WATER, WASTEWATER, AND STORMWATER

Arkansas Climate Factsheet

April 3rd, 2025

SOUTHWEST ENVIRONMENTAL FINANCE CENTER

SOUTH CENTRAL CLIMATE ADAPTATION SCIENCE CENTER

Climate change affects both typical and extreme weather.

Averages

- Temperature Increase
- Precipitation Change

Extremes

- Extreme Rainfall & Storms
- Extreme Heat & Cold
- Wildfire
- Drought
- Hurricanes
- All

This can have multiple impacts on utilities. Climate change can . . .

...make it harder to meet community needs for water.

There may be reduced water supply, caused by:

- Change from snow to rain, streamflow timing
- Increased evapo-ration & transpiration by plants
- Decreased surface water
- Decreased infiltration & recharge to ground water
- Dry, hydrophobic soils with increased run-off, less capture

There may be decreased water quality, caused by:

- Biological/microbial growth, e.g., HABs
- Heavy runoff and high winds causing erosion, contamination*
- Smoke & contamination*
- Loss of vegetation, heavy runoff causing erosion, contamination*
- Less dilution, higher concentrations of contaminants

There may be increased demands for water, used for:

- Human consumption
- Gardens, trees, other plants
- Cooling

**Chemical, mineral, organic, and particulate contamination, depending on source*

...affect utility infrastructure.

Extreme weather can lead to:

- Damage to physical infrastructure (wells, pipes, treatment, storage, etc.)
- Dry soils, pipe breaks

Infrastructure may be inadequate for:

- Stormwater or combined storm-water/wastewater overflow
- Firefighting

It can affect infrastructure operations tied to:

- Reservoir levels
- Wastewater evaporation
- Water and wastewater treatment chemistry
- Electrical power
- Telecommuni-cations service & transportation access

...affect utility administration and operations.

There may be inadequate funding for operations and improvements, associated with:

- Population decline, fewer ratepayers
- Population increase, causing greater infrastructure needs
- Financing linked to to climate vulnerability, such as bond ratings

Staff and board member availability may decrease due to:

- Population decline
- Risks to worker safety & health
- Extreme events limiting availability

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Climate Change Projections

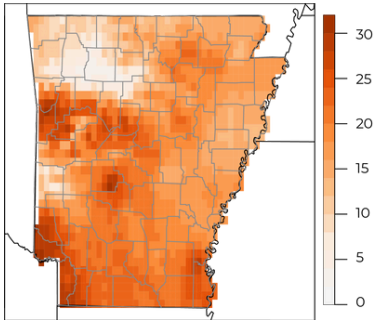
Climate science uses models to project temperature and precipitation, considering them in relation to a historical period (1981-2005) and in the future at mid-century (2035-2065) and the end of the century (2070-2099). The conditions are averaged over the entire time period being considered.

Climate science considers more than one possibility for future climate, based on scenarios developed by scientists and adopted by an international organization, the Intergovernmental Panel on Climate Change. The scenarios incorporate different levels of emissions of greenhouse gases, known as "representative concentration pathways" or RCPs. The levels of emissions are dependent on policy decisions and other factors. RCP 4.5 is considered a "moderate" climate change scenario and RCP 8.5 is considered a "high" climate change scenario.

Climate science uses global climate models to project changes at global scales and downscaling to project changes at local scales. The South Central Climate Adaptation Science Center has used methods known as statistical downscaling on projections from three global climate models from the Intergovernmental Panel on Climate Change in its fifth phase of the Coupled Model Intercomparison Project (CMIP5) to produce regional and local scale projections for the south central United States.

Source: Dixon K.W., A.M. Wootten, M.J. Nath, J. Lanzante, D.J. Adams-Smith, C.E. Whitlock, C.F. Gaitán, R.A. McPherson, 2020: South Central Climate Projections Evaluation Project (C-PrEP), South Central Climate Adaptation Science Center, Norman, Oklahoma, USA. DOI: https://doi.org/10.21429/12gk-dh47

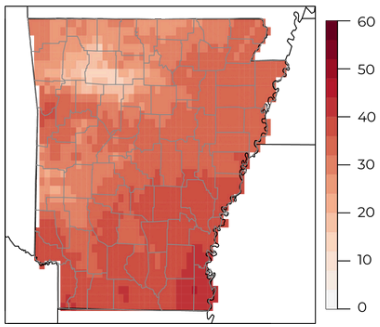
Historical and Projected Future Temperatures and Precipitation Across Arkansas



Historical Temperature Data

Over the historical period in Arkansas, the total number of days in a year **over 95˚F** has ranged from **2 to 31 days**, and the total number of days in a year **over 100˚F** has ranged from **less than 1 to 8 days**, both depending on location.

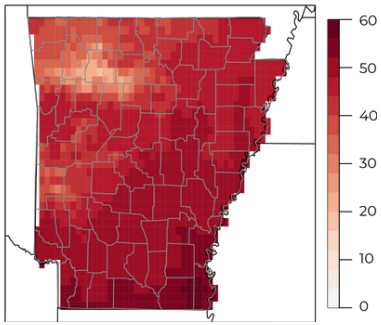
Map 1: *Total Number of Days Over 95˚F, Average from 1981-2005*



Moderate Climate Change Scenario

The number of days **over 95˚F** will increase to 15 to 70 days **(an additional 12 to 44 days)**, and the number of days **over 100˚F** will increase to 3 to 32 days **(an additional 3 to 24 days)** at mid-century in Arkansas, depending on location.

Map 2: *Increase in Number of Days Over 95˚F, Moderate Climate Scenario, Average from 2035-2065*

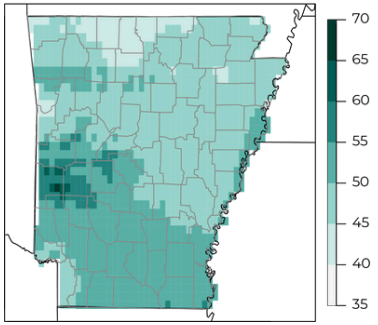


High Climate Change Scenario

The number of days **over 95˚F** will increase to 22 to 83 days **(an additional 20 to 58 days)**, and the number of days **over 100˚F** will increase to 4 to 40 days **(an additional 4 to 34 days)** at mid-century in Arkansas, depending on location.

Map 3: *Increase in Number of Days Over 95˚F, High Climate Scenario, Average from 2035-2065*

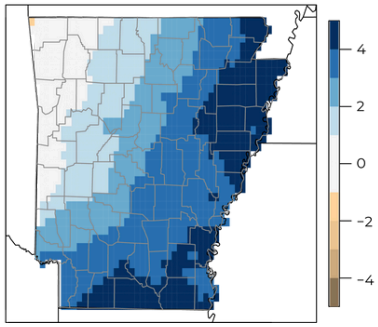
**Note that the scale changes from historical to projected data.*



Historical Precipitation Data

Over the historical period in Arkansas, the **total precipitation** over a year has ranged **from 41 inches to 65 inches**, and the **maximum precipitation in one day** has ranged from **2 inches to 4 inches** , both depending on location.

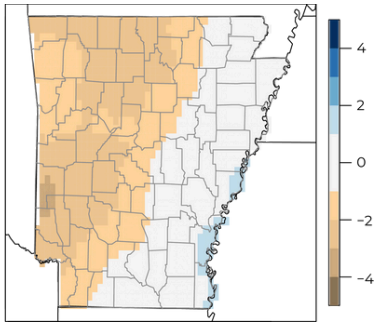
Map 1: *Total Annual Precipitation, Average from 1981-2005*



Moderate Climate Change Scenario

Precipitation change will range from a decrease of less than 1 inch to an increase of 2 inches over a year, or **a percentage decrease of approximately 1% to an increase of 5%**, and the **maximum precipitation in a day** could **decrease or increase by less than an inch** at mid-century in Arkansas, depending on location.

Map 2: *Percentage Change in Total Annual Precipitation, Moderate Climate Scenario, Average from 2035-2065*



High Climate Change Scenario

Precipitation change will range from a decrease of 2 inches to an increase of 1 inch over a year, or **a percentage decrease of 3% to an increase of 1%,** and the **maximum precipitation in a day** could **stay the same or increase by less than an inch** at mid-century in Arkansas, depending on location.

Map 3: *Percentage Change in Total Annual Precipitation, High Climate Scenario, Average from 2035-2065*

**Note that the scale changes from historical to projected data.*