

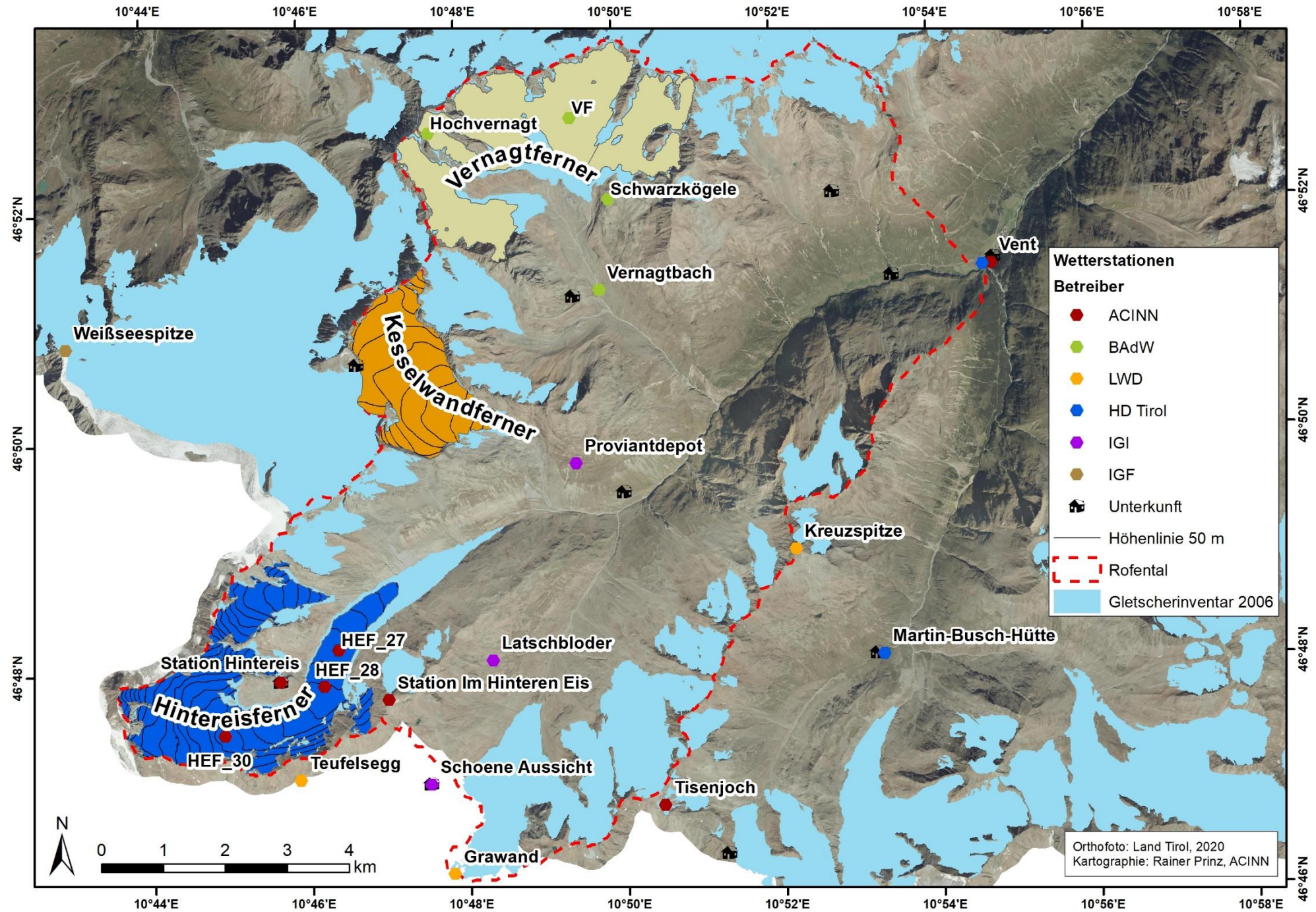
Hintereisferner / Rofental

FS 3.167: Tue 16 Sep 17:30 Advancing glacier monitoring.
Insights from the Hintereisferner laboratory

Open Air Laboratory

Rainer Prinz, PhD | rainer.prinz@uibk.ac.at

Obergurgl, 12.09.2025





Abraham Jäger 1601; Nicolussi 1990: ZGG

Archeology



Reuters/South Tyrol Archaeology Museum



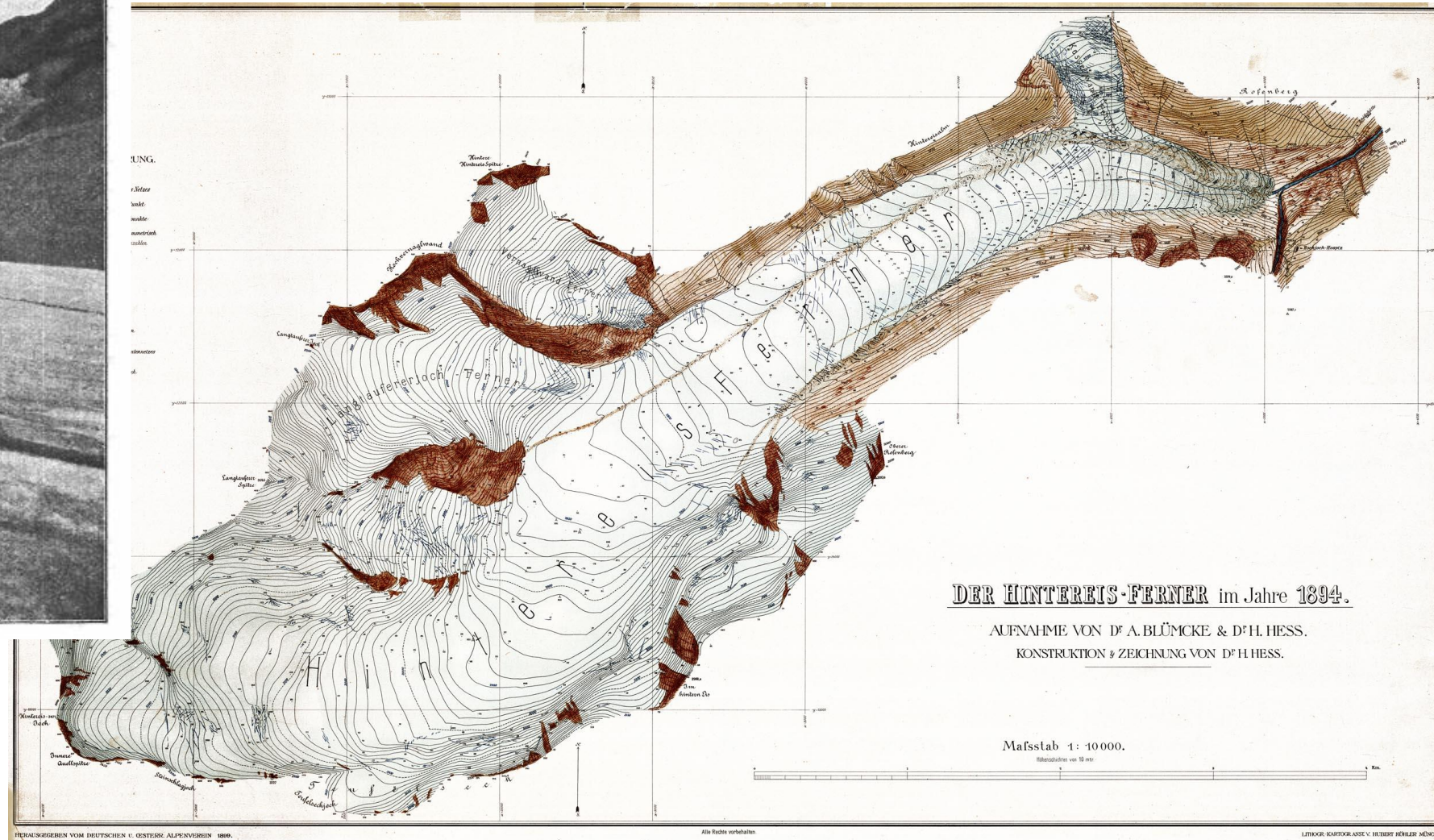
Hintereisferner – a glaciological laboratory

- ❄ **Glacier length changes since 1847**
- ❄ Drilling to bedrock 1894
- ❄ **Flow velocities since 1894**
- ❄ Theories to ice flow 1907
- ❄ Seismic ice thickness measurements 1927 -> Wegener Greenland
- ❄ **Micrometeorology: glacier wind 1935, energy balance 1952, radiation 1955**
- ❄ **Mass balance since 1952**
- ❄ **Hydrometeorology since 1966**
- ❄ Nuclear physics of ice 1970



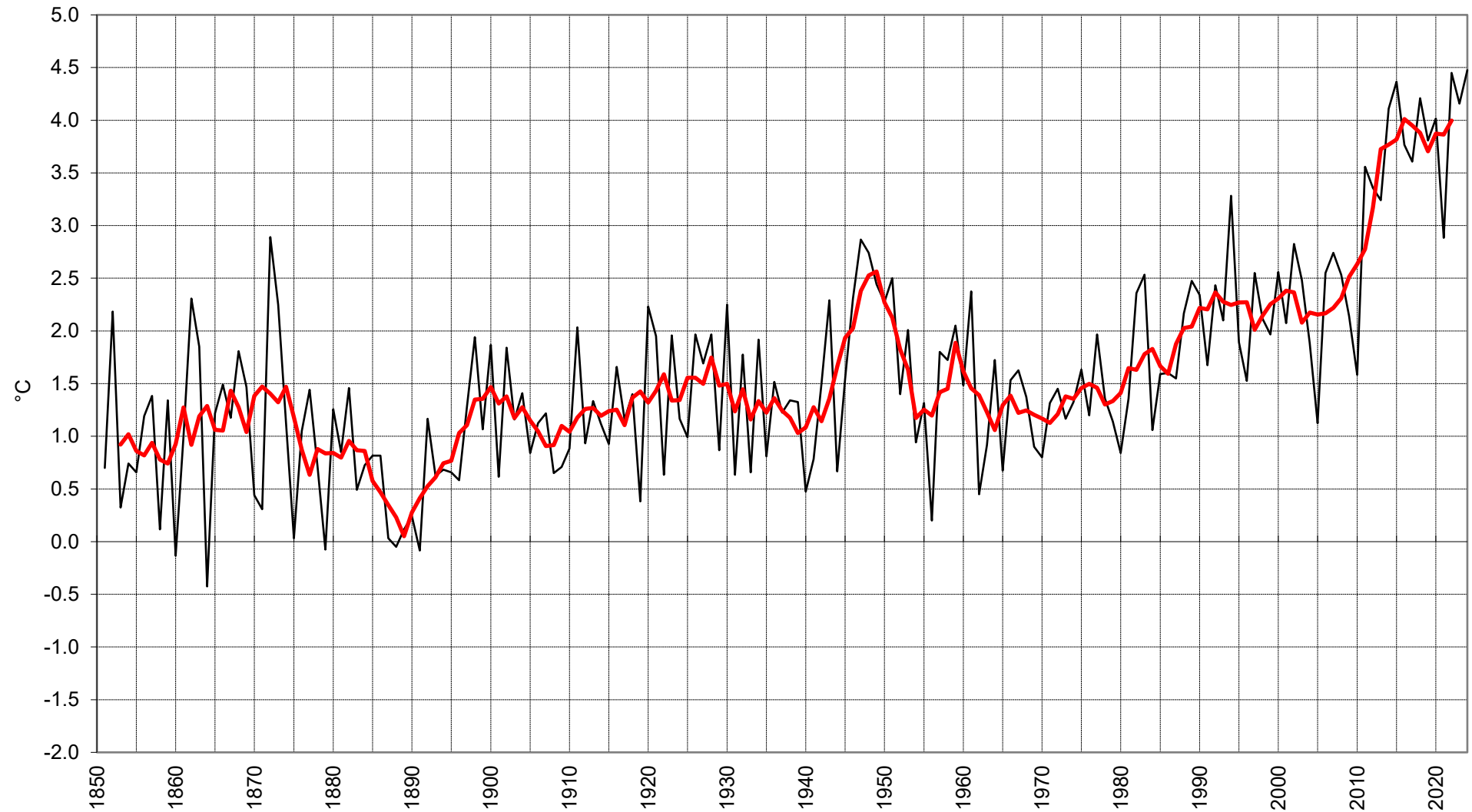
Rudolph Reschreiter 1911: public domain

Hintereisferner 1894



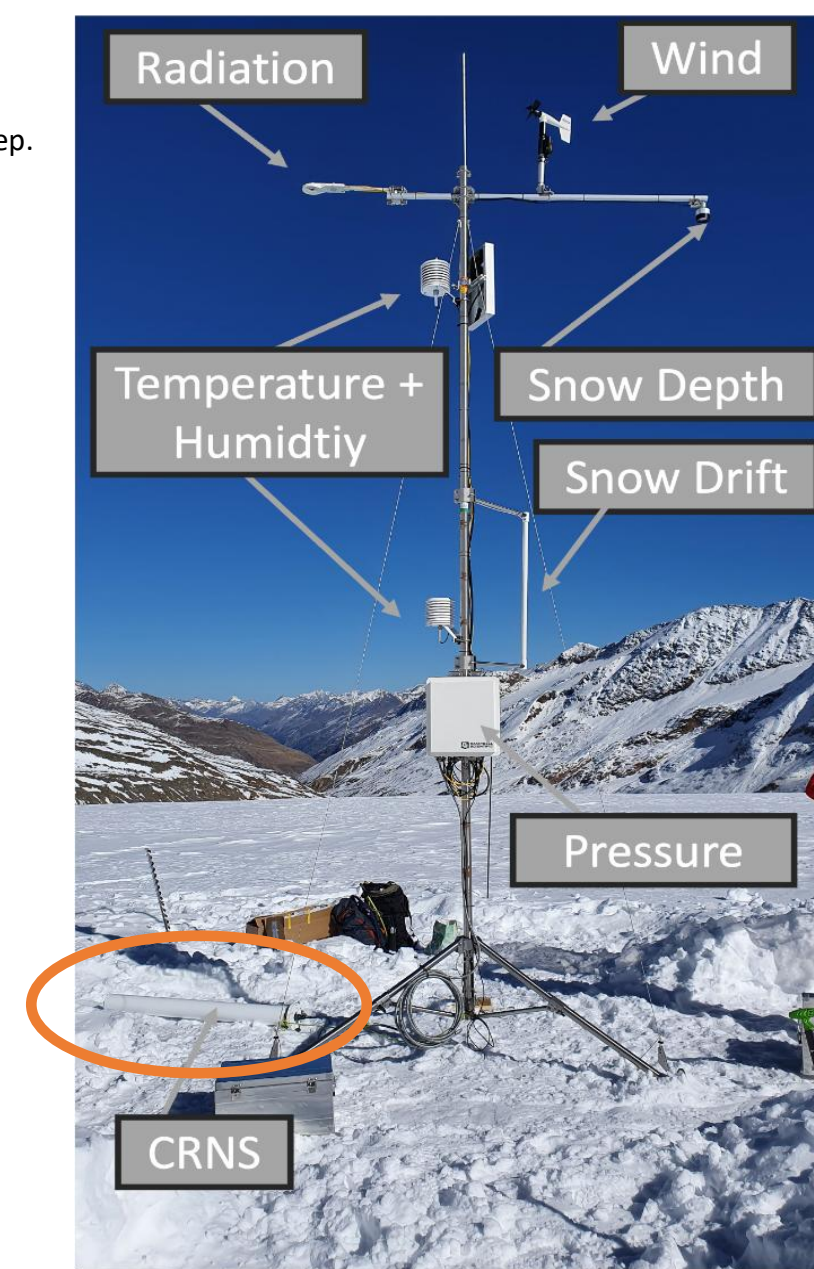
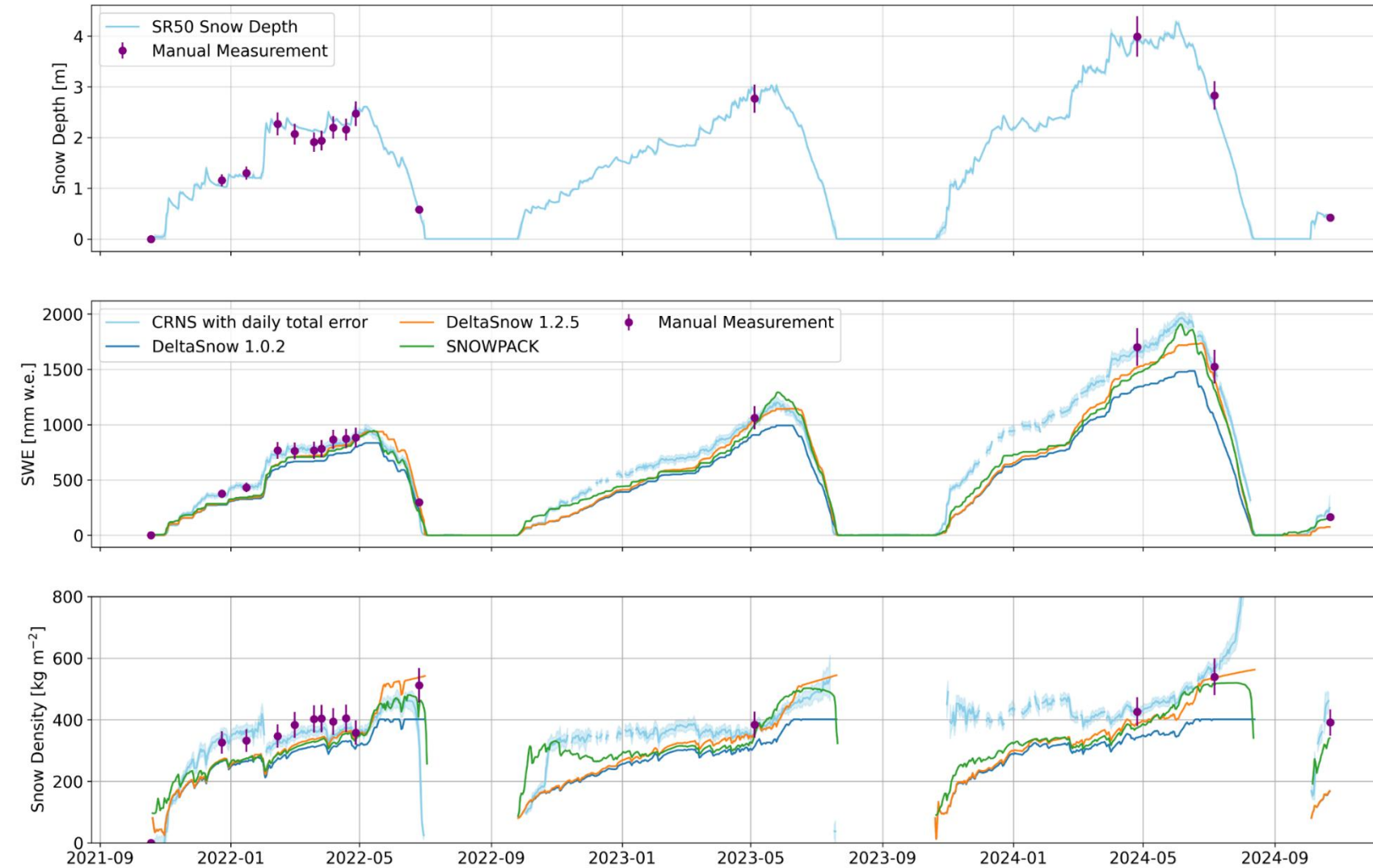
Blümcke & Hess 1899: ZDÖAV

Vent (1900 m): mean annual air temperature

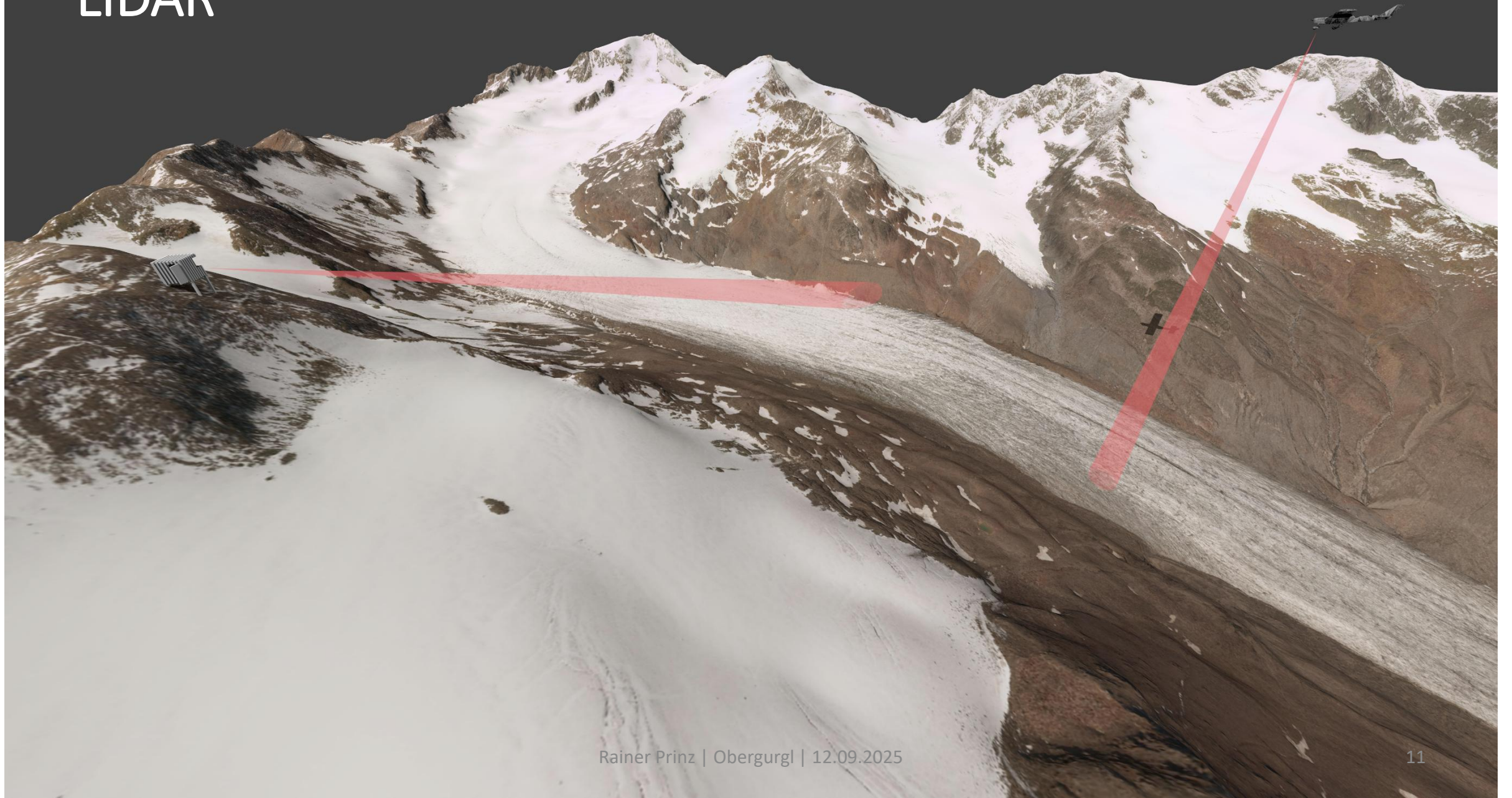


Continuous SWE measurements

Prinz et al., in prep.

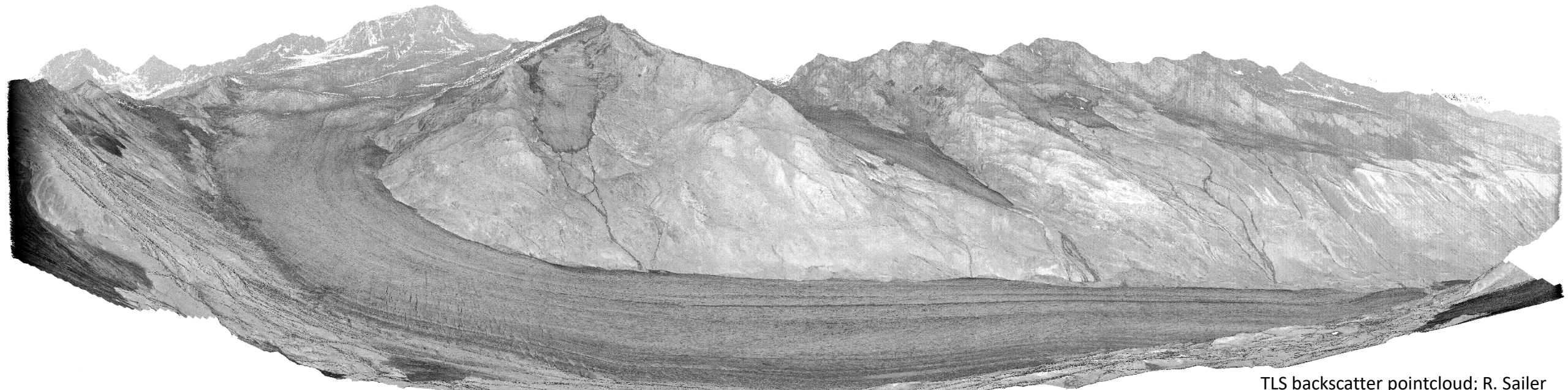


LIDAR





HEF, 05.08.2019, R. Prinz



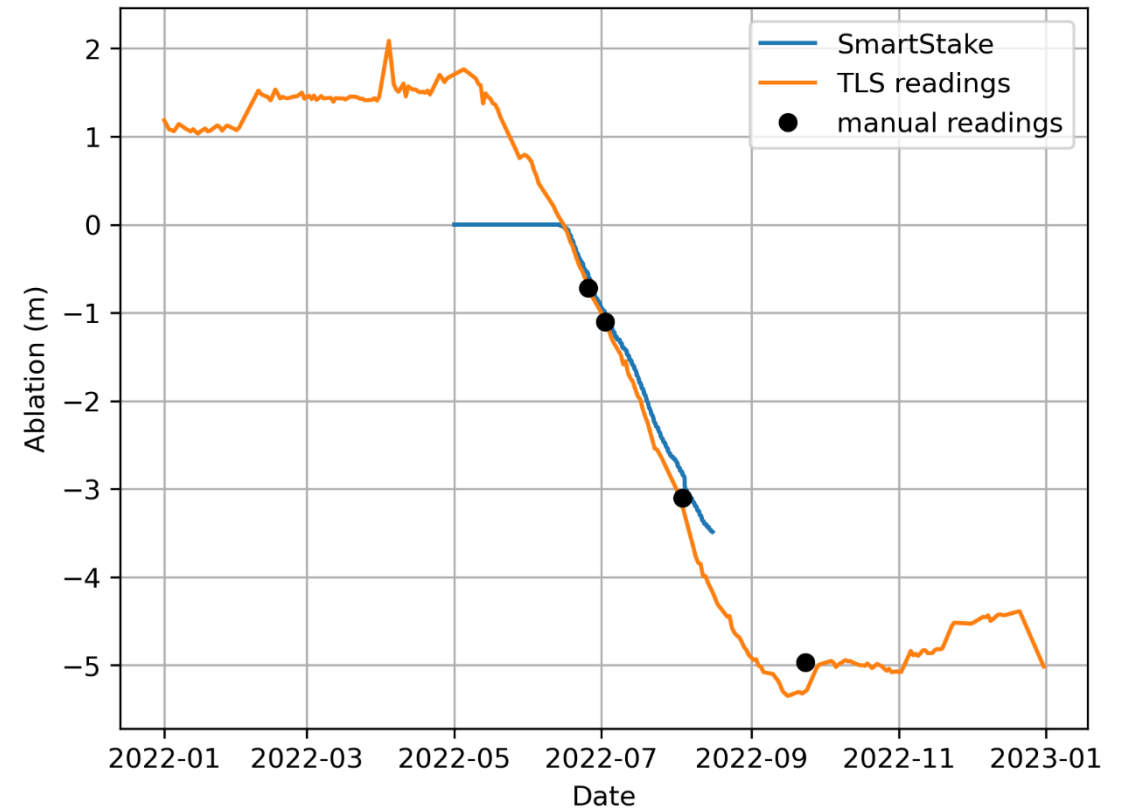
TLS backscatter pointcloud; R. Sailer

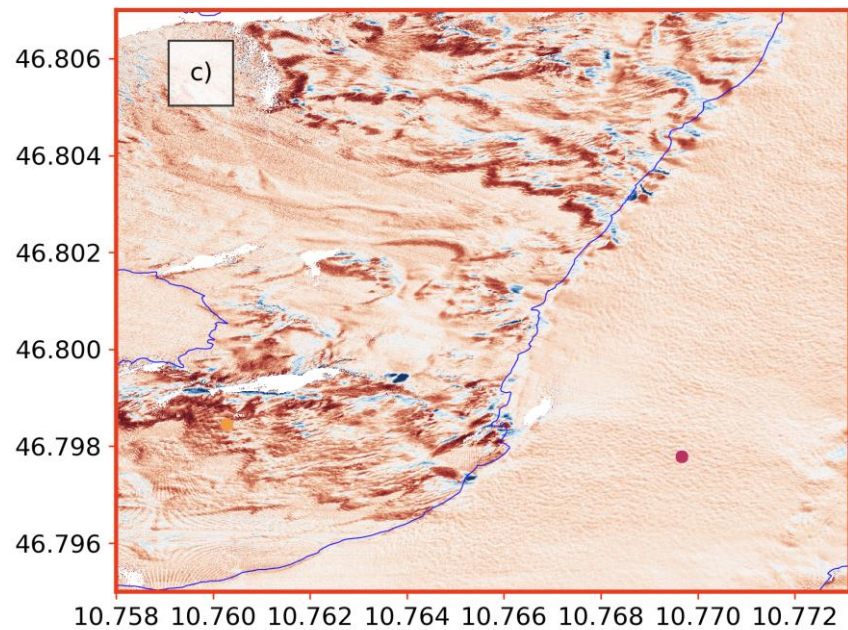
Automated surface elevation changes: Terrestrial laser scanning, SmartStake



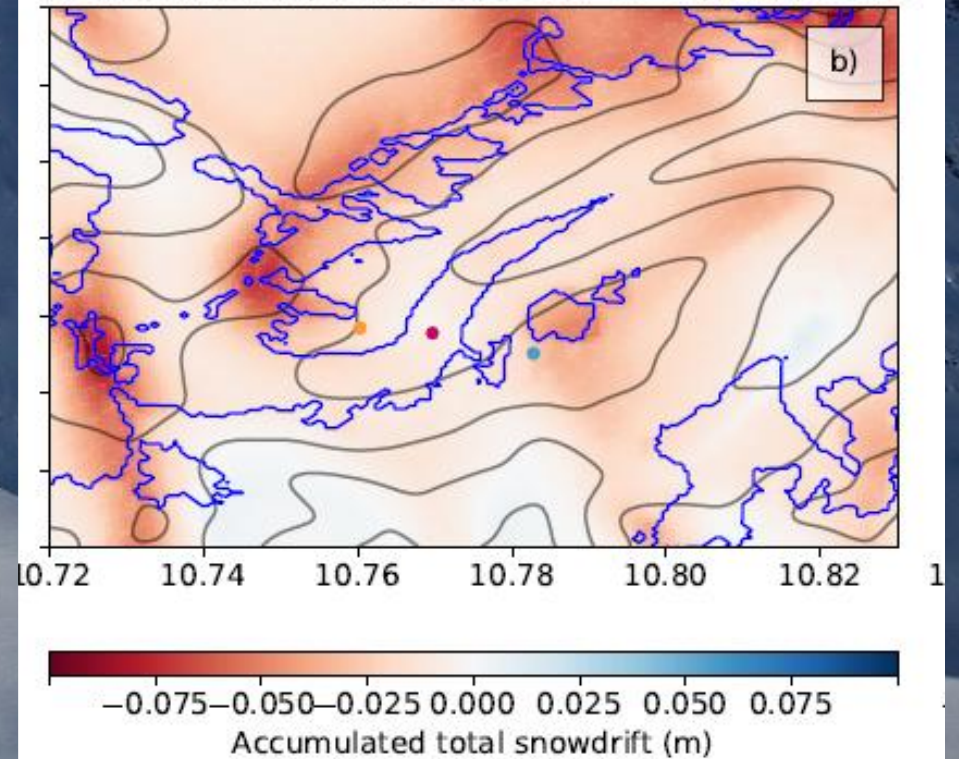
"Lollipop"

SmartStake



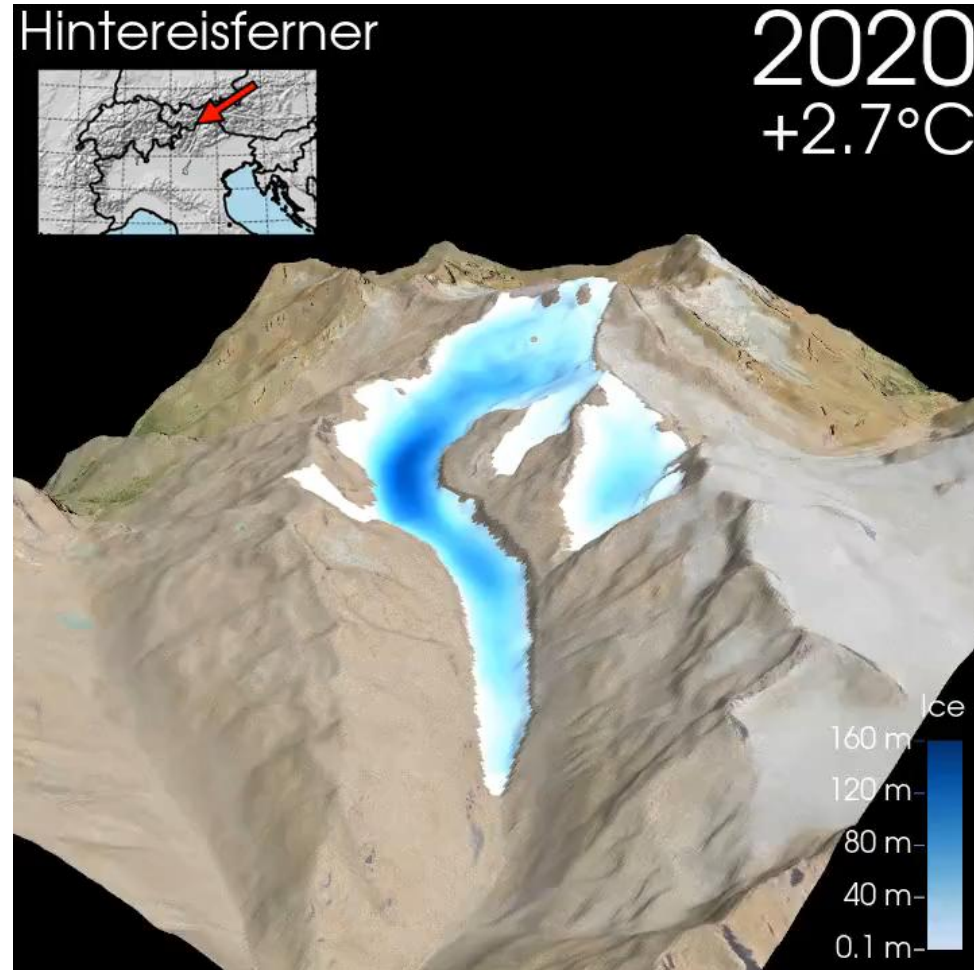


Simulated snow drift
between 8 Feb, 10:15 UTC and 8 Feb, 23:45 UTC

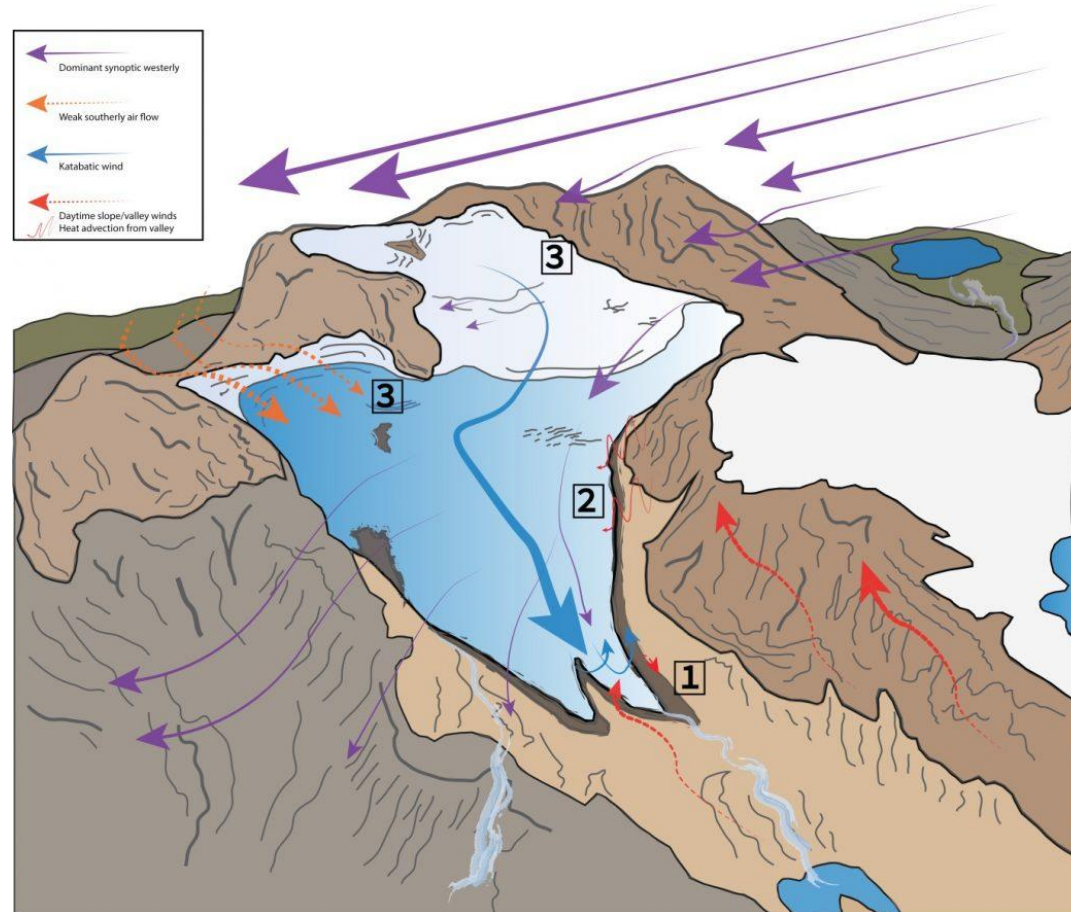


Glacier modelling - OGGM

<https://goodbye-glaciers.info/>



Hintereisferner Experiments - HEFEX



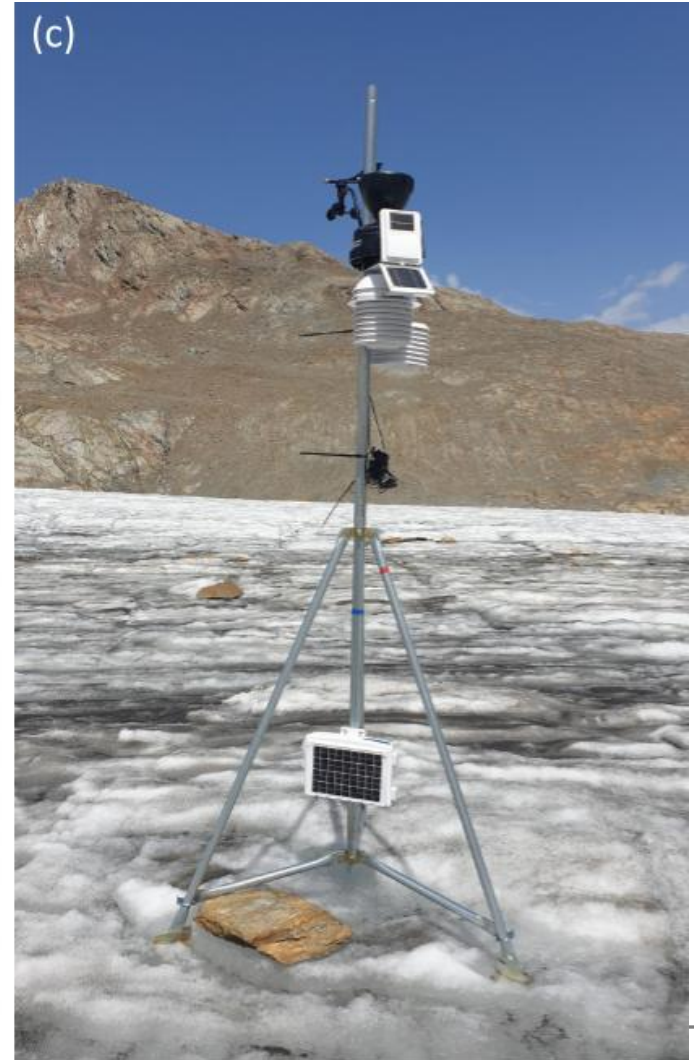
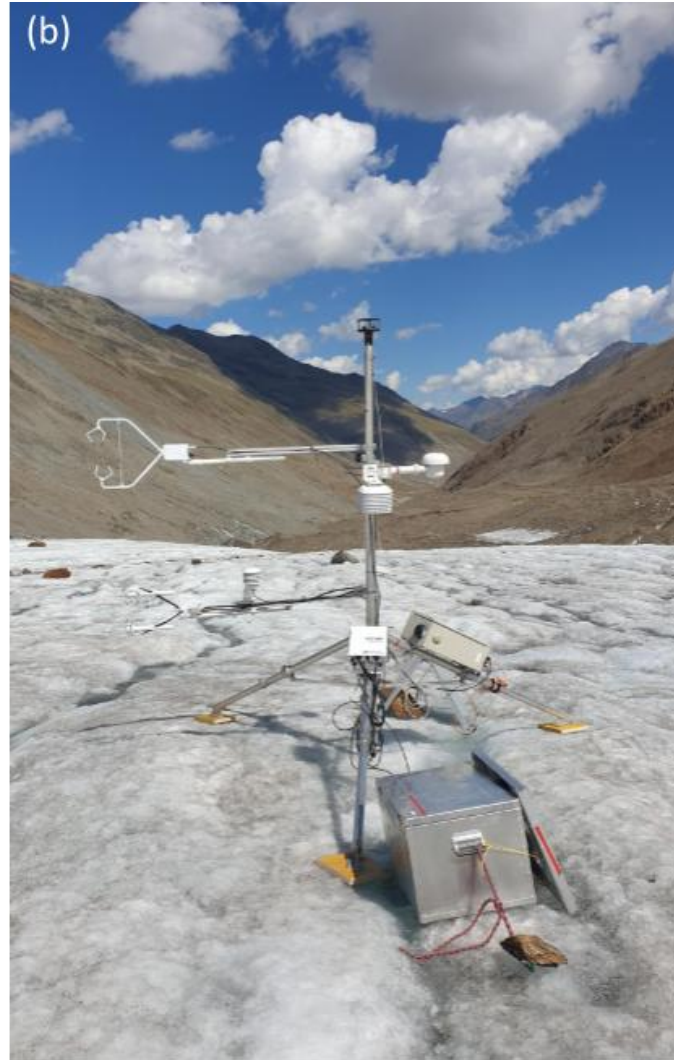
- Glacier boundary layer characteristics
- Interaction of wind systems in complex terrain

Thu 18.09. 09:30, Session 3.132:
First insights from the second
Hintereisferner Experiment

T. Shaw: EGU cryosphere blog

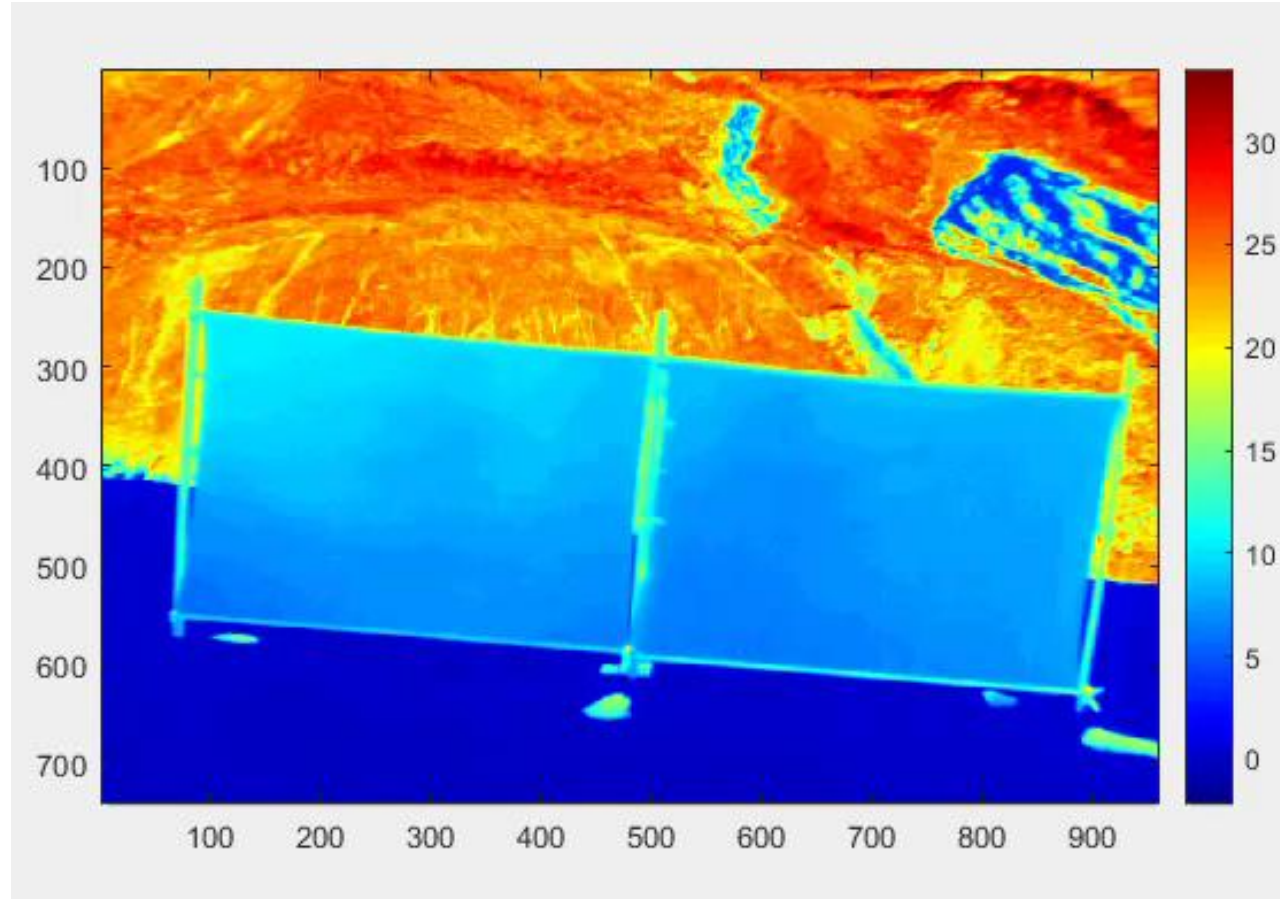
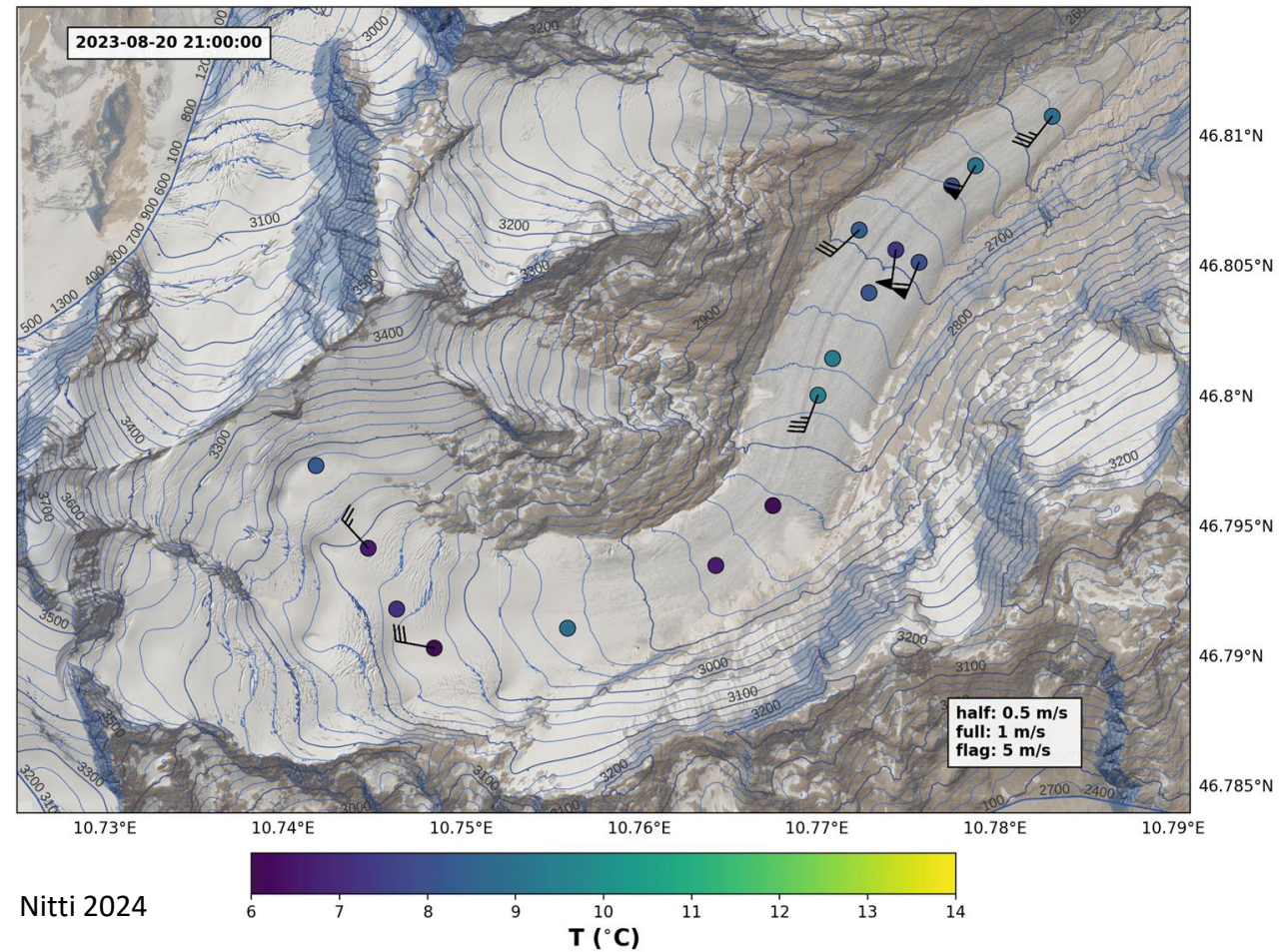
Prozess studies

Nicholson et al. 2025, BAMS





Glacier boundary layer – HEFEX I-III



Nitti 2024



Large field component





Danke für die Aufmerksamkeit!