ECMWF activities for improving polar prediction

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ECMWF activities for improving polar prediction cross-cuts through the organisation and spans model development (atmosphere, land, ocean+ice), data assimilation and observation usage, predictability and forecast evaluation. Recent developments in the context of polar prediction includes the introduction of a dynamical sea-ice model in all ECMWF forecasts.

ECMWF is also contributing in several ways to the World Meteorological Organisation's Polar Prediction Project (PPP). For example, during the Year of Polar Prediction (YOPP), ECMWF is providing an extensive global data set of coupled forecasts for the community. The data set includes model tendencies to facilitate process evaluation.

As a part of EU-H2020 project APPLICATE, which supports YOPP and PPP, ECMWF is assessing how the observation network in the Arctic helps to improve weather forecasts. The assessment is made by systematically removing observations over the Arctic and determine the impact of forecasts both in the Arctic. From these experiments also the linkages to the mid-latitudes from the Arctic are assessed. ECMWF is also developing a new snow scheme for the Integrated Forecasting System, to better capture the interactions with the atmosphere and to obtain more realistic snow melting. To understand the current capabilities in predicting the weather in the Arctic, ECMWF is performing targeted verification for the Arctic. This verification targets systematic errors, day-to-day variations in scores as well as extreme weather. To support model developments new diagnostic tools are developed.

This presentation will give an overview of current abilities and challenges for NWP in polar regions, as well as show examples of ongoing research.