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International Council for
the Exploration of the Sea

CM 1983/C:3
Hydrography Committee

Report of the
Working Group on Oceanic Hydrography

- 1 OPENING OF MEETING AND ADOPTION OF AGENDA
 - 1.1 The Working Group met at the Centre Océanologique de Bretagne (COB) near Brest, France from April 27-29 1983. Present were J Blindheim (Norway), E Buch (Denmark), R Clarke (Canada), R Dickson (UK), H Dooley (UK), D Ellett (UK), J-C Gascard (France), J Gould (UK), T Holtø (UK), K P Koltermann (FRG), C Maillard (France), F Madelain (France), Sv-A MalMBERG (Iceland), T McAndrew (UK), J Meincke (FRG), W Roether (FRG), G Prangmsma (Netherlands), J Price (USA), O Saelen (Norway), M Stein (FRG), A Svansson (Sweden).
 - 1.2 The agenda and terms of reference of the working group were reviewed and agreed. The agenda and annotations are attached as Annex 1. T McAndrew served as Rapporteur.
- 2 RESEARCH ACTIVITIES
 - 2.1 Participants presented reports on recent research in the Madeira abyssal plain, the Rockall Channel, along the mid-Atlantic Ridge, the Denmark Strait and the Norwegian Sea. Of particular interest were:-
 - (a) The large number of successful long term current meter records demonstrating the existence of a generally cyclonic flow at depth in the Eastern Basin.
 - (b) The extensive use of drifting buoys in a study of the exchange between the western and eastern North Atlantic Basins, backed up by repeated CTD sections along the mid-Atlantic Ridge.
 - (c) The seasonal signal in the intensity of the Rockall Bank Taylor Column.
 - (d) Results from CTD and tritium sections in the Denmark Strait (subsequent to Overflow '73) which throws light on the origin of the Denmark Strait overflow water.
 - (e) Fisheries oceanographic investigations in the Norwegian Sea and Davis Strait.
 - (f) The CONSLEX project (CONTinental Slope EXperiment), which suffered some equipment losses due to heavy fishing activity on the UK continental slope. The overall data return is about 70%.
 - 2.2 Plans for future work lay along similar lines and included:
 - (a) An intensive UK, French, US survey in the Eastern Basin using SOFAR floats at three levels below 700 m.
 - (b) A French/German survey of the mid-Atlantic ridge between 24N and 54N (TOPOGULF).
 - (c) Drifting buoy studies in the Rockall Channel and over the mid-Atlantic ridge.

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- (d) Continuation of study of Labrador Sea water entering the polar front and the establishment of a large mooring array near the New England Seamount to investigate Gulf Stream instabilities.
- (e) Continuation of continental slope current measurements to the west and north of the UK (CONSLEX).
- (f) Observations of horizontal advection and diffusion of Mediterranean salt tongue. (in conjunction with (a)).
- (g) Salt lens tracking (in September 1984) in eastern North Atlantic and air-sea interaction studies at three moorings in Canary Basin in vicinity of 35N from winter of 84/85 to winter of 85/86.

- 2.3 The SCOR WG 68 (Miami) meeting was discussed, taking into account a later meeting at the JOA Halifax in August 1982. It was suggested that the ICES members of that working group continue their collaboration at an informal meeting during the course of the forthcoming IUGG meeting.
- 2.4 The WG's "Inventory of Hydrographic Activities in the Oceanic ICES Area" was briefly reviewed and members invited to update their contributions. It was agreed that completed inventory questionnaires should be sent initially to the Service Hydrographique for forwarding to the editor of the inventory.

3 DEEP WATER PROJECT

- 3.1 The main field phase of the ICES Deep Water Project is now complete. Unfortunately deep water formation was not observed; the reasons may be related to climatic factors or to observational difficulties arising from the possible very localised nature of the formation process. The possibility was raised that the absence of deep water renewal may have been due to the reduced inflowing salinity associated with the 1970s anomaly. Recent satellite data have identified a polynya between Svalbard and Greenland which may be associated with a "bump" in topography. The possible implication that this may have on the formation process was discussed. Analyses of the observations collected during 1982 are continuing.
- 3.2 Mr Holt of the Climate Research Unit, Norwich, described his current work on the impact on the planned reduction in discharge of Russian rivers into the Arctic Ocean and discussed the likely implications on ice cover and hence, deep water formation. Several significant statistical links had been established but in the absence of a detailed understanding of the oceanography of the area, including the mechanisms driving the formation process, only very general inferences can be drawn.

4 TRACERS IN THE DEEP OCEAN

- 4.1 The Working Group was honoured by a presentation from Wolfgang Roether of Heidelberg University who has been active in the use of non-radioactive and radioactive tracers in interpreting mechanisms of ocean circulation at long time scales. He described the tracers used to provide information on the ventilation time of the deep ocean and the main thermocline and reviewed ongoing and forthcoming programmes in the Sargasso Sea, Norwegian Sea and the Labrador Sea. Of particular interest to the WG were the tracer results from the eastern North Atlantic. These are now

beginning to provide important, indirect, evidence of circulation, ventilation and time scales in the deep ocean for comparison with that of the conventional observational programmes conducted by members of the WG.

5 ICES MATTERS

- 5.1 In reviewing the response to a circular which advertised the proposed special topic for the 1984 Statutory Meeting (C.Res/5:2) the WG concluded that there is likely to be considerable support for such a meeting, including input from a wide spectrum of biological research activities. The latest research results relevant to the "1970s anomaly" were presented and discussed.
- 5.2 Paper CM1982/G14, presented to last year's Demersal Fish Committee was briefly discussed as its findings were of interest to the WG. However the WG were unaware of any oceanographic or meteorological mechanism which could explain the relationships established in this paper.
- 5.3 The WG agreed, following discussion of the proposed Marine Data Management Working Group's guidelines on current meter and CTD data exchange, that consideration should be given to the feasibility of including water bottle/rosette observations, collected for the purpose of calibrating CTD casts, as a standard hydro-cast station for data banking purposes. It was considered that this would ensure the rapid availability of accurate and reliable data. The importance of taking concurrent calibration observations with CTD casts was emphasised.

6 OCEAN WEATHER SHIPS

- 6.1 The WG agreed that the updating and subsequent publication of the bibliography of reports using Ocean Weather Ship data should be pursued.
- 6.2 The group was advised of the possibility that the NAOS Ocean Weather Ships would cease to operate after 1985. They considered that the long period time series of temperature and salinity measurements in the North Atlantic was an important tool in attempting to achieve an understanding of the ocean dynamics and climate of the North Atlantic. They noted that the World Climate Research Programme shared this opinion; they considered that the reliability of remote sensing methods was not yet sufficient to ensure continuation of the time series. The Oceanic Hydrography Working Group therefore invites the Hydrography Committee to re-emphasise the value of such series to ICES members and to recommend that the Council resolve at their 1983 Statutory Meeting to take such action through their respective Governments as they may consider appropriate to ensure continuation of the series of measurements.

7 NEXT MEETING

7.1 An invitation from Professor Currie to hold the next meeting at the Dunstaffnage Marine Research Laboratory, Oban, Scotland for 2 days in May 1984 was put forward by Mr Ellett and was favourably received by the members.

7.2 It was agreed that the next meeting should focus on the following topics:-

(a) The Deep Water Project. A theoretical oceanographer, expert in deep water formation processes and ocean circulation should be invited in order to contribute to the discussion of the Deep Water Project results and to present the group with the latest developments in ocean modelling.

(b) A review of our present understanding of the North Atlantic and Subarctic Sea circulation, taking into account recent studies by the WG members, including the Deep Water Project and the effect of the 1970s anomaly. In order to facilitate this review, a group consisting principally of the ICES/SCOR WG 68 members of this WG should bring together relevant information for analytical appraisal and discussion at the next meeting. This group, headed by J Gould, will attempt to identify an appropriate observational project which will seek to develop our understanding of the North Atlantic circulation and the factors causing long term changes in this circulation.

(c) It was agreed that a compilation and interpretation of Ocean Weather Ship data for the 1970s should be prepared by a small group, including D Ellett, G Prangma and J Blindheim, for discussion and comment at the next meeting with a view to preparing a contribution to the 1984 special theme and to appraising the overall usefulness of OWS data in climatological studies.

8 ANY OTHER BUSINESS

8.1 There being no other business, the chairman closed the meeting at 1220, 29 April, expressing appreciation to Francois Madelain for the excellent facilities provided for this meeting.

H D Dooley
(Chairman)

ANNOTATIONS TO THE AGENDA

- Item 1.3 - Erik Buch of Denmark has been nominated to the Working Group.
- Item 1.5 - Our Terms of Reference are contained in C.Res.1976/2:19 and C.Res.1977/2:14. They are:-
- (a) to advise and report to the Hydrography Committee on activities and progress in oceanic hydrography;
 - (b) to identify problems and propose, as required, subgroups to plan, coordinate and report cooperative research activities in oceanic hydrography;
 - (c) to coordinate hydrographic programmes on WMO North Atlantic Ocean Stations.
- Item 2.5 - The SCOR working groups of most relevance to our interests are:-
- 34 (Internal Dynamics of the Ocean). This group has now completed its work. It has strongly recommended an observational study of eddy-mean field interactions in the current, extension, and recirculation region of the Gulf Stream.
 - 51 (Evaluation of CTD data). No word yet about publication of report but the section by Fofonoff on computer algorithms is coming out as a UNESCO Technical Report in Marine Science (info from Jim Crease).
 - 66 (Oceanographic Applications of Drifting Buoys) This group has not yet met but Jens Meincke may wish to report on the group's objectives.
 - 68 (North Atlantic Circulation). This ICES/SCOR Group is represented by several members of this Group. We need to discuss the experiences of last year's Miami meeting and the objectives of the forthcoming meeting.
- Item 3.1 - Tom Holt of the Climate Research Unit, Norwich, England will present the case that variations in freshwater flow from Russian rivers can influence ice conditions in the Svalbard area and hence possibly affect deep water formation processes.
- Item 4.1 - Dr Roether will bring us up-to-date in the relatively new field of "tracer oceanography".
- Item 5.1 - We have to decide whether or not this theme justifies a multi-committee special topic for 1984 by reviewing our latest knowledge concerning the 1970's events and synthesising the overall response to the inquiry sent out to key fishery scientists at the end of last year.

OCEANIC HYDROGRAPHY WORKING GROUP

BREST 27-29 APRIL 1983

PROVISIONAL AGENDA

1. ORGANISATION OF MEETING
 - 1.1 Opening of the meeting
 - 1.2 Appointment of Rapporteur
 - 1.3 Review of membership
 - 1.4 Approval of agenda and modus operandi
 - 1.5 Review of Terms of Reference
2. REVIEW OF NATIONAL RESEARCH RESULTS
 - 2.1 Institute results
 - 2.2 Inventory (JM)
 - 2.3 International/multi-institute activities in North Atlantic (Conslex, Misex etc) (GK,JG,RD etc)
 - 2.4 NE Atlantic SOFAR Float experiments (JG,FM,RD,PR)
 - 2.5 IOC/SCOR activities [POMS,CCO,WGS34,51,66,68]
 - 2.6 Discussion on areas of interaction (JM,GK etc)
3. DEEP WATER PROJECT
 - 3.1 Effects of river runoff changes (TH)
 - 3.2 Presentation/discussion of results to date (AC,PK etc)
 - 3.3 Discussion on future of project
4. TRACERS IN THE DEEP OCEAN
 - 4.1 Review of recent work (WR)
 - 4.2 Discussion on contribution to ocean circulation problems (RD etc)
5. ICES MATTERS
 - 5.1 1984 special theme on mid-1970's anomaly (HD)
 - 5.2 Review non-hydrographic papers presented to ICES 1982 (G:14,H:61) (SM)
 - 5.3 Members papers planned for presentation at ICES 1983
 - 5.4 CTD intercalibration (C.M.1982/C:25) (JG)
 - 5.5 CTD and current meter data exchange guidelines (Ref JM letter of 9 Sept 1982 to members)
 - 5.6 Future role of Service Hydrographique (C.M.1982/C:4)
6. OCEAN WEATHER SHIPS
 - 6.1 Review and uses of data (DE)
 - 6.2 Future of Weather Ships (TM)
7. NEXT MEETING
 - 7.1 Topics
 - 7.2 Date and Place
8. ANY OTHER BUSINESS

Items 5.2,5.3,5.6 - These are information items principally for the benefit of those member's unable to attend or get access to material generated by the ICES Statutory meetings.

We should be aware of, in particular, the suggestion in paper G14 that until now small attention has been paid to the main Atlantic currents due to the difficulties in getting a detailed and extensive set of data to relate them with annual, or seasonal, fishery events. It is suggested that satellite remote sensing will make it possible to take into account the detailed and extensive features of ocean currents.

Item 6.2 - Consideration is presently being given to the complete withdrawal of the NA weather ships on 31 December 1985. If we value the oceanographic data collected by these platforms then we should consider action which hopefully may minimise this threat. In 1974, in response to a threat at that time, it was decided that (C.Res 1974/4:1): National delegates would communicate to their national authorities concerning renegotiation of the North Atlantic Ocean Stations agreement, the importance ICES places on the NAOS system in view of the valuable time series of oceanographic information the ships provide and in particular the importance they have in establishing baselines for marine pollution monitoring as well as for air-sea interaction studies.

