

Blencathra

TUNSBERGDALSREEN PROJECT: FOLLOWING EARLIER FOOTSTEPS IN THE ICE

As climate change has become a focus for attention in recent years the fate of the world's 70,000 glaciers has been attracting increasing attention. The truth is that we know remarkably little about the vast majority of those glaciers; very few are monitored by scientists. The Tunsbergdalsbreen Project described below is a small scale but long term project which will add to this knowledge.

The Tunsbergdalsbreen glacier in southern Norway flows out from the largest ice cap on continental Europe and was first surveyed 50 years ago by the Brathay Exploration Group, providing evidence of the melt rate at that time, due to natural climate change, but it has not been surveyed since 1972. The previous records collected up to that time showed that Tunsbergdalsbreen was retreating at 18metres per year, whereas contemporary records from Norway's other glaciers show an average retreat of 70 metres.

The aim of our project is to run scientific based expeditions every year to measure the melt rate using a relatively simple and practical monitoring regime. The results will become increasingly useful the longer they continue. Each year the data will be made available to Norwegian Water Resources and Energy Directorate (NVE) and the World Glacier Monitoring Service in Zurich. Results will be featured at the new Ulltveit - Moe Climate Centre, Norway's flagship body for collecting, creating and disseminating scientific and cultural-historical knowledge on snow, ice and glaciers and



At work with rover • Claire Backhouse

climate change. The actual trend in the annual average change of thickness of the glacier will be displayed for public information and comparison with the future climate scenarios speculated in the displays at the centre.

The annual expeditions will provide a wonderful educational opportunity for successive groups of young people to explore an uninhabited wilderness and observe how human activity elsewhere is changing the natural world. They will also provide career development opportunities for FSC staff in partnership with the Brathay Exploration Group to assist and lead expeditions of UK and Norwegian students.

Comparing 1959 with 2009 • Tors Hamilton



Snout area • Tors Hamilton



Everyone at Breinuscum

In August 2009 an expedition of 18 members (including three FSC staff: Claire Backhouse from Blencathra; Ben Bryant from Orielton; and Victoria "Tors" Hamilton from Castlehead), organised by Brathay Exploration Group (BEG) in cooperation with the Field Studies Council and the Norwegian Glacier Museum, went to the Tunsbergdalsbreen glacier in Norway to:

- survey and map the surface elevation of the glacier to replicate the survey of 1961;
- establish control points to measure the flow velocity of the glacier at surface level;
- field-test survey methods and note lessons learnt for future survey teams;
- enable future expedition leaders to become familiar with GPS/GNSS survey techniques.



Survey work-painting stones • Tors Hamilton

Previous expeditions were based at the glacier site for around 10 weeks. We had 12 days! Following some surveys of access routes we decided to locate the expedition base camp on a lake shore site at the lower snout end of the glacier. From here the glacier was accessible in about 1 hours walk. During the following days our group achieved the following:

- established a GPS base station on a promontory over viewing the glacier snout;
- located and recorded the position of a line of stones placed in 2008 to monitor the glacier surface velocity;
- set-out a new line of stones across the glacier to allow further monitoring of glacier surface velocity in 2010;
- recorded sufficient spot heights and edge positions to enable about 90% of the lower glacier area to be accurately mapped at 5 m interval contours;
- recorded the current snout position relative to reference markers used in previous years.

A full report of the Survey completed by Tim Westmoreland can be found on the Blencathra, Orielton or Castlehead websites.

Working collaboratively with different organizations has been both rewarding and challenging and we are currently working on the 2010 Expedition, which will be a smaller, shorter and more focused endeavour. Please contact me if you would like further details. 📧

Tim Foster