

Name of research institute or organization:

**Alfred-Wegener-Institut für Polar- und Meeresforschung  
Bremerhaven**

Title of project:

Field survey at Gornergrat, August 2008

Project leader:

Dr. Olaf Eisen

Project description:

At the end of August 2008 a one-week geophysical field survey was carried out in the accumulation region of Grenzgletscher at Colle Gnifetti. The campaign was part of the DFG-funded junior research group LIMPICS. Aim was the application of ground-penetrating radar and active reflection seismics for mapping the internal structure of the glacier at the location of a borehole.

Previous to the actual measurements the five-people team of the Alfred Wegener Institute Bremerhaven and the Institute for Environmental Physics at the University of Heidelberg spent the nights from 22.-24. August in the Kulmhotel Gornergrat. The selection of Gornergrat as the location for accommodation has several reasons: located at a high altitude for acclimatisation, easy and fast accessibility via the Gornergratbahn, access to the Findelgletscher, insight of Grenzgletscher and Zermatt.

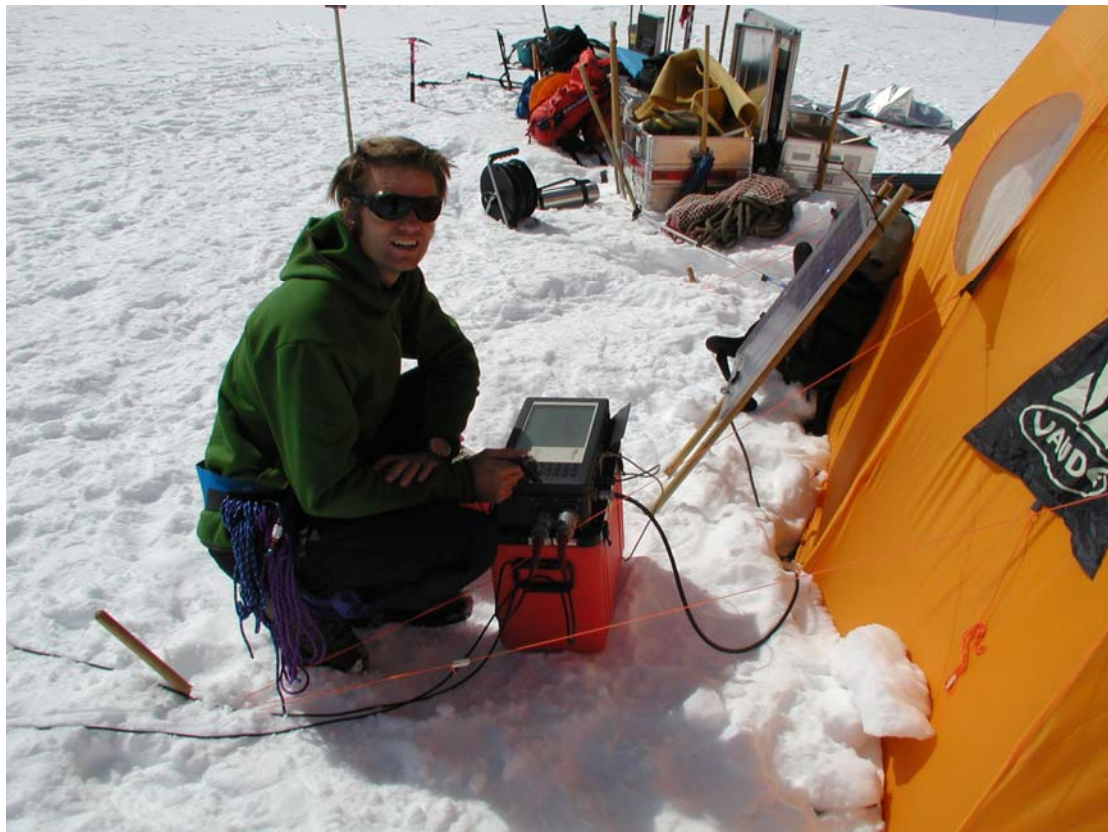


Photo 1: Seismics ©AWI

For working at Colle Gnifetti (4450 m), with overnighiting in the Capanna Margherita (4550 m), a good acclimatisation is mandatory.

Two overnighitings on Gornergrat on 3200 m represents a necessary step.

The good accessibility is important in case problems occur for transport of cargo by Air Zermatt's helicopter to Colle Gnifetti and a quick descent to Zermatt is required. Likewise, the Gornergratbahn makes a fast access to the accomodation on the day of arrival easier, leaving enough time for preparation of the cargo flights.



Photo 2: Radar ©AWI

For the actual transportation of personal from Gornergrat to Colle Gnifetti by helicopter it is important to have direct insight of the upper part of Grenzletscher and to Zermatt. In the case of bad weather this enables the usage of even short fine weather windows for transportation, or to cancel planned flights from Zermatt in time, if the weather conditions in the Monte Rosa-region does not permit a safe flight.

After the first night from 22. to 23. August we made a hike from Kulm to the accumulation region of the Findelgletscher. Currently, the Findelgletscher is the area of examination of the working group at the Geographical Institute at the University of Zürich.

One focus of the investigations is the mapping and reconstruction of the snow deposition on Findelgletscher, in order to be able to model its adaption to climate change. The period of our stay made it feasible to photographically document the snow distribution, as the melting season at the end of August is not finished, but a sufficient part of the winter snow already melted. It was clearly visible that no homogeneous snow cover was present anymore over a large altitude region of Findelgletscher. Instead, the snow left in August displayed a kind of dune structure. Areas with completely melted winter snow regularly changed with areas where snow was still present.



Photo 3: Camp ©AWI

At the end of February 2008 a strong event of dust deposition occurred, which transported large quantities of Saharian dust to the glacier. The slightly redish colouring of the snow surface covered by snow made it possible at the end of August to determine the time of snow deposition. Areas in which snow was deposited after the dust event, which was still present at the end of August, now had a bright-white colour. Where the snow deposited after the dust event had already been melted, but snow was still present, the surface still had a redish colour.

Apart from these photographical mapping the Findelglacier provided the opportunity to exercise techniques for crevasse rescue and belay for the measurements on Colle Gnifetti.



Photo 4: Distant view of the camp ©AWI



Photo 5: Findel glacier ©AWI

The campaign has been finished successfully and without any incidents with three flights on 29. August at 15 h in Zermatt.

We cordially thank the Hochalpinen Forschungsstationen for their support.

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