



Project acronym: SNAP

Project title: Snow Accumulation Patterns on Hardangerjøkulen Ice Cap using geophysical methods

Project leader: Emma Pearce, University of Leeds, UK

Discipline: Earth Sciences & Environment: Other - Earth Sciences

Station(s): Finse Alpine Research Centre (Norway)

In the project, we will resurvey the ice cap using radar methods, and redeploy seismic equipment at an area on the ice cap where significant firn accumulation was identified in the 2018 TA-SNAP project. In our seismic surveys, we will deploy a Geometrics GEODE system with 48x10 Hz multicomponent geophones and a sledgehammer source. Geophone spacing of 2m was identified as the optimum distance through parameter testing based on the 2018 acquisition. This spacing gives data which are compliant with FWI implementation (i.e., high-frequencies are faithfully recorded) whilst allowing the base of the firn layers (~ 30 m depth) to be sampled. Additionally, an automated seismic source will replace the hammer source since it provides better repeatability, a further requirement for FWI. This design should facilitate a robust recovery of the elastic properties of the firn, specifically density. Our GPR surveys will repeat the approach used in 2018. A comparative record of accumulation will be obtained by resurveying across the ice cap. The research builds on the success of the 2018 field season and contributes to the understanding of the evolution of coupled glacier, climate and hydrological systems in a warming climate.