KANSAS CLIMATE
March 2020

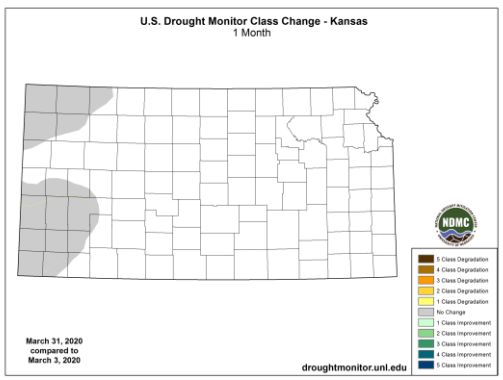
Highlights

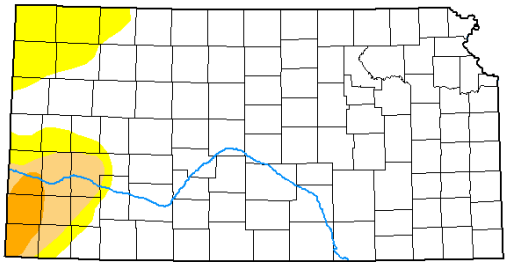
- U.S. Drought Monitor indicated continuing areas of abnormally dry (D0), moderate drought (D1), severe drought (D2) in parts of western Kansas.
- Statewide March precipitation was generally above average, ranking 94 out of 126.
- Statewide March temperatures were above average, ranking 111 out of 126.
- April outlook: slight chance of above normal temperature or equal chance above/below normal; slight chance of above normal precipitation or equal chance above/below normal.
- Drought Outlook favors long-term reduction or removal of drought from the state.

General Drought Conditions

The U.S. Drought Monitor indicated dry and drought conditions in parts of western Kansas at the beginning of the month. There has been no change in drought or dry conditions over the month of March. The condition at the end of the month is shown below in Figure 1. Change in drought classification over the month is also shown.

Figure 1. U.S. Drought Monitor Maps of Drought status





U.S. Drought Monitor

Kansas

March 31, 2020

(Released Thursday, Apr. 2, 2020)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	85.54	14.46	6.04	2.02	0.00	0.00
Last Week *03-24-2020*	85.54	14.46	6.03	2.02	0.00	0.00
3 Months Ago *12-31-2019*	67.13	32.87	9.89	4.22	0.00	0.00
Start of Calendar Year *12-31-2019*	67.13	32.87	9.89	4.22	0.00	0.00
Start of Water Year *10-01-2019*	81.26	18.74	4.91	0.00	0.00	0.00
One Year Ago *04-02-2019*	100.00	0.00	0.00	0.00	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

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More information can be found on the U.S. Drought Monitor web site https://droughtmonitor.unl.edu/.

Climate Summary

Figure 2 and Figure 3 below summarize observed precipitation and temperature, respectively, for the month using the PRISM dataset available at http://www.prism.oregonstate.edu/6month/. Additional state maps are available through the KSU Weather Data Library at http://climate.k-state.edu/maps/monthly/.

Figure 2. Monthly Precipitation maps

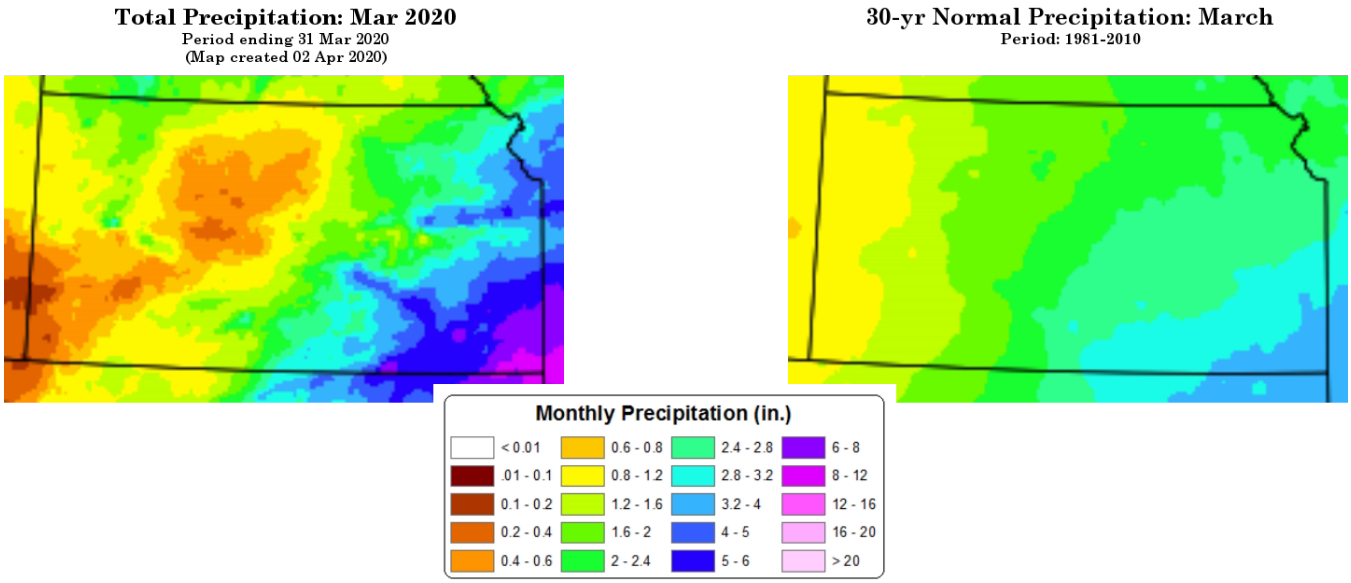
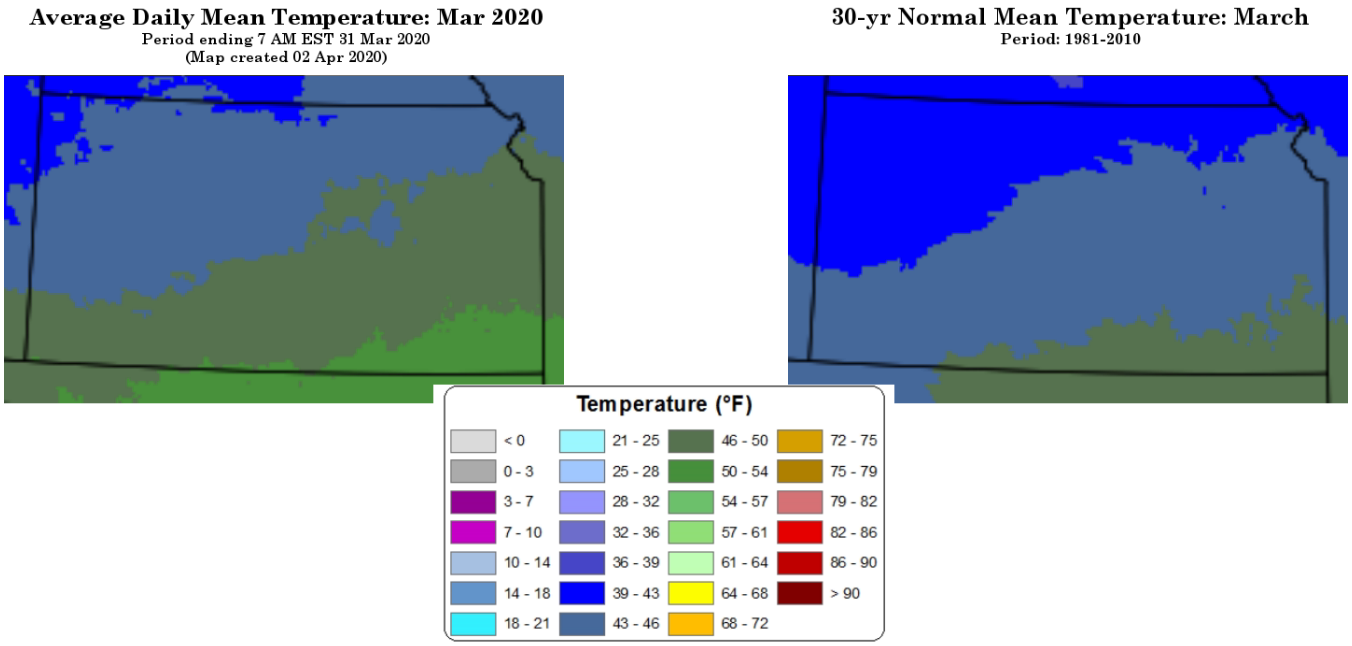


Figure 3. Monthly Temperature Maps



Outlooks

Figure 4. Drought Outlooks

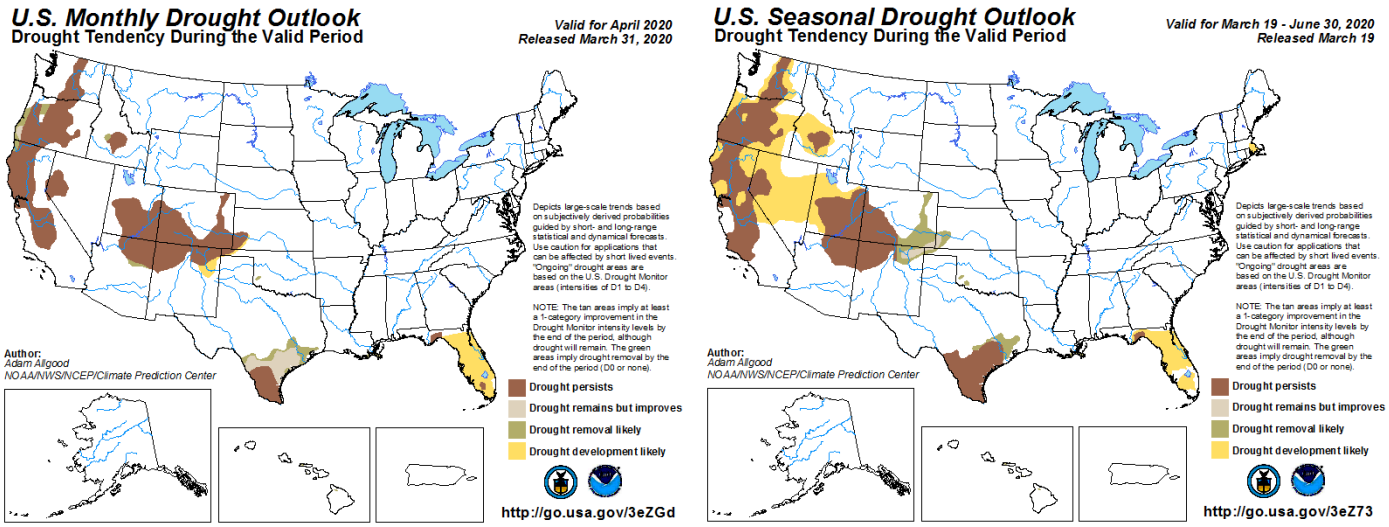


Figure 5. Next Month Precipitation and Temperature Outlooks

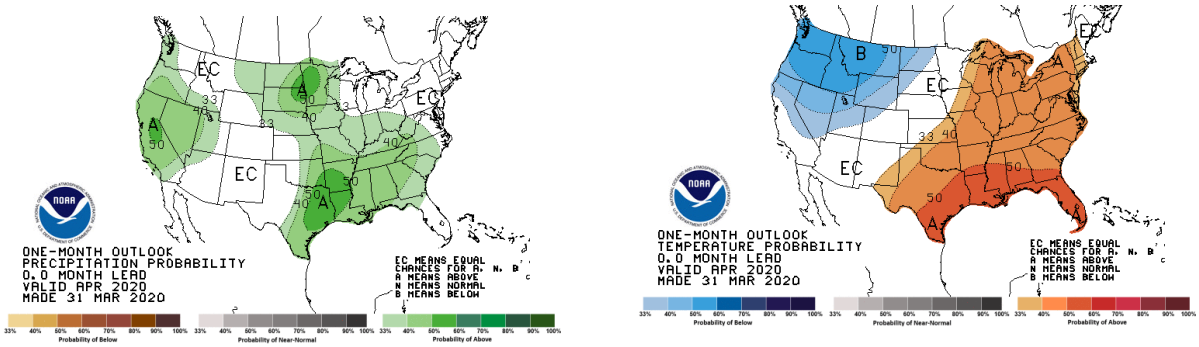
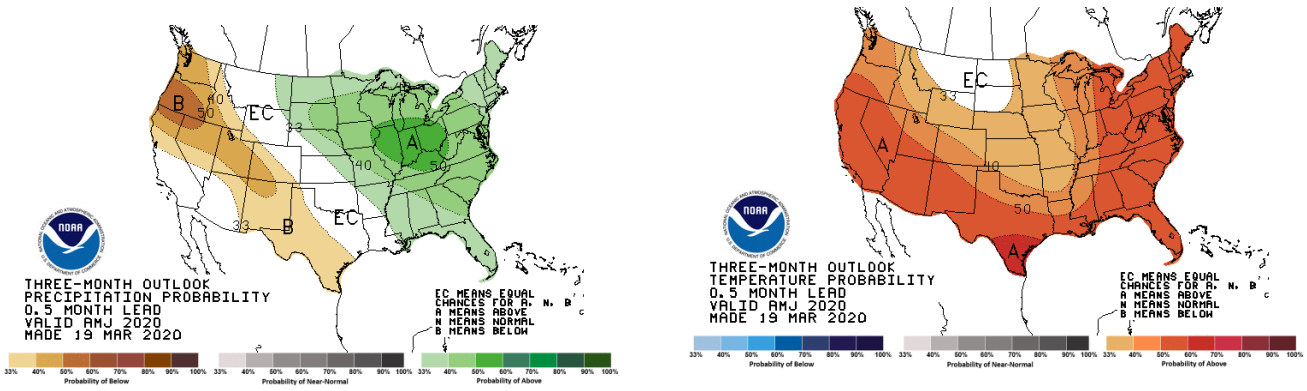


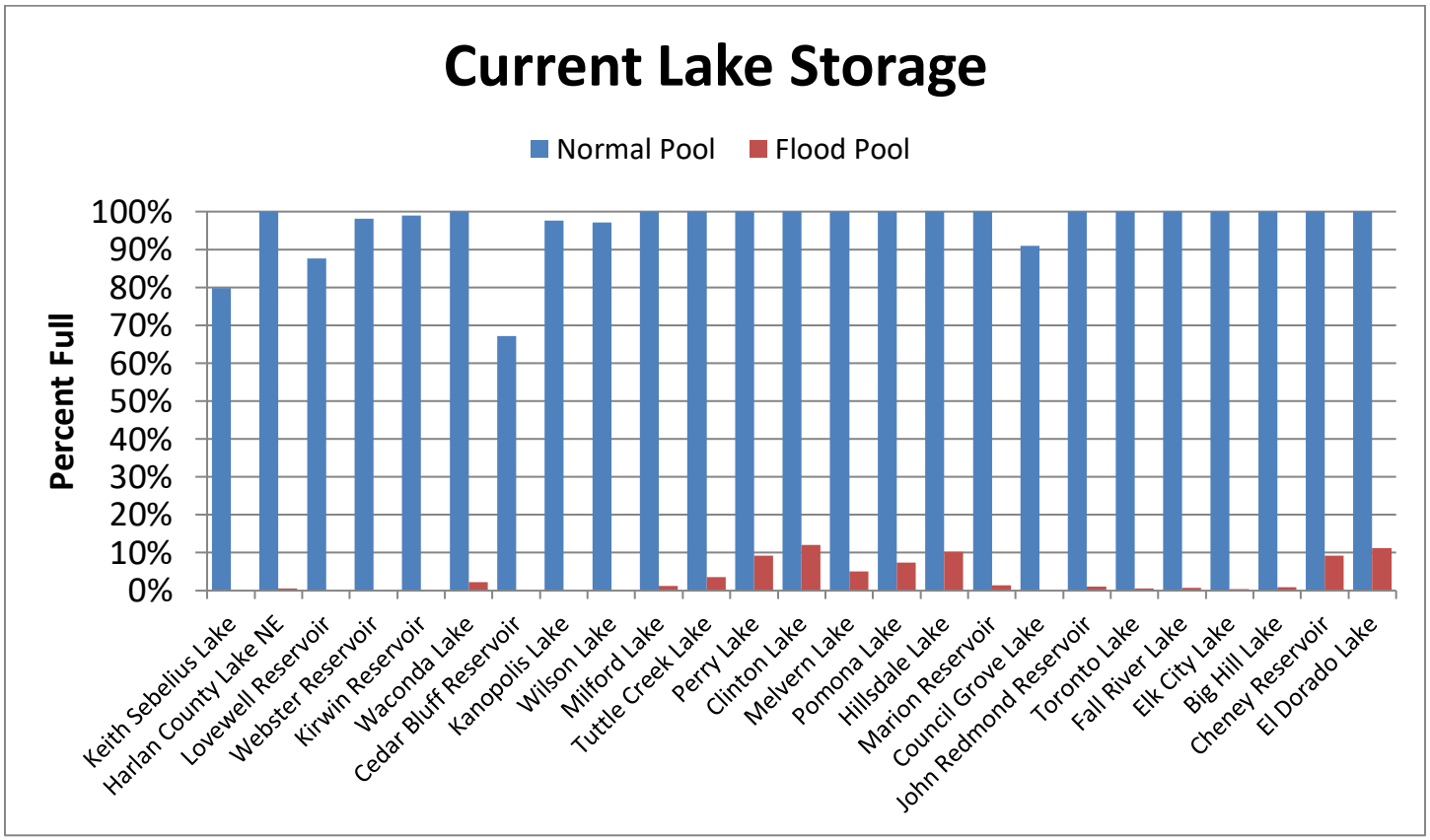
Figure 6. Three Month Precipitation and Temperature Outlooks

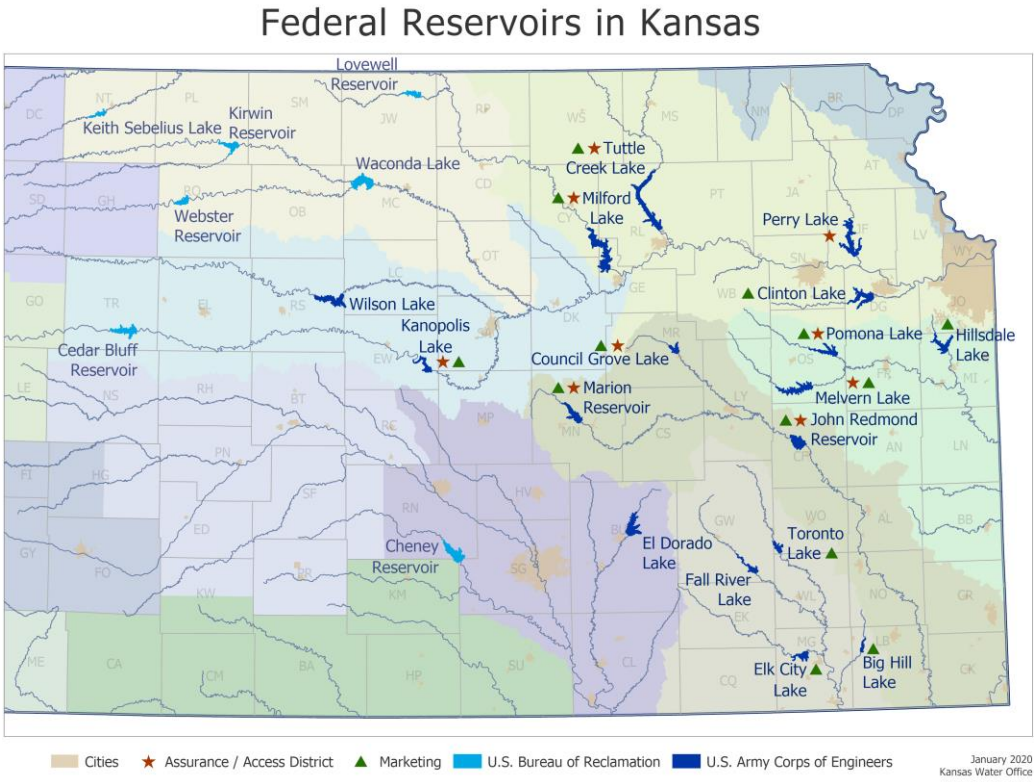


Water Supply

Reservoir Storage

Figure 7 provides the volume of the normal pool and flood pool filled in federal reservoirs in Kansas. The location and uses of the reservoirs are shown in Figure 8.

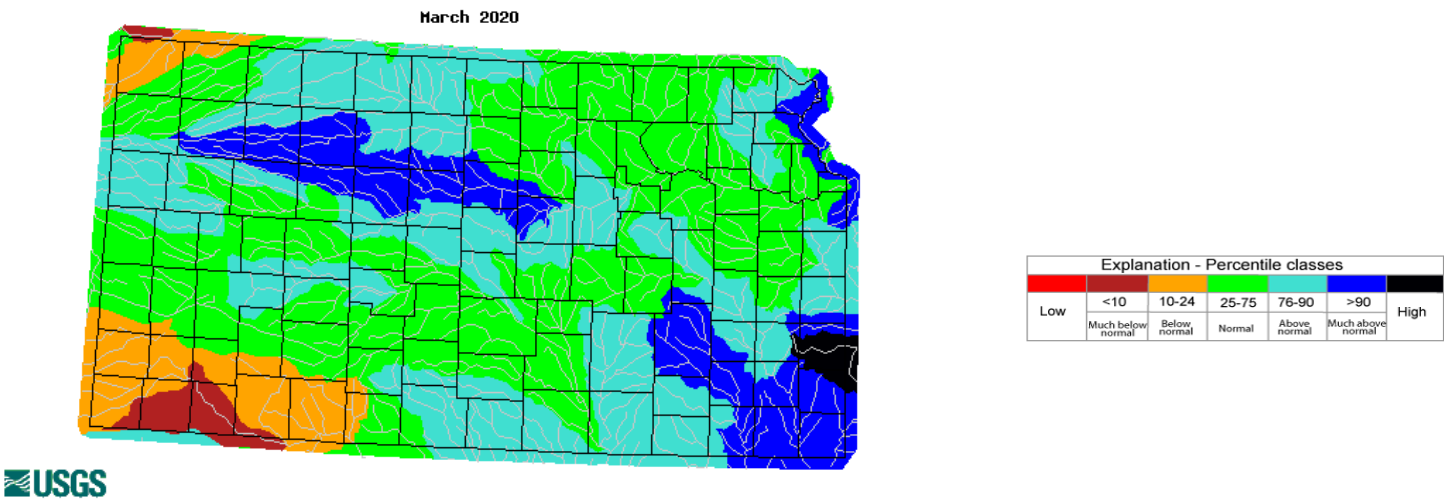




Streamflow Conditions

WaterWatch summarizes streamflow conditions in a region (state or hydrologic unit) in terms of the long-term typical condition at stream gages in the region. In general, a streamflow which is greater than the 75 percentile is considered *above normal*, a streamflow which is between 25 and 75 percentiles is considered *normal* and a streamflow which is less than the 25 percentile is considered *below normal*. Color codes are for basins with streamflow averages less than 25 percent of historic values. This comparison aids in evaluating water resources conditions for a time period. A summary of flooding in is found later in this report. Figure 9 summarizes streamflow.

Figure 9. Monthly streamflow compared to historical streamflow



Minimum Desirable Streamflow: Low flows may be reflected at gage locations when the flow does not reach Minimum Desirable Streamflow (MDS). MDS requirements are in place to ensure base flows in certain streams to protect existing water rights and to meet in-stream water uses related to water quality, fish and wildlife and recreation. The Kansas Department of Agriculture, Division of Water Resources monitors 23 streams and rivers at 33 locations for minimum desirable streamflow. When flows drop below an established threshold, pumping restrictions are imposed on permits or water rights granted after the minimum desirable streamflow provision was made into law in 1984.

The table below notes locations of concern including those below MDS.

Streamflows as of April 6, 2020			
Gaging Station	**Current Flow**	**Apr MDS**	**Comment**
Rattlesnake Creek near Macksville	6	10	No surface water diversions junior to MDS above gage
Rattlesnake Creek near Zenith	27	15	No surface water diversions junior to MDS above gage

Vegetation, Soil Moisture and Crops

Vegetative Conditions

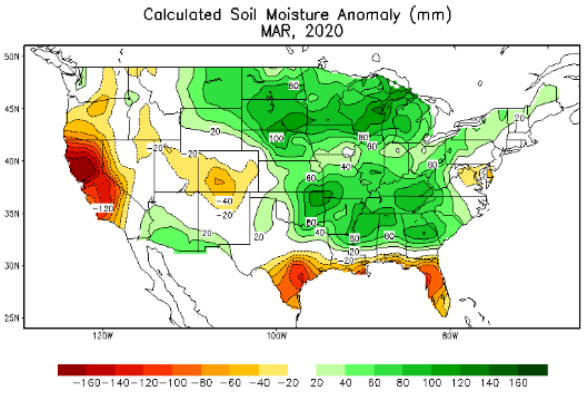
The Vegetative Condition map depicts vegetation stress. It is produced using satellite data by the National Drought Mitigation Center https://vegdri.unl.edu/Home.aspx and often customized for Kansas by the Kansas Biological Survey in the GreenReport.

Soil Moisture and Rangeland

The Climate Prediction Center (CPC), monitors soil moisture and predicts future soil moisture. Anomalies are defined as deviations from the 1971-2000 monthly climatology. The monthly soil anomaly is shown in Figure 10. (http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml).

Within Kansas soil moisture is now being measured through the Kansas Mesonet and Kansas State University the percent of soil saturation (representative of grassland vegetation). For current estimated statewide soil saturation visit: http://mesonet.k-state.edu/agriculture/soilmoist/.

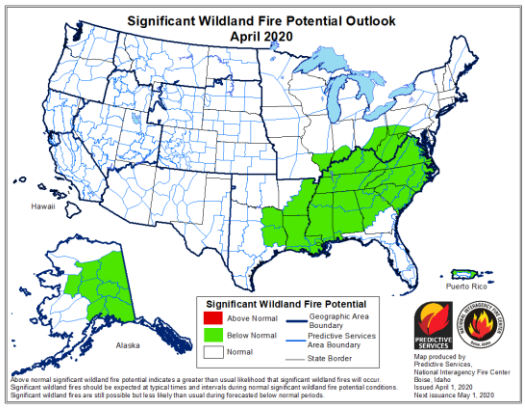
Figure 10.



Fire

The National Weather Service issues Red Flag Warnings when conditions favoring wildfire are at an increased risk. These are issued daily when needed. A Significant Wildland Fire Potential Outlook is issued monthly for the United States. Figure 11 is the most recent outlook for possible wildfires tor the next month. Additional forecasts can be found at https://www.predictiveservices.nifc.gov/outlooks/outlooks.htm.

Figure 11.



Kansas Climate Summary

The Kansas Weekly Climate Summary and Drought Report are compiled at least monthly, more frequently when conditions warrant, by the KWO. Some of the data is preliminary and subject to change once final data is available. The KWO web site, http://www.kwo.ks.gov/reports2/climate-and-drought-monitoring-response, contains additional drought information including links to other agencies with drought information and past issues of the Kansas Climate Summary and Drought Report. Details of current conditions at such as precipitation, temperature, evapotranspiration (ET), soil moisture and more are available at http://mesonet.k-state.edu/.

RESOURCES and REFERENCES

Kansas climate data is provided by Kansas State University, Weather Data Library through the Kansas Mesonet. (http://www.ksre.k-state.edu/wdl/). Soil moisture data was added in 2018 (http://mesonet.k-state.edu/agriculture/soilmoist)

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. Palmer Drought Severity Index - The Palmer Index (PDSI) is one indicator used in the U.S. Drought Monitor.

The High Plains Regional Climate Center (https://hprcc.unl.edu/) has precipitation and temperature summary maps available for the state, region and nation.

The U.S. Geological Survey (USGS) Drought Watch provides information average streamflow measured at long-term gaging stations and compares them to normal flows.

The Kansas Department of Agriculture-Division of Water Resources monitors stream flow using the USGS gages for determination of administrative needs. Administration may be needed due to Minimum Desirable Streamflow (MDS) requirements, impairments and reservoir release protection. (https://agriculture.ks.gov/divisions-programs/dwr/water-appropriation/minimum-desirable-streamflow.)

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.ks.gov .

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. This Kansas Vegetation Drought Response Index map is developed weekly by the Kansas Biological Survey using state drought triggers as its key. In addition, the National Drought Mitigation Center also produces VegDRI maps which may be found at http://vegdri.unl.edu/.

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.

The Monthly and Seasonal Drought Outlooks, developed by the NOAA Climate Prediction Center, assess the likelihood for improvement, persistence or deterioration in drought conditions for areas currently experiencing drought as identified by the U.S. Drought Monitor. (http://www.cpc.ncep.noaa.gov/) Also see: http://www.noaa.gov/.

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 KWO, provide guidance regarding drought preparedness and response. These are available at http://www.kwo.ks.gov/reports2/climate-and-drought-monitoring-response.

USDA Drought Programs and Assistance website (https://www.usda.gov/topics/disaster/drought/usda-drought-programs-and-assistance) listing the various USDA programs and agencies to assist with drought issues.

The National Interagency Coordination Center in Boise, Idaho, produces wildfire potential outlook maps monthly. (https://www.predictiveservices.nifc.gov/outlooks/outlooks.htm)

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