More detailed weather forecasts

Through model comparisons, we revealed that AROME-Arctic is the scarcest observational network and observation errors into account. user-oriented verification of Arctic phenomena, and for taking the state-of-the-art predictive skills. We developed methods for world-leading NWP model for the Arctic. It is shown that this model has surface meteorology and fluxes in the ERA5 data set. other field campaign observations to evaluate deployed in the Iceland and Greenland Seas were In situ observations from a meteorological buoy Sea surface meteorology future research studies and operational implementations.

Perturbations to observations and the model physics to better exploited when the weather forecast takes into account the horizontal and vertical extension of the atmospheric volume observed by the instrument.

Ensemble Prediction Systems add value to Arctic weather forecasts

Experiments with more vertical model levels and 0.5 km horizontal grid spacing over Svalbard and 1.25km for the AROME-Arctic domain reveals potential for improved weather forecast capabilities. This is shown for wind speed while for other parameters the release of the full forecast improvement potential can first be utilized when combined with additional model developments.

A new sea ice data assimilation framework is introduced to assimilate satellite sea ice products and improve the representation of the sea ice surface.

The model: AROME-Arctic

is a high-resolution state-of-the-art Numerical Weather Prediction Model used by MET Norway to produce short-range weather forecasts for the European East Arctic. The cornerstone of the project.

Hazardous Arctic weather: Polar Lows, cold air outbreaks, icing, warm spells.

Alertness has gained insight into the local water cycle in Cold Air Outbreaks, on the physics of polar lows, and the capabilities of NWP models capabilities to forecast them. In addition, a vessel icing model has been updated and is ready to be used as a part of an Ensemble Prediction System.

Enhanced sea ice description

Verifying Arctic weather forecasts

Through model comparisons, we revealed that AROME-Arctic is the world-leading NWP model for the Arctic. It is shown that this model has state-of-the-art predictive skills. We developed methods for user-oriented verification of Arctic phenomena, and for taking the scarce observational network and observation errors into account.

Communicating

YOPP endorsed, popular scientific articles on forskning.no, seminar on UNIS Svalbard and live Youtube presentations and Bjerkes podcast. In social media #AlertnessArctic 22 scientific publications, conference presentations.

Sharing data sets:

Output from model experiments and enhanced output for Supersites Buoy observation data from Iceland Greenland Sea, LIDAR observations from Svalbard and mobile weather station from Svalbard

Comparing models at Key Arctic locations

In an international collaboration called “YOPPsiteMIP”, we contributed with AROME-Arctic data for an in-depth model intercomparison. For selected periods, this includes physical and dynamical tendencies at the Sodankyla and Ny-Ålesund supersites. Compared to observations AROME-Arctic is among the best models in this comparison.

International collaboration

Weather forecast model development

Weather forecast evaluation

International collaboration

Oceanography

Sea Ice

Svalbard

International cooperation

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