# Training Early-Career Polar Weather and Climate Researchers

## Polar Prediction School; Abisko Scientific Research Station, Sweden, 17–27 April 2018

Students of the Polar Prediction School 2018 set up a micrometeorological mast on Sweden's frozen Lake Torneträsk. Instruments on the mast provided data that the students used to study daily variations in the lower atmosphere and atmospheric turbulence and to evaluate atmospheric models. Photo credit: Fiona Tummon

By Fiona Tummon, Jonathan Day, and Gunilla Svensson 2 hours ago

Weather and climate are changing faster in the polar regions than anywhere else on Earth. These changes are opening up new opportunities for shipping, energy extraction, and tourism, but they also expose these sensitive regions to increasing environmental hazards and pose major challenges to local communities. Limitations in our ability to predict polar weather and climate changes on scales from

days to decades hamper our ability to make effective decisions regarding responses to these changes. Furthermore, our understanding of how changes in the polar regions may affect the midlatitudes, including high-impact extreme events, is far from complete.

The course combined theory lectures, practical exercises, and fieldwork, as well as a dedicated science communication program.

The polar prediction problem (https://eos.org/project-updates/understanding-causes-and-effects-of-rapid-warming-in-the-arctic) is inherently multidisciplinary and requires cooperation across a wide community. Thus, an international group of agencies specifically designed a 10-day training course to bring together a wide group of students and lecturers to cover important topics related to polar prediction. Topics included satellite and conventional observation techniques; numerical modeling of the polar atmosphere, sea ice, and ocean; and data assimilation and model evaluation (https://eos.org/project-updates/better-tools-to-build-better-climate-models). The course included an innovative combination of theory lectures, practical exercises, and fieldwork, as well as a dedicated science communication program, each of which forms a crucial pillar of the prediction problem.

Daily weather briefings encouraged the students to interpret and evaluate forecast models specifically for the context of a mountainous polar area.

Micrometeorological (https://eos.org/research-spotlights/how-the-micrometeorology-of-alpine-forests-affects-snowmelt) observations and daily radio soundings (https://www.meteoswiss.admin.ch/home/measurement-and-forecasting-systems/atmosphere/radio-soundings.html) provided hands-on training opportunities, and these data were directly used in the practical exercises. This experience allowed the students to investigate the topics discussed in the theoretical lectures more thoroughly. The data were also used in the daily weather briefings: exercises that encouraged the students to interpret and evaluate forecast models specifically for the context of a mountainous polar area. During the science communication sessions, which complemented the scientific program, the students produced brief, informative videos aimed at the general public.

In contrast to single-discipline courses designed to address a narrow topic, a diverse course such as this is unusual. However, this approach is necessary to help build and maintain the community needed to address the inherently multidisciplinary polar prediction problem. Student feedback showed that the school was well appreciated, and we propose this model for other disciplines where cross-disciplinary links are crucial to progress.

The training school was organized under the auspices of the European Union Horizon 2020–funded Advanced Prediction in Polar Regions and Beyond (APPLICATE (https://applicate.eu/)) project in cooperation with the Association of Polar Early Career Scientists (APECS (http://www.apecs.is)) and the World Meteorological Organization's Polar Prediction Project (http://www.polarprediction.net/) on the occasion of the Year of Polar Prediction (http://www.polarprediction.net/yopp-activities/). Further sponsorship was provided by the Climate and Cryosphere (http://www.climate-cryosphere.org/) project, International

Arctic Science Committee (https://iasc.info/), and Scientific Committee on Antarctic Research (https://www.scar.org/). More information about the school can be found on the APECS website (https://www.apecs.is/events/past-event-highlights/event-highlights-2018/polar-prediction-school-2018.html).

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