

PART B

Scientific Council Annual Meeting, 13-17 September 2004

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Scientific Council Meeting, 13-17 September 2004

Standing (left to right): Enrique De Cárdenas, Ralph Mayo, Toomas Saat, Joanne Morgan, Charlotte Mogensen, Unnur Skúladóttir, Robert Rangeley, Susana Junquera, Dave Orr, Ray Bowering, Fred Serchuk, Evgeny Romanov, Helle Siegstad, Dorothy Auby, Bruce Atkinson, Bill Brodie, Antonio Vázquez, Eugene Colbourne, Ricardo Alpoim, Tissa Amaratunga, Chris Allen

Kneeling (left to right): Manfred Stein, Jean-Claude Mahé, Hiromoto Watanabe, Lisa Hendickson, Fernando Gonzalez-Costas, Antonio Avila de Melo, Hilario Murua

Missing: Sonja Fordham, Konstantin Gorchinsky, Hyun-su Jo, Vladimir Shibanov



The Chairs, Scientific Council Meeting, 13-17 September 2004 (left to right): Antonio Vázquez, Vice-Chair Scientific Council and Chair STACREC; Manfred Stein, Chair STACPUB; Joanne Morgan, Chair Scientific Council; Eugene Colbourne, Chair STACFEN; Hilario Murua, Chair STACFIS.



STACFIS in session, 13-17 September 2004

SCIENTIFIC COUNCIL MEETING, 13-17 SEPTEMBER 2004

Chair: M. Joanne Morgan

Rapporteur: Tissa Amaratunga

I. PLENARY SESSIONS

The Scientific Council met at the Holiday Inn Harbourview, Dartmouth, Nova Scotia, Canada, during 13-17 September 2004. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (France, Germany, Portugal and Spain), Iceland, Republic of Korea, Russian Federation, Ukraine and United States of America. Charlotte B. Mogensen, World Wildlife Fund, European Policy Office, Brussels, Belgium, Robert Rangeley, World Wildlife Fund Canada, Nova Scotia, Canada and Hiromoto Watanabe, Fishery Liaison Officer, FAO, Rome, attended the meeting as observers. The Deputy Executive Secretary, Tissa Amaratunga, was in attendance and the Executive Secretary, Johanne Fischer, attended when available.

The Executive Committee met prior to the opening session of the Council, and the Provisional Agenda, plan of work and other related matters were discussed. The Council noted the Scientific Council Symposium "The Ecosystem of the Flemish Cap" was successfully conducted during 8-10 September 2004. The Chair extended appreciation to the conveners and participants for the stimulating discussions that took place.

The opening session of the Council was called to order at 1000 hours on 13 September 2004.

The Chair welcomed everyone to Dartmouth, Nova Scotia, Canada, and to this venue for the Meeting. The Deputy Executive Secretary was appointed rapporteur.

The Provisional Agenda was **adopted** as presented (see Agenda II, Part D, this volume), noting some additional items may be addressed subject to Fisheries Commission requests during the course of this meeting.

The Council noted the Provisional Agenda for the Scientific Council Meeting on shrimp during 27 October-4 November 2004 in Copenhagen, Denmark, was circulated in accordance with the Rules of Procedures on 27 August 2004.

The Council and its Standing Committees met through 13-17 September 2004 as needed. At its sessions on 16 September 2004, the Council considered and **adopted** the reports of the Standing Committees (STACFIS, STACREC, STACPUB).

The concluding session was called to order at 1100 hours on 17 September 2004 when the Council addressed other outstanding agenda items. The Scientific Council then considered and **adopted** its report of this meeting.

The meeting was adjourned at 1145 hours on 17 September 2004.

The Reports of the Standing Committees as **adopted** by the Council are appended as follows: Appendix I – Report of Standing Committee on Fisheries Science (STACFIS), Appendix II – Report of Standing Committee on Research Coordination (STACREC), and Appendix III – Report of Standing Committee on Publications (STACPUB).

The Report of the Scientific Council Special Session, the Symposium on "*The Ecosystem of the Flemish Cap*" is presented at Annex 1 of this Scientific Council Report.

The Agenda, List of Research (SCR) and Summary (SCS) Documents, List of Representatives and Advisers/Experts of this meeting are given in Part D, this volume.

The Council's considerations on the Standing Committee Reports, and other matters addressed by the Council follow in Sections II-XI.

II. REVIEW OF SCIENTIFIC COUNCIL RECOMMENDATIONS FROM JUNE 2004

The Council reviewed the following:

1. At its June 2004 Meeting the Scientific Council concluded that STACREC is no longer able to fulfill its mandate of statistics compilation with the current situation. As such, Scientific Council had **recommended** that *the Chair of Scientific Council formally communicate to the Chair of Fisheries Commission the concerns of Scientific Council regarding the derivation and accuracy of catch information available, and request that for the future, each year prior to the June meeting of Scientific Council, Fisheries Commission conduct its own evaluation of catch information derived from various sources under Rule 5.1 pertaining to STACTIC, and provide Scientific Council with their agreed estimates by Contracting Party/Country to be utilized by Scientific Council in the conduct of stock assessments.*

This issue was formally communicated to the Chair of the Fisheries Commission in a letter from the Chair of Scientific Council. The issue was also discussed in a meeting between the Chairs of Scientific Council and Fisheries Commission, as well as being raised by the Chair of Scientific Council during the presentation of scientific advice to the Fisheries Commission during this Annual Meeting.

At this current Annual Meeting, the Fisheries Commission expressed its appreciation of the difficulties faced by Scientific Council in determining the best estimates of catches to be used in the stock assessments, as catch estimates often are provided from a number of sources with differing results. It was the view of the Fisheries Commission that Scientific Council is best suited to continue performing this task. However, it was proposed that sources of catch information should not be considered for evaluation if the details of their collection and estimation are not made available to the Scientific Council.

2. Considering the progress made by the Limit Reference Point Study Group (LPRSG) which was held in Lorient, France, 15-20 April 2004, the Scientific Council had strongly **recommended** that *the Precautionary Approach Framework developed by Scientific Council be endorsed and implemented by the Fisheries Commission without further delay.*

This recommendation was formally communicated by the Chair of Scientific Council to the Chair of Fisheries Commission in a letter and was also discussed in a meeting between the Chairs of the two bodies. The matter was raised by the Chair of Scientific Council during the presentation of scientific advice to the Fisheries Commission. This item was discussed by the Commission during this current 2004 Annual Meeting.

3. The Council noted that certain matters from the June 2004 Meeting, and possibly matters to be discussed at the September 2004 Meeting may need to be submitted to the CWP 21st Session. Accordingly the Council had **recommended** that *the STACREC Chair in consultation with the Secretariat ensure any Scientific Council related matters be submitted to CWP Secretariat for inclusion in the CWP 21st Agenda.*

The Deputy Executive Secretary will correspond with the Chair of STACREC and Margaret Treble (Canada) on this issue.

4. The Scientific Council viewed that the FIRMS/NAFO Arrangement is an institutional arrangement between FAO/FIRMS and NAFO. Accordingly the Scientific Council had **recommended** that *the General Council approve the FAO/FIRMS and NAFO Partnership Arrangement.*

This recommendation was formally communicated by the Chair of Scientific Council to the Chair of General Council in a letter. This matter was discussed by General Council during this current 2004 Annual Meeting.

III. FISHERIES SCIENCE

The Council **adopted** the Report of the Standing Committee on Fisheries Science (STACFIS) as presented by the Chair, Hilario Murua. The full report of STACFIS is at Appendix I.

The **recommendation** made by STACFIS as **endorsed** by the Council is as follows:

1. STACFIS **recommended** that *all available information on by-catch and discards of Greenland halibut in Subarea 2 and Divisions 3KLMNO shrimp fishery be presented during the October/November 2004 and the June 2005 Meetings of the Scientific Council for consideration in future assessments.*

IV. RESEARCH COORDINATION

The Council **adopted** the Report of the Standing Committee on Research Coordination (STACREC) as presented by the Chair, Antonio Vazquez. The full report of STACREC is at Appendix II.

The **recommendation** made by STACREC as **endorsed** by the Council is as follows:

1. *The Secretariat should seek permission from the Contracting Parties to have their existing digitized data from the NAFO Observer Program be made available to the Secretariat to increase the efficiency and cost effectiveness of the data digitizing process. In the interim, the NAFO Secretariat should compile a list of available data, and begin the process of digitizing data to better evaluate costs.*

V. PUBLICATIONS

The Council adopted the Report of the Standing Committee on Publications (STACPUB) as presented by the Chair, Manfred Stein. The full report of STACPUB is at Appendix III.

The **recommendations** made by STACPUB as **endorsed** by the Council are as follows:

1. *STACPUB Chair explore the implications of citations of individual papers in 2 different ways (in electronic html format and the usual hard copy Journal format) and report on this during the June 2005 STACPUB Meeting.*
2. *the Secretariat's work of placing electronic issues of the Journal on the NAFO website begin immediately, and that any other work needed to complete this in a speedy manner be identified and reported to STACPUB in June 2005.*
3. *instead of the redfish and blue bar proposed for the cover of the NAFO Journal (JNAFS), a logo or background figure or typical figure out of the contributions of the given Symposium [see JNAFS Vol. 23 (map with drawings), 27 (the Symposium logo)] be taken, and for "miscellaneous papers" issues of JNAFS, the figure of the satellite picture proposed by the Secretariat be taken.*

VI. REQUESTS FROM FISHERIES COMMISSION

1. Update on Advice for Northern Shrimp in Division 3M

Scientific Council reviewed the EU multi-species bottom trawl survey index and the commercial catch data for Div. 3M northern shrimp (*Pandalus borealis*). The female biomass index showed a decrease from 11 700 tons in 2002 to 9 000 tons in 2003. Icelandic commercial catch rates dropped from 311 kg/hr in 2003 to 243 kg/hr in 2004; below the long term average of 272 kg/hr. The EU survey and Icelandic commercial data indicate the presence of a strong 2002 year-class. In 2003, 62 000 tons of shrimp were taken against a recommended total catch of 45 000 tons.

Since 1988, a stratified random summer bottom trawl survey on Flemish Cap (NAFO Regulatory Area of Div. 3M) was conducted by EU. In June 2003, the research vessel changed and the 2003 indexes were transformed by a length conversion method. The entire series of abundance, biomass, mean catch-per-tow and length distribution for northern shrimp (*Pandalus borealis*) for the period 1988-2002, and the transformed data for the year 2003 were presented. In 2003, a decrease of shrimp biomass was observed. This was mainly due to a decline of age-classes 3 and 5. Also the youngest modal groups (age 1 and 2) appeared well represented, predicting a good recruitment in next years. However, all these results must be taken cautiously because of the scarce number of hauls that were carried out during the calibration and available for 2003.

Scientific Council concluded there was no basis for change in the 2005 advice for this stock.

2. Update on Advice for Northern Shrimp in Divisions 3LNO

Scientific Council reviewed the Div. 3LNO northern shrimp (*Pandalus borealis*) biomass and abundance indices from the autumn 2003 and spring 2004 Canadian Research Vessel bottom trawl surveys. The autumn index has remained stable at a high level since 2000. The confidence intervals around the 2004 spring estimate were very wide indicating considerable uncertainty associated with the estimate. Based on this review, Scientific Council concluded that there is no basis to change its 2005 advice for this stock.

3. Pelagic Redfish *Sebastes mentella* in Subareas 1-3 and Adjacent ICES Area

The Scientific Council was requested by the Fisheries Commission as follows:

Regarding pelagic Sebastes mentella redfish in NAFO Subareas 1-3, the Scientific Council is requested to review the most recent information on the distribution of this resource, as well as on the affinity of this stock to the pelagic redfish resource found in the ICES Sub-area XII, parts of SA Va and XIV and to the shelf stocks of redfish found in ICES Sub-areas V, VI and XIV, and NAFO Subareas 1-3.

In response to the Fisheries Commission request the Council submitted the following:

The Council noted a trawl-acoustic survey on pelagic redfish (*S. mentella*) in the Irminger Sea and adjacent waters was carried out by Germany, Iceland and Russia in late May/June 2003. Approximately 405 000 naut. mile² were covered. The estimate of biomass, derived from the survey, suggest that about 8% resides in the NAFO area at this time of year. Previous surveys indicated 34% (1999) and 40% (2001) of the survey biomass in the NAFO area. However, results of the 2003 survey may not be comparable to surveys in 1999 and 2001. There were slight changes in the survey design in 2003 and it was conducted about 4 weeks earlier than the 2001 survey. In addition, the 2001 and 2003 surveys covered about 40% more area than the 1999 survey.

The results of the ICES Study Group on Stock Identity and Management Units of Redfish (SGSIMUR) meeting and the Northwestern Working Group (NWWG) meeting were presented to Scientific Council. There was discussion in these groups regarding dividing the redfish stock into 3 management units rather than the 2 units that currently form the basis for management. This would result in a split of those fish shallower than 500 m from those deeper than 500 m. There was no consensus among SGSIMUR or NWWG members about the stock structure of redfish in the area.

Council also considered (a) both the NAFO Scientific Council and the ACFM of ICES have independently been requested by their respective management clients to provide scientific information and/or management advice on the pelagic *Sebastes mentella* redfish resource that occurs in both the NAFO and ICES Areas and (b) that the Memorandum of Understanding between NAFO and ICES encourages “*reciprocal consultations and regular contact between the Organization and the Council on matters of common interest in the field of marine scientific research and related aspects, particularly those involving studies in the North Atlantic Ocean and its adjacent seas, and which fall within their respective competence*”, it would be mutually beneficial for the Scientific Council and ACFM to closely collaborate in evaluating data and information on the distribution, abundance, ecology, and stock structure of pelagic *S. mentella* resource in the North Atlantic Ocean.

The Scientific Council **recommended** that *Chair of the Scientific Council contact the Chair of ACFM to develop a communications vehicle or protocol (e.g. joint subgroup, email group, etc.) that would efficiently facilitate joint and collaborative consideration by both advisory bodies of all new and forthcoming information on the pelagic S. mentella stock in the North Atlantic Ocean.*

VII. REVIEW OF FUTURE MEETING ARRANGEMENTS

1. Scientific Council Meeting on Shrimp, 27 October-4 November 2004

The Council was informed that the Chairs of Scientific Council and STACFIS had communicated with the Chair of ICES WGPAND to further the arrangements to conduct the Scientific Council assessment and the

WGPAND work. With respect to the Scientific Council work, the Council noted its Provisional Agenda for this meeting was circulated on 27 August 2004. The Council noted that the Secretariat support for this meeting will include one person from the NAFO Secretariat, while the ICES Staff will provide the balance of the support needed.

The Council addressed the issue of status of participants at this meeting. It was noted that for Scientific Council work, the delegations from NAFO Contracting Parties will assume the decision making role, while non-Contracting Party participants will provide scientific input as experts.

2. **Scientific Council Meeting, June 2005**

The Scientific Council reconfirmed that its meeting of 2-16 June 2005 will be held at Alderney Landing, Dartmouth, Nova Scotia, Canada. The Council again emphasized the importance of the LAN System for its work at the meeting.

3. **Annual Meeting, September 2005**

The NAFO Annual Meeting is scheduled for 19-23 September 2005 for when Scientific Council is to conduct its meeting. The venue as currently known will be Tallinn, Estonia. The same period has been proposed for the 2006 and 2007 annual meetings. The Council noted that this represents a shift from its usual dates for this meeting, and now causes a conflict with the dates of the ICES Annual Science Conference (ASC). This will affect attendance at Scientific Council. In addition this change will seriously impact participation in the Council's symposia and special sessions. Consequently it will impact the contributions to the Journal and its popularity. Delegates of NAFO Contracting Parties will also be unable to attend the ICES ASC. This change is not in the spirit of the MoU between NAFO and ICES. Scientific Council **recommended** that *the Chair of Scientific Council convey these concerns to the Chair of General Council and the Executive Secretary. The Council noted that should this matter not be resolved for 2006 and onward, the Council will be forced to consider the possibility of independently holding its annual meeting during different dates.*

4. **Scientific Council Meeting on Shrimp, 2005**

It is anticipated that the 2005 Scientific Council Meeting on the assessment of shrimp will be held at NAFO Headquarters in Dartmouth. The dates of the meeting, as well as cooperation with the ICES WGPAND will be discussed at the 2004 Shrimp Assessment Meeting.

5. **Scientific Council Meeting, June 2006**

The Council agreed to the tentative dates of 1-15 June 2006 for this meeting to be held at the Alderney Landing, Dartmouth, Nova Scotia, Canada.

VIII. FUTURE SPECIAL SESSIONS

1. **Topics for Special Session in 2006**

During the 8-10 September 2004 Symposium on the "*The Ecosystem of the Flemish Cap*", participants felt that it would be valuable to have a Symposium organized by Scientific Council which compares the "*Environmental and Marine Resources Histories*" in the NAFO Convention Area. The Council agreed these "Sub-Ecosystems" should cover all the NAFO Subareas and comprise the Ecosystems of Greenland (East/West), Labrador Shelf/Grand Banks and Flemish Cap, Scotian Shelf and Georges Bank. Similar to the Symposium "*The Ecosystem of the Flemish Cap*" held during 8-10 September 2004, the scope of the proposed Symposium should be to describe and compare these ecosystems considering their environment and marine resources.

The Council welcomed the proposed co-conveners, Bill Brodie (Canada), Helle Siegstad (Denmark/Greenland) and Manfred Stein (EU-Germany) to plan for a Scientific Council Special Session, a Symposium in September 2006. The Council agreed an additional convener from the USA would be valuable to address issues of SA 5 and 6. The Council invited Fred Serchuk (USA) to propose such a person intersessionally.

IX. SCIENTIFIC COUNCIL WORKING PROCEDURES AND PROTOCOL

1. Timetable and Frequency of Assessments

The following schedule of Scientific Council assessments reflects decisions that some stocks should be reviewed on a multi-year basis, with monitoring during the interim years. It also reflects the addition of thorny skate in Div. 3LNO and redfish in Div. 3O to the assessment schedule. The frequency of assessments will be reviewed at the June 2005 meeting of Scientific Council.

Since 1999, the Scientific Council has agreed to the following overall schedule (+ is assessment year, *i* is interim monitor, 0 is no assessment) subject to the Fisheries Commission and Coastal State requests for advice and concurrence:

Stock	2000	2001	2002	2003	2004	2005	2006
Multi-year Assessments							
American plaice in Div. 3LNO	<i>i</i>	+	+	+	<i>i</i>	+	<i>i</i>
Cod in Div. 3NO	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
Redfish in Div. 3LN	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
Witch flounder in Div. 2J3KL	+	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
Redfish in Div. 3M	+	+	+	+	<i>i</i>	+	<i>i</i>
Roughhead grenadier in SA 2+3	+	<i>i</i>	0	+	<i>i</i>	+	<i>i</i>
Redifsh Div. 3O	-	-	-	+	<i>i</i>	+	<i>i</i>
Redfish in SA 1	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
Other fish in SA 1	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
Cod in Div. 3M	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
American plaice in Div. 3M	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Witch flounder in Div. 3NO	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Yellowtail flounder in Div. 3LNO	+	+	+	<i>i</i>	+	<i>i</i>	+
<i>Illex</i> Squid in Subareas 3 and 4	+	+	+	<i>i</i>	+	<i>i</i>	+
Roundnose grenadier in SA 0+1	<i>i</i>	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Capelin in Div. 3NO	+	+	+	+	<i>i</i>	+	<i>i</i>
Thorny skate in Div. 3LNO	-	-	-	-	+	<i>i</i>	+
Annual Assessments							
Greenland halibut in SA2 and Div 3KLMNO	+	+	+	+	+	+	+
Northern Shrimp in Div. 3M	+	+	+	+	+	+	+
Northern Shrimp in Div. 3LNO	+	+	+	+	+	+	+
Northern Shrimp in SA 0+1	+	+	+	+	+	+	+
Northern Shrimp in Denmark Strait	+	+	+	+	+	+	+

2. Catch Estimates

See Section II.1 above.

3. Limit Reference Points

Following on the progress of the Limit Reference Point Study Group (LRPSG) Scientific Council agreed it will proceed with the recommendation of LRPs for all stocks. This will begin with an attempt to calculate LRPs during the June 2005 Scientific Council Meeting for the stocks for which advice will be provided for 2006 and 2007. Limit reference points will not be calculated for stocks that will be subject to interim monitoring in June

2005, unless a special request is received from Fisheries Commission. These stocks will be addressed during the June 2006 Meeting and/or when the full assessments are next undertaken.

X. OTHER MATTERS

1. Consideration of Application of Southeast Asian Fisheries Development Center (SEAFDEC) to Join CWP

Dr. Watanabe (FAO Fishery Liaison Officer, observer at Annual meeting) was invited by the Council to provide a brief introduction to SEAFDEC. He noted that SEAFDEC was a long-term partner with FAO and is heavily involved in the implementation of the FAO Code of Conduct, although it is not a fishery management body.

The Council appreciated the introduction, and considered and agreed SEAFDEC's application to join CWP should be endorsed. The Council accordingly requested the Deputy Executive Secretary to inform the CWP Secretariat of this endorsement.

2. Other Business

a) RFB and FAO COFI Meeting 2005

Dr. Watanabe (FAO, observer at Annual Meeting) also provided information on the upcoming meeting of the Regional Fisheries Bodies (RFB) and COFI (FAO Committee on Fisheries) to be held in March 2005 at FAO, Rome, Italy. The agenda of the RFB Meeting contains items of interest to Scientific Council, particularly the harmonization of catch documentation. Scientific Council requested the Secretariat to continue to submit the RFB and COFI Meeting reports to the June Meeting of Scientific Council.

The Council expressed its great interests in keeping abreast of information developed at these fora. In particular the Council saw the need for a member of the Council to attend these meetings in 2005, and agreed that the Chair or Vice Chair of Scientific Council be added to the lists of NAFO representatives at the RFB Meeting so that Scientific Council can more fully benefit from these discussions.

Scientific Council thanked Dr. Watanabe for his presentations on these items, which allowed detailed discussion on the subjects.

b) Other Scientific Documentation

Scientific Council reviewed a working paper which examined the rebuilding plan for Greenland halibut in Subarea 2 and Divisions 3KLMNO. The paper examined projection results from various methods, including the XSA results accepted by Scientific Council in June 2003 and 2004, as well as results from Adapt and ASPIC models. Scientific Council considered that the document had good insight and was thought-provoking. However, it was agreed the current meeting was not the most appropriate time to discuss this. Scientific Council noted that the paper needed further discussion and that the June 2005 Meeting would be a more appropriate forum, at which time an SCR Document should be presented.

c) Assessment Methodology

Scientific Council discussed the issue of changes in assessment methodology under this item. There is often limited time for members of Council to become familiar with and thoroughly evaluate changes to assessment models or new methods during the normal course of the assessment meetings. One possible approach would be to hold a Special Session of Scientific Council on this matter in conjunction with the annual meeting on a regular basis, perhaps every second year. These sessions would provide an opportunity for 'benchmark' or 'comprehensive' assessments on selected stocks as well as the evaluation of the impact of changes to assessment methods or assumptions. However, such an approach would separate important considerations related to the assessments from the assessment process. As such it was decided that an attempt must be made to address these issues during the annual assessments during the June Meetings and the October/November shrimp Meetings of Scientific Council.

d) **Secretariat Communications related to the mandate of the Scientific Council**

Scientific Council discussed a paper prepared by the Secretariat and submitted to the Fisheries Commission – the FC Working Paper 04/7 on "Johannesburg Plan of Implementation and its Implications for NAFO". The Council appreciated the NAFO Secretariat's response on this issue, but felt it unfortunate that it did not have an opportunity to review this document or provide input into its preparation. The Scientific Council offers its assistance to the Secretariat in reviewing and preparing such documents in the future.

XI. ADOPTION OF REPORTS

1. **Consideration of Report of the Symposium "*The Ecosystem of the Flemish Cap*", September 2004**

Council considered the report of the Symposium "*The Ecosystem of the Flemish Cap*", held during 8-10 September 2004 and extended congratulations to the conveners and participants on a successful meeting. Scientific Council noted that the report of the Symposium should become an SCS Document in order to facilitate access on the website (see SCS Doc. 04/19).

Scientific Council noted the recommendation arising from the Symposium regarding presentation of information on results of satellite tagging studies on seals and discussion of possible collaboration in this area. Scientific Council endorsed the importance of this information but expanded on it and **recommended** that *the NAFO/ICES Working Group on harp and hooded seals (WGHARP) provide Scientific Council with updates on the results of seal tagging studies using satellite telemetry tracking, collaborative studies and any other studies that are carried out regarding harp and/or hooded seals in the Northwest Atlantic.*

2. **Committee Reports STACFIS, STACREC, STACPUB**

The Council at its sessions on 16 September 2004 considered and **adopted** the reports of its Standing Committees, STACFIS, STACREC and STACPUB. These reports are given in Appendix I, II and III, respectively.

3. **Report of Scientific Council**

The Council at its concluding session on 17 September 2004 considered and **adopted** its own Report.

XII. ADJOURNMENT

The Chair thanked the members of the Scientific Council for their contributions during this meeting, noting especially the work of the Committee Chairs. Appreciation was extended to the NAFO Secretariat for their dedicated support during the meeting. The Chair noted that 3 members of Council, Bruce Atkinson, Ray Bowering and Arni Nicolajsen, would no longer be attending meetings. The Chair extended thanks for their long time participation in Council and wished them all the best. The Chair noted that Gordie Moulton of the Secretariat would be retiring shortly and thanked him for his many years of service and dedication to Council. There being no other business, the meeting was adjourned at 1145 hours on 17 September 2004.

ANNEX 1. REPORT OF SCIENTIFIC COUNCIL SPECIAL SESSION
"THE ECOSYSTEM OF THE FLEMISH CAP"

The Symposium on "The Ecosystem of the Flemish Cap" was held in the Holiday Inn Harbourview in Dartmouth, Nova Scotia during 8-10 September 2004. The purpose of this Symposium was to better understand the ecosystem of the Flemish Cap and its evolution, particularly addressing the topics: Oceanography of the Flemish Cap, including description of any trend, the interactions between species and their environment, and oceanographic linkages with other areas; General biology of species on the Flemish Cap, including comparisons with other nearby populations ; the isolation of the Flemish Cap or its connection to surrounding areas including studies on tagging, genetics, parasites, and similarity in timing of events; the development of fisheries for species on the Flemish Cap and their effects on the whole ecosystem; ecology of communities on the Flemish Cap, including studies on niche overlap, species assemblage, trophic linkage and their dependence from environmental conditions; comparative results from other partially isolated oceanic areas.

The Chair of Scientific Council, Joanne Morgan, opened the meeting by welcoming participants and explaining the role of Scientific Council. She noted that it was a unique situation to have the Chair and Vice-Chair of Scientific Council as co-conveners of the same Symposium. The Vice-Chair of Scientific Council, Antonio Vazquez, also welcomed participants and introduced the work plan and objectives.

The Symposium was organized into five sessions: the physical environment, descriptive ecology, the ecosystem in space, trophic ecology and the ecosystem in time. As outlined in the meeting program there were 3 invited topical presentations.

The first was by John Shaw, Bedford Institute of Oceanography, Halifax, Canada, on Palaeogeography of Atlantic Canadian continental shelves, from the last glacial maximum to the present.

The next was by Eugene B. Colbourne, Department of Fisheries and Oceans, St. John's, Canada, on Hydrographic Variability and Circulation of the Waters on and Adjacent to the Flemish Cap.

The third invited presentation opened the session the ecosystem in space. This presentation was by Enrique de Cárdenas, Secretaria General de Pesca, Spain, on Relative isolation of the Flemish Cap cod population.

The Symposium was attended by 30 participants from 8 countries (Canada, Germany, Iceland, Italy, Portugal, Russian Federation, Spain and United States of America). The Symposium consisted of 31 other papers that were presented and discussed under the selected session topics. The following represents a summary of the proceedings.

SESSION 1: THE PHYSICAL ENVIRONMENT

Session Chair: Manfred Stein

The first invited paper focused on the geological history of Flemish Cap, from the last glacial maximum to the present. Most of this work was based on core sampling carried out during the 1970s and early-1980s.

The presentation showed the history of glaciations of the past 20 000 years was characterized by several long-term cycles. The most prominent event was a river of ice in the Atlantic region in the Laurentian Channel. Depressed under the weight of the ice, the earth's crust rose with the retreat of the ice. The changes in sea level were however, not uniform in Atlantic Canada. For the Labrador region a falling sea level was observed, for Newfoundland and Nova Scotia falling and rising sea levels are encountered, and for the Quebec region a fall in sea level of more than 200 m was observed.

The most important finding of this paper in the context of the Symposium was that the Flemish Cap area was probably not glaciated and was not above sea level. The area was shallower 20 000 years Before Present (BP) than today and impacted by surge waves. The region of the Flemish Cap was shown to have been intensively impacted by icebergs in the past.

With the Laurentian Channel (LC) being the dominant ice feature in the area of Atlantic Canada, different scenarios on the ice retreat were shown: 14 000 years BP the ice front of LC retreated to the region of today's Quebec City, 13 000 years large islands formed on the Grand Banks, the Sable Island Bank and on Georges Bank. The

processes of ice reduction were twofold: calving from ice rivers like the LC, and after the disappearance of the major ice rivers, inland ice melting. At about 11 000 years BP, Paleo Indians settled on Nova Scotia. The authors suggested that their subsequent disappearance may have been due to the advancing ice.

An invited paper on the hydrographic variability and circulation of the waters on and adjacent to the Flemish Cap was presented. Historic data in the Flemish Cap area were collected as early as 1910 but the first systematic observations were not initiated until 1931. From the late-1940s to early-1950s standardized work along repeated sections was initiated. During 1955, reports on oceanographic observations were presented to the International Commission for the Northwest Atlantic Fisheries (ICNAF). Presently 38 hydrographic stations are occupied along the Flemish Cap section during spring, summer and autumn surveys.

By means of satellite derived sea surface temperature (SST) records, acoustic Doppler current profiles (ADCP) from vessels and data on density stratification, the author presented evidence for a well formed gyre circulation over Flemish Cap. Previous studies suggest that Taylor Columns might play a role in the Gyre formation. The gyre strength was found to be minimum in winter/spring and maximum during summer/autumn.

There is an annual cycle in subsurface temperatures, to approximately 100 m depth, below that temperatures range between 3.5°C and 4.0°C throughout the year. A comparison of annual temperature/salinity data from Station 27 (near St. John's, NL) and the Flemish Cap showed that the Cold Intermediate Layer (CIL) which is observed on the Newfoundland Shelf is replaced by modified Labrador Current slope water at Flemish Cap.

The long-term trends in temperature at Station 27 and the Flemish Cap correlate at 63%, whereas salinity correlates at 30%, due to the salinity at Station 27 being driven by shelf ice melt. With regard to large scale correlations, the North Atlantic Oscillation (NAO) signal comparing Newfoundland and the Barents Sea (Kola Section) in the Northeast Atlantic reveals an inverse correlation. There are positive correlations between NAO and sea ice and CIL on the Newfoundland Shelf. Flemish Cap temperature/salinity data correlate at 50%/40% with NAO. Based on Flemish Cap averaged temperature and heat flux it is shown that advection is the principle forcing in the Flemish Cap region.

A paper on a model on seasonal and interannual circulation variability in the Flemish Cap region was presented. The modelling used climatic forcing based on data of the 1990s provided from the National Centers for Environmental Prediction (NCEP), USA and the National Center for Atmospheric Research (NCAR), USA. For tidal forcing the M_2 tides were applied. At the boundaries of the modelling area monthly mean sea level data were used. May and November current flow fields were analysed. It was shown that anticyclonic (clockwise on the Northern Hemisphere) eddies were observed in both seasons. The model results for November indicated a much stronger flow (+25%) than data derived from current meter moorings. In the model the anticyclonic gyres were stronger. The water transports were lower in summer and stronger in winter. It was found that residence times of the water on Flemish Cap were much longer than those found in previous studies. It was also noted that the modelling did not include wind forcing.

A paper on the Oceanography of the Flemish Cap and adjacent waters was presented. The intention was to indicate how publicly available data can be used with suitable software to map oceanographic properties like temperature, salinity, currents and nutrients on regional and ocean-wide scales. The presentation was based on oceanographic data from the World Ocean Database 2001 (http://www.nodc.noaa.gov/OC5/WOD01/pr_wod01.html) and the Reid-Mantyla Dataset obtained from: <http://dss.ucar.edu/datasets/ds543.0/data/> consisting of about 10 000 stations. Both data sets were handled with the Ocean Data View software environment, a software provided by the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany. A third data set, consisting of global near real-time altimeter geostrophic velocity data was provided by the Colorado Center for Astrodynamic Research (CCAR), Dept. of Aerospace Engineering Sciences University of Colorado, Boulder (http://e450.colorado.edu/realtime/global_realtime/geovel.html). The transatlantic scale of the 47°N transect based on the Reid-Mantyla data set and the regional subset for the upper 1 000 m in the Flemish Cap region, clearly indicate that the Flemish Cap region is unique in its oceanographic properties compared to the adjacent North Atlantic ocean. The region is influenced to a great extent by water masses of polar origin which provide a highly oxygenated environment. There is a rich supply of nutrients, e.g. phosphate and nitrate. This might be one major reason for good environmental conditions for marine vertebrates and invertebrates. Based on satellite derived data, an example of sea surface height anomaly in the vicinity of the Flemish Cap was given. The positive and negative anomalies reveal anticyclonic and cyclonic eddy activities, mostly associated with the northeastward flowing Gulf Stream. A survey of individual pictures

throughout the year – shown as a movie clip during the presentation– indicated that the area of the Flemish Cap is rarely affected by these strong eddies.

SESSION 2: DESCRIPTIVE ECOLOGY

Session Chair: Joanne Morgan

The Descriptive Ecology session included papers on the life history, reproduction and ecology of cod, redfish, and shrimp, as well as descriptions of the occurrence of harp and hooded seals and seabirds on the Flemish Cap.

The papers on cod examined the effect of condition on reproduction and the relationship between the age composition of the spawning stock biomass and recruitment. Including such factors in estimates of reproductive potential may improve our ability to understand and predict recruitment.

The paper on redfish examined some basic life history and biological aspects of the three species of redfish found on the Flemish Cap. It also presented a comparison of these aspects among these species.

Growth, size at sex change and spawning period, were among the information examined for shrimp on Flemish Cap. The estimated size at sex change decreased from 1996-2000 but this may be an artefact of some change in the time of year at which sex change is occurring.

The occurrence of harp and hooded seals was examined through the use of satellite telemetry. Hooded seals seemed to spend much more time on the Flemish Cap in 1994 than in the most recent tagging study. Harp seals were found to spend little or no time on the Cap.

Most of the sea birds that were identified on the Cap would be those that were not breeding or were outside of their breeding season. The edges of the Cap seemed to be the richest area for sea birds.

The paper on the occurrence of seals on the Flemish Cap engendered significant discussion, particularly with respect to the possibility of collaborative studies between those analyzing fish distribution and the studies on seal distribution. Symposium participants encouraged this type of collaboration. In addition it recommended that Scientific Council request WGHARP to provide Council with an update on the results of the tagging studies using satellite tracking and any collaborative studies, when WGHARP's next report to Council is presented.

SESSION 3: THE ECOSYSTEM IN SPACE

Session Chair: Antonio Vázquez

This session consisted of 11 papers, including an invited paper. The session was focused on the isolation of the fish populations on Flemish Cap or their linkage with the stocks on neighbouring areas, as well the spatial distribution patterns of species.

It is well known that Flemish Pass is not a barrier for distribution of deep-sea species, such as Greenland halibut and grenadiers, and their population on Flemish Cap were long time ago recognized as belonging to wider distributed stocks. The situation is quite different for the shallowest species, such as cod, American plaice, redfish, and shrimp among commercial species.

Three possible mechanisms to link populations inhabiting the shallowest areas were considered in the invited paper: migration of adult individuals to outside the Flemish Cap, exchange of individuals with neighbouring areas, and larval drift from surrounding areas. For cod, migration of adults to outside the Cap has been proved by tagging experiments, however immigration was never observed. However, a paper presented during this session on mitochondrial DNA analyses concluded that the cod stock on Flemish Cap appears to be a separate stock.

Larval drift from surrounding areas to Flemish Cap was predicted based on oceanographic variables. Before the eastern branch of the Labrador Current moves to Flemish Cap it crosses areas of the Labrador Shelf and Northern Grand Bank where species also inhabiting the Cap are known to spawn. Flemish Cap would be connected in this way more likely with those areas than with central and southern Grand Bank. However, even if larval drift occurs, larval survival is the main factor in determining the resulting recruitment to the Cap. Based on these considerations, larval transport to the Cap from Labrador or Northern Grand Bank is not likely.

A paper on possible mixing of American plaice populations in the area of the Flemish Pass showed that the exchange of American plaice between Flemish Cap and northern Grand Bank is unlikely to occur based on its no occurrence in the deepest strata of Flemish Pass, even though this species reaches deep areas in some seasons. Furthermore, individuals at both sides of the Flemish Pass were clearly different in mean length at age and in their maturation. Another paper on redfish showed that the three redfish species on Flemish Cap constitute independent stocks according to results of morphometric analyses.

Two papers on northern shrimp on the Flemish Cap detailed the increase in abundance and area of distribution of shrimp in the area. Differences in year-class strength, between the Flemish Cap and adjacent areas may indicate that shrimp on Flemish Cap are not connected to those on the Newfoundland Shelf.

Papers examining the spatial distribution patterns of several species were presented. The fish fauna in Flemish Cap appears distributed in a persistent structural zonation based on factor analyses of demersal survey trawls during 1995-2000 with redfish being the dominant fish species in the area. Changes in species spatial distributions in the most recent years are related to decreases in the main demersal fish species: cod and American plaice. Declines in the cod and American plaice abundance during 1989-2002 coincided with severe range contraction and a breakdown in the spatial structure of both stocks, which have high degree of spatial overlap.

Results of a longline survey indicated that Greenland halibut and roughhead grenadier (*Macrourus berglax*) were distributed at depths up to 2 050 m, based on a long-line survey between 700 and 3 000 m depth. Other deep-sea species replaced the above mentioned ones at greater depths. Greenland halibut abundance and biomass appear related to bottom temperature, being the warmer the water, the more abundance of halibut and vice versa.

Discussion of this session brought up information on the witch flounder stock on Flemish Cap. In this area the species is distributed in the shallowest strata, so depth preferences are quite different from stocks on Labrador and Grand Bank, which are distributed in deep areas. This particular behaviour may point to the isolation of the stock over the Cap.

Some of the changes in depth distribution described in papers in this session may be related to distribution of fish by size. Large fish tend to occupy deeper waters. As populations declined and the number of bigger, older fish decreased, an apparent move to shallow water could result.

SESSION 4: TROPHIC ECOLOGY

Session Chair: Dave Orr

Three papers were presented. The first paper discussed the food and feeding of the fifteen (15) most abundant fish species, on the Flemish Cap. It dealt with indices of feeding intensity, dietary breadth and various indices of dietary importance (% frequency of occurrence, % volume and % number). The index of feeding intensity ranged from 96.3% among Atlantic cod (*Gadus morhua*) to 35% among Arctic eelpout (*Lycodes reticulatus*) indicating that respectively fewer than 4% of the Atlantic cod and 65% of the Arctic eelpouts had empty stomachs.

Crustaceans such as hyperiid amphipods, northern shrimp (*Pandalus borealis*), copepods, fish and ophiurans were the most important food items for fish living on the Flemish Cap.

Specialists, low diversity feeders and high diversity feeders were identified according to dietary breadth. Specialists are characterized as indices of breadth (1.55-2.53) indicating that they prey upon a relatively low number of species. Witch flounder (*Glyptocephalus cynoglossus*) and northern wolffish (*Anarhichas denticulatus*) were provided as examples. Low diversity feeders were characterized as having breadth indices between 3.75 and 5.69, eating an intermediate number of species and changing diets with size. Spotted wolffish (*Anarhichas minor*) and Arctic eelpout are presented as examples of low diversity feeders. High diversity feeders exhibited dietary breadth indices between 6.53 and 10.12, at a wide variety of prey species and changed diet as they grew. Greenland halibut (*Reinhardtius hippoglossoides*) is an example of a high diversity feeder.

The next two papers focused upon American plaice and Greenland halibut. Food and Relative condition factors (Kr) of animals from Div. 3LNO, 3M and ICES Area IIB were compared. Condition factors varied with species, location, season and sex. There was no relationship between Kr and biomass within each stock.

Feeding intensity for American plaice and Greenland halibut was highest in Div. 3M, then Div. 3LNO and lowest in ICES Div. IIB. American plaice diets were dependent upon location and specimen size. Echinoderms, fish and crustaceans predominated diets in Flemish Cap, Div. 3LNO and ICES Div. IIB, respectively. While diet varied with size, there was no clear trend of one prey item increasing with American plaice size.

In all areas, Greenland halibut ate mainly fish followed by crustaceans in Div. 3M and ICES Div. IIB, and molluscs in Div. 3LNO. The overall diet varied little between the 1993 and 2003; however, diet did appear to be dependent upon size of Greenland halibut. Greenland halibut <20 cm in TL fed mainly upon crustaceans, but became more piscivorous as they grew.

Participants noted the importance of food and feeding studies to the understanding of ecosystems and encouraged such work to continue.

SESSION 5: THE ECOSYSTEM IN TIME

Session Chair: Bill Brodie

There were ten presentations, covering a wide range of topics. Three papers presented summaries of various time series of surveys on Flemish Cap, including plankton surveys. Six papers dealt with biology, distribution and fisheries on several species, primarily cod and redfish, but also including shrimp and roughhead grenadier. Some of these papers also considered environmental influences on species distribution and dynamics. One paper dealt with improving fisheries monitoring using satellite-based vessel reporting systems.

From the presentations, it was clear that there have been major changes in the Flemish Cap ecosystem since the 1980s. Traditional groundfish fisheries on cod and American plaice have disappeared, as these species abundance declined to very low levels and have remained at these low levels. Major fisheries for Greenland halibut and shrimp have developed on and around Flemish Cap since the early-1990s.

Discussion focused on possible environmental influences compared to fishery effects. Although hypotheses involving environmental effects are possible, there did not seem to be strong support for this in the studies presented. Many participants stated that overfishing appeared to be the primary cause of stock depletion on Flemish Cap. It was agreed that comparative studies involving the ecosystems of Flemish Cap and other areas (e.g. Greenland, Grand Banks, Georges Bank/Gulf of Maine) would be useful as follow-up work from this Symposium.

SESSION 6: DISCUSSION/SUMMING UP

Session Chairs: Antonio Vázquez and Joanne Morgan

The discussion suggested that paleogeography of the Flemish Cap played an important role in shaping the ecosystem of today. In particular the fact that the Flemish Cap was neither glaciated nor exposed during the last major glaciation event appears to mean that it may have served as a refuge for marine species. The overall ecosystem of the Cap may have then served as specialized refugia in a historic sense.

The participants recognized the current oceanographic conditions are a major factor in the ecosystem of the Cap. The area has a fairly stable bottom temperature with very little seasonal or annual variability, and temperatures are in general warmer than the northern Grand Bank. The water retention times on the Cap may be longer than previously thought, but its implications for recruitment are unclear at this time. The gyre appears to play an important role in the area. Studies of currents indicate a closer relation between the waters of the Cap and those of the Labrador Shelf and Northern Grand Bank than with the Southern Grand Bank.

There is the possibility of interchange of individuals of various populations with other areas, either as eggs and larvae or as adults leaving the Flemish Cap. However, all of the studies presented during the Symposium that examined the relationships between most populations on the Cap and other areas found that there was little connection and that the populations on the Cap were distinguishable from those in other areas. The exceptions to this are Greenland halibut and roughhead grenadiers which are generally found in deep waters and have a wide distribution.

The meeting noted large changes occurred in the ecosystem of the Cap during the 1990s and they have continued until the present. There were major declines in the abundance of cod and American plaice, coincident with a decrease in their area of distribution and their move to shallower waters. At the same time of the cod and American plaice decline, Greenland halibut spread into shallower depths on the Cap and there was a large increase in the abundance of shrimp. Although these phenomena occurred over a similar time period, the discussion showed the cause is not necessarily the same.

Participants in the Symposium expressed particular interest in studies comparing the Flemish Cap ecosystem with other ecosystems. The discussions again brought to focus that ecosystem changes, both in time and biology, in all of the Atlantic, for example in areas off southeast and west Greenland, Labrador Shelf/Grand Banks, Scotian Shelf and Georges Bank, may show comparable patterns. They suggested that a Symposium on comparative studies of ecosystems in the Northwest Atlantic would be very worth while and of great interest, and accordingly recommended that the Scientific Council should consider this as a future area of study.

SYMPOSIUM SCHEDULE

Wednesday, 8 September 2004

- 0900-0930 Registration
- 0930-1000 Introduction (Scientific Council Chair and co-conveners)

SESSION 1: THE PHYSICAL ENVIRONMENT

Paper # Time

Session Chair: Manfred Stein

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|-------------------|-----------|--|
| 1.1 | 1000-1100 | Invited Paper: SHAW, J. Palaeogeography of Atlantic Canadian continental shelves, from the last glacial maximum to the present. |
| Break | 1100-1130 | |
| 1.2 | 1130-1230 | Invited Paper: COLBOURNE, E.B. Hydrographic Variability and Circulation of the Waters on and Adjacent to the Flemish Cap. |
| Lunch | 1230-1330 | |
| 1.3 | 1330-1350 | HAN, G. Seasonal and interannual circulation variability and its implications in the Flemish Cap region: A modelling study. |
| 1.4 | 1350-1410 | STEIN, M. Oceanography of the Flemish Cap and Adjacent Waters. |
| Discussion | 1410-1430 | |
| Break | 1430-1500 | |

SESSION 2: DESCRIPTIVE ECOLOGY

Session Chair: Joanne Morgan

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|-----|-----------|--|
| 2.1 | 1500-1520 | MORGAN, M. J., and G. R. LILLY. The impact of condition on reproduction in Flemish Cap cod. |
| 2.2 | 1520-1540 | SABORIDO-REY, F., M. J. MORGAN, and R. DOMÍNGUEZ. Estimation of reproductive potential for Flemish Cap cod |
| 2.3 | 1540-1600 | SABORIDO-REY, F., D. GARABANA, and R. DOMINGUEZ. A review of redfish life history, biology and ecology in Flemish Cap. |

- 2.4 1600-1620 SKULADOTTIR, U., U. G. PETURSSON, and S. BRYNJOLFSSON. The Biology of Northern Shrimp (*Pandalus borealis* Kr.1838) at Flemish Cap.
- 2.5 1620-1640 STENSON, G. B., M. O. HAMMILL, and B. SJARE. The Seasonal Distribution and Diving Behaviour of Harp and Hooded Seals on the Grand Banks and Flemish Cap.
- 2.6 1640-1700 MARTÍNEZ-LEYENDA, P., and I. MUNILLA-RUMBAO. The summer seabird community of the Flemish Cap in 2002
- Discussion** 1700-1730

Thursday – 9 September 2004

SESSION 3: THE ECOSYSTEM IN SPACE

Session Chair: Antonio Vázquez

- | Paper # | Time | |
|-------------------|-----------|---|
| 3.1 | 0900-1000 | Invited Paper: DE CÁRDENAS, E. Relative isolation of the Flemish Cap cod population. |
| 3.2 | 1000-1020 | GONZÁLEZ, D., X. PAZ, and X. A. CARDOSO. Persistence and Variation in the Distribution of bottom-trawl Fish Assemblages over Flemish Cap. |
| 3.3 | 1020-1050 | DE CÁRDENAS, E., H. MURUA, R. ALPOIM, and J. M. CASAS. Bathymetric distribution of deep water species in Flemish Pass. |
| Break | 1050-1110 | |
| 3.4 | 1110-1130 | HENDRICKSON, L., and A. VÁZQUEZ. Changes in the spatial distribution of dominant fish species on the Flemish Cap during July. |
| 3.5 | 1130-1150 | MARSHALL, H. D., K. A. JOHNSTONE, A. M. POPE, and S. M. CARR. Population Genomics and Stock Structure of Atlantic Cod on (& off) the Flemish Cap: insights from whole-mitochondrial-genome DNA sequences. |
| 3.6 | 1150-1210 | GARABANA, D., and F. SABORIDO-REY. Relationships between Flemish Cap and adjacent redfish populations: Is Flemish Cap an isolated population? A morphometric approach. |
| 3.7 | 1210-1230 | IGASHOV, T. M., and S. E. LOBODENKO. The effect of oceanographic conditions on dynamics and distribution of Greenland halibut stock in the Flemish Cap area in 1988-2001. |
| Lunch | 1230-1330 | |
| 3.12 | 1330-1350 | CASAS, J. M., and J. L. DEL RIO. Northern shrimp (<i>Pandalus borealis</i>) on Flemish Cap: 1988-2002. |
| 3.9 | 1350-1410 | ORR, D., G. HAN, J. CRAIG, A. NICOLAJSSEN, and P. KOELLER. Is the 3M Northern Shrimp (<i>Pandalus borealis</i>) fishery sustained through immigration of shrimp from 3LNO? |
| 3.11 | 1410-1430 | MORGAN, M. J., and W. R. BOWERING. Is there mixing of American plaice populations in the Flemish Pass? |
| Discussion | 1430-1450 | |
| Break | 1450-1510 | |

SESSION 4: TROPHIC ECOLOGY**Session Chair: Dave Orr**

- 4.1 1510-1530 ROMÁN, E., C. GONZÁLEZ, and E. CEVALLOS. Food and feeding of most abundant fish species in Flemish Cap.
- 4.3 1530-1550 GONZÁLEZ, C., E. ROMÁN, and X. PAZ. Condition and feeding of American plaice (*Hippoglossoides platessoides*) in the North Atlantic with emphasis in Flemish Cap.
- 4.4 1550-1610 ROMÁN, E., C. GONZÁLEZ, and X. PAZ. Condition and feeding of Greenland halibut (*Reinhardtius hippoglossoides*) in Flemish Cap and other areas.
- Discussion** 1610-1630

Friday – 10 September 2004**SESSION 5: THE ECOSYSTEM IN TIME****Session Chair: Bill Brodie**

- 5.2 0900-0920 BAKAY, YU. I., K. V. GORCHINSKY, S. F. LISOVSKY, S. E. LOBODENKO, and A. A. VASKOV. Review of Soviet/Russian Research on the Flemish Cap during Recent 20 years.
- 5.3 0920-0940 BRODIE, W.B. Canadian trawl surveys on Flemish Cap (NAFO Division 3M) from 1949-2004.
- 5.4 0940-1000 MAILLET, G. L., P. PEPIN, S. FRASER, and D. LANE. Overview of biological and chemical conditions on the Flemish Cap with comparisons of nearby Grand Banks Shelf and Slope waters during 1996-2003.
- Break** 1000-1030
- 5.5 1030-1050 CERVIÑO, S., and A. VÁZQUEZ. Recruitment variability on main species on Flemish Cap and adjacent areas.
- 5.6 1050-1110 MURUA, H., and F. GÓNZALEZ. A review of the Fishery and the Investigations of Roughhead grenadier (*Macrourus berglax*) in Flemish Cap and Flemish Pass.
- 5.7 1110-1130 VÁZQUEZ, A. The cod fishery on Flemish Cap.
- 5.8 1130-1150 KULKA, D. W., and D. ORR. Evolution of a fishery for Shrimp on the Flemish Cap.
- 5.9 1150-1210 SHEPHERD, I., J. CHESWORTH, G. LEMOINE, and N. KOURTI. Improving Fisheries Monitoring and Control in Oceanic Regions.
- Lunch** 1210-1330
- 5.10 1330-1350 BOROVKOV, V. A., A. A. VASKOV, and A. L. KARSAKOV. The role of fisheries and water circulation in the dynamics of redfish and cod stocks on the Flemish Cap.
- 5.11 1350-1410 CERVIÑO, S., J. GIL, and R. SANCHEZ. Changes in Flemish Cap cod distribution and its relationship with environmental changes
- Discussion** 1410-1430
- Break** 1430-1500

SESSION 6: DISCUSSION/SUMMING UP**Session Chairs: Antonio Vázquez and Joanne Morgan**

- Discussion** 1500-1600

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NAFO SECRETARIAT

Tissa Amaratunga, Deputy Executive Secretary
Dorothy Auby, Office Secretary
Stan Goodick, Finance Officer
Forbes Keating, Administration Officer & Meeting Coordinator
Barb Marshall, Information and Web Manager



Participants of Symposium on "The Ecosystem of the Flemish Cap" held at the Holiday Inn Harbourview during 8-10 September 2004.

Standing (left to right): Tissa Amaratunga, Enrique de Cardenas, Ricardo Alpoim, Tony Bauna, Bill Brodie, Garry Stenson, Ray Bowering, Lisa Hendrickson, Marty King, Steven Carr, Dawn Maddock Parsons, Unnur Skuladottir, Jason Simms, Chris Allen, Joanne Morgan, Dave Orr, Peter Koeller, Dolores Garabana, Antonio Avila de Melo, Dorothy Auby, Eugene Colbourne, Konstantin Gorchinsky; Ralph Mayo, Manfred Stein

Kneeling (left to right): Gary Maillet, Hilario Murua, Diana Gonzalez Troncoso, Antonio Vázquez, David Kulka

Missing: Han Guoqi, Barb Marshall, Robert Rangeley, John Shaw



Session Chairs: Dave Orr, Joanne Morgan, Antonio Vázquez, Manfred Stein, Bill Brodie.



Symposium on "The Ecosystem of the Flemish Cap" in session.

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

Chair: Hilario Murua

Rapporteurs: Various

I. OPENING

The Committee met at the Holiday Inn Harbourview, Dartmouth, Canada during 13-16 September 2004, to consider and report on matters referred to it by the Scientific Council, particularly those pertaining to the provision of scientific advice on certain finfish and invertebrate marine stocks. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (France, Germany, Portugal and Spain), Iceland, Republic of Korea, Russian Federation, Ukraine and United States of America. Charlotte B. Mogensen, World Wildlife Fund European Policy Office, Brussels, Belgium and Robert Rangeley, World Wildlife Fund Canada, Nova Scotia, Canada, attended the meeting as observers. The Deputy Executive Secretary was in attendance.

The Chair, Hilario Murua (European Union), opened the meeting by welcoming participants. The provisional agenda was reviewed and **adopted** with no modifications.

II. NOMINATION OF DESIGNATED EXPERTS

STACFIS reviewed the list of Designated Experts for the stocks, which have to be assessed and for which management advice is requested. The final nomination of the Designated Experts will be conducted through the normal confirmation process between the various national institutes and the Secretariat. The nominations to date by STACFIS for the 2005 assessments are:

- From the Science Branch, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, P. O. Box 5667, St. John's, NL A1C 5X1, Canada [Phone: listed below – Fax: + 709-772-4188 – E-mail: listed below]

for	Cod in Div. 3NO	Don Power	powerd@dfo-mpo.gc.ca
	Redfish Div. 3O	Don Power	powerd@dfo-mpo.gc.ca
	American Plaice in Div. 3LNO	Karen Dwyer	dwyerk@dfo-mpo.gc.ca
	Witch flounder in Div. 3NO	Dawn Maddock Parsons	parsonsd@dfo-mpo.gc.ca
	Witch flounder in Div. 2J3KL	Dawn Maddock Parsons	parsonsd@dfo-mpo.gc.ca
	Yellowtail flounder in Div. 3LNO	Steve Walsh	walshs@dfo-mpo.gc.ca
	Greenland halibut in SA 2+3KLMNO	Brian Healy	healeybp@dfo-mpo.gc.ca
	Shrimp in Div. 3LNO	David Orr	orrd@dfo-mpo.gc.ca
	Thorny skate in Div. 3LNO	David Kulka	kulkad@dfo-mpo.gc.ca
	White hake in Div. 3NO	David Kulka	kulkad@dfo-mpo.gc.ca
- From the Instituto de Investigaciones Marinas, Eduardo Cabello, 6, 36208 Vigo, Spain [Phone: +34 9 86 23 1930 – Fax: +34 9 86 29 2762 –E-mail: avazquez@iim.csic.es]

for	Cod in Div. 3M	Antonio Vázquez	
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- From the Instituto Español de Oceanografía, Aptdo 1552, E-36280 Vigo (Pontevedra), Spain [Phone: +34 9 86 49 2111 – Fax: +34 9 86 49 2351 – E-mail: fernando.gonzalez@vi.ieo.es]

for	Roughhead grenadier in SA 2+3	Fernando Gonzalez-Costas	
	Roundnose grenadier in SA 2+3	Fernando Gonzalez-Costas	
- From the Instituto Nacional de Investigacao Agrária e das Pescas (INIAP/IPIMAR), Av. de Brasilia, 1449-006 Lisbon, Portugal [Phone: +351 21 302 7000 – Fax: +351 21 301 5948 – E-mail: listed below]

for	American plaice in Div. 3M	Ricardo Alpoim	ralpoim@ipimar.pt
	Redfish in Div. 3M	Antonio Avila de Melo	amelo@ipimar.pt
	Redfish in Div. 3LN	Antonio Avila de Melo	amelo@ipimar.pt
- From the Greenland Institute of Natural Resources, P. O. Box 570, DK-3900 Nuuk, Greenland [Phone: +299 32 1095 – Fax: +299 32 5957 – E-mail: listed below]

- | | | | |
|-----|-----------------------------------|-----------------|--|
| for | Redfish in SA1 | Helle Siegstad | helle@natur.gl |
| | Other Finfish in SA1 | Helle Siegstad | helle@natur.gl |
| | Greenland halibut in Div. 1A | Bjarne Lyberth | bjly@natur.gl |
| | Northern shrimp in SA 0+1 | Carsten Hvingel | hvingel@natur.gl |
| | Northern shrimp in Denmark Strait | Carsten Hvingel | hvingel@natur.gl |
- From the Danish Institute for Fisheries Research, Charlottenlund Slot, DK-2920, Charlottenlund, Denmark
[Phone: +45 33 96 33 00 – Fax: +45 33 96 33 33 – E-mail: olj@dfu.min.dk]
- | | | |
|-----|-------------------------------|---------------|
| for | Roundnose grenadier in SA 0+1 | Ole Jørgensen |
| | Greenland halibut in SA 0+1 | Ole Jørgensen |
- From the Marine Research Institute, Skulagata 4, P. O. Box 1390, 121 - Reykjavik, Iceland
[Phone: +354 552 0240 – Fax: +354 562 3790 – E-mail: unnur@hafro.is]
- | | | |
|-----|-------------------|-------------------|
| for | Shrimp in Div. 3M | Unnur Skúladóttir |
|-----|-------------------|-------------------|
- From Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), 6 Knipovich Street, Murmansk, 183763, Russia [Phone: +7 8152 47 2532 – Fax: +7 8152 47 3331 – E-mail: gorch@pinro.ru]
- | | | |
|-----|---------------------|--------------------------|
| for | Capelin in Div. 3NO | Konstantin V. Gorchinsky |
|-----|---------------------|--------------------------|
- From the National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543
[Phone: +508-495-2285 – Fax: +508-495-2393 – E-mail: lisa.hendrickson@noaa.gov]
- | | | |
|-----|-----------------|------------------|
| for | Squid in SA 3+4 | Lisa Hendrickson |
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III. OTHER MATTERS

1. Review of SCR and SCS Documents (SCR Doc. 04/67)

STACFIS reviewed a paper on "By-catch of Greenland halibut (*Reinhardtius hippoglossoides*, Walbaum) in the Canadian Fishery for Northern Shrimp (*Pandalus borealis*, Køyer) in NAFO Subarea 2 and Divisions 3KL". The Canadian fishery for northern shrimp in NAFO Subarea 2 and Div. 3KL has been increasing substantially in recent years and by 2003 had reached a catch of about 115 000 tons. This compares to 23 000 tons in 1996. On the other hand, the June 2004 assessment of Greenland halibut in Subarea 2 and Div. 3KLMNO indicates that the resource has been declining over the last several years and is now at its lowest observed population size since 1975. Since young Greenland halibut and northern shrimp overlap in distribution, Greenland halibut is one of the most important species taken as by-catch in the northern shrimp fishery. Therefore, concerns have been raised regarding the potential effect on Greenland halibut stock recovery of by-catch in the northern shrimp fishery. This paper estimates removals at age of Greenland halibut in the Canadian fishery for northern shrimp in NAFO Subarea 2 and Div. 3KL during 1996-2003. Results indicate that during this period less than 5% of a Greenland halibut year-class of average abundance was taken as by-catch in the Canadian northern shrimp fishery. This suggests a potential loss in yield to the Greenland halibut fishery of about 900-1 400 tons annually given recent fishing patterns.

In the discussion that followed the presentation, it was proposed to extend the study of Greenland halibut by-catch in the shrimp fishery to other NAFO areas (namely Div. 3M) and other fleets and to examine the implications of incorporating the by-catch of Greenland halibut from the shrimp fishery into the Greenland halibut assessment.

Therefore, STACFIS **recommended** that *all available information on by-catch and discards of Greenland halibut in Subarea 2 and Divisions 3KLMNO shrimp fishery be presented during the October/November 2004 and the June 2005 Meetings of the Scientific Council for consideration in future assessments.*

2. Other Business

There being no other business, the Chair extended particular gratitude to the Secretariat for their assistance and support, and the meeting was adjourned.

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

Chair: Antonio Vázquez

Rapporteur: Bill Brodie

The Committee met at the Holiday Inn Harbourview in Dartmouth, Nova Scotia during 15-16 September 2004 to discuss matters pertaining to statistics and research referred to it by the Scientific Council. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (France, Germany, Portugal and Spain), Iceland, Republic of Korea, Russian Federation, Ukraine and United States of America. Charlotte B. Mogensen, World Wildlife Fund, European Policy Office, Brussels, Belgium and Robert Rangeley, World Wildlife Fund Canada, Nova Scotia, Canada, attended the meeting as observers. The Deputy Executive Secretary was in attendance.

1. Opening

The Chair opened the meeting by welcoming the participants and appointed Bill Brodie (Canada) as rapporteur. The Provisional Agenda as presented was **adopted**.

2. Fisheries Statistics

a) Progress Report on Secretariat Activities

i) Acquisition of STATLANT 21 Data

The Deputy Executive Secretary informed the Committee that there have been some STATLANT data submissions since June 2004. It was noted that STATLANT 21B data submissions for the year 2000 are almost complete.

ii) Publication of statistical information

The last published Statistical Bulletin contains data for 1999. Two outstanding STATLANT 21B reports remain for 2000. To address these outstanding data, a two-step approach was proposed. The Scientific Council Chair, along with Deputy Executive Secretary, should review the relevant parts of Convention requiring Contracting Parties to submit timely STATLANT data. General Council could then be advised, at this meeting if possible. A formal letter from the Chair of Scientific Council to Chair of General Council would follow.

It was agreed that the "Inventory of Biological Sampling, 2000-2004" should be published as soon as possible.

3. Research Activities

a) Surveys Planned for 2004 and Early-2005

STACREC noted and reviewed the draft listings of biological sampling data and survey activities (Biological Surveys Planned for 2004 and Early-2005) prepared by the NAFO Secretariat, prior to publishing it as SCS Doc. 04/17. Some proposed editorial changes were noted. STACREC noted these listings included all updates since the June 2004 Meeting, and discussed the convenience of reviewing these tables at the September Meeting. It was agreed that this process increased the accuracy of the tables and should be continued in future years.

b) Consideration of a revised edition of the Manual of Groundfish Surveys in the Northwest Atlantic (Doubleday, 1981)

Further to the proposal made at the June 2004 Meeting, STACREC was informed Steve Walsh (Canada) has agreed to compile and edit a revised manual. It was agreed that the scope of such a document should be

limited to stratified random bottom trawl surveys. It was anticipated that it could take up to two years to complete this work.

4. **NAFO Observer Program**

The Executive Secretary stated that a previous budget request of \$10 000 had been submitted, to begin the process of digitizing (key-punching) NAFO observer reports. She noted that some reports currently exist in digital format with some Contracting Parties. STACREC noted that by making the existing database(s) available, the Secretariat could undertake digitization to fill in gaps where necessary, and it would be possible to do this work on a reduced the budget, and agreed to change the budget request to \$3 000. In order for these digitized data to be made available to Scientific Council, permission is also needed. STACREC **recommended** that *the Secretariat should seek permission from the Contracting Parties to have their existing digitized data from the NAFO Observer Program be made available to the Secretariat to increase the efficiency and cost effectiveness of the data digitizing process. In the interim, the NAFO Secretariat should compile a list of available data, and begin the process of digitizing data to better evaluate costs*

5. **Stock Assessment Database**

a) **Evaluation of the Assessment Data Submission Procedure**

It was noted that assessment data were actually submitted for very few stocks in June 2004. However, a partial explanation is that many stocks were only monitored by Scientific Council in June 2004, and full assessments were mostly based on survey indices this year. This means that there were not a lot of age disaggregated data to submit and some Designated Experts were unclear as to whether to submit survey indices.

b) **Report of the *Ad hoc* Working Group**

The Working Group named during the June 2004 Meeting had worked intersessionally and proposed a template to archive data. A series of EXCEL spreadsheets was proposed, to be updated each year by Designated Experts. It was agreed instructions should be e-mailed soon to Designated Experts to allow 2004 data to be compiled before June 2005. This would allow almost all assessment data to be available by the start of the June meeting.

6. **Other Matters**

a) **Review of SCR and SCS Documents**

There were no documents to be reviewed.

b) **Other Business**

In monthly provisional catch letters, it was noted that not all Contracting Party catches were available by country. The Deputy Executive Secretary informed STACREC that the monthly provisional catch reports contain information received from Contracting Parties. It was noted that complete annual catch data are reported by Contracting Parties in the STATLANT data. For assessment purposes, data could be requested of the Contracting Party by the Designated Expert for a particular stock.

c) **Acknowledgements**

In closing, the Chair thanked all participants for their cooperation, the Deputy Executive Secretary and the NAFO Secretariat for their excellent support, the rapporteur for his work, and then closed the meeting.

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

Chair: Manfred Stein

Rapporteur: Bill Brodie

The Committee met at the Holiday Inn Harbourview in Dartmouth, Nova Scotia on 16 September 2004 to consider publication-related topics and report on various matters referred to it by the Scientific Council. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (France, Germany, Portugal and Spain), Iceland, Republic of Korea, Russian Federation, Ukraine and United States of America. Charlotte B. Mogensen, World Wildlife Fund, European Policy Office, Brussels, Belgium and Robert Rangeley, World Wildlife Fund Canada, Nova Scotia, Canada, attended the meeting as observers. The Executive Secretary and Deputy Executive Secretary were in attendance.

1. Opening

The Chair opened the meeting by welcoming the participants. The agenda as presented in the Provisional Agenda was **adopted**. Bill Brodie (Canada) was appointed rapporteur.

2. Review of Recommendations from June 2004

- a) *the Secretariat begin the electronic publication of HTML versions of the Journal.*

The Executive Secretary gave 2 reasons why this has not been completed: The choice of a Journal cover had not yet been resolved, and the requirement to establish a link to the new cover. The Executive Secretary noted that various improvements have been possible with the html versions.

- b) *a second level of password protection be established for the Scientific Council members pages.*

It was noted that this can be done in a matter of a day or 2, depending on the server provider.

- c) *the addition of new information to the web site be highlighted or "advertised" in some way to ensure the members and general public are made aware of these new features.*

The Executive Secretary noted that a "What's New" button has been added to the website. Because documents are uploaded frequently, this "What's New" link does not refer to these documents.

- d) *a link to a distribution list of e-mail addresses for current Committee and members e-mails be established to facilitate communication of information.*

- e) *a search function be added to the front page (of the website).*

The above 2 recommendations have not yet been acted upon, but are expected to be completed.

- f) *an ad hoc group be formed to deal with the Journal cover issue intersessionally, and report on this to STACPUB at the September 2004 Meeting of the Committee.*

See agenda item 5 below.

3. Status of Scientific Publications (all publications are placed on the NAFO Website www.nafo.int)

- a) **Papers from June 2004 Meeting**

The manual on ageing yellowtail flounder, reviewed by Scientific Council in June, is almost ready for publication in Scientific Council Studies.

The Executive Secretary made a presentation on the 25th Anniversary of NAFO, and urged participants to contribute stories, anecdotes etc. on their NAFO experiences to this compilation.

b) **Status of the 2002 Symposium Proceedings "Elasmobranch Fisheries: Managing for Sustainable Use and Biodiversity Conservation"**

Final galleys for hard copy publication have been prepared and approved by authors for most papers, but require conversion to HTML format and approval. There was some discussion on the differences in publishing documents in pdf versions as opposed to HTML.

c) **Other Publications**

There were no other publications discussed.

4. **NAFO Website**

a) **Web Statistics**

Visits to the NAFO Website are very similar to June 2004 and September 2003. Visits increase before the June and September meetings. STACPUB noted that this is still an interesting and well-used website.

b) **Other Matters**

It was noted that information for authors of Journal articles exists on the NAFO Journal page at the back pages of each journal issue, but may not be easy to find.

The Executive Secretary gave a presentation on the Journal on the website, and some new features were also demonstrated. There was some concern over some poor quality figures in some papers on the website. This should be eliminated with HTML versions, and existing pdf versions will be converted as time permits. A concern repeated from the June Meeting, concerning HTML versions, is that the same Journal paper will be citable in 2 different ways. STACPUB **recommended** that *STACPUB Chair explore the implications of citations of individual papers in 2 different ways (in electronic html format and the usual hard copy Journal format) and report on this during the June 2005 STACPUB Meeting.*

It was noted that not all Journal issues are on website, and that this was an ongoing concern. The Executive Secretary replied that this was mainly a workload issue, combined with difficulty in producing or obtaining electronic versions of older papers. STACPUB **recommended** that *the Secretariat's work of placing electronic issues of the Journal on the NAFO website begin immediately, and that any other work needed to complete this in a speedy manner be identified and reported to STACPUB in June 2005.*

5. **Report of Ad hoc Working Group "Journal Cover"**

An *ad hoc* Working Group in June 2004 considered 6 designs for a new cover. It was decided not to accept a picture of a fish, as it may imply a more limited scope of the Journal. It was agreed to use a satellite photo of the NAFO area. Following the *ad hoc* Working Group's recommendation that the editorial policy of JNAFS is a premise which shall not be hampered by a "fish-logo", STACPUB **recommended** that *instead of the redfish and blue bar proposed for the cover of the NAFO Journal (JNAFS), a logo or background figure or typical figure out of the contributions of the given Symposium [see JNAFS Vol. 23 (map with drawings), 27 (the Symposium logo)] be taken, and for "miscellaneous papers" issues of JNAFS, the figure of the satellite picture proposed by the Secretariat be taken.*

The decision on the logo or background figure or typical figure out of the contributions of the given Symposium will be done by the Symposium conveners.

6. **Editorial Matters Regarding Scientific Publication**

The Deputy Executive Secretary noted that there were no changes to the Editorial Board since June. A letter welcoming the new Associate Editor (Joanne Morgan – Canada) was sent by the NAFO Secretariat. Following the departure of Bruce Atkinson (Canada) from the Editorial Board in June, the Chair of Scientific Council sent

a letter to express appreciation to him for his many years of dedicated work to the Journal. STACPUB once again extended its thanks to Bruce Atkinson on this matter.

7. **Other Business**

It was noted that a separate link for SC Studies does not currently exist on the NAFO Website. There were some technical explanations for this related to website capacity, but it was noted that such a link is/would be available on the NAFO Journal page of the website. In closing, the Chair thanked all participants for their cooperation, the NAFO Secretariat for their excellent support, the rapporteur for his work, and then closed the meeting.