

# **Norwegian Climate Prediction Model Version 2 (NorCPM2): New developments and their impact**

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## **Abstract**

The Norwegian Climate Prediction Model (NorCPM) combines the Norwegian Earth System Model (NorESM) with an Ensemble Kalman Filter (EnKF) data assimilation framework to provide seasonal-to-decadal climate predictions. The system delivers operational forecasts to the WMO Lead Centre for Annual-to-Decadal Climate Prediction and the Copernicus Climate Change Service (C3S) decadal prediction service.

In preparation for the CMIP7 Decadal Climate Prediction Project, the NorCPM system has undergone a comprehensive upgrade. Key developments include the transition to a new model version (NorESM2-MM), updated external forcings (CMIP7), the assimilation of additional observational products (such as sea ice thickness and soil moisture), and changes in the products used (SST, sea ice concentration, and hydrographic profiles). Furthermore, the data assimilation workflow has been revised (pause-resume) to support more daily assimilation cycles.

In this study, we evaluate the overall performance of NorCPM2 and assess the individual and combined impacts of these developments.