International Council for
the Exploration of the Sea

C.M. 1982 / C:3
Hydrography Committee

Report of the
Working Group on Oceanic Hydrography

1. The Working Group meeting was held on February 4 and 5, 1982, at the Chr. Mikkelsen Institute, Bergen, Norway. Present were G. Becker (FRG), J. Blindheim (Norway), D. Booth (UK), R. Clarke (Canada), F. Dahl (Norway), R. Dickson (UK), H. Dooley (UK), L. Golmen (Norway), K. Gould (UK), B. Hansen (Denmark), K.-P. Koltermann (FRG), T. Kvinge (Norway), Sv.-A. Malmberg (Iceland), J. Meincke (FRG), G.J. Prangsma (Netherlands), A. Svansson (Sweden), O.H. Saelen (Norway).

2. Participants presented results of recent work and plans for further studies in the North Atlantic. Although the reports covered a wide range of topics, the major lines of research are presently related to (i) processes controlling low frequency current fluctuations in the deep basins and along slopes, to (ii) problems relevant to the oceanic heat budget and to (iii) coherence between longer term changes of hydrographic conditions and fish stocks in specific areas.

3. The WG's "Inventory on Hydrographic Activities in the Oceanic ICES-Area" was updated (see Annex).

4. The final programme for the Deep Water Project was discussed and arrangements for the exchange of preliminary results between cruises were finalized. The timing of cruises is found as Annex.

5. The future role of the Service Hydrographique was discussed along the lines set during the last WG-meeting. The information provided by the Hydrographer and D. Ellett on the discussions during the Tokyo-Meeting of the CCCO for the WCRP was also taken into account. A viable role of the Service Hydrographique was seen in its function as North Atlantic Hydrographic Data Center, which
   - assures existence, quality and access to long term hydrographic time series relevant to physical and hydro-biological climatic studies and which
   - assists in the analysis of data sets from specialized hydrographic studies in the North Atlantic, such as ships of opportunity programmes and ICES-coordinated field work.

   Immediate specific tasks for the Service Hydrographique were considered to be (i) a recovery of all data from the interim era between good quality hydrocast and good quality CTD-work (i.e. the period 1965 to 1975) and (ii) to assure that the present and future CTD-data sets meet the internationally agreed quality criteria.

   The chairman of the WG was asked to present these views to the ad-hoc Group on the Future Role of the ICES-Service Hydrographique.

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6. A proposal by Dr.'s Dooley and Kullenberg to study the impact of intermediate water mass formation and spreading on fisheries along the margins of the Greenland/Norwegian Seas was discussed. It was stated that little is known about the fluctuations of intermediate waters, about their role in deep water formation and about their interaction with surface layers. It is expected that changes in intermediate water characteristics are significant indicators for ecosystem anomalies. Thus the presently ongoing Deep Water Project and studies along the southern and eastern margins of the Norwegian/Greenland Seas should be used to initiate research in this field. As a first step a special theme "The 1970's anomaly" was proposed for the 1983 Statutory Meeting. For this purpose contacts should be made to the CCCO Biological Panels.

7. Kvinge mentioned the potential of ODAS-platforms to be used in longer-term monitoring of upper-layer characteristics in the ocean. Interest' positions for deployment of such buoys were considered to be positions north and east of Iceland to obtain time series on Atlantic and Arctic water advection into the southern Norwegian Sea.

8. The present chairman had asked to be replaced. The Working Group elected Dr Harry D. Dooley to be nominated new chairman of the Working Group on Oceanic Hydrography.

J. Meincke
Chairman

ICES Working Group on Oceanic Hydrography

Inventory on Hydrographic Activities in the Oceanic

ICES-AREA

Compilation date: March 1982 ..... Sheet No: 1 ... out of 10 ...

Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Western North Atlantic							
Western basins	4	-	5	Kinematics Antarct. bottom water	WHOI-USA	Worthington	T,S-sections, currents 1 yr
Western North Atlantic	3	ongoing	6	Describe currents with model results	WHOI-USA	Schmitz	-
Western basins	4	-	5	Oceanic tides	IOS-UK	Cartwright	Bottom pressure 5 months
Antilles current	1,3	81	1,5	Transport determinations	UCM-USA AOML-USA	Schott	T,S-sections, currents
22-32° N, 28-30° W	1,3	-	5	Absolute flow deter-determinations	WHOI-USA SIO-USA	Stommel Armi	Stratification, tracers, currents
30° N, 70° W	2,3,4	82	4,5	Regional forecast modelling	HAU-USA	Robinson, Miller, Carter	Box-type studies
35° N, 50° W	1,3,4,5	-	5	Deep water mixing	SIO-USA	Armi	Stratification, currents 1 yr
Georges Bank	1	ongoing	1	Monitoring water masses, nutrients	PSF-POLAND	Piechura, Furtak, Pastuszak	Annual investigations
East of Grand Banks	3	-	5	Monitoring	NEFC-USA	Mountain	T,S-sections, currents 1 yr

*See list of abbreviations and numbers

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Gulf Stream	2,3,6	82-83	1,5	Gulf Stream transports	URI-USA	Rossby	-
Gulf Stream off Nova Scotia	2	82	2	Mixing and surface currents	AOL-CAN.	Tang	Stratification, currents drifters, biology
Gulf Stream Extension	3	79-81	1,5	Low frequency statistics	AOL-CAN. WHOI-USA SIO-USA	Hendry Fofonoff Armi	Stratification, currents long-term
New Foundland Basin	3	81	5	Source waters of NA current	AOL-CAN.	Clarke	Stratification, currents
New Foundland Basin	3	82	5	Current system	WHOI-USA	Schmitz	SOFAR floats
Northern New Foundland Basin	1	82	1	Eastward transport along polar front	AOL-CAN.	Lazier	Stratification, currents
Labrador shelf/slope	5	79-81	1	Transport of Labrador current	AOL-CAN.	Lazier	Currents 5 yrs
Nova Scotia shelf	1,2,6	-	5	Interaction shelf-slope waters	AOL-CAN.	Smith	Stratification, currents 1 yr, drifters
Nova Scotia rise	3	81-82	5	Vorticity under warm Gulf Stream rings	AOL-CAN.	Smith	Currents 1 yr
Nova Scotia rise	4	82	1	Bottom boundary layer/ sediment interaction	URI-USA	Wimbush	Currents, sediment disturbance

*See list of abbreviations and numbers

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Seamounts in western basins	3	81	4	Effects of isolated meso-scale topography	UEA-UK	Maskell	-
Flemish Cap	1	79-81	5	Environmental oceanography	AOL-CAN.	Ross	Stratification, currents, drifters, biology
Gulf Stream to continental shelf	1,2,4,6,7	81-83	1,2,4,6	Warm core rings, their biology, chemistry and physics	URI-USA WHOI-USA	Kester Wiebe	Stratification, currents, plankton nets, satellite imagery
New Foundland Basin	1,2,7	81-84	1,2,4	Hydrographic climatology	ASC-USSR	Sarkysian	Repeated hydro-met survey (2-4 times / yr)
Central North Atlantic							
SW of Azores	1,2,3	81-82	1	Circulation and biology of oceanic fronts	IOS-UK	Gould, Fasham, Angel	Stratification, currents, drifters, floats; biological parameters
N of Azores	1,2,3,7	82-84	1,2,4	North Atlantic current crossing Mid-Atlantic Ridge	IFM-FRG	Krauß, Meincke, Woods	Stratification, currents 2 yrs, drifters,
N of Azores	1,2	81-82	5	Mixing along fronts	KNMI-NETH.	Prangsma	Upper layer stratification, drifters
N and SW of Azores	1,3	83-84	2,4	Circulation, water masses	COB-FR.	Colin de Verdiere	Stratification, currents 1 yr, floats

*See list of abbreviations and numbers

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SW of Azores	3	80-84	1,2	Gulf Stream recirculation	WHOI-USA URI-USA	Richardson, Rossby	Long range floats
SW of Iceland	1,4,5	82-84	1,5	Water mass distribution	MRI-ICEL.	Jonsson	Stratification, nutrients heavy metals, geochemistry
Eastern North Atlantic							
NE-Atlantic basins	3	82-83	1,2	Mean circulation, eddy climatology	LOW-UK IOS-UK COB-FR. IFM-FRG	Dickson, Gurbutt Gould Maillard Müller	Stratification, XBT-sections currents long-term (NEADS)
Eastern Atlantic	3	84-85	2	Horizontal dispersion	LOW-UK IOS-UK	Dickson, Gurbutt Crease	SOFAR float experiment
European continental slope	1,2,3,7	-	5,6	Water masses - sources, modification, use in deducing eddy circulation	UEA-UK LOW-UK COB-FR. LOP-FR.	Harvey Gurbutt, Durance Colin de Verdiere Gascard	Stratification, floats (Tourbillon-Exp.)

*See list of abbreviations and numbers

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Continental slope off Britain	5,6	81-83	1,2,4,5,6	Slope currents, water exchange across slope	IOS-UK SMBA-UK LOW-UK MLA-UK	Gould, Huthnance Ellett Dickson, Durance Dooley	Stratification, currents, drifters, radio-chem., nephelometry
Madeira Abyssal Plain	3,4	80-81	1,4	Benthic boundary layer	IOS-UK	Saunders, Thorpe, Webb, Richards	Stratification, currents 1 yr, floats
NW-European continental slope	3,6	81	4	Oceanic tides	IOS-UK	Davies	
Celtic Sea shelf edge	3,6	-	5	Oceanic tides	IOS-UK	Heaps	Bottom pressure 5 months
Eastern basins	1,2,4,5	delayed	1	Meridional spreading and mixing	COB-FR. CFR-FR.	Madelain Chesselet	Radioact.tracers, in relation to TTO-progr.
Eastern basins	1	81-82	1,2	Meridional spreading and mixing	IFU-FRG	Roether	Radioact.tracers, in relation to TTO-progr.
Eastern basins	1,3	82-84	1,2	Natural radio-chemical concentrations	LOW-UK	Baker, Dickson, Gurbutt	Data for model application

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Eastern basins	1,3,7	82-83	2,4,5,6	Isopycnal distr. of natural tracers	LOW-UK	Shepherd, Gurbutt	2-D modelling in isopycnal coordinates, collection of silicate and radiocarbon samples
Eastern Atlantic	2,6	83	2,5	Thermocline, ocean-atmosphere interact.	UBO-FR. LOP-FR LOA-FR.		BT, currents, met. param., radiation
Eastern basins	1,3,4	82-85	2,4	Deep diffusion and dispersion	DHI-FRG	Kautsky, Mittelstaedt	Near-bottom current meter array, 2 yrs, stratificat.
Eastern basins	2,3	81-82	4	Ocean circulation	IOM-FR.	Le Provost	-
Eastern basins	1,4	81-82	1	Variations of deep stratification	COB-FR.	Vangriesheim	Stratification, currents 1 yr
Portugal shelf/slope	1,2,5,6,7	78-84	1,2,5	Dynamics of shelf and slope circ.	UOL-PORT	Fiuza, Ambar	Stratification, currents, remote sensing
Azores-Canary Islands	1,2,3,7	82-84	1,2,4	Dynamics of Canary Basin circulation	IFM-FRG	Siedler	Stratification, currents 3 yrs
W of Ireland	5	79-81	1	Surface drift pattern	UCG-IR.	Monahan	Surface drifters
Rockall Trough	3,5	80-82	1,5	Statistics of currents	IOS-UK	Gould	Currents long-term

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Faroe-Shetland Channel	2,6	79-85	2,5	Circulation	MLA-UK	Dooley, Martin	Stratification, currents 3 months
Iceland Basin	1,5	-	5	Water mass distribution	MRI-ICEL.	Malmberg	Stratification
English Channel-Azores-OWS'C'	2	81-83	1,4	Convection parameterization	IFM-FRG	Woods	Batfish-tows
North Atlantic Ocean Stations	1,2	to 85	1,5	Monitoring	WMO-ICES		T,S
Northern North Atlantic							
Faroe waters	1,2,6	79-82	1,2,5	General hydrography and currents, fertility	AF-FAROE DIF-DK.	Hansen Olsen	Stratification, currents, waves, prim.product. nutr.
Icelandic waters	1,2	79-82	1,5	Hydrobiology	MRI-ICEL.	Malmberg, Olafsson	Stratification
Major fishing areas	1	80-82	1	Fisheries oceanography	ICES-coord.	Smed	-
Norw.+ Greenland Seas	1,2,3,5,7	79-85	1,2,4	Hydrographic climatology	AARI-USSR	Nagurni	Repeated hydro-met.surveys (2-4 times / yr)
Northern Norweg. Sea	1,3,5,6	79-82	1,5	Transport of water masses	BFA-FRG	Stein	Stratification
Jan Mayen waters	1,3,5	80-81	1	Water exchange between Greenl. and Norweg. Sea	GI-NORW.	Foldvik, Saelen	Stratification, currents 1 yr

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Greenland Sea	1,2,7	82	2	Spreading of deep waters	DHI-FRG	Koltermann	Stratification, currents 1 yr
Norwegian Sea	1	ongoing	1	Fish. oceanography	IMR-NORW.	Blindheim	Trends in distr.& struct. of water masses
Norw.+ Greenland Seas, W-Greenland	1,5,6	81-83	1,2,5,6	Water and substance exchange slope/ocean	NPI-NORW. IPO-DK.	Elverhoi Kullenberg	currents, opt.-param.
Greenland Sea	1,2,6,7	82	1	Water mass formation, circulation	AOL-CAN SIO-USA	Clarke Swift, Reid	Stratification, geo-chemistry, vertical currents, nutrients
Norw. + Greenland Seas	2,3,5,6,7	79-81	1,2,5	Transport of mass and heat	UOW-USA GI-NORW.	Aagaard Foldvik	Currents 3 yrs
Norw. + Greenland Seas	1,2,5,6,7	80-82	6	Water mass formation, circulation	SIO-USA	Swift	T,S,O_2, nutrients, geo-chemical parameters
Norw. + Greenland Seas	5	83	2	Suspended sediment/water masses	NISR-NETH.	Eisma	Stratification,turbidity
Iceland Sea	1,5	81-82	1,2,5	Deep water, stratification	MRI-ICEL.	Malmberg, Olafsson	T,S,O_2, nutrients geo-chemical parameters
Fram Strait	5	81-83	1	Transport of mass and heat	NPI-NORW.	Vinje	Ice, currents, strat.

*See list of abbreviations and numbers

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
Arctic/Atlantic Ocean	1,5,7	82-83	4,5,6	Heat and water balance	UCG-SWED.	Andersson, Rudels, Stigebrandt, Walin	-
North Atlantic							
20° S-66° N, 0-80° W	2,3,7	79-83	4,5	Mean flow, dispersal of pollutants	LOW-UK	Gurbutt, Durance	General circulation model, 3D-box model in isopycnic coordinates
25-66° N, 0-80° W	2,3,7	82-84	4,6	Atlantic circulation	IFM-FRG	Krauß	Spectral model
0-66° N, 0-80° W	2,3,7	82-84	4,6	Atlantic circulation	IFM-FRG	Willebrand	Diagnostic model
North Atlantic	1,3,5,7	80-85	3,4	General circulation	MIT-USA	Wunsch	Satellite altimetry and chemical tracers
North Atlantic basins	3,5,7	81	1	Atlantic circulation	WHOI-USA LOW-UK	Brewer Shepherd	Transient tracers (TTO-progr.)
0-30° N, 0-80° W	1	81-82	6	Subsurface fronts and mixing	CSIRO-AUST.	Tomczak	-
North of 50° N	1,5	81-82	6	Deep circulation	SIO-USA	Swift	T,S,O_2, silica, geochemical param.

*See list of abbreviations and numbers

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Area	Type of work*	Time	Status*	Major interest	Institute*	Scientist	Type of measurements or modelling
North Atlantic	1,2	81-82	6	Near surface thermal and density structures	SAI-USA	Grabowski	MBT-XBT data
North Atlantic	1	81-83	1	General circulation, heat flux, trends	MIT-USA WHOI-USA AOL-CAN.	Wunsch Stommel Hendry	High quality hydrographic sections, merid. and zonal
North Atlantic	1,2	80-82	6	Climatology, environmental oceanography	IMER-UK	Taylor	Analysis of OWS-data
North Atlantic	2,3	82-83	4	Annual variation in boundary currents	AP-UK	Andersen	-

*See list of abbreviations and numbers

List of abbreviations and numbers

Type of work:
1: Hydrography of the l h Atlantic waters
2: Upper ocean processes
3: Kinematics and dynamics of the oceans' interior
4: Deep ocean benthic processes
5: Exchanges between the North Atlantic Ocean and its adjacent seas
6: Interaction between ocean- and slope-waters
7: Vertical transport processes

tus:
1: Current field work
2: Plans for field work
3: Ideas for field work
4: Current theoretical work
5: Data analysis
6: Analysis of historical data

Institutions:

WHOI-USA:	Woods Hole Oceanographic Institution, Woods Hole, Mass., USA
MIT-USA:	Massachusetts Institute of Technology, Cambridge, USA
USCG-USA:	US Coast Guard Oceanography Unit, Wash., D.C., USA
UOW-USA:	University of Washington, Seattle, USA
UOM-USA:	University of Miami, Miami, Florida, USA
AOML-USA:	NOAA-Atlantic Oceanographic and Meteorological Laboratory, Miami, Florida, USA
NEFC-USA:	Northeastern Fisheries Center, Woods Hole, Mass., USA
URI-USA:	University of Rhode Island, Kingston, R.I., USA
SIO-USA:	Scripps Institution of Oceanography, La Jolla, California, USA
SAI-USA:	Science Applications Inc., McLean, Virginia, USA
HAU-USA:	Harvard University, Cambridge, Mass., USA
AOL-CAN.:	Atlantic Oceanographic Laboratory, Dartmouth, Nova Scotia, Canada
MRI-ICEL.:	Marine Research Institute, Reykjavik, Iceland
LOW-UK:	MAFF - Fisheries Laboratory, Lowestoft, UK
IOS-UK.:	Institute of Oceanographic Sciences, Wormley, UK
MLA-UK:	Marine Laboratory, Aberdeen, UK
SMBA-UK:	Scottish Marine Biological Assoc., Oban, Scotland
UEA-UK:	University of East Anglia, Norwich, UK
IMER-UK:	Institute for Marine Environmental Research, Prospect Place, The Hoe, Plymouth, UK
AP-UK:	Atmospheric Phyiscs, Clarendon Lab., Oxford, UK
UCG-IR.:	University College, Dept. of Oceanography, Galway, Ireland
UOG-SWED.:	University of Gothenburg, Dept. of Oceanogr., Gothenburg, Sweden
CFR-FR.:	Centre des Faibles Radioactives, Gif sur Yvette, France
COB-FR.:	Centre Océanologique de Bretagne, Brest, France
LOP-FR.:	Laboratoire d'Oceanographie Physique, Paris, France
IOM-FR.:	Institute of Mechanics, Grenoble, France
UBO-FR.:	Université Bretagne Occidentale, Brest, France
LOA-FR.:	Laboratoire d'Optique Atmospherique, Lille, France
IEO-SP:	Institut Espanol d'Oceanographie, Madrid, Spain
UOL-PORT.:	University of Lisbon, Dept. of Physics, Lisbon, Portugal
KNMI-NETH.:	Koninklikjk Nederlands Meteorologisch Instituut, De Bilt, Netherlands
NISR-NETH.:	Netherlands Institute of Sea Research, Texel, Netherlands
IFM-FRG:	Institut für Meereskunde, Kiel, FRG
DHI-FRG:	Deutsches Hydrographisches Institut, Hamburg, FRG
BFA-FRG:	Bundesforschungsanstalt für Fischerei, Hamburg, FRG
IFU-FRG:	Institut für Umweltphysik, Heidelberg, FRG
IPO-DK.:	Institute for Physical Oceanography, Copenhagen, Denmark
DIF-DK.:	Danish Institute for Fisheries and Marine Research, Hirtshals, Denmark
GI-NORW.:	Geophysical Institute, Bergen, Norway
IMR-NORW.:	Institute for Marine Research, Bergen, Norway
NPI-NORW.:	Norwegian Polar Institute, Oslo, Norway
AARI-USSR:	Arctic and Antarctic Research Inst., Leningrad, USSR
ASC-USSR:	Academy of Sciences, Moscow, USSR
PSF-POLAND:	Polish Institute for Sea Fisheries, Gdynia, Poland
AF-FAROE:	Academia Faroensis, Thorshavn, Faroe Islands
CSIRO-AUST.:	CSIRO Marine Laboratories, Div. of Oceanography, Cronulla, Australia.

ICES Working Group on Oceanic Hydrography

Timing of Cruises for the
Deep Water Project 81/82
Date: 4 February 1982

August 9-23, 1981 Icelandic RV "Bjarni Saemundsson"

Cruise in the Iceland Sea
1) Deep CTD-stations (Sv.-A. Malmberg, Institute for Marine Research, Reykjavik, Iceland)
2) Trace-metal geochemistry, Kalbeinsaj Ridge area (Jon Olafsson, Institute for Marine Research, Reykjavik, Iceland)

November 9-19, 1981 Norwegian RV "Håkon Mosby"

Cruise into the Jan Mayen area to replace moorings and try to do deep CTD-stations for volumetric analysis, optical parameters (O.H. Saelen, Geophysical Institute, University of Bergen, Norway)

February 24 - April 5, 1982 Canadian RV "Hudson"

Cruise into the Norwegian Sea concentrating on the area north of Jan Mayen. Deep CTD O_2 stations, nutrients, alkalinity and total carbon. 5-10 day deep convection experiment with vertical current meters and Batfish tows. Surface CO_2 underway.
(A. Clarke, Bedford Institute of Oceanography, Dartmouth, N.S., Canada,
J. Swift, Scripps Institution of Oceanography, La Jolla, Calif., USA)

February 22 - March 5, 1982 Icelandic RV "Bjarni Saemundsson"

Cruise from Iceland to Jan Mayen (Sv.-A. Malmberg)

March 4-16, 1982 Norwegian RV "Håkon Mosby"

Cruise to area N of Jan Mayen (O.H. Saelen)

March 1982, Russian Icebreaker "Otto Schmidt"

Cruise along the ice edge East of Greenland with Icelandic participation (Sv.-A. Malmberg)

May 19 - July 17, 1982 German RV "Meteor"

Cruise into Norwegian/Greenland Sea. Deep CTD, O_2 and nutrients, radio-chemistry. Current meter moorings and towed CTD-surveys. Station grid coordinated with Hudson-cruise.
(K.-P. Koltermann, Deutsches Hydrographisches Institut, Hamburg, FR Germany).