Lead Author e-mail: *heinemann@uni-trier.de*

Title: *Long-term dynamics of the North Water polynya: comparison of different satellite data sets and methods*

Günther Heinemann[1], Andreas Preußer[1]
[1]***Environmental Meteorology, University of Trier, Germany***

The North Water polynya (NOW) forms recurrently between Ellesmere Island and northwest Greenland and is one of the largest and therefore most important polynyas in the northern hemisphere. An investigation of NOW dynamics for the period 1978-2011 has been performed using sea ice concentration (SIC) data from the passive microwave satellite sensors (AMSR-E, SSM/I, SMMR). From SIC data we derived the total polynya area (POLA) and the open water area (OWA). Results are compared between different satellite sensors and to the PSSM method. Sensitivity studies are performed with respect to a SIC threshold defining the POLA. The dynamics of the ice bridges located at Smith Sound is investigated.

Using a SIC threshold of 70%, a relatively large difference in the mean polynya area is found between AMSR-E and SSM/I for the overlapping period of both sensors (2001-2011). While AMSR-E data yield a mean polynya area of 78000 km², SSM/I data show 89000 km². Besides this overestimation, SSM/I data show an increase of 10000 km² for the last decade for the NOW area compared to the whole data period. A comparison between the PSSM method and the chosen SIC threshold for AMSR-E data shows good agreement. The dynamics of the ice bridge located at Smith Sound has a large influence on the formation of the NOW.