

Northwest Atlantic



Fisheries Organization

Serial No. N1685

NAFO SCS Doc. 89/20

SCIENTIFIC COUNCIL MEETING - SEPTEMBER 1989

REPORT OF SCIENTIFIC COUNCIL

Annual Meeting, September 1989

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REPORT OF SCIENTIFIC COUNCIL

Annual Meeting, September 1989

Chairman: J. S. Beckett

Rapporteur: T. Amaratunga

I. PLENARY SESSIONS

The Scientific Council met at Albert Borschette Conference Centre, Brussels, Belgium, during 11-15 September 1989, to consider and report on various matters listed in the agenda (see NAFO Circular Letter 89/49). Representatives attended from Canada, Denmark (Greenland), European Economic Community (EEC), German Democratic Republic (GDR), Japan and the Union of Socialist Republics (USSR). The Assistant Executive Secretary was in attendance.

The meeting was preceded by the Special Session on "Changes in Biomass, Production and Species Composition in the Fish Populations in the Northwest Atlantic Over the Last 30 Years, and Their Possible Causes" which was held during 6-8 September 1989 with M. J. Fogarty as Convener and participation by scientists from Canada, Cuba, Denmark (Greenland), EEC, GDR, Japan, USA and USSR.

The opening meeting was called to order on 11 September 1989 at 1020 hr.

The Chairman welcomed the representatives to Brussels and to the 11th Annual Meeting. The Assistant Executive Secretary was appointed the general rapporteur. The Council adopted the agenda recognizing that the General Council or the Fisheries Commission might have specific requests that the Council would have to address.

The Provisional Report of the Scientific Council, June 1989 was then reviewed and comments from the floor taken for the preparation of a corrigendum to the Report.

The session was adjourned at 1115 hr.

On 13 September 1989, the meeting was called to order at 1400 hr.

The Scientific Council was requested by the Fisheries Commission at its meeting on 13 September 1989, to provide a draft resolution on data required on catches and discards of juvenile flatfish on the Tail of the Grand Bank area.

The Scientific Council reviewed a working paper and adopted the following text*:

"In order to advise on areal and seasonal concentrations of juvenile American plaice and yellowtail flounder on the Grand Banks (Div. 3LNO), the Scientific Council recommends that:

- a) *Member countries provide the Scientific Council with catch statistics for both landings and discards broken down on as fine a scale as possible, preferably by unit areas no larger than 1° latitude and 1° longitude, summarized on a monthly basis.*
- b) *Length sampling be enhanced for both nominal landings and discards. The sampling intensity should be on the same scale as given above, i.e. preferably by unit areas no larger than 1° latitude and 1° longitude summarized on a monthly basis.*

* This text is as revised and adopted during the Session of the Scientific Council on 14 September 1989.

- c) *Surveys on juvenile flatfish be conducted on a seasonal basis for at least one year throughout the entire stock area.*

The Scientific Council recognizes that the means of collecting these data would be determined on a fleet by fleet basis. It is further recognized that to achieve a) and b) above would require increased observer coverage by all countries concerned."

The Council was also asked by the Fisheries Commission to provide the $F_{0.1}$ mortality rate and corresponding catch levels for Capelin in Div. 3NO.

The Council noted that values for $F_{0.1}$ had been generated in the mid-1970s and had not been estimated since then. The Council continued to be concerned about the implications for the spawning stock based on exploitation at the $F_{0.1}$ value.

The session was adjourned at 1500 hr.

On 14 September 1989, the meeting was called to order at 1415 hr.

In response to a question by the Fisheries Commission on monitoring and sampling the by-catch of cod on the Flemish Cap, the Council forwarded the following text:

"The low biomass and predominance of very young cod on the Flemish Cap led to the adoption by NAFO in 1988 of a moratorium on fishing for cod in Div. 3M. In order to assess the effects of cod by-catches in the redfish and flatfish fisheries, the Scientific Council recommends that:

1. *statistics on discards of cod taken in the redfish and flatfish fisheries on the Flemish Cap be reported to the Scientific Council, in addition to the normal reports of landings.*
2. *length sampling of cod, taken in the redfish and flatfish fisheries on the Flemish Cap, be collected for the two components separately. It is important that depth information accompany each sample."*

In response to the Fisheries Commission request on the appropriateness of indicator fisheries in providing information on the stock status of cod in Division 3M, the Council forwarded the following text**:

"the Council noted that indices of stock abundance as provided by commercial catch-rate data, are important to the understanding of stock status. Where data on catch and on age composition are suitable for virtual population analysis (VPA), a commercial catch-rate series can be important for tuning the analysis, particularly if it represents fishing in most of the stock area. When a VPA is not possible due to factors such as poor catch statistics (a situation thought to exist for Div. 3M cod), a commercial catch-rate series may still provide useful information on trends in stock size.

With respect to cod in Division 3M, the last VPA was conducted in 1984, but this was tuned on abundance indices from research surveys, because data were not available either to update the trawl catch-rate data after 1980, or the longline catch-rate data after 1981, except for the small Norwegian longline fishery. It is unlikely that addition of Faroese longline data for 1981-87, which is now known to be available, would alter this situation, as there is considerable doubt about the completeness of total catch statistics in recent years.

The Scientific Council has available the data from the annual USSR bottom-trawl survey, and while highly variable from year to year, these have provided some indication of stock size. The initiation in 1988 of an annual EEC survey, and the addition of acoustic capability to the USSR survey, should enhance the ability of the Council to monitor trends in stock abundance.

** The Council reviewed and adopted the following text on 15 September 1989.

The latest review of stock status (June 1989) indicates that the total biomass remains very low compared to historical values, and likely below 30,000 tons for all age groups with only 5-10% being older than 3 years in 1988. The 1986 year-class appears, however, to be relatively strong.

The Council has advised that there should be no commercial fishery in 1990 in order to allow recent year-classes to contribute to the rapid rebuilding of the biomass. This poses the question as to the level of biomass at which a fishery may be safely reintroduced, and thus also the ability of the Scientific Council to determine the actual value of the stock size. The Council agrees that once the stock is rebuilding, additional indices of abundance could be useful in the quantitative evaluation of the extent of rebuilding. Such indices might be provided by new values for catch-rate series that existed up to the introduction of the moratorium. The Council considers, however, that given the expected higher cod by-catch rates in 1990 due to the growth of cod in the 1986 year-class, and the increase in fishing effort in the redfish fishery due to the much higher (2-1/2 fold) redfish TAC, the likely levels of removal of cod as by-catch (perhaps 2,000 tons) in the redfish and American plaice fisheries together with catches by non-members will represent a significant level of fishing mortality. Adding mortality as a result of introducing an indicator fishery that would have to take in excess of 2,000 tons would therefore likely result in total fishing mortality approaching target levels used in managing directed fisheries for other stocks. The Council considers that fishing mortality on this stock should be kept as low as possible, at least until the 1986 year-class has spawned. It is noted, however, that this conclusion can be reviewed on an annual basis as additional research surveys provide information as to the strength of year-classes subsequent to 1986 and also provide further data on the 1986 and earlier year-classes. In the mean time, the Council would welcome receipt of data that have not been previously made available on the commercial fishery prior to the moratorium, and will consider further the extent to which the resultant catch-rate series appears to have been indicative of stock status."

The Council then adopted the reports of the Standing Committees: Appendix I, Report of Standing Committee on Fishery Science (STACFIS), Appendix II, Report of Standing Committee on Research Coordination (STACREC), Appendix III, Report of Standing Committee on Publications (STACPUB).

The session was adjourned at 1840 hr.

The concluding session of the Scientific Council was called to order at 0915 hr on 15 September 1989.

The draft of the report from the Council meetings during 11-14 September was adopted. The Council then addressed the only outstanding agenda item, the Election of Officers.

Brief summaries of these reports and other matters considered by the Council are given below in Sections II-VIII. The agenda, the list of participants and the list of research (SCR) and summary (SCS) documents are given in Appendix IV, V and VI respectively.

The meeting was adjourned at 1030 hr.

II. FISHERY SCIENCE (APP. I)

1. Special Session on Changes in Fish Populations

The Council endorsed the general discussions and conclusions presented to STACFIS by the Convener, M. J. Fogarty (USA), at the end of the Special Session. The Council made special note that participants considered the Special Session to be a very successful meeting and congratulations were extended to the convener for a job well done.

The Council endorsed the recommendation that more detailed analysis of the changes in growth and its importance in productivity of these systems be undertaken.

2. Future Special Sessions

a) Workshop on silver hake database

The Council noted that a comprehensive outline was drawn up by STACFIS for the proposed meeting to be held in January 1990.

b) Special Session in September 1990

The Council noted that some guidelines for the meeting were received by STACFIS from the Convener, J. Shepherd, and an outline would be prepared by the STACFIS Chairman and the Assistant Executive Secretary and circulated in the near future.

c) Proposed Theme for Special Session in September 1991

The Council was very pleased to learn that R. Wells (Canada) had consented to be the Convener of the Special Session to be held in September 1991 entitled "Atlantic Cod: the Understanding on Physiology, Dynamics, Ecology and Environmental Relationships", and invited him to develop an outline and format for the meeting.

3. Other Matters

a) Designated Experts

The Council concurred with the general tasks described by STACFIS for designated experts and hoped that the early nomination of experts would expedite the work of STACFIS during the assessment meetings in June 1990.

The Council endorsed the selection of laboratories where the preliminary assessment of various stocks would be undertaken, and noted that designated experts would be chosen by the respective laboratories and communicated to the Assistant Executive Secretary before the end of November 1989.

b) Capelin in Division 3L

The Council concurred with the incorporation of the amended assessment results to its June 1989 Report.

c) Acknowledgements

The Council thanked the Chairman of STACFIS for his hard work and contributions to the work of the Council during the year.

III. RESEARCH COORDINATION (APP. II)

1. Fishery Statistics

a) Acquisition of STATLANT 21A and 21B Reports

The Council noted with grave concern that deficiencies still exist in data due to delays in submission of some national STATLANT 21B reports for 1986 and 1987. The Council endorsed the STACREC recommendation to bring the matter to the attention of the Fisheries Commission.

b) Publication of Statistical Information

The Council endorsed the STACREC recommendation that the publication of

the Statistical Bulletin (No. 36 for 1986) should not be delayed any further.

2. Separate Fishery Statistics for the Regulatory Area

The Council noted STACREC's view that the requirements for requesting statistics separately for the Regulatory Area needed to be clearly defined, and agreed that the matter should be held open for further definition by the representatives of the justification of the effort that would be required to change the present reporting scheme.

3. Other Matters

The Chairman on behalf of the Council thanked the outgoing Chairman of STACREC for his valuable contributions to the Council's work, particularly recognizing the difficulties STACREC was faced with in acquisition of data.

IV. PUBLICATIONS (APP. III)

1. Review of Editorial Board

The Council welcomed the appointment of G. Krause of the Alfred Wegener Institut fur Polar und Meeresforschung, Federal Republic of Germany, to the position of Associate Editor for Biological Oceanography, and extended its appreciation to R. Misra (Canada) for his interests in the Journal's Editorial Board.

2. Invitational Papers

The Council was pleased to note that another paper, in addition to the one announced to STACPUB in June 1989, was likely to be submitted for consideration for a special issue of the Journal.

3. Review of Papers for Possible Publication

The Council was pleased to note the quick response and the significantly large number of positive responses from authors of the papers nominated at the June 1989 Meeting of STACPUB.

The Council noted the long deliberations by STACPUB on the publication of papers presented at the Special Session and endorsed its views that a single issue of the Journal be considered for their publication by mid-1990. The Council noted that STACPUB would review the status of that publication in June 1990.

4. Other Matters

The Council invited attendees to participate in STACPUB's selection of a new cover to the Journal in order to promote the Journal.

The Chairman, on behalf of the Council, thanked the outgoing Chairman of STACPUB for his valuable contributions during his 2 years in office.

V. ADOPTION OF REPORTS

1. Provisional Report of Scientific Council in June 1989

The Council reviewed the Provisional Report and issued a corrigendum to accommodate minor modifications before adopting the report. It was noted that the modification of the assessment of Capelin in Div. 3L would be identified with footnotes in the appropriate sections of the report.

2. Committee Reports of Present Meeting

The Council adopted the reports of STACFIS, STACREC and STACPUB as presented by the respective Chairmen.

VI. FUTURE SCIENTIFIC MEETINGS

1. Workshop on Shrimp Ageing, October 1989

The Council was pleased to note that arrangements for the meeting in Iceland were progressing well and as planned.

2. Workshop on Silver Hake, Early 1990

The Council noted that the details of the workshop on silver hake had been discussed and reported to STACFIS, and the tentative dates were 8-12 January 1990.

3. June 1990 Meeting of Scientific Council

The Council confirmed its earlier decision to meet at the NAFO Headquarters in Dartmouth, Nova Scotia, during 6-20 June 1990. The meeting would deal with the usual requests for scientific advice on fisheries management and other fishery-related research, publication and statistical activities.

4. Special Session and Annual Meeting, September 1990

The Council reaffirmed its earlier decision that the Annual Meeting of the Scientific Council would be held during 10-14 September 1990 in Halifax, Nova Scotia. The meeting would be preceded by the Special Session from 5-7 September 1990.

5. June 1991 Meeting of Scientific Council

The Council agreed on the tentative dates of 7-21 June 1991 for the meeting of the Scientific Council.

6. Special Session and Annual Meeting, September 1991

The Council noted that the proposed dates for the beginning of the Annual Meeting would fall on Labour Day (a national holiday in Canada). The Council accordingly agreed on a tentative plan to hold the Special Session immediately after the Annual Meeting (rather than preceding the meeting).

VII. NOMINATION AND ELECTION OF OFFICERS

1. Officers for 1989-91

The Chairman noted that the offices open for election to two-year terms beginning immediately after the Eleventh Annual Meeting were: Chairman of Scientific Council, Vice-Chairman of Scientific Council, Chairman of STACREC, and Chairman of STACPUB and it was recognized that the Vice-Chairman of the Scientific Council would become *ex officio* Chairman of STACPUB. The position of Chairman of STACFIS (H. Lassen) had been filled as of September 1988 for a two-year term ending in September 1990. The Chairman noted that the six Contracting Parties present (Canada, Denmark (Greenland), EEC, GDR, Japan and USSR) and the two proxies held by the Executive Secretary (Iceland and Norway) constituted a quorum in accordance with the Rules of Procedure. The Chairman then called for nominations for the Office of Chairman of Scientific Council. B. Jones (EEC), who had been nominated at the June 1989 Meeting to the Scientific Council, agreed to stand for election. Sv. Aa. Horsted was also nominated, however, he

declined stating that he was grateful to be nominated but was pleased not to have an election to that office.

There being no other nominations, B. Jones was duly declared the incoming Chairman of the Scientific Council. He thanked members for the confidence they had placed in him and hoped they would bear with him in executing his duties especially in view of his limited experience with NAFO in recent years. Sv. Aa. Horsted, recognizing B. Jones was very new to NAFO although he had experience elsewhere, hoped the Council would help the new Chairman through the very trying times as had been recently experienced. The Chairman on behalf of the Council wished him well.

The Chairman then called for nominations for the Office of Vice-Chairman of the Scientific Council. V. P. Serebryakov (USSR) was nominated. There being no other nominations, V. P. Serebryakov was duly declared the incoming Vice-Chairman. The Council conveyed a welcome to him and offered its assistance to him as he assumed the duties of that office as well as those of Chairman of STACPUB.

For the Office of Chairman of STACREC, W. B. Brodie (Canada) was nominated. There being no other nominations, W. B. Brodie was duly declared the incoming Chairman of STACREC. The Council extended a warm welcome to him recognizing his significant contributions to the Council in the past.

VIII. OTHER BUSINESS

1. Questions by the Fisheries Commission

With regard to the comment made by the Council to the Fisheries Commission in its June 1989 Report that a more fruitful interaction would be prompted by framing inquiries in the context of the problems which the Fisheries Commission would wish to resolve, the Council found it difficult to propose specific formulations of questions. This was particularly because the Council could not pose specific questions such as that with respect to Cod in Div. 2J+3KL, as the Fisheries Commission should decide such matters.

Responses to several questions from the Fisheries Commission forwarded to the Council during this meeting are given above (see Plenary Sessions).

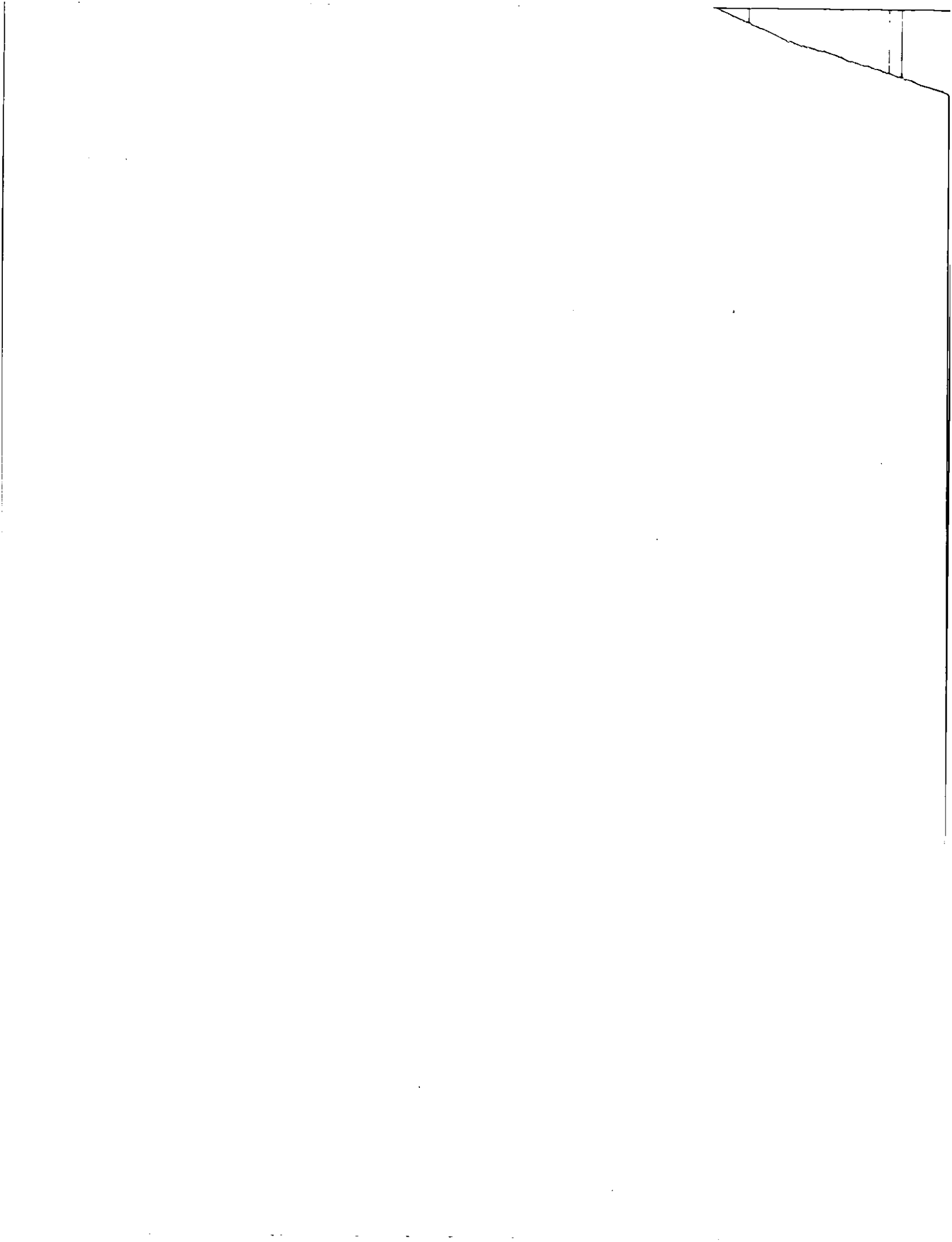
2. Proposal for Joint ICES/NAFO Working Group on Seals

The Chairman had communicated with the General Secretary of ICES and had received a letter that identified ways of developing terms of reference for meeting of the Working Group. The Council agreed that the Chairman should respond positively by letter to the ICES proposal that questions would initially be posed to the organization with responsibility for the particular area. The response would note that once the Joint Working Group was established, the Council would normally expect to refer to the Joint Working Group, requests for analysis of information on seals that were received according to the NAFO procedures.

IX. ADJOURNMENT

The Chairman adjourned the meeting by thanking all participants for their help to him over his term of office. He made specific mention of the work of the Assistant Executive Secretary, and of the support of the Secretariat. Without them, and their long hours of work, the meetings of the Council would become almost impossible to complete.

J. Messtorff, as the senior member of the Council, thanked the outgoing Chairman for his able guidance of the Council through his term, and hoped that he would continue to help the Council.



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

Chairman: H. Lassen

Rapporteurs: Various

The Committee met at the Albert Borschette Conference Centre, Brussels, Belgium on 11-14 September 1989, to consider and report on various matters referred to it by the Scientific Council. Representatives attended from Canada, Denmark (Greenland), EEC, GDR, Japan and USSR.

The meeting was preceded on 6-8 September 1989 by the Special Session on "Changes in Fish Populations". Matters which were considered at both meetings are outlined below.

STACFIS received the report of the Special Session from the convener M. Fogarty (USA), which is given below. STACFIS recommended that more detailed analyses of the changes in growth and its importance in the productivity of these systems be undertaken, as contained in the report of the Special Session.

I. SPECIAL SESSION ON CHANGES IN FISH POPULATIONS

1. Introduction

The Special Session on "Changes in Biomass, Production and Species Composition of the Fish Populations in the Northwest Atlantic Over the Last 30 Years, and Their Possible Causes", with M. Fogarty (USA) as convener, was held at the Centre des Conférences Albert Borschette, Brussels, Belgium, during 6-8 September 1989. A total of 18 presentations were made: 16 papers (SCR Doc. 89/62, 89/72 and 89/74 to 89/87) and two oral presentations. The Session was attended by scientists from Canada, Cuba, Denmark (Greenland), EEC, GDR, Japan, USA and USSR.

2. Specific Topics

The response of fish populations to sustained perturbations such as harvesting or pollution and habitat degradation is dependent on the regulatory mechanisms (i.e. compensatory responses) characteristic of each population. The nature and relative importance of the compensatory mechanisms governs the stability and resilience of populations to natural and man-made disturbances. Species with little or no compensatory capacity will be particularly vulnerable to exploitation or other perturbations. The principal objective of the Special Session was to explore the available information on responses of fish populations in the Northwest Atlantic to exploitation and variability in the biotic and abiotic environment. The deliberations of the group were centred around stabilizing factors in fish populations and their dynamic ecological setting. These problems were examined from both a single species and a multiple species perspective.

A total of eight presentations dealt specifically with the effects of exploitation on the abundance of individual species or groups of species. Seven papers provided information principally on environmental effects on fish populations and two presentations involved biotic interactions (primarily predator-prey dynamics). An overview paper provided a general framework for discussion of the role of anthropogenic and natural factors on exploited populations.

Dramatic shifts in the biomass levels and species composition were documented for several systems throughout the NAFO convention area. The nature of these changes and their possible causes are described in the following discussion which reflects both the presentations made during the session and comments made during the final discussion period.

a) Exploitation effects

The role of exploitation on the structure of marine fish communities was examined in several papers. Biomass declines under increasing exploitation rates with the arrival of distant water fleets were documented for Georges Bank, Southwest Nova Scotia, Gulf of St. Lawrence, Newfoundland, and the Grand Banks. Recovery of biomass levels in these areas was noted following implementation of extended jurisdiction although on Georges Bank, the biomass of commercially desirable species has since continued to decline. Comparisons of biomass levels inside and outside of the two hundred mile limit on the Grand Bank also show a reduction in abundance under exploitation. Exploitation effects were implicated in the declines of a diverse array of species.

Changes in relative species composition were also apparent for the Georges Bank, Grand Bank, and Flemish Cap based on analyses of changes in fish assemblages, aggregate biomass, or abundance of selected groups of species. Analyses of species assemblages indicate the composition and spatial configuration of the groups tends to remain relatively constant but that the abundance levels of the component species and the assemblage as a whole can vary widely. Structural changes in the Georges Bank system, with a current domination by elasmobranchs is a particularly striking example of a change in relative species composition. These changes appear to be related to selective harvesting of marketable species.

The nature of the changes expected in each system may be highly dependent on its underlying structure. For example, a system characterized by low diversity may exhibit qualitatively different responses than higher diversity systems to a reduction or deletion of one or more species (e.g. replacement effects may not be observed). If a stock is reduced to a critical level in a productive system, it may continue to exist in the system at a low level. Conversely, in a system characterized by low productivity, the species may be forced to local extinction.

Although considerable evidence for changes in biomass levels was provided, the question of overall changes in productivity was not addressed. In particular, the role of changes in growth rates was not explored. This component of production can conceivably exert considerable influence in overall production rates in the system. It is recommended that more detailed analyses of the changes in growth and its importance in the productivity of these systems be undertaken. With respect to the importance of recruitment to production rates, a distinction between changes in base levels of recruitment should be distinguished from short term fluctuations.

b) Biotic interactions

The role of intraspecific interactions was described for several stocks. Cannibalism was shown to be a potentially important factor in the regulation of silver hake and herring stocks. In addition, density-dependent survival rates of herring eggs in egg beds were described. Interspecific interactions between cod and several species were also suggested in an exploratory correlation analysis.

The possibility of interactive effects between predation and environmental effects on growth were noted. If growth rates decline under sub-optimal environmental conditions, the larvae may be vulnerable to predation stress for a longer period of time, resulting in increased mortality rates. Thus, subtle interactions between abiotic and biotic factors can be important.

It was noted that a critical lack of information exists for the earliest life stages. Specifically, time series of abundance estimates for the

egg and larval stages are not generally available. It is therefore not possible to partition the sources of variability in pre-recruit survival into specific developmental periods.

Comparisons between Northeast and Northwest Atlantic systems can be instructive, however, the general exploitation on smaller sizes and a broader diversity of component species in the Northeast Atlantic prohibit direct comparisons of system response to exploitation and predation effects in these two systems.

Changes in the relative abundance of predators can alter pathways of energy flow in systems in indirect ways. For example, the depletion or removal of a predator can result in a change in benthic-pelagic coupling, disrupting energy transfer among certain components of the system.

The apparent dominance of elasmobranchs in the Georges Bank region in recent years may signal a fundamental change in the system. These species are important piscivores and may exert considerable predation pressure on commercially desirable species. If current selective harvesting patterns are maintained, the synergistic effects of exploitation and predation may result in continued low biomass levels of harvestable species.

c) Environmental effects

The importance of identifying the relevant spatial and temporal scales for integration of biological and physical processes was discussed. In particular, the linkage between physical processes and their potential effects on biological systems is crucial to the correct selection of scales in time and space.

Specification of the underlying mechanisms (or hypothesized mechanisms) relating environmental factors to growth and survival of fish at different life stages is critical to advancing from empirical relationships based on correlational studies to a full understanding of environmental effects on fish populations.

The potential implications of global climate change on fish populations were discussed. Clear evidence of warming trends have been obtained from water temperature records for West Greenland. Sustained trends of this type are likely to have much different implications for fish populations than short-term variability. These changes may fundamentally alter the production characteristics of boreal-temperate systems which are expected to be more strongly impacted by global warming than lower latitudes.

It was noted that collaboration between physical oceanographers and fishery ecologists on the effects of small-scale variability in oceanographic processes on larval fish survival and growth has been very fruitful.

d) Conclusions

Clear evidence of changes in biomass levels and relative species compositions in response to exploitation has been obtained in the Northwest Atlantic during the last three decades. The observed response of fish populations to disturbances such as fishing has immediate implications for fishery management. These observations can also provide insights into basic ecological processes and structuring mechanisms in marine ecosystems. The broad spatial and temporal scales over which fisheries operate represent major perturbations to these systems. The relative strength of the perturbation can be measured and the responses of systems to these disturbances can be determined. Basic ecological questions such as the possible existence of alternate stable states in system configurations can be addressed by measuring changes in the

structure of fish communities with changes in exploitation rates and patterns.

Exploitation can dramatically alter the biomass levels in marine systems. This effect was unequivocally shown in a number of systems considered during the Special Session and for a broad range of species or species groups. Interesting comparisons between lower diversity, higher latitude systems can be instructive. The effects of exploitation on productivity of these systems, however, is less clear because the relevant comparisons have not often been attempted.

Changes in fish populations under exploitation are embedded in a complex physical setting and it may not always be possible to clearly distinguish between the effects of harvesting and environmental effects in the short term. Accordingly, it is crucial that consistent time series of relevant biological, physical and fishery-related information be maintained and that these sources of information be synthesized into an overview of system response to the factors affecting the component species.

The papers presented during the Special Session provided valuable case studies of the importance of exploitation, environmental factors, and biotic interactions on marine systems. It is recommended that papers presented during the Special Session be considered for publication collectively in an issue of the *Journal of the Northwest Atlantic Fishery Science*, as appropriate.

II. FUTURE MEETINGS

1. Workshop on Silver Hake Database

The Scientific Council recommended at its June 1989 meeting that a workshop be held on "silver hake assessment data and analysis" and that this workshop should be held in early 1990.

The chairman suggested that a small group should prepare an outline of the workshop for consideration by STACFIS. The group met on the afternoon of 11 September 1989. The results were then discussed by STACFIS and the final outline is given below.

The objective of the workshop is to review data available for silver hake assessment, resolve the apparent discrepancies and establish an agreed database.

Six topics were identified:

a) Sampling for length and ageing material

Discrepancies between length frequencies collected by several countries have been noted. Therefore sampling methods for all countries should be reviewed (e. g. sample size, randomization scheme, equipment used and measurements taken).

b) Ageing methods

Results of the otolith exchange programs between Canada and USSR were reported in June 1989, and a bias was still apparent in the data. The workshop should therefore attempt to resolve those problems.

c) Methods used in the construction of yearly catch compositions

Procedures for aggregating age and length data should be reviewed, particularly stratification schemes. The database at present only goes back to 1977. While data for the 1962-76 period are available, they have not been analyzed yet.

d) Commercial catch rate data series

There is a break in the nature of the data series so two periods need to be addressed: 1970-85 and 1986-89.

e) Research vessel survey data

Stratification schemes, sampling and raising procedures should be reviewed. The ageing and length measurement problems referred to above will also influence the survey results.

f) Assessment methods

The methods which are currently employed to assess silver hake should be reviewed and new methods should be evaluated before they are used in assessments.

Output of the Workshop

For items a-e listed above, the agreed database and how it was constructed should be fully documented. Further, effects on the assessment as a consequence of any changes in the database should be documented.

For item f, validation of the methods should be sought.

Standard methods of sampling, stratification, length measurement etc. should be established wherever possible.

Place and time of the Workshop

The time constraints on the laboratories are quite severe, but it was agreed that 8-12 January 1990 might be the earliest possible dates. The chairman of STACFIS (Hans Lassen) should convene the workshop and the services of the Assistant Executive Secretary would be required for the workshop.

2. Special Session in September 1990

Regarding the Special Session on "Management Under Uncertainties Related to Biology and Assessments, with Case Studies on Some North Atlantic Fisheries", STACFIS received a telefax from the convener John Shepherd (Lowestoft, UK) giving some guidelines for the meeting which should be included in the flyer to go out with invitations to the meeting. STACFIS discussed the guidelines and asked the Assistant Executive Secretary with assistance of the chairman of STACFIS to prepare the flyer and invitation.

3. Special Session in September 1991

STACFIS discussed possible topics for 1991 and decided on "Atlantic Cod: The Understanding on physiology, Dynamics, Ecology and Environmental Relationships".

The chairman asked the committee to consider an appropriate convener, who the Chairman of the Scientific Council would then approach. The outline for the meeting would be reviewed at the June 1990 Meeting of the Scientific Council, in the light of the convener's input.

III. OTHER MATTERS

1. Designated Experts

STACFIS discussed the assignment of designated experts for the June 1990 meeting. The designated expert should arrange to receive all data pertinent to an assessment, prior to the STACFIS meeting from all parties investigating a

given stock. On this basis, the designated expert should provide STACFIS with a preliminary assessment for its consideration. The designated expert should further act as rapporteur for that particular section of the STACFIS report. It was pointed out that the success of this scheme depends critically on the data made available to the expert in due time. It is not acceptable that data submission to the relevant designated expert be delayed until the beginning of the STACFIS meeting. This would put the designated expert under pressure and prevent the person in participating in the general review of other assessments.

It was further noted that this system is established to expedite the work of STACFIS. While the designated expert is expected to provide a preliminary assessment for STACFIS, consideration of input from other members, preferably in the form of research documents, are essential for a full discussion of the assessments at STACFIS.

STACFIS identified the laboratories which would provide designated experts and these are listed below. The general principle was to choose laboratories which were holding a significant amount of the data on the relevant stock and were actively engaged in the research.

List of Laboratories which would provide designated experts for various stocks

Species	Area	Laboratory
Cod	SA 1	Greenland ¹
	Div. 3M	Vigo ²
	Div. 3NO	St. John's ³
Redfish	SA 1	Hamburg ⁴
	Div. 3M	PINRO ⁵
	Div. 3LN	St. John's
Silver hake	Div. 4VWX	Dartmouth ⁶
American plaice	Div. 3M	Vigo
	Div. 3LNO	St. John's
Witch flounder	Div. 3NO	St. John's
Yellowtail flounder	Div. 3LNO	St. John's
Greenland halibut	SA 0+1	Greenland
	SA 2 + Div. 3KL	St. John's
Roundnose grenadier	SA 0+1	St. John's
	SA 2+3	St. John's
Wolffish	SA 1	Greenland
Capelin	Div. 3L	St. John's
	Div. 3NO	St. John's
Squid	SA 3+4	St. John's
Northern shrimp	SA 0+1	Greenland
	Denmark Strait	Greenland

¹ Greenland Fisheries Research Institute
Tagensvej 135, 1, DK-2200 Copenhagen N, Denmark

² Instituto Investigaciones Marinas
Muelle de Bouzas, Vigo, Spain

³ Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans
P. O. Box 5667, St. John's, Newfoundland, Canada

⁴ Institut für Seefischerei
Palmallee 9, D-2000 Hamburg, 50, Federal Republic of Germany

⁵ Polar Research Institute of Marine Fisheries and Oceanography (PINRO)
6 Knipovich Street, Murmansk, 183763, USSR

⁶ Bedford Institute of Oceanography, Marine Fish Division
P. O. Box 1006, Dartmouth, Nova Scotia, Canada

STACFIS chairman would, in the case of additions to the stocks listed above, contact laboratories likely to provide designated experts. Conversely, the Chairman would contact the laboratories if some stocks listed above may not be required. STACFIS agreed that laboratories notify the Assistant Executive

Secretary at NAFO Headquarters, of the names of the designated experts well in advance of the June meeting, preferably before the end of November 1989. The list would then be circulated by the Secretariat.

2. Capelin in Division 3L

NAFO SCR Doc. 89/52 which was presented at the June 1989 Meeting, was resubmitted with an addendum to indicate an error in calibration of the hydroacoustic equipment. The resulting changes to the assessment were incorporated in the Report of the June 1989 Meeting of the Scientific Council and those changes are indicated with footnotes.

3. Yellowtail Flounder in Divisions 3LNO

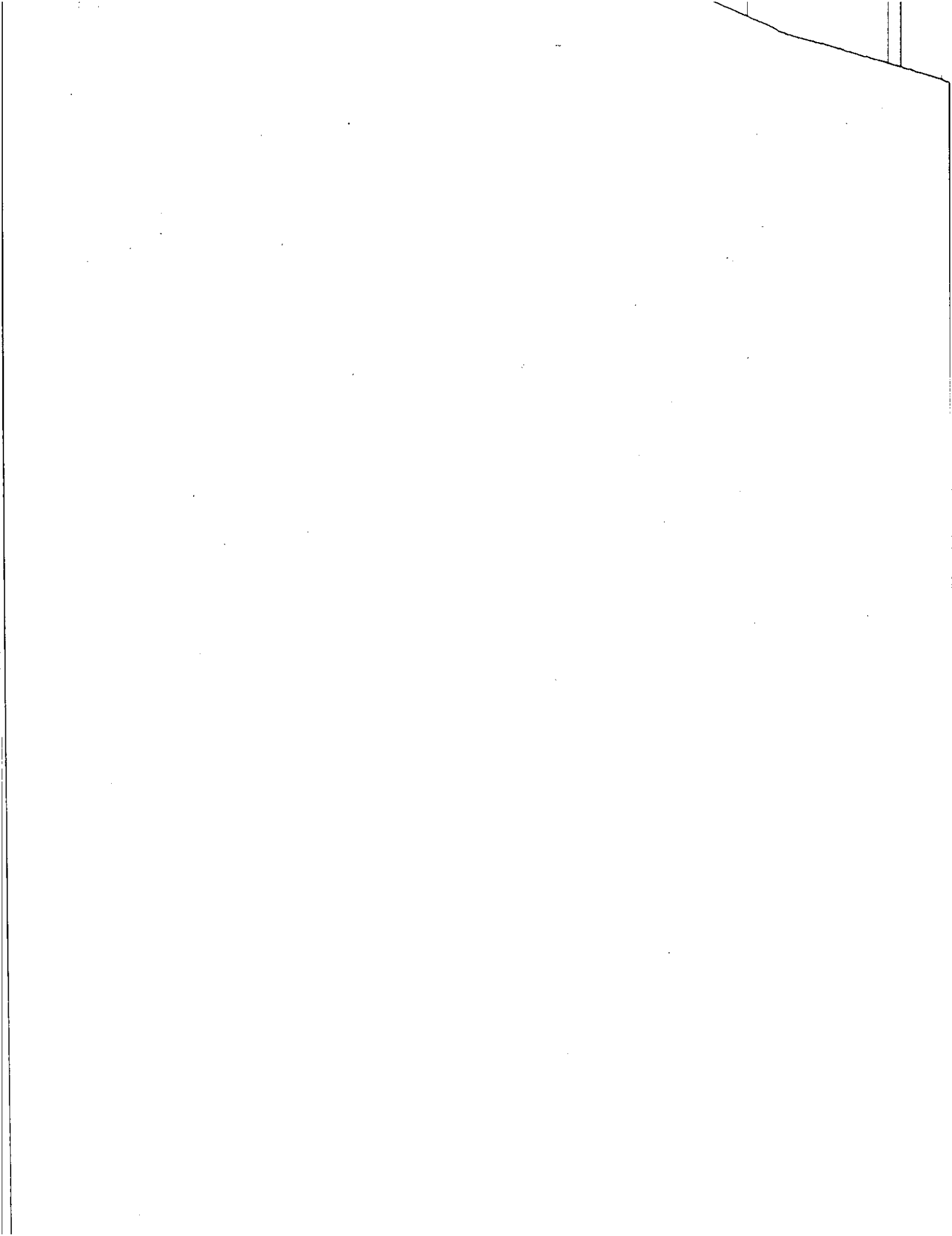
In response to a question regarding the wording in the Provisional Report of the Scientific Council, June 1989, with respect to how much of the juvenile stock (ages 1-4) occurs in the Regulatory area, the same database that was available in June 1989 was reviewed. The wording in the Scientific Council report was slightly amended. This new phrasing was incorporated in the report of the June Meeting.

4. Review of Scientific Papers

Two papers submitted during the meeting, titled "Results of parasitological investigations as an index of stock delimitations concerning occurrences of Greenland halibut (*Reinhardtius hippoglossoides* Walb.) in the Northwest Atlantic" by L. W. Reimer and P. Ernst (SCR Doc. 89/73), and "Yield-per-recruit of American plaice in Div. 3LNO" by J. Bertrand and R. Noé (SCR Doc. 89/88), were found to be relevant to stock assessments, and STACFIS agreed to review those documents at the June 1990 Meeting, when the assessments would be carried out.

5. Acknowledgements

In closing the meeting, the Chairman thanked the members of the Committee for their contributions, the Assistant Executive Secretary and the staff of the NAFO Secretariat for the most efficient assistance to STACFIS.



APPENDIX II. REPORT OF STANDING COMMITTEE ON RESEARCH COORDINATION (STACREC)

Chairman: A. Vazquez

Rapporteur: Various

The Committee met at the Albert Borschette Conference Centre, Brussels, Belgium, on 11 and 14 September 1989 to consider and report on various matters referred to it by the Scientific Council. Representatives attended from Canada, Denmark (Greenland), EEC, GDR, Japan and USSR.

1. Fishery Statisticsa) Acquisition of STATLANT 21A and 21B Reports

The Committee was informed by the Assistant Executive Secretary that no new statistical information was received since the June Meeting. Consequently, the deficiencies in STATLANT 21B national reports for 1986 and 1987 as well as in STATLANT 21A provisional catches for 1988, as pointed out in the June report, still remain. STACREC reiterates the necessity of accurate statistical information for the Scientific Council objectives. STACREC recommends that *since the submission of statistical information is worsening, the Scientific Council brings this matter to the attention of the Fisheries Commission.*

Provisional nominal catches in NAFO Convention Area for 1988 are still incomplete due to the lack of France and Faroe Islands data. It was agreed that a table containing nominal catches for 1987 and 1988 with indications of its deficiencies should be included in the Scientific Council Report.

b) Publication of statistical information

Information was received that the STATLANT 21B report for 1986 from Canada (N) would be available very shortly.

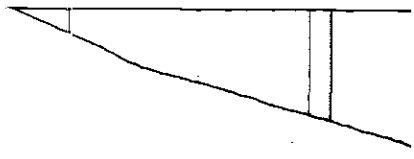
The Committee observed that the proposed publication date of September for the Statistical Bulletin (No. 36) for 1986 as proposed at the June Meeting, was not realized. STACREC recognized the need to obtain these necessary data and recommends that *the publication should not be delayed any further and every attempt be made to publish as soon as possible.*

2. Separate Fishery Statistics for the Regulatory Area (SCS Doc. 89/18)

The implication of requesting statistics separately for the Regulatory Area was considered. The Committee reviewed the relevant sections of the Convention in relation to catch and effort data submission by member countries (SCS Doc. 89/18). It was pointed out that such new requirements may involve important changes in current routines for acquisition, reporting and editing statistical data. These changes were judged to be serious disturbances to those routines. It was agreed that objectives to be achieved by obtaining separate fishing statistics for the Regulatory Area was at present not sufficiently defined to justify the effort implied to change the present statistical reporting requirements and that STACREC would not at present pursue with a request for separate fishery statistics.

3. Other Matter

There being no other business, the Chairman thanked the participants and the Assistant Executive Secretary for their contribution to the meeting.



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

Chairman: Sv. Aa. Horsted

Rapporteur: T. Amaratunga

The Committee met at the Albert Borschette Conference Centre of the EEC in Brussels, Belgium on 12 September 1989. In attendance were Sv. Aa. Horsted (Chairman, Denmark/Greenland), W. R. Bowering (Canada), J. Messtorff (EEC), V. A. Rikhter (USSR), A. Vazquez (EEC) and the Assistant Executive Secretary (T. Amaratunga).

1. Review of Editorial Board

The Committee noted the need for the appointment to the position of Associate Editor for Biological Oceanography. The Committee was informed that Gunther Krause of the Alfred Wegener Institut fur Polar und Meeresforschung, Federal Republic of Germany and Raj Misra of the Department of Fisheries and Oceans, Canada, had agreed to be nominated to serve on the Editorial Board.

In view of the present needs of the Board and the desirability to maintain the international nature of the Board, the Committee elected to appoint G. Krause to the position of Associate Editor for Biological Oceanography.

STACPUB expressed its appreciation to both eminent scientists for their interest in the Journal and hoped that it may have the opportunity to draw on R. Misra's expertise at a later date.

2. Invitational Papers

M. Stein (EEC) had indicated his interests in presenting a review paper in 1990. STACPUB welcomed the prospects of receiving this paper, in addition to the one announced in June 1989 by R. G. Halliday and A. T. Pinhorn for the latter part of 1989, for consideration for publishing special issues of the Journal.

3. Review of Papers for Possible Publicationa) Review of Responses to Proposals From Past Meetings

The Committee was pleased to note that the Secretariat had responses from authors of 9 of the 13 papers, which included 2 submissions, nominated in June. All papers, except one, were intended for consideration for the Journal. In addition, there was one further response from the nominations in 1988.

b) Papers From the September 1989 Special Session

In reviewing papers presented at the Special Session, the Committee noted the recommendation made in the Convener's report that a single issue of the Journal for publication be considered, and recognized the importance of keeping the papers together.

After extensive discussion on the standards of papers received at the meeting and the possible approaches that could be taken, STACPUB agreed to invite and act on the views of the convener. STACPUB accordingly agreed to invite the authors of all papers presented at the meeting, to respond with their intentions within one month. The submitted papers would be reviewed in the normal process, and with the assistance of the convener and the Assistant Executive Secretary, to aim at publishing a single issue of the Journal by mid 1990. STACPUB would review the progress of this publication in June 1990.

c) Other Contributions

There were no contributions to be considered.

4. Other Mattersa) Publication of Statistical Bulletin No. 36

STACPUB noted with concern that the publication in September of the Statistical Bulletin No. 36 for 1986 was not achieved as defined by the Scientific Council in June 1989, because certain necessary data had not yet been submitted to the Secretariat.

b) Promotion of the Journal

In response to the Committee's request from the June 1989 Meeting, the Assistant Executive Secretary presented a selection of designs for the proposed cover of the Journal. STACPUB agreed that the selection be shown to representatives of the Scientific Council and assigned the task of determining the most suitable cover, to the Assistant Executive Secretary.

c) Acknowledgements

The Chairman thanked the members of the Committee and the Assistant Executive Secretary for their good cooperation and contribution to the work of the Committee through the two years when he had been in the Chair. The Committee and the Assistant Executive Secretary expressed their appreciation to the Chairman for his good service through his term as Chairman of the Committee.

APPENDIX IV. AGENDA FOR SCIENTIFIC COUNCIL MEETING - SEPTEMBER 1989

I. Opening (Chairman: J. S. Beckett)

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

II. Fishery Science (STACFIS Chairman: H. Lassen)

1. Report of Special Session on "Changes in Biomass, Production and Species Composition of the Fish Populations in the Northwest Atlantic Over the Last 30 Years, and Their Possible Causes" (6-8 September 1989 with M. J. Fogarty as Convener).

a) General Theme

Fish populations in the Northwest Atlantic have undergone dramatic changes during the last thirty years in response to environmental effects, exploitation and other anthropogenic factors. The primary objective of the session is to document changes in abundance, production and community composition and to examine hypotheses regarding underlying mechanisms. The principal focus will be on the northwestern Atlantic but comparative studies from other regions will be welcome.

b) Specific Topics

Community-level change
 Exploitation effects
 The biotic environment
 The physical environment
 Other anthropogenic effects
 Indirect and secondary effects

2. Future Special Sessions

- a) Workshop on Silver hake, early 1990, on input data and analyses
- b) Special Session in September 1990, on management under uncertainties related to biology and assessments, with case studies on some North Atlantic fisheries
- c) Proposed theme for Special Session in September 1991

3. Other Matters

III. Research Coordination (STACREC Chairman: A. Vazquez)

1. Fishery Statistics

- a) Acquisition of STATLANT 21A and 21B reports
- b) Publication of statistical information

2. Separate fishery statistics for the Regulatory Area

3. Other Matters

IV. Publications (STACPUB Chairman: Sv. Aa. Horsted)

1. Review of Editorial Board
2. Invitational Papers

3. Review of Papers for Possible Publication
 - a) Review of responses to proposals from past meetings
 - b) Papers from the September 1989 Special Session
 - c) Other contributions
4. Other Matters
- V. Adoption of Reports
 1. Provisional Report of Scientific Council, June 1989
 2. Committee Reports of Present Meeting
- VI. Review of Future Meeting Arrangements
 1. Workshop on Shrimp Ageing, October 1989
 2. Workshop on Silver Hake, Early 1990
 3. June 1990 Meeting of the Scientific Council
 4. Special Session and Annual Meeting, September 1990
 5. June 1991 Meeting of Scientific Council
- VII. Nomination and Election of Officers for 1989-91
 1. Scientific Council
 2. Standing Committees (excluding STACFIS)
- VIII. Other Business
- IX. Adjournment

APPENDIX V. LIST OF PARTICIPANTS

CANADA

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Fogarty, M. J.

NOAA, National Mar. Fish. Service, Woods Hole, MA 02543,

APPENDIX VI. LIST OF RESEARCH AND SUMMARY DOCUMENTS

RESEARCH DOCUMENTS (SCR)

SCR # Ser.#

- 89/62* N1642 NOSKOV, A. S. Peculiarities of recruitment to herring stocks in the Northwest Atlantic as exemplified by the strong 1970 year-classes.
- 89/72* N1653 PAZ, J., and M. G. LARRANETA. Cod in Div. 3NO: year-class variations and the abundance of other commercial fish.
- 89/73 N1654 REIMER, L. W., and P. ERNST. Results of parasitological investigations as an index of stock delimitations concerning occurrences of Greenland halibut (*Reinhardtius hippoglossoides* Walb.) in the Northwest Atlantic.
- 89/74* N1655 MESSIEH, S. N. Changes in the Gulf of St. Lawrence herring populations in the past three decades.
- 89/75* N1656 GOMES, M. C., J. C. RICE, and C. R. HAEDRICH. Fish assemblages on the Grand Bank of Newfoundland.
- 89/76* N1660 MURAWSKI, S. A., and J. S. IDOINE. Multispecies size composition: a conservative property of exploited fishery systems?
- 89/77* N1661 GABRIEL, W. L. Persistence in northwestern demersal fish assemblages.
- 89/78* N1662 FOGARTY, M. J., R. K. MAYO, F. M. SERCHUK, and F. P. ALMEIDA. Trends in aggregate fish biomass and production on Georges Bank.
- 89/79* N1663 BRODIE, W. Analysis of catches of American plaice, cod, and yellowtail flounder from research vessel surveys on the Tail of the Grand Bank from 1971 to 1989.
- 89/80* N1664 WELLS, R. Fish populations on the Flemish Cap.
- 89/81* N1665 WALDRON, D. E. Cannibalism in the Scotian Shelf silver hake population and how it may influence population status.
- 89/82* N1666 PEZZACK, D. S. Lobster (*Homarus americanus*) abundance in the Canadian Maritimes over the last 30 years, an example of extremes.
- 89/83* N1667 TROYANOVSKY, F. M. On nature of non-maturing redfish (*Sebastes mentella* Travin) in the Northwest Atlantic.
- 89/84* N1668 BAIDALINOV, A. P. On the influence of long-term changes in environmental factors on the state of some fish population stocks in the Northwest Atlantic.
- 89/85* N1669 SIGAEV, I. K. On possible causes of the Scotian silver hake abundance fluctuations.
- 89/86* N1670 SEREBRYAKOV, V. P., A. K. CHUMAKOV, and I. I. TEVS. Spawning stock, population fecundity and year-class strength of Greenland halibut from the Northwest Atlantic in 1969-1988.
- 89/87* N1671 BOROVKOV, V. A., A. Yu. BULATOVA, A. K. CHUMAKOV, P. I. SAVVATIMSKY, and I. I. TEVS. Bottom water effects on the distribution and density of bottom fish in NAFO Subarea 3.
- 89/88 N1674 BERTRAND, J., and R. NOÉ. Yield-per-recruit of American plaice in Div. 3LNO.

SUMMARY DOCUMENTS (SCS)

SCS # Ser. #

- 89/18 N1659 NAFO EXECUTIVE SECRETARY. Sections of the Convention relevant to reporting statistics separately for waters within the Regulatory Area and for Convention waters under Coastal State jurisdiction.

89/19 N1676 ERNST, P., and R. EGGERS. German Democratic Republic research report for 1988.

89/20 N1685 NAFO SECRETARIAT. Report of Scientific Council, Annual Meeting, September 1989.

* Special Session papers