

REPORT OF THE AD HOC WORKING GROUP ON SEA-BED CHARTING

Copenhagen, 21-22 April 1980

1. Attached is the report of the ad hoc Working Group which was established by C.Res. 1979/2:9 to advise the Bureau concerning the feasibility of preparing sea-bed charts. The Bureau considered the report at its meeting on 19-20 May 1980, and the following is an extract from its protocol :

"The Group was complimented with the amount of information they had gathered, which contributes significantly to the discussion of the feasibility of this important project. The Bureau noted that the Council had previously given support in principle to it, subject to the outcome of the feasibility study. It was felt, however, that before the Bureau could recommend any action to the Council, the matter should again be discussed by the scientific community in the Council's Committees during the forthcoming Statutory Meeting. The General Secretary was therefore asked to make the report available as a general document to the meeting, preferably also with advance distribution to the relevant Committees' members."

REPORT OF THE AD HOC WORKING GROUP MEETING ON SEA-BED CHARTING

Copenhagen, 21-22 April 1980

The ad hoc Working Group (WG) convened at 10.00 am and included representatives from 7 member nations (Annex 1). The purpose of the meeting was:

- 1) to advise the Bureau in regard to the possibilities to establish protocols, and
- 2) to develop the standard methods, including symbols, notations, etc., essential to preparation of charts on sea-bed characteristics, uses, and important benthic invertebrates and finfishes.

Several participants emphasised that the proposed charts would have great value in resolving situations when issues of multiple uses of the sea-bed, e.g. aggregate extraction, oil development and fisheries, might develop. Moreover, properly charted resource maps will be useful in planning activities involving the continental shelves and sea-beds of major coastal areas.

Following the introduction by the General Secretary, who emphasised that the WG should be especially concerned with format, publication form, i.e. separate sheets or bound atlas, and editing, the Chairman distributed a preliminary Agenda (Annex 3) and the pertaining resolution (Annex 2).

Participants reviewed the various mapping projects that are presently ongoing in several member nations. Many of these are referenced in Annex 4. It was readily apparent that there were numerous data, especially geological, that could be used to prepare standard-based charts for an ICES series. References were made to several ICES documents which might be important to the project, especially Doc. C.M.1978/E:12. A number of participants noted that work was ongoing in member nations with regard to preparing standard maps or charts. Particular emphasis was given to the efforts of the Royal Geographical Society's (United Kingdom) North Sea Resources Atlas project and noted that persons from this project had already been in contact with the General Secretary of ICES. It was further noted that a number of projects were held in abeyance until the results of the present meeting were known. The participants concurred that an ICES series might include 1) the North Sea and Channel, 2) the Irish Sea and coastal waters of the United Kingdom, Iceland and the Republic of Ireland, 3) the Baltic Sea and 4) the waters of the western Atlantic off Canada and the United States. It was agreed that to begin the project, it will be necessary to develop base maps, which emphasise depiction of surficial sediment type distributions for the North Sea and other areas, e.g. western North Atlantic, for which information is readily available.

The series should also be mapped on a larger scale initially and reduced to A4 format in an economical fashion; black and white printing could be done by ICES internally. The system reported by the Netherlands (Anon., 1980) appears efficient and might lend itself to periodic upgrading.

It was noted that, with some exceptions, there have been few efforts to integrate fisheries data with geological and other physical data, and, especially, that there were few previous efforts to synthesise or project life history information on charts. Moreover, the participants noted that gaps in information will become clear when mapping proceeds; the project could be of particular use in identifying areas of needed research.

In a number of instances, it was noted that necessary or important information might be withheld or delayed because of the security importance of such information.

While several projections have been used for presentation of existing data, there were several suggestions that, for the larger-scale charts, the UTM projection might be useful at latitudes below 80°N and Polar Stereographic projection north of this. The UTM projection is compatible with the presentation of certain satellite-derived data and is becoming standardised among nations. The geologists and physical scientists present noted that there had been previous compilations of certain physical data from member nations under the auspices of UNESCO. They also noted that existing geological data, especially on sedimentology, were often presented in a diverse manner and it would be necessary to format data from member nations so that they could be reported in standard units, i.e. as phi units, grain size in mm, etc. It was also stressed that some ways of reporting geological data would have greater utility to biologists; gross break-downs of sediment types might not be useful in interpreting the nature of successful spawning and recruitment processes. It was noted, for instance, that several categories of sand types might be essential. In relation to these matters, the advice of the Chairman of the Pelagic Fish Committee was sought in regard to the role of sediment type in herring spawning. He indicated that while earlier studies suggested a close relationship between sediment types and herring spawning, in recent years these fish are spawning in other localities, which previously did not appear to be major spawning grounds. It is believed that other environmental conditions may override the importance of sediment type in relation to spawning. Nevertheless, the WG believed that spawning areas, both recent and historical, should be mapped, so that these areas can be considered when large-scale extraction and development activities are proposed. One participant noted that recent studies show that successful spawning of herring may be contingent upon proper sediment type, currents and temperature and other environmental variables. (See also de Groot (1979) Annex 4.)

A presentation by the ICES Statistician was requested to determine the possibility of obtaining sufficient ICES data useful in mapping fisheries distribution by standard statistical rectangles (ICES, 1977). It appears that in recent years there are not sufficient data from this source alone to complete the mapping of fisheries resources in a more or less synoptic fashion. Participants strongly suggested that it would be most useful to the project to continue and increase ICES reporting of fisheries data by use of the standard ICES Statistical Rectangles Coding System.

The participants concurred that the first steps to be taken included the preparation of base maps on an approximative 1 : 1000000 scale, and on a 1 : 300000 scale where suitable. The initial charts should use existing data to develop depictions of the distribution(s) of sediment types and morphology, and topography. It was also noted that local and national maps already contain information on cable and pipeline locations, which would be useful for the scales and format proposed.

The scales to be used as well as how to combine sediment charting with other parameters, such as for instance bottom currents, need to be discussed further by the advisory group proposed below.

The procedure(s) necessary in carrying on the proposed ICES project, the way forward, could perhaps best be done by obtaining the services of an individual, who would see to the details and continuity of the mapping activities. This person would work with one or more ICES Working Groups through an advisory machinery formed of representatives of these Groups to bring together various data of a physical and chemical nature, as well as the diverse information on living resources. The principal investigator, in consultation with the advisory group, could

- 1) identify the needs for the resulting charts, as well as the principal user groups,
- 2) identify and assess the accuracy of existing data and

information, and 3) determine who the principal national contributors of data might be, and how they can collaborate in producing the proposed charts so that they best meet the needs of the users.

Preliminary draft charts would then be prepared on aspects of the distributions abundances, natural history of species, migration routes, spawning areas, etc. in relation to charts showing surficial sediment and other physical information. The assisting advisory group could be convened on the basis of need in terms of assisting the principal investigator and would suggest new procedures. The drafts would be presented for review to appropriate national experts. Following comments from the reviewers, the responsible individual would then see to the drafting of charts for publication. It was stressed that appropriate national representation would be required to ensure the requisite data for areas bounded by several nations, e.g. the Baltic Sea. Moreover, it was strongly recommended that national experts be questioned in regard to known relationships between organisms and sediment types and other physical variables that might be mapped, e.g. pollution effects. etc.

Certain details, such as the type of position fixing used for the collection of data for chart preparation, must be given.

The WG had the following recommendations to the Bureau:

- 1) that a mechanism similar to the foregoing be set up within ICES to appoint a principal responsible investigator (editor) and an advisory group to carry forward the preparation of charts;
- 2) that the first charts should involve the preparation of base maps (according to the advice and specifications of the advisory committee), which contain information on the surficial sediments of the North Sea and other areas of interest to ICES and for which the requisite information exists;
- 3) that the various standing ICES fisheries and shellfish committees be queried in regard to what information exists which could be of immediate or eventual use in mapping biological information from the ICES statistical areas and the western North Atlantic off Canada and United States;
- 4) that the appropriate Committees should be requested to, in as far as possible, collect and analyse data essential to the charting of various species and life-stages of interest;
- 5) that ICES, in whatever manner possible, encourages and fosters the collaboration of sedimentologists and biologists, to further understand the relationships between the well-being of biota and their sediment habitats.

To this end the WG suggested that a mini-symposium should be convened, perhaps during the 1982 or 1983 Statutory Meeting, which would bring together participants from several disciplines to further our knowledge of the relationships between marine biota and their benthic habitats.

The initial draft base charts, hopefully prepared before the mini-symposium is convened, would serve as a basis for presentations and discussions.

- 6) that ICES should take all steps to ensure adequate communication between biologists and mappers of member countries and Organisations such as the International Association of Sedimentologists (IAS).¹⁾ Such interactions could be expedited jointly by ICES and SCOR.
- 7) that, prior to the implementation of the aforementioned recommendations, ICES encourage the charting of resources on the national levels; such activities will contribute to the eventual ICES international mapping program.
- 8) that members of the present ad hoc Working Group furnish to the Chairman additional information on the availability and source of charted data and information beyond that given in Annex 4.
- 9) that, where possible, information and data on long-term changes in demersal fisheries and spawning areas, benthos and sediments, be furnished to the Chairman of the ad hoc Working Group so that they can be forwarded to the other Working Group members and interested ICES scientists.

1) I.A.S.
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ANNEX I

LIST OF PARTICIPANTS

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ANNEX 2

Resolution from ICES Statutory Meeting in 1979

"C.Res.1979/2:9

It was decided, that an ad hoc Working Group should be formed and convened in March or April 1980 to - as preparation for a feasibility study - advise the Bureau about possibilities to establish protocol and develop the standard methods required for preparation of charts on sea-bed physical characteristics, uses, and commercially important benthic invertebrates and finfishes.

The Group should be prepared to select the standard symbols and other details required for preparation of the charts as well as to identify the various national resources and persons that are presently involved in making maps and which could be used as resources.

The Group should report to the Bureau at its mid-year meeting on 19 and 20 May 1980. In inviting representation to the Group, the Council should stress the need to establish contacts with the right institutions and authorities in the different member countries".

ANNEX 3

A G E N D A

ICES

ad hoc Working Group on the
Feasibility of Seabed Charting

Copenhagen, Denmark

April 21-22, 1980

1. Introduction by the General Secretary.
2. Consideration of national mapping activities.
3. Discussion of the need for an ICES international mapping project.
4. The way forward in developing an ICES mapping project.
 - 4.1 The committee and its responsibilities.
 - 4.2 The role of ICES staff; the role of national scientists and mappers.
 - 4.3 The format for the ICES mapping series.

ANNEX 4

LIST OF LITERATURE AND CHARTS

LITERATURE

- Anon. 1979a. Kodiak Interim Synthesis Report. Environmental Assessment of the Alaskan Continental Shelf. Boulder, Colorado, US Dept. Commerce, NOAA, ERL, US Dept. Interior. Bur.Landmanagement, 1-XV, 1-215, ills.
- Anon. 1979b. Lower Cook Inlet. Interim Synthesis Report. Environmental Assessment of the Alaskan Continental Shelf. Boulder, Colorado, US Dept. Commerce, NOAA, ERL, US Dept. Interior, Bur.Landmanagement, I-XVI, 1-241.
- Anon. 1979c. Report of the Norwegian EEC Joint Scientific Sub-group on the distribution of shared fish stocks in the North Sea (12-15 June, 1979, Bergen). ICES, Doc. C.M.1979/H:61 (mimeo.).
- Anon. 1980. Leaflet of the Rijkswaterstaat North Sea Directorate of the Neth. Dept. of Public Works giving information on availability of documentation charts (1: 50000) of the Dutch part of the Continental Shelf.
- Ellis, M Y (Edit.). 1978. Coastal Mapping Handbook. US Dept. of the Interior, Geological Survey; and US Dept. of Commerce, National Oceanic and Atmospheric Admin.
- Good, R E et al. 1978. Analysis and delineation of submerged vegetation of coastal New Jersey. A case study of Little Egg Harbor. Rutgers, State Univ., New Jersey. Center for Coastal and Environm. Studies, I-XI, 1-58, ills.
- Groot, S J de. 1979. The consequence of marine gravel extraction for the spawning of herring. ICES, C.M.1979/E:5 (mimeo.).
- Lee, A J and Ramster, J W. 1979. Atlas of the seas around the British Isles. MAFF, Dir.Fish.Res., Lowestoft, Fish.Res.Techn.Rep. 20 (1979 version), 51 maps.
- Lippson, A J (Edit.). 1973. The Chesapeake Bay in Maryland. An atlas of natural resources. Baltimore, John Hopkins Univ.Press, I-VIII, 1-55, ills.
- Lippson, A J et al. 1979. Environmental atlas of the Potomac Estuary, with 9 maps. Maryland Dept. of Natural Resources.
- Ruckley, N A and D Evans. 1979. Catalogue of IGS maps and reports for offshore Scotland (February 1978). Inst. Geol.Sciences, CSNU Rep. 79/1, 1-37, ills.
- Schüttenhelm, R T E. 1980. The superficial geology of the Dutch sector of the North Sea. Mar.Geol., 34, M 27 - M 37.
- Soule, D F and M Oguri (Edit.). 1976. Potential effects of dredging on the biota of outer Los Angeles harbor. Toxicity, bioassay, and recolonisation studies. Mar.Stud.San Pedro Bay, Calif. Part II:237-260, ills.
- Williams, A B and R L Wigley. 1979. Distribution of decapod crustacea off north-eastern United States based on specimens at the Northeast Fisheries Center, Woods Hole, Mass. NOAA Techn.Rep., NMFS Circ. 407, I-III,1-44, ills.

CHARTS AND MAPS

France:

Carte géologique de la France à 1/50 000. Map sheet, La Haye-du-Puits (Feuille XII-12), 1977, was demonstrated.

Carte sédimentologique sous marines des côtes de la France au 1/100 000. Map sheet St-Vaast-La Hougue (Feuille F-5) by C Larssonneur, 1967, was demonstrated.

Atlas des fonds meubles du plateau continental du Golfe de Gascogne. Cartes biosédimentaires. Editées par Claude Chassé et Michel Glémarec, Laboratoire d'Océanographie Biologique, Univ. de Bretagne occidentale avec le concours du CNEXO.

In preparation: Chart of the Channel area (La Manche) 1/500 000 to supersede the 1/100 000 issue (aprox. mid-1980). CNEXO. Brest.

Netherlands:

Set of 7 charts issued by the Geological Survey of the Netherlands (Haarlem) and/or North Sea Directorate of Ministry of Transport and Public Works (Rijkswijk - Z-H.).

1. The superficial geology of the Dutch sector of the North Sea. Preliminary edition (issued 17.11.1979).
2. Norfolk Grind Concessie (Gravel Concession Area) - Westminster Gravels Ltd. - RGD Nr. B.7. 24a (1974).
3. Norfolk Grind Concessie (Gravel Concession Area) - Isoconcentration Map - RGD Nr. B.7.24 (1974).
4. Interpretation side scan sonar (3.4.1980) - no grid.
5. Isoconcentration Map - same area as nr.4. (15.4.1980) - no grid.
6. Blok S/2 - sample chart, Documentation Sheets (see Anon, 1980).
7. Blok L 15 - sample chart ABC, Documentation Sheets (see Anon., 1980).

Sweden:

- a. Marine Geological Map of the Sound (Öresund). Issue 1979. 5 parts, Kullaberg, Helsingborg, Landskrona, Malmö, Falsterbo 1/50 000.
- b. The Sound (1/250 000):
 - 1) Clay content in superficial (0-10 cm) sediments;
 - 2) Content of organic C.org. in superficial (0-10 cm) sediments;
 - 3) Content of CaCO₃ in superficial (0-10 cm) sediments;
 - 4) Contour map of the surface at the base of the post-glacial sediments.

SGU Rapporten och Meddelanden 13, prepared by A Hörnsten.