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Written Testimony
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Subcommittee on Conservation, Climate, Forestry and Natural Resources
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Chairman Bennet and Ranking Member Marshall, thank you for the opportunity to appear today to discuss "The High Plains: Combating Drought with Innovation." My name is Constance C. Owen. I serve as the Director of the Kansas Water Office (KWO) located in Topeka, Kansas. Our office is the state level policy, planning and coordination agency for all water issues in Kansas. The KWO also serves as a public water supply utility through contracts with the U.S. Army Corps of Engineers for water storage space in federal reservoirs in Kansas. A flagship responsibility of the KWO is the development of the Kansas Water Plan, which focuses on the water challenges in Kansas and recommends actions to address those challenges.

The Kansas Water Plan focuses on five guiding principles: Conserve and Extend the High Plains Aquifer; Secure, Protect, and Restore our Kansas Reservoirs; Improve the State's Water Quality; Increase Awareness of Kansas Water Resources; and Reduce Our Vulnerability to Extreme Events. The latter principle addresses resilience to drought, floods, and climate change. Preventing and mitigating the adverse impacts of drought in Kansas are of utmost importance to all water uses, whether agricultural, municipal, industrial, recreational or environmental. In recent years, the increasing severity of drought in Kansas magnifies the urgency of the need to address this threat.

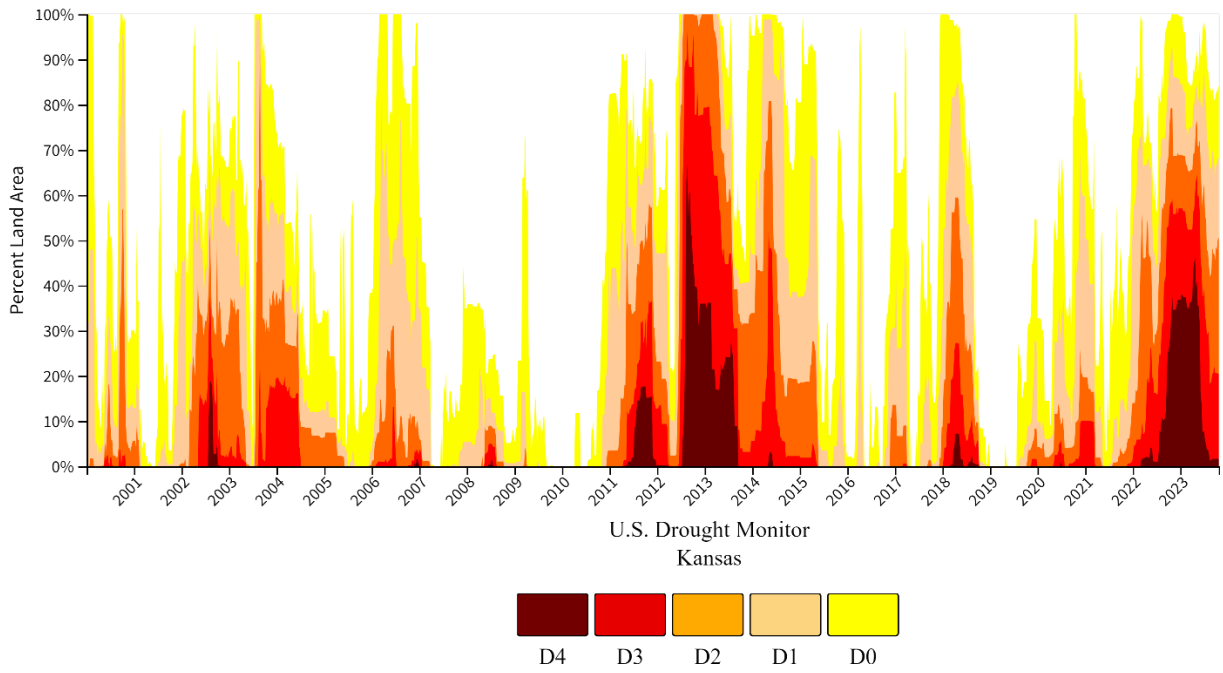
As reported in the Kansas Water Authority's 2024 Annual Report to the Governor and Legislature:

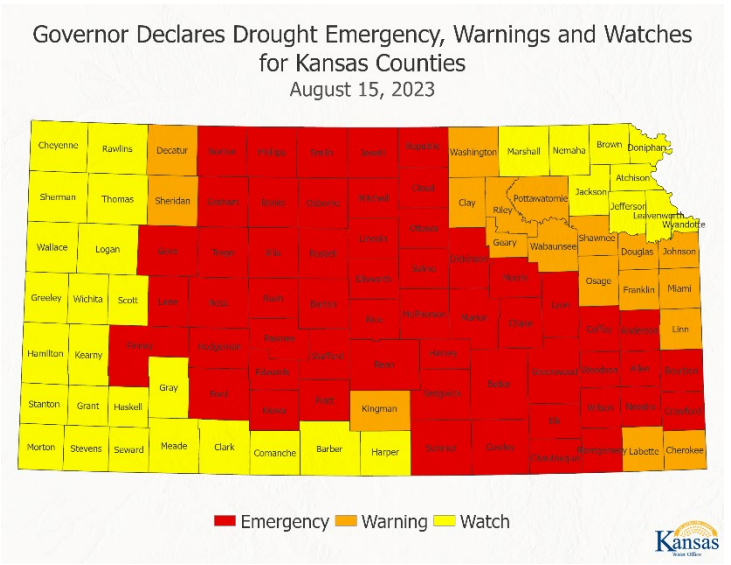
"The Kansas Water Office is responsible for monitoring drought and notifying the Governor when drought conditions exist within the state and recommending assembly of the

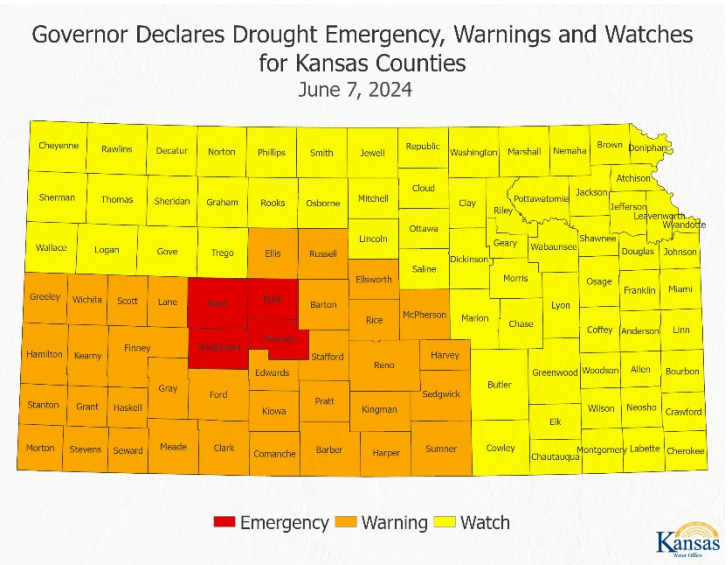
Governor's Drought Response Team. The team reviews conditions and recommends drought stages for each county. The Director of the Kansas Water Office makes a recommendation to the Governor, who then issues a drought declaration through executive order. This declaration is in effect until rescinded or superseded. Response to drought is provided through many state programs and associated authorities or responsibilities. The Drought Response Team is responsible for implementing an interagency state government response to drought that is properly coordinated with local and federal response activities at all drought stages. For example, an interagency agreement between the Kansas Water Office, Kansas Department of Wildlife and Parks, and the Kansas Division of Emergency Management qualifies counties in emergency status for emergency use of water from certain state fishing lakes to fight wildfires. These counties also become eligible for water in some federal reservoirs, in addition to state fishing lakes, for domestic stock water."[1]

The latest drought declaration from Governor Laura Kelly was issued on June 7, 2024, through executive proclamation. The drought declaration placed four counties into emergency status, 35 counties in warning status, and 66 counties in watch status. Although this declaration is not nearly as dire as in some recent years, the forecast for the coming summer predicts warmer and drier conditions.

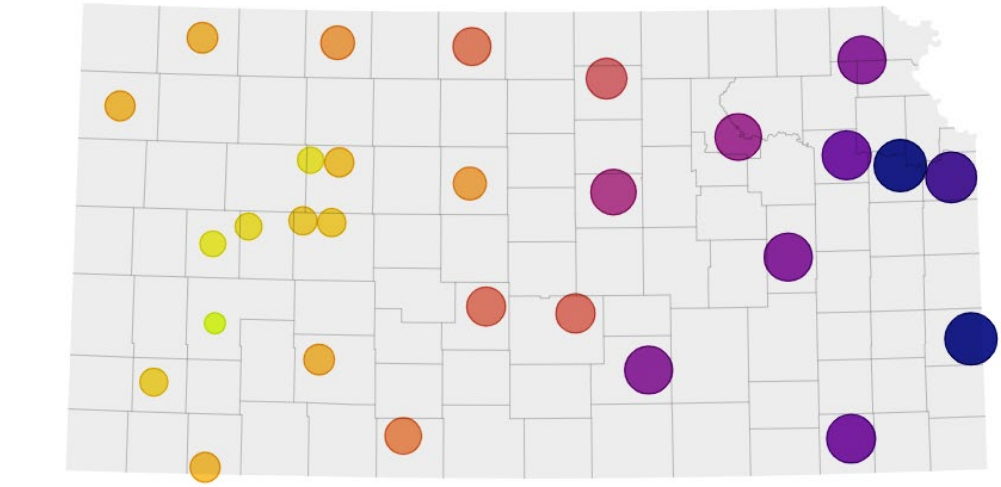
Quite recently, Kansas suffered through the 33rd driest period on record since 1895. During the months of October 2022 through September 2023, precipitation was an average of 3.56 inches below normal. The drought declaration issued in response to those conditions placed 55 counties into emergency status, 18 counties in warning status, and 32 counties in watch status.







The economic impacts of severe drought can be devastating, as was seen in the 2022 drought. Many agricultural areas in Kansas, dependent on precipitation and a dwindling groundwater aquifer, saw records broken for the least amount of rainfall since record-keeping began. Finney County saw only 5.03 inches all year, the lowest amount since 1893; Scott County saw only 8.01 inches, the lowest since 1895; and Lane County saw 8.75 inches, the lowest since 1901. Other record lows were recorded in Trego and Ness Counties, as well.[2]



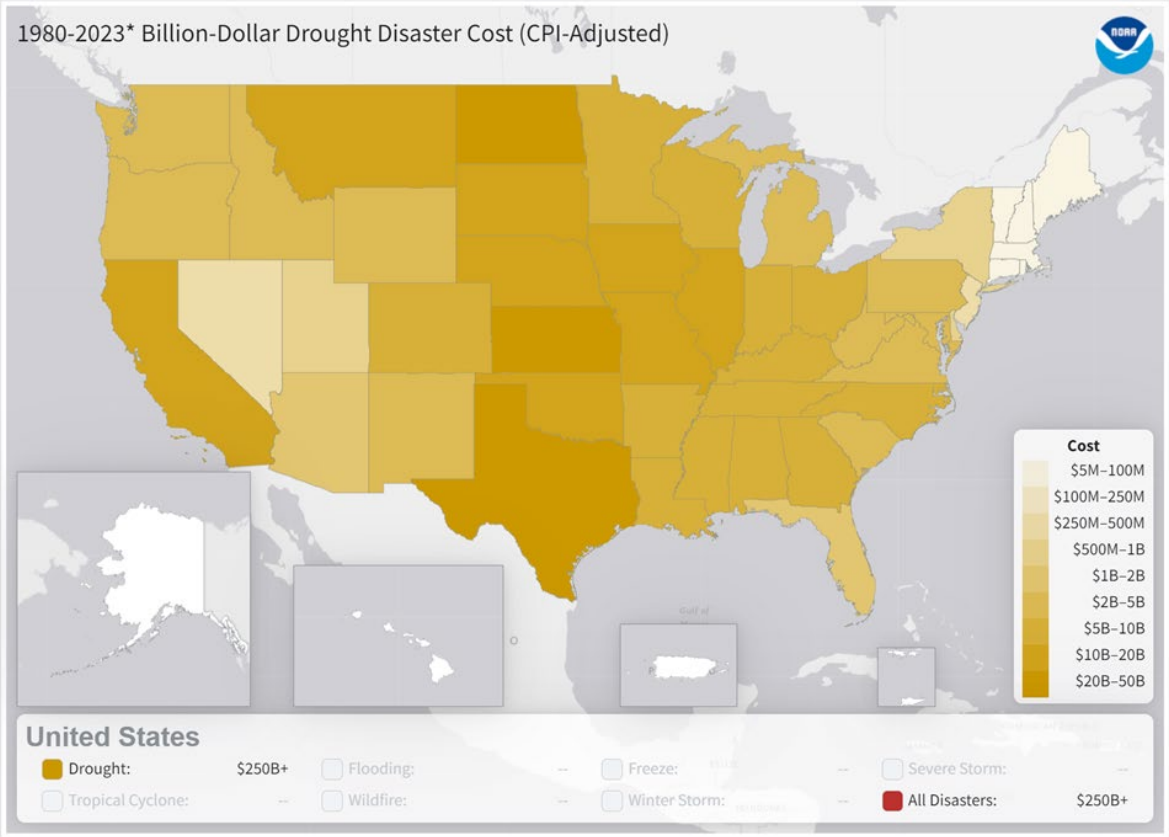
Map: David Condos, Kansas News Service • Source: NOAA ACIS • Created with Datawrapper

In Kansas, the economic driver for most of the state is agriculture, including crops and livestock. Without adequate water, the domino effect of drought can cripple a local, regional and statewide economy. With large scale crop failures due to drought, the lost income stream is felt down the supply chain, from seed sellers to equipment repair shops, to grocery stores and local retailers. Predictably, the impact can lead to higher food prices and food scarcity. Ultimately, severe and extended drought conditions can threaten national security interests.

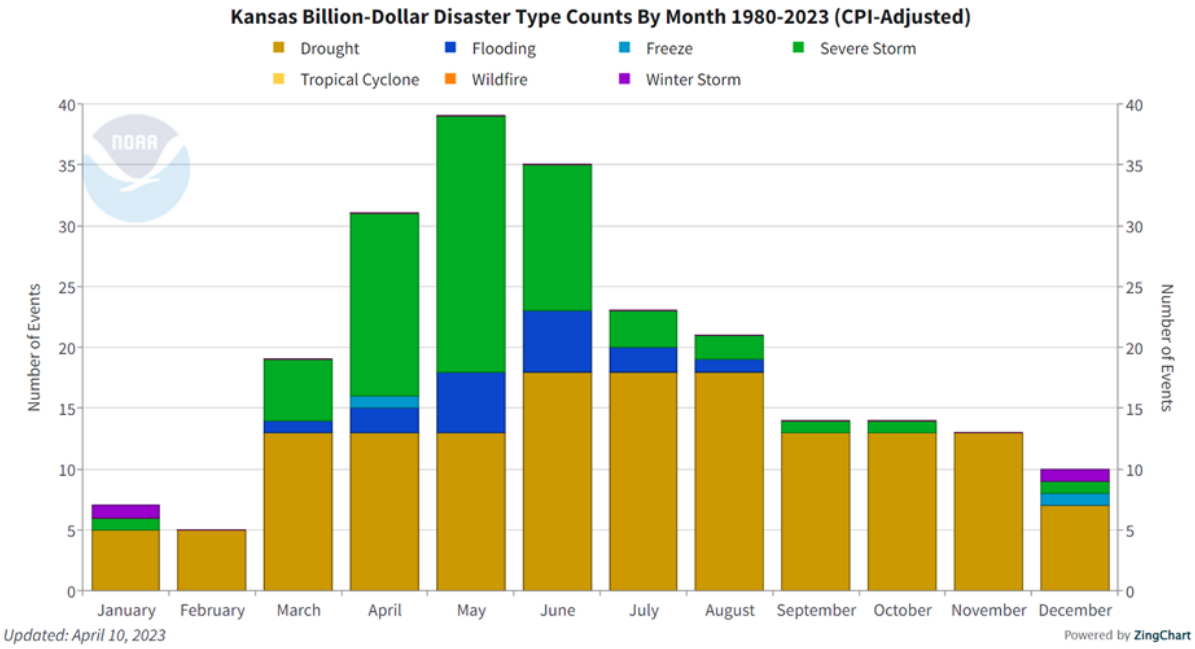
As reported in the Kansas Water Plan, Kansas is facing a warming trend in the future accompanied by a potential increase in the frequency, duration, and intensity of extreme events. This is evidenced by temperatures in Kansas rising about 1.5°F since the beginning of the 20th century with temperature increases more pronounced in the winter and spring. Even small increases in average temperatures result in increased evaporation and evapotranspiration, as well as raise the risk of heat waves, wildfires and droughts. Additionally, higher surface water evaporation and more turbulent atmospheric conditions can lead to severe weather.[3]

Extreme high temperatures and higher than normal wind conditions contributed to the agricultural devastation. “Across western Kansas — in towns from WaKeeney to Dodge City to Oakley — the number of 100-degree days in 2022 landed in the top 10 of all years on record.”[4] Some areas experienced wind conditions breaking records dating back to the 1940s.[5] In the

summer of 2022, the intense heat and lack of precipitation was responsible for the deaths of thousands of cattle in several Kansas counties, including Seward, Haskell, Grant, Finney, Gray and Scott.[6] Kansas sits behind only Texas and North Dakota in the number of Billion-Dollar drought disasters dating back to 1980.[7]



Our most common disaster type in Kansas is drought, with roughly 65% of Kansas billion-dollar disaster events dating back to 1980 being drought-related.[8]

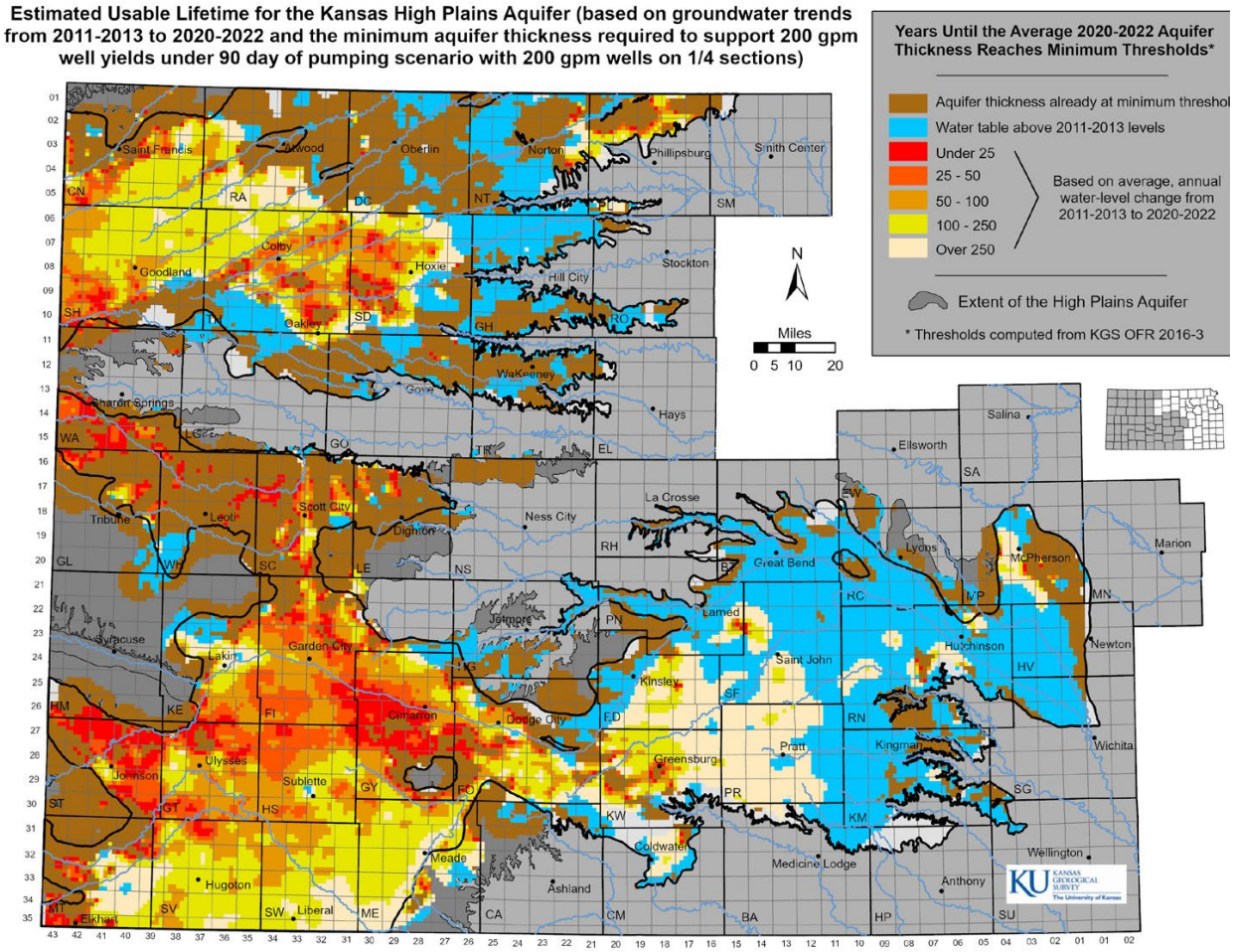


Kansas suffered another extreme drought from late 2010 to late 2015.[9] That multi-year drought peaked in 2012, the warmest and one of the driest years on record, averaging 4.9 inches of rain in May through July.[10] Each year, drought costs the United States an average of $8 billion to $9 billion, as estimated by the USGS.[11] In recent years, drought-related losses in Kansas have been particularly significant in agriculture. In 2017, Kansas ranked 2nd in the country for total crop acres. The total value of agricultural products sold in 2017 was $18.8 billion according to the USDA's National Agricultural Statistics Service.[12]

In 2011, the Kansas Department of Agriculture (KDA) estimated that drought caused roughly $1.8 billion in crop losses in Kansas including the price farmers would have received for lost production and nearly $366 million in drought-related herd liquidation to overfilled cattle livestock auction houses.[13] Even more destructive, the 2012 drought caused more than $3 billion in drought-related crop losses in Kansas. Additionally, more than $1.3 billion in crop insurance indemnity payments for failed commodities were paid to Kansans in 2012 according to the U.S. Department of Agriculture's Risk Management Agency.[14]

In western Kansas, droughts worsen the dire situation of the Ogallala Aquifer's depletion. The Ogallala Aquifer, part of the multi-state High Plains Aquifer, provides nearly all of the water used in western Kansas. Groundwater levels have appreciably declined over the Ogallala region

of the aquifer since the onset of substantial irrigation development (1940s to 1950s in most areas).[15] The water levels have dropped so much in certain areas of the Ogallala region that less than 40% of the original saturated thickness is left.[16] Projections in some areas show no more than 20 years of water remaining if pumping continues at current rates. Other areas in west central Kansas have already reached the point of no return where many acres of once-irrigated land have now been converted to dryland crops or pastures for cattle grazing. Preventing continued (and complete) depletion of the Ogallala Aquifer requires sufficient reduction in withdrawals, a challenge made more difficult to meet when precipitation levels drop.



This Kansas Geological Survey map uses the measured water level change from 2011 to 2022 to estimate how many years into the future until present day aquifer levels reach a point where continuous (>/= 200 gallons per minute) well yields will be unachievable.

While temperature increases in the state are projected to increase drought, the frequency and severity of wildfires are also projected to increase. Warmer temperatures combined with dry vegetation and soil raises the potential for wildfires.[17] In December of 2021, the warmest December to date in Kansas, devastating wildfires swept central Kansas, burning over 165,000 acres of land.[18]

According to the National Drought Mitigation Center, droughts also result in negative environmental and social impacts, as indicated below.[19]

Environmental impacts include:

- Destruction of fish and wildlife habitat
- Lack of food and drinking water for wild animals
- Increase in disease in wild animals, because of reduced food and water supplies
- Migration of wildlife
- Increased stress on endangered species or even extinction
- Lower water levels in reservoirs, lakes, and ponds
- Loss of wetlands
- More wildfires
- Wind and water erosion of soils
- Poor soil quality

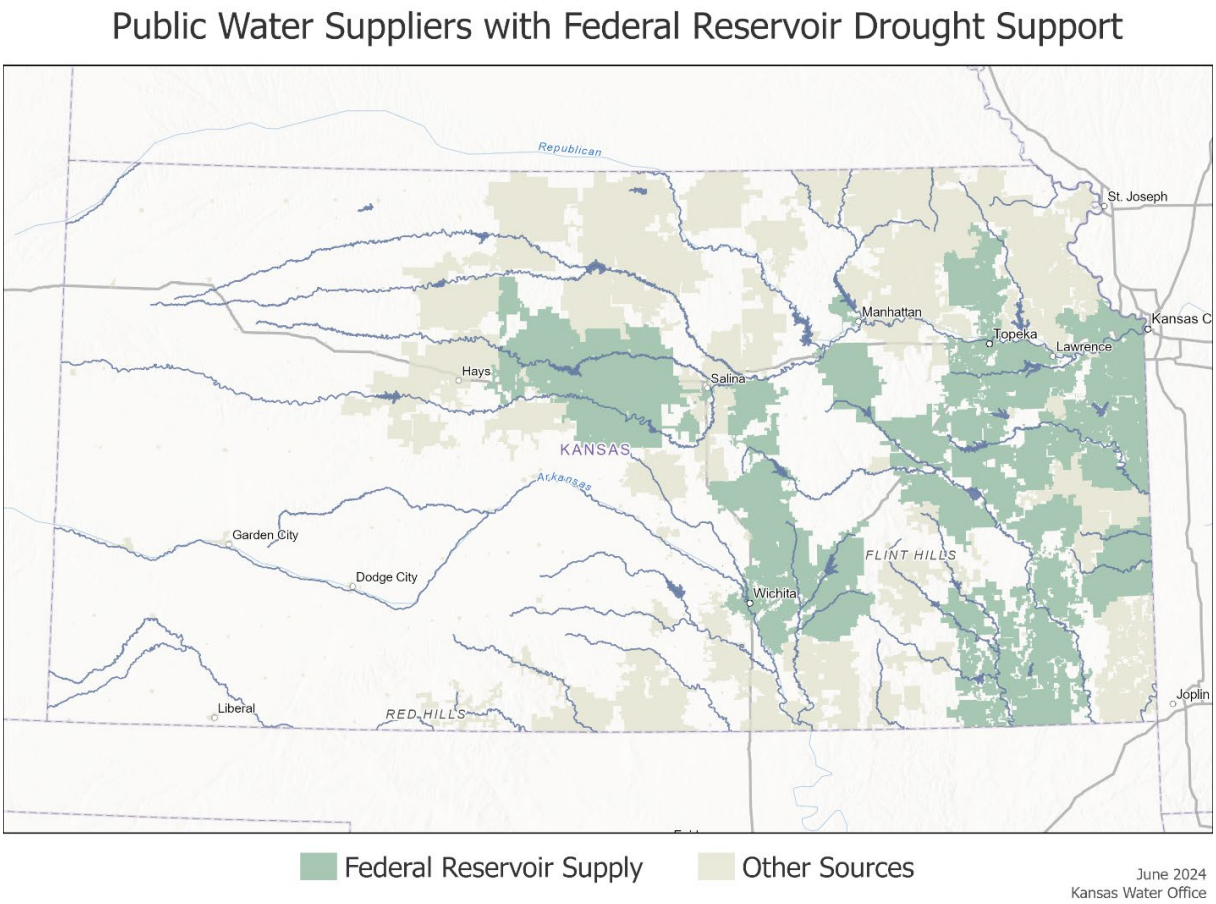
Social impacts can include:

- Anxiety or depression about economic losses caused by drought
- Health problems related to low water flows and poor water quality
- Health problems related to dust
- Loss of human life
- Threat to public safety from an increased number of forest and range fires
- Reduced incomes

- People may have to move from farms into cities, or from one city to another
- Fewer recreational activities

Coping with drought also presents a challenge for public water suppliers. The Kansas Water Office is responsible for the management of state-controlled conservation storage in 15 federal reservoirs to maintain adequate streamflow and water supplies for Kansans, critical to satisfying municipal and industrial demands. Two thirds of the state's population is reliant on stored water in federal reservoirs during drought, and all 15 reservoirs are used to support these needs.[20]

More specifically, 245 water systems or cities in Kansas rely, at least in part, on interconnections with federal reservoirs in Kansas (see map on page 10). Within this group, the largest population centers include WaterOne (Johnson County), Wichita, Topeka, Manhattan, Salina, Emporia, Coffeyville and Independence. Many of these communities and public water supply recipients in Kansas survive drought only because of support from federal reservoir releases. Reservoir support of streamflow was quite dramatic in 2023, with reservoir releases making up more than 90% of the flow in some river reaches.[21]



The critical role of reservoir storage in times of drought amplifies the need to develop ways to manage the increased sedimentation of the reservoirs. Over the life of a reservoir, incoming water brings sediment, which settles into the reservoir. This sediment builds up over time, shrinking the storage capacity for water in the reservoir. New techniques are needed to address this problem, as conventional dredging, as was done at John Redmond Reservoir in 2016, is cost-prohibitive and temporary. The Kansas Water Office is partnering with the U.S. Army Corps of Engineers to conduct a water injection dredging pilot project at Tuttle Creek Lake as a method for addressing sediment build-up. Tuttle Creek Lake presents the most urgent need, as it is the workhorse reservoir for the Kansas River basin (affecting Manhattan, Topeka. Lawrence and Johnson County) and its storage capacity has shrunk by nearly 50%.[22]

In short, when reservoirs lose storage capacity due to sedimentation, they lose the ability to store water for when it is vitally needed during drought. Because 245 water suppliers and

communities in Kansas rely on releases from reservoirs in times of drought, reduced storage of water increases the risks posed to those communities.

Drought also affects communities and water users who rely on other sources of water. The small town of Caney (population less than 2000) does not rely on water released from federal reservoirs; instead, it relies primarily on the flow of the Little Caney River. In 2023, Caney faced a crisis as the area suffered a severe drought and that river virtually ran dry.[23] The town employed major restrictions, including the use of bottled water only in restaurants, portable toilets at the public schools, fewer school days and closure of the swimming pool and car wash in an effort to endure the shortage.[24] Although the situation improved by the beginning of 2024, the long-term supply remains in doubt, and the city is planning infrastructure improvements to connect to a more reliable system nearby.[25]

In an effort to assist communities to plan for drought and employ conservation practices, the Kansas Water Office develops and maintains guidelines for developing water conservation plans and practices.[26] These plans include information on state drought declarations, stages, triggers, goals and responsive actions for public water suppliers. For responding to drought, the Conservation Plan Guidelines identify three stages of implementation: water watch (in which suppliers need to stay alert for changing conditions), water warning (in which some curtailment of use is recommended for decreasing supplies), and water emergency (in which mandatory restrictions are in place because severe water shortages could result in system failure without improvement).[27]

In summary, droughts in Kansas have been increasing in frequency and intensity. Every sector, including agriculture, municipalities, industry, recreation and the environment, is experiencing, and will continue to experience, negative impacts of drought. The fact that the state's water supplies are shrinking, from depletion of the Ogallala Aquifer to sedimentation of federal reservoirs, only accelerates this crisis. Adaptation and planning for resilience will be critical.

[1] 2024 Annual Report, pg. 34, kwo.ks.gov
[2] David Condos. How bad was the 2022 drought? For these 7 Kansas communities, it was the driest on record.
[3] 2022 Kansas Water Plan, pg. 61, kwo.ks.gov
[4] David Condos. How bad was the 2022 drought? For these 7 Kansas communities, it was the driest on record
[5] David Condos. How bad was the 2022 drought? For these 7 Kansas communities, it was the driest on record
[6] David Condos. The heat killed so many Kansas cattle in June that the only place to take carcasses was a landfill.
[7] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2023). https://www.ncei.noaa.gov/access/billions/
[8] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2023). https://www.ncei.noaa.gov/access/billions/
[9] 2022 Kansas Water Plan, pg. 65, kwo.ks.gov
[10] Frankson, R., K.E. Kunkel, L.E. Stevens, D.R. Easterling, X. Lin, M. Shulski, N.A. Umphlett, and C.J. Stiles. 2022. Kansas State Climate Summary 2022. NOAA Technical Report NESDIS 150-KS. NOAA/NESDIS, Silver Spring, MD, 5 pp. https://statesummaries.ncics.org/chapter/ks/
[11] USGS, Kansas Water Science Center, Kansas Drought. https://www.usgs.gov/centers/ kswsc/science/kansas-drought
[12] United States Department of Agriculture, National Agricultural Statistics Service. https://www.nass.usda.gov/index.php
[13] 2022 Kansas Water Plan, pg. 66, kwo.ks.gov
[14] Bickel, Amy. “End of Dry Conditions on Horizon for Some in Kansas.” The Topeka Capital Journal, 12 Apr. 2013. https://www.cjonline.com/story/news/2013/04/12/end-dryconditions-horizon-some-kansas/16400636007
[15] 2022 Kansas Water Plan, pg. 18, kwo.ks.gov.
[16] Status of the High Plains Aquifer in Kansas; Donald O. Whittemore, James J. Butler, Jr., and B. Brownie Wilson; KGS Technical Series 22-2018; http://www.kgs.ku.edu/Publications/Bulletins/ TS22/index.html
[17] 2022 Kansas Water Plan, pg. 65, kwo.ks.gov
[18] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2022). https://www.ncei.noaa.gov/access/billions/
[19] National Drought Mitigation Center. How Does Drought Affect Our Lives?
[20] 2024 Annual Report, Kansas Water Authority, pg. 34.
[21] 2024 Annual Report, Kansas Water Authority, pg. 34.
[22] 2024 Annual Report, Kansas Water Authority, pg.17.
[23] Allison Kite. Southeast Kansas town is almost out of water, and signs of crisis are everywhere.
[24] Allison Kite. Southeast Kansas town is almost out of water, and signs of crisis are everywhere.
[25] Amber Jenkins. Caney finds relief in water shortage, plans for future sustainability.
[26] Kansas Water Office. Climate and Drought in Kansas.
[27] Kansas Water Office. Climate and Drought in Kansas.