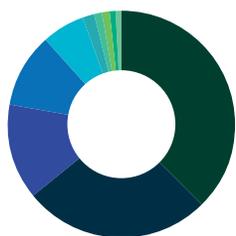


Idaho Climate-Economy Impacts Assessment

Snapshot: Agriculture

Agriculture, Climate, and Idaho's Economy

Agriculture is important for the livelihoods of many Idahoans, and is the backbone industry for many small towns. Agriculture and food processing account for 13% of Idaho's gross domestic product (GDP), or 18% percent of total economic sales. Changes in climate can stress Idaho's agriculture, resulting in challenges for Idaho's agricultural producers and processors.



IDAHO'S AGRICULTURAL PRODUCTION (2019)

33.3%	Milk	9.2%	Wheat & Barley	1.1%	Corn	0.6%	Trout
23.4%	Cattle & Calves	5.5%	Hay	0.9%	Hops		
12.1%	Potatoes	1.3%	Pulses (dry beans, lentils, & dry peas)	0.8%	Onions		

Changes in climate

- Increasing temperatures
- Increasing spring precipitation
- Earlier peak runoff
- Decreasing summer precipitation
- Decreasing summer streamflow
- Decreasing summer soil moisture

Increasing hazards

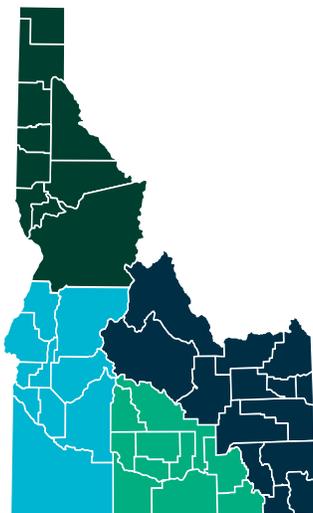
- Floods
- Drought
- Wildfires
- Smoke

Economic risks

- Increasing heat stress and heat illness in livestock
- Increasing cost of summer irrigation
- Delays in planting due to excessive spring rain
- Increasing energy use
- Increasing cost for temperature-controlled storage
- Increasing cost of pest management

Climate Impacts Vary by Region

Regional variations in climate influence the scope of impacts to Idaho's crops and livestock, leading to greater risks for some regions and agricultural industries compared to others.



North—The primary crops produced in northern Idaho are wheat, barley, lentils, beans, and peas. The northern region will experience snowmelt earlier in the season, which can increase pest and weed pressure on crops due to higher soil temperatures.

West—Western Idaho is home to several region-specific crops, including onions and hops. From 2040 to 2069, western Idaho is expected to experience more than a fivefold increase in the number of high heat days. While this will likely increase hop yields, it may decrease crop quality.

Central—Dairy and cattle industries are concentrated primarily in central Idaho. Central Idaho is expected to experience a sizable increase in high heat days, which will expand the potential for heat stress and heat illness in livestock. Heat stress impacts food supply for livestock, and is a significant factor in loss of milk productivity.

East—A substantial share of the state's agricultural production, including potatoes, occurs in eastern Idaho. While eastern Idaho is projected to experience less severe changes in climate compared to other parts of the state, the potato growing season is expected to start earlier and be up to 20 days shorter in length.

Preparing Idaho for Impacts to Agriculture

Water supply will become increasingly unreliable

Crops and water: Warmer temperatures increase the amount of water that plants need.

Precipitation timing: As the climate changes, more precipitation will fall as rain, rather than snow, altering the timing of streamflow. Higher streamflow is expected in spring, with lower streamflow in summer.

Water storage: When peak runoff occurs earlier in spring, it is not aligned with current irrigation demands. Additional water storage may be needed to capture increased water runoff in the winter and early spring to prevent flooding, meet water demand, and offset water shortages in the warmer months.

Crops will be unequally impacted

Regional sensitivity: Some regionally-specific crops are more sensitive to climate impacts than others. Changes in climate, such as warmer temperatures, may be beneficial or detrimental, depending on the crop and location. For example, onions have been found to be more sensitive to changes in temperature than grains. If farmers can anticipate changes in climate for their region, then they have an opportunity to prepare and adapt, such as changing their mix of crops.

Keeping it Cool

For decades, potato storage facilities have relied on Idaho's winters and cool nights to keep potatoes at the right temperature. Storage allows Idaho's potato processing facilities to operate year-round, meeting demand for French fries, chips, and other potato products. Historically, Idaho experienced an average of 101-250 frost free days; however, this average is expected to increase to 151-300 frost free days. This expansion means fewer cool days and nights for potatoes in storage. By comparing the systems required to keep potatoes cool in warmer regions like southwest Idaho and Germany, energy use can be determined. A 2°C higher average temperature equates to an increased airflow demand for cooling of nearly three times what is currently used in Idaho. This means that more energy is needed to run ventilation and mechanical refrigeration systems, increasing cost for construction and operation of potato storage facilities.

Opportunities for Adaptation: Strategies for Reduced Water Use

Idaho farmers and stakeholder partners are leading the way, experimenting with new practices and methods to reduce risks connected to climate change, such as reduced surface and groundwater availability. For example, farmers could adopt the following practices to reduce water consumption:

- Improving current irrigation system efficiency.
- Switching to a new more efficient irrigation system.
- Managing irrigation timing to coincide with crop need.
- Adjusting crop rotations, including planting new seed varieties.
- Improving soil health to increase water retention.
- Joining agricultural associations to share knowledge and resources.

Additionally, considering strategies to protect Idaho's Eastern Snake Plain Aquifer (ESPA) may be beneficial for many farmers. The ESPA region covers most of southern Idaho, and contributes substantially to agricultural production in the state, including potatoes, sugar beets, and wheat. Income from agricultural activities accounts for almost two-thirds of the median household income in the region.

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

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

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