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FIRST REPORT OF THE WORKING GROUP ON POLLUTION BASELINE
AND MONITORING STUDIES IN THE OSLO COMMISSION AND ICNAF AREAS

Charlottenlund, 7-9 January 1975

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FIRST REPORT OF THE WORKING GROUP ON POLLUTION BASELINE AND
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Report of the meeting held at Charlottenlund Slot 7-9 January 1975

1. Opening of the meeting

The meeting was opened by the Chairman, Mr A Preston, who formally welcomed the members (Annex 2) and, in particular, those new to what in many respects may be regarded as an extension of the old Working Group on the Study of Pollution of the North Sea. He reminded all participants that this would be a very important first meeting of a group which would provide much of the scientific basis for advice which the Council would be called upon to give to a number of other International bodies, such as IOC and the Commission of the Oslo Convention.

In welcoming the Group on behalf of Council, and in supporting the opening remarks of the chairman, Mr Tambs-Lyche told the group that ICES had now had a formal request from the Commission of the Oslo Convention to conduct a baseline study of pollution in the Convention area as a preliminary to any monitoring operation.+

2. Terms of reference

The terms of reference (Annex 3) were noted and formally adopted. In adopting these terms of reference the members agreed to interpret them as including studies of effects of pollutants on living resources and their exploitation. In taking this view it was noted that this was a subject which had been the responsibility of the North Sea Pollution Working Group, and that the Consultative Committee had stressed the importance of continuing the work of this earlier group.

3. Appointment of Rapporteur

Dr J E Portmann was appointed as Rapporteur to the Working Group.

4. Adoption of the agenda

The draft agenda, as circulated prior to the meeting, was modified slightly and formally adopted (Annex 4).

* This is essentially the same as the NEAFC area.

+ Points for action arising as a result of this first meeting are given at Annex 1 to this report together with the names of those responsible for such action.

5. Extension of the North Sea Fish and Shellfish Baseline Survey to the remainder of the NEAFC and parts of ICNAF areas

- 5.1 The Working Group noted that a plan had been drawn up in December 1973 by an ad hoc meeting of analysts and biologists, for an extension of the North Sea pollution baseline study to the remainder of the NEAFC area. This plan had been approved in principle by both the Working Group on the Study of the Pollution of the North Sea and the Advisory Committee on Marine Pollution (ACMP). At the time of the analysts and biologists meeting, it had been proposed to conduct this extension to the North Sea baseline in 1974 but, as Council approval had not been obtained until the 62nd Statutory meeting, it had been necessary to postpone the survey until 1975. The Working Group examined the proposals (ICES C.M. 1974/E:3 Annex 6) to ensure that they were compatible with requirements of the Oslo Commission and IOC for baseline measurements in the Oslo Commission and ICNAF areas.
- 5.2 After some discussion it was agreed that the proposals fulfilled such basic requirements. It was pointed out that the major effort would be concentrated on two species, namely cod and hake: however, the inclusion of several additional species for selected parts of the proposed study area was also catered for, and was the best that could be managed in the light of the restrictions imposed by analytical capacity. It was also agreed that, as some samples would be taken from the North Sea area at the same time, a continuity of baseline data would be maintained throughout the ICES area.
- 5.3 The Working Group recognised that it might be necessary to amend the selection of year classes of fish to be sampled; however, enquiries to date did not indicate that this would be necessary, and most countries did not expect any undue difficulties in collecting the proposed samples during the suggested period of July-September 1975. It was, however, agreed to defer final decision on this matter until the end of April 1975, to allow members to make final confirmation of the availability of the proposed year classes in their sampling areas.

- 5.4 The Working Group noted that the ICES/SCOR study group on the Pollution of the Baltic had considered it desirable to establish guidelines for the preparation of samples of fish or shellfish, and agreed that such a common approach was desirable to ensure the comparability of preliminary methodology.
- 5.5 The proposed list of contaminants to be studied was examined and agreed as PCBs, organo-chlorine pesticide residues and the metals lead, cadmium, mercury, copper and zinc. It was further suggested that it might be desirable to analyse for the following additional contaminants: arsenic, thallium, other chlorinated organic substances - possibly as total organically-bound chlorine - and petroleum hydrocarbons. It was, however, agreed to leave these substances as optional extras, to be included at the discretion of the individual member countries. Chromium was also mentioned since it had been selected by the Oslo monitoring group, but in the light of a recent GESAMP review it was agreed that chromium need only be included on the optional list.
- 5.6 In this context note was taken of the progress of the second ICES inter-calibration exercise and, in the light of a progress report given by Dr Topping, it was agreed that a new exercise should be conducted for metals. It was also agreed that at the earliest possible date a report should be circulated on the results of 1973/74 intercalibration exercise.
- 5.7 So that sufficient laboratories would be catered for in the proposed new exercise it was agreed that 100-150 samples would be prepared, and that members should write to Dr Topping not later than February 28, 1975, giving him the names and addresses of laboratories which require the new intercalibration samples.
- 5.8 In this connection it was recognised that samples of the new material should also be sent to Professor Grasshoff for distribution to the laboratories taking part in the ICES/SCOR Study of Pollution in the Baltic.
- 5.9 In relation to the optional contaminants, to be included at the discretion

of the Laboratory doing the analysis, it was agreed that those laboratories intending to conduct such analyses should analyse either the existing or planned exchange samples for these optional pollutants, or should exchange appropriate samples. If necessary it was agreed that the Rapporteur, Dr Portmann, should act as a co-ordinator in such exchanges.

5.10 The Working Group noted that its terms of reference provided for an extension of the baseline beyond the NEAFC area into parts of the ICNAF area. The members from Canada and Greenland indicated that they would be able to give limited coverage on cod, herring and mackerel, and cod and capelin respectively, at least for the major fisheries along their coasts. However, Dr Uthe indicated that Canada might experience some difficulties over sampling in such a large area, and Mr Johansen indicated that for Greenland there may be some problems over analysis. It was agreed that Dr Uthe and Mr Johansen should consult further with each other and with their colleagues at home, and draw up as soon as possible detailed proposals for both sampling and analysis. If necessary, other countries would attempt to provide suitable support either in terms of sampling or analysis, with a view to obtaining adequate coverage for the ICNAF area. Countries able to provide such support would notify the Rapporteur, Dr Portmann, as soon as possible.

5.11 The view was expressed that it was unfortunate that as yet the USA had not considered it possible to take part in the extension to the ICNAF area, and that, as a result, a substantial part of the area might not be included in the study. Following discussion on this point it was agreed that the Chairman would attempt to contact a number of individual scientists in the USA who had previously indicated some interest in the proposals. In this way it was hoped that, albeit perhaps on an informal basis, some extra coverage could be provided within the ICNAF area, even if not all of the data so obtained were available for publication in an ICES report.

5.12 The Chairman, in summarising the work to be done on the extension of the

fish baseline survey, indicated that a considerable work load was involved, and suggested that it would be advisable to establish a sub-group to co-ordinate this part of the Working Group's task. This suggestion was accepted and Dr Portmann was appointed Chairman. This sub-group and its terms of reference are given in Annex 5 part 1, together with the names of the persons who will act as initial national contacts and/or members of the sub-group.

5.13 The detailed proposals, as modified and agreed by the Working Group, for the extension of the baseline to the remainder of the NEAFC and ICNAF areas are given in full in Annex 6. These are subject to confirmation (paragraph 5.3) and this task was assigned to Dr Portmann's sub-group.

5.14 In concluding discussion on this topic it was agreed that all results should be submitted to Dr Portmann not later than 31 December, 1975.

6. Baseline studies of metal levels in sea water in the Oslo Commission and ICNAF areas

6.1 In inviting discussion on this topic, the Chairman pointed out that the proposals regarding fish analysis would not satisfy the requirements of IOC for the GIPME programme in terms of geographic coverage, since large areas of the North Atlantic would remain unsampled. He also reminded the Working Group that some work of this nature had been carried out under the auspices of the old Working Group on the Study of Pollution of the North Sea, and informed the Working Group of work conducted by the United Kingdom in the Irish Sea and English Channel, and that there were further UK proposals for work in the enlarged study area. The Working Group was also aware of the interest shown by ACMP in this type of work (Coop. Res. Rep. No. 43 para 4.12).

6.2 It was suggested that, although there had been some difficulties of an intercomparison nature regarding results submitted by different laboratories in the North Sea area, it was nevertheless worthwhile. Discussion then took place on the suitability of a survey of metal levels in sea water from the extended study area.

6.3 Following a description by Dr Jones of the difficulties encountered to

date in the North Sea studies, and the way in which progress had been made in resolving such difficulties, it was agreed that an initial attempt at a baseline survey of metal levels in sea water was desirable in the Oslo Commission and ICNAF areas, and that this should as far as possible run in parallel with the survey of contaminant levels in fish.

- 6.4 It was, however, recognized that detailed planning of such a survey would be impossible within the main Working Group. It was accordingly agreed to establish a sub-group under the chairmanship of Dr Schmidt, who agreed to convene a meeting of his sub-group as soon as possible, and in any case not later than 30 May, 1975.
- 6.5 Terms of reference for this sub-group were drawn up and agreed, and a core of members was established (Annex 5, part 2). It was agreed that, even though not all countries were at present able to take part in the proposed survey due to lack of suitable expertise in the field of sea water analysis, it was desirable that as many countries as possible with membership in the Working Group should be represented, so that in due course they would be able to make a contribution to such surveys. In this connection Dr Uthe undertook to inform his colleagues at the Bedford Institute of Oceanography, and it was agreed that the Chairman should approach the Delegate for Spain with a view to securing their participation in this and other parts of the Working Group's investigations.
- 6.6 In this same general context Dr Jones informed the Working Group that he had almost completed work on a review of metal levels in sea water. This work stemmed from a request made by the ACMP (Coop. Res. Rep. No. 43 para 6.1) and he had concentrated his attention on recent literature (post 1963) and waters off the continental shelf. The Working Group noted that, although the material was still in draft form, he was hopeful of an early completion, and suggested that the review, even if not finalised, would be useful to Dr Schmidt's sub-group. Dr Jones undertook to ensure that copies were made available to that sub-group when it meets.

7. Survey of contaminant levels in sediments in the North Sea and elsewhere

- 7.1 The Working Group noted that the ACMP had suggested in its first report (Coop. Res. Rep. No. 43 para 4.15) that the Working Group on the Study of Pollution in the North Sea should establish an ad hoc group of scientists interested in the use of sediments as indicators of pollutant levels in the marine environment, and concluded that, as the successor to that Working Group, it should take up this outstanding item of business.
- 7.2 In the course of the discussion which followed, the Working Group were informed of United Kingdom experience in this field by Dr Topping and Dr Jones, who indicated that, except in areas of intensive input of pollutants, eg in a dumping situation, it was not possible to detect measurable increases in pollutant concentration in sediments. In general the levels of a pollutant in sediment do not appear to be directly related to the levels of the same pollutants in the water, though there may be a relationship with the particle size of the sediment itself. The Working Group noted that the results of some of this UK work were being prepared for publication and could be made available to ICES if required.
- 7.3 Professor Elskens informed the Working Group that the experience of the Belgian workers was similar to that of the United Kingdom, although they had found that sediment interstitial water levels were more closely related to those in the sediment.
- 7.4 The members of the Working Group were of the general opinion that the relationships between sediment contaminant levels and benthic animals were also complex, and concluded that at the present time there was little point in a major effort being exerted in a survey of the pollutant levels in sediments from the North Sea, and certainly not for the wider NEAFC and ICNAF areas.
- 7.5 The Working Group was reminded by the Chairman of its responsibilities in these matters in the light of the ACMP request, but confirmed its

view that the state of knowledge was not as yet adequate to allow sediments to be used in monitoring operations, except perhaps in closely confined areas. It was concluded that where there was major polluted input, much more basic work was required, and the Working Group accordingly drafted a recommendation to the effect that an expert Working Group should be established to deal with the subject (see page 18).

8. Co-ordinated monitoring in the North Sea, Skaggerak and Kattegat areas

- 8.1 In opening the discussion on this topic, the Chairman pointed out that this was a responsibility imposed specifically by the Working Group's terms of reference, and that the Consultative Committee had placed special emphasis on this aspect of the Working Group's duties. He informed the Working Group that unfortunately it had not been possible for the sub-group of ACMP (Coop. Res. Ref. No. 43 para 4.11) to complete its task of identifying those national programmes of monitoring in the North Sea which were suitable for co-ordination, and that it would not therefore be possible to table a separate list. However, it would be possible for the Rapporteur, on the basis of discussions held with the Chairman, to indicate which programmes might be selected from the list presented as Annex 5 of ICES C.M. 1974/E:3.
- 8.2 The Rapporteur explained that the selection had been made from those laboratories which had taken part in the first intercalibration exercise and included only those pollutants which had been intercalibrated in that exercise.
- 8.3 The Working Group endorsed these selection criteria and the programme chosen on this basis, and agreed that it should call for the results of programmes concerned with contaminant levels in both water and fish or shellfish. It also agreed that, as the Norwegian and United Kingdom programmes on petroleum hydrocarbons in sea water were being intercalibrated, the results of these programmes should also be called for. The agreed list of selected programmes is reproduced in full as Annex 7.
- 8.4 The Working Group considered the timetable for submission of results

agreed at the January 1974 meeting of the old Working Group on the Study of Pollution of the North Sea but thought that it was essential to have a report on the 1974 data available for consideration at the 63rd Statutory Meeting.

- 8.5 In this connection the Working Group were informed by the General-Secretary that, although ICES had proposals for the employment of an Environment Officer, it was unlikely that one would be in post before late 1975, and that as a consequence no Secretariat assistance could be expected in the compilation of monitoring data submitted to ICES.
- 8.6 In the light of this information the Working Group agreed that all the required data should be submitted to the chairman of the Working Group before April 30th, 1975, or as soon as possible thereafter. Norway, Germany, Netherlands, Belgium and the United Kingdom all indicated that they could meet this deadline, and the remaining countries undertook to send their data as soon as possible.
- 8.7 On receipt of the data the Chairman, with the assistance of the Rapporteur, would attempt a preliminary compilation of the data and its interpretation. If at all possible, he would then circulate the draft material to all members of the Working Group, so that they could submit their comments to him in time for them to be considered by a small editorial group comprising members from each of the countries submitting data. The Working Group agreed to authorise this sub-group, which would meet in Lowestoft, probably during the first week of July, 1975, to conduct the task of editing the report so that it could be submitted directly to the 63rd Statutory Meeting.
- 8.8 The Working Group then considered how it should in the future extend its coverage of pollutant monitoring in the North Sea. A number of pollutants were tentatively proposed for inclusion in a co-ordinated programme. It was also suggested that, instead of analyzing only fish and shellfish, some attention should be given to the analysis of plankton which, for some pollutants, might be more likely to reflect water levels than either fish or

shellfish. However, it was noted that there were considerable difficulties of sampling and interpretation involved in plankton monitoring.

8.9 Following discussion of the feasibility of these various suggestions being adopted on any scale, and the problems of interpretation of results, the Working Group agreed that it was more appropriate at this time to encourage better coverage for existing pollutants and media. This can only be achieved by extension of the intercalibration exercise to those laboratories whose programmes are relevant but who have not as yet participated in such an exercise. All members of the Working Group were urged to take steps to ensure this is achieved and, whenever possible, to extend their programmes, particularly in their own coastal water areas.

8.10 The Anglo-Norwegian programme of petroleum hydrocarbon measurement in sea water, marine organisms etc was drawn to the attention of the Working Group, and it was pointed out that when this was started it had been widely publicised within ICES, but that, although other countries had been urged to join as soon as possible, none had so far done so. The members from Greenland, Sweden, Germany and Portugal all informed the Working Group that they were aware of activities in this field in their countries, and undertook to ensure that their sampling and measurement techniques were intercalibrated with those of the Norwegian and United Kingdom workers.

8.11 There was a lengthy discussion on the timetable which should be adopted for the submission of data on programmes to be conducted in 1975. It was noted that the report on the results would have to be submitted to the ACMP before it could be passed to the Oslo Commission, or any other international organisation, but that, in the absence of any firm knowledge on the dates on which the ACMP or Oslo Commission would meet in 1976, it would be best to select the earliest practicable date. With this in mind 30 April, 1976 was tentatively agreed as the latest date for submission of data in relation to the 1975 programmes.

9. Data on sewage sludge and dredge spoils

- 9.1 At the last meeting of the Working Group on the Study of Pollution of the North Sea, held in January, 1974, it had been noted that, although it was known that sewage sludge and dredge spoil contained trace concentrations of a number of pollutants, information as to the degree of contamination was not very good. It had therefore been agreed that members should seek out such information and submit it to Dr Portmann for compilation into a report, which would be submitted to the Fisheries Improvement Committee at the 62nd Statutory Meeting.
- 9.2 Dr Portmann informed the Working Group that this timetable had been met and that in noting the information supplied (ICES C.M. 1974/E:20) the Fisheries Improvement Committee had commented that, although it represented a significant improvement in knowledge, more data were still required.
- 9.3 The Working Group considered the report and endorsed this view. It was also pointed out that the information related only to sewage sludge, and that information on the liquid effluents of both treated and untreated sewage was still totally lacking. However, it was recognized that, for it to be of any real value in establishing inputs, it would be necessary to ensure that the values quoted were representative of average concentrations and did not relate to spot samples.
- 9.4 It was therefore agreed that members should seek information of the following nature on dredge spoil, sewage sludge, raw or partially treated sewage effluents and fully treated sewage effluents: total solids, metals eg lead, cadmium, mercury, copper, zinc, chromium, arsenic, petroleum hydrocarbons, organochlorine compounds (especially pesticide residues and PCBs) and nutrients. It is not considered necessary to provide comprehensive data, but it is suggested that the best approach would be to select a number of key situations, collecting a number of samples over a period at each situation and analysing these. These samples should be analysed either individually, or on the basis of a bulked

sample, for each situation indicating which alternative was used, the objective being to provide a series of average values which could subsequently be used for overall, order of magnitude, calculations on input. The information should be reported to the Secretariat in time for consideration by the Working Group at its next meeting.

10. Requirements for further input data

- 10.1 The Chairman reminded the Working Group that it was specifically charged with considering the compilation of input data, and that this responsibility covered both an improvement in the existing data for the North Sea and an extension to input data for the Oslo Commission and ICNAF areas.
- 10.2 The suggestion was made that even with improved data it would still not be possible to assess the impact of such inputs on the environment, and, in view of the effort that would be involved in obtaining the required data, perhaps the rationale of the terms of reference should be questioned. It was pointed out however, that it would be possible in due course to relate input data to concentrations found in one or more selected components of the marine environment, and that this relationship would provide the essential basis for control. Input monitoring was an integral part of monitoring according to the interpretation of the word adopted by ICES and the Oslo Commission.
- 10.3 Several members indicated that the quantity and quality of information obtained in response to the questionnaire used by the Working Group on the Study of Pollution in the North Sea had been affected by difficulties experienced by national authorities in understanding the purpose and terminology of that questionnaire. In particular it was noted that, for major river systems, input values were almost certainly inaccurate and that, in a situation like that of the Schelde estuary, there was opportunity for the inputs to be quoted twice. Many countries had also experienced difficulties over the separation of sewage and industrial wastes.
- 10.4 The General-Secretary informed the Working Group that similar difficulties

had been experienced by the ICES/SCOR Working Group on the Study of the Pollution of the Baltic and that, as a result, they had drawn up an amended questionnaire.

- 10.5 It was generally agreed that, compared with their response in 1972, most countries could now give improved information to a similar questionnaire, and that it would be useful to circulate a revised form of questionnaire to all countries with membership of the Working Group.
- 10.6 In discussing the revisions that should be made note was taken of the main purpose of the questionnaire, ie the provision of order of magnitude data on inputs of pollutant to the study area by the major pathways, the fact that river input information would be necessary, and that national authorities would need a measure of flexibility in preparing their responses.
- 10.7 As on the previous occasion it was agreed that coastlines should be divided into convenient sections. In view of the difficulties involved in assessing what proportion of a pollutant entering an estuary reaches the open sea, it was agreed that estuaries should be regarded as integral parts of the study area without distinction, but that note could be made accordingly if information was available on flux out of the estuary to the open sea. It was also agreed that each major estuary should count as a coastal area in its own right, and that, in cases such as the Schelde, the countries concerned should combine forces to produce the best information possible.
- 10.8 The list of pollutants to be featured in the replies was examined and revised in the light of the responses obtained from the earlier questionnaire and the increasing array of pollutants recognized as being of interest.
- 10.9 It was, however, agreed that radioactivity should not be included since this subject is already adequately covered by several specialist organizations such as NEA and IAEA. The General-Secretary confirmed that this decision was in accordance with ICES policy.

- 10.10 In the light of the extensive discussions which took place it was finally agreed that a completely new questionnaire should be devised. This was drawn up by the Chairman and Rapporteur and, after a few amendments, was tentatively adopted (Annex 8). It was agreed that final adoption should be held over until after submission of comments on the Draft Report.
- 10.11 In connection with the section to be completed on atmospheric inputs the Working Group were reminded that this was a topic which the ACMP (Coop. Res. Rep. No. 43 para 2.8) had been particularly concerned about. The Working Group was informed that the United Kingdom programme, which had contributed most of the information available to the North Sea Working Group, had recently been modified and extended. The range of pollutants included had been extended to include organochlorine pesticides and PCBs as well as metals, and that plans were in hand to add PNAHs. In addition two stations on the eastern side of the North Sea had recently been established at Bergen in Norway and Petten in the Netherlands.
- 10.12 Professor Elskens informed the Working Group that a new station had recently been established as part of their major North Sea study programme, and that this included instrumentation for sampling atmospheric deposition. The Working Group noted this with interest and urged that the sampling and analysis methods should be intercalibrated with the United Kingdom programme.
- 10.13 The General-Secretary undertook to formally issue the questionnaire as amended, to the members listed in Annex 8 who agreed to act as initial contacts in their respective countries. The questionnaire would be copied for information to Delegates together with an explanatory letter. It was agreed that the deadline for the return of replies should be 31 December, 1975.
- 10.14 It was agreed that Mr Vagn Olsen, in conjunction with the ICES Secretariat, should act as co-ordinator for the replies. If, after an initial

compilation of the replies, assistance was necessary it was agreed that he would consult with the Chairman with a view to convening a small sub-group to assist him. Terms of Reference for this sub-group were agreed (Annex 5, part 3).

11. Eutrophication in the North Sea - Southern Bight, Kattegat and Skaggeiak areas

- 11.1 In introducing discussion of this topic the Chairman informed the Working Group that the old Working Group on the Study of Pollution of the North Sea had, in the light of reports of increasing nutrient levels in sea water, established two ad hoc working groups under the chairmanship of Mr D Tromp and Dr A Svansson. The reports from these two working groups had been considered by the Fisheries Improvement Committee and at a joint meeting of the Fisheries Improvement, Plankton and Hydrography Committees, but no real account had yet been taken of the recommendations made in the reports (ICES C.M. 1974/E:30 and E:53).
- 11.2 The Working Group accordingly examined the recommendations and noted that both sets were very similar, except that the Southern Bight group had recommended that further nutrient surveys should be conducted in that area. However, as the Working Group had already discussed this aspect earlier in the meeting and agreed that it was necessary, no further action in that context was considered necessary.
- 11.3 In relation to the recommendations relating to the problem of algal blooms the Working Group agreed that the General-Secretary should request the members of the Plankton Committee to provide, in their Administrative Reports, information on the occurrence and composition of algal blooms and any possible related detrimental effects. It was further agreed that the Plankton Committee should be requested to examine this information and decide whether or not the continued collection of such data would be useful, and also to consider soliciting a review paper on the subject of algal blooms and their related detrimental effects.
- 11.4 The Working Group noted that there was evidence of a 2-3 fold increase

in nutrient levels in recent years in parts of the Southern North Sea and an increase in the Skaggeiak-Kattegat areas, but that the relationship between nutrient levels, TOC(DOC) and oxygen levels and possible changes in plankton populations was not fully understood. The Working Group considered this to be a problem which merits urgent attention, especially if the changes are adverse, and if information on relationships is not already available they suggest that the Plankton Committee be requested to draw up plans for the conduct of a study designed to elucidate the relevant relationships.

12. ICES data exchange system

12.1 Discussion on this item was opened early in the meeting by Mr Smed who summarized the content of a paper which had been presented to the Working Group on Marine Data Management of the Hydrography Committee at the 62nd Statutory Meeting (ICES C.M. 1974/C:41). Discussion was resumed at the end of the meeting after members had had the opportunity to study the proposals.

12.2 It was noted that the proposals were in two parts, one on punch cards and the other for an inventory system, and that although the proposals took account of other international initiatives in the same field of interest it was difficult to ensure that all the relevant information was brought to Mr Smed's attention at ICES, and at least two specific cases were noted. The assistance of members in this matter was solicited and several undertook to supply information to Mr Smed on both national and international activities.

12.3 A few suggestions were made for improvements to the proposed punch cards but several members expressed the view that, since there would clearly eventually be an international system covering global pollution data, it might be inappropriate for ICES to initiate work on its own card system until a clear need was demonstrated. It was however agreed that work on the card system could usefully continue provided this remained in line with other initiatives.

12.4 There was general agreement that the proposed punch cards were at an advanced stage of development, but that the stage of development was disproportionate to that of the proposed inventory which also lagged behind other international systems which, it was pointed out, were concentrating on inventories rather than punch cards. It was suggested that steps be taken to correct this situation.

12.5 At the conclusion of the discussion on this topic the members agreed that they should consider the various proposals in the intersessional period, and that at the next meeting consideration should be given to giving a trial run to the proposed ICES systems for the inventory and, possibly, the punch cards.

13. Monitoring of effects of pollutants

13.1 The Group noted that its membership and present concern with baseline and monitoring exercises did not permit it to pay sufficient attention within the full group to the study of the effects of pollutants on living resources and their exploitation. The Group was concerned that the expansion of the membership necessary to prosecute such work might make it unduly large or unwieldy. Some members felt that the assessment of effects on living resources, as distinct from those of a public health nature, were not sufficiently far advanced as to permit their use in a surveillance programme, and that much more basic work needed to be undertaken before this stage was reached.

13.2 However, the Group was concerned that some action in this field should be initiated as soon as possible; after discussion they agreed to invite Dr McIntyre, with the assistance of a small number of experts in the field, to examine the problems involved in dealing with this aspect of the work. The composition of the group should be agreed with the Chairman and it should report back to the next session of the Parent Working Group. Its terms of reference are given in Annex 5, part 4.

14. Any other business

Mention was made of work being conducted or proposed by WHO in the marine

pollution field, and it was noted that, although ICES had been represented at the first of a series of WHO sponsored meetings (at Bilthoven), the Council had not been represented at a recent meeting on a similar topic. The General Secretary was urged to maintain contact with WHO to ensure no duplication and the minimum of overlap in the two organisations' fields of interest.

15. Date of the next meeting

It was tentatively agreed that the next meeting should take place at Charlottenlund during the last week in April, 1976. This date will be finalised at or about the time of the 63rd Statutory Meeting and all members will be notified as soon as possible thereafter.

16. Closure of the meeting

There being no other business the Chairman closed the meeting at 1745 hrs on Thursday 9 January, 1975, and thanked all the members for their attention and co-operation, and the General-Secretary and his staff for their assistance at the meeting.

RECOMMENDATIONS

Following extensive discussion of the problems involved in monitoring contaminant levels in sediments, para 7.5, the Working Group recommends that:

Council establish a specialist Working Group comprising membership from those countries which had established national study groups in accordance with C. Res. 1974/4:2 together with any other interested parties, to examine the problems involved, and to make recommendations for a co-ordinated programme of work directed towards the establishment of the necessary scientific basis for the use of sediments in monitoring operations. The group should consist of scientists actively engaged in this field of work. It is further suggested that effort should be concentrated on specific areas rather than on a large and general scale, eg fjord systems, dumping grounds and major river estuaries.

RESPONSIBILITY FOR AGREED FURTHER ACTION

ALL members attending the meeting 7-9 January 1975

1. To inform the Rapporteur IMMEDIATELY if they are able to give any assistance in sampling or analysis of fish from the ICNAF area. Para 5.10 refers.
2. To submit to the Rapporteur IMMEDIATELY any comments on the draft Questionnaire at Annex 8 of the Draft report. Para 10.13 refers.
3. To consider IMMEDIATELY whether any national programmes can be incorporated in the ICES intercalibration scheme. Para 8.9 refers.
4. To inform Dr Topping before the end of February 1975 of the names and addresses of any analyst wishing to take part in the third ICES intercalibration exercise on metals and of the results of the second exercise on metals. Paras 5.6 and 5.7 refer.
5. To confirm to the Rapporteur not later than 30 April, 1975 the availability of the selected year classes of fish for the Oslo Commission area Baseline survey. Para 5.3 and Annex 6 refer.
6. To inform Mr Smed not later than say 31 May, 1975 of any national or recent international developments in the field of pollution inventories or punch card systems. Para 12.12 refers.
7. To supply to Dr Portmann before 31 December, 1975 all results of the NEAFC Baseline survey analyses. Para 5.14 refers.
8. To return to The General-Secretary, ICES, no later than 31 December, 1975 the completed Questionnaires. Para 10.13 and Annex 7 refer.
9. To supply to the Secretariat information on the pollutant content of dredge spoil, sewage sludge and sewage effluents in time for consideration at the next meeting of the Working Group, say by 29 February, 1976 (para 9.4 refers).

Members from Norway, Sweden, Denmark, Germany, Netherlands, Belgium and United Kingdom

10. To submit to the Chairman not later than 30 April, 1975 the results of the selected programmes of monitoring in the North Sea. Annex 7 and Para 8.6 refer.
11. To submit to the Chairman not later than 30 April, 1976 the results of

selected programmes of monitoring in the North Sea. Annex 7 and para 8.11 refer.

Members from Sweden, Germany, Portugal and Greenland

12. To contact Mr Palmork regarding intercalibration of their programmes on petroleum hydrocarbon analysis with a view to intercalibration with the Anglo-Norwegian programme. No deadline but para 8.10 refers.

For individual attention

13. Dr Johansen and Dr Uthe to submit to the Rapporteur IMMEDIATELY detailed plans for their coverage of sampling and analysis of fish in the ICNAF area, together with any requirements for assistance.
14. Dr Uthe to contact IMMEDIATELY colleagues at B.I.O. regarding membership of the sub-group on metals in sea water and participation in any proposed survey. Para 6.5 refers.
15. Dr Jones to supply copies of his draft material on metal levels in N. Atlantic sea water for consideration by metals in sea water sub-group - not later than 31 May, 1975. Para 6.6 refers.
16. Dr Schmidt to convene a meeting of his sub-group not later than 31 May, 1975. Para 6.4 refers.
17. Dr McIntyre to establish a working group. Para 13.2 and Annex 5.4 refer.
18. Dr Portmann to act as chairman of sub-group on the Oslo Commission and ICNAF Fish survey. Para 5.12 and Annex 5.1 refer.
19. Mr Vagn Olsen to act, with assistance from ICES Secretariat, as co-ordinator of the Questionnaire replies. Para 10.14 and Annex 5.3 refer.
20. Professor Elskens to arrange for the intercalibration with the UK programme, of methods of sampling and analysis of the Belgian atmospheric deposition station. Para 10.12 refers.
21. Dr Topping to prepare a report on the 2nd ICES intercalibration exercise on metal analysis. To prepare a set of samples for a 3rd exercise on metals. To submit to Professor Grasshoff 6 samples from the 2nd exercise and 12 samples from the 3rd exercise. All actions to be taken as soon as possible. Paras 5.6, 5.7 and 5.8 refer.
22. Chairman (i) to contact scientists in the USA. Para 5.11 refers

(ii) to contact the delegate from Spain. Para 6.5 refers.

(iii) to circulate, if at all possible, a draft of the report on 1974 North Sea Monitoring programmes prior to its consideration by an editorial group early in July. Para 8.7 refers.

23. Rapporteur to act as clearing house as required on any bilateral intercalibrations on new pollutants. Para 5.9 refers.

24. General-Secretary (i) to send out the agreed (and amended) Questionnaire not later than say 31 March, 1975. Para 10.13 and Annex 8 refer.

(ii) to contact all members of the Plankton Committee re Plankton Blooms say early in February. Para 11.3 refers.

LIST OF PARTICIPANTS

| | |
|-------------------------------------|---|
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| Prof Dr E Elskens | Université Libre de Bruxelles 105, Buyllaan, B-1050 Brussels, Belgium. |
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| Mr K H Palmork | Institute of Marine Research, P O B 2906 Nordnesparken 2, 5011 Bergen-Nordnes, Norway. |
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Terms of Reference of the Working Group on Pollution Baseline and Monitoring Studies in the Oslo Commission and ICNAF Areas set up to replace the Working Group on the Study of the Pollution of the North Sea:-

- (a) to extend the Baseline Study to the Oslo Commission and ICNAF regions in such a way that ICES would from time to time be able to answer enquiries from bodies such as the Oslo Commission and IOC. In this extension priorities should be given to the same pollutants and media as were studied in the North Sea,
- (b) to co-ordinate the task of monitoring the North Sea coastal areas, the Southern Bight, Skaggerak and Kattegat on the basis of national programmes, to supervise the submission of such monitoring data and the preparation of monitoring reports, and to make recommendations to the Advisory Committee on Marine Pollution regarding such changes or additions to national programmes as appear to be necessary,
- (c) to collect information on the input of pollutants to the extended area and especially to improve the coverage and quality of existing information on inputs for the North Sea.

AGENDA

1. Opening of the Meeting.
2. Composition of the Membership.
3. Terms of Reference of the Working Group.
4. Adoption of the Agenda.
5. Appointment of Rapporteur.
6. (1) Consideration of the Proposed Plans for the Extension of the North Sea Fish and Shellfish Survey (ICES, C.M.1974/E:3) Baseline of the NEAFC and ICNAF Areas in the Light of the Requirements of:
 - (i) the Oslo Commission, and
 - (ii) the Intergovernmental Oceanographic Commission.(2) Water: Metal Levels in the North Sea and NEAFC/ICNAF Areas
(3) Sediments: Metal and Other Residue Levels in the North Sea and possibly NEAFC/ICNAF Areas.
7. Consideration of the Advisory Committee on Marine Pollution Proposals for:
 - (i) Co-ordinated Monitoring in the Coastal Areas of the North Sea, Southern Bight, Skaggerak and Kattegat; and
 - (ii) Extension to Other Pollutants and/or Media.
8. Consideration of the Data on Sewage Sludges and Dredge Spoil Inputs. (ICES C.M. 1974/E:30 and E:53).
9. Requirements for Further Input Data:
 - (1) North Sea Area.
 - (2) Other Coastal Areas.
 - (3) Remainder of Study Areas.
10. Consideration of the Report of the Two Groups on Eutrophication. (ICES C.M. 1974/E:30 and E:53).
11. Consideration of an ICES Marine Pollution Data Exchange System. (ICES C.M. 1974/C:41).
12. Date of Next Meeting.
13. Any Other Business.

Terms of Reference of Sub-Groups established 8-9 January, 1975

1. Sub-Group for the Fish Baseline Survey - Chairman Dr J E Portmann

To co-ordinate the survey of residue levels in fish in the proposed North Atlantic study area and compile a draft report for consideration by the parent Working Group at its next meeting. In carrying out the early stages of its task this sub-group should pay attention particularly to:

- (i) Confirmation of the year classes of fish to be sampled (before 30 April, 1975)
- (ii) Confirmation of the list of pollutants which should be covered
 - (a) as a matter of priority and (b) optionally.
- (iii) To circulate the results of the 1973/74 intercalibration exercise and to exchange information on anomalies revealed and their causes.
- (iv) To arrange for the conduct of a new intercalibration exercise. Analysis of the exchange sample should wherever possible be carried out, and the results be submitted, prior to the analysis of the survey material.
- (v) To agree upon a set of sampling, preservation and preparation procedures to be adopted by all laboratories participating in the study. The proposals should be based upon the Baltic group recommendation.
- (vi) So far as possible this sub-group is expected to work by correspondence.

Membership/National contacts

| | | | |
|---------|-----------------|-----------|------------------|
| Belgium | Dr P Hovart | Greenland | Mr P Johansen |
| Canada | Mr J R Uthe | Iceland | Mr J Olafsson |
| Denmark | Mr O Vagn Olsen | Norway | Mr K H Palmork |
| England | Dr J E Portmann | Portugal | Dr M E Mergulhao |
| FDR | Dr U Harms | Scotland | Dr G Topping |
| France | Mr Y Thibaud | Sweden | Dr A Lindquist |

2. Sub-Group on Contaminant Levels in Sea Water - Chairman Dr D Schmidt

- (i) To examine in the light of knowledge gained in the course of the baseline investigations of metal levels in sea water in the North Sea area, whether or not routine observations of these contaminants are yet appropriate in a

monitoring context.

- (a) If they are, to draw up recommendations for such observations in the North Sea area and to supervise their conduct and prepare a draft report on the results for consideration by the parent Working Group;
 - (b) If they are not, to draw up plans for further development work so that at an early stage routine observations can be conducted.
- (ii) In the light of knowledge gained in the course of the baseline studies of metals in sea water in the North Sea area, and as a preparatory to any possible monitoring operations in an extended area, to plan and conduct a baseline survey of metal levels in sea water for the remainder of the NEAFC and relevant parts of the ICNAF areas and to prepare a draft report of the results for submission to the parent Working Group.

Core Membership/National contacts

Dr D Schmidt

Dr P Jones

Prof E Elskens (through Dr P Jones)

Mr O Vagn Olsen

Dr M Figueiredo

Dr A Walton

Mr J Olafsson

Mr D Tromp

Dr G Topping

Additional members are requested to contact Dr Portmann.

3. Sub-Group on Input data - Chairman, Mr O Vagn Olsen

To co-ordinate the submission of input data in the North Atlantic study area and to compile a draft report for consideration by the parent Working Group. So far as possible this sub-group is expected to work by correspondence.

Membership to be arranged.

4. Sub-Group on the feasibility of Effects Monitoring - Chairman, Dr A D McIntyre

- (i) To review the present state of knowledge relating to the effects of marine pollutants on living resources and their exploitation.

- (ii) To examine how such effects may be demonstrated or measured experimentally; how the results of such work may be interpreted and applied to their detection and evaluation in the field, including their relevance to data from current baseline and monitoring programmes.

Membership to be arranged.

1. ARRANGEMENTS FOR SAMPLING OF COD*

| <u>Area</u> | <u>Country</u> |
|--|------------------------------|
| E Greenland | Germany (Fed.Rep. of) |
| Iceland | Iceland/Denmark, Belgium |
| Spitzbergen | Norway |
| N Norway (x2) | Norway |
| W Barents Sea | Norway+/Sweden, Netherlands+ |
| E Barents Sea | Norway+/Sweden, Netherlands+ |
| Faroes | Scotland, Denmark |
| Faroes Bank | Scotland |
| W Scotland | Scotland |
| Irish Sea | England |
| W Ireland | Ireland |
| S W Ireland | Ireland |
| Kattegat | Sweden, Denmark |
| Biscay | France, Spain |
| Portugal | Portugal |
| English Channel | England |
| Bristol Channel | England |
| Azores | Portugal |
| S North Sea | Belgium, Germany |
| E North Sea | Netherlands |
| Grand Banks |) |
| |) |
| Emerald Banks |) |
| |) |
| Scotia Shelf |) Canada |
| |) |
| and 3 other areas |) |
| ICNAF Area 1; all sub-areas will be sampled if possible | Greenland |

All samples to consist of 10 fish.

For metals each fish to be analysed individually for muscle tissue and in duplicate on an homogenate of the livers.

For organochlorines and PCBs each fish to be analysed individually for liver tissue and in duplicate on an homogenate of the muscle tissues.

* where cod are not available, use hake.

+ to be assisted by Sweden with analysis if necessary.

2. SPECIES OF FISH IN ADDITION TO COD TO BE ANALYSED DURING THE BASELINE SURVEY

| <u>Country</u> | <u>Area</u> | <u>Species</u> |
|------------------------|-----------------|--------------------------------|
| Norway | Barents Sea | Capelin, Plaice or Flounder |
| | Norwegian Coast | Herring and Flounder or Plaice |
| Sweden | Skaggerak | Flounder or Plaice, Herring |
| | Iceland* | " " " |
| | E Barents Sea | " " " |
| Denmark | Faroe | Herring |
| | E Greenland | Capelin |
| | Kattegat | Herring, Plaice, Sole |
| Germany (Fed. Rep. of) | S North Sea | Plaice |
| Netherlands | S Ireland | Hake |
| | Irish Sea | Sole |
| | North Sea | Sole |
| Belgium | Irish Sea | Sole, Plaice |
| | English Channel | Sole, Plaice |
| | Bristol Channel | Sole, Plaice |
| | S North Sea | Sole, Plaice |
| | S North Sea | Herring |
| Portugal | Portugal | Hake, Pilchard, Sole |
| | Azores | as above, if possible |
| England | W Scotland | Hake |
| | N Irish Sea | Hake |
| | S North Sea | Sole |
| | English Channel | Pilchard |
| Scotland | Faroe | Plaice |
| | Faroe Bank | Plaice |
| | W Scotland | Plaice, Herring |

| <u>Country</u> | <u>Area</u> | <u>Species</u> |
|----------------|--|--|
| Canada | Grand Banks | Herring, Mackerel; Capelin? |
| | Emerald Banks | " " " |
| | Scotia Shelf | " " " |
| | 3 other major | " " " |
| Greenland | ICNAF area 1; all ICNAF sub-areas will be sampled if possible | Capelin, Greenland Halibut and Deep-Sea Prawn |

* if required by Iceland

Each sample to consist of 10 fish, liver and muscle tissue to be analysed either separately or in duplicate on homogenates of muscle samples from the 10 fish, and of the livers from the 10 fish.

3. DETAILS OF YEAR CLASS AND TIME OF SAMPLING*

and substances to be analysed

* As proposed at the January, 1975 meeting. Full details to be confirmed by Dr Portmann early May, 1975. (paras 5.3, 5.13 and Annex 5, part 1 refer).

| <u>Species</u> | <u>Year Class</u> | <u>Remarks</u> |
|----------------|--|--|
| Cod | 1972 1969 | 1969 Year Class in Northern Waters |
| Sole | 1963 (N Sea) | 1967 - Irish Sea 1969 - Bristol Channel 1969 or 1963 - English Channel 1969 - S North Sea/English Coast |
| Hake | Age difficulty - length to be selected 40-50 cm. | |
| Plaice | 1968 | 1969 (Irish Sea, Bristol Channel, English Channel) |
| Herring | 1972 | Norway will do the best they can to get 1972 year class |
| Capelin | 1971 | |
| Pilchard | 1971 | |

Special instructions:

(1) the above samples should be collected within the period July-September and each sample should consist of 10 fish.

(2) All samples (muscle and liver) to be analysed for the following organic substances, organochlorine pesticide residues, PCBs, and wherever possible polychlorinated terphenyls; all samples will also be analysed for mercury, cadmium, lead, copper and zinc, and wherever possible for organic mercury. Other metals and organics may be included at the discretion of the analyst concerned, (see paras 5.5 to 5.7 of the Report), but certainly wherever possible, for all liver samples, results for pesticides and PCBs to be expressed on both fat and fresh weight basis.

(3) Full details of the sample and its area of collection should accompany the analytical results, which should include brief details of methods used. In addition, for each substance analysed the limit of detection and blank values should be given. If duplicate analyses are conducted, provide both results.

| Years | Parameters | Area | Frequency of Measurement | Type of Sample | Age/Length | No./Amount | Institute |
|-------------------|-----------------------------------|--|-------------------------------------|--|--|--|-------------|
| BELGIUM | | | | | | | |
| 1971 to 1974 etc | Metals (see note) | South North Sea | all year " " " " September | Fish (muscle and liver). Cod Sole Plaice Herring | 1969 to 1971 1968 to 1971 1963 to 1971 1972 | >10 individ. >10 individ. >10 individ. >10 individ. | IRC |
| " | Pesticides | " | " | " | " | " | CRA |
| 1971 to 1974 etc. | Metals (see note) | South North Sea and Belgian coast | twice/year " " " | Cod Plaice Whiting Sprat Shrimps | 1969 to 1971 1968 to 1971 1969 to 1971 - - | >10 individ. >10 individ. >10 individ. >10 lots >10 lots | IRC |
| " | Pesticides and PCBs | " | " | " | " | " | CRA |
| 1971 to 1975 | Metals, Nutrients and other chem. | South. North Sea, Math. Model area (25 points) | 4 times a year and. addit. | water | | 25 (3 depths) and addit. | VUB U Lg |
| " | Pesticides and PCBs | " | " | " | " | " | VUB |
| " | Metals and other chem. | " | " | " | " | " | VUB U Lg |
| | Metals and other chem. | South. North Sea Estuaries | all year | water | | >10 | ULB |

Note. Metals: Hg, tot.org. Hg, Me-Hg, Cd, Cu, Pb, Zn, (Se, Sn ...)*
 Key:- IRC Institut de Recherches Chimiques (min.Agri.), Tervuren

CRA Centre Rech. Agronomiques (min.Agri.), Stat. Phycopharmacie, Gembloux

VUB Vrije Universiteit, Brussels

U Lg Universite de Liege

ULB Universite Libre de Bruxelles

* Other institutes have programmes which are relevant but have not been intercalibrated.

| Start of Project | Parameters | Area | Frequency of Measurement. | Type of Sample | Age/Length | No./Amount | Institute |
|------------------|--------------------|------------------------|---------------------------|---|------------|-----------------|-----------|
| DENMARK | | | | | | | |
| Jan. 1973 | Hg, Cd, Pb, Cu, Zn | Kattegat and North Sea | Monthly | Cod Cod liver Flounder Herring | | 500 g " " | NFI |

Note. Other programmes are in operation which are relevant but which have not been intercalibrated

Abbreviations NFI National Food Institute, Copenhagen.

GERMANY, Fed. Rep. of

| | | | | | | | |
|----------|--|---|----------------|---------------------------------|---------------|-------------------|--------|
| May 1973 | Heavy metals (Mn, Fe, Co, Ni, Cu Zn, Cd, Hg, Pb) | 1) German Bight (SE North Sea) 2) Estuary of River Elbe | twice per year | Fish (Cod, plaice) muscle | 4-6 years old | 5-10 individually | BfF(I) |
| 1972 | PCBs, Pesticides | North Sea | 1/year | Fish | Plaice | 10 (homogen.) | IfKuBF |
| 1973 | | | | Shrimp | 4 years | | |
| 1974 | | | | Mussel | Mussels | | |
| | | | | | 55-65 mm | | |

Note. Other institutes and programmes are of relevance but have not been intercalibrated.

Abbreviations BfF(I) Bundesforschungsanstalt für Fischerei, Isotopenlaboratorium

IfKuBF Institut für Küsten- und Binnenfischerei der BfF

| Start of Project | Parameters | Area | Frequency of Measurement | Type of Sample | Age/Length | No./Amount | Institute |
|--|--|--|--------------------------|---|-----------------------|--------------------------------------|-----------|
| NETHERLANDS | | | | | | | |
| Oct 1971 | Heavy metals (Hg, Cd, Pb, Cu, Zn, As, Cr, and others) | Texel Rhine-mouth W. Scheldt estuary | 4/year | Sole | Average market sample | 10 kg 10 kg 10 kg | RIVO |
| | PCBs and Organo-chlorine pesticides | Ems estuary | | Shrimp | | 15 kg | RZS |
| Jan 1972 | Heavy metals (Hg, Cd, Pb, Cu, Zn, Ni, As, Cr and others). Organo-chlorine compounds | 6 lines (between the Belgium border and Den Helder, 30 km into the North Sea, 6 stats. per line) | 9/year | Water (filtered and non-filtered) | | 1 litre bottles (3 at every station) | RIZA |
| Note Other institutes have relevant programmes but have not intercalibrated | | | | | | | |
| Abbreviations | | | | | | | |
| | RIVO | Rijksinstituut voor Visserijonderzoek, IJmuiden | | | | | |
| | RIZA | RIZA, Westeinde 3A, Voorbing (Z.H.) | | | | | |
| | RZS | Rijkszuivelstation, Vreewijkstraat 12b, Leiden | | | | | |
| NORWAY | | | | | | | |
| Sep 1971 | Hydrocarbons | Bergen-Shetland | monthly | Seawater | - | 36 | IMR |
| Jun 1972 | Hydrocarbons | Ekofisk | once a year | Seawater | - | 24 | IMR |
| Jun 1973 | Heavy metals: Pb, Cd, Cu, Zn, Fe, Hg | Oslofjord | monthly | Flounder (muscle, liver gonad, heart, skin, stomach content), Seawater and sediment | All age groups | Individuals 50 from 7 diff. loc. | IMBL |

| Start of Project | Parameters | Area | Frequency of Measurement. | Type of Sample | Age/Length | No./Amount | Institute |
|--|---|--|---------------------------|--|----------------------------------|--|------------|
| <u>NORWAY (continued)</u> | | | | | | | |
| 1970 | Heavy metals Hg (Cd, Cu, Zn Pb) | Norwegian coastal waters | regularly | Commercial fish, shellfish and fish products | Available groups | 200-500 | IMR |
| <u>Abbreviations</u> IMR Institute of Marine Research, Bergen IMBL Institute of Marine Biology and Limnology University of Oslo | | | | | | | |
| ----- | | | | | | | |
| <u>SWEDEN</u> | | | | | | | |
| 1970 | Tot. Hg, Zn, Cu, Cr, Pb, Cd DDT + deriv., PCB | Göteborg Archipelago | Irreg. | Cod Herring muscle Flounder Cod liver | Various | About 10 of each species | FB and EPB |
| 1971 | Tot. Hg, Zn, Cu, Cr, Pb, Cd DDT + deriv., PCB | Kattegat and Skagerrak, 4 localities | Irreg. | Cod Herring muscle Plaice Cod liver | Various | " | " |
| 1972 | Tot. Hg, Zn, Cu, Cr, Pb, Cd DDT + deriv. PCB | From Norw. border to South of Göteborg | once | <u>Mytilus edulis</u> | 45-50 mm 50-55 mm 55-60 mm | 25 in each sample (less in some cases) | " |
| <u>Abbreviations</u> FB Fishery Board EPB Environment Protection Board | | | | | | | |

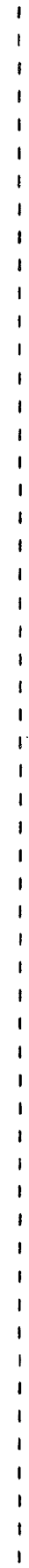
| Start of Project | Parameters | Area | Frequency of Measurement | Type of Sample | Age/Length | No./Amount | Institute |
|------------------|---------------------------------|-------------------------------------|--|--|-----------------------------|--|---------------|
| UNITED KINGDOM | | | | | | | |
| 1972 | Petroleum derived hydro-carbons | 7 Areas Scotland 6 Areas England | to be repeated at approx. 2 year intervals | Surface film, Sub-surface water, Sediment, Plankton, Benthos, Fish | - | Generally of each item per site Benthos/Fish as available | MAFF/ DAFS |
| 1973 | " | In vicinity of N. Sea Oil Wells | As necessary | As above + more fish | - | - | MAFF/ DAFS |
| 1971 | Hg, Cd, Cu, Zn, Pb, Cr | England coast | Twice year | Cod, Plaice } muscle Herring } Mackerel } cle | Specified size each species | 10 fish | MAFF |
| 1971 | Hg, Cd, Cu, Zn Pb, Cr | " | Irreg. | Misc. commercial fish and shellfish: Edible Portion | | 10 fish | MAFF |
| 1971 | Hg, Pb, Cd | Thames | Irreg. | Fish and Shellfish: Edible Portions | Commercial catch | 10 fish 50-100 shellfish | MAFF |
| 1968 | O/Cs, PCBs* | 14 areas England, Wales, Scotland | Twice year | Cod, Whiting, Mackerel, Herring and Plaice: muscle and liver homogenates | Specified size ranges | 10 fish | MAFF/ DAFS |

| Start of Project | Parameters | Area | Frequency of Measurment. | Type of Samples | Age/Length | No./Amount | Institute |
|----------------------------|---|--------------------------------------|--|---|---|--------------|-----------|
| UNITED KINGDOM (continued) | | | | | | | |
| 1972 | O/Cs, PCBs* | 14 Areas England, Wales, Scotland | Twice year | Cod, Herring Plaice: muscle and liver homogenates | " | 10 fish | MAFF/DAFS |
| 1974 | Relevant pollutants includes O/Cs, PCBs, Hg, Cd, Pb, Cr, Cu, Zn as appropriate* | Coastal dumping areas around England | Approx. 1-2 times per year according to site | Fish and various benthic animals | Catch from research vessels by grab, dredge and trawl | As available | MAFF |
| 1969 | Zn, Fe, Mn, Cu, Ni, Pb, Cd, Co | British coastal waters North Sea | 1/year | Sea water and sediments | Sampling by research vessels | | MAFF |

Note. Other programmes are relevant but have not been intercalibrated

Abbreviations MAFF Ministry of Agriculture, Fisheries and Food
DAFS Department of Agriculture and Fisheries for Scotland

* Only data for North Sea programmes are relevant.



DRAFT QUESTIONNAIRE

A. Explanatory Notes

1. Objectives: The purpose of the questionnaire is to provide a basis for an estimate (order of magnitude) of the input of major categories of pollutants to the marine environment in the North Sea, the Oslo Commission area and parts of the ICNAF region. For this purpose the marine environment will be taken to include river estuaries and fjords. Information is called for on all major pathways and on any individual sources which national authorities consider should be specified separately.
2. Inputs which are of concern are via the following pathways or routes.
 - (i) River input to the marine environment.
 - (ii) Input directly to the marine environment (as distinct from river, dumping or atmosphere), eg pipeline discharges, etc., to estuaries and coastal waters.
 - (iii) Atmospheric inputs.
 - (iv) Dumping.
 - (v) Other sources, eg incineration at sea.
3. It is suggested that coastlines be divided into sections of convenient size at the discretion of national authorities, so that input figures for the various individual pathways can be given for each section of the coast. However, major estuaries or fjord systems should be dealt with as discrete units.
4. Wherever possible in an estuarine or fjord situation, it is requested that an estimate be provided of the proportion of the input entering the estuary or fjord which actually enters the open sea.
5. It will be noted that in certain cases, eg as in the case of dredging of river estuaries, the dumping of such spoil in the open sea is not an input but a transfer and should be included in the estimates of estuarine pollution load reaching the open sea.
6. It will be noted that details of radioactive wastes, eg from nuclear power programmes, are not required as these are being dealt with under the auspices of other International bodies. However, details are required of the volume and temperature

elevation of power station effluents, whether nuclear or not.

B. Categories of Pollutant and Waste (to apply to pathways 1, 2, 4 and 5 above, whether of domestic, industrial or other origin).

1. Quantities to be given in a m³/day or metric tons per year. These should be average quantities over the most recent available 12 month period, which should be specified. Where there is evidence that the dates thus provided are significantly different to the most recent situation, a note should be provided to this effect.

Provide details of:-

Total flow

Total population contributing to the flow

Per capita water usage

Suspended solids

Total solids

BOD

COD

Total nitrogen

Total phosphorus

Organochlorine compounds, especially pesticides and PCBs.

Petroleum waste and tar products

Metals, ie lead, cadmium, mercury, zinc, copper, arsenic and chromium

Other substances

Heated effluents (flow and temperature elevation).

2. A map should be provided showing major estuaries and the way in which the coastline has been divided.

3. Information should be provided concerning the degree of treatment of sewage and industrial wastes, especially where data on individual pollutant concentrations and these quantities, are not available.

C. Dumping

1. Include industrial wastes, sewage sludges, mining wastes, harbour dredging (see note above) household refuse, etc. Provide information on approved dumping

activities over the most recently available twelve month period in terms of quantities, composition and origin. Details are also required of the position of dumping, whether or not the waste was in a container, and whether the waste is expected to disperse or remain in the immediate vicinity of the area of disposal.

D. Atmospheric input

Give details of national programmes to determine atmospheric fallout including sampling sites. Wherever possible estimates should be given of the annual input for the individual pollutants specified above.

E. Other sources

Data appropriate to incineration at sea should include quantities, composition, origin, temperature of incineration and location of vessel conducting incineration. Please include any other known source not already listed.

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The following members agreed to act as initial contacts in distributing the Questionnaire and returning the collected information to ICES and Dr Vagn Olsen.

| | |
|----------------------|--|
| Canada | Dr J F Uthe |
| Norway | Dr Saetersdahl for attention of Mr G Berge |
| Belgium | Professor E Elskens |
| Scotland | Dr A McIntyre |
| England | Mr A Preston |
| Portugal | Dr M Figueiredo |
| France | Mme Soudan |
| Greenland | Mr P J Johansen |
| Germany (Fed.Rep.of) | DHI |
| Netherlands | Mr D Tromp |
| Sweden | Fishery Board (Göteborg) |
| Denmark | Mr O Vagn Olsen |
| Iceland | Mr J Olafsson |
| Ireland | Dr A Gibson |
| Spain | Delegates |

Replies to be in not later than 31 December, 1975.