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Third Report of Joint Russian/German Data Evaluation of Oceanographic Data  
from ICNAF/NAFO Standard Sections in the Davis Strait/Labrador Region

by

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A Workshop consisting of V. A. Borovkov (PINRO, Murmansk, Russia), M. Stein (ISH, Hamburg, Germany) and G. Nesvetov (PINRO, Murmansk, Interpreter) met at the Institut für Seefischerei Hamburg (ISH) during 22-26 April 1996. Terms of references and agenda as formulated during the first meeting in Hamburg, September 1995, formed the basis for the Third Workshop (see Annex I of this report).

**Activities between Second and Third Workshop**

V.A. Borovkov supplied the workshop with a duplicate checked Russian/German data set. M. Stein provided the necessary literature data base for the workshop.

**Results**

In contrast to both previous workshops, this workshop concentrated on the achievement of a scientific publication entitled "Climatic Variability of Deep Waters off Greenland and in the Labrador Sea" (Abstract enclosed as Annex II of this report). This paper will be presented by M. Stein to the next NAFO Scientific Council Meeting in June 1996, in Dartmouth, N.S., Canada. It is planned to publish the manuscript in primary literature.

**Acknowledgements**

The members of the workshop appreciate the administrative help given by the director of ISH, Dr. G. Hubold and his staff.

**Abbreviations:**

ICNAF	International Commission for Northwest Atlantic Fisheries
ISH	Institut für Seefischerei
NAFO	Northwest Atlantic Fisheries Organisation
PINRO	Polar Research Institute of Marine Fisheries and Oceanography

**Joint Russian/German Data Evaluation of Oceanographic Data from  
ICNAF/NAFO Standard Sections in the Davis Strait/Labrador Region**

***Provisional agenda***

third meeting in Hamburg, 22 - 26 April 1996

- i) definition of terms of references
  - a) detection of variability on different time-scales
  - b) parameters to be analyzed
  - c) regional/basin-wide coherence of events
  
- ii) availability of data on Russian/German databases
  - a) data formats
  - b) data products
  
- iii) possible use of other data sources (NODC, WDC, others)
  - a) data formats
  - b) data products
  
- iv) available literature to compare workshop results
  
- v) publication of results (Report, NAFO, primary literature)

Annex II

## Climatic Variability of Deep Waters off Greenland and in the Labrador Sea

by

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### Abstract

The paper elucidates the distribution of the major water masses and some climatic events in deep water layers of the Labrador Sea area and of the eastern and western slope region. Temperature variance in the bottom water layer of the Labrador Sea (3,500m depth) amounts to 1K, compared to 0.5K in the deep water layers above the Denmark Strait Overflow (DSOW)-layer. The significant variance of the thermohaline signals points at high frequency variability in this layer. Trend analysis of both time-series reveals a small positive trend which amounts to 0.0002 PSU/year and 0.02 K/year. An east-west consistency both between the trend of the temperature/salinity time-series, and the vertical coherence profiles at the Cape Desolation Section off West Greenland, and at section 8A off Labrador is found. In the water layers dominated by the Irminger Atlantic Water (500-600m) and by the Labrador Sea Water (1,200-1,500m), variation of the thermohaline signal is significantly coherent ( $r > 0.6$ ,  $p < 0.001$ ). At Fylla Bank which is located at the shelf slope off Nuuk/West Greenland, consistency between the thermal and haline signal is less expressed than at the previous two sections. A hypothesis is formulated to explain the significant decrease of salinity in the DSOW-layer at the end of the 1950s. It is suggested that this anomaly is part of the Great Salinity Anomaly cycle. Further analysis of this phenomenon points at several low salinity/temperature events throughout the 45 years of observation. Following the above given hypothesis of DSOW formation mode and travel time, it would appear that the historic data series point at a regular advection of low salinity/temperature events in the DSOW-layer on a decadal time scale.

*Key words:* Deep waters, climatic variation, Denmark Strait Overflow water, Great Salinity Anomaly, Labrador Sea, Greenland

### Background

During the meeting of the NAFO Subcommittee on Environmental Research in June 1992, it was realized that there are large oceanographic databases in various institutes of Contracting Parties, and it was proposed that analyses should be undertaken in the view of climatic time-series, consistency of events and possible interrelationship with recruitment patterns in fish stocks. The area of interest should comprise the Labrador Sea and its eastern and western slope areas. Based on the Cooperation in Agricultural Research between Russia and Germany a project was finally