Probabilistic evaluation of the MiKlip decadal prediction system

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This contribution looks at different methods applied to decadal hindcasts of three dimensional prognostic atmospheric variables to evaluate the MiKlip (Mittelfristige Klimaprognosen – Decadal climate predictions) prediction system.

The ERA-Interim reanalysis from ECMWF and the HOAPS climatology (Hamburg Ocean Atmosphere Parameters and Fluxes from Satellite Data) from EUMETSAT CM SAF form the basic observations. The simulations to be compared stem from various versions of the MiKlip prediction system. We analyze annual and multi-year averages of air temperature, geopotential heights and the freshwater flux as an important variable for atmosphere-ocean coupling.

The verification uses necessary and sufficient tests for probabilistic evaluation of each ensemble prediction system. The results reveal that the three dimensional analyses clearly indicate a mid-tropospheric temperature error developing in the tropical Pacific area. Moreover, initializing the atmospheric component is more important for predictability than the difference in resolution between the two model versions. It has the effect of increasing the predictability in the inner tropics from 2 to 3 years. The freshwater flux is far more sensible to model deficiencies than the basic dynamical variables and the predictability fades away much earlier with prediction lead time.