

GLACIERS EXPLAINED

**Science behind
the melting ice**

INFO SHEET FROM THE WEBINAR
HELD ON JANUARY 22, 2026



HOW GLACIERS FORM

Snow + Cold + Time

What a glacier needs to survive:

- The continuous accumulation of snow of all kinds (precipitation, wind, avalanches)
- Cold conditions (temperatures below freezing), a shady location
- Years of pressure that turn snow into firn and then ice

Two processes are characteristic of a glacier

ACCUMULATION

Glacier growth: more snow falls than melts.

ABLATION

Glacier retreat: ice and snow melt, sublimate, or break away.

The balance between the two decides whether a glacier grows or shrinks.





WHY GLACIERS MATTER

68 %

of Earth's
freshwater
is locked in ice
and glaciers.

STORE WATER

Meltwater supports rivers during warm and dry periods and is important for our water security.

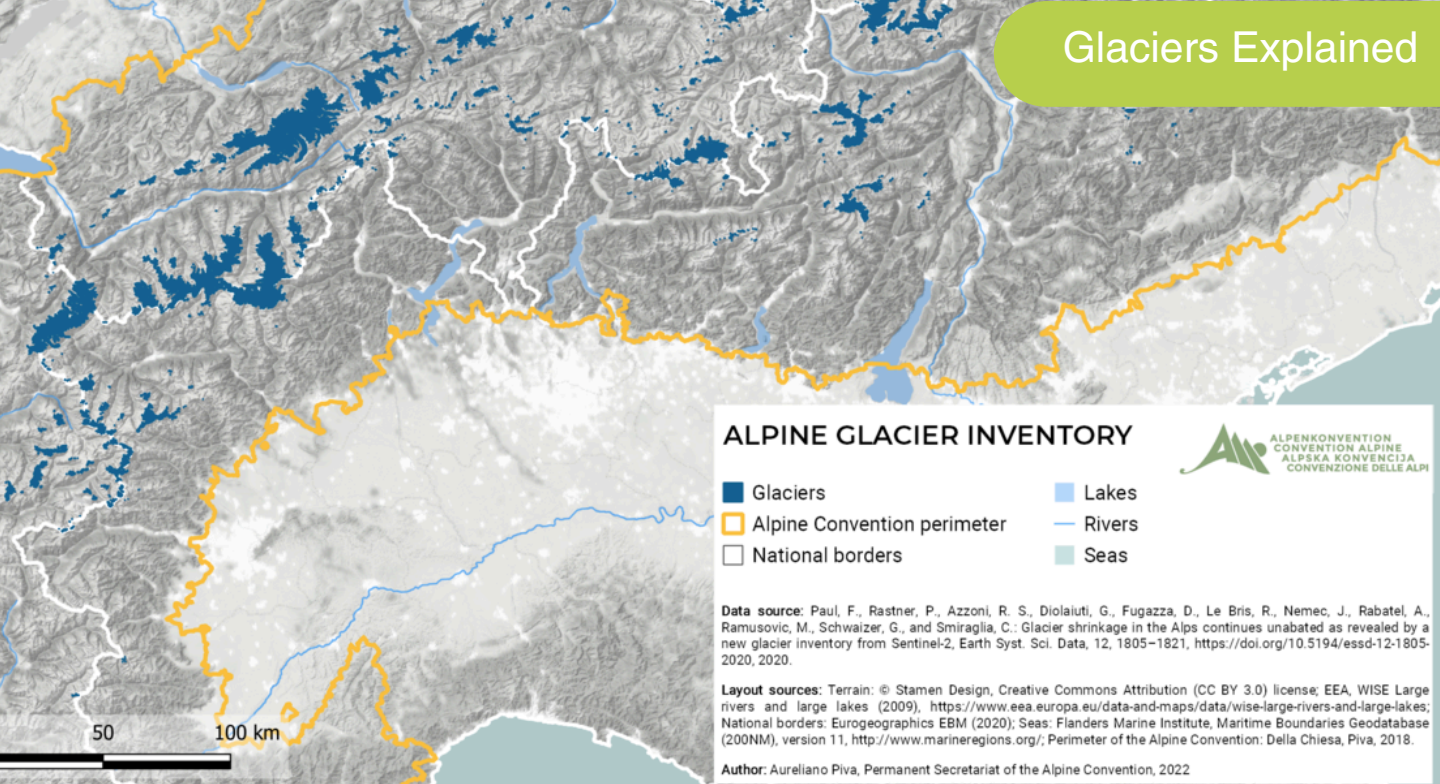
REFLECT SUNLIGHT

Snow and ice reflect solar energy and help cool down our planet. This is called Ice-Albedo feedback*.

SHAPE LANDSCAPES

Glaciers carve valleys, build moraines and influence tourism, access and passability of glacial and glacially modified areas.

*As air temperatures rise and ice melts, the Earth's surface becomes less reflective of solar radiation. This causes land and water to absorb more solar energy in the form of heat, leading to further warming of the atmosphere.



WHY GLACIERS ARE MELTING



The Alpeiner Ferner glacier in the Stubai Alps, Austria, lost 114.3 metres of ice in 2024/25. This equals a bit longer than a whole football field.

WHAT IS CHANGING

Retreat is accelerating

39 %

Central Europe ice loss

Central Europe's glaciers lost about 39 % of their mass between 2000 and 2023.

2033 - 2041

Possible Alpine peak-loss window

The Alps could reach peak glacier extinction within the next two decades.

94 %

Alpine ice volume loss by 2100

With a temperature rise of 1.5°C, glaciers in the European Alps are projected to largely disappear.

Smaller and lower-elevation glaciers are most at risk to retreat, especially in mountain regions with many small glaciers.

AS ICE RETREATS, RISKS RISE

LESS VISIBLE THAN MELTING



■ THAWING PERMAFROST

Permafrost is permanently frozen ground (soil, rock or sediment ...) that is frozen for more than two consecutive years.

■ ROCKFALLS & ICE AVALANCHES

Less ice support and warmer rock walls can trigger sudden collapse.

■ CHANGING ROUTES

Mountaineering paths and crossings become less predictable and more dangerous, therefore, they must be relocated or, in some cases, completely closed.

■ NEW LAKES & FLOOD HAZARDS

Freshly deglaciated terrain can create unstable basins and local flood risk.

Permafrost covers about 25 % of exposed land in the Northern Hemisphere; when it thaws, ground can subside and foundations can fail.

ALPS WITHOUT GLACIERS

■ WHAT WE LOSE:

- Water storage, freshwater supplies, sea level stability
- Safety for tourism, infrastructure and settlements
- Testimonies of the Earth's history and cultural heritage
- Unique ecosystems

■ WHAT WE WIN:

- New post-glacial landscapes and ecosystems

Glaciers are sensitive indicators of climate change. The idea of Alps without glaciers is no longer a distant, hypothetical scenario. With current warming trends a near total disappearance of glaciers in the Alps is increasingly likely within this century.



WHAT NEEDS TO HAPPEN NOW

Mitigate. Adapt. Govern.



**European Manifesto for
Glacier Governance
and Related Resources**

1 CUT EMISSIONS

Without rapid greenhouse-gas cuts, glacier loss accelerates and many Alpine glaciers will not survive.

2 MONITOR CONTINUOUSLY

Track glacier mass, slope stability, permafrost, water and route safety together, not in isolation.

3 PLAN ACROSS BORDERS

Water, hazards and mountain access do not stop at national borders; governance has to be transnational too.

Info Sheet based on the “Glaciers Explained” webinar with Vanda Bonardo, Miha Pavšek, Marco Giardino.

Young Glacier Voices invites young people to learn, witness and speak up for glacier protection.



FURTHER INFORMATION

- **GLACIER REPORT BY AUSTRIAN ALPINE CLUB 2024/25 (DE):**
www.alpenverein.at/portal/service/presse/2026/2026_03_13_gletscherbericht.php
- **PEAK GLACIER EXTINCTION IN THE MID-TWENTY-FIRST CENTURY (EN):**
www.nature.com/articles/s41558-025-02513-9
- **CAROVANA DEI GHIACCIAI (IT):**
www.legambiente.it/campagne-e-progetti/carovana-dei-ghiacciai/
- **SZENEALPEN NR. 112 - «NACH DEM GLETSCHER» (DE, FR,IT,SL):**
www.cipra.org/de/publikationen/szenealpen-nr-112-nach-dem-gletscher
- **YOUNG GLACIER VOICES**
www.cipra.org/en/projects/young-glacier-voices



ABOUT THE PROJECT



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