

Subseasonal-to-Seasonal Forecasts with the Norwegian Climate Prediction Model

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There is now a renewed concerted international effort to tackle the time scales that fall between weather and climate, i.e. between 10 days and one season, the so-called subseasonal-to-seasonal (S2S) time scale. We present first results of S2S forecasts extending into the stratosphere, with the Norwegian Climate Prediction model (NorCPM). As an initialized prediction system for seasonal-to-decadal prediction, NorCPM developed from the Norwegian Earth System Model (NorESM), a state-of-the-art climate model, and advanced data assimilation techniques based on the Ensemble Kalman Filter approach. The initialisation of land is carried out by using an off-line simulation of the Community Land Model (CLM) driven by the NCEP (National Centers for Environmental Prediction) reanalysis. The initialisation of ocean is carried out by an ocean analysis using the Miami Isopycnic Coordinate Ocean Model (MICOM), in which sea surface temperature anomaly and temperature and salinity profiles are assimilated monthly. The atmospheric component of the model is WACCM, a “high-top” chemistry–climate model that extends from the Earth's surface to the lower thermosphere, and is run with interactive stratospheric chemistry. The initialisation of atmosphere is via a nudging approach of WACCM towards the NCEP reanalysis. One of the focus is the role of land initialisation, especially snow cover and depth, at mid and high northern latitudes. The impact of the snow from the surface to the stratosphere, in particular on the North Atlantic Oscillation through a stratospheric pathway (e.g. Orsolini et al., 2016), is examined in pairs of 3-month ensemble forecasts started on every 1st November over the years 1980–2010, with either realistic initialization of snow variables, or else with “scrambled” snow initial conditions from an alternate year.

Key words: Seasonal prediction– Stratosphere – Polar

Orsolini, Y., and Coauthors, 2016: *Clim. Dyn.*, **47**, 2709–2725.