Geophysical Research Abstracts,
Vol. 11, EGU2009-10710, 2009
EGU General Assembly 2009

Simulations of mesoscale flow over an Arctic fjord

T Kilpeläinen (1,2) and H. Ólafsson (1,2,3)

(1) The University Centre in Svalbard (UNIS), Longyearbyen, Spitzbergen (tiina.kilpelainen@unis.no), (2) Bergen School of Meteorology, Geophysical Institute, University of Bergen, Norway, (3) University of Iceland and Icelandic Meteorological Office

Fjords, narrow inlets of the sea, are features of mountainous regions and are distributed at high latitudes in both hemispheres. Meteorological conditions in fjord systems are affected by surrounding complex topography, possible sea ice and oceanographic phenomena. The atmospheric boundary layer over the fjords is poorly understood and many processes occur on spatial scales that cannot be resolved by climate and weather prediction models.

The Weather Research and Forecasting (WRF) model, designed to simulate mesoscale and regional-scale atmospheric circulation, is used to study the effect of large-scale flow conditions on mesoscale flow and turbulent fluxes over Isfjorden, Svalbard (situated between 78°N and 79°N and 14°E and 17°E). The model is validated over Isfjorden by comparing the simulations with mast measurements performed on the southern coast of Isfjorden. Several short periods from spring 2008 representing different large scale flow directions were chosen for model simulations. The simulations indicate that large scale flow has an influence on the spatial distribution of wind speed, air temperature and humidity over Isfjorden and as a consequence of these also the spatial distribution of the turbulent fluxes is largely influenced. Some characteristics of mesoscale flow and the spatial variability over Isfjorden are presented.