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SCIENTIFIC COUNCIL MEETING - SEPTEMBER 1985

Provisional Report of the Scientific Council

Annual Meeting, Havana, Cuba, 9-13 September 1985

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PROVISIONAL REPORT OF SCIENTIFIC COUNCIL

Annual Meeting, September 1985

Chairman: V. A. Rikhter Rapporteur: V. M. Hodder

The Scientific Council and its Standing Committees on Fishery Science (STACFIS) and Publications (STACPUB) met at the Palacio de las Convenciones (Convention Palace), Havana, Cuba, during 9-13 September 1985, to consider and report on various matters listed in the Agenda (Appendix III). Representatives attended from Canada, Cuba, European Economic Community (Federal Republic of Germany, France, and Commission of the European Communities), Japan, Spain and Union of Soviet Socialist Republics (USSR) (Appendix IV).

The Havana Meeting was preceded by the Special Session on "Design and Evaluation of Biological Surveys in Relation to Stock Assessments," which was held at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada, during 4-6 September. The Special Session was attended by 67 scientists from Canada, Denmark, European Economic Community (Federal Republic of Germany, France, Italy, and the Commission of European Communities in Belgium), Iceland, Norway, Spain, Trinidad, United States of America (USA), and a representative of the International Pacific Halibut Commission, Seattle, USA.

The reports of the Standing Committees, as adopted by the Council at this meeting are at Appendix I (STACFIS) and Appendix II (STACPUB). Brief summaries of these reports and other matters considered by the Council are given below.

I. FISHLRY SCIENCE (APP. I)

1. Special Session on Design and Evaluation of Biological Surveys

At the Special Session which was convened by J. Messtorff (EEC), 29 scientific papers were presented by authors from Canada, Federal Republic of Germany, Iceland, Norway and USA. Two additional USSR papers, which were not received in time for the Special Session, were considered later by STACFIS at the Annual Meeting in Havana, Cuba. The majority of the papers dealt with three of the five major topics: survey design and operations, evaluation of survey data, and importance of survey data for stock assessments. Several authors emphasized the value of survey results as independent means of assessing marine resources which are subjected to regulated exploitation.

The Council was encouraged by the number of papers which dealt with new statistical techniques to analyze time series of trawl survey data. However, the range of new techniques clearly indicated that there is yet no standard technique for analysis of these data. Overall, the Special Session was considered to have been very successful with good attendance and high quality papers that promoted considerable discussion. It not only highlighted current knowledge about analysis of survey data but allowed investigators to identify promising areas for future research.

2. Stock Assessments

No new stock assessments were considered at this meeting. However, the Council agreed with the advice of STACFIS concerning questions on the cod stocks in Div. 3M and 3NO, which had been referred to it at this meeting by the Fisheries Commission.

The Council noted that STACFIS had reviewed the arrangements that had been adopted for dealing with stock assessments at the June 1985 Meeting and it endorsed the recommendations for further improving the efficient use of time at future June meetings.

3. Topics for Future Special Sessions

The Council adopted the program outlined by STACFIS for the Special Session in September 1986 on "Recent Advances in Understanding Recruitment of Marine Fishes, with Particular Emphasis on Georges

Bank Herring and Flemish Cap cod and Redfish Stocks", noting that M. D. Grosslein (USA) had agreed to be Convener, and requested the Secretariat to prepare and circulate a suitable announcement as soon as possible after the present meeting.

The Council also adopted the proposal by STACFIS that the theme for the Special Session in 1987 be "Biology of Demersal Resources of the North Atlantic Continental Slope, with Emphasis on Greenland Halibut and Grenadiers".

4. Review of Research Documents

The Council noted that STACFIS had reviewed two papers which were relevant to the Special Session on design and evaluation of biological surveys and had deferred consideration of four papers to the June 1986 Meeting.

5. Other Matters

Data were not available for STACFIS to provide advice on trawl escapement and selectivity problems which were requested by the Fisheries Commission, and the matter was deferred to the June 1986 Meeting.

The Council noted the continuing concern of STACFIS about environmentally-induced variations in catchability and its effect on stock assessments, and endorsed the production of papers on this problem for review at the June 1986 Meeting.

II. RESEARCH COORDINATION

1. Draft Format Regarding Documentation of Survey Procedures

At the June 1985 Meeting, the Council endorsed the recommendation that "appropriate documentation of survey design, vessel and gear used, operation of gear, sampling procedures and other factors potentially affecting survey results be provided to STACREC at its June 1986 Meeting". To assist in the reporting of such data, the Secretariat solicited proposals from various laboratories which conduct surveys in the Northwest, but the only response was from Canadian scientists.

A small *ad hoc* working group was requested to prepare a list of items (to be subsequently arranged in tabular format by the Secretariat) for documentation of materials and methods for conducting bottom trawl groundfish surveys in Subareas 2 and 3 (and surveys for Greenland halibut and roundnose grenadier in Subarea 0) to determine abundance and biomass. The following list of items was adopted as the basis for drafting the format to be used in soliciting information on complete time series of stratified-random, fixed-station and other transect surveys.

	Item	Comment
1.	Country and year	
2.	Surveyed area	- NAFO division
3.	Period of survey	-
4.	Purpose of survey	- Species or species groups, adult or juvenile stages
5.	Vessel used	- Name, length, tonnage, horsepower
6.	Gear used	- Type (with appropriate scale diagram, if possible); floats and rollers; other rigging such as chafers; mesh size, especially of codend; presence of liner and mesh size
7.	Speed and duration of tow	- standard parameters
8.	Distance towed	
9.	Area swept by trawl	- How determined?
10.	Trawl height when towing	
11.	Survey design	- Stratified-random, transect, fixed-station, random station, etc.
12.	Number of successful sets	- Criteria for rejecting invalid sets
13.	Table of strata	- Sampling units and number of sets in each
14.	Station selection procedure	- Fixed stations, method of selecting at random
15.	Criteria for changing position	- Unexpected depth, rough bottom, etc.?

	Item	Comment
16.	Criteria for determining number of sets in each stratum	- Equal sampling density or porportional to density?
17.	Daily period of fishing	- Daylight hours or 24 hours?
18.	Catch sorting procedures	- All species or selected species
19.	Weighting procedures	- Individual specimens, standard baskets or containers, etc.
20.	Enumeration procedures	- Measuring, counting, subsampling
21.	Sampling large catches	- To obtain total weight and total number of each species
22.	Sampling for age material	- Random or stratified; specimens from each set or not; specified number of otoliths or scales for each length group; number in total for area adjusted to length frequency or not
23.	Sampling for length	- Fork, total or partial length to cm below or to nearest cm or half-cm; length frequency for each successful set; adjustment of sub-sampled length frequency to total catch in the set
24.	Other sampling activity	- List types of material collected (e.g. parasites, stomachs, fecundity, etc.)
25.	Oceangraphy activity	- NAFO Standard stations occupied; other observations (e.g. 50 BT casts, one at each fishing station)
26.	Procedure to determine abundance indices	- E.g. catch-per-tow, catch-per-standard tow, abundance from contour plots or from raising to survey area; list chronology of changes to procedures used to obtain indices

2. Maritime Boundary Between Canada and the United States of America in Relation to NAFO Statistical Boundaries (SCR Doc. 85/96).

The Scientific Council, in accordance with its decision at the June 1985 Meeting (SCR Doc. 85/22) and in the light of the subsequent Canadian proposal to the General Council that the Subarea 4/5 boundary be adjusted to coincide with the maritime boundary between Canada and the USA (GC Doc. 85/6), considered the technical implications of the Canadian proposal.

The maritime boundary between Canada and the USA in the Gulf of Maine area, as defined by the International Court of Justice (ICJ) in October 1984, is shown in Fig. 1 in relation to the present Subarea 4/5 boundary. The ICJ line originates at Point A in the northeastern part of Div. 5Y and approximates the present Subarea 4/5 boundary until it reaches latitude 42°20'N. It then runs in an approximately southeasterly direction, dividing Subdiv. 5Ze in northeasterly and southwesterly parts, and ends at Point D. This latter point lies approximately 2' of longitude west of the present Subarea 4/5 boundary. Areas of jurisdiction of Canada and the USA landward of Point A and seaward of Point D remain to be resolved, however. The Canadian proposal is not complete in that the Subarea 4/5 boundary cannot consist of the ICJ line alone. The Subarea 4/5 boundary must originate from a point more or less on land, such as the land boundary terminus between Canada and the USA which forms the origin of the present boundary, and end in the northern boundary of Subarea 6 at 39°00'N latitude.

Utilization of fisheries statistics is an integral part of all major aspects of fisheries management and many ancilliary activities. To function effectively, all aspects of fisheries management must utilize a common base of fisheries statistics. The present Subarea 4/5 boundary delimited the areas of regulatory responsibility of Panels 4 and 5 under the ICNAF Convention and hence assumed great administrative apportance. In the present situation, the ICJ line has become the primary regulatory boundary in the Gulf of Maine. However, the present statistical system does not permit fisheries statistics to be reported on the basis which conforms geographically to the Canadian and USA jurisdicational areas. Requirement for such statistics is beyond question and a means to provide them needs to be devised. In doing so, however, it is critically important not to significantly disrupt historical

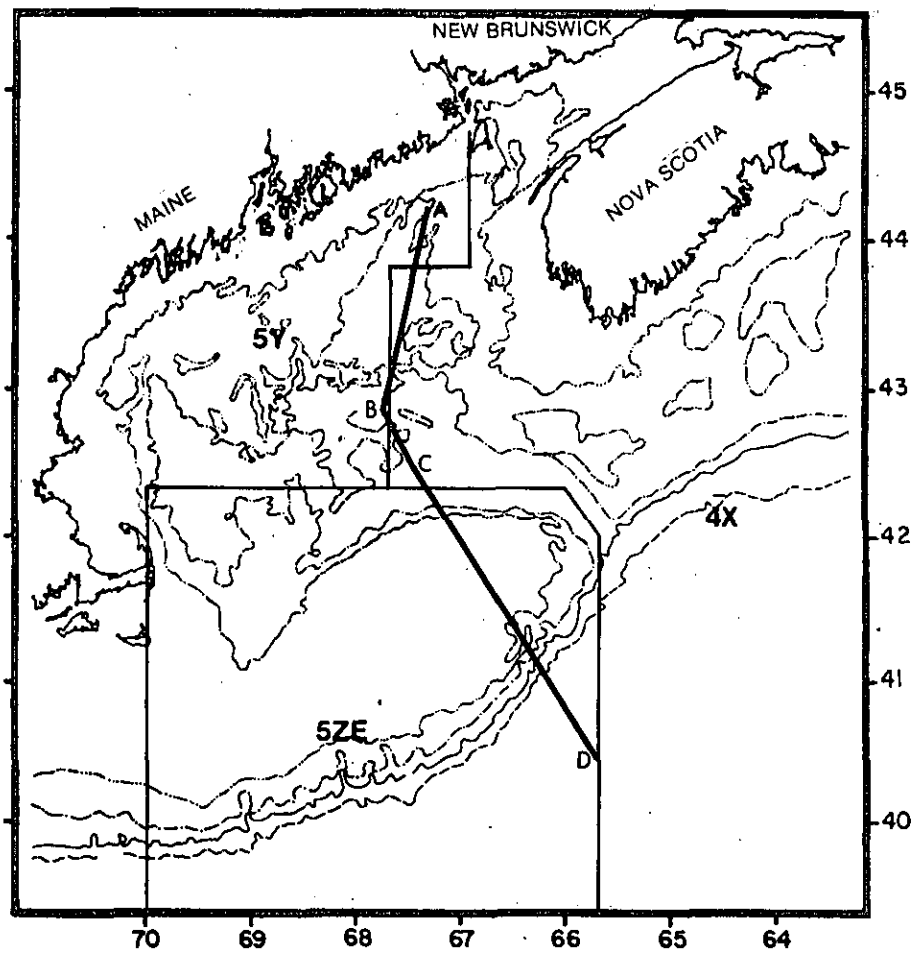

Fig. 1. The ICJ line in relation to NAFO statistical boundaries.

statistical data series which have been the basis for resource assessment and management advice. Otherwise, present ability to give advice will be seriously impaired and this undesirable situation will continue for a number of years.

As already noted, the northern part of the ICJ line approximates the present Subarea 4/5 line as far south as 42°20'N. The areas which would be transferred from one subarea to the other through adoption of the Canadian proposal are small. A review of biological and fisheries data indicates that these small areas do not contain especially high quantities of resources and are not the focus of important fisheries (SCR Doc. 85/96). Indeed, fishing in these areas is relatively sparse in comparison to some other parts of the statistical divisions in the Gulf of Maine area. Thus, to replace the present Subarea 4/5 line with the ICJ line in this region would not result in significant disruption to historical statistical data series.

South of 42°20'N, the divergence between the ICJ line and the present Subarea 4/5 boundary is substantial. Under the Canadian proposal, an area which includes the presently fished area of about 2,400 square nautical miles (defined as that part shallower than 200 fathoms) would be transferred from Subarea 5 to Subarea 4. This area is intermediate in size between Subdiv. 3Pn and 4Vn (again considering only those parts shallower than 200 fathoms. These subdivisions are the smallest statistical units in the present NAFO system. The area that would be transferred has also been the focus of important fisheries, and to simply transfer this area from Subdiv. 5Ze to the adjacent Div. 4X would result in a major disruption of the statistical data series for both of these units. If the Canadian proposal were to be implemented, it would not only be practical but essential to establish a new statistical division within Subarea 4 for

the area to be transferred from Subarea 5. This would prevent any disruption of historical data series, because data series for the present Subdiv. 5Ze could be constructed by adding together those for the new division of Subarea 4 and those for the residual part of Subdiv. 5Ze which remains in Subarea 5. Indeed, some statistical advantages could accrue from having an additional statistical division, as it would allow a more detailed description and analysis of fishery events in the Gulf of Maine area. If such a new division is established, it could be designated as Div. 4Zc and the residual part of the present Subdiv. 5Ze could be labelled Subdiv. 5Zu. The use of Z as a common designator may help in data summarization on a historical basis. Additional designation by "c" and "u" is required because Ze cannot be retained without possible confusion from having the same designator for different areas in past and future statistics. The "c" and "u" designators were chosen to refer to Canadian and USA sides of the boundary and to avoid confusion in having both sides labelled "Z".

No proposals have yet been made concerning the ends of the proposed new statistical boundary, of which the ICJ line would form an integral part. With regard to the northern part of the proposed new line, the Council noted that statistical data series are not likely to be greatly affected irrespective of the way in which the problem is solved. With regard to the southern part of the proposed new line, the part of the ICJ line south of about 41°00'N lies over depths greater than 1,000 fathoms, where there has been no historical fishing with the exception of specialized fisheries for large pelagic species. Thus, any proposal relating to the area south of 41°00'N is not likely to have significant practical impact on statistical data series.

In summary, as fisheries regulation and administration are now based on the ICJ line, it is essential that statistics be collected and recorded in such a manner that they will be available on the basis of the regulatory area in use. If the Canadian proposal is implemented, this objective would be achieved. However, it is essential that such implementation include the establishment of a new statistical division, consisting of that part of the present Subdiv. 5Ze which would become part of Subarea 4. Otherwise, historical data series will be disrupted and the scientific advisory function will be seriously impaired. For other sectors of the boundary, simple replacement of the present line by the new line is the only practical approach. No significant disruption of historical data series will result from doing this.

III. PUBLICATIONS (APP. II)

1. Editorial Matters

The Council was pleased to note that G. A. Robinson (Institute for Marine Environmental Research, Plymouth, United Kingdom) had accepted the offer to serve as Associate Editor of the Journal for Biological Oceanography from 1 July 1985 and that B. E. Skud (National Marine Fisheries Service, Narragansett, Rhode Island, USA) had accepted the offer to serve as Editor of the Journal from mid-July 1985. The Council agreed that the Editor of the Journal should be invited to participate in STACPUB discussions concerning editorial matters at the June 1986 Meeting and requested the Executive Secretary to arrange for the necessary funding for this purpose.

The Council welcomed further initiatives by STACPUB concerning promotion and distribution of the Journal in the light of suggestions by the new Editor. The Council also noted that the role and scope of its secondary publication (Studies) was further discussed and that STACPUB had developed a set of editorial guidelines which were unanimously adopted.

2. Review of Publications

The Council was pleased to note that the revised editions of five Statistical Bulletin volumes (27-31 for the years 1977-81) would be completed as scheduled before the end of 1985, but it was quite concerned about the long delay in publication of Vol. 33 for 1983 due to the absence of fishery statistics from France.

3. Papers for Possible Publication

The Council noted that STACPUB had reviewed the scientific papers which had been presented at this meeting and the preceding special session on biological surveys and that 22 of them had been recommended for publication in one of the Council's publication series, subject to revisions by the authors and acceptance by the editors.

IV. AMENDMENT TO RULES OF PROCEDURE

1. Consideration of a Proposal for Voting at Scientific Council Meetings

Although most of the decisions within the Scientific Council are by consensus, the difficulty in situtions where decision have to be taken under the terms of Convention Article X(2) has been the lack of a quorum whereby the presence of at least two-thirds of the Contracting Parties is required. After discussion of a possible procedure at the June 1985 Meeting, the Executive Secretary was requested to develop the main features of such a procedure for consideration at the September 1985 Meeting. After consideration of the Executive Secretary's proposal (SCS Doc. 85/23) and an alternative proposal by Canadian Scientific Council Representatives (SCS Doc. 85/26), the Council unanimously agreed to replace Rules 1 and 2 of the Rules of Procedures for the Scientific Council (NAFO Handbook, 1984, page 75) with those listed below. In the absence of a quorum at this meeting, the Executive Secretary was requested to conduct a vote on the amendments by mail and report the results at the June 1986 Meeting.

REPRESENTATION

Rule 1

1.1 Each Contracting Party shall notify the Executive Secretary as far as possible in advance of any meeting of the names of its representatives, alternates, experts and advisers who will attend.

1.2 A Contracting Party may be represented at a meeting by the Executive Secretary, if so empowered by the Contracting Party, for the sole purpose of voting as specified under Rule 2.3.

1.3 The Scientific Council may invite any non-Member Government and any international, public or private, organization to be represented at meetings of the Scientific Council or its subsidiary bodies by an observer or observers.

VOTING

Rule 2

2.1 Observers, experts and advisers may address plenary or subsidiary body meetings, but shall not be entitled to vote under Article X, paragraph 2.

2.2 Votes, in accordance with Article X, paragraph 2, shall be taken by a show of hands, by roll call, in the English alphabetical order of the names of the Contracting Parties, or by ballot, as determined by the Chairman, except that votes in which proxy votes are being cast under Rule 2.3 shall be by roll call only.

2.3 a) The Executive Secretary will cast votes of abstention on behalf of all Contracting Parties from which he has received prior approval to vote, provided that he shall not vote for a Contracting Party if another representative of that Contracting Party is present at the meeting.

b) For the purpose of this rule, the Assistant Executive Secretary can act for the Executive Secretary in the absence of the Executive Secretary and with the prior approval of the Contracting Party or Parties for which a vote is to be cast.

c) Authorization for the Executive Secretary, and for the Assistant Executive Secretary as specified under 2.3.b, to vote on behalf of a Contracting Party shall be sought by the Executive Secretary from those Contracting Parties for which the Chairman considers such authorization to be necessary for the purpose of providing the Scientific Council with a quorum.

d) Authorizations to vote received under Rule 2.3.c. shall be effective for a period as specified by the Contracting Party but in any case shall not be considered effective for more than 12 months without renewal.

e) No more than five (5) proxy votes shall be cast at any one vote.

2.4 In the case of an emergency between meetings, a vote may be taken by mail or other means of communication.

V. FUTURE SCIENTIFIC MEETINGS

1. Special Meeting in January 1986

The Council reaffirmed its decision of June 1985 to meet at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada, during 14-20 January 1986 to review the status of the shrimp stocks and to provide scientific advice on the management of these stocks, as requested by Canada and Denmark (on behalf of Greenland) (SCS Doc. 85/6, 7 and 8). The Vice-Chairman will act as Chairman for this meeting.

2. Scientific Meeting in June 1986

The Scientific Council reaffirmed its decision in June 1985 to meet, together with its Standing Committees on Fishery Science, Research Coordination and Publications and the Environmental Subcommittee, during 4-19 June 1986. This meeting will deal with the usual requests for scientific advice on fisheries management and with other fisheries-related research and statistical matters, including those which have been deferred from preceding meetings.

3. Annual Meeting in September 1986

The Scientific Council will meet in conjunction with the Annual Meeting of NAFO during 8-12 September 1986. This meeting will be preceded by the Special Session on "Recent Advances in Understanding Recruitment in Marine Fishes of the Northwest Atlantic..." on 3-5 September 1986 at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada.

4. Scientific Meeting in June 1987

Considering the need for the Secretariat to arrange meeting facilities at the Bedford Institute of Oceanography more than a year in advance of scientific meetings, the Council tentatively agreed to meet during 3-18 June 1987.

VI. OTHER MATTERS

1. Provisional Report of Scientific Council, June 1985

The Council reviewed and adopted its report of the June 1985 Meeting (SCS Doc. 85/22) with the addition of sections dealing with Fishery Trends, which could not be completed earlier due to incomplete statistics, and with various editorial corrections which were listed in the Corrigendum to the document.

2. Consideration of Proposal for Joint ICES/NAFO Working Group on Seals (SCS Doc. 85/2)

The Council, while agreeing that a cooperative arrangement with ICES was desirable, noted that it had received no proposal for a future meeting of scientists on seals. Consequently, it was decided that the question of a formal relationship with the ICES Working Group would best be left until there is some clear indication of what advice will be requested by the coastal states, but that the possibility of joint collaboration should be explored informally. It was agreed that Dr. A. Schumacher be requested to express the above opinion of the Council, if the matter is raised during the ICES Meeting in October 1985, and Dr. J. Messtorff agreed to convey the information to Dr. A. Schumacher.

VII. ELECTION OF OFFICERS FOR 1985-87

The Council was pleased to confirm, as a result of votes (11) submitted to the Executive Secretary following the lack of a quorum at the June 1985 Meeting, the election of the following officers to serve from the end of the present meeting until the end of the 1987 Annual Meeting:

1. Scientific Council

Chairman	-	J. Messtorff (EEC)
Vice-chairman	-	J. S. Beckett (Canada)

2. Standing Committees

Chairman of STACFIS	-	W. R. Bowering (Canada)
Chairman of STACREC	-	R. Dominguez (Cuba)
Chairman of STACPUB	-	J. S. Beckett (Canada) (*ex officio*)

VIII. ADJOURNMENT

There being no further business, the Chairman noted that the end of this meeting coincides with the election of officers who will guide the Scientific Council and its Committees for the next 2 years. Despite the difficulties that have been encountered during the past 2 years, mainly those related to finding sufficient time for STACFIS to complete the stock assessments, acceptable solutions were generally always found through the joint effort of all participants. Some innovations were recently introduced to facilitate the work of STACFIS, but the process cannot be considered as being complete until the practice of having night sessions is eliminated. An important aspect of future work involves the placing of more emphasis on the analysis of the relationships between hydrological factors and the distribution, migration and abundance of the major fish species..

The Chairman expressed his thanks to the chairmen, conveners and rapporteurs of the various committees, subcommittees, working groups and special sessions, and to all participants for their cooperation and contributions to the success of all meetings during his 2-year term of office. Not to be forgotten is the efficient role of the Secretariat not only in organizing and servicing meetings but also for their continuing contributions to the work of the Council throughout the year. On behalf of all scientists at this meeting, the Chairman expressed his gratitude to the Cuban hosts who provided excellent conditions for both work and relaxation during this very pleasant week in Havana. Their hospitality was beyond reproach.

Various members of the Council expressed their appreciation to the Chairman for his guidance during the past 2 years. The Chairman then congratulated the incoming officers upon their election to the Council and the Standing Committees for the next 2 years and adjourned the meeting at 1800 hrs on 20 September 1985.

APPENDIX I. REPORT OF STANDING COMMITTEE ON FISHERY SCIENCE (STACFIS)

Chairman: J. E. Carscadden Rapporteur: Various

The Committee met at the Palacio de las Convenciones (Convention Palace), Havana, Cuba, during 9-13 September 1985, to consider and report on various matters referred to it by the Scientific Council (see Appendix III, Agenda Section II). Representatives attended from Canada, Cuba, EEC (Federal Republic of Germany, France, and Commission of the European Communities), Japan, Spain and USSR.

The Havana meeting was preceded by the Special Session on "Design and Evaluation of Biological Surveys in Relation to Stock Assessments", which was held at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada, during 4-6 September 1985. The various matters considered at that session and at the Havana Meeting are outlined below, including comments on questions on the cod stocks in Div. 3M and Div. 3NO, which were referred to the Scientific Council by the Fisheries Commission during the course of this meeting. Various participants contributed to the preparation of initial drafts of different sections of this report.

I. SPECIAL SESSION ON DESIGN AND EVALUATION OF BIOLOGICAL SURVEYS

1. Introduction

The Special Session, convened by J. Messtorff (EEC), was held at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada during 4-6 September 1985, and attracted nearly 70 scientists from various parts of Europe and North and Central America. Twenty-nine papers were presented by scientists from Canada, Federal Republic of Germany, Iceland, Norway and USA. Two USSR papers, which had been accepted for the Special Session, arrived too late for presentation, and these were reviewed by STACFIS at the Havana Meeting.

2. General Considerations

The majority of the papers dealt with three of the five major topics on the agenda: survey design and operations were considered in 18 papers, evaluation of survey data in 8 papers, and the importance and value of survey data for stock assessments were mentioned in many of the contributions. Very few of these papers were confined exclusively to a single topic. Of the remaining two major topics, four papers dealt with survey gear, performance and catchability, and one paper with the effect of environmental factors on variation in catchability of survey gears.

Papers on design, operation and evaluation of stratified-random bottom-trawl surveys were the most numerous, and the availability of long time-series enabled validation of survey results in relation to assessment of groundfish stocks. Attention was also drawn to surveys which were especially designed to assess resources of more or less sedentary species such as crustaceans and molluscs, employing aerial visual and photogrammetric techniques (for lobsters) and underwater television (for snow crabs) and geostatistical methods ("Kriging" techniques) for evaluation. The applicability of bottom-trawl and midwater-trawl surveys to assess the abundance of juvenile species was also discussed. One paper dealt with surveys which were designed to assess the abundance of dolphins in Pacific waters by visual counts of dolphin schools during synoptic coverage of the survey area. In adaptation to special areas (e.g. Everglades National Park, Florida), biomass surveys were designed with a view to combining the results of aerial visual, aerial photogrammetric and shipboard sampling methods. The design and application of aerial photographic surveys to estimate inshore abundance of capelin at Newfoundland was also discussed. The importance of survey results as independent means of assessing marine resources, which are subjected to regulated exploitation, was emphasized by several authors as well as during discussion of the papers.

3. Conclusions

The Special Session was considered to have been very successful with the presentation of good quality papers which promoted considerable discussion. For instance, STACFIS was encouraged by analysis that

employed statistical techniques to integrate the most recent survey data in a time series with historical survey data to improve the most current index of abundance. STACFIS also noted several papers which contained a variety of statistical techniques to analyze trawl survey data. These papers illustrated that there are as yet no standard techniques for analyses of such data and STACFIS encourages further research in this direction. In addition, it was noted that considerable instrumentation is available for monitoring trawl performance, as demonstrated by analyses presented at the Special Session, and that increased use of such instrumentation would aid in identification of sources of variance in survey data.

4. Papers Presented

Research documents that were presented and discussed at the Special Session are SCR Doc. 85/79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107 and 108 (see Appendix V for titles and authors). STACFIS noted that many of these papers were worthy of publication in the Scientific Council's publication series, and accordingly recommends

that STACPUB consider the publication status of the papers which were presented at the Special Session on Biological Surveys.

II. STOCK ASSESSMENTS

1. Questions to the Scientific Council by the Fisheries Commission on the Cod Stock in Division 3M

a) What are the consequences of maintaining the existing TAC?

Estimates of cohort analyses idicate that the stock size in the late 1970's was in the order of 30,000-35,000 tons. Indices of abundance from research vessel surveys indicate that the population size has not changed since then. However, the data are very imprecise and the change would have to be substantial in order to detect it. Catches have declined from about 30,000 tons in the late 1970's to 10,000-14,000 tons in 1980-84, and these recent levels have not resulted in any apparent change in biomass. These catches have corresponded to fishing mortality rates (F) of about 1.0. On the basis of these considerations, STACFIS advises that a catch of 13,000 tons in 1986 will not lead to any stock rebuilding, and fishing mortality is likely to continue at about the level of 1.0. Furthermore, STACFIS stresses that the 1981 year-class, which appears to be the strongest of recent year-classes, will likely be almost completely fished up by 1986, and the 1982 year-class does not appear to be strong. In recent years, younger fish have predominated in the catches, and only a few year-classes will support the fishery in the near future. Also, Canadian research vessel surveys in 1978-85 have indicated a trend towards younger age-groups in the research catches. There is no evidence of a progressive trend of increasing recruitment and, therefore, the trend towards younger ages in the research catches has likely occurred because of decreased abundance of older age-groups. STACFIS concludes that maintaining the present level of catch may not, in fact, result in stability of the stock and the fishery.

b) What are the consequences of increasing the TAC to 17,000 tons?

A catch of 17,000 tons in 1986 would result in a decline in stock size by the beginning of 1977 and a fully recruited F in 1986 of 1.7. The implication is that only about 15% of the fully-recruited fish at the beginning of 1986 will remain alive at the end of 1986.

c) How large is the TAC that would allow a constant stock size?

As indicated in 1(a) above, the TAC that would allow a constant stock size appears to be in the order of 13,000 tons.

d) Is there a level of TAC below 12,965 tons at which rebuilding could occur?

Rebuilding of the stock could occur at catch levels below about 13,000 tons. STACFIS notes that the probability of recovery and the rate of recovery increase as the catch is reduced below the

level that provides for maintenance of the current biomass. The grave concern of STACFIS about the condition of this stock was the basis of the advice that was given in the report of the June 1985 Meeting (SCS Doc. 85/22), namely that the reference biomass "...can most speedily be met by a cessation of fishing in order to allow young fish, including the 1982 year-class, to contribute fully to the fishable biomass and to the spawning stock".

e) What is the sustainable yield at the $F_{0.1}$ level if the stock were rebuilt fully?

It was not possible to determine precisely the value of $F_{0.1}$ at this meeting, but interpretation of figure 2 of ICNAF Res. Doc. 79/VI/79, which illustrates a yield-per-recruit relationship for this stock, gives an approximate $F_{0.1}$ value of 0.13. This implies that the long-term sustainable yield at $F_{0.1}$ is about 35,000 tons.

f) What is the biomass associated with a rebuilt stock?

The long-term equilibrium biomass which is associated with fishing at $F_{0.1}$ under the assumption of average recruitment of 32 million fish at age 3 is roughly 300,000 tons. From the previously-mentioned data source (ICNAF Res. Doc. 79/VI/79), the long-term equilibrium biomass associated with fishing at F_{max} = 0.27 was estimated to be about 170,000 tons.

g) What management strategy is necessary to rebuild the stock in 3, 5 or 10 years?

Data were not available at the June 1985 Meeting to allow a precise estimate of the abundance of cod year-classes in 1984. Therefore, the requested projections cannot be calculated at this time.

h) Why was the target biomass of 85,000 tons chosen?

Several years ago, the Fisheries Commission agreed that the TAC for this stock would not be increased until the stock biomass had increased to a level of about half of that associated with fishing at F_{max}. In order to provide advice on the basis of this criterion, it was necessary for STACFIS to establish the actual biomass level (in tons) which corresponded to the Commission's criterion in relative terms. The level of 85,000 tons is the biomass that was implicit in the Commission's strategy. The determination of that level was explained in detail by STACFIS in its report of the June 1984 Meeting (*NAFO Sci. Coun. Rep.*, 1984, page 41), as follows: "STACFIS noted the management strategy of the Fisheries Commision for this stock (*NAFO FC Doc. 83/IX/4*, revised), namely that 'the TAC will not be increased beyond 12,965 metric tons until the Scientific Council advises that the age 3+ equilibrium biomass has reach a level approximately equal to one-half the mean age 3+ equilibrium biomass associated with fishing at F_{max}, and assuming long-term average recruitment levels'. A previous yield-per-recruit analysis (*ICNAF Res. Doc. 79/VI/79*) indicated F_{max} = 0.27. Recruitment estimates from SCR Doc. 80/II/28 and 81/II/12 indicated that, for the years 1959-78, the geometric mean of 3 year-olds recruiting to the fishery was 32 million fish. With selection pattern and average weight-at-age values as in ICNAF Res. Doc. 79/VI/79 and with fishing at F_{max} = 0.27, one-half of the mean age 3+ equilibrium biomass is about 85 thousand tons."

STACFIS interprets the 85,000 tons not as a target biomass in the sense of an objective to be attained on a continuing basis but rather the level which defines the first stage in a possible program of stock rehabilitation.

i) What are the consequences of raising this stock biomass (85,000 tons) level?

The answer to question 1(a) indicates that the Commission's present strategy of maintaining a TAC of 12,965 tons has not resulted to date in any discernible stock rebuilding. It is possible, therefore, that the present strategy will not result in the 85,000 ton biomass being reached. In this case, adoption of a higher reference level has no consequences. If recruitment to the stock improve substantially over recent levels, a higher reference biomass level could result in the TAC being held at the present level for a longer period. This would help to speed recovery of the stock and would have greater conservation value than the present level of 85,000 tons.

2. Questions to the Scientific Council by the Fisheries Commission on the Cod Stock in Divisions 3N and 3O

a) What are the equilibrium biomass levels associated with fishing at $F_{0.1}$ and F_{max}?

Although the $F_{0.1}$ level that was used in providing advice in recent years has been F = 0.18, the yield-per-recruit curve from which this value was derived was not available. However, a yield-per-recruit curve in SCR Doc. 81/II/11 for cod in Div. 3NO gives the following: 1.222 kg/recruit at $F_{0.1}$ = 0.14, and 1.300 kg/recruit at F_{max} = 0.23. Using the long-term geometric mean recruitment value of 60 million fish, the equilibrium biomass level associated with fishing at $F_{0.1}$ = 0.14 is about 600,000 tons and the level associated with fishing at F_{max} = 0.23 is about 400,000 tons.

b) What yield in 1986 would be associated with fishing at F_{max}?

The yield in 1986 which would be associated with fishing at F_{max} = 0.23 is about 40,000 tons.

c) What yield in 1986 would be associated with maintaining biomass on 1 January 1987 at the same level as on 1 January 1986?

A catch (equal to the TAC) of 33,000 tons in 1985 is projected to result in an age 3+ population biomass of about 270,000 tons on 1 January 1986. A catch of about 50,000 tons in 1986 would then result in a projected age 3+ population biomass on 1 January 1987 of about 270,000 tons.

d) What measures might be taken over 3-year and 5-year periods to build the biomass to the equilibrium level associated with fishing at $F_{0.1}$?

STACFIS noted the difficulty of interpreting yearly projections in the light of observed fluctuations in recruitment and of ignorance about the level of minimum catch that may be required as the stock rebuilds. A cessation of fishing would provide for the most speedy rebuilding, but the actual rate of recovery to a particular equilibrium level of biomass would then depend largely upon recruitment.

The average recruitment level of the 1968-82 year-classes (35 million fish) was adopted by STACFIS at the June 1985 Meeting for projections of catches in the short term. With this recruitment level and an average catch of 50,000 tons associated with fishing at F = 0.3, the mean age 3+ population biomass (which was about 225,000 tons in 1984) would not change appreciably over the 10-year period to 1994.

Stock biomass would be expected to increase and this increase would be more rapid and to a higher level as the fishing mortality is lowered from F = 0.3. At a fishing mortality of 0.2, and hence at an average catch of 40,000 tons, the biomass would be expected to increase from the level of 225,000 tons in 1984 to about 300,000 tons over a 10-year period. At a fishing mortality of 0.2 with an average catch of about 30,000 tons, the mean age 3+ biomass is projected to increase to 350,000-400,000 tons during the same period.

STACFIS concluded from these calculations that, if recruitment continues at recent levels (35 million fish), the age 3+ stock biomass cannot reach the approximate $F_{0.1}$ long-term equilibrium biomass of 600,000 tons. However, this stock is known to have produced much higher recruitment in the past (average of 60 million fish for the 1956-80 year-classes), and the long-term equilibrium stock sizes given in 2(a) above are based on the assumption that this will occur. While the more conservative assumption was used in the illustrative calculations given above, STACFIS has no reason to change its long-term expectations regarding stock productivity.

3. Review of Arrangements for Conducting Stock Assessments

STACFIS noted that the analyses of most stocks had been completed and were ready for review at the beginning of the June 1985 Meeting. In the instances where sampling and catch data were incomplete, the preliminary analyses had to be revised substantially during the meeting. In order to ensure that adequate data are available well in advance of the June Meeting, some revisions to the guidelines were considered to be necessary. It was agreed that the Chairman of STACFIS, by 1 February 1986 (with a reminder by 1 March 1986), should contact the Scientific Council representatives with the request that

(i) 1985 commercial sampling data including length and age compositions, and (ii) 1985 catch statistics to enable calculation of the catches by number, be forwarded to designated experts (and to the NAFO Secretariat) for use by 1 May 1986. Since actual catch statistics are often not available to the designated experts prior to the June Meeting, provision of the best estimates of catch for all months of the year would benefit the experts in their preparatory work. Official statistics will, of course, continue to be submitted to the NAFO Secretariat in the usual way. When there are no catch or sampling data, a note to that effect to the designated experts (and the NAFO Secretariat) would be helpful.

It was noted that the use of two working groups at the June 1985 Meeting (for cod and other species) had allowed additional scope for review and reanalysis during the meeting. In some cases, the additional work was considerable and comprised a very heavy work load for some members. The reallocation of some stocks from one working group to the other does not appear to offer a solution toward better sharing of the workload because some experts would still have the same responsibilities. Nevertheless, STACFIS supports the concept of using two working groups, with the Chairman of STACFIS having the option of being convener of one of the groups as he considers appropriate. The Chairman should consult with as many of the participants of the June 1985 Meeting as he deems necessary in order to plan the most appropriate allocation of species among the working groups for the June 1986 Meeting.

At the June 1985 Meeting, the working groups carried their work forward through the report approval stage. This resulted in some duplication of work, because the reports had to be approved by STACFIS and there was some confusion as to what was open for discussion at the STACFIS level. It was agreed that, at the June 1986 Meeting, the working groups would carry their work only as far as agreement on report content and that the first draft of the report be discussed and approved by STACFIS. It will be the responsibility of the working group conveners, in conjunction with the rapporteurs, that a satisfactory first draft be made available to STACFIS.

It was noted that a solution to the problem of excessive workload at the June meeting might be adoption by STACFIS of standard series of stock abundance indices from commercial catch rates and research vessel surveys and of recruitment indices. The standard series would then be followed each year until sufficient argument is documented to set up an improved series. The work involved in providing *ad hoc* solutions to such problems would thus be considerably lessened. STACFIS accordingly agreed that 2 days be utilized at the beginning of the June 1986 Meeting to derive the following indices for the cod stock in Div. 2J+3KL: (i) a standard index of abundance from commercial catch and effort data, taking into account changes in fleet compositions and strategies especially as affected by changes in management regimes; and/or a standard index from results of research vessel surveys, including consideration of precision and present survey methods in general, use of seasonal surveys, and procedures to accommodate missing strata; and (ii) a standard index of recruitment from commercial and/or research vessel data.

The Chairman of STACFIS will appoint a convener of an *ad hoc* working group to consider these matters prior to the June 1986 Meeting. The Convener will initiate consdieration of the standard indices by as wide a group of experts as he considers necessary and arrange for presentations at the June 1986 Meeting.

III. TOPICS FOR FUTURE SPECIAL SESSIONS

1. Outline for Special Session in September 1986

At the June 1984 Meeting, "Recent Advances in Understanding Recruitment of Marine Fishes, with Particular Emphasis on Georges Bank Herring and Flemish Cap Cod and Redfish Stocks" was chosen as the theme for the Special Session in advance of the Annual Meeting in September 1986. At the June 1985 Meeting, M. D. Grosslein (USA) was unanimously nominated to be Convener for the Special Session. The following outline was adopted, together with comments on deadlines and data analysis.

a) Specific topics

i) Brief synopsis of research to date and current knowledge of recruitment processes for selected stocks.

ii) Evaluation of sampling methods with major focus on first-year life stages: sampling designs, gear and its efficiency relative to behavior; methods of collection and processing samples and measurement conventions; ageing methods and their accuracy.

iii) Estimation of key biological aspects of recruitment processes (focus on interannual variation): fecundity and spawning; distribution and dispersal of eggs, larvae and juveniles; abundance at age and size (accuracy of growth and mortality rates); recruitment and spawning stock estimates and their accuracy.

iv) Examination of recruitment variability *versus* potential controlling factors: patterns of physical environment *versus* spawning and recruitment events; possible biological factors (recruitment time series *versus* food, predators, spawning stock, disease, parasites).

v) Critique of hypotheses on factors controlling recruitment variability and implications for future research.

b) Deadlines

Authors should forward titles and brief descriptions of their potential contributions to the Convener by 1 March 1986. Papers will be selected on the basis of their relevance to the topics, and authors will be notified of accepted contributions by 15 April 1986. Completed manuscripts (typescript or good quality photocopy) must arrive at the NAFO Secretariat for mimeographing by 20 August 1986.

c) Data analyses

The majority of papers for the Special Session are expected to be review and synthesis papers. Therefore, in order to allow synthesis of the results from individual investigations under the Georges Bank Larval Herring and the Flemish Cap programs, analyses of previously unreported data should be presented at the June 1986 Meeting of the Scientific Council. Opportunity will be provided at that meeting for review of such documented analyses. These submissions may then contribute to the review and synthesis papers for the Special Session.

Discrepancies have been noted in age compositions of Flemish Cap cod and redfish samples that have been reported to NAFO by USSR and Canadian laboratories. These discrepancies are apparently due to differences in criteria for age determination. In view of the necessity to establish a consistent series of abundance estimates for recruiting year-classes of each species, laboratories with material suitable for age validation are requested to undertake such studies and present the results at the June 1986 Meeting. In particular, laboratories with results from research vessel surveys are urged to present validation studies at that meeting, as these will include estimates of abundance of young fish before they enter the commercial fishery and at a time when their length distributions by age are most distinct. The documented material should include length frequencies, age-length keys, and age-length tables (after application of age-length keys to the corresponding length frequencies). These analyses will form the basis for STACFIS to decide on an appropriate series of abundance estimates of recruiting year-classes for these species on Flemish Cap.

2. Proposed Theme for Special Session in September 1987

STACFIS discussed the need for synthesizing information on demersal resources along the continental slope, and accordingly

recommends

that the theme of the Special Session to be held in conjunction with the Annual Meeting of the Scientific Council in September 1987 be "Biology of Demersal Resources of the North Atlantic Continental Slope, with Emphasis on Greenland Halibut and Grenadiers".

The primary intent of this theme is to elicit research papers on Greenland halibut and grenadiers, which have established commercial potential but about which relatively little is known. It is considered worthwhile, however, to broaden the scope of the Special Session to include other unexploited deepwater species which share the same or greater depths on the continental slope, including benthic invertebrates of the slope but excluding such well-studied species as cod and redfish, even though these species are distributed along the upper parts of the slope. Papers which deal with hydrographic features of the slope areas, especially in relation to the biology of the deepwater species, should also be invited.

IV. REVIEW OF RESEARCH DOCUMENTS

1. Additional Papers Relevant to the Special Session on Biological Surveys

Two research documents (SCR 85/110 and 111), which were intended for presentation at the Special Session on "Design and Evaluation of Biological Surveys in Relation to Stock Assessments" arrived too late for consideration at that session. These were briefly considered by STACFIS with the proposal that they be evaluated, together with the other Special Session papers, for possible publication. One paper considered methods and results of measurement of average target strength of blue whiting in scattered aggregations in the Norwegian Sea. The other paper (SCR Doc. 85/111) on identification of trawl catchability by underwater methods was considered to be directly relevant to stock assessments, and it was agreed that this paper be presented again to a wider audience of stock assessment experts at the June 1986 Meeting.

2. Other Papers Relevant to Fishery Science

Four research documents (SCR 85/109, 112, 113 and 114) were deferred for consideration at the June 1986 Meeting of STACFIS.

V. OTHER MATTERS

1. Trawl Escapement and Selectivity Problems

The Scientific Council was requested by the Fisheries Commission to consider escapement and selectivity problems that are associated with the use of strengthening ropes, splitting straps and codend floats (FC Doc. 84/6, revised, para. 21; FC Doc. 82/VI/2, revised). STACFIS agreed to defer this matter to the June 1986 Meeting.

2. Environmentally-induced Variations to Stock Assessments

At the June 1986 Meeting, STACFIS noted the need for a more extensive review of the problem of catchability, especially of environmentally-induced variations to stock assessments, and several scientists, together with the Chairman of the Environmental Subcommittee, agreed to discuss the problem in more detail. The group, consisting of R. G. Halliday and A. T. Pinhorn (Canada), M. D. Grosslein (USA), and H. P. Cornus, J. Messtorff and M. Stein (EEC), met at the NAFO Secretariat in Dartmouth, Nova Scotia, Canada, on 6 September 1985 and agreed to provide STACFIS at the June 1986 Meeting with documentation on catchability problems and anomalies in biological and hydrographic time series of data.

3. Acknowledgements

There being no further business, the Chairman expressed his appreciation to J. Messtorff who convened the Special Session on Biological Surveys, to the rapporteurs and participants for their cooperation during the various sessions, to the Secretariat staff for their support at all times, and to the Cuban hosts whose arrangements contributed to the success of the meeting in Havana. The Chairman also expressed his thanks for the support which he has received during his tenure as Chairman.

The participants unanimously expressed their gratitude to the outgoing Chairman for his leadership and expertise during the past 2 years. The meeting was adjourned at 1200 hr on 13 September 1985.

APPENDIX II. REPORT OF STANDING COMMITTEE ON PUBLICATIONS (STACPUB)

Chairman: J. Messtorff Rapporteur: A. T. Pinhorn

The Committee met at the Palacio de las Convenciones (Convention Palace), Havana, Cuba on 9 and 12 September 1985. In attendance at both sessions were J. Messtorff (EEC), R. G. Halliday and A. T. Pinhorn (Canada), S. Kawahara (Japan), and M. G. Larrañeta (Spain), as well as the Chairman of the Scientific Council (V. A. Rikhter) and the Assistant Executive Secretary (V. M. Hodder). The prospective Chairman of STACPUB (J. S. Beckett) attended the first session as an observer.

1. Editorial Matters

a) Editorial board

The Chairman reported that Bernard E. Skud (National Marine Fisheries Service, Narragansett, Rhode Island, USA) had accepted the Scientific Council's offer of Editor of the Journal of Northwest Atlantic Fishery Science (mid-July 1985) and had visited the Secretariat in early August to arrange the transfer of responsibility from the outgoing Editor (V. M. Hodder). The Assistant Executive Secretary reported that G. A. Robinson (Institute of Marine Environmental Research, Plymouth, United Kingdom) had accepted the position of Associate Editor for Biological Oceanography and that the Editor had already forwarded papers to him for consideration.

b) Promotion of the Journal

In addition to preliminary discussions about the Journal during his visit to the Secretariat, the new Editor, outlined some of his initial thoughts in a letter to the Chairman of STACPUB, expressing concern about the lack of papers from countries other than Canada and the small number of contributions for the next issue of the Journal (only six papers thus far). He offered several suggestions to overcome this problem and requested STACPUB to discuss the matter further.

After discussion, STACPUB made the following suggestions for promoting the Journal of Northwest Atlantic Fishery Science:

i) Although some announcements of the scope and content of the Journal have in the past been circulated with Journal issues and by other means, the Chairman of STACPUB should explore with the Executive Secretary the production of a colorful brochure advertising the Journal.

ii) The Executive Secretary is to check whether Journal papers are abstracted in Biological Abstracts and to take corrective action if they are not.

iii) The Chairman of STACPUB should correspond with the Editor of the Journal concerning his proposal to solicit review papers from recognized authorities in particular fields and explore suggestions as to what types of papers should be solicited and who should be appoached to provide such review papers.

iv) Selected authors could be approached to produce decadal reviews of fisheries and fishery management in the Northwest Atlantic since the extension of jurisdiction by coastal states in 1977. Such papers could deal with national management regimes or be organized by subarea.

v) Although a single Journal for the North Atlantic, combining both the NAFO and ICES publications, is difficult to envisage, the Editors of these Journals should explore joint arrangements and present suggestions to STACPUB at its June 1986 Meeting.

vi) In light of his experience as past Editor of the Journal, V. M. Hodder is requested to list any initiatives that might be taken for promoting the Journal and present them at the June 1986 Meeting of STACPUB.

vii) The Editor of the Journal should attend STACPUB Meetings periodically, commencing with the June 1986 Meeting, and NAFO should cover the cost of his attendance.

c) Role and scope of Scientific Council Studies

At the June 1985 Meeting, the Editor of Studies (V. M. Hodder) was requested to provide guidelines of editorial standards for consideration by STACPUB at the September 1985 Meeting. However, upon reflection, he considered it to be the role of STACPUB to produce such guidelines. Consequently, two members of STACPUB drafted a set of guidelines which, after discussion, were adopted as editorial standards for NAFO Scientific Council Studies (Annex 1).

2. Status of Publications Since June 1985

a) Journal of Northwest Atlantic Fishery Science

Although Vol. 6(1) was printed in June 1985, distribution was delayed until August due to a bookbinding problem.

b) NAFO Scientific Council Studies

Number 9, containing many of the papers from the Special Session on Squids in September 1984, is expected to be published in November 1985.

c) NAFO Statistical Bulletin

Of the five volumes which were recommended for reissue (Vol. 27-31), three have been distributed and Vol. 27 and 28 will be completed before the end of 1985. Production of Vol. 33 (for 1983) is still delayed due to the absence of data for France.

3. Papers for Possible Publication

The Committee reviewed the research documents which were presented at meetings of the Scientific Council in September 1985 and requested the Assistant Executive Secretary to invite the authors of the following documents to submit suitably revised manuscripts for possible publication in the Journal or Studies series: SCR Doc. 85/79, 80, 81, 83, 84, 87, 88, 91, 93, 94, 95, 96, 97, 98, 99, 101, 102, 103, 106, 108, 110 and 111. In relation to SCR Doc. 85/107, the Assistant Executive Secretary was requested to contact the authors to determine the status of the paper and whether they wish to submit a completed manuscript for consideration for the Journal or Studies. The Committee also considered a manuscript on marine benthic invertebrates, which had been submitted directly to the Assistant Executive Secretary for possible publication in the NAFO series, and proposed that it be considered for Studies. Consideration of four documents which had not been reviewed by STACFIS (SCR Doc. 85/109, 112, 113 and 114) was deferred to the June 1986 Meeting.

The Committee noted with satisfaction the number of papers that its members had considered suitable for possible publication in the Journal or Studies and recognized that the success of the Special Session on Biological Surveys was largely responsible.

4. Acknowledgements

The Chairman expressed his thanks to all members for their participation and to the Rapporteur and the Secretariat for their support of the Committee's work. The participants expressed gratitude to the Chairman for his devoted service during the past 2 years.

ANNEX 1. EDITORIAL STANDARDS FOR NAFO SCIENTIFIC COUNCIL STUDIES

The Scientific Council's Studies is a vehicle for publication of material that is considered to be of some lasting interest and of value to the conduct of the Council's work but which is not suitable for publication in another of the Council's publication series. It may contain manuals, special reports, and review articles, but most of the material will consist of papers dealing with the results of research which have first been presented to the Council as research documents.

Selection of material for inclusion in Studies is the responsibility of STACPUB, but, in the case of research papers, final decision on publication will be made by the Assistant Executive Secretary (as Editor), subject to editorial standards being met. STACPUB's selection of research papers for possible publication in Studies will be based on its judgment that a document contains new data or analysis of substance, that it is of more lasting interest than those providing current assessment advice, and that it appears to be scientifically sound. STACPUB members may obtain the advice of their colleagues as they deem necessary, and, in the case of a research document, they should take into account the views expressed in the Council Meeting at which the paper was presented, in exercising their judgment on a paper. Papers may be submitted directly to the Editor of Studies for consideration, even though they have not appeared in the Research Document series. Such papers will be considered by STACPUB for inclusion in Studies in the same manner as research documents. While such consideration will normally occur during regular meetings of STACPUB, consultation by mail will be considered to avoid any significant delay in publication. Papers which have been rejected by the Editor of the Council's Journal of Northwest Atlantic Fishery Science on grounds of their limited scientific scope (but not on grounds of scientific inaccuracy) may be referred by him to the Editor of Studies, and such papers may be included in Studies based solely on the judgment of the Studies Editor. It is also within the purview of the Studies Editor to refer papers, which have been submitted for publication in Studies, to the Journal Editor for consideration, if the Studies Editor considers the papers to be of adequate quality for primary publication and if he has the authors' agreement for such referral.

Studies is an unrefereed (secondary) publication, and submissions for publication will not be subject to scientific editing of any sort (i.e. there will be no attempt to encourage authors to extend or contract their analyses or utilize other statistical or mathematical techniques). Submissions will be subject to limited technical editing which is designed to ensure clear and unambiguous exposition of research results. As a result of the editing process, published papers will contain tables and figures with adequate legends and complete headings and annotations (e.g. units of measurements). The text will not only contain appropriate reference to such tables and figures but statements and conclusions in the text will need to be consistent with the results contained in the theme. Nevertheless, the author's interpretation of his data will not be challenged on a scientific basis. Methods must be adequately explained or referenced. All literature references must be listed at the end of the paper, and, conversely, all references must be used in the text. Terminological usage will be modified to ensure clarity and proper usage of the English language, but the author's preference with regard to style and terminology will be fully respected.

APPENDIX III. AGENDA FOR THE SEPTEMBER 1985 MEETINGS OF THE SCIENTIFIC COUNCIL

I. Opening (Chairman: V. A. Rikhter)

1. Appointment of rapporteur
2. Adoption of agenda
3. Plan of work

II. Fishery Science (STACFIS Chairman: J. E. Carscadden)

1. Report of Special Session on "Design and Evaluation of Biological Surveys in Relation to Stock Assessments" (see footnote * below) which involved the following topics:

   a) Survey design and operations

      i) Stratified-random groundfish surveys (standard bottom trawl)
      ii) Surveys designed for pelagic species (e.g. hydroacoustic, midwater trawl, aerial)
      iii) Surveys of invertebrate stocks (e.g. photographic, trap)
      iv) Surveys of marine mammals (e.g. aerial)
      v) Surveys of early stages of fish and invertebrates (e.g. eggs, larvae and juveniles) for assessment purposes

   b) Survey gear, performance and catchability

      i) Determination of gear parameters
      ii) Variability of parameters according to towing speed, bottom conditions and topography, currents, etc.

   c) Environmental factors effecting variation in catchability of survey gears

   d) Evaluation of survey data

      i) Survey indices
      ii) Abundance and biomass estimates
      iii) Reliability of survey estimates

   e) Importance and value of survey data for stock assessments

2. Stock assessments

   a) Further considerations of assessments, if required

   b) Review of new arrangements for conducting stock assessments at the June Meeting

3. Future special sessions

   a) Development of topical outline relevant to the theme for the special session in September 1986, namely "Recent Advances in Understanding Recruitment in Marine Fishes of the Northwest Atlantic, with Particular Emphasis on Georges Bank and Flemish Cap". [The outline will form the basis for a poster to be distributed soon after this meeting.]

   b) Proposed theme for a special session in September 1987

4. Other matters

III. Research Coordination

1. Consideration of draft format regarding documentation of survey procedures, resulting from Secretariat's consultation with relevant laboratories

2. Consideration of the need for changes in statistical boundaries in the light of the maritime boundary between Canada and USA

IV. Publications (STACPUB Chairman: J. Messtorff)

1. Editorial matters regarding scientific publications

   a) Editorial board
   b) Status of publications
   c) Role and scope of Scientific Council Studies

2. Papers for possible publication

3. Other matters

V. Rule of Procedure

1. Consideration of a proposal that would allow voting under Convention Article X.2 at Scientific Council meetings

VI. Adoption of Reports

1. Standing Committee on Fishery Science (STACFIS) (this meeting)

2. Standing Committee on Publications (STACPUB) (this meeting)

3. Provisional Report of Scientific Council Meeting June 1985 (SCS Doc. 85/22, excluding Appendices)

VII. Review of Future Meeting Arrangements

1. Assessment of shrimp stocks (deferred from June 1985 Meeting and tentatively scheduled for 5-6 days beginning on 14 January 1986 at the Bedford Institute of Oceanography)

2. Meeting of the Scientific Council and its Committees in June 1986 (tentatively scheduled for 4-19 June 1986)

3. Annual Meeting in September 1986 and arrangement for the Special Session in advance of that meeting

4. Tentative dates for June 1987 Meeting

VIII. Election of Officers for 1985-87

IX. Other Matters

1. Further consideration of proposal for joint ICES/NAFO Working Group on Seals (SCS Doc. 85/2, page 6)

2. Escapement and selectivity problems associated with the use of strengthening ropes, splitting straps and codend floats (FC Doc. 84/IX/6, revised, para. 21; FC Doc. 82/VI/2, revised)

X. Adjournment

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* The Special Session will be held at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada, on 4-6 September 1985, with Dr. J. Messtorff (EEC) as Convener (see NAFO Circular Letter 85/59, dated 27 June 1985).

APPENDIX IV. LIST OF THE PARTICIPANTS AT SEPTEMBER 1985 MEETINGS OF SCIENTIFIC COUNCIL

CANADA

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McGlade, J. M.	" " " " " " "
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*Carscadden, J. E.	" " " " " " "
Miller, D.	" " " " " " "
Myers, R. A.	" " " " " " "
Nakashima, B. S.	" " " " " " "
*Pinhorn, A. T.	" " " " " " "
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NOTE: Most of the participants listed above attended the Special Session on Design and Evaluation of Biological Surveys at the Bedford Institute of Oceanography, Dartmouth, Canada. The names preceded by two asterisks (**) attended only the Annual Meeting in Havana, Cuba. The names preceded by a single asterisk (*) attended the Special Session and the Annual Meeting.

APPENDIX V. LIST OF RESEARCH AND SUMMARY DOCUMENTS

RESEARCH DOCUMENTS

SCR #	Serial #	
85/79	N1051	PALSSON, O. K., E. JONSSON, S. A. SCHOPKA, B. Æ. STEINARSSON, and G. THORSTEINSSON. Icelandic groundfish survey, 1985. (55 pages)
85/80	N1054	HOLT, R. S., T. GERRODETTE, and J. B. COLOGNE Research vessel survey design for monitoring dolphin abundance in the eastern Tropical Pacific, 1986-1990. (18 pages)
85/81	N1055	PENNINGTON, M. Some statistical techniques for estimating abundance indices from trawl surveys. (12 pages)
85/82	N1056	AUSTER, P. J. A CPUE indicator for crustacean trap fisheries unbiased by distribution of soak time. (7 pages)
85/83	N1057	KOELLER, P. A., L. COATES-MARKLE, P. PERLEY, and J. D. NEILSON. Juvenile fish surveys on the Scotian Shelf: implications for year-class size assessments. (31 pages)
85/84	N1058	NAKASHIMA, B. S. The design and application of aerial surveys to estimate inshore distribution and relative abundance of capelin. (11 pages)
85/85	N1060	PRINGLE, J. D., R. E. DUGGAN, and G. J. SHARP. An evaluation of techniques designed to assess lobster fishing effort in eastern Canadian waters. (14 pages)
85/86	N1061	CONAN, G. Y., D. R. MAYNARD, and E. WADE. Estimates of lobster fishing effort by aerial surveys. (20 pages)
85/87	N1062	CONAN, G. Y., D. R. MAYNARD, and R. J. CORMIER. Estimates of snow crab (Chionoecetes opilio) abundance by underwater television. (13 pages)
85/88	N1063	SERCHUK, F. M., and S. E. WIGLEY. Evaluation of USA and Canadian research vessel surveys and survey design in assessing abundance, size composition and recruitment of sea scallops on Georges Bank. (20 pages)
85/89	N1064	SMOLOWITZ, R. J., F. M. SERCHUK, J. NICOLAS, and S. E. WIGLEY. Performance of an offshore scallop survey dredge equipped with rock chains. (21 pages)
85/90	N1065	BYRNE, C. J., and M. J. FOGARTY. Comparison of the fishing power of two fisheries research vessels. (14 pages)
85/91	N1066	MYERS, R. A., and A. A. ROSENBURG. Estimation using research survey data and commercial catch data. (20 pages)
85/92	N1067	SCOTT, J. S., and S. GAVARIS. Age-related temporal and seasonal changes in distribution of cod on the eastern Scotian Shelf. (9 pages)
85/93	N1068	GAVARIS, S., and S. J. SMITH. A comparison of survey stratification schemes based on depth and on historical spatial dispersion. (16 pages)
85/94	N1069	PERRY, R. I., and S. GAVARIS. The relation of cod distributions with environmental conditions on the eastern Scotian Shelf, 1970-84. (12 pages)
85/95	N1071	MESSTORFF, J. Cod biomass and abundance estimates for NAFO Division 2J from stratified-random bottom-trawl survey results over a time series of 12 years, 1972-1983. (13 pages)
85/96	N1072	HALLIDAY, R. G., J. McGLADE, R. MOHN, R. N. O'BOYLE, and M. SINCLAIR. Resource and fishery distributions in the Gulf of Maine area in relation to the Subarea 4/5 boundary. (55 pages)
85/97	N1073	MOHN, R. K., G. ROBERT, and D. L. RODDICK. Research sampling and survey design of Georges Bank scallops. (17 pages)

RESEARCH DOCUMENTS (cont'd)

SCR #	Serial #	
85/98	N1074	CORNUS, H. P. Development of a bottom trawl survey off East Greenland from 1980 to 1984. (17 pages)
85/99	N1075	SCOTT, G. P., M. R. DEWEY, L. J. HANSEN, R. E. OWEN, and E. S. RUTHEFORD. Mullet stock biomass estimation using aerial visual, shipboard, and photogrammetric sampling. (30 pages)
85/100	N1076	WELLS, R. A stratagem for handling zero catches in fish survey results. (2 pages)
85/101	N1077	SCHMITT, C. C. Reliability of trawl survey estimates of juvenile halibut abundance. (20 pages)
85/102	N1078	ENGÅS, A., and O. R. GODØ. The influence of trawl geometry and performance and fish vertical distribution on fish sampling with bottom trawl. (15 pages)
85/103	N1079	DeVRIES, D. A. Description and preliminary evaluation of a statewide estuarine trawl survey in North Carolina. (24 pages)
85/104	N1080	RUBEC, P. J., R. J. PLANCK, and S. N. MESSIEH. New developments in computerized field data acquisition equipment for groundfish surveys. (13 pages)
85/105	N1081	MILLER, D. S. The use of hydroacoustic surveys to estimate capelin biomass in NAFO Divisions 2J+3KLNO. (18 pages)
85/106	N1082	BRODIE, W. B., and R. WELLS. The distribution of trawl catches of cod and American plaice from research vessel surveys in NAFO Divisions 3L, 3M and 3N. (14 pages)
85/107	N1083	ILES, T. D., M. J. POWER, and R. L. STEPHENSON. Evaluation of the use of larval survey data to tune herring stock assessments in the Bay of Fundy/ Gulf of Maine. (16 pages)
85/108	N1084	CONAN, G. Y. Assessment of shellfish stocks by geostatistical techniques. (18 pages)
85/109	N1085	BOWERING, W. R., and G. R. LILLY. Diet of Greenland halibut off southern Labrador and northeastern Newfoundland (Div. 2J+3K) in autumn of 1981-82, emphasizing predation on capelin. (16 pages)
85/110	N1087	ERMOLCHEV, V. A. Methods and results of *in situ* measurements of the average target strength of pelagic fishes. (11 pages)
85/111	N1088	ZAFERMAN, M. L., and L. I. SEREBROV. Results of identification of trawl catchability by underwater methods in relation to some fish species of the Northwest Atlantic. (16 pages)
85/112	N1089	IVANOVA, N. M., A. I. SHERSTJUKOV. Calculated estimate of differential catchability for two fry trawls (International IYGPT and the Soviet 13.6 m trawls). (10 pages)
85/113	N1090	NOSKOV, A. S., and A. N. ROMANCHENKO. Abundance and distribution of 0-group redfish (*Sebastes mentella* Travin) in the Irminger Sea in 1984. (13 pages)
85/114	N1091	NOSKOV, A. S., A. I. SHERSTJUKOV, and V. I. VINOGRADOV. Distribution and fluctuations of the Scotian silver hake abundance in early stages. (16 pages)

SUMMARY DOCUMENTS

SCS #	Serial #	
85/22	N1048	NAFO. Provisional report of Scientific Council, Dartmouth, Canada, 5-20 June 1985. (83 pages + Addendum + Corrigenda)
85/23 (Revised)	N1049	EXECUTIVE SECRETARY. Elaboration of the proposal for a new Rule of Procedure. (2 pages)
85/24	N1050	DOMINGUEZ, R. Cuban research report for 1984. (3 pages)
85/25	N1070	NAFO SECRETARIAT. Provisional nominal catches in the Northwest Atlantic. (55 pages)
85/26	N1086	CANADIAN SCIENTIFIC COUNCIL REPRESENTATIVE. Alternative proposal for revision of Scientific Council Rules of Procedures concerning voting. (1 page)
85/27	N1092	NAFO. Provisional report of Scientific Council, Annual Meeting, Havana, Cuba, 9-13 September 1985. (29 pages)
85/28	N1093	FISHERIES COMMISSION. Fisheries Commission request for scientific advice on management in 1987 of certain stocks in Subareas 2 to 4. (2 pages)