Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08980, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08980
EGU General Assembly 2008

A two year climatology of polar low events over the Nordic Seas from satellite remote sensing

A.-M. Blechschmidt

Meteorological Institute, University of Hamburg, Hamburg, Germany

Polar lows are known as intense maritime mesocyclones at the high latitudes. Knowledge about their phenomenology, origin and life cycle is limited. This is mostly due to a lack of meterological in-situ data in polar low genesis regions. Moreover the small scale and short lifetime of these systems complicates the representation in numerical models. A large number of studies about polar lows therefore benefit from satellite observations.

A new two year dataset of polar low events over the Nordic Seas is presented. The detection of polar lows is based on the combined use of infrared AVHRR imagery and SSM/I derived wind speeds from the satellite climatology HOAPS (Hamburg Ocean Atmosphere and Fluxes from Satellite Data). A total of 90 polar lows are found in 2004 and 2005 with a maximum of polar low activity during the winter months. The main regions of cyclogenesis occur along the coast of Norway. Fewer polar lows develop in the Barents Sea and to the east of South Greenland. Statistics for several atmospheric parameters (e.g. wind speed, precipitation, cloud top temperatures) which describe the intensity of the cyclones are retrieved from satellite observations.

The large scale atmospheric environment during polar low development is investigated with the use of NCEP reanalysis data. A composite analysis shows that four different polar low types occur in the Nordic Seas and that these types are associated with four typical large scale circulation patterns. It is shown that large differences between the SST and upper level temperature occur during the development of polar lows. Upper level potential vorticity anomalies are essential for polar low formation. Threshold values for polar low development (e.g. for potential vorticity) will be presented. The

results of this study are relevant to the improvement of polar low forecasts.