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International Council for the
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Marine Environmental Quality Committee

REPORT OF THE SECOND JOINT SESSION 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

Göteborg, 27 January 1982

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1. OPENING OF THE MEETING AND ADOPTION OF THE AGENDA

The meeting was opened at 9.00 hours on 27 January by the Co-Chairmen, Dr M Parker, Chairman of the Working Group on Marine Pollution Baseline and Monitoring Studies in the North Atlantic, and Professor G Kullenberg, Chairman of the ICES/SCOR Working Group on the Study of the Pollution of the Baltic. The draft agenda was adopted without amendment and is attached as Annex 1. The list of participants is attached as Annex 2. The ICES Environment Officer acted as Rapporteur.

2. BIOLOGICAL EFFECTS STUDIES

- 2.1 Dr Parker summarized the discussions on biological effects studies which had taken place in the meeting of the Working Group on Marine Pollution Baseline and Monitoring Studies in the North Atlantic (WGMPNA) the preceding day. He stated that WGMPNA had collected and considered reports on the various techniques for studying the biological effects of pollution presently in use. These reports showed that there is a large diversity of aims and techniques for biological effects monitoring and indicated the difficulties of international cooperation on this subject. Nonetheless, beginning in 1981, WGMPNA had started collecting data on fish diseases in relation to pollution on a coordinated basis; the first data obtained under this programme had been considered and the Working Group had agreed that more data are needed before any conclusions can be drawn. Finally, the WGMPNA had considered the issue of developing a strategy for biological effects monitoring and had decided that the GESAMP report (Reports and Studies No.12) provided the best conceptual framework for a strategy, but required some modifications.
- 2.2 Professor Kullenberg then summarized the discussions in the ICES/SCOR Working Group on this subject. These discussions centered on the results of studies of fish disease in relation to pollution. Professor Kullenberg stressed the importance of establishing contacts between scientists who are developing techniques to study the biological effects of pollution in the Baltic Sea and those conducting similar work in other areas of the North Atlantic.
- 2.3 Concerning other types of biological effects monitoring in the Baltic Sea, Dr Lassig reported that ecological monitoring (of phytoplankton, zooplankton and macrobenthos) is being carried out as part of the Baltic Monitoring Programme under the Helsinki Commission. This monitoring is conducted to determine possible changes in the system, even if the cause of change cannot necessarily be identified.

- 2.4 In the general discussion of biological effects monitoring techniques, it was noted that each laboratory studying this subject has chosen a different technique and very few laboratories have had the resources to utilize a suite of techniques. It was felt that, in order to make progress on this subject, it is important that the results of biological effects monitoring studies continue to be reported to ICES along with an evaluation of the usefulness of the technique employed. These results should then be evaluated on an overall basis so that appropriate techniques or suites of techniques for various circumstances can be identified. This reporting activity should be carried out in both Working Groups and each Working Group should prepare lists containing the names of institutes conducting biological effects monitoring studies and stating the technique(s) used by each institute and the overall results obtained employing that technique. These lists should be exchanged between the two Working Groups to promote the establishment of contacts amongst the scientists involved.
- 2.5 The use of primary production measurements in biological effects monitoring programmes was then discussed. It was noted that primary production is included in the Baltic Monitoring Programme for measurement in the open Baltic Sea and countries around the Baltic Sea regularly monitor primary production in their coastal waters on a national basis. Primary production has also been measured in a long-term study of Norwegian coastal waters. It was reported that the former ICES Working Group on Primary Production Methodology recommended that primary production indices be considered for measurement as part of an environmental monitoring programme.
- 2.6 Taking note of this information, the Joint Session felt that although the frequency of monitoring primary production is often not ideal in that it is too low, it is useful to monitor primary production. The two Working Groups looked forward to reviewing the results of the Workshop on Inter-comparison of Techniques in Measurements of Primary Production, which is planned to be held in 1983.
- 2.7 The subject of unusual plankton blooms was considered and it was noted that "plankton blooms, their causes and their effects on the fisheries and ecosystems" will be the topic of a joint session of the Marine Environmental Quality Committee, the Biological Oceanography Committee and the Hydrography Committee at the 1982 Statutory Meeting. In discussing the types of measurements to be taken when studying unusual plankton blooms, the problem of low oxygen concentrations in near-bottom waters was mentioned. The two Working Groups agreed that measurements should be taken of the oxygen concentration approximately 0.5 m above the sea bottom (in addition to at standard depths) in areas near unusual plankton blooms. In addition, it was agreed that action should be taken on a coordinated basis to record the occurrence, location and extent of unusual plankton blooms. This information should be collected into a central register. It was agreed that this issue should be discussed at the Joint Session on Unusual Plankton Blooms at the 1982 Statutory Meeting with the aim of determining exactly what types of information should be collected and who should carry out this work.

3. SEDIMENT STUDIES

- 3.1 It was noted that the Working Group on Marine Sediments in Relation to Pollution (WGMS) is coordinating two pilot studies on pollutants in sediments, one in the German Bight and the other in the Skagerrak, to study

basic issues concerning the use of sediments in monitoring marine pollution. The WGMS has also developed decision trees to be used when determining where to monitor sediments for pollutants, but these trees still lacked numbers.

- 3.2 Professor Kullenberg reported that the WGMS had felt that a pilot sediment study should also be carried out in the Baltic Sea but, owing to a lack of adequate expertise on the Baltic Sea, had requested the ICES/SCOR Working Group on the Study of the Pollution of the Baltic to plan and coordinate this study. Agreeing with this approach, the ICES/SCOR Working Group had established a Task Group under Dr Niemistö to elaborate a framework for a programme to study sediments and sediment processes in the Baltic Sea.
- 3.3 Dr Niemistö then outlined the three basic questions which had been identified as central to this study, namely: (1) determining the pollution history of dated sediment samples and monitoring the rate of sedimentation and the pollutant concentrations in such sediments, (2) determining the role of the sediments as a final sink for pollutants with respect to materials balances, and (3) determining the role of sediments as sources of material to the water column, including considerations of transformation processes in the sediments especially in varying oxic and anoxic conditions in the bottom waters.
- 3.4 The Joint Session agreed that these three questions were crucial and that it was very important that they be answered as fully as possible. The two Working Groups looked forward to reviewing the results of these pilot sediment studies, hopefully, in the fairly near future.

4. STUDIES OF CONTAMINANT LEVELS AND INPUTS

4.1 Baseline Studies

- 4.1.1 Dr Portmann summarized the results of the "Six-Year Review of the ICES Co-ordinated Monitoring Programme", in which the results from the first six years of this programme had been considered on an overall basis and recommendations for a revision of the programme had been made. The monitoring programme has now been changed so that, beginning in 1982, different schemes for sample collection and preparation, frequency of monitoring, and reporting of data will be used for each of the three identified aims of monitoring contaminants in fish and shellfish, i.e., (1) monitoring to assure quality of fish and shellfish for human consumption, (2) monitoring over wide geographical areas (baseline survey), and (3) trend monitoring over time. The monitoring to achieve objective 2, namely, a baseline survey over wide geographical areas, was to be conducted every fifth year with the first survey proposed for 1983.
- 4.1.2 Professor Kullenberg reported that the ICES/SCOR Working Group had discussed the possibility of carrying out a baseline survey of contaminant concentrations in fish and shellfish in the Baltic Sea in conjunction with the WGMFNA baseline survey in the rest of the North Atlantic. He stated that the ICES/SCOR Working Group felt that this coordination of baseline surveys would be of great value, provided that agreement could be reached between the two groups concerning the species and contaminants to be studied and the timing of the survey. The ICES/SCOR Working Group had decided that, in order to obtain full support of appropriate laboratories working in the Baltic Sea, the backing of the Helsinki Commission should be sought and the survey should be postponed until 1984 or possibly 1985.

4.1.3 Having considered this information, the Joint Session agreed that the baseline survey should be postponed until 1985 so that it can be conducted throughout the entire ICES area at the same time. It was further agreed that a small group should be established to draw up the plans for and coordinate the baseline survey. The group will consist of Dr Portmann as Coordinator, Dr Pearce from WGMFNA and Dr Jensen from the ICES/SCOR Working Group. Detailed proposals for the conduct of the baseline survey should be available for review at the 1983 meetings of the two Working Groups.

4.2 Trend Monitoring

4.2.1 The development of appropriate specifications for the composition of a fish sample (number of specimens, length stratification criteria, etc.) for use in programmes to study temporal trends in contaminant concentrations in organisms was discussed. It was noted that, while the WGMFNA has been working on this subject for a number of years and now has prepared firm recommendations on procedures to be used (in Guidelines for Objective 3 for monitoring), the ICES/SCOR Working Group has not conducted any work on this subject. Several scientists working on matters related to the Baltic Sea expressed the opinion that it would be very difficult to adapt the WGMFNA guidelines on trend monitoring for use on pelagic fish in the Baltic Sea because of the number of different stocks and their migration activities. However, it was felt that it was possible to carry out a trend monitoring programme on relatively stationary species of fish living in coastal areas.

4.2.2 In concluding the discussion on trend monitoring, the Joint Session encouraged the Baltic scientific community to conduct studies relevant to trend monitoring using marine organisms in the Baltic Sea.

4.3 Inputs of Pollutants

4.3.1 In discussing the subject of the input of pollutants to the marine environment, the Joint Session stressed that more detailed information is needed on the transport of materials via rivers and the atmosphere to the marine environment. It was noted that a sampling scheme for determining the gross riverine transport of trace metals and organochlorines to the marine environment has been developed under the Marine Chemistry Working Group. It was thus felt that accurate and precise information can be obtained on the gross transport of trace metals in rivers if this scheme is carefully adapted to each individual river and if laboratories participate in inter-calibration exercises on the analysis of trace metals in fresh water.

4.3.2 It was reported that countries around the Baltic Sea have studied the riverine inputs of organic matter and nutrients to the Baltic over a period of time. These and other studies have resulted in a fairly good understanding of the cycling of these substances in certain regions of the Baltic Sea. However, studies concerning the riverine inputs of trace metals to the Baltic Sea are still in an earlier phase.

4.3.3 Dr Pearce provided information on several major input studies which have been carried out for certain coastal areas in the United States. He reported that the inputs of chemical contaminants to the New York Bight and to the Hudson-Raritan Estuary have been studied and the results compiled. On the West Coast of the USA, pollutant inputs to the Southern and Central Puget Sound have been recorded. Another major study, the 1980 Chesapeake Bay Plume Study - SUPERFLUX 1980 - used airborne remote sensing to assess the impact of the outflow from Chesapeake Bay on shelf sea ecosystems.

Reports on the results of these studies have been published and the references are listed in Annex 3.

- 4.3.4 Also relevant to this subject, Professor Kullenberg reported that ICES will sponsor a three-day interdisciplinary Symposium followed by a two-day Workshop on "Pollutant fluxes through the Coastal Zone" in the spring of 1984. As Convenor of this Symposium/Workshop, Professor Kullenberg expressed the hope that there will be papers on coastal zone influences in many areas covered by ICES, especially for the North-eastern Atlantic and the Baltic Sea.
- 4.3.5 In concluding the discussion on this subject, the Joint Session emphasized the importance of studying the input of contaminants to the marine environment and encouraged, in particular, the conduct of studies of gross river inputs of trace metals and organochlorines using the measurement methodology accepted by the Marine Chemistry Working Group.

5. SELECTED PROBLEMS FROM THE BALTIC ASSESSMENT DOCUMENT

- 5.1 It was noted that one of the problems identified in the document "Assessment of the Effects of Pollution on the Natural Resources of the Baltic Sea" was the lack of knowledge concerning "new contaminants" in the Baltic Sea. The Joint Session agreed that this is a problem not only for the Baltic Sea but for the entire ICES area. It was felt that there are at least two scales to the problem of identification of "new contaminants": the more local scale, where the issue is to identify the components (and their toxicity) of particular industrial effluents, e.g., from pharmaceutical industries or paper and pulp mills using a bleaching process; and the broader regional scale, where the question is to identify contaminants of concern to many or all ICES member countries.
- 5.2 Concerning the first issue, the identification of components of an industrial effluent, it was felt that it would be useful if reports could be made available on the results of studies to characterize the various types of effluents. Regarding the second issue, it was agreed that when a "new contaminant" is identified as being of high priority, one or several Working Group members should prepare an overview paper on the toxicity, distribution, etc., of this contaminant so that the Working Groups and the Marine Environmental Quality Committee can review the information and decide whether there is sufficiently wide concern to merit a proposal that coordinated work be conducted on this contaminant, beginning with an inter-calibration exercise on the analysis of the contaminant. Having agreed this, the two Working Groups further decided that, as the organochlorine compound toxaphene is of concern both in the Baltic Sea and in other parts of the North Atlantic, a joint overview paper should be prepared on this contaminant for review by the two Working Groups at their respective meetings in 1983. Accordingly, Dr Reutergerårdh and Dr Uthe agreed to collaborate on the preparation of an overview paper on the production, sources of input to and distribution in the marine environment, and biological effects of toxaphene.

6. REGIONAL ASSESSMENTS

- 6.1 Professor Kullenberg opened the discussion on this subject, stating that the ACMP had pointed to the importance of carrying out assessments

of the health of the marine environment on a regional basis and had requested the two Working Groups to consider this issue and develop an overall format containing the minimum requirements for the conduct of regional assessments. He stated that the ACMP had requested that this framework, identifying the elements of a common approach and methodology, be developed in order to facilitate and stimulate the conduct of regional assessments in the ICES area.

- 6.2 Several recently completed assessments were then discussed, including (1) the global assessment carried out by a GESAMP working group, "Review of the Health of the Oceans", (2) an assessment of the pollution situation in the Skagerrak-Kattegat area, conducted under the Nordic Council of Ministers, and (3) an assessment of the state of the environment of the Puget Sound on the west coast of the USA by the US EPA and NOAA. It was also noted that a major review of the environmental problems of the North Sea has recently been prepared by the Federal Republic of Germany; this could serve as the basis for an assessment of the health of the marine environment of the North Sea.
- 6.3 The Joint Session generally felt that there should be some set of guidelines or common framework for the conduct of regional assessments. Additionally, the audience to which the assessments are being addressed must be defined. It was further felt that assessments should be carried out on a stepwise basis, beginning with collecting and interpreting the information, reviewing the compiled document, and drawing conclusions. The process of having the draft regional assessment reviewed by a wide variety of experts was considered important in providing a broad scientific backing for the assessment.

7. CLOSURE OF MEETING

As there was no other business, the Co-Chairmen, Dr Parker and Professor Kullenberg, thanked the members of the two Working Groups for their participation and agreed that the joint meeting had been very valuable. The meeting was closed at 14.00 hrs on 27 January.

ANNEX 1

JOINT SESSION 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

Göteborg, 27 January 1982

AGENDA

1. Opening of meeting and adoption of agenda
2. Biological effects studies
3. Sediment studies
4. Studies of contaminant levels and inputs
 - 4.1 Baseline studies
 - 4.2 Trend monitoring
 - 4.3 Inputs of pollutants
5. Selected problems from the Baltic Assessment Document
6. Regional Assessments
7. Closure of meeting

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ANNEX 3

LIST OF REFERENCES FOR REPORTS ON INPUT STUDIES
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- Mueller, J., J. Jeris, A. Anderson and C. Hughes, 1976. Contaminant Inputs to the New York Bight. NOAA Technical Memo ERL MESA-6. MESA Program Office, Boulder, Colo. 347 pp.
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