

DISCOVER...

Pocket Science

Snowpack Trends

The Basics: The Crown of the Continent Ecosystem (CCE) covers the headwaters of the Columbia River and includes parts of Montana, Idaho, and Canada.

The long-term trend from 1969 through 2007 has shown a decrease in snowpack across the CCE.

Snowpack is a primary reservoir for water storage through the winter. With warmer temperatures in

spring and summer the snow melts, providing water for streams, lakes, and groundwater. A smaller snowpack decreases the amount of water available as runoff in spring.



The Crown of the Continent Ecosystem includes landscapes like Glacier National Park.

Questions:

- How have temperature, precipitation, and snowpack patterns changed in the CCE?
- How do these changes effect the hydrologic system in the CCE?
- What changes can we expect in the future?

Tools and Data: A variety of tools are used for collecting a wide range of data. These are some of the tools used and the type of data collected with them:

- Records from SNOTEL stations provide information on the snowpack, including how much snow



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there is, when the maximum snowpack occurs, and when the snow is melting.

- Stream gauges are used to record the amount of water in the streams and the timing for peak discharge.
- Meteorological stations provide data on maximum and minimum temperatures and total precipitation, both snow and rain.



The Findings:

In the Crown of the Continent

Ecosystem the number of snow-free days annually has increased by about 14 days since 1969. This change is likely driven by increases in regional temperature, with minimum winter temperatures increasing 5.13 degrees fahrenheit since 1981. With these changes, the peak discharge from snowmelt occurs earlier now than in the past, meaning that rivers have their highest water levels earlier in the season. This change has the potential to increase the severity of summer droughts in the CCE. The climate in this region is expected to warm further in the future, likely continuing the trend of decreasing snowpack.

Implications: While some changes sound small, they can have a significant impact on plants, animals, and people. For example, people depend on snowpack to store summer drinking water and fish depend on spring runoff to keep rivers at a healthy water level. Studying snowpack changes is imperative as we seek to understand the role of climate in our future.

Questions?

Find answers on the Big Sky Institute website:
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