

EGU21-3844, updated on 12 Jun 2021

<https://doi.org/10.5194/egusphere-egu21-3844>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Decadal Prediction of Marine Heatwaves in MPI-ESM

Laura Hövel^{1,2}, Sebastian Brune¹, and Johanna Baehr¹

¹Institute for Oceanography, CEN, Universität Hamburg, Hamburg, Germany

²Institute of Geography and Oeschger Centre for Climate Change Research, University of Bern, Bern, Switzerland

Marine Heatwaves (MHWs) are Sea Surface Temperature (SST) extremes that can have devastating impacts on marine ecosystems but can also impact circulation patterns in the ocean and the atmosphere. The variability of MHWs has been studied in historical observations and longterm climate projections, but predictability has only been analyzed on seasonal timescales. Here, we present the first attempt to study the decadal predictability of MHW days per year in an ensemble of decadal hindcasts based on the Max Planck Institute Earth System Model (MPI-ESM-LR).

Our results show that there are strong regional differences in prediction skill. While many regions show little to no skill, we find in the Subpolar North Atlantic correlation coefficients up to 0.7 for MHW days up to lead year 8. We demonstrate that these correlations mainly arise from correctly predicting the absence of MHWs in individual years. MHW days per year might be successfully predicted by only using yearly mean SST as a proxy, which also demonstrates that in the Subpolar North Atlantic, any increase in SST is accompanied by more MHWs and vice versa.