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Second Report of Joint Russian/German Project "Assessment of Short-time Climatic Variations in the Labrador Sea"

by

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A Workshop consisting of V. A. Borovkov (PINRO, Murmansk, Russia), M. Stein (ISH, Hamburg, Germany) and G. Nesvetova (PINRO, Murmansk, Interpreter) met at the Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO) during 24-31 August 1998. Terms of references and agenda as formulated during the fifth meeting of the previous project „Joint Russian/German Data Evaluation of Oceanographic Data from ICNAF/NAFO Standard Sections in the Davis Strait/Labrador Region" in Murmansk, August 1997, formed the basis for this Workshop.

Preliminary Results

Data acquisition

By means of data sets, derived from the World Ocean Atlas 1994 (WOA94) accessible from CD-ROM, and through the INTERNET page:

http://ingrid.ldgo.columbia.edu/SOURCES/.IGOSS/.data_products.html ,

which was used to download the mean monthly sea surface temperatures (SST, November, 1981 to July, 1998):

http://ingrid.ldgo.columbia.edu/SOURCES/.IGOSS/.nmc/.monthly/.sst/T+462.5/VALUE/X+-4.82034+64.82034+RANGE/Y+40.10894+79.89106+RANGE/?help+datafiles ,

interannual variability of the slope trapped boundary currents along the Seal Island-Cape Farewell Section, as well as the temporal changes of SST in the Labrador Sea region were analysed.
Data on regional mean sea level air pressure of land based stations around the Labrador Sea were provided by the Seewetteramt, Hamburg, Germany. The data cover the period from 1949 to 1998.

Software acquisition
The most recent version (August 1998) of the OCEAN-DATA-VIEW 4.0 software (ODV 4.0.3), as provided by R. Schlitzer from the Alfred-Wegener-Institute for Polar and Marine Research, Bremerhaven, Germany through the INTERNET (http://www.awi-bremerhaven.de/GPH/ODV), was used. The SST data were analysed by means of the software GriDV 1.0, provided by M. Antsiferov, PINRO.

Geostrophic computations
For consistency we used hydrographic data obtained along the Seal Island-Cape Farewell Section (Stein, 1988). These data were obtained by US Coast Guard vessels between 1948 and 1973 (Anon., 1965, 1967). The surface expressions of the two main ocean currents, the West Greenland Current and the Labrador Current, clearly emerged from the vertical fields of geostrophic velocities. In years where a polar water mass component was present in the West Greenland shelf and slope region, strong currents were encountered in this area.

SST-time series
Analysis will be made with the focus on potential differences in timing and amount of SST-anomalies on both sides of the Labrador Sea, and in the Labrador Sea proper.

Mean Sea Level Air Pressure
From the available data sets the station data of Nuuk, Frobisher Bay and Goose Bay were chosen to compute a regional air pressure index which characterise north/south, and west/east transports. The results show significant, positive correlations between the zonal transport Frobisher Bay/Goose Bay, and the North Atlantic Oscillation Index (NAO Index). This means when there is a positive NAO Index northwesterlies become stronger in the Labrador Sea region. Meridional transports Frobisher Bay/Nuuk are not significantly correlated to the NAO Index.

Strength of West Greenland Current/Year Class Strength of Cod

Current speed across the Seal Island-Cape Farewell section, as derived from the geostrophic computations, was considered to be relevant to the abundance of young cod off West Greenland. Thus, data on the year-class strength of cod at age 3 were taken from literature (Hansen and Buch, 1986), and compared to the current speed at 25m depth within the core of the West Greenland current. Statistical treatment shows that both data sets are significantly correlated ($r^2 = 0.46$, $p < 0.02$).

Future activities

It is planned to publish the results of the first and second workshop in primary literature. First scientific results may be presented at the NAFO June 1999 meeting in Dartmouth, Nova Scotia, Canada.

Next Meeting

The next Workshop meeting within the scope of the project will be held in ISH, Hamburg, Germany, tentatively during 9 to 16 May, 1999.

Acknowledgements

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