



## **Extreme warming in the NE Atlantic in the winter period 2002-2012 – an analysis with the regional atmospheric model COSMO-CLM and the Arctic System Reanalysis.**

Svenja Kohnemann (1), Guenther Heinemann (1), Oliver Gutjahr (1), and David H. Bromwich (2)

(1) University of Trier, Trier, Germany (kohnemann@uni-trier.de), (2) Byrd Polar and Climate Research Center, Ohio State University, Columbus, USA

The high-resolution atmospheric model COSMO-CLM (CCLM, German Meteorological Service) is used to simulate the 2m-temperature and the boundary layer structures in the Arctic with focus on the NE Atlantic section the winter periods (Nov-Apr) between 2002 and 2015. The CCLM simulations have a horizontal resolution of 15 km for the whole Arctic. The comparable Arctic System Reanalysis data (ASR, Byrd Polar and Climate Research Center), which has been optimized for the Arctic, are available for the same time period with a horizontal resolution of 30 km. In addition, climatological data from Automatic Weather Stations (AWS) stations are used as verification.

The comparison between the CCLM simulations and the ASR data shows a high agreement. Also the verification of both data sets with AWS and Era-Interim data shows a very high correlation for the air temperature. Slight differences between CCLM and ASR are recognizable in the extreme values as CCLM has the better ice information assimilated and the higher resolution during simulations. Time series of monthly mean based 2m-temperature indicate an enormous increase for the single months for the NE Atlantic and especially the region around the Siberian Island Novaya Zemlya. For example the CCLM March increase amounts up to 16 °C for the regional maximum for the period 2002-2012. The strong increase is mainly reducible to the decreasing sea ice situation in that region during the same time.