

Drought in the West

Snow Drought

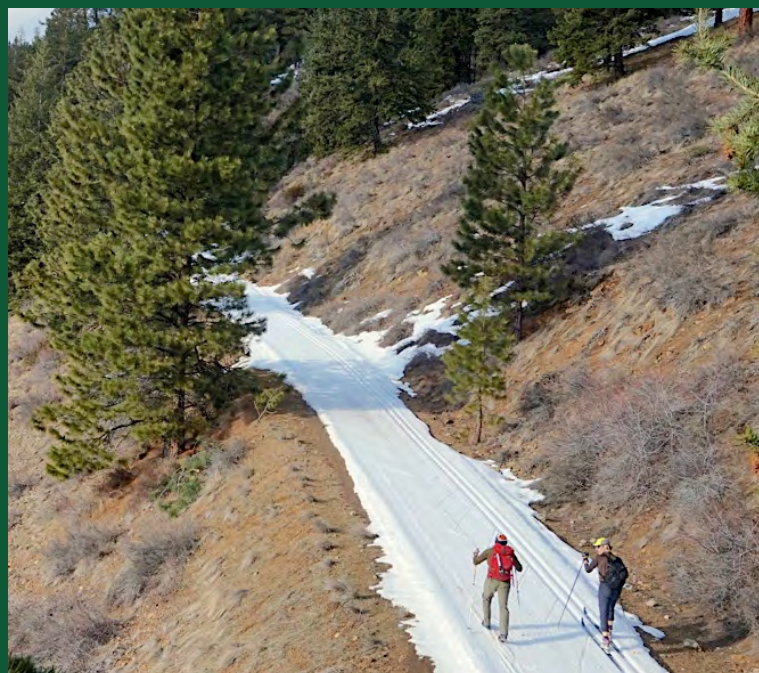
A typical winter in the mountains of the Western United States is characterized by cold temperatures and snow. The snowpack stores water and slowly releases it during spring and summer, providing soil moisture, recharging groundwater, and supplying streams with cool water. Snow also offers recreation opportunities and wildlife habitat. In many watersheds in the West, people and ecosystems depend on snowpack.

Snow drought occurs when snowpack is abnormally low, relative to the time of year and location. Snow drought can occur in two ways:

- Lack of precipitation, regardless of air temperatures, results in limited snow accumulation—this is a **dry snow drought**
- Warm temperatures result in precipitation falling as rain rather than snow—this is a **warm snow drought**



Mount Baker in northwest Washington during a normal snow year (July 3, 2023; top), and during a snow drought (July 3, 2015; bottom). [NASA Earth Observatory](#) images by [Joshua Stevens](#).



Low snow levels affect winter recreation. February 21, 2015, Okanogan-Wenatchee National Forest. USDA photo by Jim Cronan.

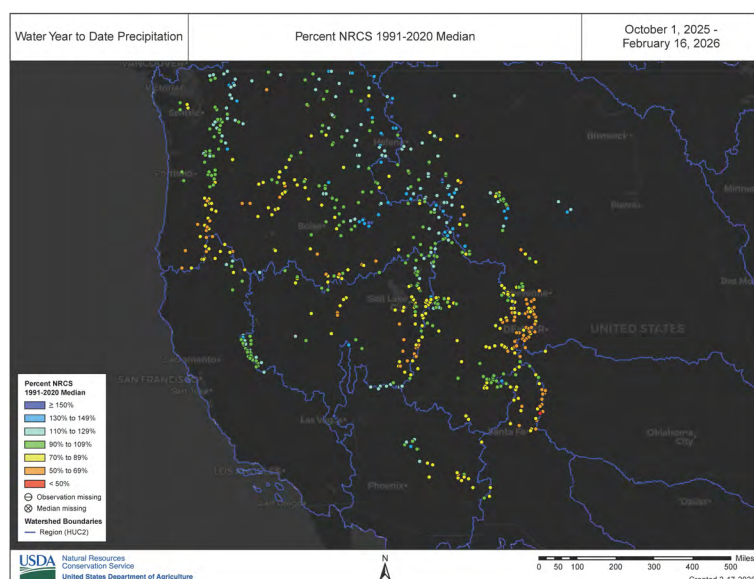
Dry Snow Drought

Dry snow drought is a specific type of meteorological drought that occurs when precipitation is limited, regardless of temperature. In the West, snow drought also contributes to hydrological drought because there is less water from snow to supply streams, lakes, rivers, and groundwater later in the year.

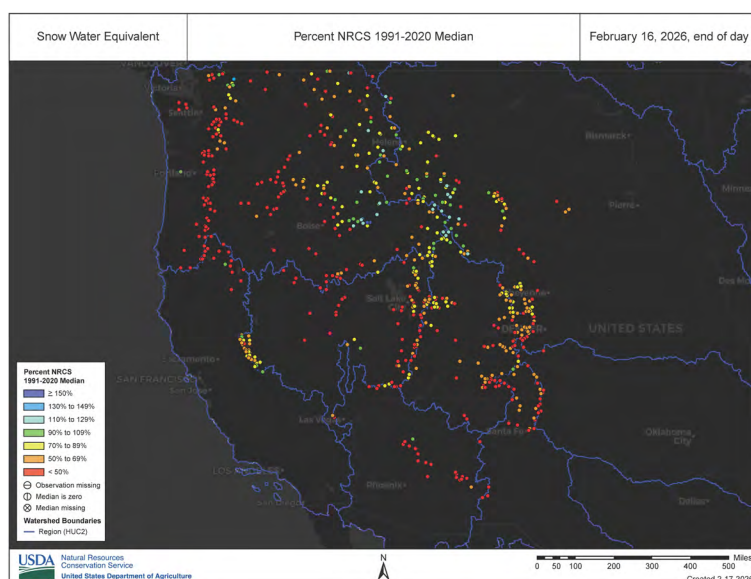
Warm Snow Drought

During warm snow droughts, precipitation can be normal, but because temperatures are above freezing, precipitation falls as rain rather than snow. Warm temperatures cause snow to melt, and rain-on-snow events can accelerate snowmelt, reducing snowpack. Warm snow drought contributes to hydrological drought (low water supply), but not meteorological drought because rain accumulation may be normal.

Examining weather station data to compare precipitation accumulation to snow water equivalent amounts can reveal areas experiencing dry or warm snow droughts. The left map shows a lack of precipitation in portions of Oregon, Nevada, Utah, and Colorado, indicating a dry snow drought due to low precipitation. The right map shows low amounts of water stored by snow across the West, which is a sign of a warm snow drought.



Percentage of precipitation from October 1, 2025, to February 16, 2026, as compared to the 1991–2020 median.



Percentage of snow water equivalent on February 16, 2026, as compared to the 1991–2020 median.

Importance of Snow in the West

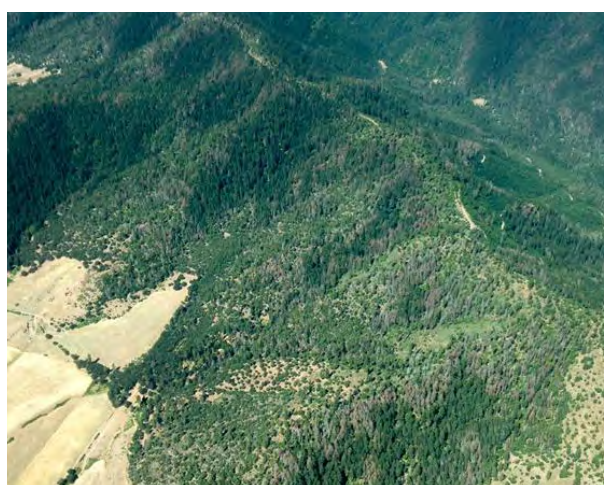
People and ecosystems throughout many areas in the West depend on snowmelt to replenish groundwater, waterways, and soil moisture.

- It is a source for drinking water and irrigation.
- Reduced soil moisture stresses trees, grass, and other vegetation, creating conditions favorable for some insects or invasive plants. Low soil moisture dries vegetation and contributes to fuels for wildfire. Soil moisture is a predictor of daily spread of wildfire in the northern Rocky Mountains.
- Both types of snow drought result in reduced streamflow, negatively affecting salmon and some other aquatic life.
- Snow drought affects winter recreation and some types of water-based recreation.

Adjusting management activities during dry conditions can help reduce impacts. Some options include the following:

- Increased monitoring and abatement of pests and invasive species.
- Monitoring “living maps” for changes to wildlife habitat.
- Aligning management activities with available moisture (i.e. thinning, reforestation, grazing, herbicide applications, prescribed burning, etc.).

Find more information about drought and how environmental disturbances interact with drought on the WWETAC website.



Aerial view of mortality due to flatheaded fir borer in the Applegate Valley in southwest Oregon, June 2016. USDA photo by Bob Schroeder.

The Western Wildland Environmental Threat Assessment Center (WWETAC) develops and communicates the latest scientific understanding of environmental threats to the Western United States. We conduct applied science and provide tools and information to help land managers assess and respond to environmental threats, leading to more resilient landscapes. To learn more, visit <https://research.fs.usda.gov/pnw/centers/wwetac>.

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