

PROCESS STUDIES AND DATA ANALYSIS FOR SURFACE SIGNALS IN THE CONVECTIVELY ACTIVE REGIONS OF THE POLAR SEAS

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The primary objectives of this project are:

1. Develop schemes to determine the onset times and regions of oceanic convection in the polar seas.

2. Estimate the surface fluxes of heat and brine over the polar convective regions during the ERS-2 (and parts of the ERS-1) lifetime.

The principal ERS instruments to be used were the ATSR and the SAR (AMI). The focus of the study was the Labrador Sea where an international program for understanding oceanic convection has been in the preparation stage for the past 2 years. The major ship-based activity of the Labrador Sea Project will take place in the winter of 1997 with another intensive period being discussed for the winter of 1998. A goal of this project was to make satellite data, specifically SAR and surface temperature data, an integral part of an oceanic process investigation; thus, a large multi-investigator project such as this is essential. For the winters of 1995 and 1996 ERS data have been examined, and plans are underway for use of the 1997 data. The ocean surface temperature data was to be used to monitor the secular process of convection development, the cooling the ocean in early winter (December and January) and the subsequent warming when convection brought warmer water from depth to the surface. This process has been observed to a certain extent given the limitations that cloud cover have imposed on the ATSR data. The SAR data were to be used to monitor the development of the mesoscale structures associated with convective dynamics, similar to the use of the ERS-1 data in the Greenland Sea from the first ERS AO as reported previously. Mesoscale structures have been identified, but the connection of these with the convection has not gone as well, partly due to the obscuration of the eddy signals by winds and possibly due to climate fluctuations. An interesting eddy process was observed at the shelf break near the convecting area, and this may result in an additional examination of the data, and we have not give up hope of monitoring the convection process in 1997 and 1998, if the warming of the region does not close down the convection for those years.