DKT-12-37
https://doi.org/10.5194/dkt-12-37
12. Deutsche Klimatagung


# Decadal North Atlantic Surface Temperature Prediction Skill in CMIP6

**Leonard Borchert**[1], Matthew Menary[1], Didier Swingedouw[2], Giovanni Sgubin[2], Leon Hermanson[3], and Juliette Mignot[1]
[1]Sorbonne Universités (SU/CNRS/IRD/MNHN), Institut Pierre-Simon Laplace (IPSL), LOCEAN Laboratory, Paris, France (leonard.borchert@locean-ipsl.upmc.fr)
[2]EPOC, Université de Bordeaux, Pessac, France
[3]Met Office Hadley Centre, Exeter, UK

Due to its wide-ranging impacts, predicting decadal variations of sea surface temperature (SST) in the subpolar North Atlantic remains a key goal of climate science. Here, we compare the representation of observed subpolar SST variations since 1960 in initialized and uninitialized historical simulations from the 5th and 6th phases of the Coupled Model Intercomparison Project (CMIP5/6). CMIP6 simulations demonstrate improved skill in this region with 88% (initialized vs. 77% non-initialized) observed variance explained post-1980 compared to 42% (8%) in CMIP5. During this time, we find particularly high agreement between observations and historical simulations in CMIP6, indicating a more prominent role for forcing in driving observed subpolar SST changes than previously thought. Analysis of single-forcing experiments suggests much of this post-1980 agreement is due to natural forcings, explaining ~55% of the observed variance, consistent with a conceptual model of the large-scale oceanic response to volcanic forcing.
SPG SST skill differs between individual model ensemble means in CMIP6 hindcasts. Prediction skill for summer surface air temperature over Europe appears to be seasonally and regionally connected to the individual models' skill at predicting SPG SST, illustrating the societal value of understanding SPG SST prediction skill.