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## *The Ecosystem of the Flemish Cap*

### SYMPOSIUM

Hosted by the Scientific Council of the  
Northwest Atlantic Fisheries Organization (NAFO)

**8-10 September 2004**  
Dartmouth, Nova Scotia, Canada

The Scientific Council of NAFO is pleased to announce this Symposium to be held in conjunction with the NAFO 26<sup>th</sup> Annual Meeting, at the Holiday Inn, Harbourview, in Dartmouth, Nova Scotia, Canada. The Symposium will be co-convened by A. Vazquez (EU-Spain) and M. J. Morgan (Canada), and organized by the NAFO Secretariat.

The Flemish Cap is a unique area of the Northwest Atlantic due to its partial isolation and recent changes in the abundance of the main species. Consequently, the traditional fisheries on demersal fish stocks have been replaced by the current ones on shrimp and deep-sea species, such as Greenland halibut.

The purpose of this Symposium is 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 trends, 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

#### Keynote Invited Speakers

The paleogeology of the continental shelf of Atlantic Canada - J. Shaw, Canada  
An overview of the oceanography of the Flemish Cap - E.B. Colbourne, Canada  
Relative isolation of the Flemish Cap cod population - E. de Cardenas, Spain  
The role of cod in the ecosystem of the Flemish Cap - G.R. Lilly, Canada

#### Remarks

Paper titles along with abstracts should be submitted to the co-convenors by 30 June 2004. Papers will be selected on the basis of their relevance to the topic and scientific suitability. It is anticipated that the proceedings of this Symposium will be published in the *Journal of the Northwest Atlantic Fishery Science*, following the normal peer review process of the Journal.

#### Further information may be obtained from:

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## Information for Preparing Manuscripts for NAFO Scientific Publications

### Introduction

The manuscript should be in English. The sequence of the material should be: title page, Abstract, text including Introduction, Materials and Methods, Results, Discussion and Acknowledgements and References. Number all pages, including the title page, consecutively with arabic numbers in the center of the top margin. There is usually no page limitation or page charge for accepted publications.

### Content of Manuscript

#### Title page

This page should contain the title, followed by the name(s) and address(es) of the author(s) including professional affiliation, and any related footnotes. The title should be limited to what is documented in the manuscript and be as concise as possible. Where necessary the scientific names of species should be included.

#### Abstract

An informative abstract must be provided, which does not exceed one double-spaced page or about 250 words, the ultimate length being dependent on the size of the manuscript. The abstract should concisely indicate the content and emphasis of the paper. It should begin with the main conclusion from the study and be supported by statements of relevant findings. The scientific names of species where necessary should be included here. It is important that the abstract accurately reflect the contents of the paper because it is often separated from the main body of the paper by abstracting and indexing services.

#### Text

In general, the text should be organized into Introduction, Materials and Methods, Results, Discussion, Acknowledgments and References. Authors should be guided by the organization of papers that have been published in the NAFO Journal or Studies and by such authorities as the Council of Biological Editors Style Manual (CBE, 9650 Rockville Pike, Bethesda, MD 20814, USA).

The **Introduction** should be limited to the purpose and rationale of the study. The article should begin with a clear description of the subject (include where necessary the scientific names of species), stating the hypothesis and/or defining the problem(s) the research was designed to solve. Define the time of the study, along with literature review and other information limited to what is relevant to the problem.

The **Materials and Methods** should provide the framework for obtaining answers to the problems which concern the purpose of the study. Describe in sufficient detail the materials and methods used so as to enable other scientists to evaluate the work or replicate the work.

The **Results** should answer the questions evolving from the purpose of the study in a comprehensive manner in an orderly

and coherent sequence, with illustrative tables and figures. Ensure only relevant information is presented to substantiate the findings. Avoid any confusion between facts and inferences and the restatement of table and figure captions in the text.

The **Discussion** should give the main contributions from the study, with appropriate interpretation of the results focussing on the problem or hypothesis. Compare with those of other authors. Speculation should be limited to what can be supported with reasonable evidence. In the case of short papers, it may be useful to combine Results and Discussion to avoid repetition.

The **Acknowledgements** should be limited to the names of individuals who provided significant scientific and technical support, including reviews, during the preparation of the manuscript, and the names of agencies which provided financial support.

The **References** represents the list of references cited in the text listed alphabetically. Good judgment should be used in the selection of references, which should be restricted largely to significant published literature. Unpublished data and documents, manuscripts in preparation, and manuscripts awaiting acceptance to other journals may be noted in the text as unpublished data or personal communications, with full contact addresses.

Literature references cited in the text must be by author's surname and year of publication, e.g. (Collins, 1960). The surnames of two authors may be used in a citation, but, for more than two authors the citation should be (Collins *et al.*, 1960). The citation of mimeographed manuscript reports and meeting documents should contain the abbreviation "MS", e.g. (Collins *et al.*, MS 1960). All papers referred to in the text must be cited in the References alphabetically by the first author's surname and initials, followed by the initials and surnames of other authors, year of publication, full title of the paper, name of the periodical, volume and/or number, and range of pages. Abbreviations of periodicals should, if possible, follow the "*World List of Aquatic Sciences and Fisheries Serials Titles*", published periodically by FAO (Food and Agriculture Organization of the United Nations). References to monographs should, in addition to the author(s), year and title, contain the name and place of the publisher and the number of pages in the volume. Reference to a paper in a book containing a collection of papers should also contain the page range of the paper, name(s) of editor(s), and actual title of the book. The accuracy of all references and their correspondence with text citations is the responsibility of the author.

#### Comments on Tables and Figures

All Tables and Figures must be mentioned or discussed in the text. Tables and Figures must be numbered consecutively in arabic numerals, which correspond with the order of presentation in the text. The required position of the Tables and Figures in the text should be indicated in the left margin of the relevant page. Place the originals of Tables and Figures after the list of references.

**Tables.** Note a well constructed Table can eliminate elaborate text descriptions. Each Table should be carefully constructed to be easily read and understood. Each column and row must be concisely headed, ensuring relevant units of the values are given (usually within parentheses). Each Table should have a complete but concise descriptive heading, and should be on a separate sheet.

**Figures.** Note any reference to geographic areas relevant to the study should be shown in a Figure (or map) form giving coordinates. These and illustrations and photographs can eliminate elaborate text descriptions.

Each Figure should be carefully constructed and labelled to be easily read and understood. Each vertical and horizontal axis (e.g.  $x$  and  $y$  axes on a graph or latitude and longitudes on a map) must have a concise header with relevant units (usually within parentheses). Each Figure would have a complete but concise descriptive heading, and should be on a separate sheet.

When preparing figures, consideration should be given to details such as shading and lettering with respect to the effects of reduction in size to a page width (e.g. lettering should not be overbearing or too small). If oversized figures are necessary, only good quality page-size photocopies should be submitted. If the paper contains photographs, ensure they have good contrast whether they are in colour or black and white.

*Mathematical equations and formulae* must be accurately stated, with clear definitions of the various letters and symbols. If logarithmic expressions are used, the type of function (e.g.  $\log$ ,  $\ln$ ,  $\log_{10}$  or  $\log_e$ ) must be clearly indicated.

### Manuscript Submission

**NOTE:** The following are the two major NAFO scientific publications, while the Scientific Council Research Documents (SCR Doc.) and Summary Document (SCS Doc.) are series that are submitted for meeting considerations.

The NAFO Secretariat now prefers to receive manuscript submissions, for any of the above publications in a computer electronic form.

The manuscript submissions may be done by e-mail (with a hard copy and diskette also forwarded by mail), or by mail (one hard copy and diskette). All texts, Tables and Figures should be formatted using Word or WordPerfect (Word is preferred), with each Table and Figure saved in a separate file (eps (preferably), tiff, pct, jpg, bmp or gif).

**Please note:** *In view of the considerable costs involved in colour printing, the NAFO Secretariat will be printing figures not requiring full colour in grayscale unless colour contributes to the content of the figure.*

The Secretariat may request alternative formats as publication technologies develop.

### Journal of Northwest Atlantic Fishery Science

The Journal provides a forum for the primary publication of original research papers. While it is intended to be regional in scope, papers of general applicability and methodology, irrespective of region, may be considered. Both practical and theoretical papers are eligible. Space is also provided for notes, letters to the editor and notices.

Such manuscripts are considered for publication with the understanding that the content is unpublished and is not being submitted elsewhere for publication. Each manuscript is assigned to an Associate Editor of the Journals Editorial Board, for scientific editing. Papers are normally sent by the Associate Editors to two referees for appraisal regarding its suitability as a primary article.

### NAFO Scientific Council Studies

The Studies publishes papers which are of topical interest and importance to the current and future activities of the Scientific Council, but which are not considered to be sufficiently high quality to meet the standards for primary publication in the Journal. Such papers have usually been presented as research documents at Scientific Council meetings and nominated for publication by the Standing Committee on Publications. These manuscripts are not normally refereed but undergo critical scrutiny by the Studies editor and by an expert familiar with the subject matter selected from the Journal editorial board.

Manuscripts (one hard copy and one copy saved on a computer diskette) being submitted should be addressed to:

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## Scientific Publications of the Northwest Atlantic Fisheries Organization

### Journal of Northwest Atlantic Fishery Science

The Journal provides an international forum for the primary publication of original research papers on fisheries science in the Northwest Atlantic, with emphasis on environmental, biological, ecological and fishery aspects of the living marine resources and ecosystems. (Scientific publications during ICNAF times during 1949–79 are available at the Secretariat).

- Vol. 1 – Miscellaneous papers, (10), December 1980, 112 pp.
- Vol. 2 – Miscellaneous papers, (10), October 1981, 76 pp.
- Vol. 3, No. 1, 2 – Miscellaneous papers, (17), May and December 1982, 180 pp.
- Vol. 4 – Special issue *Guide to the Early Stages of Marine Fishes Occurring in the Western North Atlantic Ocean, Cape Hatteras to the Southern Scotian Shelf*, July 1983, 424 pp.
- Vol. 5, No. 1, 2 – Miscellaneous papers, (26), January and November 1984, 224 pp.
- Vol. 6, No. 1, 2 – Miscellaneous papers, (17), June and December 1985, 179 pp.
- Vol. 7, No. 1, 2 – Miscellaneous papers, (18), December 1986 and December 1987, 177 pp.
- Vol. 8 – Miscellaneous papers, (7), December 1988, 88 pp.
- Vol. 9 – Miscellaneous papers, (13), September and December 1989, 159 pp.
- Vol. 10 – Special issue, (1), *The Delimitation of Fishing Areas in the Northwest Atlantic*, December 1990, 57 pp.
- Vol. 11 – Miscellaneous papers, (7), February 1991, 80 pp.
- Vol. 12 – Miscellaneous papers, (7), January 1992, 84 pp.
- Vol. 13 – Miscellaneous papers, (7), December 1992, 114 pp.
- Vol. 14 – Symposium papers, (12), 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*, December 1992, 160 pp.
- Vol. 15 – Special issue, (1), *Decapod Crustacean Larvae from Ungava Bay*, December 1993, 170 pp.
- Vol. 16 – Miscellaneous papers, (7), July 1994, 100 pp.
- Vol. 17 – Miscellaneous papers, (6), October 1994, 78 pp.
- Vol. 18 – Miscellaneous papers, (6) (1 Note), April 1996, 115 pp.
- Vol. 19 – Symposium papers, (11), on *Gear Selectivity/Technical Interactions in Mixed Species Fisheries*, September 1996, 145 pp.
- Vol. 20 – Special issue, (1), *North Atlantic Fishery Management Systems: A Comparison of Management Methods and Resource Trends*, September 1996, 143 pp.
- Vol. 21 – Miscellaneous papers, (5), April 1997, 83 pp.
- Vol. 22 – Symposium papers, (25) (1 Note), on *The Role of Marine Mammals in the Ecosystem*, December 1997, 387 pp.
- Vol. 23 – Symposium papers, (16), *What Future for Capture Fisheries*, October 1998, 277 pp.
- Vol. 24 – Miscellaneous papers, (4), November, 1998, 97 pp.
- Vol. 25 – Symposium papers, (17), (2 Notes), on "*Variations in Maturation, Growth, Condition and Spawning Stock Biomass Production in Groundfish*", October 1999, 233 pp.
- Vol. 26 – Miscellaneous papers, (6), December 2000, 145 pp.
- Vol. 27 – Symposium papers (22) (1 Note), *Pandalid Shrimp Fisheries – Science and Management at the Millennium*, December 2000, 289 pp.
- Vol. 28 – Special issue, (1), *A Review of the Cod Fisheries at Greenland, 1910–1995*, December 2000, 121 pp.
- Vol. 29 – Miscellaneous papers, (5), December, 2001, 99 pp.
- Vol. 30 – Miscellaneous papers, (5), December, 2002, 91 pp.
- Vol. 31 – Symposium papers (34) (1 Abstract), October, 2003, 496 pp.
- Vol. 32 – Miscellaneous papers, (4), December, 2003, 72 pp.
- Vol. 33 – Symposium papers, (9), *Reproductive Potential of Fish Populations of the North Atlantic*, December 2003, 214 pp.

### NAFO Scientific Council Studies

This publication includes papers of topical interest and importance to the current and future activities of the Scientific Council.

- No. 1 – Miscellaneous papers, (11), March 1981, 101 pp.
- No. 2 – Manual on *Groundfish Surveys*, December 1981, 56 pp.

**NAFO Scientific Council Studies (Continued)**

- No. 3 – Miscellaneous papers, (8), April 1982, 82 pp.
- No. 4 – Special Session papers, (12), on *Remote-Sensing Applications to Fishery Science*, September 1982, 98 pp.
- No. 5 – Symposium papers, (12), on *Environmental Conditions in 1970–79*, December 1982, 114 pp.
- No. 6 – Miscellaneous papers, (8), December 1983, 104 pp.
- No. 7 – Miscellaneous papers, (9), August 1984, 98 pp.
- No. 8 – Miscellaneous papers, (12), April 1985, 96 pp.
- No. 9 – Special Session papers, (17), on *Squids*, November 1985, 180 pp.
- No. 10 – Miscellaneous papers, (9), August 1986, 112 pp.
- No. 11 – Miscellaneous papers, (11), March 1987, 127 pp.
- No. 12 – Miscellaneous papers, (8), March 1988, 90 pp.
- No. 13 – Miscellaneous papers, (5), November 1989, 82 pp.
- No. 14 – Miscellaneous papers, (6), May 1990, 74 pp.
- No. 15 – Miscellaneous papers, (7), May 1991, 68 pp.
- No. 16 – Special Session papers, (22), on *Management Under Uncertainties*, November 1991, 190 pp.
- No. 17 – Workbook on *Introduction to Sequential Population Analysis*, February 1993, 98 pp.
- No. 18 – Symposium papers, (18), on *Changes in Abundance and Biology of Cod Stocks and Their Possible Causes*, July 1993, 110 pp.
- No. 19 – Miscellaneous papers, (8), October 1993, 98 pp.
- No. 20 – Miscellaneous papers, (7), February 1994, 114 pp.
- No. 21 – Collections of Papers, (10), Related to *Northern Cod and Seals in NAFO Divisions 2J and 3KL*, December 1994, 165 pp.
- No. 22 – Miscellaneous papers, (6), May 1995, 95 pp.
- No. 23 – Miscellaneous papers, (5), September 1995, 95 pp.
- No. 24 – Symposium papers, (12), on *Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life*, September 1994, 155 pp.
- No. 25 – Collection of Papers, (5), *Flemish Cap Selected Environmental and Other Papers*, July 1996, 91 pp.
- No. 26 – Selected Papers, (11), (2 Notes), on *Harp and Hooded Seals*, December 1996, 129 pp.
- No. 27 – Miscellaneous papers, (5), (1 Note), December 1996, 81 pp.
- No. 28 – Special Session papers, (6), on *Assessment of Groundfish Stocks Based on Bottom Trawl Survey Results*, December 1996, 105 pp.
- No. 29 – Selected Papers, (11), *Selected Studies Related to Assessment of Cod in NAFO Divisions 2J+3KL*, May 1997, 125 pp.
- No. 30 – Miscellaneous papers, (9), December 1997, 117 pp.
- No. 31 – Miscellaneous papers, (8), December 1998, 165 pp.
- No. 32 – Miscellaneous papers, (8), April 1999, 133 pp.
- No. 33 – Miscellaneous papers, (7), May 2000, 135 pp.
- No. 34 – Miscellaneous papers, (3), October, 2001, 91 pp.
- No. 35 – Workshop: *The Canada-United States Yellowtail Flounder Age Reading*, December 2002, 68 pp.
- No. 36 – Workshop on Assessment Methods, May 2003, 320 pp.
- No. 37 – Working Group on Reproductive Potential, August 2003, 378 pp.

**NAFO Scientific Council Reports**

This publication contains reports of Scientific Council Meetings held through each year since NAFO replaced ICNAF. (The comparable publication during ICNAF was called the *Redbook*).

- 1980 – Reports of seven meetings in 1979 and 1980, Published December 1980, 190 pp.
- 1981 – Reports of four meetings in 1981, Published December 1981, 148 pp.
- 1982 – Reports of two meetings in 1982, Published December 1982, 110 pp.
- 1983 – Reports of three meetings in 1983, Published December 1983, 152 pp.
- 1984 – Reports of three meetings in 1984, Published December 1984, 126 pp.
- 1985 – Reports of three meetings in 1985, Published December 1985, 146 pp.
- 1986 – Reports of three meetings in 1986, Published December 1986, 156 pp.
- 1987 – Reports of three meetings in 1987, Published December 1987, 138 pp.
- 1988 – Reports of two meetings in 1988, Published December 1988, 150 pp.
- 1989 – Reports of two meetings in 1989, Published December 1989, 180 pp.
- 1990 – Reports of two meetings in 1990, Published December 1990, 188 pp.

**NAFO Scientific Council Reports (Continued)**

- 1991 – Reports of two meetings in 1991, Published December 1991, 164 pp.
  - 1992 – Reports of four meetings in 1992, Published December 1992, 212 pp.
  - 1993 – Reports of three meetings in 1993, Published January 1994, 234 pp.
  - 1994 – Reports of four meetings in 1994, Published January 1995, 234 pp.
  - 1994 – Reports of four meetings in 1994, Published January 1995, 234 pp.
  - 1995 – Reports of three meetings in 1995, Published January 1996, 244 pp.
  - 1996 – Reports of three meetings in 1996, Published January 1997, 226 pp.
  - 1997 – Reports of three meetings in 1997, Published January 1998, 274 pp.
  - 1998 – Reports of three meetings in 1998, Published January 1999, 257 pp.
  - 1999 – Report of four meetings in 1999, Published January 2000, 327 pp.
  - 2000 – Report of four meetings in 2000, Published January 2001, 303 pp.
  - 2001 – Report of three meetings in 2001, Published January 2002, 339 pp.
  - 2002 – Report of three meetings in 2002, Published January 2003, 323 pp.
  - 2002/2003 – Report of four meetings in 2002-03, Published August 2003, 383 pp.
  - 2003 – Report of two meetings in 2003, Published January 2004, 104 pp.
- (Supplement)

**NAFO Statistical Bulletin**

This publication replaced *ICNAF Statistical Bulletin* which terminated with Vol. 28 (revised). The volume numbering continues the series as the *NAFO Statistical Bulletin*.

- Vol. 29 – Fishery statistics for 1979, Originally published July 1981; revised edition published November 1984, 290 pp.
- Vol. 30 – Fishery statistics for 1980, Originally published August 1982; revised edition published October 1984, 280 pp.
- Vol. 31 – Fishery statistics for 1981, Originally published September 1983; revised edition published March 1985, 276 pp.
- Vol. 32 – Fishery statistics for 1982, Published December 1984, 284 pp.
- Vol. 33 – Fishery statistics for 1983, Published December 1985, 280 pp.
- Vol. 34 – Fishery statistics for 1984, Published December 1986, 304 pp.
- Vol. 35 – Fishery statistics for 1985, Published December 1987, 322 pp.
- Vol. 36 – Fishery statistics for 1986, Published October 1989, 304 pp.
- Vol. 37 – Fishery statistics for 1987, Published April 1990, 295 pp.
- Vol. 38 – Fishery statistics for 1988, Published February 1991, 307 pp.
- Vol. 39 – Fishery statistics for 1989, Published February 1993, 300 pp.
- Vol. 40 – Fishery statistics for 1990, Published February 1994, 309 pp.
- Vol. 41 – Fishery statistics for 1991, Published February 1995, 318 pp.
- Statistical Bulletin Supplementary Issue, 1960–90, (statistics) Published April 1995, 156 pp.
- Vol. 42 – Fishery statistics for 1992, Published October 1995, 310 pp.
- Vol. 43 – Fishery statistics for 1993, Published December 1997, 329 pp.
- Vol. 44 – Fishery statistics for 1994, Published December 2000, 201 pp.
- Vol. 45 – Fishery statistics for 1995, Published October 2001, 207 pp.
- Vol. 46 – Fishery statistics for 1996, Published November 2001, 214 pp.
- Vol. 47 – Fishery statistics for 1997, Published November 2001, 216 pp.
- Vol. 48 – Fishery statistics for 1998, Published November 2001, 210 pp.
- Vol. 49 – Fishery statistics for 1999, Published January 2002, 210 pp.

**Inventory of Sampling Data**

This publication replaced *ICNAF Inventory of Sampling Data 1967–1978* which was completed in 1986.

- Inventory of Sampling Data 1979–1984, Published April 1989, 250 pp.
- Inventory of Sampling Data 1985–1989, Published March 1993, 265 pp.
- Inventory of Sampling Data 1990–1994, Published October 1999, 287 pp.
- Inventory of Sampling Data 1995–1999, Published November 2002, 142 pp.

**NAFO Index of Meeting Documents**

This publication contains lists of all documents along with a subject and author index of the NAFO Scientific Council documents issued during 5-year periods.

- 1979–84 – Index of Meeting Documents, Published March 1985, 146 pp.
  - 1985–89 – Index of Meeting Documents, Published December 1990, 116 pp.
  - 1990–94 – Index of Meeting Documents, Published November 1995, 139 pp.
  - 1995–99 – Index of Meeting Documents, Published December 2000, 141 pp.
-