

Idaho Climate-Economy Impacts Assessment

Snapshot: Water

Water, Climate, and Idaho's Economy

Idaho's mountains accumulate snowpack in the winter months, which feeds Idaho's watersheds in the spring and summer months. The gradual melting and runoff during the spring and summer provide streamflow and replenish groundwater for the warmer, drier months. Several major aquifers in Idaho provide significant storage of groundwater. These groundwater resources are vital to the water supply for food production and processing, as well as commercial, household, industrial, and municipal needs. As changes in climate increase, the pattern of water availability for Idaho's economy also will change.

Changes in Climate Impact Idaho's Water Quantity and Quality

Drought

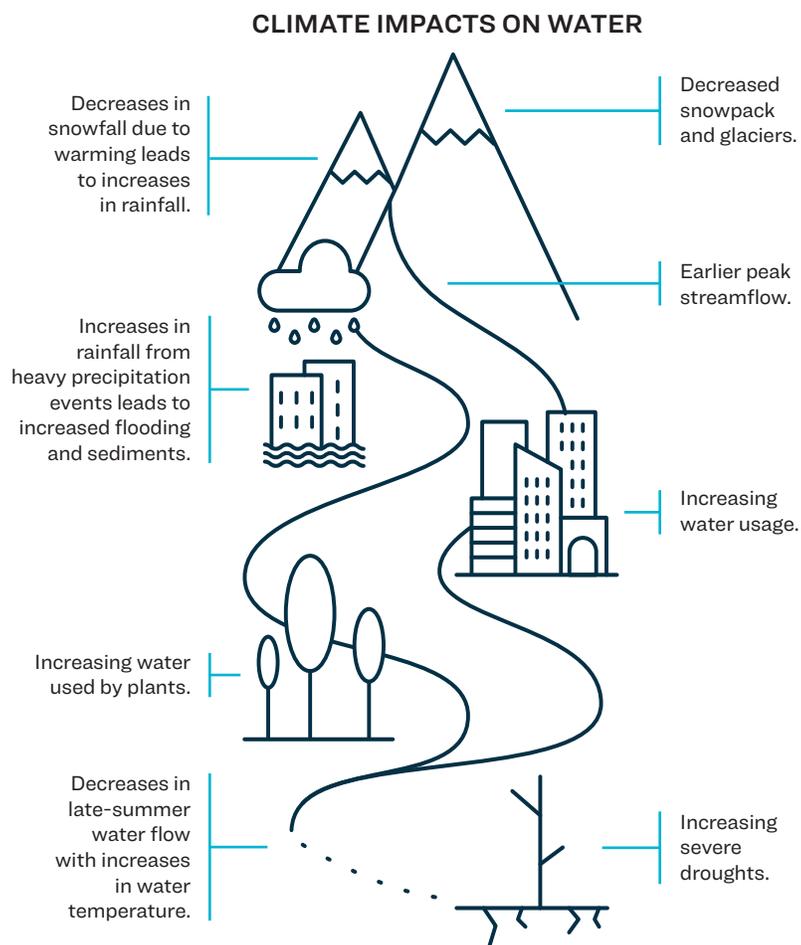
Decreasing snowpack, greater precipitation variability (rain and snow), and increasing temperatures lead to unstable and unreliable water sources. Some of these impacts are already occurring. In 2021, the Magic Reservoir experienced its shortest season since 1977—only 27 days of irrigated water. Climate projections show a continued increase in drought conditions, putting users at greater risk for economic loss associated with lack of water.

Floods

For high elevation regions in southern Idaho, rain-on-snow events may be more intense due to increased spring rain with warming temperatures. Rain-on-snow events can cause rapid snowmelt and runoff, leading to a higher risk for severe flooding.

Habitat and health

Increasing water temperatures and changes in seasonal concentrations of organic matter and contaminants in streams, lakes, and reservoirs pose risks to aquatic species' habitat, such as Idaho's fish populations. Additionally, cyanobacteria and harmful algae blooms create health risks for humans and other species.



Impacts to Coeur d'Alene Lake

The Coeur d'Alene Lake Basin is culturally important for the Coeur d'Alene Tribe. High streamflow rates from rain-on-snow events increase sedimentation and the presence of excessive organic matter and metals in the lake. This is of particular concern to the local community and the Coeur d'Alene Tribe with respect to contamination of cultural resources for indigenous populations, including freshwater fish and water potatoes.

Preparing Idaho for Impacts to Water Quantity and Quality

Over the last several decades, peak streamflow in Idaho has advanced 1 to 2 weeks earlier in the year. This is leading to higher than normal flows in the winter and lower flows in the summer, ultimately compressing peak runoff into a shorter period of time. These changes in water dynamics put several key economic sectors at risk.

Energy demand



The ability to adapt to greater power demands during the warmer and drier portions of the summer will become increasingly important. Demand for air conditioning peaks in the residential and commercial sectors at the same time that more power is required for irrigating crops. The timing of this increasing demand also coincides with lower summer streamflow, and negatively impacts the ability to generate hydropower, a primary source of electricity for Idaho.

Flood control



Rain-on-snow events increase flood risk. Additional flood control measures, such as management plans and water diversion methods, likely will be necessary to reduce impacts to Idaho's economy. Potential impacts include transportation delays, road and bridge collapse, and flooding of residences and businesses in flood plains.

Water storage



When peak runoff occurs earlier in spring, it is not aligned with historic water demands for irrigation. Additional water storage and water recharge may be needed to capture increased water runoff in the winter and early spring to prevent flooding, meet water use demand, and offset water shortages in the warmer months. Improving soil health and switching to less water intensive crops are also options to help mitigate the change in water supply timing.

Water Demand Will Increase

Idaho has one of the highest rates of population growth in the U.S. The Treasure Valley is expected to see a >150% increase in demand for water by 2060. It will be challenging to meet that demand without additional actions, such as diversions from the Boise River or groundwater recharge. Additionally, while agriculture land stores carbon and allows water to be absorbed in aquifers, urban areas often use water without recharging the water system.

The Eastern Snake Plain Aquifer (ESPA) is a vital resource for many farmers and residents in eastern Idaho. Half the farmland in eastern Idaho, approximately 1.6 million acres, as well as urban areas, are dependent on the ESPA.

Opportunities for Adaptation: Improving Water Quality

Wildfires and industries, such as agriculture, forestry, mining, aquaculture, and manufacturing, as well as urban runoff, impair water quality in Idaho. Primary water pollutants are temperature (thermal), sediment, nutrients, pathogens, and heavy metals. These pollutants can result in impacts to human and ecosystem health, such as harmful algal blooms from nutrient runoff. Reducing water runoff and planting trees to shade and protect streams can improve water quality and provide resiliency against climate change by keeping water cooler and rivers deeper.

Interested in learning more about economic impacts and Idaho's water resources?

For further information, resources, tools, references, and additional reports, please visit www.uidaho.edu/iceia



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