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### **Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life**

#### **SYMPOSIUM**

Hosted by the Scientific Council of NAFO  
14–16 September 1994

The Scientific Council is pleased to announce this Symposium and invite papers from the general international scientific community. The Symposium will be co-convened by E. Buch (Denmark), M. Sinclair (Canada) and M. Stein (Germany), and organized by the NAFO Secretariat. The purpose of this Symposium is to focus attention on possible impact of anomalous environmental conditions during the early-1990s in the Northwest Atlantic on the distribution and behaviour of marine life. Environmental conditions in the area should also be considered to relate the early-1990s conditions to the 1980s and the previous decades.

#### **Specific Topics**

- Climatic change in the Northwest Atlantic and sub-arctic regions
- Meteorological conditions
- Sea ice and iceberg conditions
- Oceanographic conditions
- Changes in the distribution and abundance of commercially important fish species
- Impacts of changes in environmental conditions on population and community processes
- Incorporation of environmental trends into the fisheries management process

Interested scientists are requested to send titles and brief descriptions of the contribution to the NAFO Secretariat by **30 March 1994**. Papers will be selected on the basis of their relevance to the topics, and authors will be informed of selected contributions by **15 April 1994**. The completed manuscripts will be required at the NAFO Secretariat by **30 August 1994**.

#### **Publication of Papers**

Papers presented at the Symposium will be considered for publication in the *Journal of Northwest Atlantic Fishery Science* or *NAFO Scientific Council Studies*, depending on the nature and quality of the papers.

Further information may be obtained from:

#### **Co-conveners**

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Royal Danish Administration  
of Navigation and Hydrography  
Farvandsvaesenet  
P. O. Box 1919  
DK-1023 Copenhagen K  
Denmark

M. Sinclair  
Bedford Institute of Oceanography  
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#### **NAFO Secretariat**

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Canada B2Y 3Y9

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# NOTICE

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## **The Role of Marine Mammals in the Ecosystem**

### **SYMPOSIUM**

Hosted by the Scientific Council of NAFO in Collaboration with ICES  
6–8 September 1995

The Scientific Council at its September 1992 Meeting chose this theme for the Special Session to be held in September 1995.

Details of organizational arrangements, including confirmation of time and place, outline of topics to be covered, and deadlines for the submission of abstracts and completed manuscripts will be finalized during the June 1994 Meeting of the Scientific Council.

Co-conveners: Dr G. B. Stenson  
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Marine Research Institute  
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Skúlagata 4  
121 Reykjavik  
Iceland



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## NOTICE

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### Microfiche of ICNAF Meeting Documents, 1951–79

The International Commission for the Northwest Atlantic Fisheries (ICNAF) came into being in July 1950, and the first annual meeting took place at Washington, USA, in April 1951. From that time until the termination of ICNAF in 1979 (29 annual meetings and numerous special and midterm meetings), documentation of research and statistical activities grew as the Commission's interest expanded from developing the groundwork for scientific investigation of the marine living resources during the 1950s and 1960s to managing more than 70 fish and invertebrate stocks in the Northwest Atlantic during the 1970s, until the 200-mile fishery conservation zones of the coastal states were implemented in 1977. However, ICNAF continued until 1979, when it was replaced by the Northwest Atlantic Fisheries Organization (NAFO).

Under the ICNAF regime, it was the mandate of the Standing Committee on Research and Statistics (STACRES) to keep under review and provide regular assessments of the exploited stocks, and to develop policies and procedures for the collection, compilation, analysis and dissemination of fishery statistics in the Convention Area and adjacent waters. Thousands of meeting documents were generated during the 30-year life of ICNAF, most of which were scientific in nature. The Scientific Council of NAFO recognized the historical value of this long series of ICNAF documents and, in 1983, recommended that all papers related to fishery science and statistics should be assembled and copied on microfiche.

Before 1965, all ICNAF documents were designated "Meeting Documents", with no distinction between documents presented at scientific meetings and those for consideration by Commissioners. During 1965–72, documents were issued in two series, designated as "Commission Documents" and

"Research Documents". During 1973–79, further division occurred with the issue of "Summary Documents". The microfiche series contains all documents from 1951–64, all Research and a few relevant Commission documents for 1965–72, and all Research and Summary documents for 1973–79. The task of locating and preparing the papers for microfiche began in early 1985 and was completed in late 1986. Nearly 2,700 documents (31,500 pages) have been recorded on 632 fiche (98-page format, negative). When organizing the material, an index fiche was included to start the series for each year, to provide the user with ready access to the authors and titles of papers and the document numbers. The title strip on each fiche is color-coded by document series, and contains the name of the document series, the year of issue and the document number(s).

A limited number of microfiche sets are available for immediate shipment on a "first come, first served" basis. When the current supply has been exhausted, subsequent orders will involve a delay of approximately 4–5 weeks before delivery.

The price of a set of ICNAF microfiche is \$ 770.00 Canadian which includes delivery by first-class mail in Canada and by airmail to all other countries. Payment in Canadian funds should accompany the order. Please address orders and make cheque (or money order) payable to:

Northwest Atlantic Fisheries Organization  
P. O. Box 638, Dartmouth, Nova Scotia  
Canada B2Y 3Y9

Fax No.: (902) 469-5729

Telex No.: 019-31475



# Information for Authors in Preparing Manuscripts for NAFO Scientific Publications

## General Guidelines

The manuscript should be typed in English on white paper, preferably 21.5 x 28 cm (8.5 x 11 in.), on one side only. All typing should be double-spaced with at least 2.5 cm margins around the page. Avoid breaking words at the end of lines. Number all pages, including the title page, consecutively with arabic numbers in the center of the top margin. The sequence of the material should be: title page, abstract, text, references, tables, captions for figures, and figures.

## 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. Limit the title to what is documented in the manuscript, and keep it as concise as possible.

### 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. It is important that the abstract accurately reflect the paper's contents, 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, Acknowledgements 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, with literature review and other information limited to what is needed to define the problem. The Materials and Methods should provide the framework for obtaining answers to the problems which concern the purpose of the study. The Results should answer the questions evolving from the purpose of the study in a comprehensive manner, avoiding 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 and comparison with those of other authors. Speculation should be limited to what can be supported with reasonable evidence, in the case of short papers, it is often useful to combine Results and Discussion to avoid repetition. 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.

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 (base 10 or natural logarithms) must be clearly indicated in the text or by appropriate symbols (" $\log_{10}$ " or "log" for ordinary logarithms, and " $\log_e$ " or "ln" for natural logarithms).

## References

Good judgment should be used in the selection of references, which must be restricted largely to significant published literature. References to unpublished data and documents, manuscripts in preparation, and manuscripts submitted to other journals (if not yet accepted for a particular issue) must not be cited in the list of references but may be noted in the text as unpublished data or personal communications (with full mailing address of the authors). Citation of meeting documents which have limited circulation should be avoided whenever possible, except when such documents contain significant new findings for which no other published sources of the information exist.

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, if more than two authors are involved 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 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.

### Tables

All tables must be discussed or mentioned in the text. Tables should be carefully constructed so that the data presented in them are clearly understood and that they fit within either a column or page of the periodical. Each table should start on a separate page and be headed by a description which, together with the column headings, makes the table intelligible with reference to the text. Tables must be numbered consecutively in arabic numerals, which correspond with the order of presentation in the text. The required position of tables in the text should be indicated in the left margin of the relevant page. Place the tables after the list of references.

### Figures

All figures must be referred to or discussed in the text. Each figure in the form of illustration or photograph must be on a separate sheet and numbered consecutively with arabic numerals.

The figure number should be clearly indicated on the back or in the bottom margin of each illustration. Figure captions should be typed on a separate sheet which follows the tables in paging sequence. The approximate location of each figure in the text should be indicated in the left margin of the relevant page. A complete set of originals or clear, good quality copies must accompany the original of the manuscript and good quality photocopies must be appended to the other copies for review purposes.

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 (17 cm) or a single column width (8 cm) (e.g. lettering should not be overbearing or too small). Ideally dimensions of figures should not exceed 17 cm x 20 cm. If over-sized figures are necessary, only good quality page-size photocopies should be submitted and the large originals should be retained by the author and submitted only if requested by the Associate Editor or the NAFO Secretariat. If the paper contains photographs which

will not photocopy clearly (e.g. poor contrast photographs), a set of such photographs must accompany each copy of the manuscript. Colour photographs are expensive to reproduce in colour and should be avoided if possible. If they are essential to the understanding of the text, the author will be required to pay for the additional cost of reproduction.

## Manuscript Submission

### 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.

Manuscripts are considered for publication with the understanding that their content is unpublished and is not being submitted elsewhere for publication. Each manuscript is assigned to an Associate Editor for scientific editing and is normally reviewed by two referees for appraisal regarding its suitability as a primary article. Submissions (original and three copies) should be addressed to:

Assistant Executive Secretary  
Northwest Atlantic Fisheries Organization  
P. O. Box 638  
Dartmouth, Nova Scotia  
Canada B2Y 3Y9

### 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 if necessary by an expert familiar with the subject matter. Manuscripts (one copy only) should be addressed to:

Assistant Executive Secretary  
Northwest Atlantic Fisheries Organization  
P. O. Box 638  
Dartmouth, Nova Scotia  
Canada B2Y 3Y9



## **Scientific Publications of the Northwest Atlantic Fisheries Organization**

### **Journal of Northwest Atlantic Fishery Science**

This publication began after the ICNAF Research Bulletin which terminated with No. 14 in September 1979. Prior to 1990 each annual volume consists of one or more numbers, and since then each issue is given a volume number.

- Vol. 1 – One number, 10 papers 112 pages (Published December 1980)
- Vol. 2 – One number, 10 papers, 76 pages (Published October 1981)
- Vol. 3 – Two numbers, 17 papers, 180 pages (Published May and December 1982)
- Vol. 4 – One number, special issue on early stages of marine fishes, 424 pages (Published July 1983)
- Vol. 5 – Two numbers, 26 papers, 224 pages (Published January and November 1984)
- Vol. 6 – Two numbers, 17 papers, 179 pages (Published June and December 1985)
- Vol. 7 – Two numbers, 18 papers, 177 pages (Published December 1986 and December 1987)
- Vol. 8 – One number, 7 papers, 88 pages (Published December 1988)
- Vol. 9 – Two numbers, 13 papers, 159 pages (Published September and December 1989)
- Vol. 10 – One number, special issue of an invited review paper, 57 pages (Published December 1990)
- Vol. 11 – One number, 7 papers, 80 pages (Published February 1991)
- Vol. 12 – One number, 7 papers, 84 pages (Published January 1992)
- Vol. 13 – One number, 7 papers, 114 pages (Published December 1992)
- Vol. 14 – One number, 12 papers. Symposium on changes in biomass, production and species composition of the fish populations in the Northwest Atlantic over the last 30 years, 160 pages (Published December 1992).

### **NAFO Scientific Council Studies**

This publication replaced ICNAF Special Publication, which terminated with Number 11 (revised) in August 1980, and ICNAF Selected Papers, which terminated with Number 6 in January 1980. Each issue is given a number.

- No. 1 – Miscellaneous papers (11), 101 pages (Published March 1981)
- No. 2 – Manual on groundfish surveys, 56 pages (Published December 1981)
- No. 3 – Miscellaneous papers (8), 82 pages (Published April 1982)
- No. 4 – Special Session papers (12) on remote-sensing applications to fishery science, 98 pages (Published September 1982)
- No. 5 – Symposium papers (12) on environmental conditions in 1970–79, 114 pages (Published December 1982)
- No. 6 – Miscellaneous papers (8), 104 pages (Published December 1983)
- No. 7 – Miscellaneous papers (9), 98 pages (Published August 1984)
- No. 8 – Miscellaneous papers (12), 96 pages (Published April 1985)
- No. 9 – Special Session papers(17) on squids, 180 pages (Published November 1985)
- No. 10 – Miscellaneous papers (9), 112 pages (Published August 1986)
- No. 11 – Miscellaneous papers (11), 127 pages (Published March 1987)
- No. 12 – Miscellaneous papers (8), 90 pages (Published March 1988)
- No. 13 – Miscellaneous papers (5), 82 pages (Published November 1989)
- No. 14 – Miscellaneous papers (6), 74 pages (Published May 1990)
- No. 15 – Miscellaneous papers (7), 68 pages (Published May 1991)
- No. 16 – Symposium papers (22) on Management Under Uncertainties 5–7 September 1990, 190 pages (Published November 1991)
- No. 17 – Workshop on Introduction to Sequential Population Analysis, 98 pages (Published February 1993)
- No. 18 – Symposium papers (18) on Changes in Abundance and Biology of Cod Stocks and Their Possible Causes, 110 pages (Published July 1993)
- No. 19 – Miscellaneous papers (8), 98 pages (Published October 1993)

### **NAFO Scientific Council Reports**

This publication (issued annually) replaced ICNAF Redbook which terminated with the issue in December 1979.

- 1980 – Reports of seven meetings in 1979 and 1980, 190 pages (Published December 1980)
- 1981 – Reports of four meetings in 1981, 148 pages (Published December 1981)
- 1982 – Reports of two meetings in 1982, 110 pages (Published December 1982)
- 1983 – Reports of three meetings in 1983, 152 pages (Published December 1983)
- 1984 – Reports of three meetings in 1984, 126 pages (Published December 1984)
- 1985 – Reports of three meetings in 1985, 146 pages (Published December 1985)
- 1986 – Reports of three meetings in 1986, 156 pages (Published December 1986)
- 1987 – Reports of three meetings in 1987, 138 pages (Published December 1987)
- 1988 – Reports of two meetings in 1988, 150 pages (Published December 1988)
- 1989 – Reports of two meetings in 1989, 180 pages (Published December 1989)
- 1990 – Reports of two meetings in 1990, 188 pages (Published December 1990)
- 1991 – Reports of two meetings in 1991, 164 pages (Published December 1991)
- 1992 – Reports of four meetings in 1992, 212 pages (Published December 1992)
- 1993 – Reports of three meetings in 1993, 234 pages (Published January 1994)

### **NAFO Statistical Bulletin**

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

- Vol. 29 – Fishery statistics for 1979, 290 pages (Originally published July 1981; revised edition published November 1984)
- Vol. 30 – Fishery statistics for 1980, 280 pages (Originally published August 1982; revised edition published October 1984)
- Vol. 31 – Fishery statistics for 1981, 276 pages (Originally published September 1983; revised edition published March 1985)
- Vol. 32 – Fishery statistics for 1982, 284 pages (Published December 1984)
- Vol. 33 – Fishery statistics for 1983, 280 pages (Published December 1985)
- Vol. 34 – Fishery statistics for 1984, 304 pages (Published December 1986)
- Vol. 35 – Fishery statistics for 1985, 322 pages (Published December 1987)
- Vol. 36 – Fishery statistics for 1986, 304 pages (Published October 1989)
- Vol. 37 – Fishery statistics for 1987, 295 pages (Published April 1990)
- Vol. 38 – Fishery statistics for 1988, 307 pages (Published February 1991)
- Vol. 39 – Fishery statistics for 1989, 300 pages (Published February 1993)
- Vol. 40 – Fishery statistics for 1990, 309 pages (Published February 1994)

### **NAFO List of Fishing Vessels**

This triennial publication replaced ICNAF List of Fishing Vessels which terminated with the 1977 list in April 1980.

- 1980 – List for 1980, 48 pages (Published March 1983)
- 1983 – List for 1983, 43 pages (Published April 1985)
- 1986 – List for 1986, 48 pages (Published July 1988)
- 1989 – List for 1989, 44 pages (Published January 1992)

### **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, 250 pages (Published April 1989)
- Inventory of Sampling Data 1985–1989, 265 pages (Published March 1993)

**NAFO Index of Meeting Documents**

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

- 1979–84 – Index of Meeting Documents, 146 pages (Published March 1985)
- 1985–89 – Index of Meeting Documents, 116 pages (Published December 1990)

*A price list for these publications may be obtained upon request. Orders for current and back issues and standing orders for future issues should be forwarded to the Executive Secretary, Northwest Atlantic Fisheries Organization, P. O. Box 638, Dartmouth, Nova Scotia, Canada B2Y 3Y9.*

