

The Census of Marine Life

An Update on Activities

June 2001

Introduction

The Census of Marine Life (CoML) is an emerging international program for research to assess and explain the diversity, distribution, and abundance of marine organisms throughout the world's oceans. A decadal program, planning and development stage for the CoML is expected to require 1-2 more years. Pilot field projects should take place in 2002-2004. The main field projects should occur in 2005-2007. Analysis and integration of information should culminate in 2008 2010. The CoML home page is: <http://www.coml.org>

Scientific Steering Committee

Leadership and guidance for the Census of Marine Life are the responsibilities of the international Scientific Steering Committee (SSC), formed in June 1999. The SSC has met six times, and will meet during the rest of 2001 in Alaska and Argentina. The present focus of the SSC is the development of the scientific strategy for the CoML. The SSC has initially chosen to remain small in order to ease the scheduling of frequent meetings, but it expects that its membership will grow as the program takes shape and becomes more global. Subcommittees will be formed to lead particular aspects and projects of the CoML. Current SSC members are J. Frederick Grassle (Chair), Rutgers University, USA; Vera Alexander, University of Alaska Fairbanks, USA; Patricio Bernal, Chile, and Intergovernmental Oceanographic Commission, France; Donald Boesch, University of Maryland, USA; David Farmer, Institute for Ocean Sciences, British Columbia, Canada and University of Rhode Island, USA; Olav Rune Godoe, Institute of Marine Research, Bergen, Norway; Carlo Heip, Netherlands Institute of Ecology, The Netherlands; Poul Holm, Southern Denmark University, Denmark; Yoshihisa Shirayama, Kyoto University, Japan; Andrew Solow, Woods Hole Oceanographic Institution, USA.

Secretariat and Scientific Team

The Secretariat for the CoML program is located in Washington DC and is hosted by the Consortium for Oceanographic Research and Education (CORE). CORE is comprised of 63 oceanographic research institutions in the United States including

universities, government laboratories, and non-profit aquaria. Dr. Cynthia Decker, a benthic ecologist, directs the activities of the Secretariat. Her associates include Dr. Ron O'Dor, senior scientist involved with international governmental, non-governmental organizations, and the general public; Pamela Baker-Masson, concerned with public outreach and education; and Scott Sparks, program associate and webmaster.

Alasdair McIntyre, emeritus professor of fisheries and oceanography at the University of Aberdeen, Scotland is serving as a senior consultant to the Census of Marine Life SSC and Secretariat, helping to develop European participation in the CoML. Dr. McIntyre earlier served as editor-in-chief of Fisheries Research and as chair of the United Nations Joint Group of Experts on Scientific Aspects of Marine Pollution (GESAMP).

Scientific Strategy

The Scientific Strategy, laying out the overall goals and plans for the CoML, is scheduled for release in late 2001 for review and comment by the scientific and relevant stakeholder communities. The document will be posted on the CoML website as well as actively circulated. The plan is to revise the document for publication by early 2002.

The SSC has sought to balance the writing of planning documents with the timely launching of components of the CoML that the community has indicated are already well-defined and urgently needed. Two components of the CoML, its framework for assimilation of data (OBIS), and its studies to document the history of marine animal populations (HMAP) are now underway. In addition, several pilot field projects are in planning.

Ocean Biogeographical Information System

The Ocean Biogeographical Information System (OBIS) is envisioned as a distributed network of repositories of marine biological and environmental data for use in examining changes in diversity, distribution, and abundance of organisms in time and space. In May 2000, the CoML announced the funding of eight projects to foster the design and development of OBIS. Under the auspices of the US National Oceanographic Partnership Program (NOPP), eight OBIS projects received funding totaling US \$3,700,000 over two years (see [censpr1.html](#)). The projects will involve the participation of researchers at 63 institutions in 15 countries.

In September 2000, the CoML sponsored an international workshop at the University of Rhode Island Graduate School of Oceanography to further plan and organize the OBIS network. Co chaired by Fred Grassle and Mel Briscoe (US Office of Naval Research), the workshop brought together the principal investigators of the eight funded projects, as well as several experienced leaders in the design and management of oceanographic and ecological databases. Topics discussed included interoperability of databases, taxonomic and regional data priorities, and the management of OBIS. A Workshop report has been posted on the CoML website.

The SSC will consider the workshop's recommendations for the governance of OBIS and will work with other stakeholders to develop effective mechanisms for its rapid, reliable fruition. The SSC is establishing a steering committee for OBIS that will guide the development of the system, particularly in the context of other data system efforts that are emerging such as the US Virtual Ocean Data Hub and the Global Biodiversity Information Facility (GBIF).

History of Marine Animal Populations

Early in the planning effort for the CoML, participants recommended strongly that the CoML include a historical component to obtain, assemble, and make accessible information on marine animal populations since fishing became important. The History of Marine Animal Populations (HMAP) will combine classic historical archival research with marine biology to examine the distribution and abundance of species in the oceans over the past 500-1000 years. The aim of HMAP is to improve our understanding of marine ecosystem dynamics through interdisciplinary studies, specifically with regard to the ecological impact of large-scale harvesting, long-term changes in stock-abundance, and the role of marine resources in the development of human society. Integral to HMAP is the design and implementation of standard databases for marine species in collaboration with OBIS, the design and implementation of innovative biological sampling techniques to explore the marine environment, and the identification and use of historical data to aid in the development of predictive environmental models.

In December 2000 the SSC announced the formal launching of HMAP, with the establishment of Centers for the Study of the History of Marine Animal Populations at Southern Denmark University, University of Hull (UK), and the University of New Hampshire (USA). The initial phase of HMAP, supported with more than US\$1,200,000 in grants, will include case studies of marine populations in seven regions involving 31 institutions in 18 countries. The overall leader of HMAP is Steering Committee member Poul Holm of Southern Denmark

University. A special issue of the International Journal of Maritime History dedicated to HMAP will be published in early 2001. A second HMAP workshop will be held in Denmark in August 2001. <http://www.cmrh.dk/hmapindx.html>

Pilot Projects

The Census of Marine Life will ultimately be the sum of a set of specially designed field projects observing populations in a variety of regions and ways, and integrated with ongoing (and enhanced) survey activities conducted by fisheries and environmental agencies. The Steering Committee has been working with several segments of the research community to design Pilot Projects that can demonstrate the effectiveness in diverse settings of new approaches and technologies for the observation of marine life. While the SSC can influence resources sufficient to help complete the planning phases for Pilot Projects, each Project must ultimately secure the finances for research activities on its own. The goal is for the Pilot Projects to get the financial commitments to be "in the water" soon and to be completed in 2-3 years, so they can serve as examples for the main body of fieldwork conducted under the CoML. So far, groups of scientists have initiated planning for six promising pilot projects under the auspices of the CoML.

Pilot Census of Marine Life in the Gulf of Maine; Ken Foote, Woods Hole Oceanographic Institution, USA (<http://www.whoi.edu/marinecensus/>)

The Gulf of Maine and Georges Bank are much-studied regions commercially important for fisheries, and they thus offer an excellent chance to calibrate and demonstrate the superiority of new technologies to describe the diversity, distribution, and abundance of marine life. Targets include finfish, zooplankton communities, and the poorly-known benthic communities. A workshop held 2-3 May 2000 led to the establishment of a steering committee for the project and laid the basis for a regional consortium of institutions to carry out the project. A second workshop will be held on 9-10 May 2001 to advance the interests of this program.

Patterns and Process of the Ecosystems of the Northern Mid-Atlantic (MAR-ECO); Odd Aksel Bergstad, Institute of Marine Research, Norway

The biology of the waters overlying the Mid-Atlantic Ridge has been little studied and offers difficult challenges for new technologies to see deep and far. The tentative project goal is to identify and model the ecological processes that cause variability in the distribution, abundance, and trophic relationships among organisms inhabiting this pelagic zone. A planning workshop held 12-13 February 2001 in Bergen, Norway has led to the establishment of a steering committee for the project, which will further develop the project. The formal planning phase for this project is expected to start in late 2001.

Pacific Ocean Salmon Tracking; David Welch, Pacific Biological Station,
Nanaimo, British Columbia, Canada

Little is known about the distribution and behavior of salmon once they leave the rivers. This project proposes to use electronic tags and innovative acoustic arrays to track and monitor salmon populations on the continental shelf of Canada and the US and in the open waters of the North Pacific. A planning workshop 8-9 December 2000 in Vancouver, Canada, brought together leading experts on a variety of salmon populations to consider the design of this project and how it can serve as a template for study of salmon and other anadromous fish populations in the world. The program has recently been funded by the Census of Marine Life program to begin its planning phase.

Tagging of Pacific Pelagics; Barbara Block, Stanford University, USA

A workshop 13-14 November 2000 explored the design of an ambitious pilot in the North Pacific to deploy advanced electronic data-storage tags to track and monitor large vertebrates, such as whales, sea turtles, and tuna. A much better understanding of the distribution and behavior of large pelagic animals at the top of the food chain may allow strong inferences about the distribution and abundance of many other organisms that live in the oceans. The workshop generated great interest among the public in the Census of Marine Life as evidenced by coverage in the San Francisco Chronicle and on the news websites of ABC News and National Geographic. The formal planning phase for this project is expected to begin in mid 2001.

Chemosynthetic Ecosystems in the Arctic and Northern Atlantic Oceans; Cindy Lee Van Dover, College of William and Mary, USA

Little is known about the basin-scale diversity, distribution, and abundance of marine life in deep sea chemosynthetic ecosystems such as hydrothermal vents and seeps in the Northern Atlantic and Arctic oceans. In order to study these systems, new technologies for plume-tracking from autonomous underwater vehicles (AUVs) will need to be refined and used over large spatial scales. A planning workshop to develop this Pilot Project was held on 16-17 March 2001. The formal planning phase for this project is expected to begin in late 2001.

Coastal Survey of the Western Pacific; Yoshihisa Shirayama, Seto Marine Biological Laboratory, Kyoto University, Japan

A major unanswered question is how marine biodiversity varies with the latitudinal gradient. A coastal study to be conducted under the auspices of the Diversitas International in the Western Pacific Area (DIWPA) program aims to quantitatively survey marine life and examine biodiversity in near-shore areas in the Western

Pacific in a continuum from the northern to southern boreal regions using traditional sampling methods (i.e. , scuba gear). A workshop to be held on 17-24 June 2001 will refine the plans for this project.

Other Activities

SCOR Working Group

The Scientific Committee on Oceanographic Research (SCOR) of the International Council of Scientific Unions has formed a Working Group on New Technologies for Observing Marine Life, which held its first meeting on 9-11 November in Sidney, BC, Canada. The Working Group, chaired by David Farmer, is considering individual technologies, their integration, and transition to practice. censscor1.html

Museums and Marine Laboratories

Natural history museums contain precious collections and expertise on marine biodiversity, as do marine laboratories, and the participation of these institutions is key to the success of the CoML. A workshop was held on 15-17 November 2000 at the Institute of Marine Biology, Crete, Greece that was organized by Annelies Pierrot-Bults (Zoological Museum of Amsterdam), Ross Simons (Smithsonian Institution, USA) and Carlo Heip (Netherlands Institute of Ecology, The Netherlands). This workshop explored ways for museums and marine laboratories to contribute to the CoML and their interests in it. Over 30 experts from 15 countries attended the workshop, which has sparked further interest in the CoML within these communities. A report on the Crete workshop will be published shortly.

Aquariums

Aquariums house displays of marine biodiversity and are a main way that the public learns about it. The CoML was featured in a plenary presentation in November 2000 at the International Aquarium Congress hosted by Monaco's Musee Oceanographique and was strongly endorsed as "an opportunity too good to pass up" in the concluding summary address by Jerry Schubel, director of the New England Aquarium. Follow-up activities will increase involvement of aquariums in the CoML. Jordi Sabate, director of the Barcelona Aquarium, brought together the directors of several of the world's foremost public aquariums in April of 2001 to explore creation of a consortium of aquariums to work with the CoML. Meanwhile, another workshop at the New England Aquarium brought together exhibit designers, film makers, and persons involved in outreach activities to advance the education and outreach dimensions of the CoML. The report resulting from this workshop will identify the most effective vehicles for bringing the plans

and discoveries of the CoML to the 150 million people who visit aquariums each year.

Southeast Asia Workshop

To strengthen CoML activities in the tropical areas of Southeast Asia and the Western Pacific, the SSC is teaming with the Intergovernmental Oceanographic Commission's (IOC) SubCommission for the Western Pacific (IOC/WESTPAC). A workshop in October 2001 in Phuket, Thailand will bring together numerous scientists from countries in the region involved in assessing the diversity, distribution, and abundance of species in Southeast Asia and the Western Pacific.

POGO

About twenty of the world's leading oceanographic research institutions are now participating in a new Partnership for Observation of the Global Oceans (POGO), with a Secretariat at the Bedford Institute of Oceanography, Nova Scotia, Canada. The POGO institutions play major roles in the development and deployment of new monitoring systems, such as the Argo floats. The leaders of POGO are eager to assure that biological observations develop in conjunction with other environmental measures and have decided to make biological observations the focus of their 2001 meeting. The CoML provided a progress report at the November 2000 POGO meeting in Sao Paulo, Brazil.

<http://www.oceanpartners.org/>

US Government Initiatives

The US Congress passed the Oceans Act in 2000. This legislation directs that a Presidential Commission on the Oceans be established to review all US government ocean activities in the next two years and provide recommendations to the President and Congress. The Census of Marine Life expects to be invited to make a presentation to the Commission soon after it is established.

The US government is considering a major new initiative on ocean exploration, as recommended by the President's Panel on Ocean Exploration, whose report was released on 4 December in Washington DC. The report recognizes the Census of Marine Life and the Ocean Biogeographical Information System. Marcia McNutt, director of the Monterey Bay Aquarium Research Institute, chaired the panel, whose members included Frederick Grassle and Jesse Ausubel.

http://oceanpanel.nos.noaa.gov/panelreport/ocean_panel_report.html

National Committees

Several nations are now in the process of bringing together the stakeholders in the CoML within that country to determine how best to organize at the national level

for the Program. Following a pattern successful in other major global research programs, which require organization at both the international and national (and sometimes regional) level, the formation of National Committees for the Census of Marine Life should be one of the important developments during the next couple of years. The SSC and Secretariat are eager to work with the national interests for this purpose, and small amounts of funds will be available to help convene the appropriate national stakeholders.

For additional information on the Census of Marine Life program, contact the [Secretariat](#) or see the website at <http://www.coml.org>.