

Seasonal to inter-annual variability of the Norwegian Atlantic Current

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Causes for measured variability in the Norwegian Atlantic Current during the period from 1995-2000 are investigated by considering complementary data providing information on the upstream and atmospheric forcing. These data are fields of sea surface height variability from the TOPEX altimeter, reanalysed mean sea level pressure, and repeated hydrographic measurements both in the northern North Atlantic and in the Norwegian Sea. The analysis indicates a close coupling between the strength of the westerly as inferred by the mean sea level pressure gradient through geostrophy and the large scale sea surface slope across the Iceland-Scotland Ridge with phase lag on the order of a few months. Harmonic as well as EOF analysis reveal that there is a seasonality in the local ssh. This seasonal cycle in ssh is stronger in the Norwegian Sea as compared to the North Atlantic leading to a steeper meridional sea surface slope across the Iceland-Scotland Ridge during winter as opposed to summer. The data indicate a relation between the large scale seasurface slope and the strength of the Norwegian Atlantic Slope Current. However to resolve the variability in the Norwegian Atlantic Slope Current from 1995 to 1996 requires representation of the zonally differential sea surface slope variability (i.e. torsion) across the Iceland-Scotland Ridge, due to changes in the hydrography. There is evidence for change in the hydrography from 1995 to 1996 in the northern North-Atlantic based on repeated XBT sections, and also but weaker north of the Faroes, that possibly affects the relative strength of the two branches of the Norwegian Atlantic Current. The work will proceed with a more thorough analysis of some of the data sets in order to present more definite conclusions. The questions that will be specifically addressed are:

- Is the variability of the Atlantic Inflow driven by the regional wind stress field through modulation of the sea surface slope across the Iceland-Scotland Ridge?
- What is the effect of hydrographic anomalies in the northern North Atlantic on the NAC?
- What are the effect of atmospheric forcing on the total and the relative distribution of the eastern and western branch of the NAC?