

# Report: Climate change impacts on water are profound and unequal

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Climate change is intensifying rainfall and floods, deepening droughts, and shifting weather patterns across the globe, threatening terrestrial freshwater supplies and water quality, according to the [Fifth National](#)

[Climate Assessment \(NCA5\)](#), released Nov. 14. These impacts are unequal, disproportionately affecting the most frontline populations in the United States.

"Climate change will manifest through profound changes to the movement, amounts, and timing of water," said CU Boulder's Liz Payton, a water resources specialist in the CIRES-based Western Water Assessment, and lead author of the water chapter. "The water chapter offers a big-picture understanding of the magnitude of these changes and the challenges ahead."

Payton worked closely with a team of 11 authors from around the country who brought expertise in [climate science](#), hydrology, groundwater, [water management](#), water quality, and Tribal water issues.

The NCA is a Congressionally mandated report released every four years by the U.S. Global Change Research Program. It synthesizes scientific knowledge about current and projected trends in [global change](#), both human-induced and natural, for the recent past and the next 25 to 100 years.

The water chapter, one of 32 chapters in the NCA5, explores the nexus of climate change and water, such as how increasingly heavy rainfall events threaten people and infrastructure in U.S. cities and [rural communities](#).

Overall, [climate change impacts](#) on water are dire; but the authors explained that science advances are increasingly helping to shape decisions. For example, the report cites international collaboration among two Canadian provinces, eight U.S. states, and several sovereign Tribes and First Nations to manage the water in the Great Lakes collaboratively and equitably, addressing both flooding and coastal wetland health.

By contrast, there has been little to no progress in many areas, the chapter notes, for example, in managing the country's aging [water infrastructure](#). "More than 1,000 community water systems—primarily serving [older adults](#) and people who are economically disadvantaged, rural, Indigenous, or with less education—are already providing poor-quality water and are not prepared to cope with climate change-driven flooding, drought, and waterborne diseases," the authors wrote.

"Water is critical to all communities," said Heather Tanana, co-author and Visiting Professor at the University of California, Irvine. "Although climate impacts to water vary across the United States, the NCA5 provides important information on how water cycle changes disproportionately affect certain communities, including Tribes. The report is a valuable tool to understand and address these inequities."

Imtiaz Rangwala, a co-author on the water chapter added that the report details many other examples of how climate change is and will impact both [water quality](#) and water availability in challenging ways.

"Stories of climate change are largely stories of water, whether we are talking about droughts, desertification, wildfire, or floods," said Rangwala, the lead climate scientist at the North Central Climate Adaptation Science Center (NC CASC).

In the NCA5 Overview, the US Global Change Research Program highlighted reasons for hope: "U.S. emissions have decreased, while the economy and population have grown," the report states. And "Efforts to adapt to climate change and reduce net greenhouse gas emissions are underway in every U.S. region and have expanded since 2018."

Today, the NCA5 is in the hands of Congress and decision-makers so they can understand the current implications of climate change, including impacts on water, and what the country can expect in the

future. Payton and the lead authors of other chapters are in Washington D.C. for the unveiling of the report, and they will spend the next few weeks and months discussing findings with various stakeholders and the general public in online webinars and regional workshops.

"There are few, if any, benign consequences from [climate change](#), and the impacts will be felt largely through changes in water," said Payton. "But there is momentum in the water resources community to prepare and adapt for the changes we're seeing now and expect to experience in the future."

**More information:** Report: [Fifth National Climate Assessment \(NCA5\)](#)

Provided by University of Colorado at Boulder

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