for a comparison with surrounding states as of January 24, 2010. Near normal conditions are shown in south central Kansas for the areas not reported as out of season (gray). See Appendix B for larger map of Kansas conditions.



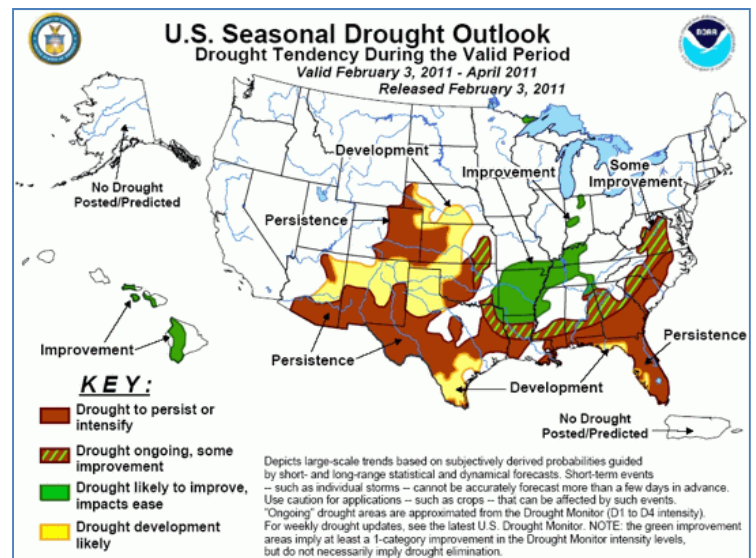
Wildfire

The [Wildland Fire Outlook](#) issued by the National Interagency Fire Center on February 1, 2011 foresees normal significant wildfire potential across Kansas during February 2011. The forecast for the March – May 2011 period for wildfire potential to increase to above normal for all but a small area of extreme north east Kansas. (8)

LOOKING AHEAD

The Seasonal Drought Outlook http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html was released by the NOAA Climate Prediction Center February 3, 2011 (9)

According to the Climate Prediction Center, based upon the good agreement among precipitation tools and a relatively dry climatology, **drought is likely to persist** and develop across western Nebraska, eastern Colorado, and **western parts of Kansas**, Oklahoma, and Texas.



ADDITIONAL INFORMATION

The Kansas Climate Summary and Drought Report is compiled each month by the Kansas Water Office from various federal, state, local and academic sources. Some data used is preliminary and is subject to change when final data is available at a later date. 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 Climate Summary and Drought Report. Kansas State Climatologist Mary Knapp is the primary source of the narrative on each month's weather. She works closely with meteorologists throughout the state and region. Details of current conditions at Evapotranspiration (ET) and Mesonet sites across Kansas are available at <http://www.ksre.k-state.edu/wdl/>.

RESOURCES

1. The [U.S. Drought Monitor](#), from the national Drought Mitigation Center at the University of Nebraska-Lincoln, provides a “big picture” perspective of conditions across the nation. In the Kansas county drought stage scheme, a Drought Watch equates roughly 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.

2. The National Weather Service (NWS) Cooperative Observer Program (COOP) is the Nation's weather and climate observing network made up of observers that send monthly reports of daily temperatures and precipitation to the NWS. <http://www.nws.noaa.gov/om/coop/wfo-rfcmap.htm>

CoCoRaHS is a community-based network of volunteers that measure and map precipitation (rain, hail and snow). Locations and daily precipitation observed through the CoCoRaHS system can be seen at <http://www.cocorahs.org/state.aspx?state=ks>

3. The [Kansas Crop Progress and Condition Report](#) is updated weekly by USDA during the growing season and monthly during the winter. The weekly report is found at http://www.nass.usda.gov/Statistics_by_State/Kansas/Publications/Crop_Progress_and_Condition.

4. The U.S. Geological Survey [Drought Watch](#) provides information on 7-day average streamflow measured at long-term gaging stations and compares them to normal flows.

5. The water levels of the federal lakes fluctuate during a year according to the management plan. [Lake level management](#) plans are posted on the Kansas Water Office web site www.kwo.org.

6. [Responding to Drought: A Guide for City, County and Water System Officials](#) provides an overview of Kansas county drought stage declarations, local planning and coordination, disaster declarations, and available state and federal assistance. [The 2007 Municipal Water Conservation Plan Guidelines](#) and the [Drought Vulnerability Assessment Report](#), both by Kansas Water Office, provide guidance regarding drought preparedness and response.

7. The Kansas Applied Remote Sensing Program (KARS) at the University of Kansas produces a [Kansas Green Report](#) each week during the growing season. For a full set of national and regional **GreenReport®** maps, go to: <http://www.kars.ku.edu/products/greenreport/greenreport.shtml>

The Vegetation Drought Response Index ([VegDRI](#)) by the National Drought Mitigation Center provides another perspective on vegetation conditions across the nation. VegDRI updated bi-weekly, attempts to isolate the impact of drought or other moisture conditions that influence vegetation condition.

8. The [Wildland Fire Outlook](#) is issued by the National Interagency Fire Center.

The National Weather Service (NWS) provides fire weather products and services for Kansas that include the Rangeland Fire Danger Index, Fire Weather Forecasts, Red Flag Watches/Warnings, and Spot Forecasts. The five NWS offices that serve Kansas websites may be accessed from the [NWS Offices' page](#).

[Fire weather](#) links also are available from the Weather Data Library at Kansas State University, as are prescribed burning guidance publications.

9. The [Seasonal Drought Outlook](#), developed by the NOAA Climate Prediction Center (NOAA CPC), assesses the likelihood for improvement, persistence or deterioration in drought conditions for areas currently experiencing drought as identified by the U.S. Drought Monitor.

Please contact Diane Coe at the Kansas Water Office (785) 296-3185 or diane.coe@kwo.ks.gov should you have any questions or suggestions.

**Appendix A
January 2011
Kansas Regional Climate Summary**

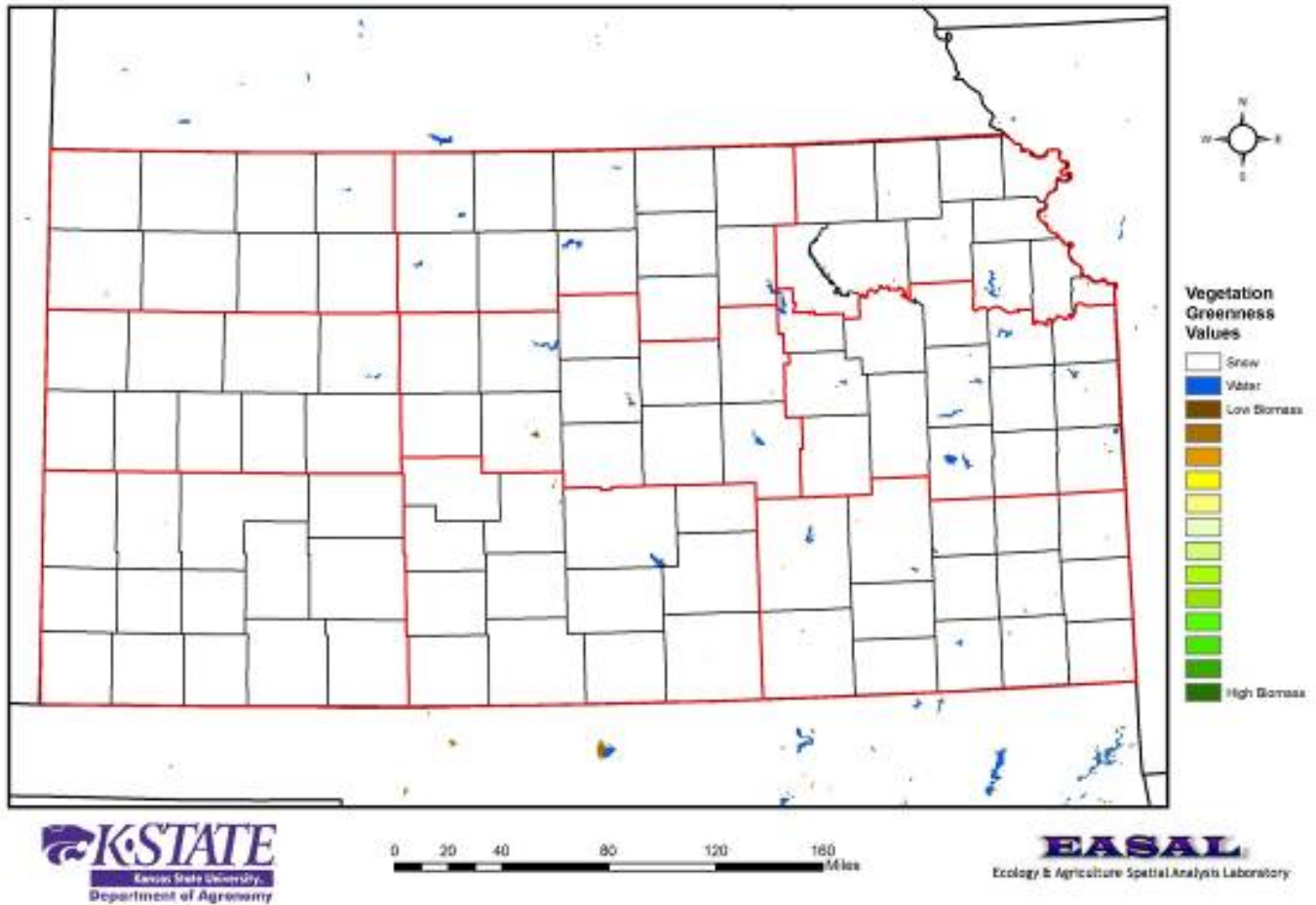
Station	Precipitation (inches)			Temperature (Degrees Fahrenheit)			
	Total	Departure	Percent Normal	Mean	Departure	Extreme (Date)	
						Highest	Lowest
West							
Burlington, CO	0.04	-0.29	33%	27.5	0.1	67 (28)	-16 (11)
Dodge City	0.34	-0.28	55%	29.5	-0.6	71 (28)	-5 (11)
Garden City	0.14	-0.26	35%	28.5	-0.7	71 (28)	-8 (11)
Goodland	0.39	-0.04	91%	28.5	0.9	67 (28)	-12 (11)
Guymon, OK	0.08	-0.21	28%	33.9	0.7	74 (29,28)	-6 (11)
Hill City	0.15	-0.41	27%	26.9		69 (28)	-12 (11)
Lamar, CO	0.02			27.4		69 (28)	-14 (1)
McCook, NE	0.15	-0.35	30%	25.7	-0.7	67 (28)	-13 (12)
Springfield, CO	0.36			31.0		70 (28)	-6 (1)
Central							
Concordia	0.69	0.03	105%	24.4	-2.2	60 (28)	-6 (12)
Hebron, NE	M	M	M	M	M	M	M
Medicine Lodge	0.38	-0.34	53%	30.2	-0.3	74 (28)	-2 (12)
Ponca City, OK	0.80			31.3	-2.5	76 (29)	1 (13,12)
Salina	0.46	-0.34	58%	26.2	-2.8	66 (28)	-6 (12)
Wichita (ICT)	0.34	-0.5	40%	28.9	-1.3	72 (28)	-1 (13)
East							
Bartlesville, OK	0.15	-1.29	10%	32.3	-3.1	77 (29)	2 (13)
Chanute	0.24	-1.04	19%	28.4	-2.4	70 (29)	-5 (12)
Fall City, NE	1.17	0.30	134%	20.1	-4.0	48 (6)	-130
Johnson Co. Exec. Apt	0.19	-1.07	15%	24.1	-5.0	54 (28)	-3 (13)
Joplin, MO	0.16	-1.68	9%	31.0	-2.1	73 (29)	-1 (12)
Kansas City (MCI), MO	1.24	0.09	108%	22.8	-4.1	48 (28,6)	-6 (13)
St. Joseph, MO	1.26	0.38	143%	20.1	-6.3	48 (6)	-11 (12)
Topeka (TOP)	1.26	0.31	133%	24.2	-3.0	53 (28)	-7 (13)

1. Airport Automated Observation Stations (NWS/FAA)
2. Departure from 1971-2000 normal value
T - Trace; M - Missing; --- no normal value from which to calculate departure or percent of normal Source:
National Weather Service F-6 Climate Summaries

Appendix B

Kansas Vegetation Condition

Period 04: 01/11/2011 - 01/24/2011



Map 1. The Vegetation Condition Report for Kansas for January 11 – 24 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that all of the state saw some snow or ice. Unfortunately, the moisture equivalent values for much of the state were lacking. Only the Northeast and the North Central divisions saw above average moisture at 144% and 124% of Normal respectively. The South Central division saw the least moisture, with an average of only 0.02 inches or eight percent of Normal.