

PAMIR

SWISS POLAR INSTITUTE
FLAGSHIP INITIATIVE



Francesca Pellicciotti
Martin Hoelzle

SPI (Swiss Polar Institute) Flagship Initiative

Our project

*“From ice to microorganisms and humans:
Toward an interdisciplinary understanding of
climate change impacts on the Third Pole”*

Short: PAMIR

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SPI Flagship Initiative

Call

Only for fieldwork

- Transformative data with potential to change current understanding
- That no other funding mechanism would fund

Call for programmes
NOT projects

- Interdisciplinary, high risk, global relevance

SPI Flagship Initiative

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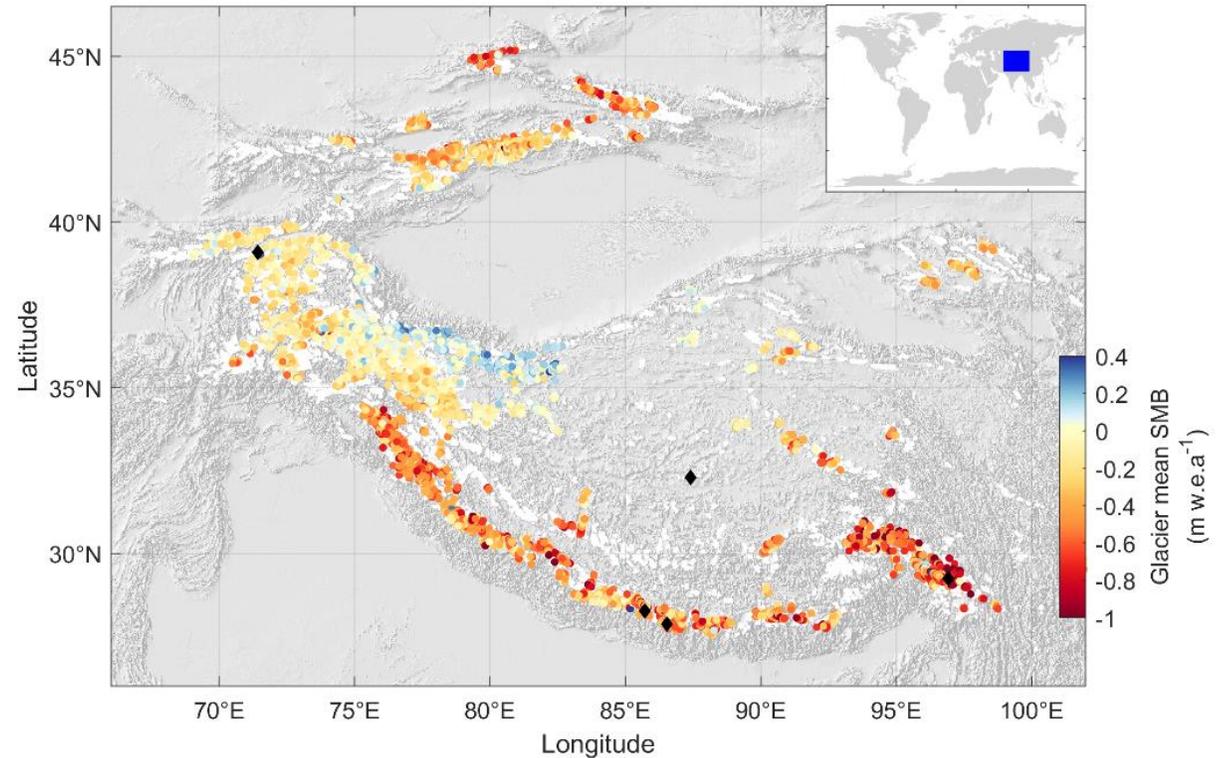
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PAMIR

Unique region

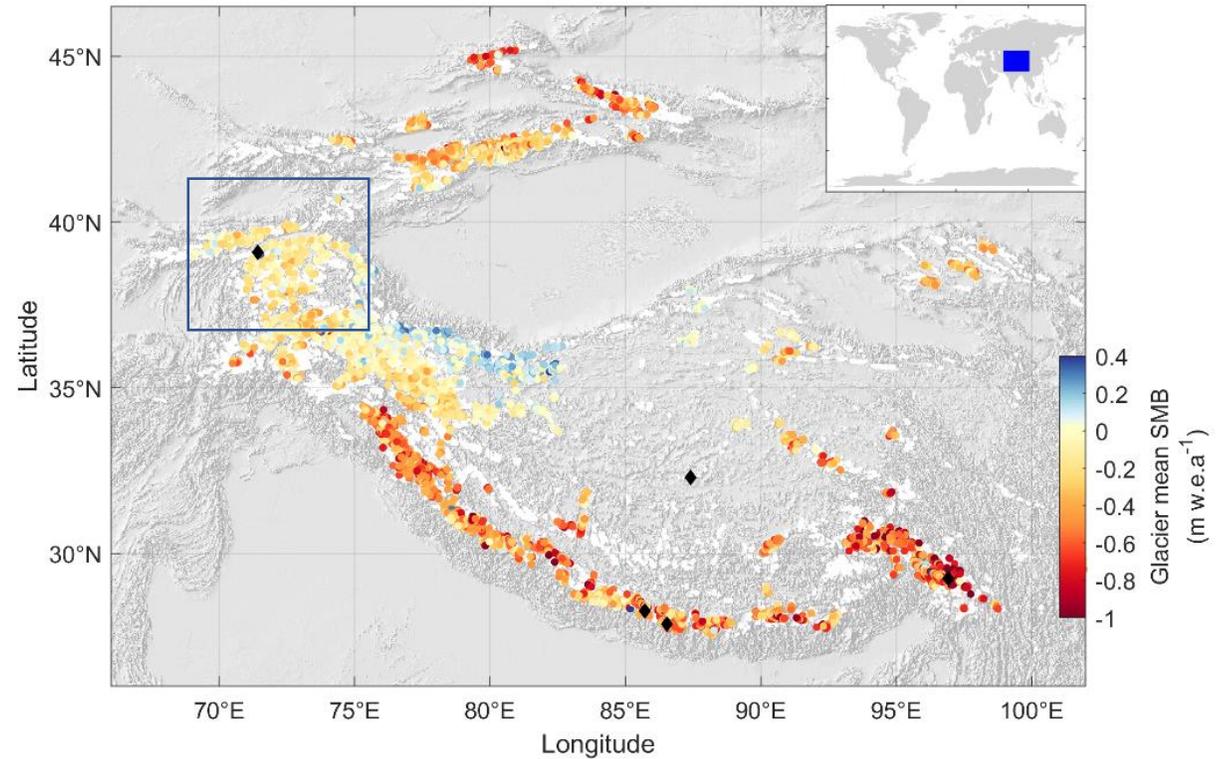
- 1 The only region with stable glaciers:
"Karakoram Pamir Anomaly"
- 2 The most vulnerable basin in the world in terms of water resources



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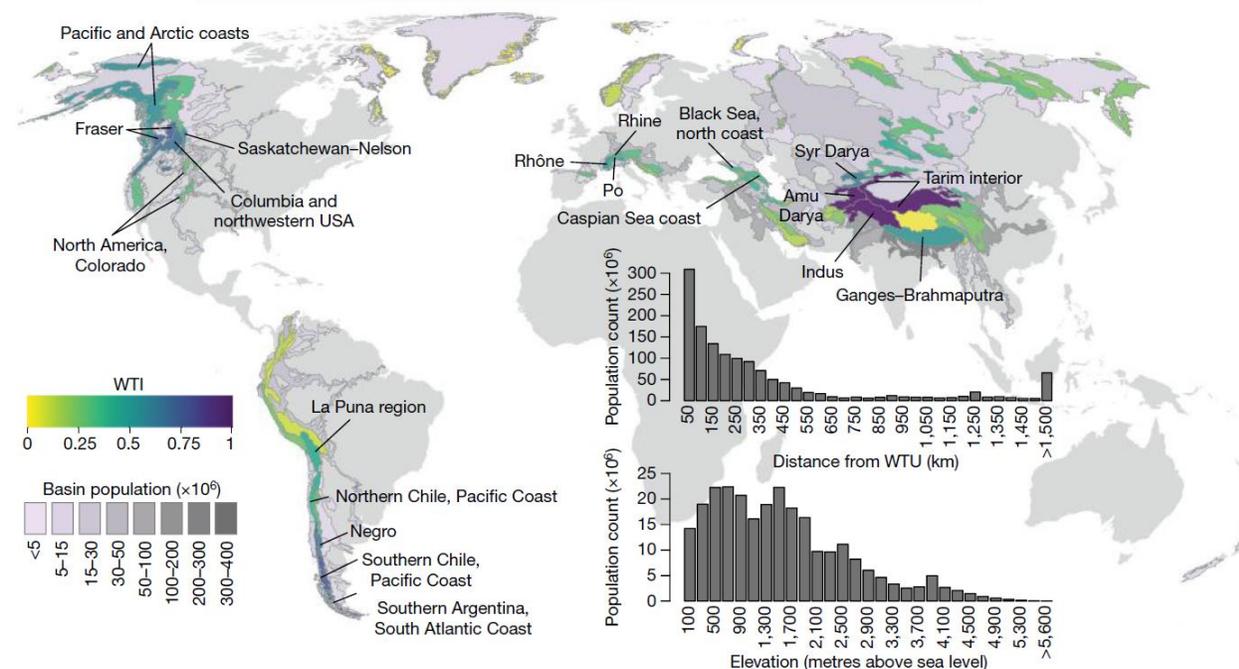
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PAMIR

Goal

Current state of the Pamir cryosphere

- Understand the causes and character of the Anomaly
- Understand its impact on ecosystems, hazards and water resources



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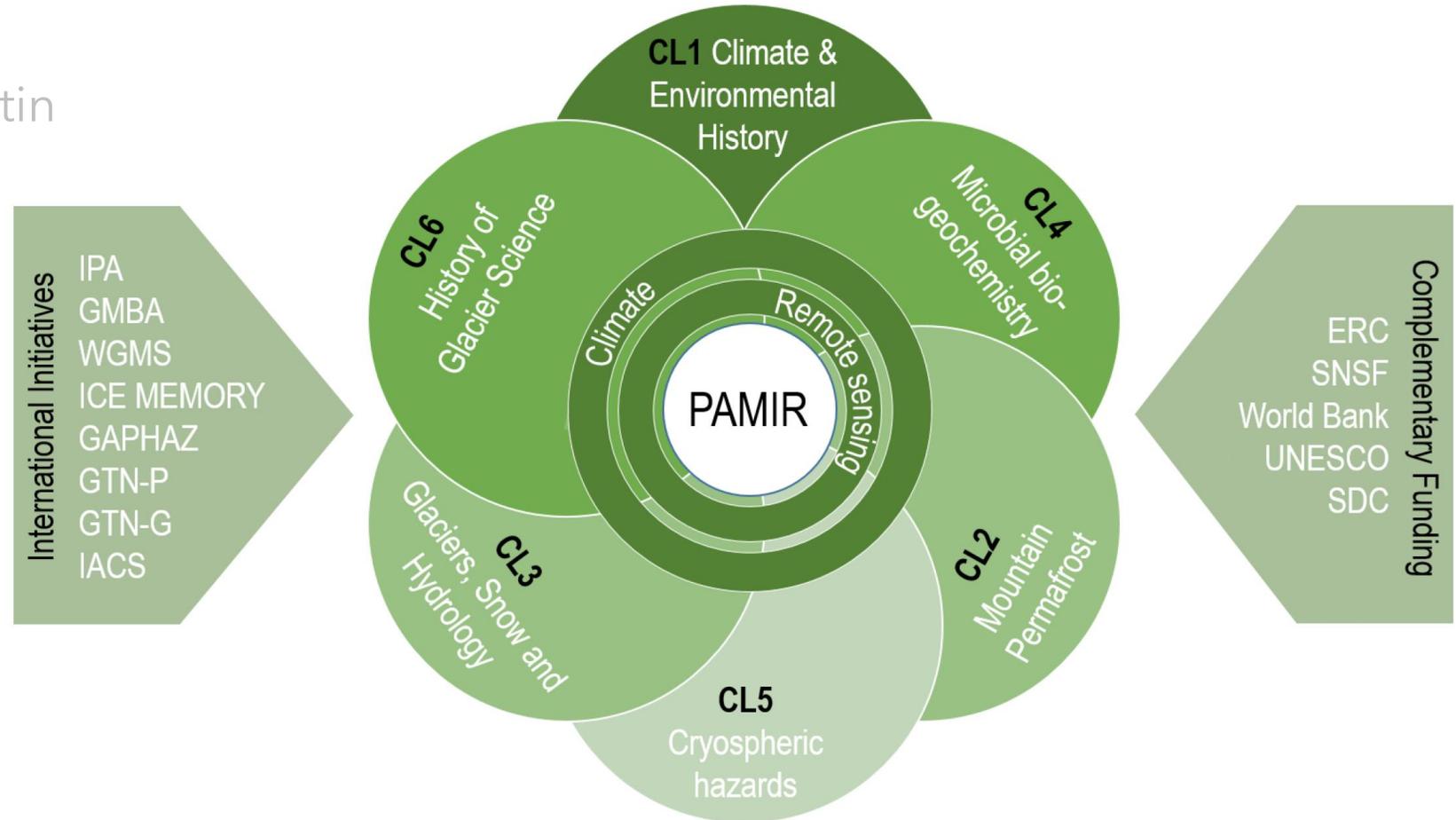
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Consortium

PAMIR Flagship Initiative

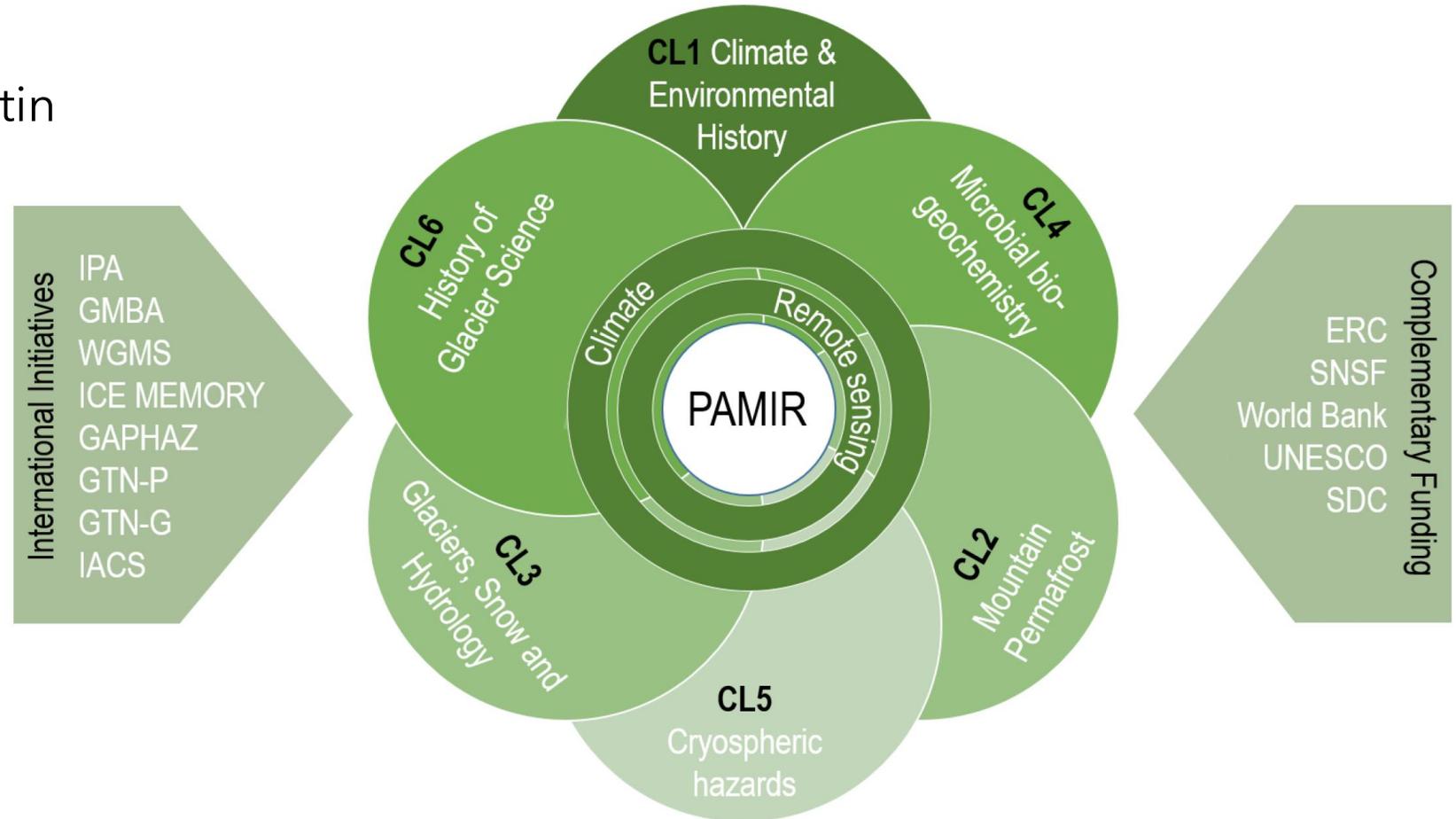
- Highly interdisciplinary
- 2 PIs: Francesca and Martin
- 6 Research Clusters



Consortium

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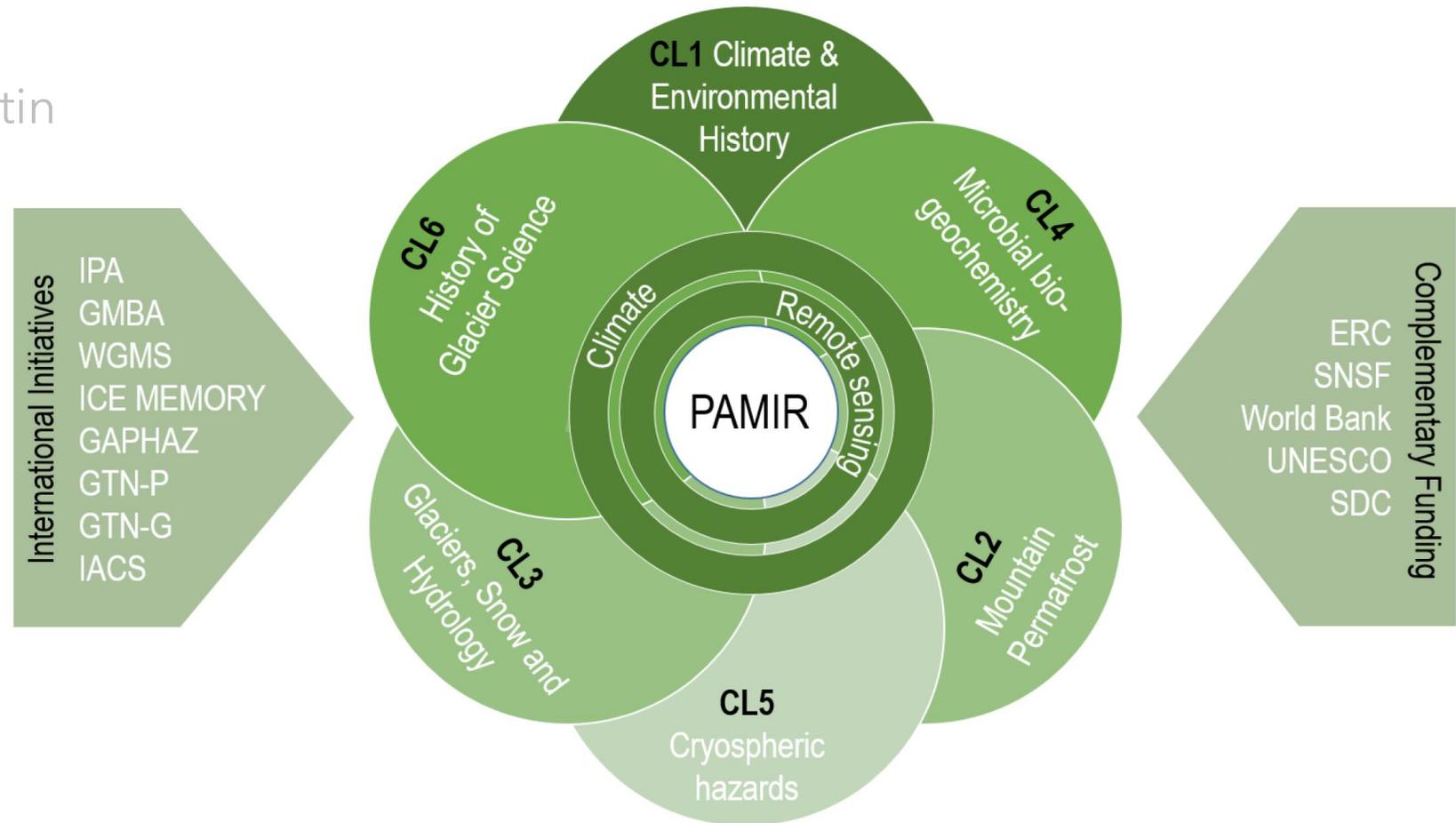
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Cluster 1 *Climate and environmental history (Schwikowski)*

Research Clusters

- Two deep ice cores on Fedchenko glacier
- Past changes in snow accumulation, precipitation origin, and regional scale atmospheric dynamics



Cluster 1 *Climate and environmental history (Schwikowski)*

Research Clusters

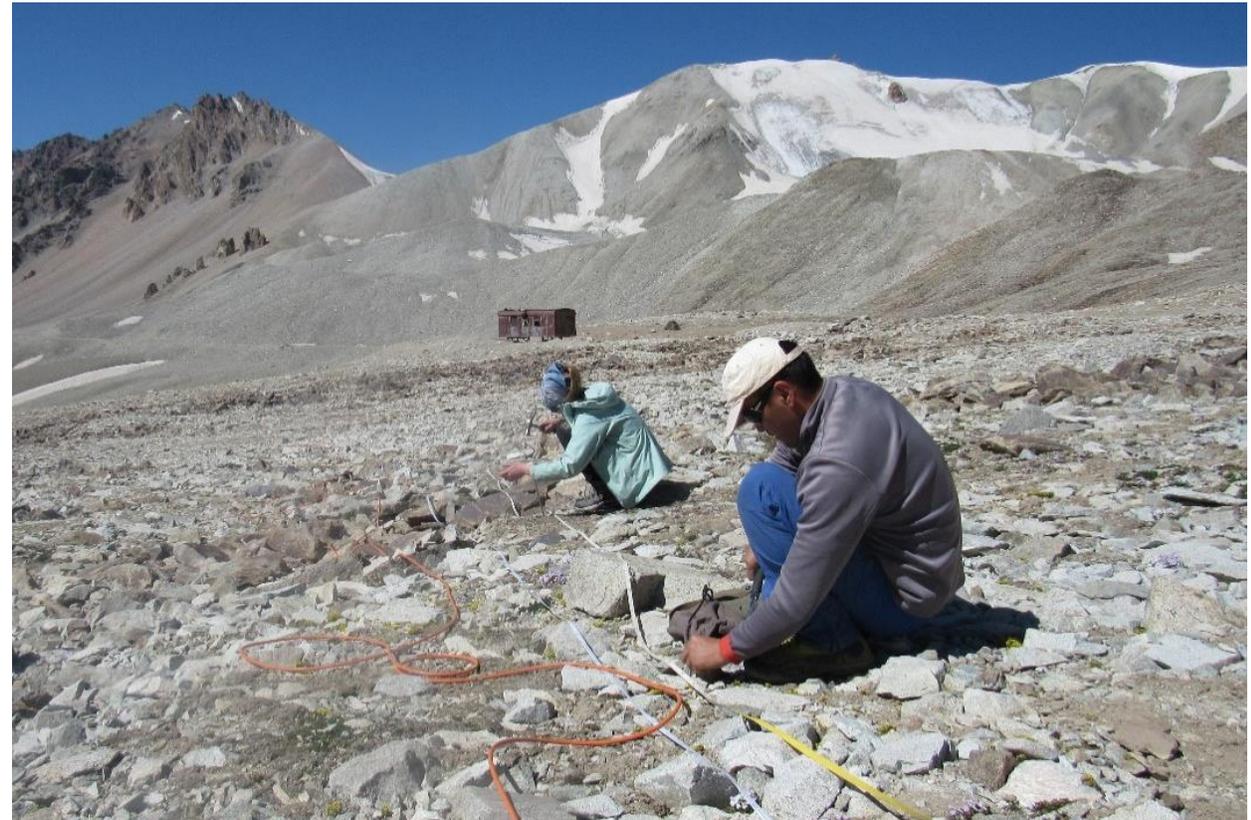
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Cluster 2 *Mountain permafrost (Hoelzle)*

Research Clusters

- Permafrost distribution across the region
- Evidence base to understand how permafrost will thaw and degrade



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Cluster 3 *Glaciers, snow and hydrology (Pellicciotti)*

Research Clusters

- State of glaciers and snow
- Observational benchmark for climate, glacier and hydrological modelling



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Cluster 4 *Microbial geochemistry (Battin)*

Research Clusters

- Microbial communities in glacier-fed streams
- Impacts of climate change on microbe communities and their bio-geochemistry



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Cluster 5 *Cryospheric hazards* (Allen)

Research Clusters

- Unique hazards associated with glaciers and permafrost
- Multi-hazard early warning systems



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Cluster 6 *History of glacier science (Bichsel)*

Research Clusters

- History of Soviet glaciology
- Historical trajectories of politics and scientific knowledge production



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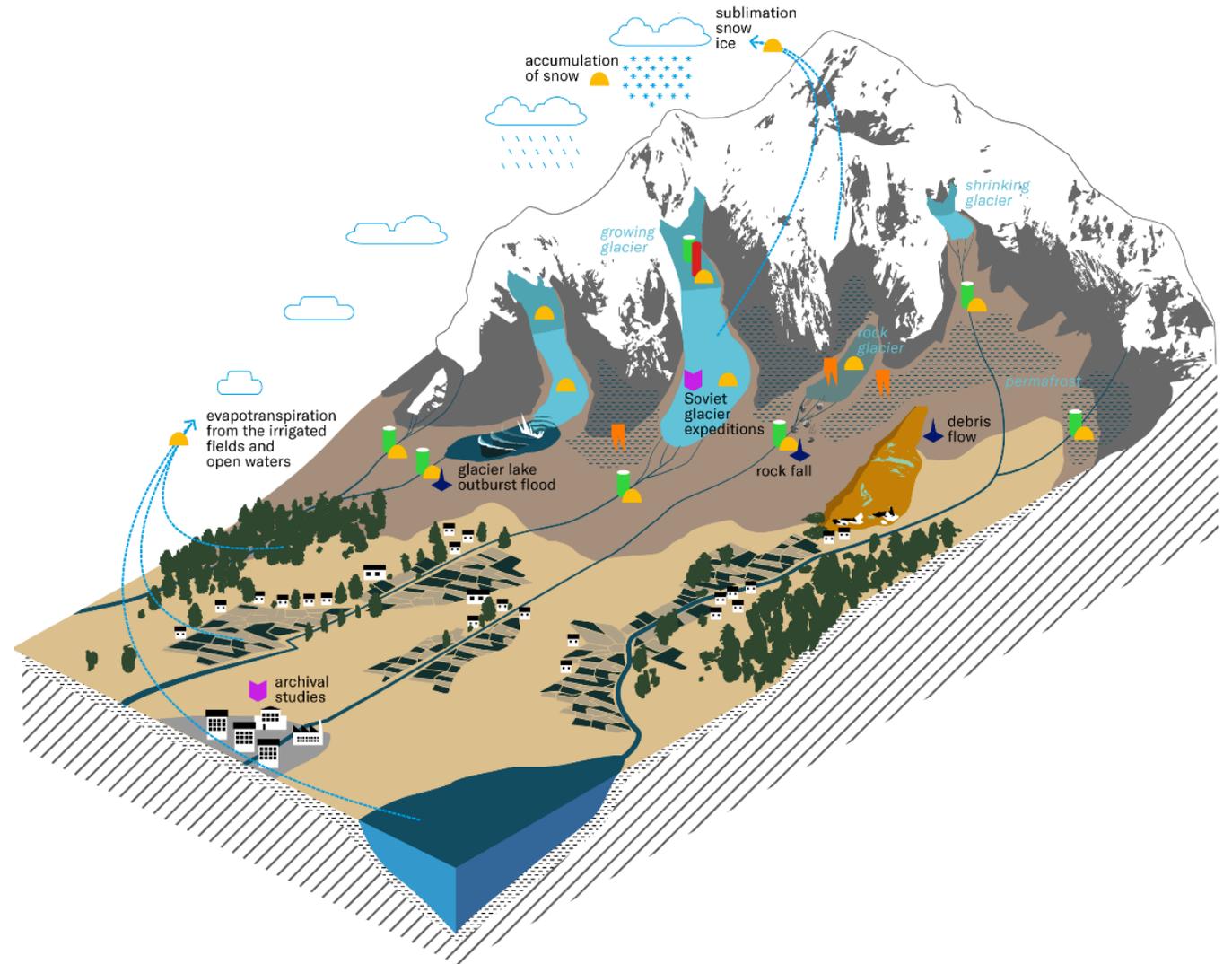
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Strong and diverse

- 41 Swiss
21 Tajik
16 international partners
- 21 professors/senior scientists
20 early-career scientists

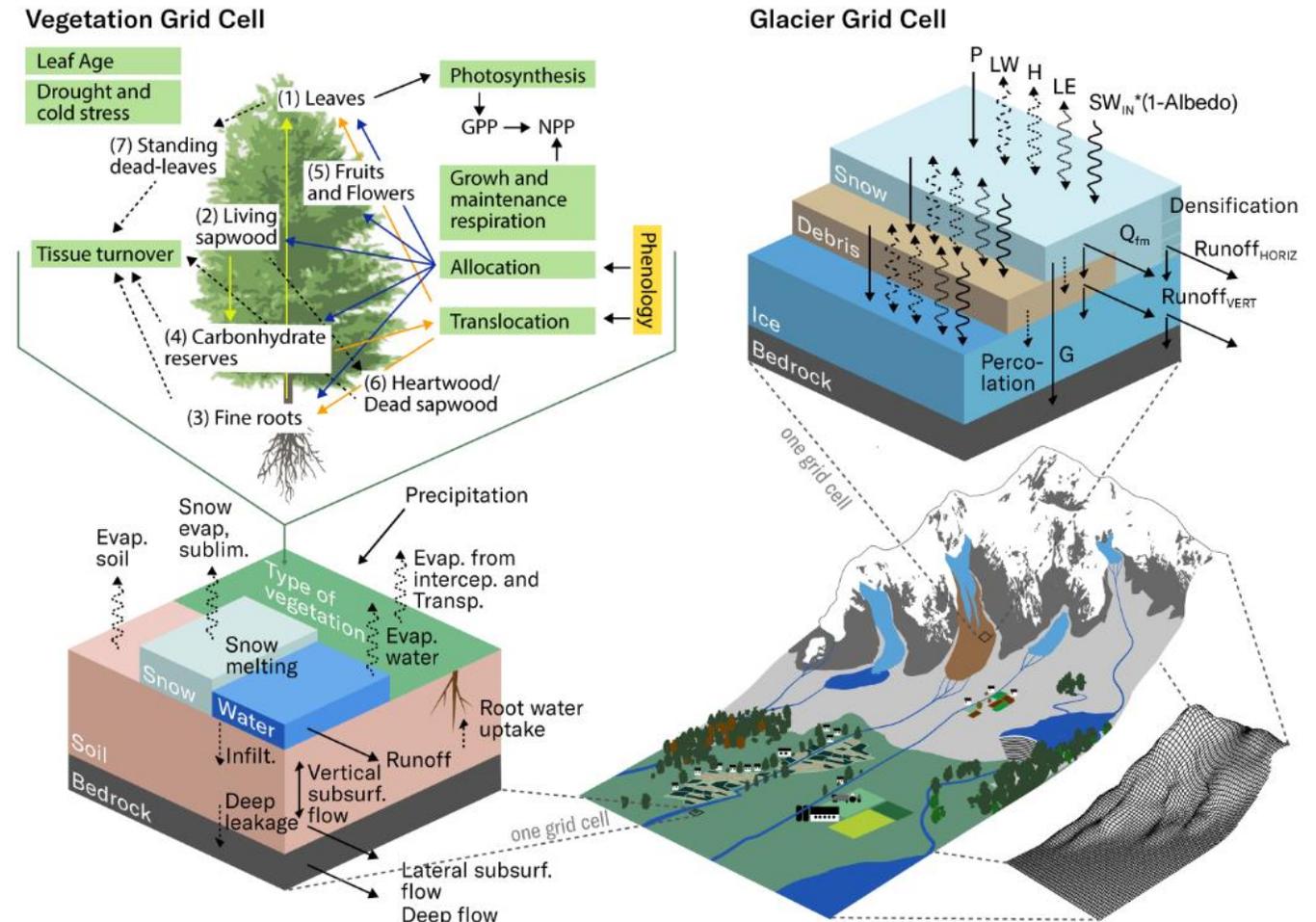
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Modelling novelty

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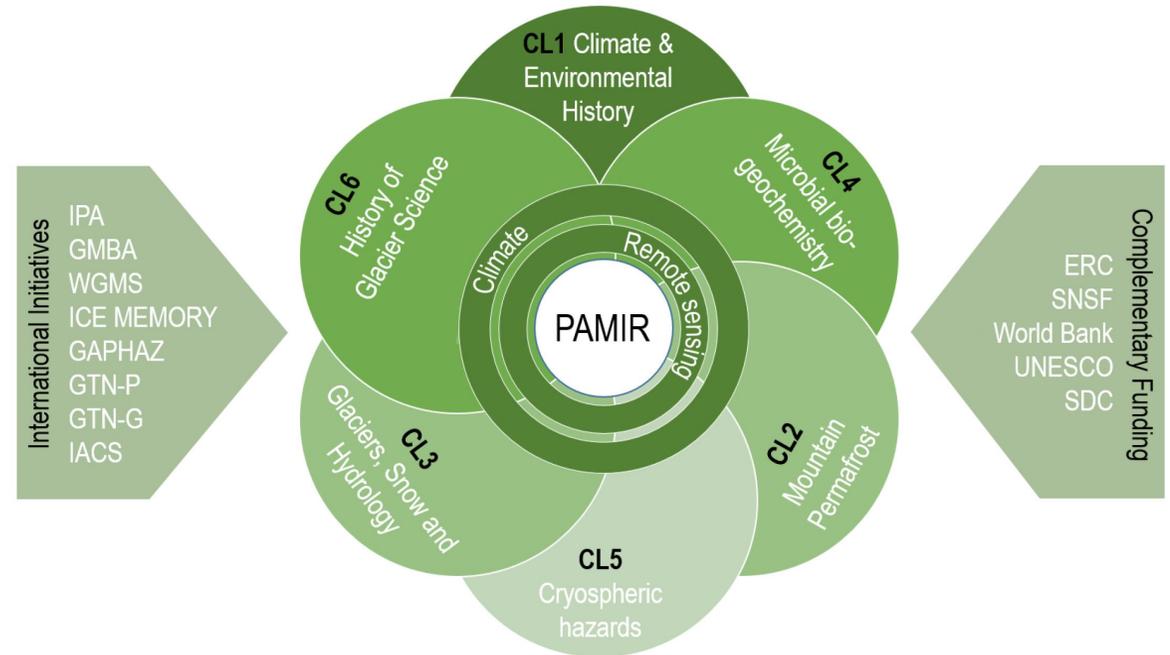
A new generation of hyper-resolution land surface models



Fieldwork summer 2022

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- Cluster 1
- Cluster 2
- Cluster 3
- Cluster 4
- Cluster 5
- Cluster 6



Cluster 1 *Climate and environmental history*

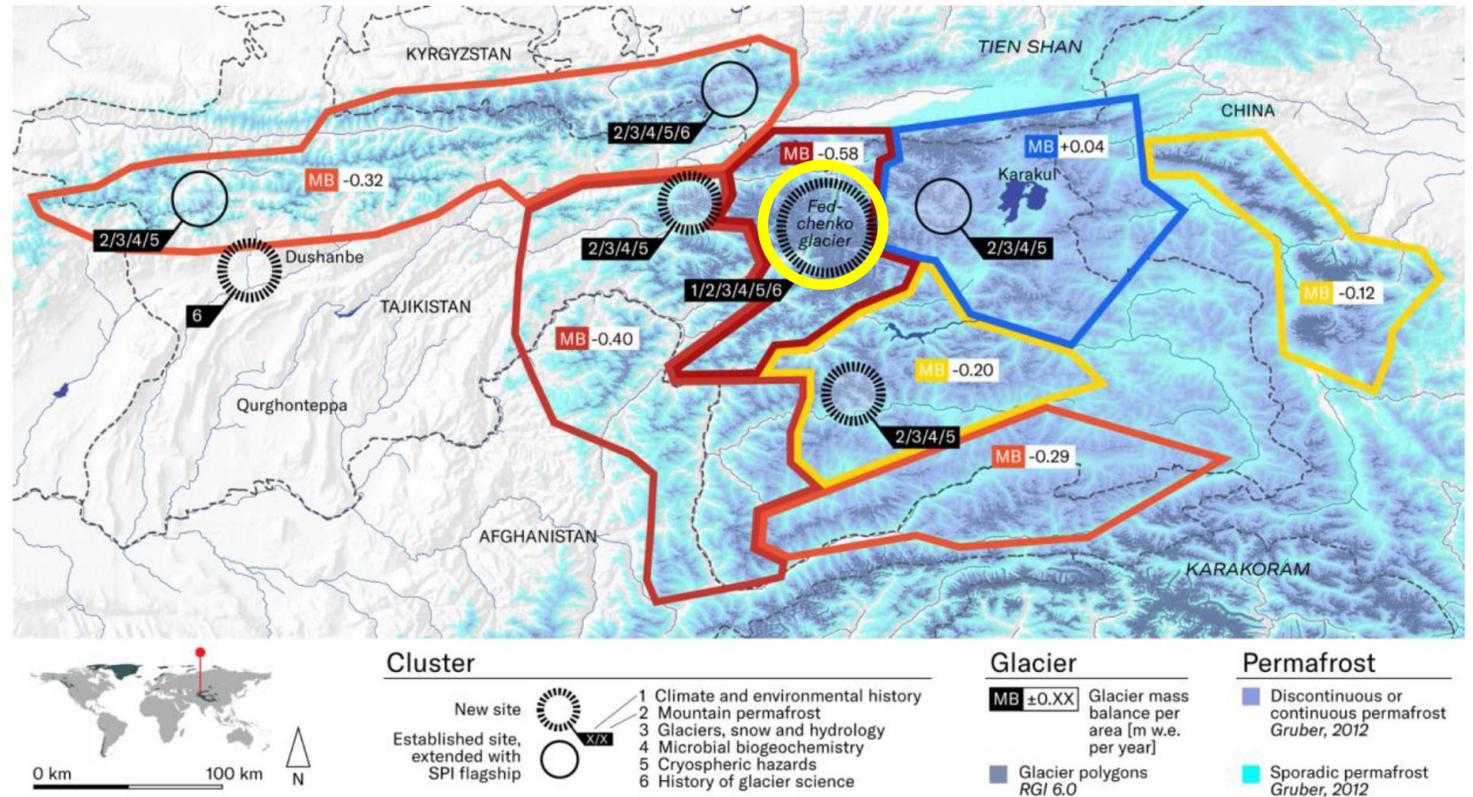
Fieldwork 2022



Cluster 1 *Climate and environmental history*

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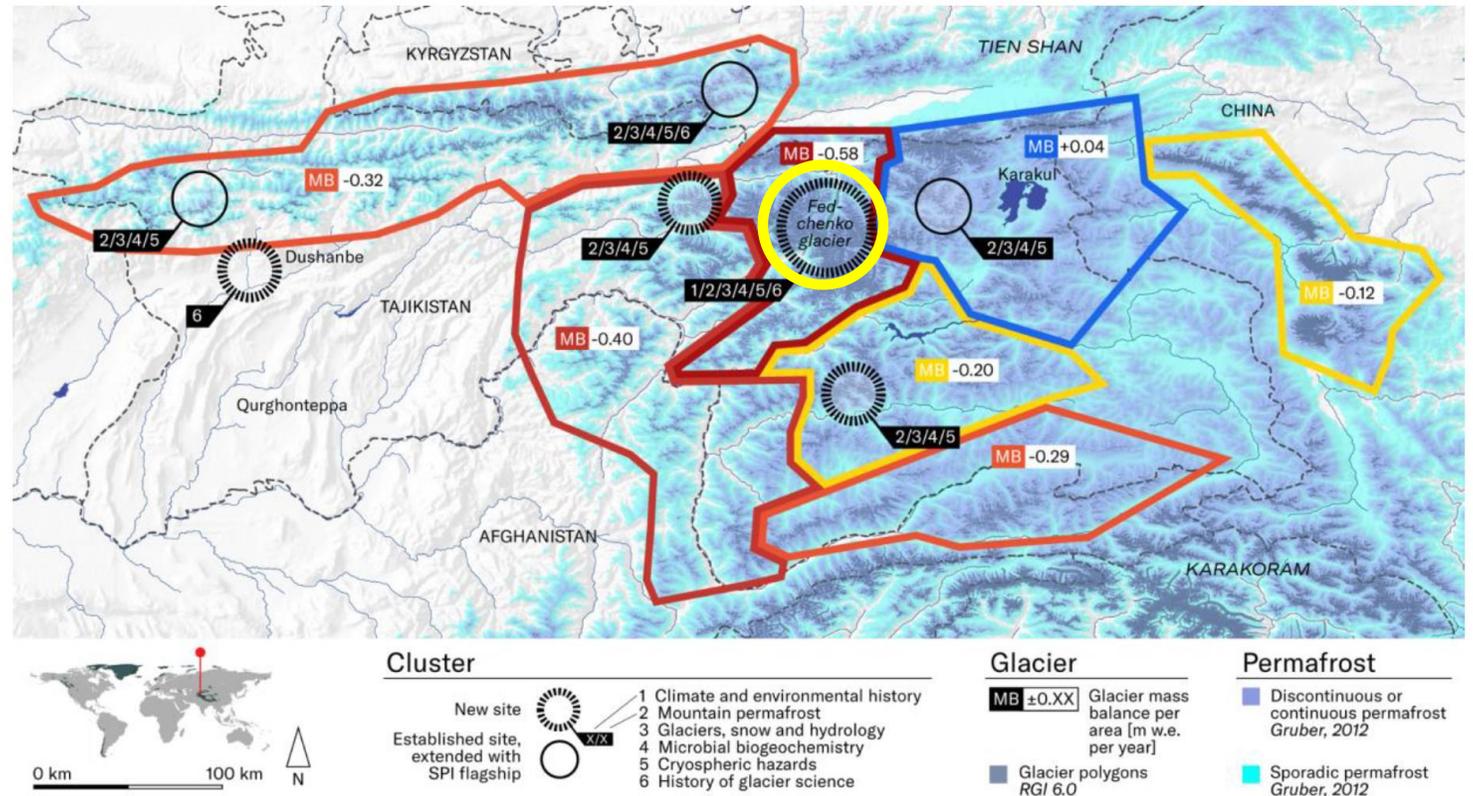
- Fedchenko glacier



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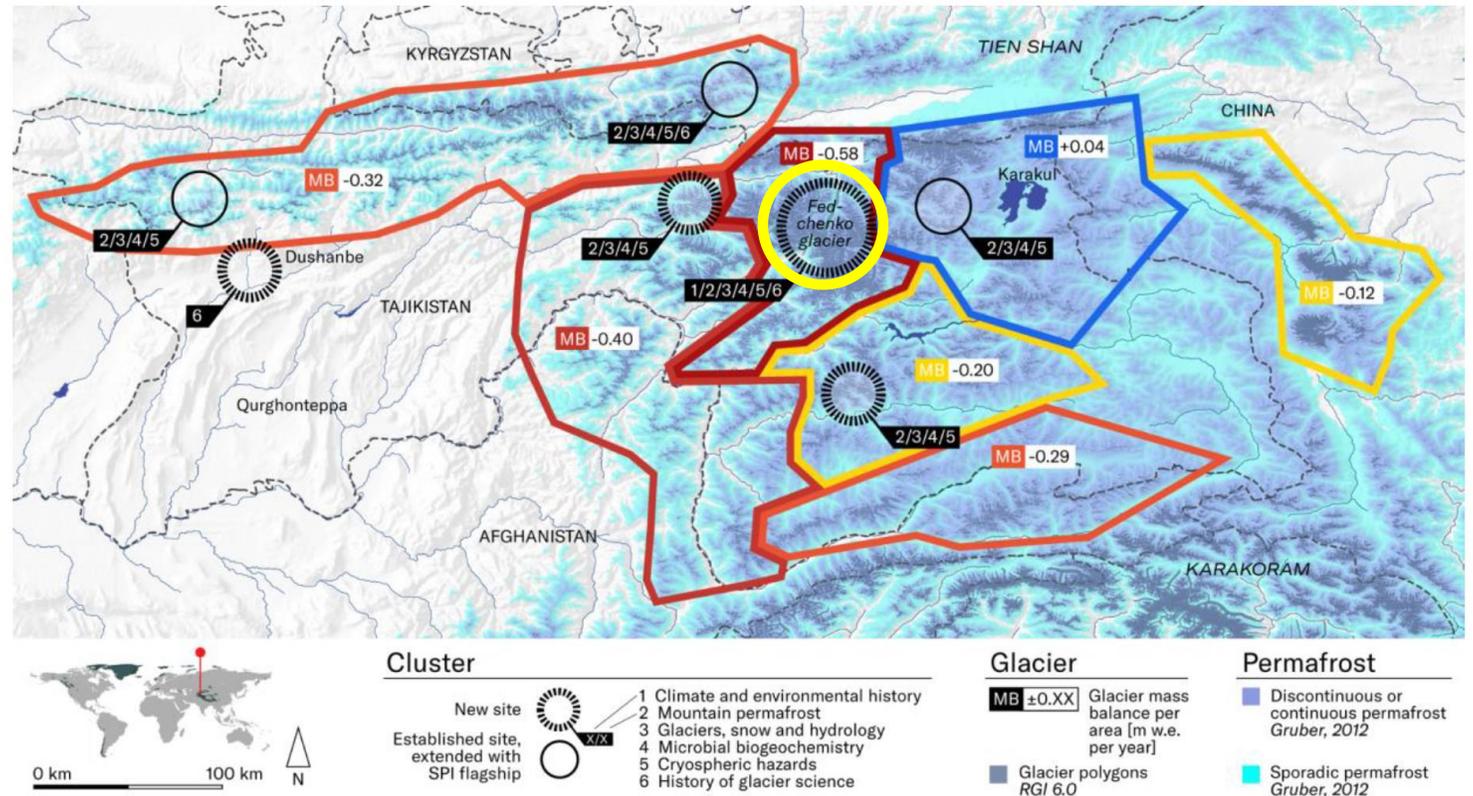
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- 2022-2023: capacity building
- 2023 or 2024: main drilling



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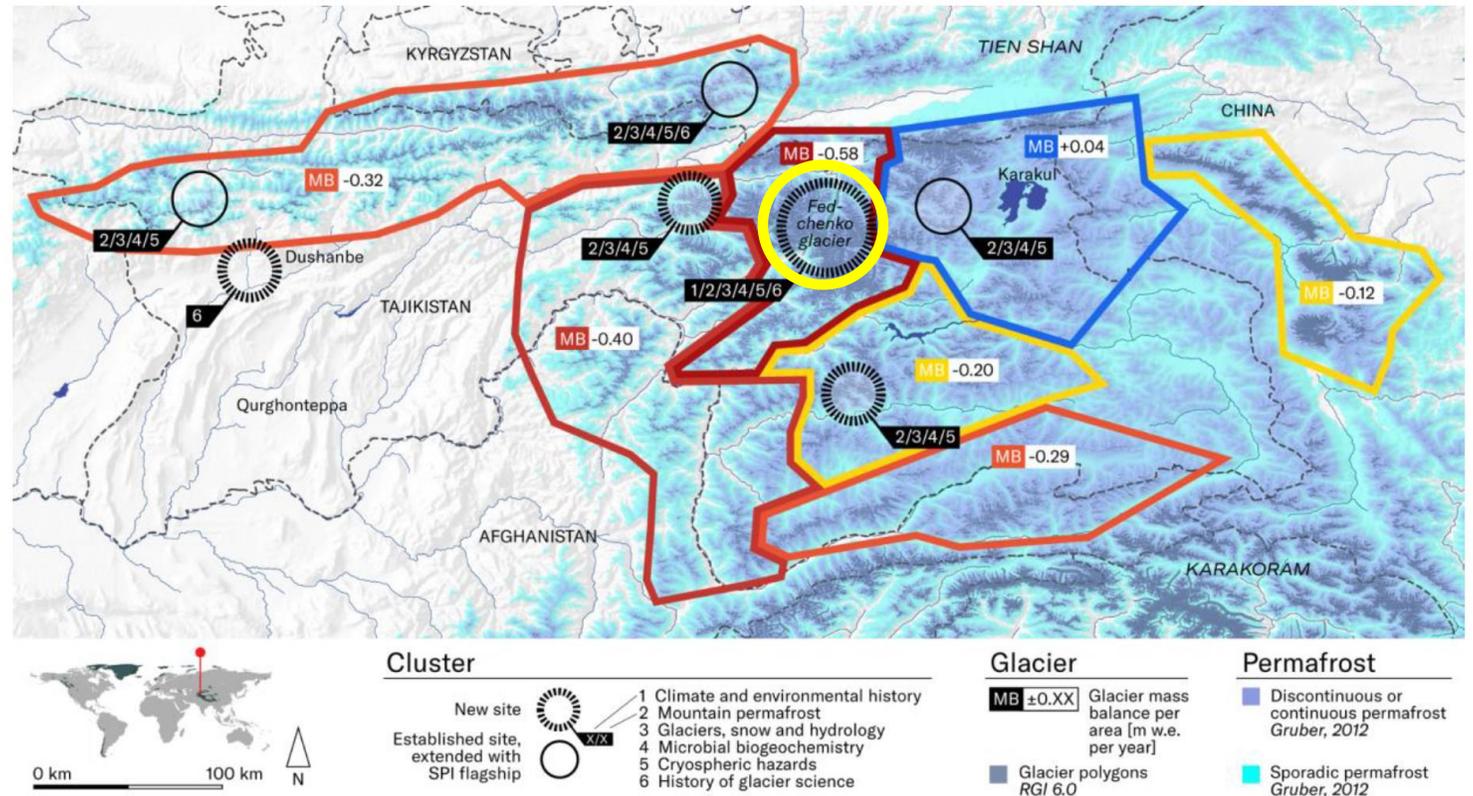
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Cluster 2 *Mountain permafrost*

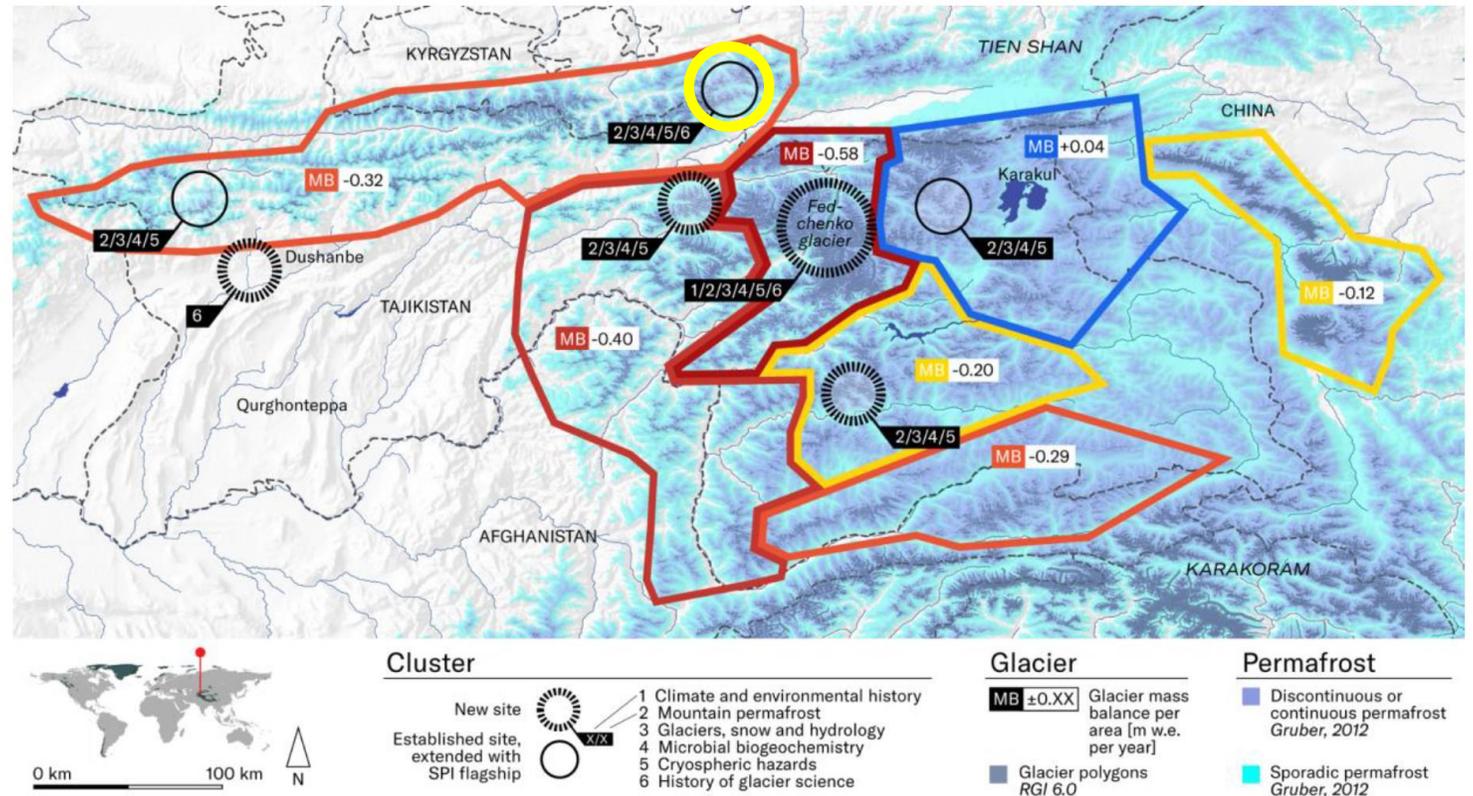
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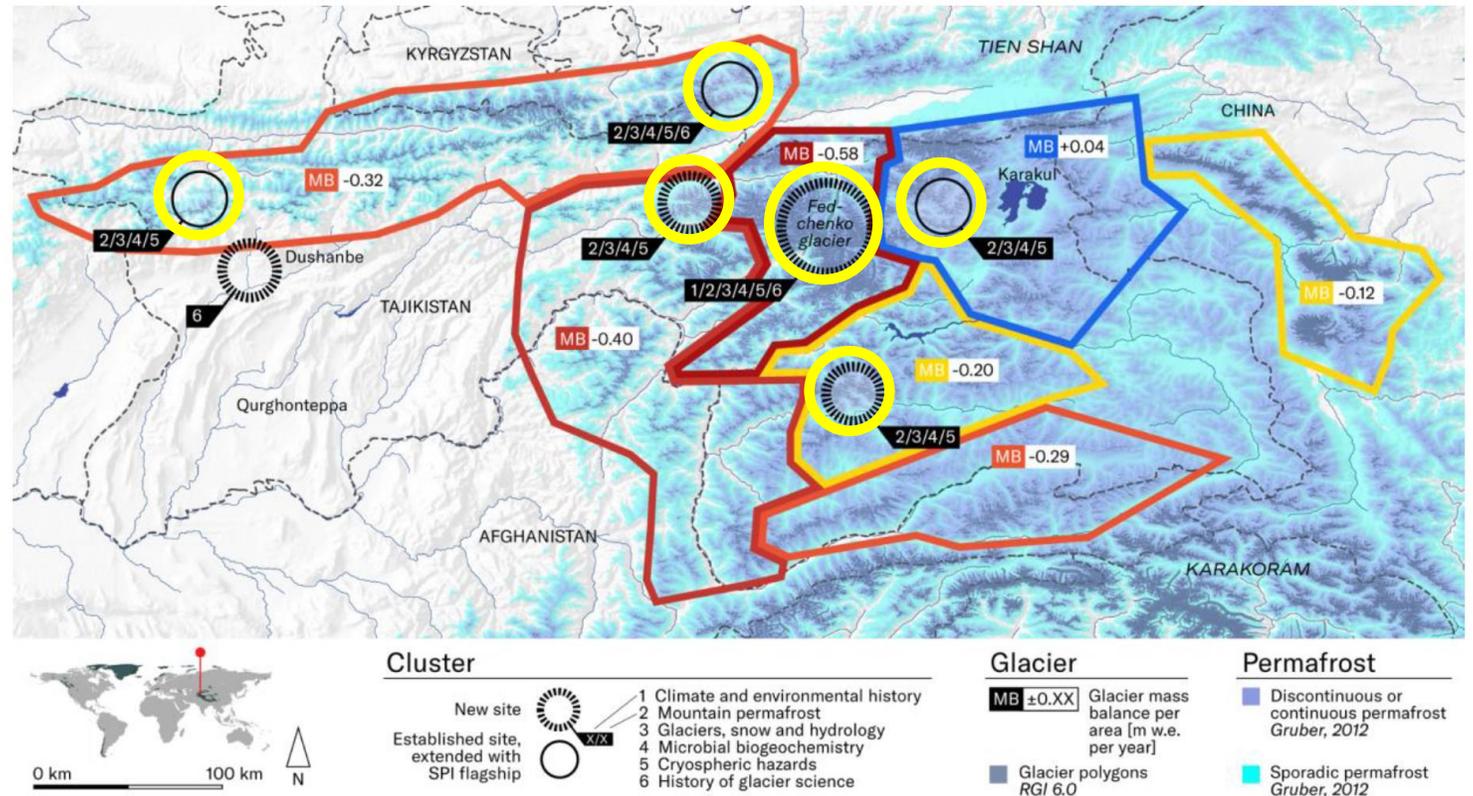
- Abramov glacier
 - Jul - Aug 2022
 - Geoelectrical and seismic measurements for ground ice content
- 2023: all sites



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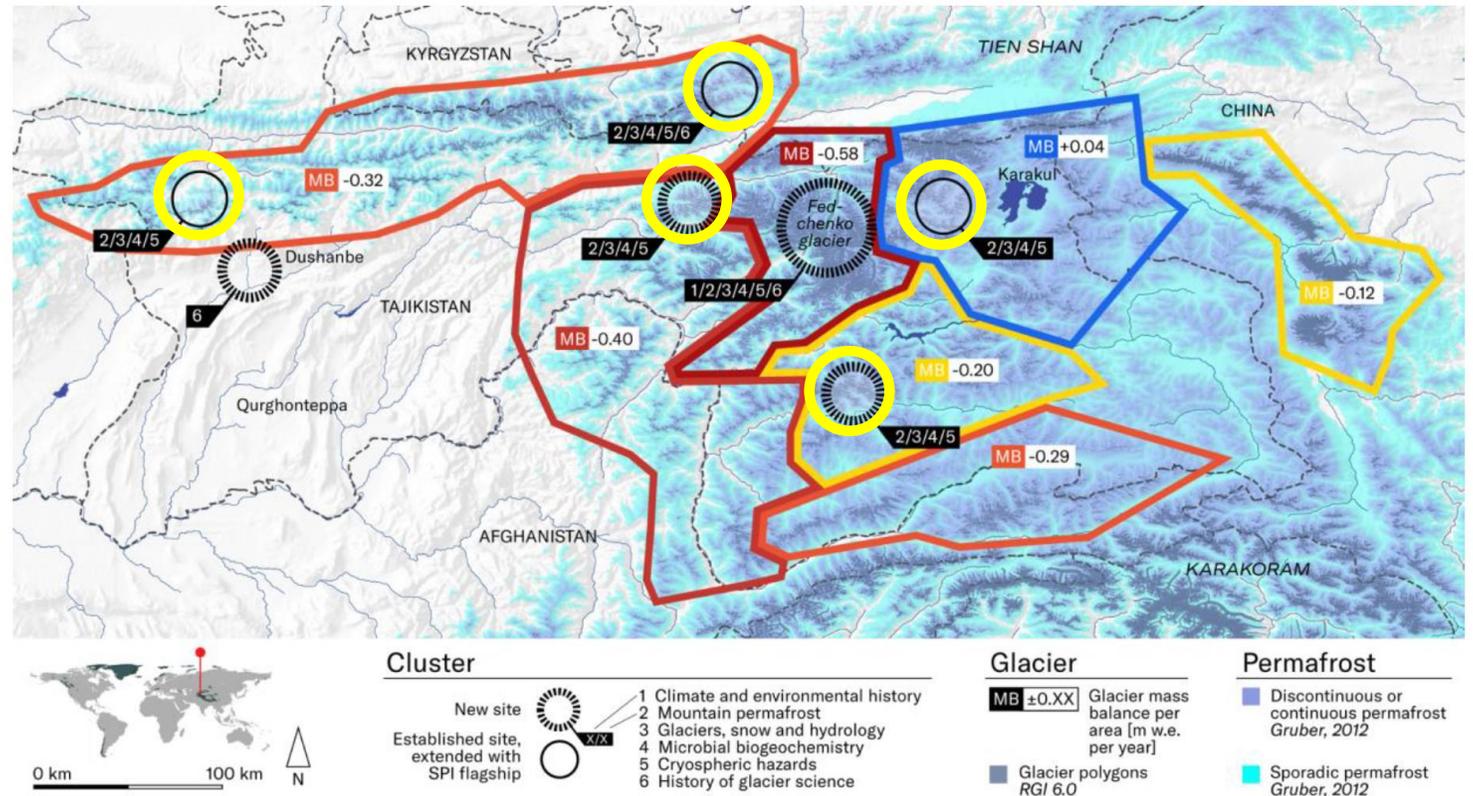
Fieldwork 2022



Cluster 3 *Glaciers, snow and hydrology*

Fieldwork 2022

- 2022: all sites equipped with
 - mass balance
 - meteo station
 - gauging station



Cluster 3 *Glaciers, snow and hydrology*

Fieldwork 2022

- Kyzylsu: in the global INARCH COPE network
 - Pluviometer
 - High elevation snow stations
 - Debris measurements
 - Lake pressure
 - Time lapse cameras
 - AWS on glacier



Cluster 6 *History of glacier science*

Fieldwork 2022



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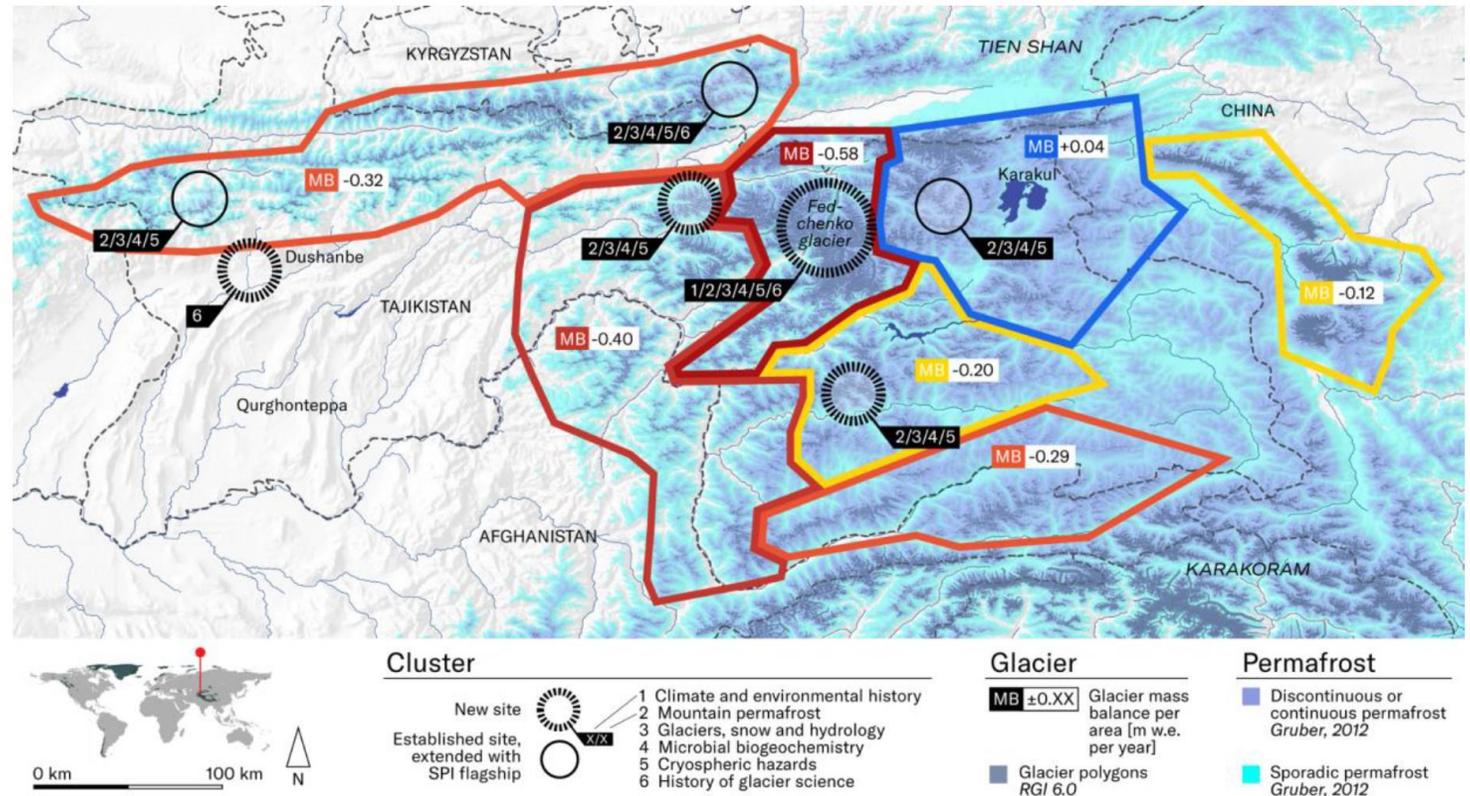
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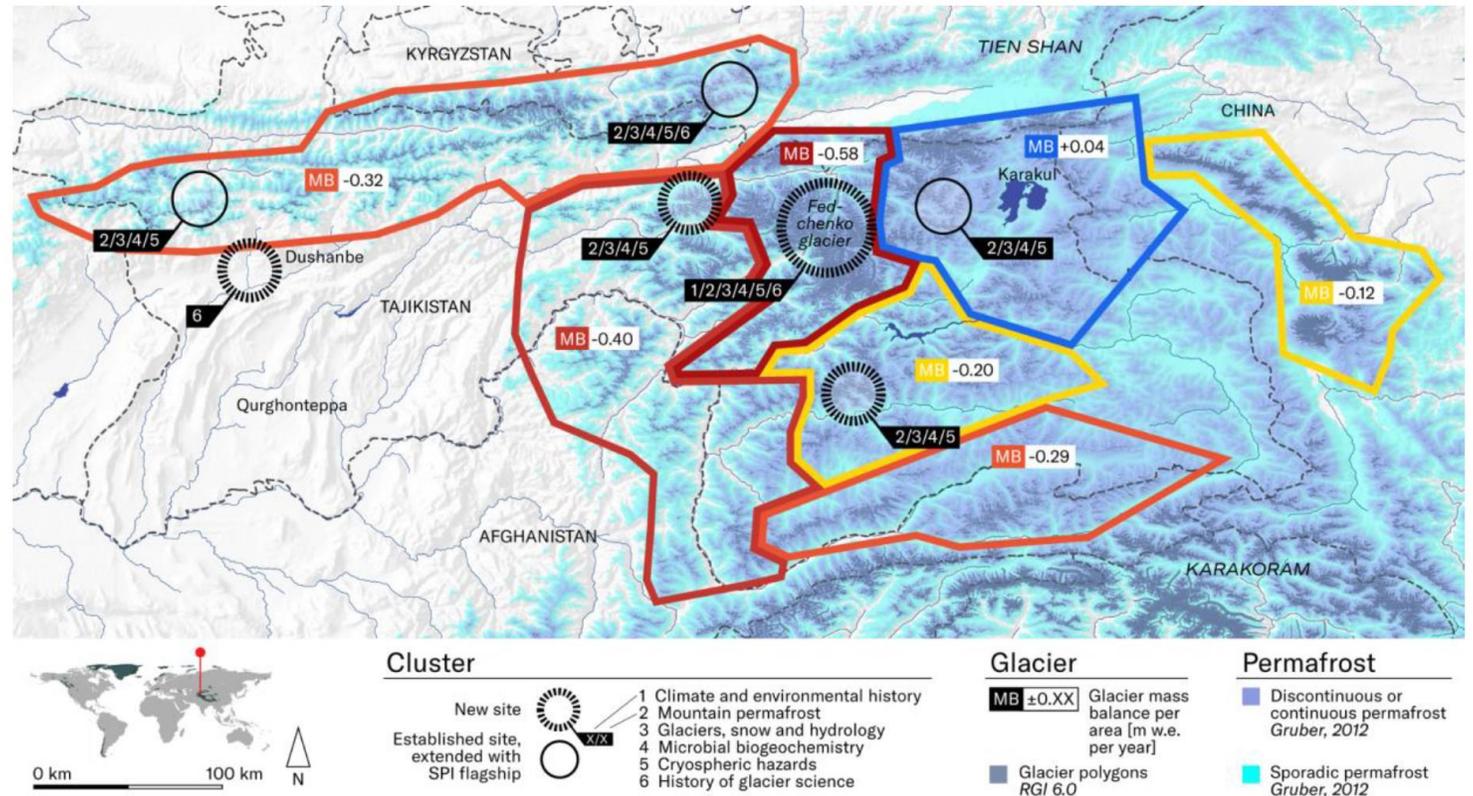


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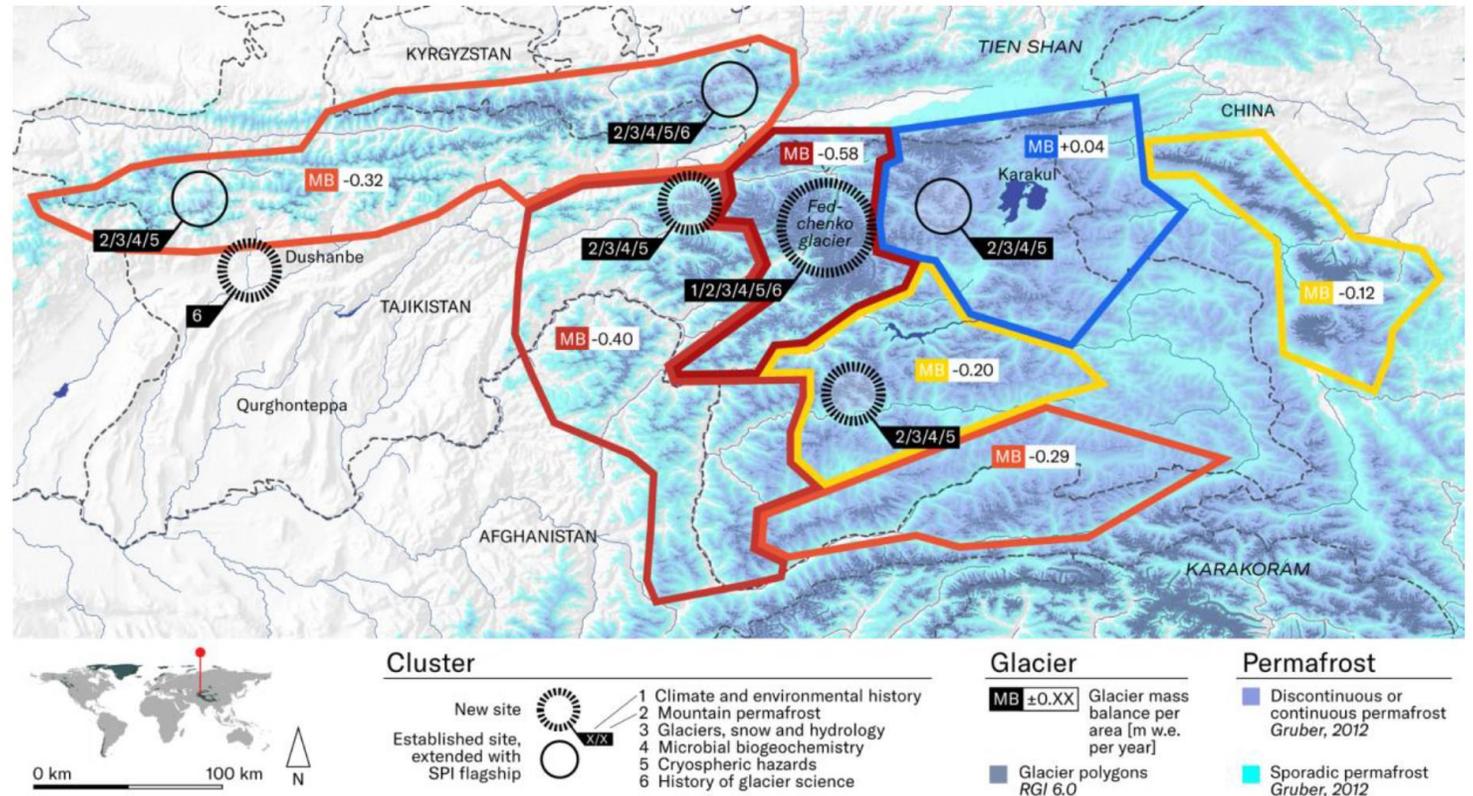


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- Gold mine



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Output

- 1 Fundamental, ground-breaking science
- 2 Impactful science for people

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Thank you very much
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