



Decadal variability of North Atlantic winter cyclone tracks in the 20C Reanalysis and MPI-ESM-LR

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Weather and climate in Central and Western Europe are strongly influenced by extra-tropical cyclones in the North Atlantic region. Therefore, the prediction of cyclones is of great interest. The MiKlip joint project aims at developing a decadal prediction system with Europe as one focus area.

As part of MiKlip, this study uses a cyclone tracking identification algorithm based on the Laplacian of sea level pressure to investigate the decadal variability of North Atlantic winter (ONDJFM) cyclone tracks. For this purpose, we develop a set of indices to describe the spatial extent as well as the orientation of the mean path of cyclone tracks and climatological cyclone track densities. Linking these indices to atmospheric and oceanic phenomena, such as the NAO and AMO, we seek to identify physical processes influencing the variability of North Atlantic winter cyclone tracks. We use the Twentieth Century Reanalysis and the HadISST1.1 sea surface temperature datasets to create long-term (1871-2007) index time series and to identify these processes. The results from the reanalysis datasets are compared to decadal hindcasts of the MPI-ESM-LR (contributor to cmip5). First results indicate problems of the model to reproduce the results from the reanalysis dataset.