Geophysical Research Abstracts
Vol. 19, EGU2017-7608, 2017
EGU General Assembly 2017

The impact of horizontal resolution on the representation of air-sea interaction over North Atlantic open ocean convection sites

Kent Moore (1), Ian Renfrew (2), David Bromwich (3), Aaron Wilson (3), Kjetil Vage (4), and Lesheng Bai (3)

(1) University of Toronto, Toronto, Canada (gwk.moore@utoronto.ca), (2) University of East Anglia, Norwich, UK, (3) The Ohio State University, Columbus, USA, (4) University of Bergen, Bergen, Norway

Open ocean convection, where a loss of surface buoyancy leads to an overturning of the water column, occurs in four distinct regions of the North Atlantic and is an integral component of the Atlantic Meridional Overturning Circulation (AMOC). The overturning typically occurs during cold air outbreaks characterized by large surface turbulent heat fluxes and convective roll cloud development. Here we compare the statistics of the air-sea interaction over these convection sites as represented in three reanalyses with horizontal grid sizes ranging from 80km to 15km. We show that increasing the resolution increases the magnitude and frequency of the most extreme total turbulent heat fluxes, as well as displacing the maxima downstream away from the ice edges. We argue that these changes are a result of the higher resolution reanalysis being better able to represent mesoscale processes that occur within the atmospheric boundary layer during cold air outbreaks.