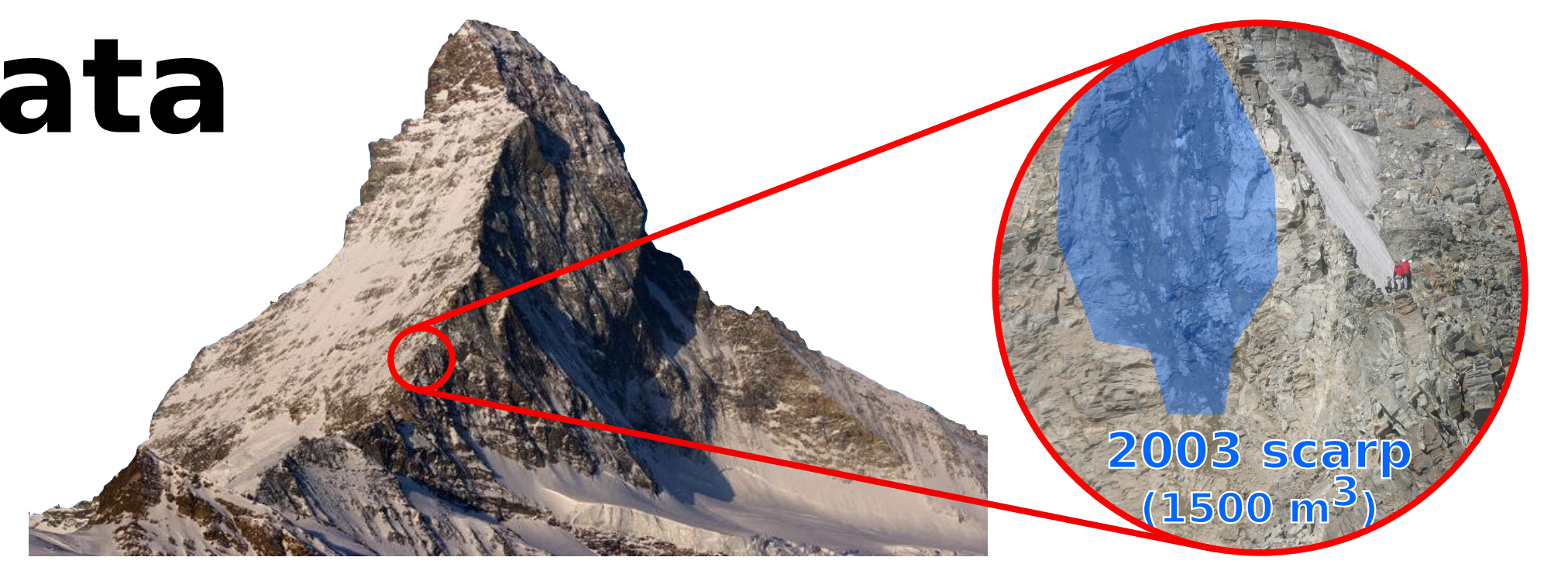


A decade of high-mountain permafrost data at Matterhorn Hörnligrat (Zermatt, CH)

Samuel Weber, Jan Beutel, Alain Geiger, Stephan Gruber, Tonio Gsell, Andreas Hasler, Philippe Limpach, Matthias Meyer, Lothar Thiele, Andreas Vieli



Motivation

→ Rockfall event (1000-2000m³) in July 2003 exposed an ice layer

Initial goals

→ Measure unprecedented data and evaluate wireless technology at scale

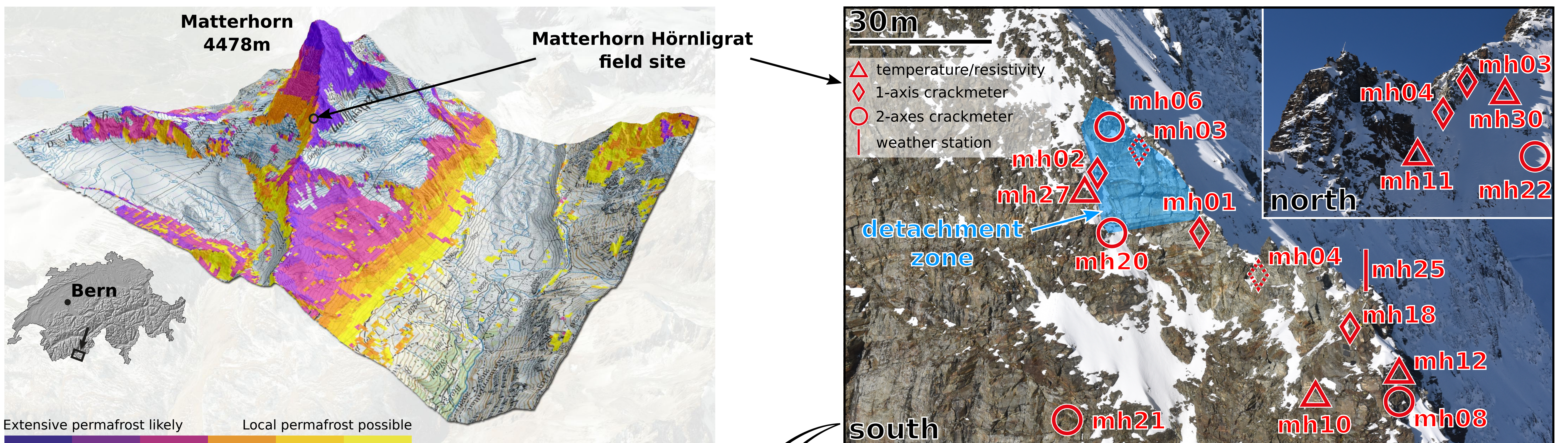
Evolution

→ Full fledged outdoor infrastructure supporting diverse experiments

Outcome

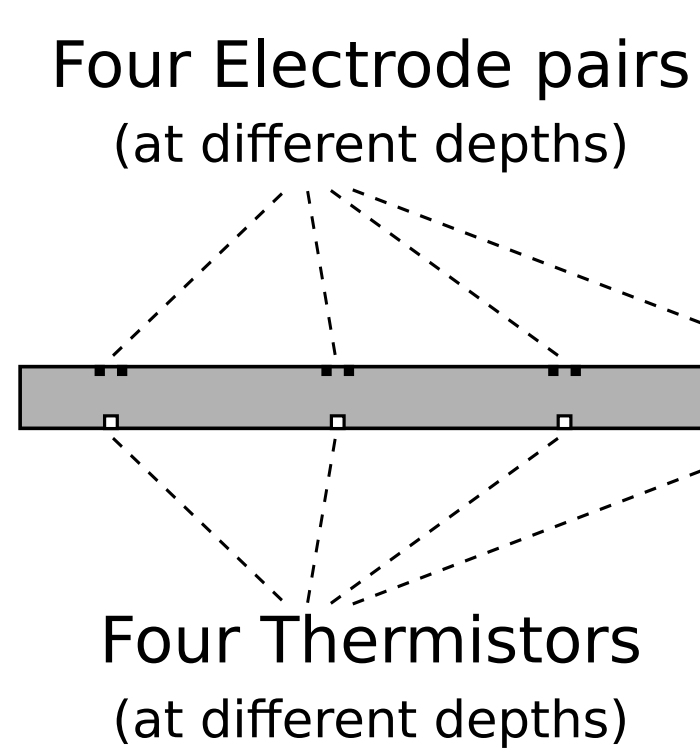
→ Longest data record in the Alps w.r.t. permanent monitoring at high elevation

Matterhorn Hörnligrat field site: potential permafrost distribution & experiment setup

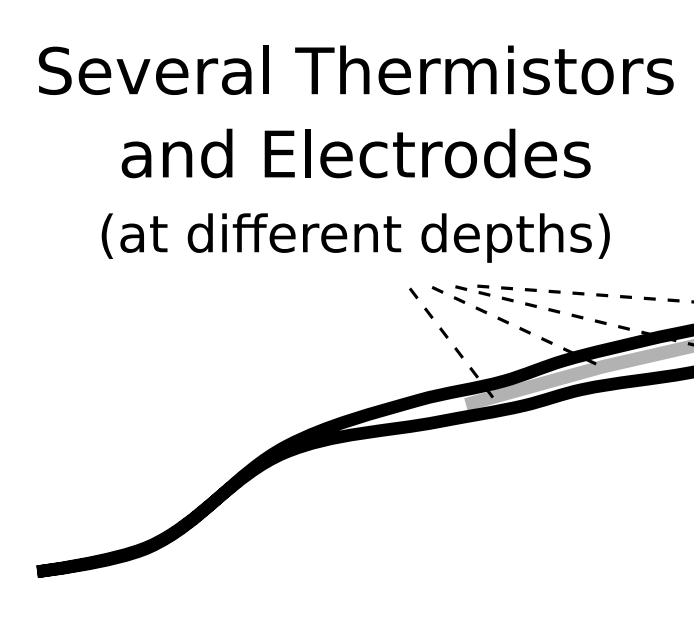


Sensors & instrumentation

Ground temperature and resistivity in rock



Ground temperature and resistivity in fracture



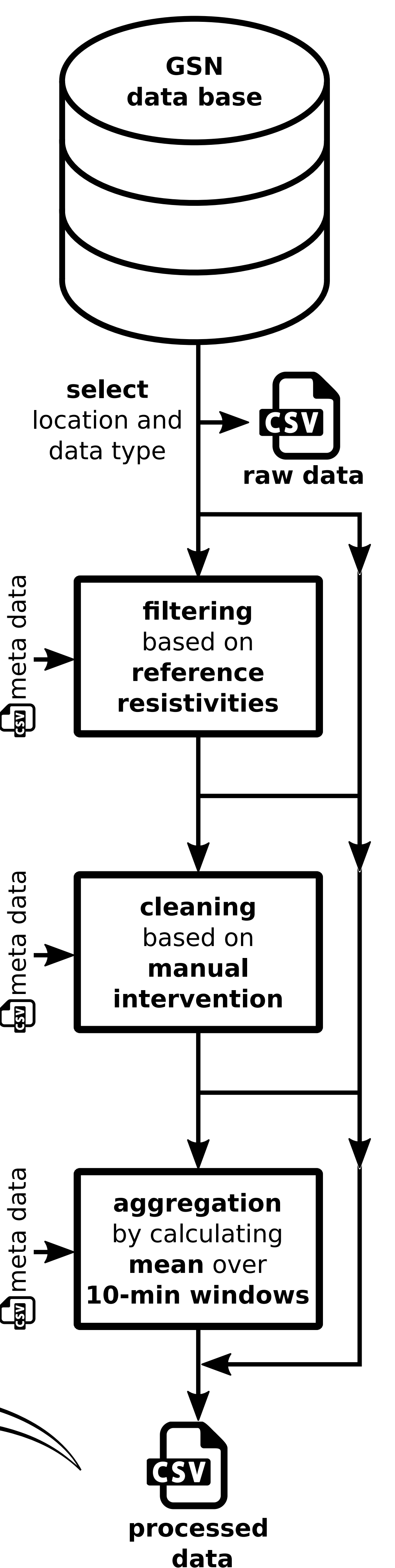
Fracture displacement



Weather station

- Radiometer
- Position coordinates
- Inclination
- Time lapse camera
- Acoustic emission
- Micro-seismology

Data processing



Timeseries visualization

