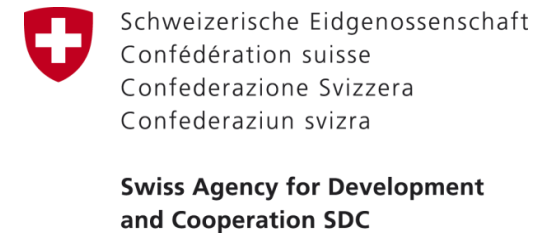
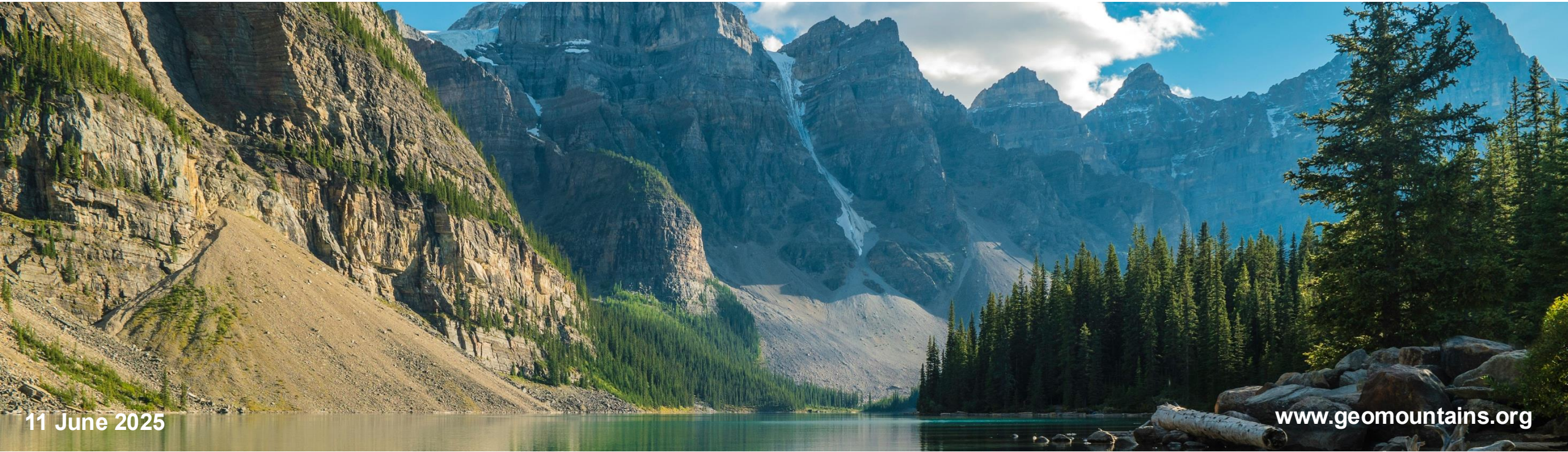


GEO Mountains General Meeting 2025 #1



Housekeeping



- ☐ Please **raise your hand** to request the floor
- ☐ Any comments can be made / questions asked **in the chat**
- ☐ **The meeting is being recorded** – if you have any concerns about this, please let me know;
the recording may be made available upon request
- ☐ **The slides will be circulated** to registered participants afterwards

Agenda



- | | |
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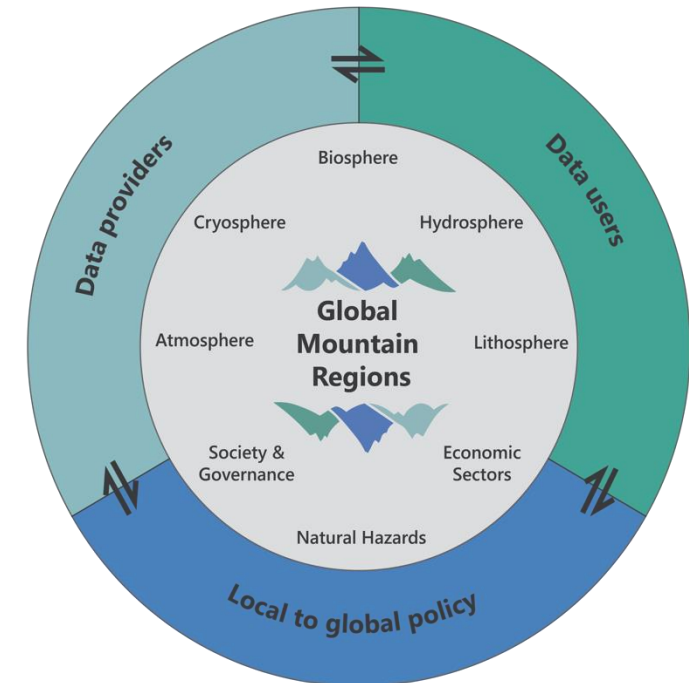


GEO Mountains

The Global Network for Observations and Information in Mountain Environments

A Group on Earth Observations (GEO) Work Programme Initiative, co-led by the Mountain Research Initiative (MRI) & the National Research Council of Italy (CNR), since 2016

- ❑ To **increase** the **discoverability**, **accessibility**, and **usability** of a wide range of **data and information** pertaining to **mountains globally**
- ❑ To **integrate** and **apply** such data and information for **scientific**, **policy**, and **practical impact**
- ❑ To **build**, **connect**, **coordinate**, and **share capacity** across a **community** of mountain researchers, practitioners, and policy makers



Adaptation at Altitude

- ❑ The **Swiss Agency for Development and Cooperation (SDC)** continues to support the GEO Mountains Secretariat and network activities (via the Mountain Research Initiative) under the Adaptation at Altitude Programme from **2024 – 2027**
- ❑ Under Outcome 1, GEO Mountains works to support bridging data & information gaps in Andes, East Africa, HKH, Caucasus and Central Asia



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

**Swiss Agency for Development
and Cooperation SDC**

 Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC



CONDESAN
Consortio para el Desarrollo Sostenible
de la Ecorregión Andina

ICIMOD

UN
environment
programme

SEI Stockholm
Environment
Institute



**UNIVERSITÉ
DE GENÈVE**



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GEO Global Forum & Youth Ideathon: Updates



- ❑ MRI was represented at the GEO Global Forum in Rome as a GEO Participating Organisation and as Co-Lead for GEO Mountains, as part of the Swiss delegation.
- ❑ GEO-20 Plenary: Post-2025 Work Programme was adopted, with GEO Mountains confirmed as a GEO Initiative, starting with a first 3-year term 2026-2028.
- ❑ Youth Ideathon: Young professionals collaborated on local environmental challenges using Earth Observation data, with a focus on innovative solutions for local businesses
- ❑ GEO Mountains and ArcticGEOSS hosted a joint session
- ❑ GEO Mountains presented an [e-poster](#) as part of an exhibition hosted by [EuroGEO at the European Commission exhibition booth](#)

<https://mountainresearchinitiative.org/news/mri-at-the-geo-global-forum-2025-highlights-from-the-youth-ideathon-community-events-and-geo-20-plenary/>



Figure 1 (above). GEO Global Forum
Figure 2 (below) The GEO Youth Ideathon participants
@GEO Moutains

GEO Mountains in the post-2025: Activities in development



☐ Enhanced Data & Tools:

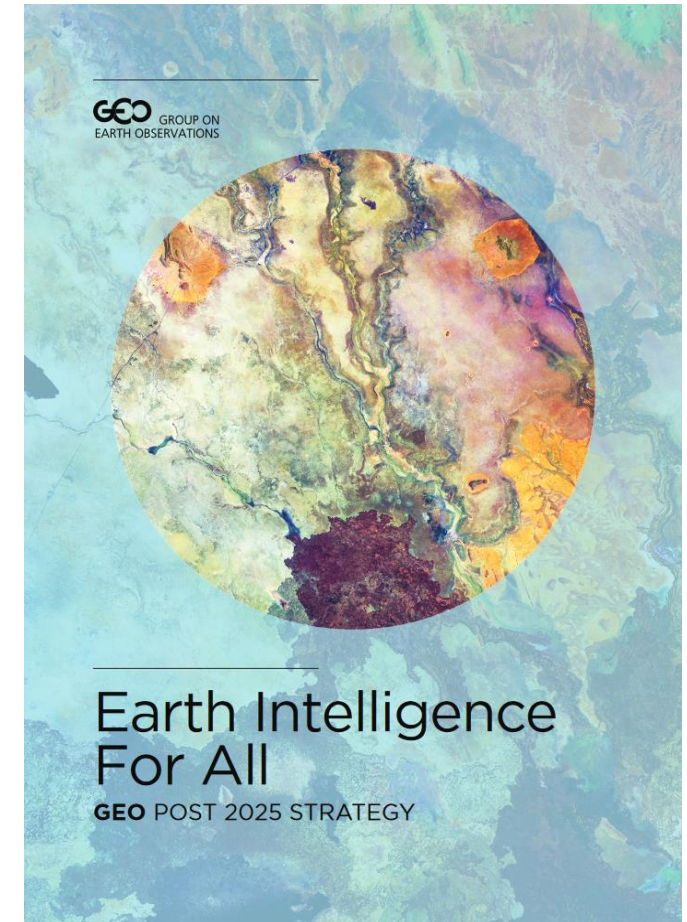
- ☐ Expand and validate inventories of mountain observation data, infrastructure, and models.
- ☐ Develop a Virtual Research Environment for better data access and integration.
- ☐ Systematize internal findings into a clear, public user engagement plan.
- ☐ Guide use and uptake of GEO Mountains outputs in the post-2025 phase.

☐ Assessment-Relevant Publications:

- ☐ Aggregate and synthesize data on climate change impacts, water, ecosystems, and adaptation in mountain regions.
- ☐ Support global and regional assessments with targeted analyses.

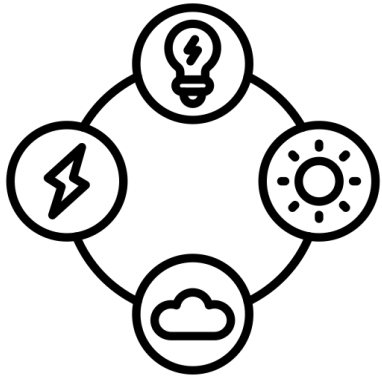
☐ Re-define GEO Mountains governance structure

☐ UPDATED work plan and outlook for 2026 to be presented for discussion and inputs at GM in November 2025



<https://earthobservations.org/storage/documents/Key-Documents/GEO%20Post%202025%20Strategy%20Full%20Document.pdf>

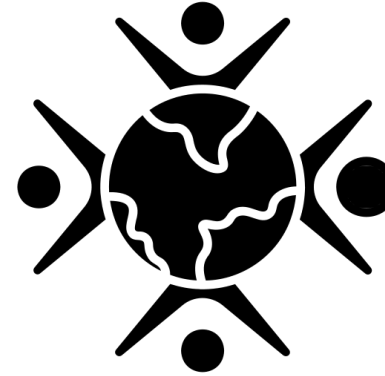
GEO Mountains in the post-2025: Future priorities



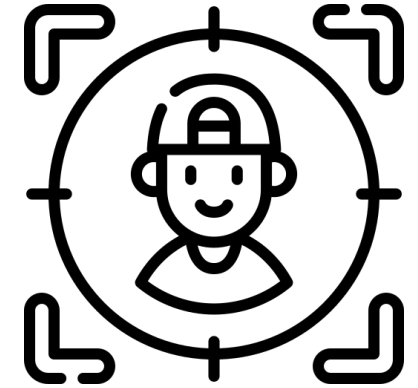
Integration of **various sources of information**, such as socio-economic data, citizen observations, indigenous/traditional knowledge



Improve **interoperability and utility** of data and information for various users and their knowledge **needs**, including moving from information to supporting climate change adaptation applications



Continue encouraging **diversity** within the Mountain Research Community



Develop a targeted and structured approach to **youth engagement**

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RADISC & GEO Mountains Regional Workshop in the Caucasus (20-22 May 2025)



- ❑ The MRI contributed to and co-led a recent Regional Adaptation Dialogue in the South Caucasus (RADISC) in Georgia entitled *"Snow and Ice in the Caucasus Mountains - Adapting to a Critical Resource in Decline"*.
- ❑ The MRI-led segment, in collaboration with the WMO, included a follow up on infrastructure, data and information needs from the July 2023 GEO Mountains workshop held in Kutaisi, Georgia.
- ❑ The event brought together experts from Armenia, Azerbaijan, and Georgia (national hydromet agency experts & researchers), plus international experts, to discuss enhancing cooperation regarding climate and cryosphere monitoring and data sharing, alongside adaptation policy responses.
- ❑ An associated Policy Brief on these topics is currently in development.

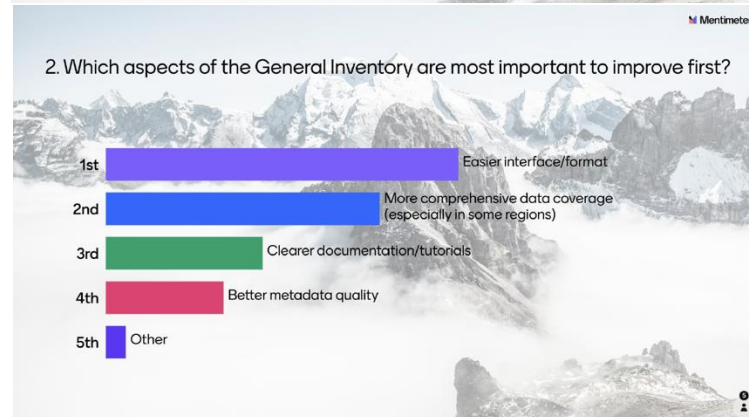
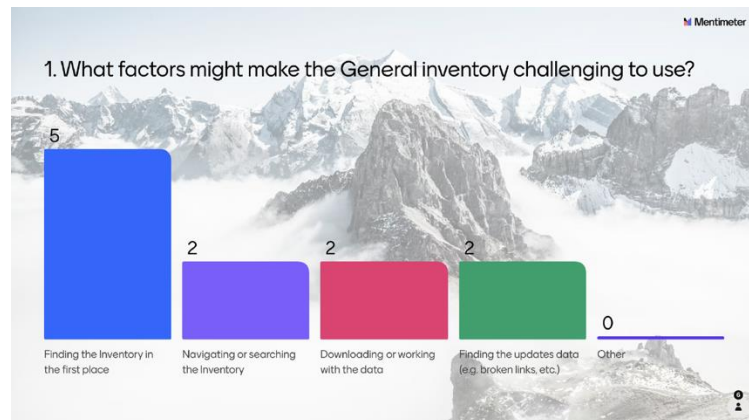


@Miriam Drevidze



Task Group 1 – Inventories: Updates

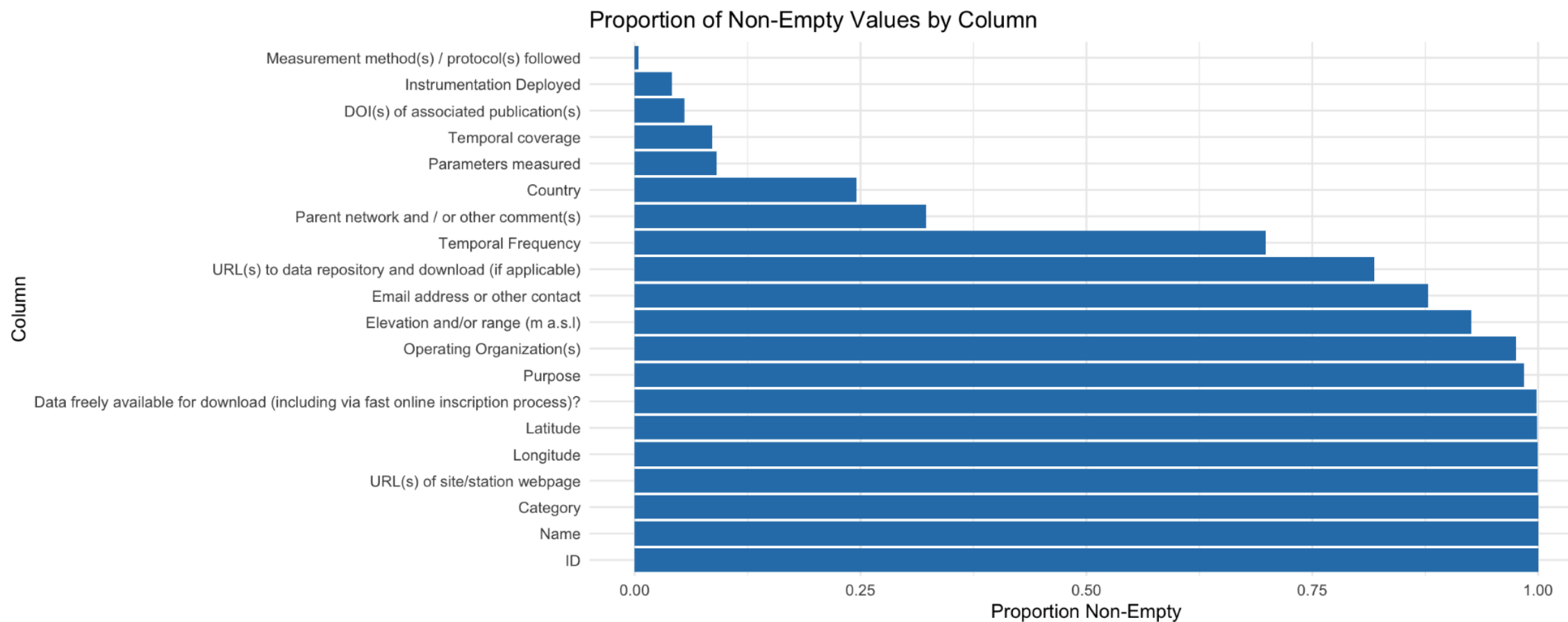
Feedback was collected on both GEO Mountains inventories via a survey in December 2024, and a first meeting took place in March 2025 to help prioritise and shape future versions (see slides and outcomes [here](#)).



General feedback:

- ☐ In Situ Inventory web map: enhanced filters & search
- ☐ Partner with national hydromet agencies to increase number of stations & metadata completeness
- ☐ Splitting inventories by regions
- ☐ Increase visibility (e.g. via tutorials, case studies)
- ☐ Focus on mountain-specific data for General Inventory

Task Group 1 – Inventories: Updates



Task Group 3 – Global Policy Outreach: Updates



- ❑ GEO Mountains will develop a Technical Supplemental to the UNFCCC National Adaptation Plans (NAP) on the topic of "**Earth Observation for Monitoring Adaptation in Mountains**"
- ❑ A preliminary analysis of NAP coverage with respect to mountains was conducted by the Zoï Environment Network in 2023, and will provide a very useful foundation
- ❑ Next week, the first meeting of TG3 will take place; please sign up if you are interested!



GEO Mountains Task Group 3 - National Adaptation Plan Guidelines

18/06/2025 14:00 — 15:00 GEO Mountains Event

📍 Event location

Online

Online

<https://geomountains.org/news-page-all/138-geo-mountains/2922-outcomes-of-the-geo-mountains-task-groups-kick-off-meeting-9-october-2024>

Treaties Spatialisation: Updates

Global Coverage of Mountain-specific International Environmental Agreements

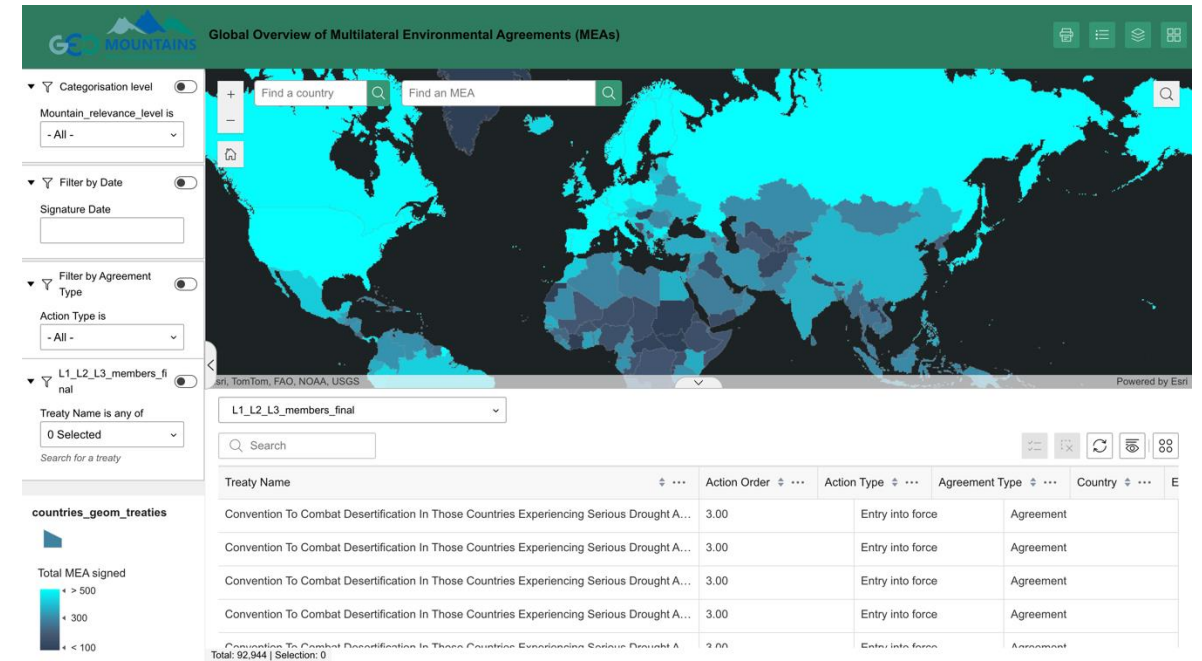
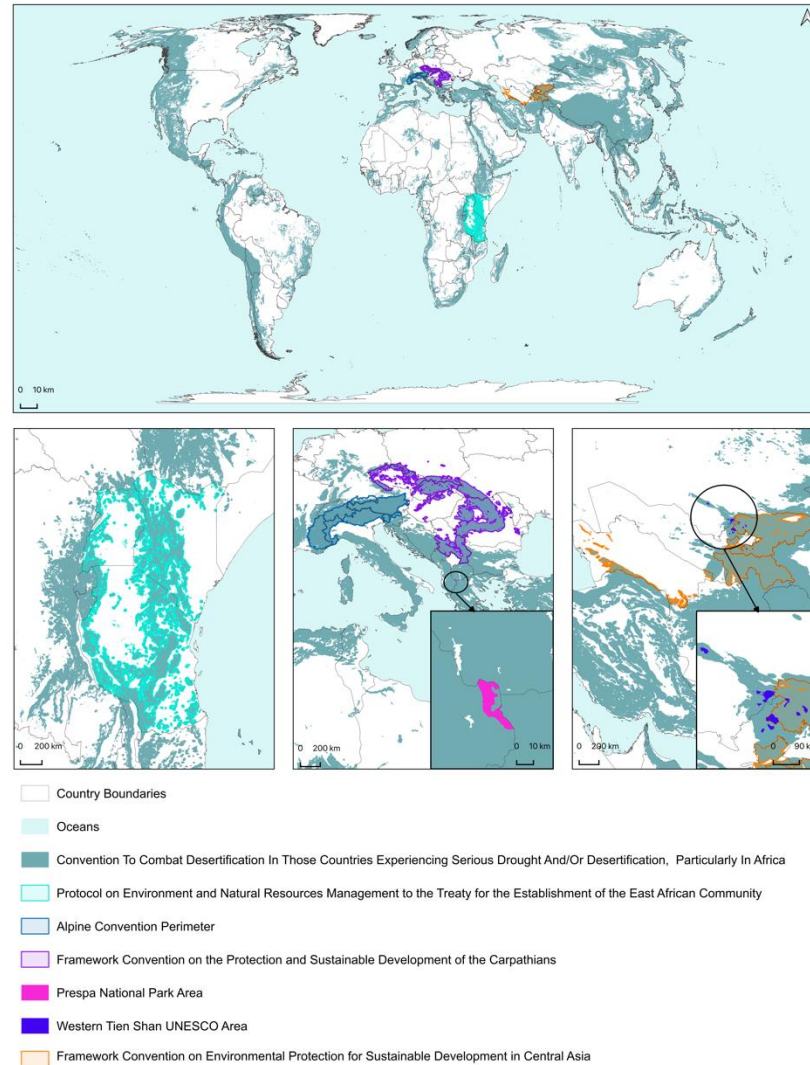


Figure 1 (left). Treaties Spatialisation: Global coverage of "mountain-specific" international environmental agreements – Work in progress

Figure 2 (right). Prototype of interactive web map for international environmental agreements (level 1-2-3) – Work in progress

Treaties Spatialisation: Next steps

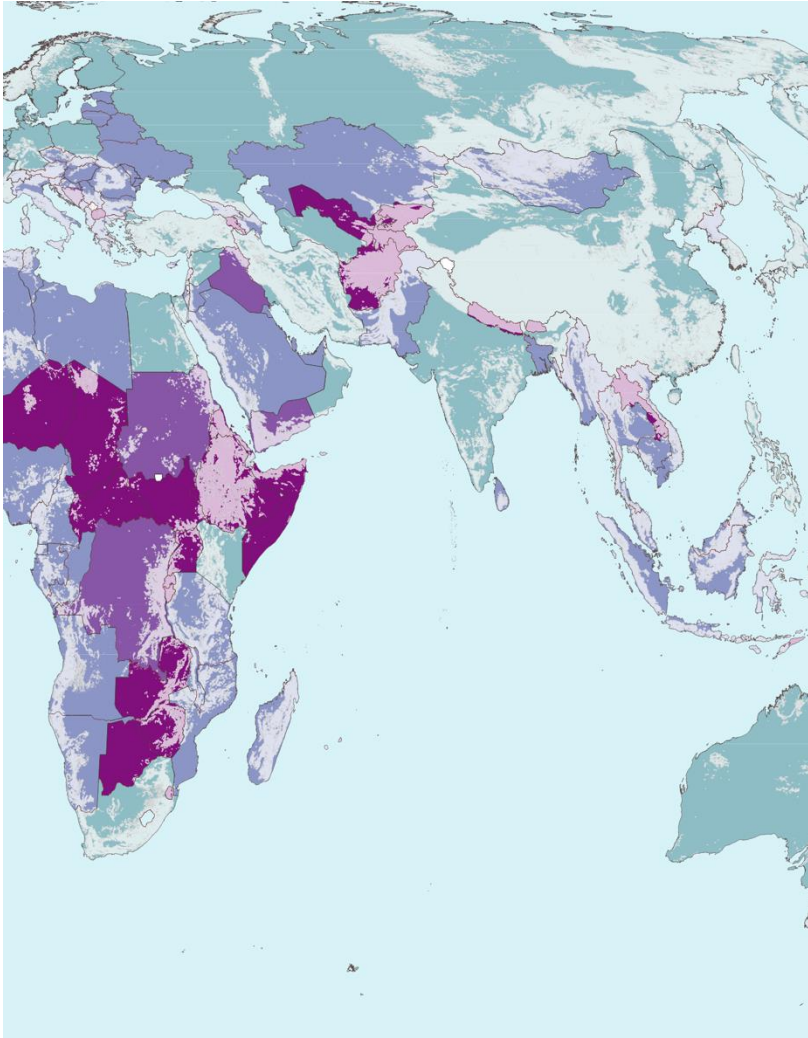
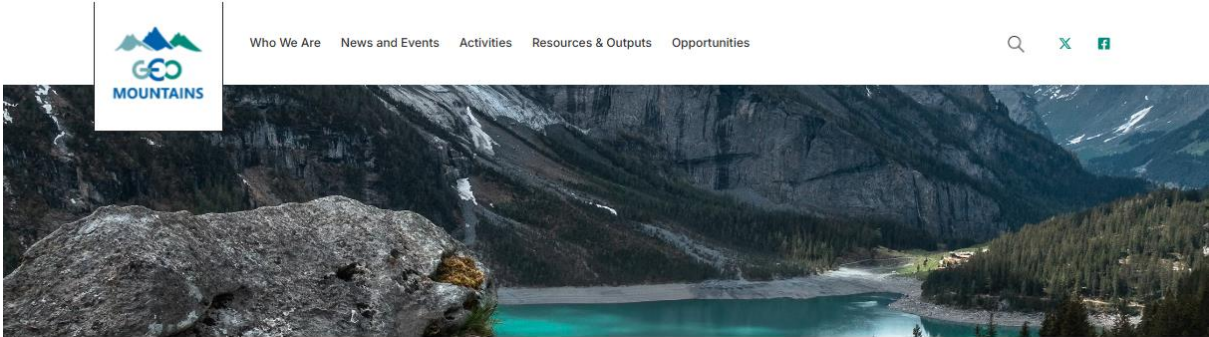


Figure 1. Work-in-progress insight of the treaties spatialization results map.

- ☐ Consolidating results and finalise report
- ☐ Include the results of the MRI Mountain Governance Working Group Survey
- ☐ Get feedback on the potential use of the database and interactive map (e.g. through Task Group 4 or MRI MG WG)
- ☐ Results will be presented in a session at the International Mountain Conference in September 2025: “WS 3.121: The science-policy interface for regional mountain governance” (exact date TBC)

New website

❑ To be released within the next 3 weeks!



MRI at the GEO Global Forum 2025: Highlights from the Youth Ideathon, Community Events, and GEO-20 Plenary

At the inaugural GEO Global Forum 2025 in Rome, the Mountain Research Initiative and GEO Mountains participated in key discussions on advancing Earth Observations (EO) for sustainable mountain development. Highlights...

[Read more](#)

News

[Read more News](#)

GEO Mountains

GEO Mountains and MRI to be Represented at the AGU Fall Meeting 2024

Dr. James Thornton will represent GEO Mountains and the MRI at the American Geophysical Union (AGU) Fall Meeting 2024, which will take place in Washington.

Global News

WGMS Call for Data

The World Glacier Monitoring Service has opened its annual call for data. Contribute now!

Projects

Here you'll find an overview of GEO Mountains' projects, both past and ongoing. Our work is organized into three main project types:

- Secretariat-Led Projects (GEO Mountains Projects):** Those projects led by or, heavily involving, GEO Mountains Secretariat staff, often in conjunction with the GEO Mountains Task Group members and MRI Working Groups
- Small Grants Projects:** Those projects funded via the GEO Mountains Small Grants Programme under Adaptation at Altitude
- Community Projects:** Projects funded and/or initiated independently of GEO Mountains, but which nevertheless contribute substantially to the aims of GEO Mountains, and which the project team has agreed to list here

Category

Region

Status

Search

Filter by Year

2015 — 2025

RESET FILTER

Small Grants Projects 2023

Revisiting inter-annual glacier mass balance as a response to recent climate variability along the Andes

Universidad Yachay Tech (Ecuador), INAGEM (Peru), Universidad Mayor de San Andrés (Bolivia), IANIGLA (Argentina), Universidad Regional Amazónica IKIAM (Ecuador), Universidad Austral de Chile (Chile).

Small Grants Projects 2023

Snow monitoring in the Argentinean and Chilean Andes Cordillera (HR-SCA-SWE-Andes)

Eurac Research (Italy)

Small Grants Projects 2023

Monitoring Landscape Changes and Invasive Species Mapping around Mt Kenya

Regional Centre for Mapping of Resources for Development (RCMRD) (Kenya) & NASA (USA)

Small Grants Projects 2023

Small Grants Projects 2023

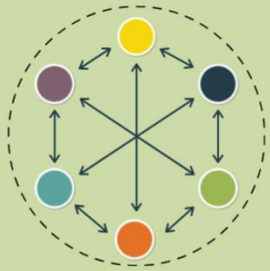
Small Grants Projects 2023

Updates on governance structure consultation

- ❑ The ad-hoc GEO Mountains "core group" were consulted on potential (post-2025) governance structures for the network going forwards
- ❑ Various potential models were presented and discussed:

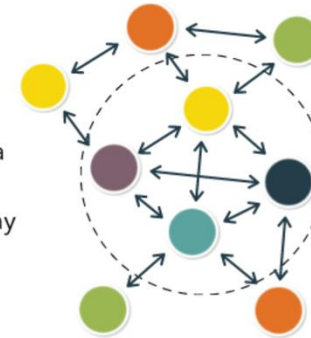
Self-Governing Network

The self-governing network is characterized by a distributed leadership structure with consent-based decision-making. Rather than any one network member lead, all members take part in and share governance responsibilities.



Council or Board Governed Network

In a council or board governed network, a sub-group of members makes major decisions & manages the network on a day to day level. This balances involvement without spreading leadership too thin.



Lead Organization Governed Network

In a lead organization governed network, one member organization takes the lead in convening members and managing the network, but others still take on specialized core roles.



Backbone Org Governed Network

In a backbone organization, a new organization is created to serve specifically as the backbone of the network. They drive decision-making and management for the entire network.



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- ❑ The results suggested a preference for a **council / Board-governed network**, with a lead-organisation-governed network coming in second place

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Joint Body on the Status of Mountain Snow Cover (JB-SMSC)

GEO Mountain General Meeting

11.06.2025

Michael Matiu, Wolfgang Schöner, Simon Gascoin, and many more...



IACS



The overall goal of this Joint Body:

**Highlight the relevance of the
mountain snow cover in general**

Overview

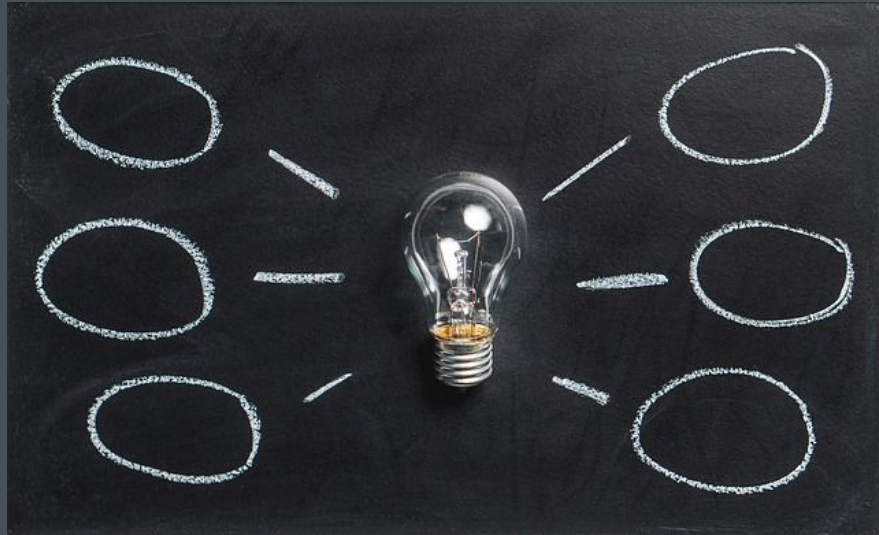
The ideas:

1. provide robust information on mountain snow cover changes at a global scale in the past few decades based on compiling and standardizing existing data (sources) at sufficiently high resolution
2. better understand processes of accumulation and ablation based on existing modelling and observational studies
3. open access to the snow data for the research community and contribute to the operational capacity building in terms of understanding mountain snow cover changes and its impacts on and responses to climate, water and environment.

> 120 experts from all over the world



Then comes life



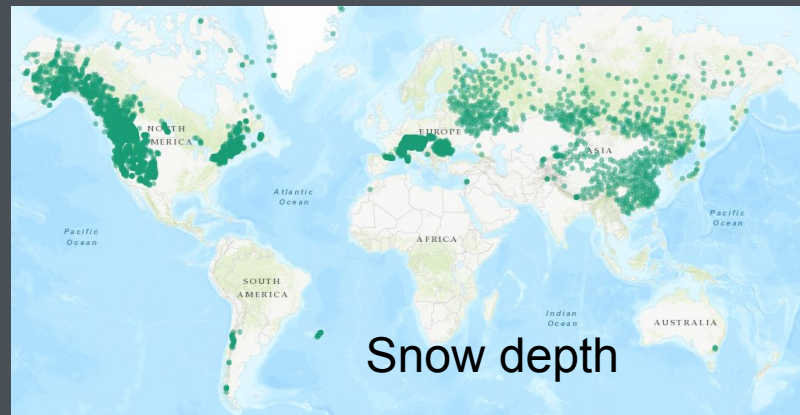
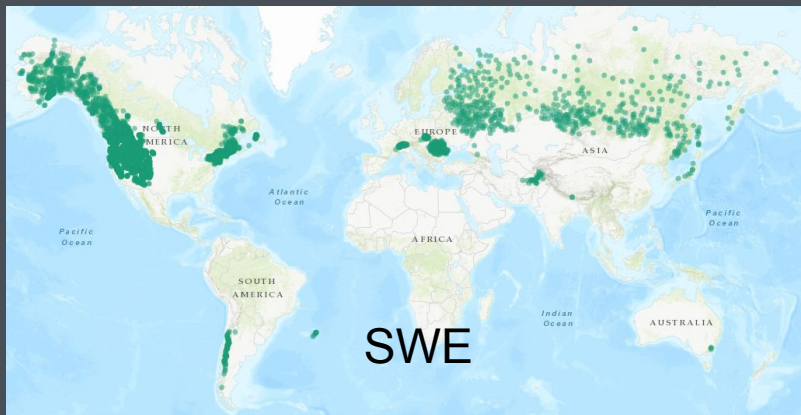
... a few small groups of
people found themselves...

In-situ snow data collection and harmonization

- meta-data only (at the moment)
- work-in-progress (neverending)

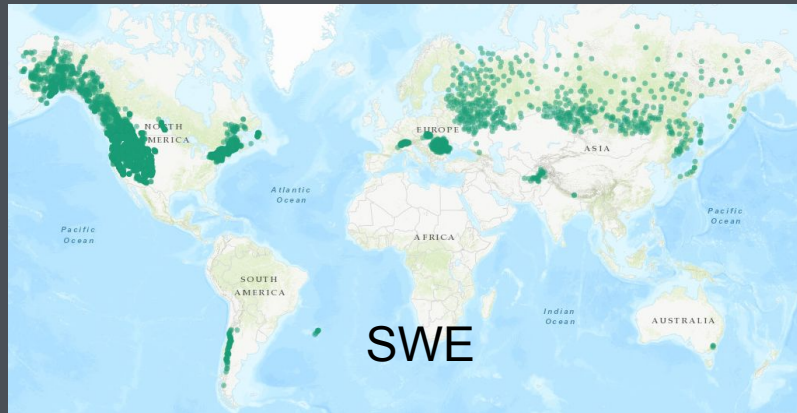
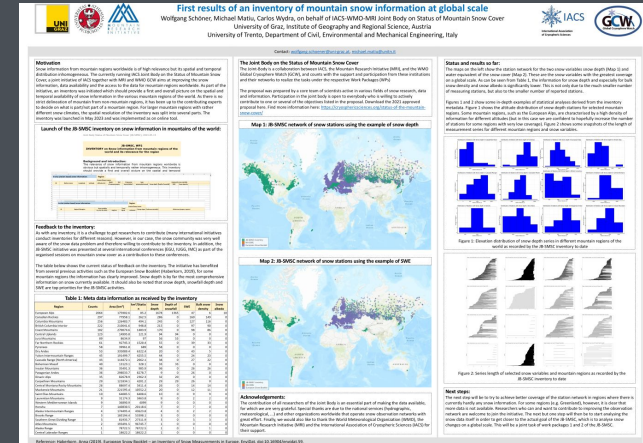
In-situ snow data collection and harmonization

- meta-data only (at the moment)
- work-in-progress (neverending)
- <https://jb-smsc.github.io/inventory/>



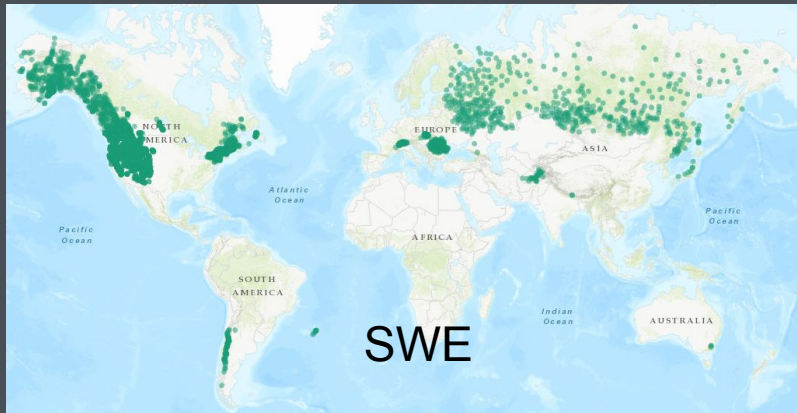
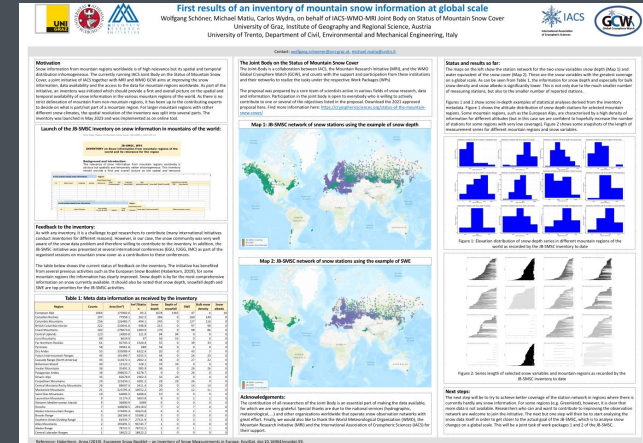
In-situ snow data collection and harmonization

- meta-data only (at the moment)
- work-in-progress (neverending)
- <https://jb-smisc.github.io/inventory/>
- some analysis presented at EGU24



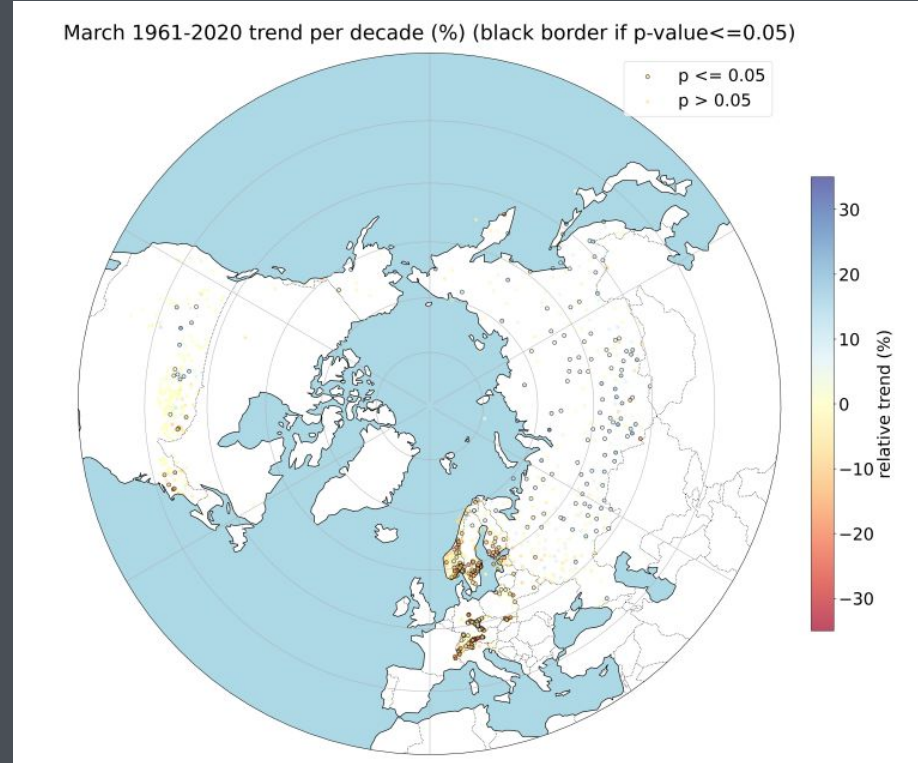
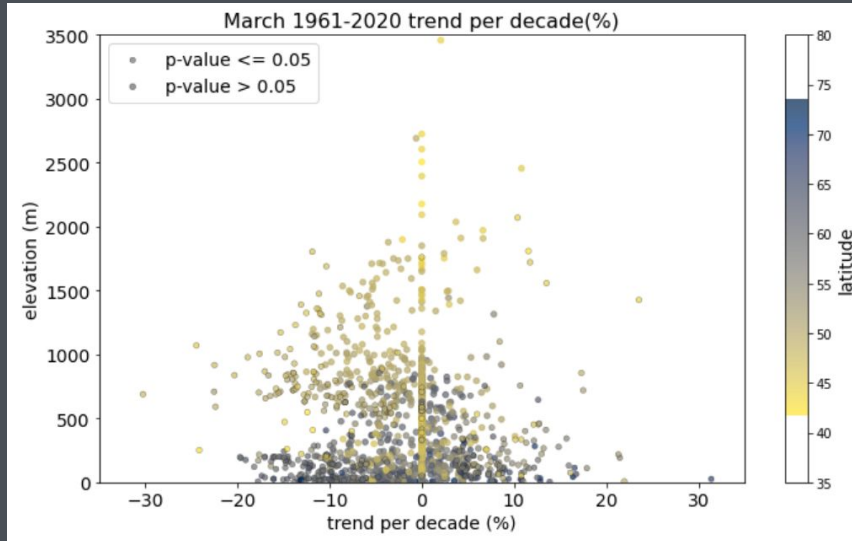
In-situ snow data collection and harmonization

- meta-data only (at the moment)
- work-in-progress (neverending)
- <https://jb-smisc.github.io/inventory/>
- some analysis presented at EGU24
- PhD@UniGraz working on getting real data



Northern Hemisphere snow climatology & trends

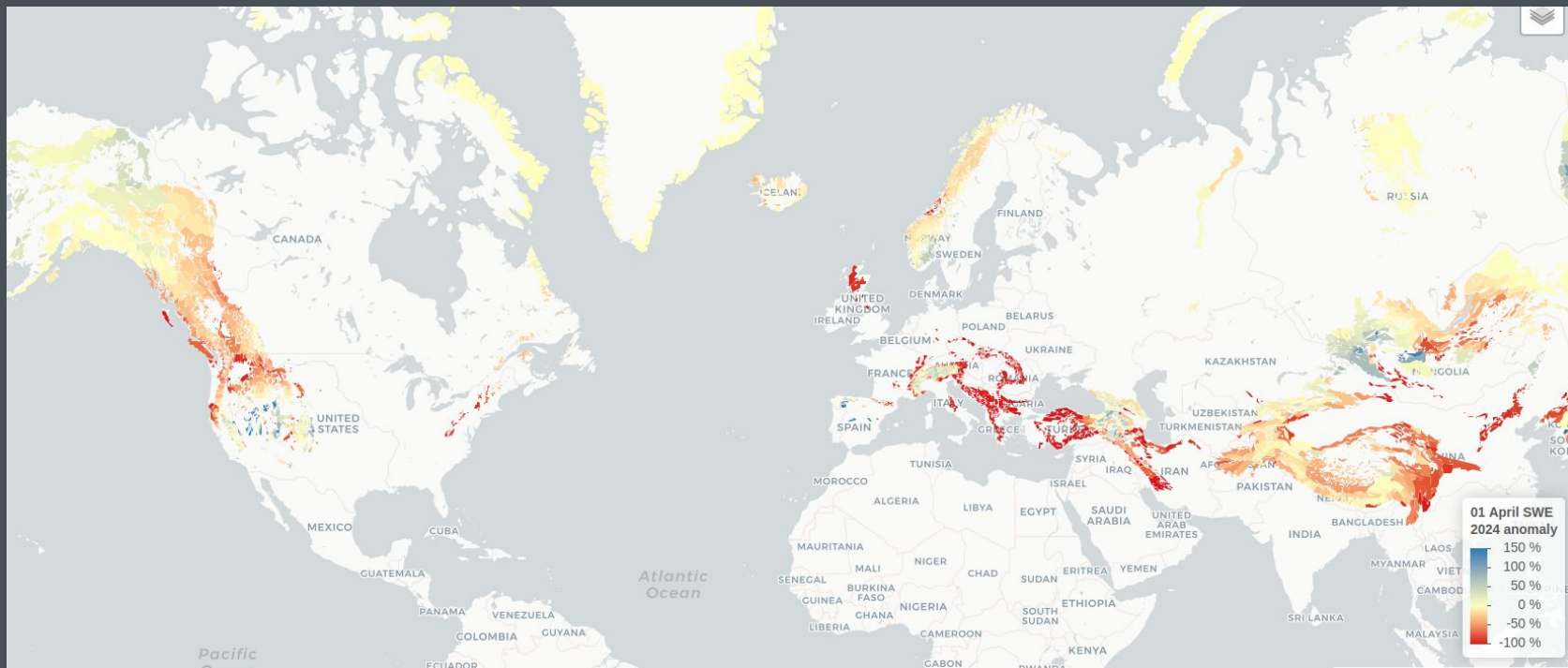
- Master thesis @ UniTrento



Climate monitoring - State of the cryosphere 1/2

2024 Apr 01 SWE anomaly ERA5-Land (GMBA mountain polygons)

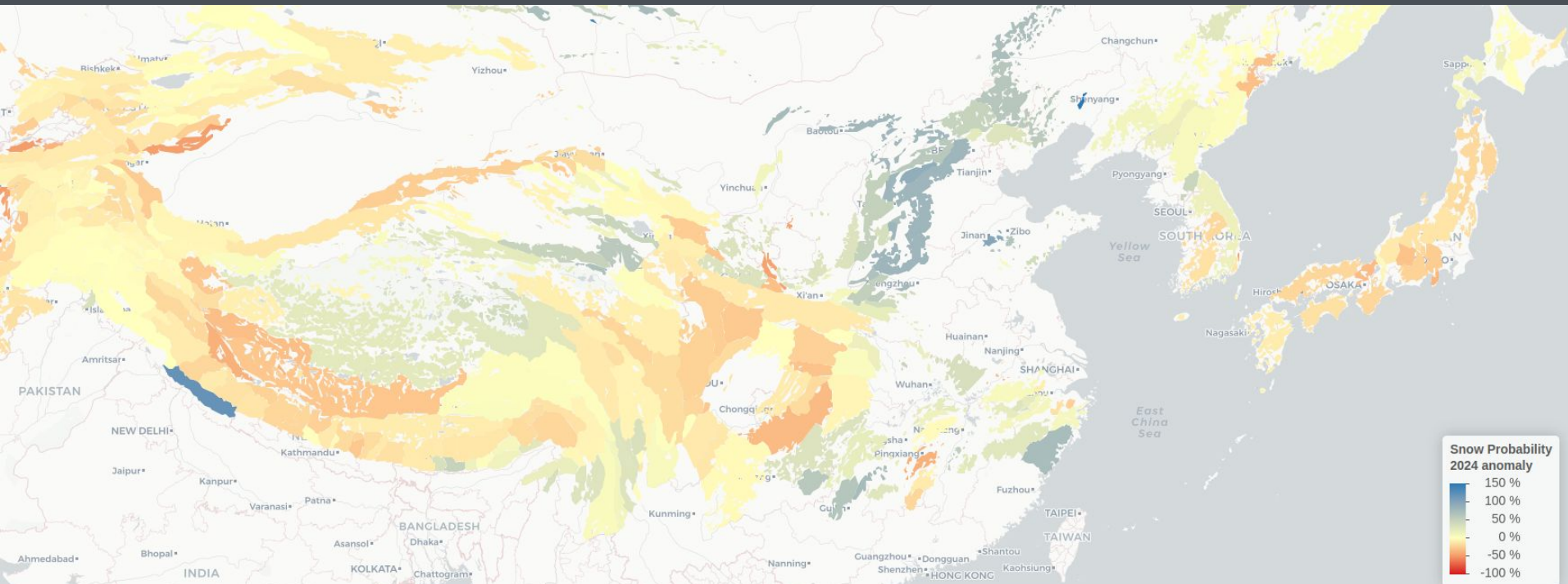
<https://jb-sm-sc.github.io/gmba-swe/>



Climate monitoring - State of the cryosphere 2/2

MODIS snow probability anomaly 2023-2024 (GMBA mountain polygons)

<https://jb-smc.github.io/gmba-snowprob/>



Some more study ideas

- Input to Review of the GCOS Snow ECV (essential climate variables)
- Participation at
 - WMO Snow Watch Team
 - ESA Snow CCI User Workshop
- Review “Snow cover in the world's mountains: current state of observation, trends and implications” (Working Title)
- Climate Chronicles Snow 2025
- ...

Conclusions

- People matter
- Connections matter
- In-person meetings and side-event at conferences matter (IMC2022, IUGG2023, EGU24, EGU25)
- -> long-lasting effects



- Challenges to go global
- Every task needs a lead/responsible: motivated and with spare time

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Events outlook

- ❑ GEO Mountains Task Group 3 – NAP Guidelines, 18 June, 14:00 – 15:00, <https://geomountains.org/news/events/details/2025-06-18/395-geo-mountains-task-group-3-nap-guidelines>
- ❑ GEO Mountains represented at the Climate Change Networking Regional Workshop in the Andes: 2 July, Lima, Peru
- ❑ International Mountain Conference 2025 (Innsbruck, 14-18 September): [MRI & GEO Mountains Sessions](#) (see next slide)
- ❑ Next GEO Mountains General Meeting, in November (Date TBC)
- ❑ GEO Mountains Regional Workshop in the Hindu Kush Himalaya, 16-20 February 2026, Kathmandu, Nepal



IMC: 14–18 September 2025: GEO Mountains & MRI sessions

Focus Sessions:

- ❑ FS 3.192 | Generating and integrating interdisciplinary data to understand mountain socio-ecological dynamics and support multi-scale policy formulation
- ❑ FS 3.204 | Transformative changes towards 'Living Well' in mountains: How does it feel?
- ❑ FS 3.127 | Mountain futures – Assessing challenges and co-producing solutions to mountain-social-ecological futures

Workshops:

- ❑ WS 3.117 | Exploring opportunities and best practices to enhance integrated monitoring and effective associated policy interaction
- ❑ WS 3.104 | What new methods, concepts, and empirical innovation can help advance integrated future mountain research?
- ❑ WS 3.111 | Elevating mountains in the IPCC seventh assessment (AR7): addressing assessment-relevant knowledge needs
- ❑ WS 3.121 | The science-policy interface for regional mountain governance

Side Event:

- ❑ SE 3.105 | High Resolution climate models for mountain regions
- ❑ SE 3.107 | Elevation-Dependent Climate Change: Exploring Statistical Methods, Driving Mechanisms, and the Role of Mountain Observatories



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| 15:15 – 15:30 | 3. Recent and ongoing GEO Mountains activities |
| 15:30 – 15:40 | 4. Community Input #1: Michael Christian Matiu, University of Trento, Joint Body on Mountain Snow Cover |
| 15:40 – 15:50 | 5. Community Input #2: Ruben Basantes, Universidad Yachay Tech, Revisiting inter-annual glacier mass balance as a response to recent climate variability along the Andes |
| 15:50 – 16:00 | 6. Joint Q&A |
| 15:50 – 16:00 | 7. Future Activities |
| 16:10 – 16:30 | 8. General discussion & wrap-up |

AOB / Q&A



Many thanks!

Please kindly provide some
feedback on this meeting:



geomountains@mountainresearchinitiative.org