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Ocean initialization in a coupled climate model using an ensemble Kalman Filter

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We describe the ocean initialization for the further development of a coupled decadal prediction system (MiKlip). We use an Ensemble Kalman Filter (EnKF) provided by the Parallel Data Assimilation Framework (PDAF) to assimilate monthly subsurface oceanic temperature and salinity (EN3) into the oceanic part of the MPI-ESM coupled climate model.
We test appropriate settings for the EnKF, in particular ensemble size, amount of subsurface observations used for assimilation, and different representations of the observation error. For an assimilation run (1958-2012) with the coupled climate model we find that the variability of temperature and salinity in our EnKF assimilation improves over an uninitialized historical run.
For the initialization of decadal predictions, we compare the results from our EnKF assimilation system run with those from an already existing simple nudging scheme. Overall, we find that nudged assimilation reproduces spatial and temporal variability of temperature and salinity from the observation better than the EnKF assimilation; though the mean model bias remains unchanged in both assimilations.
As a first step towards initializing decadal forecasts, we perform a small ensemble of hindcasts initialized by the EnKF assimilation and the nudging scheme, respectively. Preliminary results of these hindcasts are shown and discussed.