

MEMO

DATE: February 19, 2021
 TO: Chairman Ron Highland
 FROM: Connie Owen, Director
 RE: House Committee on Water Presentation Follow Up

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The Kansas Water Office (KWO) is providing the following information in response to questions posed by you and Rep. Rhiley during the question portion of the Kansas Water Office presentation before the House Committee on Water on February 16, 2021. If you or members of the Committee have any further questions on these topics or others, please feel free to contact me by email at Connie.Owen@kwo.ks.gov or the phone number listed above.

Drought Monitoring, Classification & Trends within Kansas

Drought Monitoring

KWO coordinates with multiple federal and state officials to monitor climate conditions, soil moisture, current water demands, and available water resources needed to supplement deficient precipitation. This monitoring effort requires daily engagement during periods of drought within the state.

Drought Classification

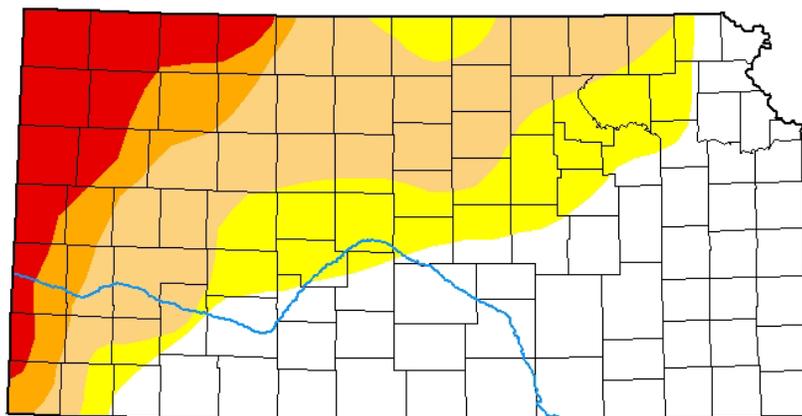
In Kansas, drought is classified in two ways. The first is through a nation-wide process put out by the National Oceanic and Atmospheric Administration (NOAA). As described above, this classification process takes many types of data from multiple partners to develop maps that show areas experiencing below normal precipitation.

U.S. Drought Monitor Kansas

February 16, 2021

(Released Thursday, Feb. 18, 2021)

Valid 7 a.m. EST



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>

Author:

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droughtmonitor.unl.edu

Examples of Tools Used to Identify Drought Conditions

Category	Description	Ranges				
		Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Kansas-Specific Drought Impacts per Category

Category	Impact
D0	Stock pond levels decrease, planting is delayed (particularly for winter wheat), irrigation/watering demands increase
D1	Wheat and grasses are drought stressed; hay demand increases
	Fire danger increases Pond levels are low; habitat is poor in migratory flyways
D2	Wheat, corn, soybean, and hay yields are low; crops are severely damaged
	Burn bans are implemented; firework sales are banned; more grass fires occur Blue-green algae impacts water supply; ponds and streams are dry
D3	Cattle sales are high; emergency grazing is opened; corn and wheat crops fail; pasture conditions are poor
	Major infestation of locusts occurs; quail and pheasant populations are reduced; trees are stressed Emergency water supplies are needed; river levels are low; municipal water restrictions are implemented
D4	All crops are severely impacted/not harvested; ground is cracking
	Wildfires and large dust storms occur
	All aquatic species and food chains are affected; fish kills occur
	Negative impact on economy is noted Irrigation is turned off; river has dried up

Drought Trends in South-Central Kansas: 1980 to Current for Cowley County

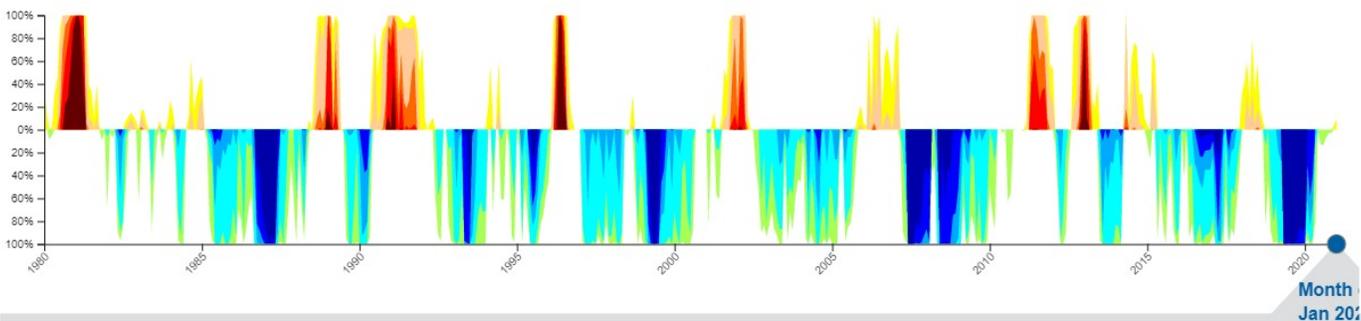
Information in the below graphic reflects trends in Standardized Precipitation Index (SPI) values specifically for Cowley County dating back to 1980. Yellow, orange and red values indicate periods of time when the SPI index indicated periods of abnormally dry through exceptional drought conditions. The green and blue values indicate periods of time abnormally wet through exceptionally wet conditions were observed for Cowley County over the last 40 years. The map indicates current SPI index values for Kansas. This information can be obtained for each county in Kansas to help characterize periods of wet and dry times across Kansas dating back to 1895.

1895 - Present (Monthly)

The Standardized Precipitation Index (SPI) is an index to characterize meteorological drought on a range of timescales, ranging from 1 to 72 months, for the lower 48 U.S. states. The SPI is the number of standard deviations that observed cumulative precipitation deviates from the climatological average. NOAA's National Centers for Environmental Information produce the 9-month SPI values below on a monthly basis, going back to 1895.*

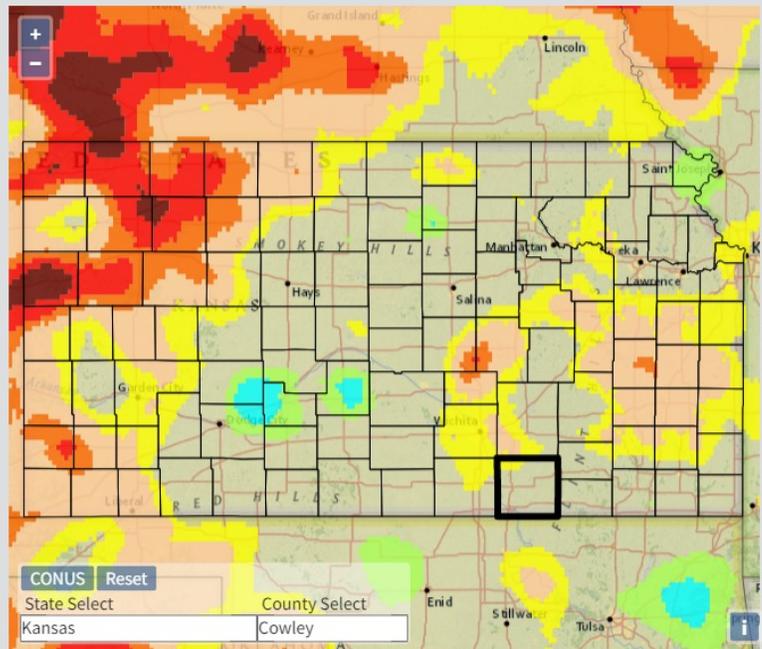
* Currently, data is only available for the contiguous U.S.

Time Period (Years): to [Update Graph](#) [Reset Graph](#)



Month
Jan 2021

D0 - Abnormally Dry	9.6% of Cowley County (D0-D4)	W0 - Abnormally Wet	0% of Cowley County (W0-W4)
D1 - Moderate Drought	0% of Cowley County (D1-D4)	W1 - Moderate Wet	0% of Cowley County (W1-W4)
D2 - Severe Drought	0% of Cowley County (D2-D4)	W2 - Severe Wet	0% of Cowley County (W2-W4)
D3 - Extreme Drought	0% of Cowley County (D3-D4)	W3 - Extreme Wet	0% of Cowley County (W3-W4)
D4 - Exceptional Drought	0% of Cowley County (D4)	W4 - Exceptional Wet	0% of Cowley County (W4)
No Data Available	0% of Cowley County		



CONUS [Reset](#)
 State Select County Select

State of Kansas Drought Response Process

The KWO is responsible for monitoring drought and notifying the Governor when drought conditions exist within the state. Coordination of drought response activities in Kansas is accomplished through the Governor's Drought Response Team which has been in place since the 1980's. The Director of the KWO serves as the committee chair and advises the Governor when to assemble this team, which represents 11 state and federal agencies.

Kansas Drought Response Process:

- Kansas Water Office monitors state drought conditions
- Director of KWO calls Drought Response Team meeting when conditions indicate drought
- Drought Response Team reviews conditions
- Drought Response Team recommends drought stages and counties
- Director of KWO makes recommendation to Governor
- Governor Issues Declaration
- Declaration in effect until rescinded or superseded
- KWO monitors state conditions, coordinates with agencies as well as seeks input on federal drought status
- Repeat cycle

Stage	U.S. Drought Monitor Description	Declared by	Possible Impacts	Response Summary ¹
Drought Watch	Moderate Drought	Governor	Some damage to crops and pastures; high rangeland fire danger; streams or reservoirs low; serious public water system water shortages not imminent, but likelihood of shortages growing.	Governor notified by Kansas Water Office; Governor's Drought Response Team activated; public notification; outdoor burning bans may be imposed; public water systems may implement Stage 1 Water Watch phase of municipal water conservation plan; Governor may request USDA disaster declaration for drought.
Drought Warning	Severe Drought	Governor	Crop or pasture losses likely; some stock water shortages; very high rangeland fire danger; public water system water shortages present; some streamflow targets not met.	Public water systems may implement Stage 2 Water Warning phase of municipal water conservation plan; Hay and Pasture Exchange activated; urgent surplus water contracts from state controlled storage authorized; Governor may request authorization for haying and grazing of Conservation Reserve Program acres; Governor may request USDA disaster declaration for drought.
Drought Emergency	Extreme and Exceptional Drought	Governor	Widespread major crop and pasture losses; extreme rangeland fire danger; stock water shortages; widespread public water system water shortages or restrictions; streamflow targets not met; reservoir supplies low.	Governor may declare outdoor burning ban upon advice of Adjutant General; public water systems may implement Stage 3 Water Emergency phase of municipal water conservation plans; emergency surplus water contracts from state controlled storage authorized; emergency water withdrawals from USACE reservoirs and state fishing lakes per MOU's authorized; USACE emergency water assistance possible; Governor may request Presidential disaster declaration and/or USDA disaster declaration for drought.

The table above describes the Kansas Drought Stages. More information on our phased response plan can be found by following this link to the Kansas Water Office website: <https://kwo.ks.gov/reports2/climate-and-drought-monitoring-response>

Kansas Water Supply Storage Contracts and U.S. Army Corps of Engineers Reservoirs

The KWO operates the Kansas Water Marketing, Water Assurance and Access District programs as part of its Public Water Supply Program. Kansas has contracts with the U.S. Army Corps of Engineers (USACE) for purchase of water supply storage in 14 reservoirs; 12 of those have storage currently committed to, and being paid for by, the customers of the Water Marketing Program; 8 of the reservoirs have storage that has been sold to Assurance Districts for district members; 1 reservoir has storage that has been sold to the Lower Smoky Hill Access District; and 5 of the reservoirs have Future Use Storage that has been purchased by the state, but has not yet been called into service.

The water supply storage purchase contracts between the USACE and the KWO authorize the KWO to utilize storage space within the conservation pool to store water. The conservation pool refers to the storage space below the normal pool level, the water you would see when visiting a lake at a time without extreme wet conditions. Storing and using water in the conservation pool is authorized by State of Kansas water rights, acquired by the Director of the KWO through the State Water Plan Storage Act. High pool levels, above the conservation pool, is storage space called the flood pool and it is controlled by the USACE. The KWO exercises control of the conservation pool by calling for releases from

state-owned storage when needed to meet the demands of the state's customers and district members. When water is being stored within the reservoir above the conservation pool (within the flood pool), the USACE can make releases to evacuate the storage within the flood pool.

The water supply storage purchase contracts contain language that allow USACE to control and use all storage within the reservoir in specific circumstances. This includes measures that may be necessary to protect life and/or property, including carrying out inspections, performing maintenance or in order to make repairs to the reservoir/dam. The USACE has coordinated closely with the KWO in times when this control has been necessary, including lowering releases from Tuttle Creek Lake in order to complete maintenance at the dam, which is currently ongoing.