

Impact of Drought Investigation

Driving question: What impact does drought have on the stability of the deer population?

Learning goal: Analyze evidence and data to explain how droughts affect ecosystem stability and mule deer populations.

Directions: Analyze the information provided in your group materials. Use evidence from graphs, articles, maps, and data trends to develop explanations about how drought affects mule deer populations and ecosystem stability.

Group 1: Environmental Data Analysis

Do the 2022 drought conditions represent a moderate or extreme environmental change? Use evidence from the data to support your answer.

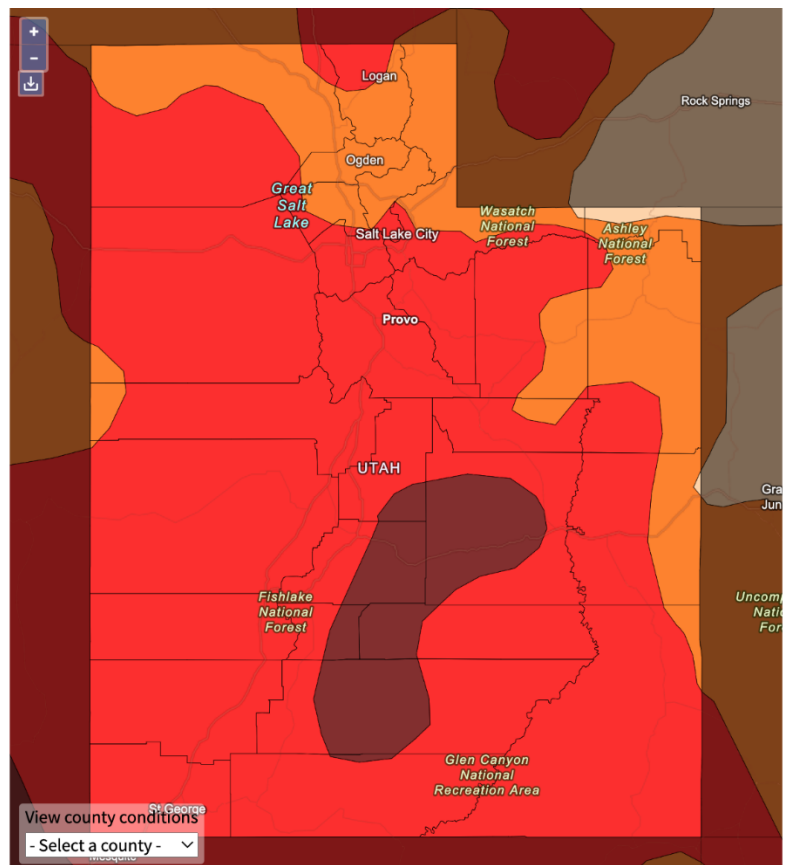
1. Utah Drought Monitor Map

The U.S. Drought Monitor (USDM) is updated each Thursday to show the location and intensity of drought across the country. This map shows drought conditions across Utah using a five-category system, from Abnormally Dry (D0) conditions to Exceptional Drought (D4). The USDM is a joint effort of the National Drought Mitigation Center, USDA, and NOAA. [Learn more.](#)

The following state-specific drought impacts were compiled by the [National Drought Mitigation Center](#). While these impacts are not exhaustive, they can help provide a clearer picture of drought in Utah.

	D0 - Abnormally Dry • Dryland crops are struggling • Water for cattle is limited	100.0% of UT (D0-D4)
	D1 - Moderate Drought • Soil moisture is low; winter wheat germination is poor • Feed for cattle is limited • Springs are drying	100.0% of UT (D1-D4)
	D2 - Severe Drought • Pasture and water is inadequate for cattle; ranching management practices change • Air quality is poor; dust is a problem • Streams and ponds are dry	99.6% of UT (D2-D4)
	D3 - Extreme Drought • Fire danger increases; fire bans on public land are implemented • Native vegetation is stressed • Streamflow is low	82.8% of UT (D3-D4)
	D4 - Exceptional Drought • Fire restrictions increase • Irrigation water allotments are cut	7.7% of UT (D4)

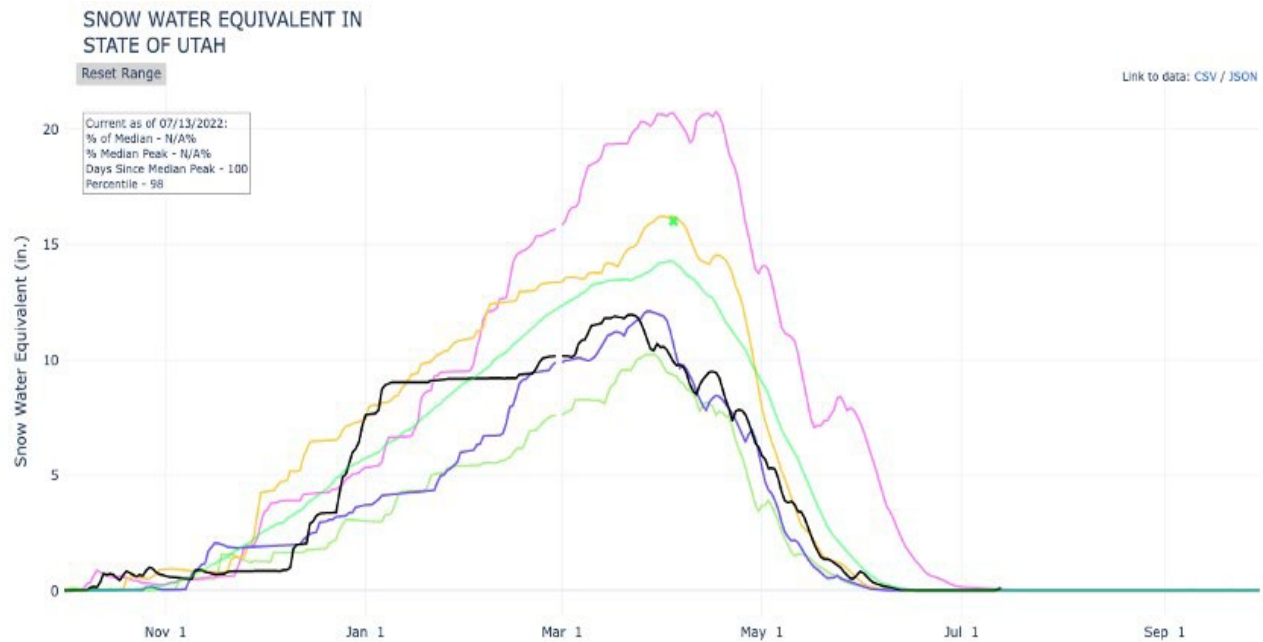
Source(s): NDMC, NOAA, USDA



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- What conclusions do you draw from the 2022 Utah Drought Monitor Map?
- What is the difference between D0 and D1 drought conditions?
- What is the difference between D2 and D3 drought conditions?
- What larger environmental problems can result from D4 drought conditions?

2. Utah Snowpack Data (2018-2022)



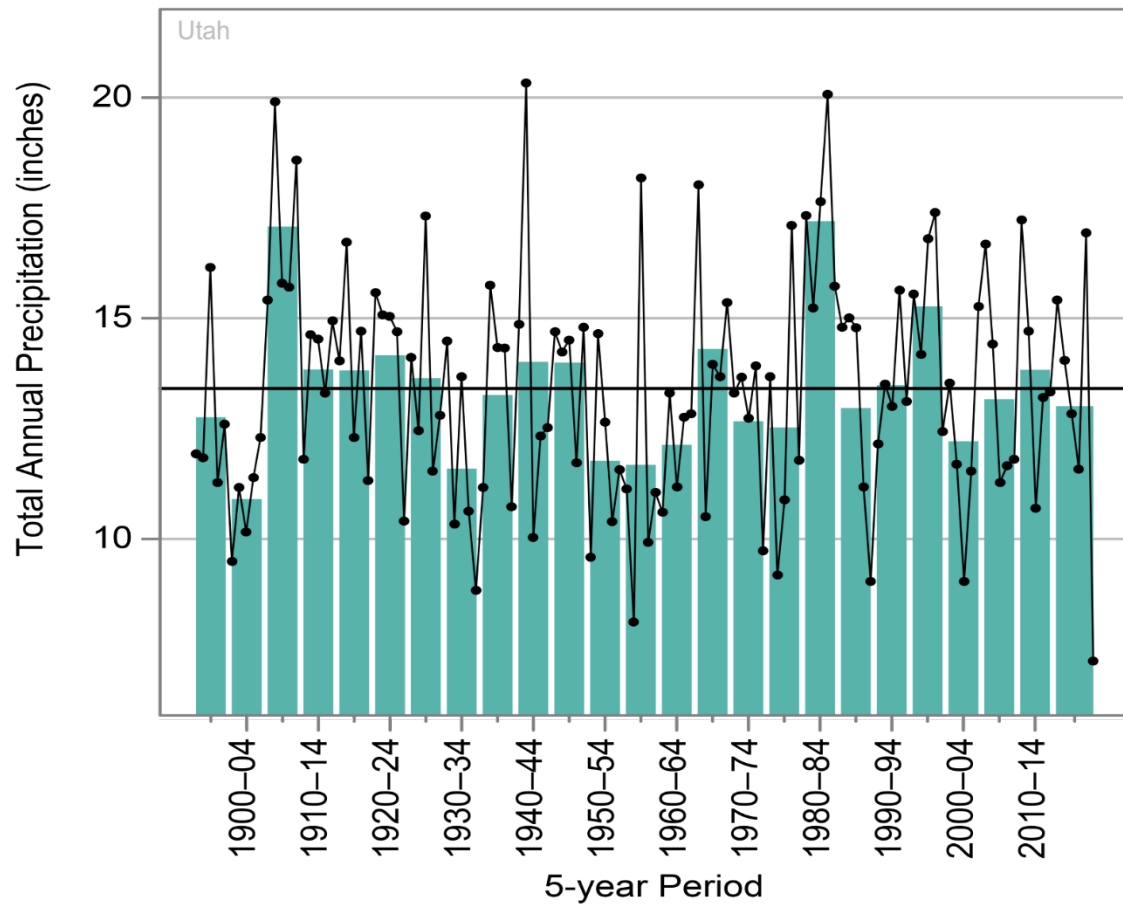
Graph Key

Lighter Green = 2018
Purple = 2019
Yellow = 2020
Blue = 2021
Black = 2022
Darker Green – Average snowpack (mean)

- What patterns do you notice in the snowpack data?
- What year had the highest snowpack?
- What trends or changes do you notice over time?
- How might snowpack contribute to drought conditions in Utah?

3. Utah Annual Precipitation Data

Observed Annual Precipitation



Each dot on this graph represents a specific year. Each green bar represents the average precipitation for a 5-year period.

- What trends do you notice in precipitation over time?
- During which years was precipitation most stable?
- Which year (black dot) had the lowest precipitation on record?
- How do the 5-year averages compare over time?

Final Explanations

Based on all three data sources:

1. What patterns or trends do you observe?
2. What evidence suggests Utah is experiencing drought conditions?
3. Do the current drought conditions represent a moderate or extreme environmental change?