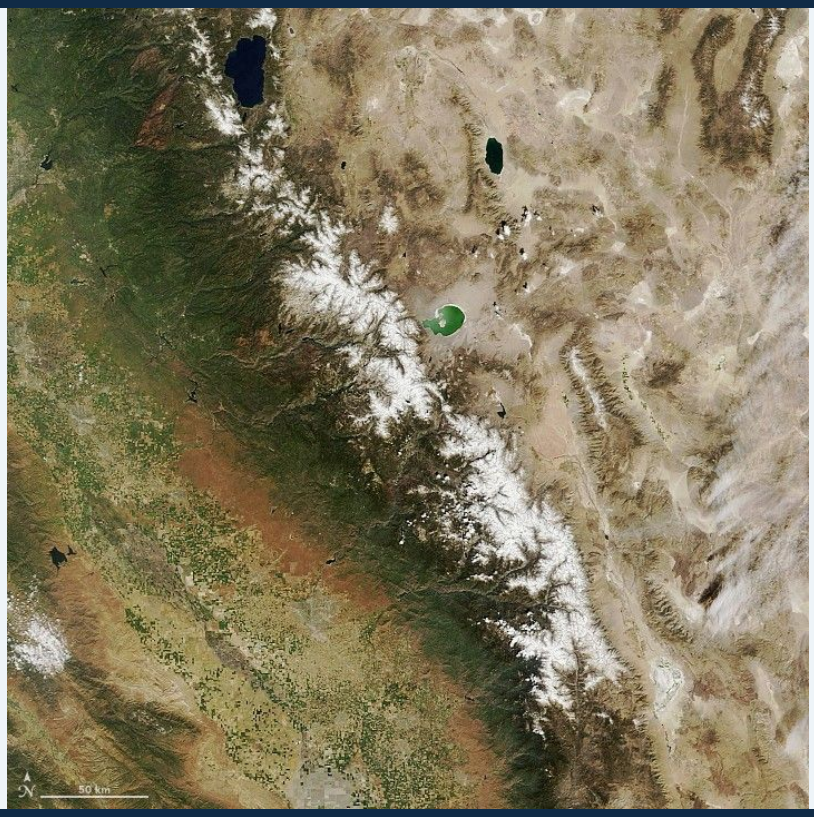
Snowpack & avalanche observations

What the mountain holds, and what an observation can actually tell you.



MODIS view from NASA’s 2015 Sierra Nevada snow-cover series. Credit: NASA Earth Observatory, using Terra MODIS data.

Historical evidence. Better questions. Useful records.

Snow-cover images, snow-water estimates and avalanche observations are useful for different reasons. This collection keeps them separate.

What the records reveal

SCOPE AND METHOD

Three historical snowpack examples and an observation-method record. This is a reference notebook, not a current avalanche forecast or route-planning tool.

A COMPARISON WORTH MAKING

Snow cover describes area; snow-water equivalent describes stored water; avalanche observations describe particular past conditions. None can substitute for the others.

IMAGES AND UNCERTAINTY

Photographs and satellite views carry their original credits. Quantitative charts use cited values; conceptual diagrams are explicitly labeled and contain no invented measurements. AI assisted research and drafting; references were checked and limitations retained. A picture shows a place and moment; it does not prove an entire event boundary, impact or cause. This is a historical reference, not a live warning service.

IN THIS COLLECTION

01 Sierra Nevada 2015: a sparse snow year 3

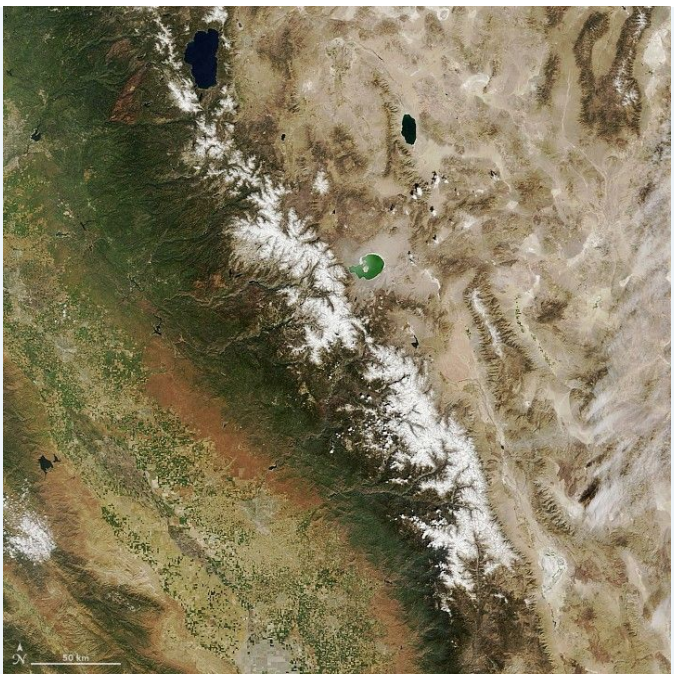
02 Sierra Nevada 2023: water stored as snow 4

03 Andes 2023: snow that lingered into summer 5

04 Avalanche observations: past evidence, not a forecast 6

Sierra Nevada 2015: a sparse snow year

Spring 2015 within a 2006-2024 image series | Sierra Nevada, California



MODIS view from NASA's 2015 Sierra Nevada snow-cover series. Credit: NASA Earth Observatory, using Terra MODIS data.

Comparison source
NASA World of Change

Imagery
MODIS satellite series

Visible measurement
Snow-covered area

Not measured by color
Snow depth or water content

WHAT HAPPENED

NASA's multi-year image series shows the sparse Sierra snow cover of 2015 alongside snowier years. Comparable seasonal views help reveal the contrast.

WHAT THE DATA REVEALS

Use a consistent season and document clouds. A visually small snow-covered area is an observation about extent, not a direct measurement of total stored water.

READ WITH CARE

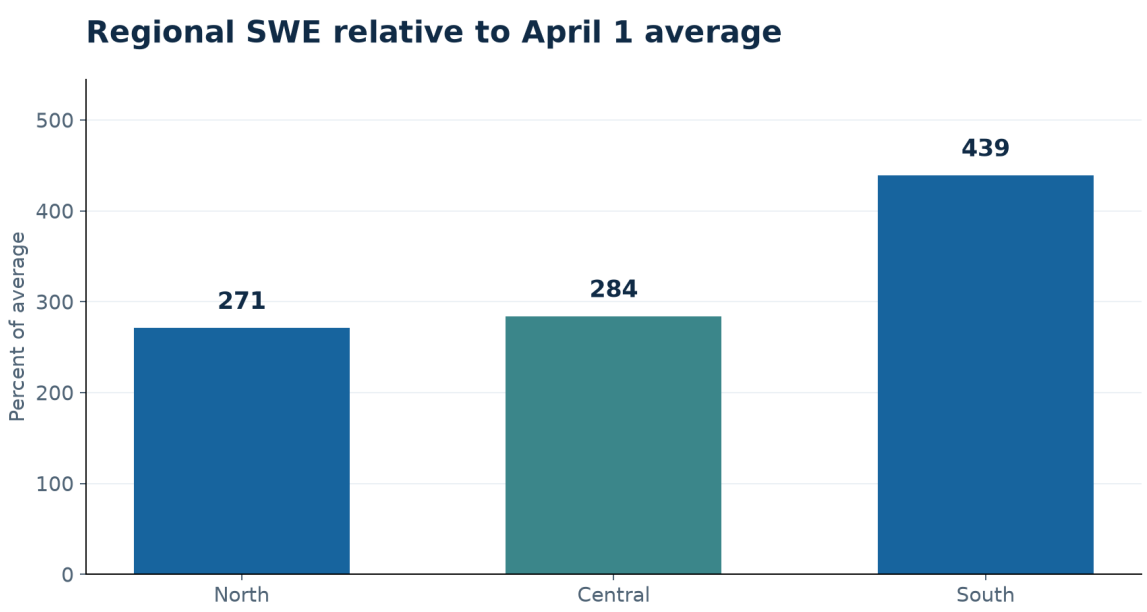
The illustration is a method guide unless an original satellite image is shown. No depth or SWE value has been inferred from image color.

Source 1 >

Visual / data >

Sierra Nevada 2023: water stored as snow

1 April 2023 analysis | Northern, central and southern Sierra Nevada



INSTAAR analysis reported by NASA, April 2023. A method-specific comparison, not avalanche danger. Credit: Dattle; original graphic from the cited reference.

Northern Sierra SWE
271% of average

Central Sierra SWE
284% of average

Southern Sierra SWE
439% of average

Method
INSTAAR satellite-based analysis

WHAT HAPPENED

NASA reported markedly different snow-water-equivalent anomalies across the range in April 2023. The southern Sierra reached 439% of the analysis's April 1 average.

WHAT THE DATA REVEALS

The regional pattern is more informative than a single statewide headline. Keep the analysis method and reference date with each percentage.

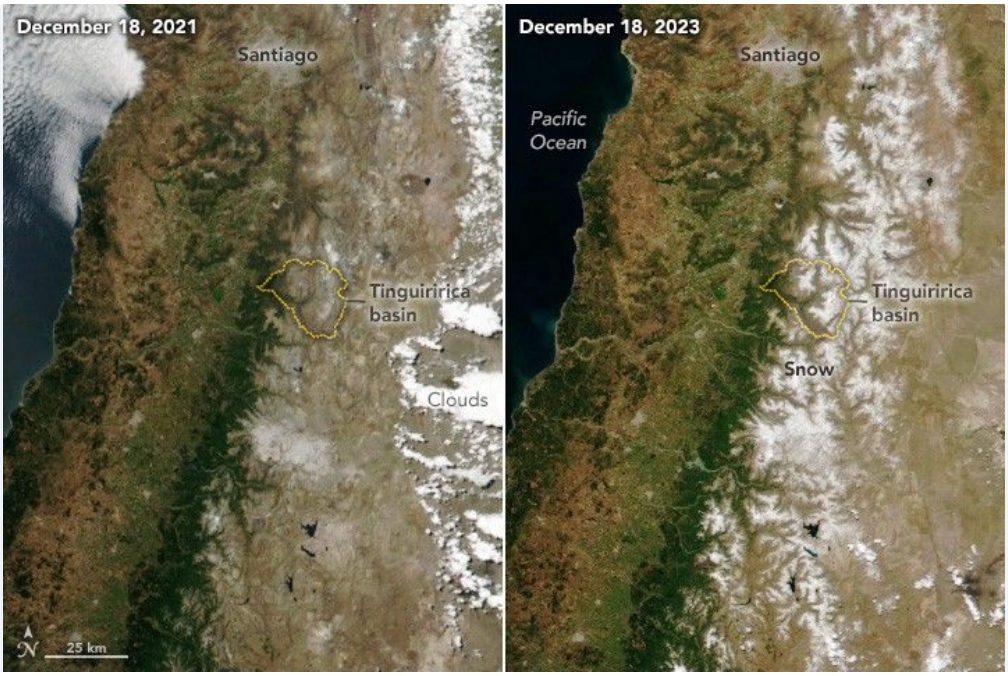
READ WITH CARE

These regional estimates are distinct from California's ground-sensor statewide survey. They are not snow-depth percentages or avalanche-danger ratings.

Source 1 > **Visual / data >**

Andes 2023: snow that lingered into summer

18 December 2021 and 18 December 2023 | Central Andes, Chile-Argentina



Central Andes, 18 December 2023; VIIRS satellite image. Credit: NASA Earth Observatory/Wanmei Liang, using VIIRS/JPSS data.

Comparison
Same calendar date, different years

Sensor
VIIRS on NOAA-20

Season
Early Southern Hemisphere summer

Context
Wet winter and cool spring in 2023

WHAT HAPPENED

NASA compared December satellite views showing more lingering snow in 2023 after winter storms and a cool spring.

WHAT THE DATA REVEALS

Matching the calendar date reduces one source of seasonal mismatch. Weather and snowmelt timing still need to be recorded.

READ WITH CARE

One snowy year does not establish that a long-running drought has ended. Snow visible from space is not a slope-stability assessment.

Source 1 > **Visual / data >**

Avalanche observations: past evidence, not a forecast

Monitoring method; checked 12 November 2026 | Sierra Avalanche Center observation area



Dattle reference diagram; labels summarize the cited source. Not an event photograph or measured time series. Credit: Dattle; original graphic from the cited reference.

Record type
Reported past conditions

Public observations
Not necessarily checked for accuracy

Missing reports
Do not establish absence

Decision source
Current official forecast

WHAT HAPPENED

The Sierra Avalanche Center explains that its observations document past conditions and that public submissions are not necessarily checked for accuracy.

WHAT THE DATA REVEALS

Preserve observer confidence, time, elevation and aspect. An observation can inform a question without proving that a nearby slope is safe.

READ WITH CARE

Use current official forecasts and appropriate training for travel decisions. The absence of a reported avalanche is not evidence that none occurred.

Source 1 >

Visual / data >

From examples to observations

A USEFUL RECORD KEEPS ITS EVIDENCE

Keep the time, place, measurement method, unit, source and uncertainty with every observation. Separate what you saw from an estimate or interpretation. Repeat observations consistently, and retain the original evidence when updating a record.

SUGGESTED DATTLE FIELDS

- Date, timezone, location, elevation and aspect
- Snow cover, depth or SWE with units
- Measurement method and reference period
- Weather and recent loading
- Observed avalanche details and uncertainty
- Official forecast link and issue time

AI AS AN ACCELERATOR

Use this prompt to draft a collection structure, then review it. AI can organize the questions and fields; it cannot supply missing observations or replace source verification.

> Create a Dattle for snowpack & avalanche observations. Include Date, timezone, location, elevation and aspect, Snow cover, depth or SWE with units, Measurement method and reference period, Weather and recent loading, Observed avalanche details and uncertainty, Official forecast link and issue time. Start with an empty collection. Separate observations, estimates and interpretations. Do not invent measurements, dates, locations or sources. Retain units, uncertainty and source links; flag missing information for review.

Explore Dattle at dattle.com. Availability, features and plan limits are described on the website.

Sources and image credits

Primary references checked November 12, 2026. Records and estimates can be revised. Every case page links to its evidence; full addresses are retained here for reuse.

01. Sierra Nevada 2015: a sparse snow year - primary reference
https://science.nasa.gov/earth/earth-observatory/world-of-change/sierra-nevada/

02. Sierra Nevada 2023: water stored as snow - primary reference
https://science.nasa.gov/earth/earth-observatory/a-boom-year-for-sierra-nevada-snow-151232/

03. Andes 2023: snow that lingered into summer - primary reference
https://science.nasa.gov/earth/earth-observatory/andes-snowpack-hangs-on-152309/

04. Avalanche observations: past evidence, not a forecast - primary reference
https://www.sierraavalanchecenter.org/observations