

Water

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Key Message 4.1

Climate Change Will Continue to Cause Profound Changes in the Water Cycle

Changes to the water cycle pose risks to people and nature. Alaska and northern and eastern regions of the US are seeing and expect to see more precipitation on average, while the Caribbean, Hawai'i, and southwestern regions of the US are seeing and expect to see less precipitation (*medium confidence*). Heavier rainfall events are expected to increase across the Nation (*very likely, very high confidence*), and warming will increase evaporation and plant water use where moisture is not a limiting factor (*medium confidence*). Groundwater supplies are also threatened by warming temperatures that are expected to increase demand (*very likely, high confidence*). Snow cover will decrease and melt earlier (*very likely, high confidence*). Increasing aridity, declining groundwater levels, declining snow cover, and drought threaten freshwater supplies (*medium confidence*).

Key Message 4.2

Water Cycle Changes Will Affect All Communities, with Disproportionate Impacts for Some

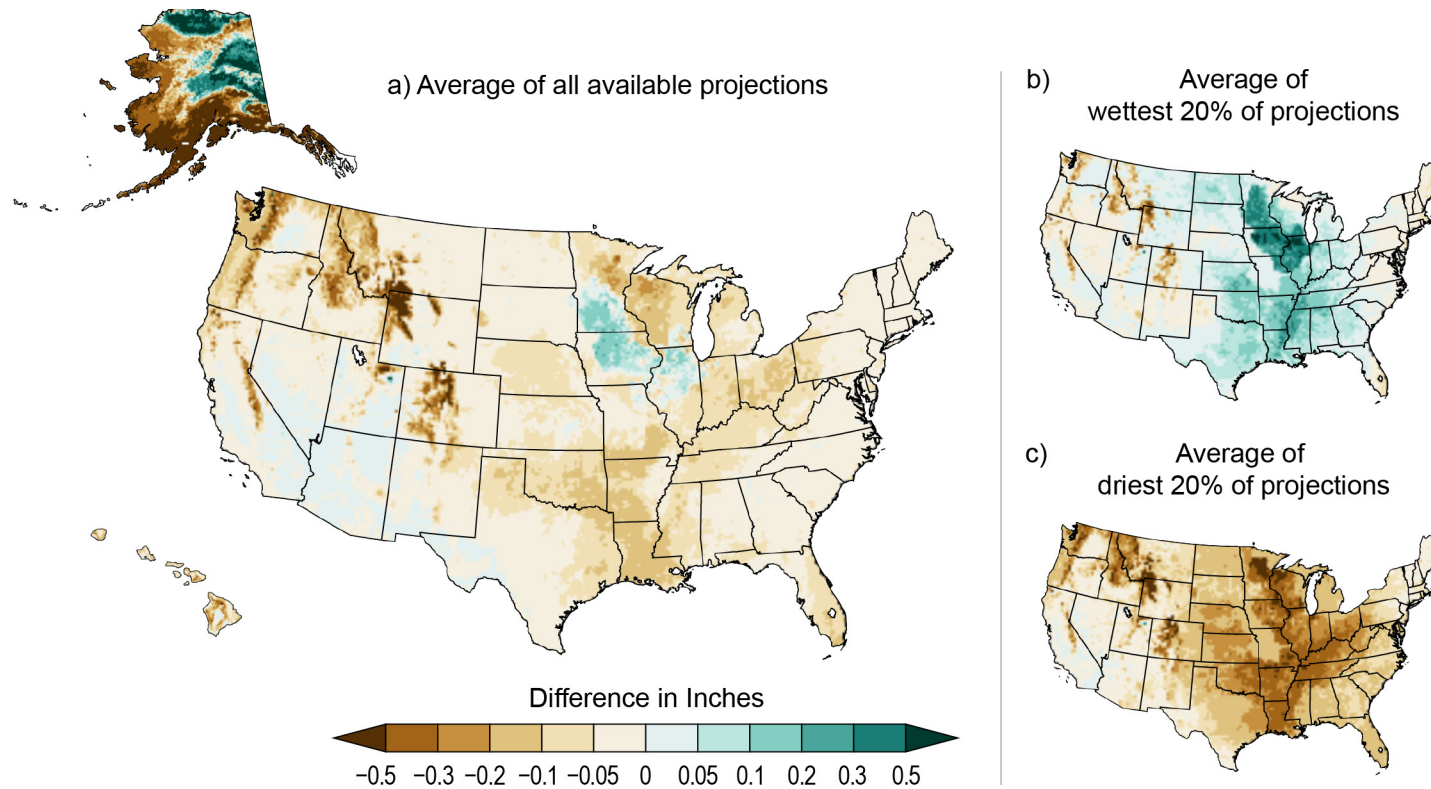
Natural and human systems have evolved under the water cycle's historical patterns, making rapid adaptation challenging. Heavier rainfall, combined with changes in land use and other factors such as soil moisture and snow, is leading to increasing flood damage (*likely, high confidence*). Drought impacts are also increasing (*medium confidence*), as are flood- and drought-related water quality impacts (*medium confidence*). All communities will be affected, but in particular those on the frontline of climate change—including many Black, Hispanic, Tribal, Indigenous, and socioeconomically disadvantaged communities—face growing risks from changes to water quantity and quality due to the proximity of their homes and workplaces to hazards and limited access to resources and infrastructure (*very likely, high confidence*).

Key Message 4.3

Progress Toward Adaptation Has Been Uneven

The ability of water managers to adapt to changes has improved with better data, advances in decision-making, and steps toward cooperation. However, infrastructure standards and water allocation institutions have been slow to adapt to a changing climate (*high confidence*), and efforts are confounded by wet and dry cycles driven by natural climate variability (*very likely, high confidence*). Frontline, Tribal, and Indigenous communities are heavily impacted but lack resources to adapt effectively, and they are not fully represented in decision-making (*high confidence*).

Projected Changes in Average Summer (June–August) Soil Moisture by Midcentury



Projected decreases in summer soil moisture will have important implications for agriculture and ecosystems.

Figure 4.6. Summer soil moisture supports dryland agriculture and ecosystem functions and reduces irrigation demand and wildfire risk. Under an intermediate scenario (RCP 4.5), soil moisture is projected to decrease during the summer months (June, July, and August) for most of the country (a), with the West seeing decreases even under the wettest projections. Exceptions include portions of the Upper Midwest and Alaska. The range between the wettest (b) and driest (c) projections illustrate the uncertainty in summer soil projections. Projections are not available for the US Caribbean or US-Affiliated Pacific Islands. Figure credit: University of Colorado Boulder, NOAA NCEI, and CISS NC.

Recommended Citation

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