



## **Relating model bias and prediction skill in the tropical Atlantic**

Francois Counillon (1,2), Noel Keenlyside (2,1), Shunya Koseki (2), Teferi Demissie (3), Thomas Toniazzo (3), Yiguo Wang (1), Lea Svendsen (2), and Ingo Bethke (3)

(1) NERSC, Bergen, Norway (francois.counillon@nersc.no), (2) Geophysical Institute, University of Bergen, Norway, (3) Uni Research Climate, Bergen, Norway

Current state-of-the-art models exhibit large climatological errors in the tropical Atlantic. To what extent this contributes to the poor seasonal prediction of these models in the tropical Atlantic remains unclear. Here we investigate this issue by comparing simulations and predictions with a standard and an anomaly coupled configurations of the Norwegian Climate Prediction Model (NorCPM), which aims at providing seasonal-to-decadal prediction by assimilating data into the Norwegian Earth system model (NorESM) with the Ensemble Kalman Filter. The standard NorESM has climatological biases typical of other models: too weak equatorial cold tongue and poor representation of variability. Correcting momentum and SST fields exchanged between oceanic and atmospheric models significantly reduces the climatological errors in the anomaly-coupled version. The mechanisms for equatorial Atlantic variability are better represented, but the variability is reduced in strength. This enhances the ability of the model to assimilate ocean observations in this region. A set of seasonal predictions with both standard and anomaly-coupled models indicates that together this leads to a significant improvement in the skill in predicting the Atlantic Niño mode.