Seasonal-to-decadal Prediction with the Norwegian Climate Prediction Model

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The Norwegian Climate prediction Model (NorCPM) is a fully coupled forecasting system that combines the Norwegian Earth system model with the Ensemble Kalman filter data assimilation method. We are testing the prediction skill of NorCPM with different ocean observation networks and for different time scales. At seasonal time scale, we find that NorCPM can achieve competitive skill in the ocean with assimilation of SST only e.g. in the ENSO region and in the region that extends from the Iceland Basin to the Barents Sea. As a downstream consequence, NorCPM shows skill in predicting Arctic sea ice extent (SIE) up to one year lead time from January and April at time when the influence of the ocean is consequent. Complementing the system with assimilation of ocean subsurface data have moderate impact on seasonal time scale, but it yields large improvements for longer time scale in the subpolar gyre and in the Nordic Seas. This relates to the improved representation of the salinity anomaly below the mixed layer, which causes a better initialisation of the density anomaly in the Labrador Sea.

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