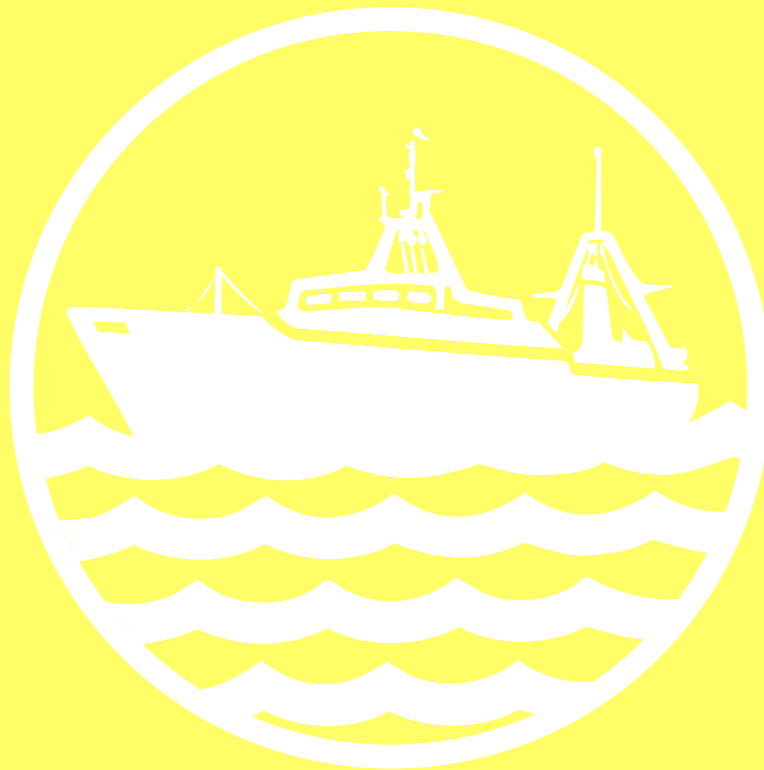


Journal  
of  
Northwest Atlantic  
Fishery Science



Volume 14  
December 1992

Northwest Atlantic Fisheries Organization  
Dartmouth, Canada



# Journal of Northwest Atlantic Fishery Science



Volume 14

Changes in Biomass, Production and Species Composition  
of the Fish Populations in the Northwest Atlantic Over  
the Last 30 Years, and Their Possible Causes

M. Fogarty, Editor

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# Journal of Northwest Atlantic Fishery Science

Scientific publications by ICNAF and NAFO have been in existence since ICNAF began in 1949 with the *ICNAF Special Publication Series* dealing with Proceedings of scientific symposia. The *ICNAF Research Bulletin* was started in 1964 to provide a means of publishing results of scientific research relevant to the Commission. The *ICNAF Research Bulletin* was terminated in September 1979 after the issue of Number 14. The primary scientific publication of NAFO began with the first issue of the *Journal of Northwest Atlantic Fishery Science* in December 1980.

## Editorial Policy

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. While the Journal is intended to be regional in scope, papers of general applicability, and methodological and review papers, irrespective of region, are considered. Space is available for notes and letters to the editor to facilitate scientific discussion of published papers. All papers are peer-reviewed to determine their suitability for primary publication. Associate Editors arrange for the peer-reviews and ensure that the papers accepted for publication meet the high standards required for the Journal. Manuscripts approved for publication are accepted with the understanding that they are not copyrighted, published or submitted elsewhere except in abstract form. There are no page charges.

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# Foreword

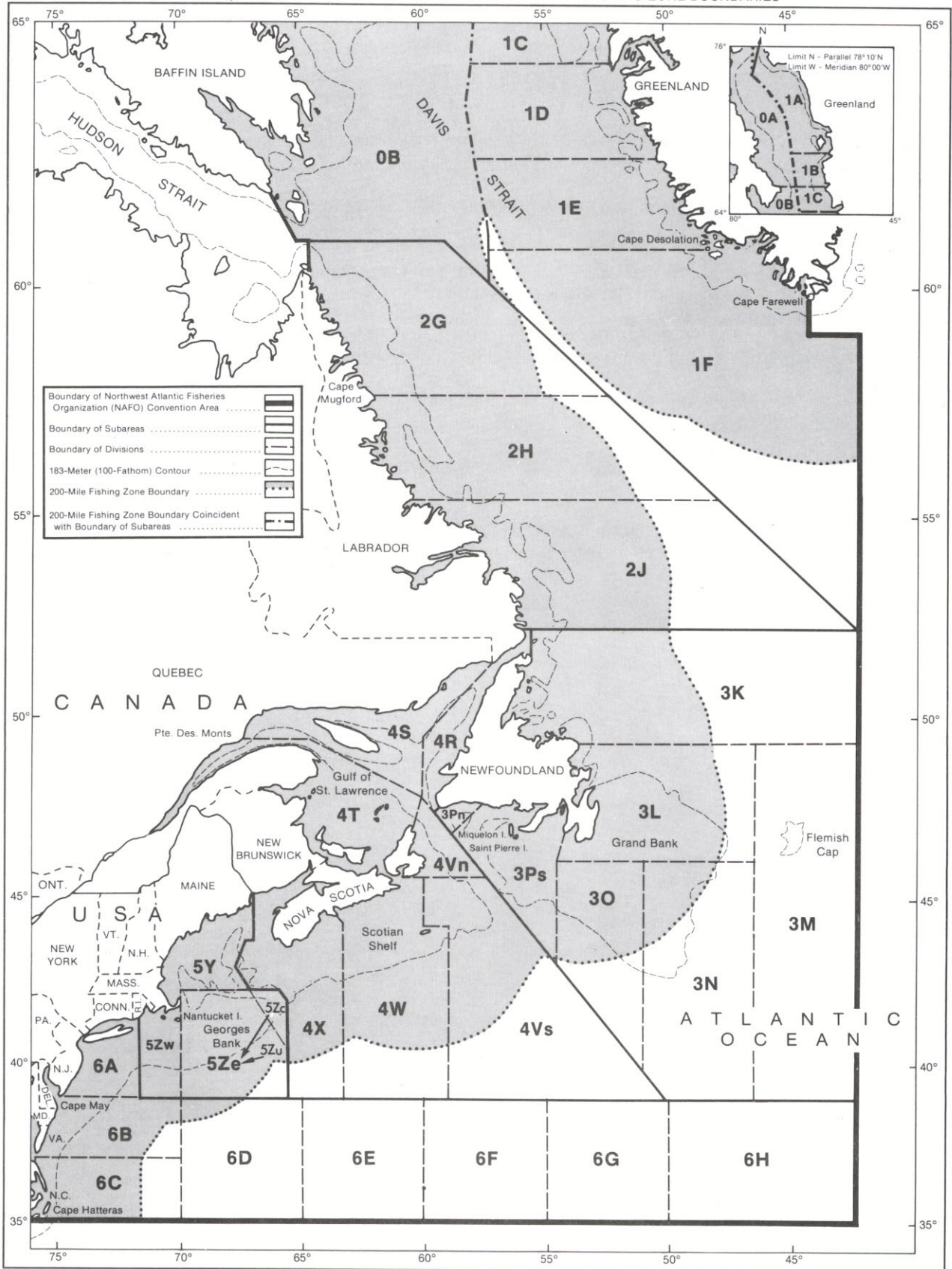
In accordance with its mandate to disseminate information on fisheries research to the scientific community, the Scientific Council of NAFO publishes the *Journal of Northwest Atlantic Fishery Science*, which contains peer-reviewed primary papers and notes on original research, and *NAFO Scientific Council Studies*, which contains review papers of topical interest and importance. Each year since 1981, the Scientific Council has held a Special Session on a topic of particular interest, and many of the contributions to those sessions have been published in NAFO publications.

During 6-8 September 1989, the Scientific Council held a Special Session on "Changes in Biomass, Production and Species Composition of the Fish Populations in the Northwest Atlantic Over the Last 30 Years, and Their Possible Causes", with M. Fogarty (USA) as convener. Keen interest in the contributions and associated discussions resulted in the Special Session recommendation that the Scientific Council consider publishing all contributions in a single volume of the *Journal of Northwest Atlantic Fishery Science*. The Scientific Council, however, noted that the standards of papers presented varied considerably, but agreed with the views of the Convener and the Standing Committee on Publications (STACPUB) to accept the recommendation. Accordingly, the Convener was invited to select the appropriate papers for publication in the issue and undertake the normal Journal editorial process. Of the 16 presentations made at the Session, 12 papers and 1 extended abstract were accepted for publication in this issue.

December 1992

T. Amaratunga  
Technical Editor  
Journal of Northwest Atlantic Fishery Science  
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MAP ILLUSTRATING NAFO'S CONVENTION AREA AND 200-MILE FISHING ZONE BOUNDARIES





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