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Exploration of the Sea

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Marine Environment Quality Commtt.

REPORT OF THE FIRST MEETING OF THE WORKING GROUP ON POLLUTION-RELATED STUDIES IN THE SKAGERRAK AND KATTEGAT

Copenhagen, 4-5 May 1983

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REPORT OF THE FIRST MEETING OF THE WORKING GROUP ON POLLUTION-RELATED STUDIES IN THE SKAGERRAK AND KATTEGAT

Copenhagen, 4-5 May 1983

1. OPENING OF THE MEETING

1.1 The Chairman, Mr P Hognestad, opened the meeting at 10.00 hrs on 4 May 1983 and welcomed the participants to the first meeting of the new Working Group.

1.2 Each participant introduced him- or herself and indicated the main areas of research or scientific interest.

2. APPROVAL OF THE AGENDA

2.1 The Working Group reviewed the draft agenda and made several amendments including the addition of a new item on the assessment of the environmental conditions in the Skagerrak-Kattegat. The agenda as approved is attached as Annex 1. The list of participants is attached as Annex 2. The ICES Environment Officer served as Rapporteur.

3. REVIEW OF TERMS OF REFERENCE

3.1 The Chairman read the terms of reference of the Working Group, as contained in C.Res.1982/2:3. According to the terms of reference, the Working Group has been established "to promote cooperation and coordination of research (physical, chemical and biological) related to pollution studies in the Skagerrak-Kattegat area by

(i) preparing an assessment of the situation in the area with respect to natural and man-made conditions in water,

(ii) promoting interactions and discussions among scientists active in the area,

(iii) considering the priorities in such studies, keeping in mind the available national and international resources, and

(iv) planning international research and projects".

3.2 In considering these terms of reference, the Working Group first discussed how the Skagerrak-Kattegat area should be defined. Noting that the generally accepted definition of the western boundary of the Skagerrak is a line from Lindesnes, Norway to Hanstholm, Denmark and the southern boundary of the Kattegat is from Kullen, Sweden to Gilbjerghoved (Gilleleje) in North Sjælland, Denmark and from Gruben Point to Hassensør in eastern Jutland, Denmark, the Group considered whether these boundaries should be fairly strictly observed in its work or whether a broader definition of the area should be used which would also include the Sound and Belt Sea. The general opinion of the Group was that the usual definition of the boundaries should be

loosely observed and, when necessary, the area west of the Skagerrak or south of the southern borders of the Kattegat should be included. Water and substances coming out of the Sound and the Belt Sea into the Kattegat should be considered but these areas themselves will not generally be covered in the work of the Group.

3.3 The Working Group then discussed the intentions behind each point in the terms of reference and the priority which the Group could give to each item. Concerning the membership of the Working Group, it was agreed that there should be a broad representation from the various relevant scientific fields and this is not presently the case. For example, there are no sedimentologists in the Group. It was agreed that, to stimulate interest in the Group, the Chairman should write informally to the Chairmen of other relevant Working Groups and Committees in ICES to tell about the Group and explore the possibilities of cooperation with these other groups. Accordingly, the Chairman agreed to send an informal notice to the Chairmen of the Marine Environmental Quality Committee, the Hydrography Committee, the Biological Oceanography Committee, the Working Group on Marine Pollution Baseline and Monitoring Studies in the North Atlantic, the ICES/SCOR Working Group on the Study of the Pollution of the Baltic, the Marine Chemistry Working Group and the Working Group on Marine Sediments in Relation to Pollution to inform them about the work of this Group and find out who may be interested in cooperating with it.

4. ON-GOING RESEARCH PROGRAMMES

4.1 The Working Group discussed how it could obtain a full picture of the on-going pollution-related research projects in the Skagerrak-Kattegat area, set in the context of the results of relatively recent major projects. Among the recent major projects and reports noted were: (1) a Symposium in Göteborg in 1976 on "Förorenings-situationen i Kattegatt och Skagerrak", (2) a meeting in Oslo in 1980, the lectures from which have been collected into the book "Forurenings-situationen i Skagerrak-Kattegat" (an English summary is available), (3) a Symposium on the Norwegian Coastal Current held in Gielo in 1980, for which the papers have been published, (4) an atlas published by ICES on the results of coordinated hydrographic investigations in the Skagerrak- Kattegat area in 1976, (5) the document "Assessment of the Effects of Pollution on the Natural Resources of the Baltic Sea, 1980" (Baltic Sea Environment Proceedings No.5B (1981)), which contains sections on the Sound and the Kattegat, (6) the final report of the Belt Project, (7) a report by the Øresunds Commission in 1981 assessing the environment in the Sound, and (8) a pamphlet issued in 1980 on research projects in Norway, some of which are in the Skagerrak-Kattegat. It was agreed that a list of these and other books and reports of this type should be compiled and sent to all Working Group members so that they can obtain copies if they wish. The Chairman mentioned that there is a working group which coordinates monitoring activities in the Skagerrak-Kattegat area and agreed to prepare an information paper reviewing the work of that group for distribution to the members of this Working Group.

4.2 The Working Group agreed that to obtain appropriate information on the activities in the different institutes in the countries with research activities in the Skagerrak-Kattegat area, a review should be made, coordinated by one scientist from each of the relevant countries. These reviews should have a uniform style and contain the following information:

(1) Responsible institute and person

(2) Aims

(3) Area covered

(4) Parameters studied

(5) Time and frequency of study

(6) Participation.

The description of each project should cover about one-half of a typewritten page. The literature in connection with a project should be listed. Additionally, other relevant literature, including that from routine programmes and literature on earlier major, relevant projects, should also be listed. Coordinators for the preparation of these reviews were agreed as follows:

Denmark - a scientist from the Marine Pollution Laboratory, Charlottenlund

Federal Republic of Germany - Dr Weichart

Norway - a scientist from the Institute of Marine Research, Bergen

Sweden - Mr Thorell

It was agreed that these reviews should be completed by September and sent to the ICES Environment Officer to arrive by 10 September 1983 for distribution to all members of the Working Group. If possible, they can then be considered at an informal meeting during the ICES Statutory Meeting in Göteborg (10-19 October 1983).

4.3 Having agreed to the preparation of written reviews of on-going research projects, the Working Group felt that it would be very useful to have oral presentations of projects at the meeting. Accordingly, members described various research projects and monitoring programmes which are being carried out in the Skagerrak-Kattegat area. The following projects were reported:

Denmark:

(1) The routine Baltic Monitoring Programme is carried out in the Kattegat four times per year and monitoring is done in the Skagerrak once per year.

(2) In connection with the occurrences of low oxygen concentrations in the bottom water in certain areas and associated fish kills, a study was made of the possible causes and the influence of anthropogenic activities. Information was collected on all discharges of nitrogen, phosphorus and organic matter and mathematical models are being developed to determine the influence of these discharges.

(3) The water quality of nearshore areas, including the discharges of nutrients and hazardous substances, is being studied and mathematical models for dispersion and effects are being developed.

(4) A project to study oil pollution in Danish waters has been started; the project is now concentrating on the Kalundborg Fjord.

(5) Fish are sampled annually from three fishing areas and analyzed for heavy metals and organochlorines.

(6) Routine cruises are being carried out to study the Jutland Current.

Federal Republic of Germany

(1) In 1975-1980 there were a series of investigations of radiological activity in the southwestern Baltic Sea and also in the Skagerrak-Kattegat area. These studies have been followed up occasionally since that time.

(2) Some work is being done on sediments in the Kattegat.

Norway

(1) An annual cruise is carried out in the Skagerrak-Kattegat to study hydrographic conditions, nutrients, oxygen, chlorophyll, and also fish larvae.

(2) Monthly cross-sections are made from Torungen to Hirtshals, studying hydrography, nutrients, primary production and, recently, phytoplankton.

(3) An experiment was carried out in 1983 to study the water masses and fluxes in the Skagerrak and the Norwegian Coastal Current.

(4) Fixed stations in the Skagerrak have been operated for decades studying temperature and salinity.

(5) Monitoring work is carried out in the Oslofjord and in the heavily polluted (trace metals) Idefjord.

(6) Sediment investigations have been carried out in the Dybbe Rev; results of analyses will be reported next year.

(7) A cooperative Norwegian-Dutch-Swedish project in the Skagerrak Deep area is investigating suspended matter with regard to grain size, trace metals, chlorophyll, temperature and salinity.

Sweden:

(1) The Swedish National Environment Protection Board has funded a major project on the marine coastal zone, in which the entire coastal zone area of Sweden was assessed with regard to nutrient levels, shallow-water benthic organisms, bottom vegetation, and sediments. Transport from the coast to the open sea was studied, including physical processes, sediment transfer and dispersion of contaminants. The effects of four specific anthropogenic activities were studied: (1) pleasure boats in harbours, (2) dredge spoil dumping, (3) sand and gravel extraction, and (4) eutrophication.

The results of this work will be used in the development of guidelines giving advice to planning officers on ecological implications of various activities in the coastal zone.

(2) Another major project funded by the Swedish National Environment Protection Board is on eutrophication in the marine environment. This is a new project with the objective of providing advice to governmental bodies on how to stop or decrease the effects of eutrophication. Important questions include: (a) what are the limiting nutrients for primary production, (b) where do the

nutrients come from,(c) what are the effects on living resources, and (d) when did these effects start in the past? The studies in the Kattegat will include physical and chemical oceanography; phytoplankton primary production and limiting nutrients; nitrogen fixation and denitrification; and energy budgets for zooplankton and for pelagic and demersal fish. The final programme will be developed this summer on the basis of a major document evaluating the environmental situation in the Kattegat and Baltic Sea.

(3) In terms of the Baltic Monitoring Programme, stations in the Kattegat are investigated three times per year.

(4) A model of water exchange between the Kattegat and the Baltic Sea is being developed.

(5) Studies of currents and dynamics are carried out in the Skagerrak.

(6) Studies of patchiness (inhomogeneous distributions) are being carried out in the Kattegat and the Baltic Sea.

(7) Studies are being done of the trace metal concentrations in marine sediments.

4.4 Having noted this information on on-going projects presented orally, the Working Group looked forward to reviewing the written descriptions of the various projects, as agreed in paragraph 4.2, above, at an informal meeting in connection with the 1983 Statutory Meeting, if possible, and at the next meeting of the Working Group.

5. FUTURE RESEARCH NEEDS AND WORK PROGRAMME OF THE WORKING GROUP

5.1 The Working Group noted that it will be easier to discuss future research needs after the papers have been prepared on on-going research and monitoring programmes, as agreed under Agenda Item 4. It was noted, however, that some institutes have had difficulties in obtaining staff and ship time for the conduct of pollution-related research in the Skagerrak-Kattegat area. The Working Group agreed that this is a serious issue and felt that one way of helping this situation would be to have a coordination of ship time in the Skagerrak-Kattegat area for both monitoring as well as other studies. It was felt that one of the main purposes of the Working Group should be to coordinate scientific work in the Skagerrak-Kattegat and ensure that monitoring and other types of studies cover the area as well as possible throughout the year. Accordingly, the Working Group adopted Recommendation 1 encouraging ICES member countries who work in the Skagerrak-Kattegat area to allocate ship time and coordinate cruises and observation systems for studies related to pollution and its biological effects in the Skagerrak-Kattegat. The full text of the recommendation is contained in Annex 3.

5.2 With regard to specific cruises, Mr Føyn welcomed the participation of other scientists in the annual November cruise by his Institute in the Skagerrak and northern Kattegat. This cruise studies hydrography, nutrients, oxygen, chlorophyll, particles, etc., on six cross-sections to investigate the influence of Baltic and Belt Sea water and fjord water on the production in the Norwegian Coastal Current. Interested persons should contact Mr Føyn.

5.3 Mr Rosenberg informed the Group about two Swedish cruises which will take place in the summer and autumn of 1983 in connection with the study of eutrophication in coastal waters. One of these cruises will concentrate on the Laholm Bight, studying chemistry, phytoplankton, primary production, and other parameters, using an

ecosystem approach. Scientists interested in participating in these cruises should contact Mr Rosenberg. In this connection, it was pointed out that there is a need to be able to use large research vessels to carry out a pollution study of this type.

5.4 Dr Jensen informed the Working Group about the Pilot Study of Pollutants in Sediments in the Skagerrak, which is being conducted under the Working Group on Marine Sediments in Relation to Pollution. He stated that this project is in need of additional support so that core samples can be taken and analyzed to permit the fulfillment of the study. Mr Føyn, pointing out that this case illustrates the problems resulting from lack of coordination of ship time, stated that it may be possible to have the sediment cores taken for this study during the November cruise by his Institute, if the planning can be done enough in advance.

5.5 The Environment Officer provided information on the ICES Baseline Survey of Contaminants in Fish and Shellfish which will take place in the North Atlantic and the Baltic Sea in 1985 under the coordination of the Working Group on Marine Pollution Baseline and Monitoring Studies in the North Atlantic and the ICES/SCOR Working Group on the Study of the Pollution of the Baltic, respectively. The plans for this study call for samples to be taken of cod, herring, and plaice or flounder in normal fishing areas and samples of mussels (Mytilus edulis) to be collected at coastal sites to give a good shoreline coverage. These samples are to be analyzed for a number of trace metals and organochlorines to provide a picture of the "health" or state of the marine environment in the ICES area. The Working Group agreed that it would try to support this activity.

5.6 The Working Group took note of a letter from Professor J Gray proposing a joint experiment in the Skagerrak-Kattegat; the proposal was not discussed because it was felt to be too early to consider such a project.

5.7 In closing discussion of this item, the Working Group reaffirmed the importance of having a means of coordinating research vessel cruises in the Skagerrak-Kattegat area and agreed that proposals on how to achieve this coordination should be prepared for consideration during the informal meeting in October in connection with the Statutory Meeting, so that some coordination of 1984 cruises might be achieved.

6. ASSESSMENT OF THE ENVIRONMENTAL CONDITIONS IN THE SKAGERRAK-KATTEGAT

6.1 In beginning the consideration of this item, the question was raised as to whether the periodic assessment work under the Helsinki Commission will cover the Kattegat. Dr Ærtebjerg was requested to check with the Helsinki Commission's Group of Experts on Assessment regarding their intended coverage of the Kattegat and to inform them that the Working Group wished to carry out an assessment of the Kattegat if this will not be an overlap in work.

6.2 Turning to a general consideration of the subject of assessments of the marine environment, the Environment Officer summarized the work which had been carried out to prepare the first major assessment of the Baltic Sea, "Assessment of the Effects of Pollution on the Natural Resources of the Baltic Sea, 1980"(Baltic Sea Environment Proceedings No.5B (1981)). As a result of this and other work, the Advisory Committee on Marine Pollution had proposed that a set a guidelines be developed

in order that all regional assessments prepared in the ICES area can follow a generally similar approach so that comparisons between areas may be made. Accordingly, several members of the Working Group on Marine Pollution Baseline and Monitoring Studies in the North Atlantic had drafted the paper "Guidelines for the Preparation of Regional Environmental Assessments" (C.M.1982/E:22). According to these guidelines, each assessment is intended to comprise a review of the kinds and degrees of anthropogenic disturbances to an area set in the context of existing knowledge of physical,chemical and biological conditions. Accordingly, each assessment should contain a succinct review of the physical, chemical and biological conditions in the area and a multi-disciplinary assessment of the kinds and degrees of effects of anthropogenic activities. The total length of the document should be about 25 pages. These proposed guidelines were accepted by the relevant Committees during the 1982 Statutory Meeting and the Council thereafter encouraged the conduct of such assessments of coastal and regional areas in C.Res.1982/4:10.

6.3 Having considered this background information, the Working Group discussed the preparation of an assessment of the conditions in the Skagerrak-Kattegat area. Some members were of the opinion that the approved guidelines in C.M.1982/E:22 should be followed and that the published information on the physical, chemical and biological conditions of the area should be presented in a clear, succinct manner and used as the basis for identifying changes in the conditions and also gaps in knowledge or understanding. To carry this out, a small group should be set up to coordinate the preparation of the assessment, including identifying authors for the various sections, collecting together the sections, etc. Other members, however, felt that to follow this "classical" approach would be an enormous effort. Mr Rosenberg proposed a "problem area" approach instead of the "classical" approach. He identified six problem areas which could be covered: (1) trace metals, (2) chlorinated hydrocarbons, (3) eutrophication, including changes in nutrient levels and oxygen deficiency, (4) changes in fisheries, (5) long-term changes in temperature, salinity, etc., and (6) other changes. For each problem area, a description of the problem can be given and changes over the past five years can be indicated.

6.4 With these two proposals on the table, the Working Group discussed which approach would give the most useful results and would be easier to carry out. In this connection, it was pointed out that, in terms of the Nordic Council of Ministers whose request had spurred the establishment of the Group, what is needed is a report which will be useful in promoting future joint research programmes in the Scandinavian countries. Thus, the report should point to major problems in the area and to what kinds of studies are needed to solve these problems.

6.5 After further discussion, the Working Group generally agreed that Mr Rosenberg's proposal for a "problem area" approach should be used. Accordingly, the chapter headings for the report will be as follows:

1. Trace metals
2. Chlorinated hydrocarbons- DDT, PCBs, PVC, etc.
3. Eutrophication, including changes in nutrients in the water column, oxygen deficiency and related problems, e.g., algal blooms
4. Changes in fisheries patterns and stocks
5. Long-term changes in salinity and temperature
6. Other changes, e.g., radionuclides, dumping, etc.

Each chapter should contain a review of the present situation and recent changes and should point to research needs to understand the situation better. It was suggested that the order of the chapters be changed so that Chapter 5 on long-term changes in temperature and salinity is covered first, as this is very basic to the other chapters. It was further suggested that the report should begin with a summary of the physical oceanography of the area as the basis for succeeding chapters. Several members felt that the authors should receive more detailed questions or specifications of what they should cover in their chapters.

6.6 Having thus agreed that the focus of the report will be on problems in the Skagerrak-Kattegat area and having agreed on the chapter headings for the report, the Working Group then considered how the report should be prepared. It was agreed that the Chairman should coordinate the work and should ask various people to prepare chapters. Mr Rosenberg agreed to prepare an elaboration of the disposition of each chapter for the Chairman to send to the author(s) of each chapter.

7. ANY OTHER BUSINESS

7.1 The Working Group agreed that it should have an informal meeting in October 1983 in connection with the ICES Statutory Meeting to review the papers on on-going research and monitoring programmes in the Skagerrak-Kattegat. Concerning the next formal meeting of the Group, it was recommended that a two-day meeting be held in Copenhagen, preferably at the beginning of May, with the following terms of reference:

1. Review the draft sections of the assessment of problems in the Skagerrak-Kattegat area and plan the continuation of this work,
2. Review the papers on the on-going research programmes carried out in the Skagerrak-Kattegat area, and
3. Develop proposals for the coordination of research vessel cruises in the Skagerrak-Kattegat area.

As an alternative venue to Copenhagen, Dr Vagn Hansen offered to host the meeting at the North Sea Center in Hirtshals.

7.2 As there was no other business, the Chairman thanked the participants for their fruitful discussion and thanked the Rapporteur for her assistance. The Chairman then closed the meeting at 12.00 hrs on 5 May 1983.

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ANNEX 1

MEETING OF THE WORKING GROUP ON POLLUTION-RELATED TO STUDIES IN THE SKAGERRAK AND KATTEGAT

Copenhagen, 4-5 May 1983

AGENDA

1. Opening of the Meeting
2. Approval of the Agenda
3. Review of terms of reference
4. On-going research programmes
5. Future research needs and work programme of the Working Group
6. Assessment of the environmental conditions in the Skagerrak-Kattegat
7. Any other business

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ANNEX 2

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ANNEX 3

RECOMMENDATIONS

Recommendation 1

Noting that the Skagerrak-Kattegat area is heavily exploited, with recently observed changes in the fish stocks of various species and unusual mass occurrences of phytoplankton, among others, of species new to the area, with polluted coastal zones, and noting further the gaps in knowledge of the state of pollution and its biological effects in the area, the Working Group on Pollution-Related Studies in the Skagerrak and Kattegat recommends that ICES member countries concerned intensify observations by allocating more shiptime and coordinate cruises and observation systems in order to cover this area during biologically important seasons.

Recommendation 2

The Working Group on Pollution-Related Studies in the Skagerrak and Kattegat (Chairman: Mr P Hognestad) recommends that the Group meet in Copenhagen for two days, preferably in early May 1984, to:

(a) Review the draft sections of the assessment of problems in the Skagerrak-Kattegat area and plan the continuation of this work,

(b) Review the papers on the on-going research programmes carried out in the Skagerrak and Kattegat, and

(c) Develop proposals for the coordination of research vessel cruises in the Skagerrak-Kattegat area.