

CoML Annual Progress Report for 2007 (as of Sept. 2007)

Sub-Saharan Africa Regional Implementation Committee

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Vice Chair-person: None appointed

Project Manager: none

Education and Outreach Network Liaison: none

Address of the site(s) most closely related to this effort <http://www.afrobis.csir.co.za:8000..>

1. 2007 ACCOMPLISHMENTS & SCIENTIFIC HIGHLIGHTS

This is a small group, consisting of:

- a) (A percentage of the time of) Charles Griffiths and his research students, who are conducting research on African marine biodiversity patterns
- b) The regional committee, who have not met this year at the time of writing, but are due to have a face to face meeting associated with the WIOMSA conference in Durban, South Africa in October 2007
- c) The AfrOBIS node, which is managed by Marten Grundlingh. A short summary of progress within AfrOBIS follows (and they will also submit a full report separately to OBIS).

Our scientific activities in the last year are listed under subheadings below.

a) Research findings

Several research projects dealing with marine biodiversity in the region are underway under the supervision of the regional chair. These include:

-A Master's thesis project being undertaken by Hannah Medd and attempting to estimate the unknown marine biodiversity of South Africa. Comparisons between the taxonomic composition of African and European faunas indicate that at least 6 000 additional macroscopic marine species remain to be described from South Africa, mainly among the smaller-sized taxa, such as Nematoda, Copepoda, Platyhelminthes, etc. An analysis of the species richness of benthic samples collected from different parts of the country shows that samples from the east coast are more species rich than those from the south, which are in turn richer than those from the west. Sampling has, however, been most intense in the west and sparse to the east. As a result east coast diversity is greatly under-represented and remains a priority for future sampling effort. This thesis was examined in late 2006 and passed subject to corrections. The corrected version are being submitted in September 2007 and the student will graduate in December 2007

-Another Masters thesis by Robyn Scott is examining biodiversity and range patterns of marine species around the coast of Southern Africa. The west coast shows lowest diversity of all taxa. Many groups become progressively more species rich as one moves into the tropical east coast, but others show maximum species richness in the south, declining again to the east. The net result is that overall species richness appears low in the west and relatively uniform along the south and east coasts (but note the latter is under-sampled –see above). A very interesting finding is that large numbers of species are restricted to very narrow ranges (of 300 km or less) around the ecotones between biogeographic provinces, especially where the warm south and cold west coast provinces join at Cape Point. Submission of this thesis has been long delayed by the birth of a daughter to the student and subsequent leave of absence, but she has now re-registered and is intending to submit in late 2007. Several papers should emerge from this thesis.

-In a third HMAP funded project masters student Kate Watermeyer is attempting to use Ecopath and Ecosim models to recreate trophic flows in the Benguela as they existed before the arrival of western settlers. This thesis is completed and was submitted in February 2007, but is still under examination. The student is concurrently preparing the work into two papers for publication.

- A morphological and genetic study co-authored by honours student Max Edkins has shown that the well-known and widespread crowned crab *Hymenosoma orbiculare* is in fact five well-separated species. A paper describing these findings was published in the journal *Crustaceana* in 2007 and two of the new species are being described by co-author Isabelle Papadopolous.

- Funding has been obtained from the South African National Research Foundation to undertake a new project documenting the invertebrate by-catch of in the South African trawl fishery and mapping the biogeographical distribution patterns of these benthic communities. PhD student Louise Lange has been appointed to undertake this work and has already undertaken three cruises and collected a large number of invertebrate records, which will shortly be submitted to the AfrOBIS system. Several new or previously unreported species have been detected and sent to specialists for authoritative identification and description.

- A new grant was obtained from the HNS (History of the Near Shore) programme, and is aimed at repeating intertidal surveys undertaken around the South African coast in the 1930-40's and determining the forcing factors driving any distributional changes so detected. PhD student Angela Mead has been appointed to do this work. Angela has to date repeated several of the surveys but analysis of these results has not yet begun. The data are being collected using the NaGISA protocol, so these data can also be used as NaGISA sites. A paper on the temporal and spatial impact of marine invasive species (one of the key forcing factors of change) has been completed and is in press. A detailed study of temporal changes along the False Bay coastline by Honours student Karen Tunley has convincingly demonstrated the disappearance of warm water forms (like the mussel *Perna perna*) and appearance of cold water ones (like kelp) over the past 50 years. A partnership has been established with SAEON (South African Earth Observation Network) to help fund these projects.

- A collaborative initiative has been entered into between CoML and ACEP (African Coelacanth Ecosystem Programme) to survey sites in Tanga, Tanzania, with a view to the creation of marine protected areas designed to conserve the coelacanth population in that region, along with their associated ecosystems. A workshop to initiate this process has been held (see meetings report below) and the first field surveys are being undertaken in September-October 2007, with participation by MSc student Tessa Hempson from the CoML group.

AfrOBIS progress

Progress by the AfrOBIS node has been exceptional, largely due to the sterling efforts of the manager Marten Grundlingh and his staff in scouting for and obtaining data. To date the node has reformatted and loaded some 3.2 million records of 14 000 species (cf. the initial target of 360 000!). The final report submitted to the OBIS Managers Committee in Sao Paulo in April was very well received. The data centre is fully operational and can be visited and interrogated at afrobis.csir.co.za.

In terms of the origin of the data, many South African organisations gladly submitted data, eventually comprising more than 98% of the data that was loaded. The organisation that submitted the most data was the Marine and Coastal Management Branch of the state department of Environmental Affairs and Tourism, South Africa.

In spite of repeatedly contacting researchers in about 20 countries outside South Africa, the response from this segment was disappointing. The single largest data set was submitted by Malika bel Hassen of Tunisia. The mobilising and further scouting for data is one of the goals of AfrOBIS for the future. Apart from capturing the important information that lies hidden in such data sets, it is also important from an African perspective that data is submitted from as wide a field as possible. There are still also some significant data sets remaining within South Africa, and these still need to be captured. Three data sets have already been identified and are in the process of being mobilised.

Other scientific achievements

Charles Griffiths has given several CoML Biodiversity associated conference presentations since the last progress report in September 2006. These include talks at the NaGISA World Congress in Kobe, Japan in October 2006; The Society for Conservation Biology Conference in South Africa July 2007 and The Zoological Society of Southern Africa Conference in July 2007. A special ACEP/CoML session has been organized at the WIOMSA conference in October 2007 and several members of this committee will be speaking in this session (Ribbink, Griffiths, Grundlingh, Wafer). A poster presentation comparing Benguela and Humbolt systems was also made at the Humboldt Current System meeting in Lima Peru in November 2006. Prof Griffiths was awarded the Gold Medal of the Zoological Society of Southern Africa at a ceremony in July 2007 for his contributions to zoology, which lie mainly in the field of biodiversity research.

2. COMMITTEE STRUCTURE, MANAGEMENT & INTERNAL COMMUNICATION

The regional NRIC committee has not held a face-to-face meeting since its original conference meeting in 2003, communication between members being by email. This is partly for logistical reasons (South African foreign exchange regulations prohibit the purchase of air tickets in South Africa that do not land in South Africa, so only meetings here are possible!). Mainly, though, this is because no issue specifically demanding a face-to-face meeting has been identified and so a costly meeting seemed unjustified.

Some of the original committee members have, however, been relatively inactive, so it was decided in 2007 to reorganize and expand the committee and to allocate members clearly defined action portfolios. This process is now completed and the new committee and their revised portfolios are as follows:

a) **Regional representatives:**

Yunus Mgya – East Africa

Nirmal Shar – Indian Ocean islands

Charles Griffiths- South Africa (and committee chair)

Maria Sarhinha – SW Africa

AK Armah- West Africa

b) Portfolio members

Marten Grundlingh – AfrOBIS

Tony Ribbink – ACEP

Edward Kimani- NaGISA

Mohideen Wafer – link with IO NRIC

Mika Odida- OdinAfrica

Kirsten Martin- NRICS liaison representative

A face to face meeting of members active in the Indian Ocean is to be held in association with the WIOMSA (Western Indian Ocean Marine Science Association) conference in October 2007, at which a special ACEP/CoML session will also be convened.

3. 2007 EDUCATION & OUTREACH EFFORTS

We really do not have an education and outreach effort, or staff, within this committee although during the year the chair has been interviewed on SABC TV and on UCT Radio on matters pertaining to marine biodiversity. He has also written a guest editorial on the state of the marine environment for the popular magazine *African Wildlife* and two articles for the junior magazine *Envirokids*. The discovery of a new giant lobster species in 2006 was featured in the UCT Alumni magazine *Impact 2007*, and in several press articles.

4. GEOGRAPHIC EXPANSION

Additional funding has been obtained from several sources, notably National Research Foundation of South Africa and SAEON to support the original research of the group (see research report above) and this has in turn involved staff and students from those organizations.

With the aid of a grant from the Sloan Foundation the main expansion during the year has been to undertake a joint programme with the African Coelacanth Ecosystem Programme (Tony Ribbink) aimed at setting up conservation areas for coelacanths and their associated ecosystems in Tanzania. In pursuit of these aims meetings were held in Dar es Salaam and Tanga, Tanzania, with a wide range of both academic and community representatives and a cruise to the area is currently underway (September 2007). It is hoped that this will lead to the collection of much data on the biodiversity of this region.

5. PARTNERSHIPS & COLLABORATION

a. Partnerships

Organization Name	Point-of-Contact (Name)	Nature of Relationship
ACEP African Coelacanth Ecosystem Programme	Tony Ribbink	Joint research projects
SAEON South African Earth Observation Network	Angus Paterson	Joint funding of long term research
National Research Foundation	Renee le Roux	Joint funding biodiversity

(South Africa)		research
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b. Links to CoML Ocean Realm Projects

Project Name	Liaison or Cross-over personnel	Nature of Relationship
NaGISA	Robin Rigby, Edward Kimani	Shared research and funding
HNS	Ribin Rigby	Research project
HMAP		Completed project in 2007

c. Links to other CoML National and Regional Implementation Committees (NRICs)

NRIC	Liaison or Cross-over personnel	Nature of Relationship
Indian Ocean	Mohideen Wafer	Shared areas of concern and committee membership

d. Liaisons to CoML Cross-Cutting Groups

Project Name	Liaison Name & Institution	Nature of the Relationship
OBIS	Marten Grundlingh	Manager AfrOBIS node
HMAP	Charles Griffiths	Grant holder

e. Effectiveness of the Partnerships and collaborations

The number of partnerships we have is limited, mainly due to the small number of qualified personnel and limited research capacity available in this region. Our main concern at present is to stimulate activity, and submission of data for OBIS, from African countries to the north. To data participation and collaboration from South African organizations has been excellent, but almost no data have been forthcoming from other countries. Hopefully our new initiatives in Tanzania will assist in at least that region. There are no other problems though, just not enough time to do more!

CoML Australia

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1. 2007 ACCOMPLISHMENTS & SCIENTIFIC HIGHLIGHTS

Great Barrier Reef (GBR) Seabed Biodiversity Project

Mapping Diversity, Distribution & Abundance in fine detail at large scale

After 300 days at sea visiting almost 1,500 sites, during 10 voyages over 3 years, Census affiliated scientists have mapped habitats and associated biodiversity in 210,000 km² of poorly known shelf seabed, in Australia's unique and internationally significant GBR World Heritage Area, and produced a comprehensive inventory of more than 140,000 records of distribution and abundance for more than 7,000 species — >4 times more than previous studies. Already >50 species are new to science including: fishes, elasmobranchs, crustaceans and sponges, and many more are new records for Australia — further taxonomic work will reveal hundreds of others, particularly in less well studied invertebrate groups and algae, adding substantially to the known but underestimated biodiversity.

Sophisticated statistical modelling techniques were used to identify key environmental variables likely to be important in structuring seabed species distributions, including: sediment composition, benthic irradiance, current stress, bathymetry, bottom water physical attributes, nutrients and turbidity — and to develop predictive models for seabed species based on bio-physical relationships with the physical environment.

The information is being used to assess conservation goals, fishery risks and management tools, to help ensure human activities are conducted sustainably in the multiple-use GBR Marine Park.

Census of Antarctic Marine Life – Ocean Realm Project

Australia leads the Ocean Realm project on the Census of Antarctic Marine Life (CAML www.caml.aq). This project will deliver a robust benchmark on the current state of marine biodiversity in Antarctic waters, against which changes related to climate change may be measured. The benchmark will be a significant legacy of the International Polar Year (IPY www.ipy.org).

The CAML coordinates over 200 researchers in 20 countries, in particular the seven South American nations through LA-CAML and the local NRIC. In cooperation with the Scientific Committee on Antarctic Research (SCAR www.scar.org) and IPY, CAML is coordinating marine biodiversity projects on 18 research vessels during the 2007/08 season. The dataportal SCAR-MarBIN www.scarmarbin.be is the regional node of OBIS for

Antarctica. Initiated by SCAR and CAML, this significant facility is now funded by the Belgian government until 2010, to provide a federative network for Antarctic biodiversity research.

In March 2007 the CAML celebrated the launch of IPY with the significant results of the first research voyage. The German icebreaker Polarstern showed that seafloor communities were already responding to the disintegration of the Larsen A and B iceshelves. Located on the Antarctic Peninsula, this region experiences among the most rapid rise in temperature on the planet. The world's media reported the findings in over 200 articles in 17 languages. An Education and Outreach officer will be coordinated by CAML on each voyage, to continue the publicity.

Close links with the Arctic biodiversity researchers in the Ocean Realm project ArcOD ensure that an "Ice Oceans" approach to ecosystems is promoted, in the spirit of IPY. A joint presentation from CAML and ArcOD will present the results to the CoML All Programs meeting in November.

Business in \$3.4 million partnership to support reef research under the CReef Project

Australia is particularly important to the CReef project having some of the healthiest and best managed coral reefs in the world. There are three CReef sites in Australia, two in the Great Barrier Reef and one on Ningaloo Reef, Western Australia.

BHP Billiton, the world's largest diversified resources company, the Great Barrier Reef Foundation and the Australian Institute of Marine Science (AIMS) have developed a partnership which will allow three Australian reef sites to be studied as part of CReef.

This \$3.4 million project, over four years, will enable marine scientists and taxonomists to collect and identify samples during a series of field trips to the Great Barrier Reef's Heron and Lizard Islands and Ningaloo Reef in Western Australia.

BHP Billiton's investment will support the documenting of coral reef biodiversity and identification of issues to be addressed to safeguard critical biodiversity heritage. This partnership delivers as substantial private funding input and this investment in this effort is both timely and important.

The partnership will see the implementation of an employee participation program for BHP Billiton staff who will actively engage in the research project by attending field trips and assisting with data collection. This initiative will give BHP Billiton employees the opportunity to learn about coral reefs directly from the experts.

Ocean Biogeographic Information System

The Ocean Biogeographic Information System (OBIS) is the key data delivery mechanism for CoML projects. DEW (National Oceans Office Branch) and CSIRO Marine and Atmospheric Research are joint node collaborators for Australia.

OBIS Australia will be delivering additional data points from the Australian region to the international OBIS node thus making this information publicly accessible. The datasets being published initially are largely records of fish and invertebrates.

Completion of a small grants program has resulted in additional datasets being made available for connection to OBIS by the Australian Antarctic Division and the West Australian Museum, and further CSIRO datasets are in preparation for connection to the system. "C-squares" web mapping services have continued to be provided to the OBIS International portal, with all "base level" International OBIS maps for any species, taxonomic group, or data source currently created on demand on the OBIS Australia server. An Australian mirror site for OBIS is undergoing final testing at OBIS Australia and is expected to be operational before the end of 2007. Work is

also continuing on the construction of a master species names list for OBIS Australia and International OBIS use that will improve the data flow of Australian museums and other data into the OBIS data network, by permitting marine species names to be distinguished from non-marine taxa in mixed lists.

North-west Australia deep water habitat discovery

The 2006 Annual Report referred to CoML Australia efforts to coordinate a voyage of discovery in the Australian region. To inform CoML Australia planning for a “Voyage of Discovery”, the Department of the Environment and Water Resources (DEW) collaborated with CSIRO Marine and Atmospheric Research in July 2007 to undertake a biodiversity survey of deep water habitats in the waters off North-western Australia.

This voyage “Exploring and characterising marine ecosystems of the NW Region” collected a wealth of information on the distribution of deep seabed habitats and benthic fauna in this relatively unexplored region. The information will contribute to a circum-Australia collection of deep shelf and slope benthic fauna that can be used to test hypotheses on the evolution and biogeography of Australia's biodiversity. It will also contribute to the validation and refinement of a marine bioregionalisation in this region.

A follow program / voyage of discovery clearly badged as a CoML initiative did not eventuate. Sloan Foundation funding was not available for this initiative and competing priorities of potential voyage collaborators did not allow a specific CoML-badged initiative.

2. COMMITTEE STRUCTURE, MANAGEMENT & INTERNAL COMMUNICATION

CoML Australia committee

The Oceans Policy Science Advisory Group (OPSAG), which is the Australian Government's marine science coordinating body, has shown its support for CoML Australia through agreeing to the formation of a sub-committee, consisting of CSIRO, the Australian Institute of Marine Science (AIMS) and Australian Bureau of Rural Sciences (BRS).

This sub-committee of OPSAG has been tasked with driving the broader CoML agenda in Australia, and facilitating CoML initiatives. This will allow CoML to take advantage of established OPSAG networks in engaging other agencies or industries in the CoML initiative. CoML International expects Australia to have a National Implementation Committee. In considering their involvement in moving the CoML agenda forward, it is anticipated that the sub-committee will investigate the best mechanism to meet this need.

The CoML subcommittee of OPSAG will assist in identifying a new chair and membership, current membership of CoML Australia was appointed on a two year, which has now expired.

Support for the subcommittee's operation to be provided jointly by several agencies / research institutions. The Australian Government's Department of the Environment and Water Resources (DEW) continues to provide the chair and secretariat support in the interim.

3. 2007 EDUCATION & OUTREACH EFFORTS

The CoML Australia initiative supports the concept of making data and information more widely available and provides other opportunities for adding value in the marine research field. The information collected through this initiative will contribute to building a clearer picture of marine life within the Australian region.

The Chair of CoML is a member of the Australian Government's Oceans Policy Science Advisory Group (OPSAG). CoML initiatives are regularly discussed through that forum. OPSAG is contributing to CoML through a coordinating subcommittee.

The CoML Australia website has been a communication tool for CoML initiatives. The website is currently down, but it is anticipated that it will be upgraded when the CoML Australia committee is reinvigorated.

Media events / releases promoting CoML initiatives include the GBR Seabed Biodiversity Project and the CReef funding partnership with BHP Billiton. The BHP Billiton contribution includes an education and outreach program for its employees.

Great Barrier Reef Seabed Biodiversity Project, has been very successful in inspiring the community through regular press releases and an educational website: <http://www.reef.crc.org.au/resprogram/programC/seabed/index.htm>.

CoML international initiatives are regularly publicised in Australia through the AIMS and the Australian Antarctic Division's website.

OBIS Australia will be delivering additional data points from the Australian region to the international OBIS node thus making this information publicly accessible. The datasets being published initially are largely records of fish and invertebrates. Researchers are encouraged to visit the OBIS Australia website (<http://www.obis.org.au/>) and explore ways to contribute information and to use this comprehensive data resource.

4. GEOGRAPHIC EXPANSION

In the previous Annual Report CoML Australia identified deep water habitats off north-western and north-eastern Australia as priority areas for exploration. A major survey of across the continental slope of north-western Australian waters in 2007 by CSIRO has substantially added to knowledge of this area. Deeper waters off north-eastern Australia remain a top priority for collaborative research.

5. PARTNERSHIPS & COLLABORATION

a. Partnerships

Organization Name	Point-of-Contact (Name)	Nature of Relationship
CRC Reef Research Centre	Dr Roland Pitcher (CSIRO)	CoML affiliated project
Oceans Policy Science Advisory Group	Dr Ian Poiner (AIMS) Dr Stephen Bygrave (BRS) John Gunn (CSIRO)	Support and advice

b. Links to CoML Ocean Realm Projects

Project Name	Liaison or Cross-over personnel	Nature of Relationship
Census of Antarctic Marine Life (CAML)	Prof Michael Stoddart and Dr Vicki Wadley	Regular liaison and exploration of program linkages

Census of Coral Reefs (CReef)	Dr Ian Poiner	Regular liaison and exploration of program linkages
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c. Links to other CoML National and Regional Implementation Committees (NRICs)

NRIC	Liaison or Cross-over personnel	Nature of Relationship
Indonesia	Through CoML Indonesia	Involvement in review of biodiversity of Arafura and Timor Seas in association with CoML Indonesia and Timor Leste and Papua New Guinea
USA	Mark Fornwall	Discussing linkages between OBIS nodes in the US, Australia and New Zealand

d. Liaisons to CoML Cross-Cutting Groups

Project Name	Liaison Name & Institution	Nature of the Relationship
OBIS	Alicja Mosbauer, DEW Tony Rees, CSIRO Marine and Atmospheric Research	OBIS AU Regional Node Manager OBIS International Steering Committee
HMAP	Neil Klaer, CSIRO Marine and Atmospheric Research	CoML Australia member
FMAP		
SCOR Tech Panel	John Gunn, CSIRO Marine and Atmospheric Research	Member of Oceans Policy Science Advisory Group
E&O	Andrew Zacharek, DEW	CoML Australia Secretariat
Barcoding	Dr Robert Ward, Dr Ian Poiner, CSIRO Marine and Atmospheric Research	Chair FISH-BOL CoML SSC member

e. Effectiveness of the Partnerships and collaborations

Future Plans for Expeditions and Analysis: CoML Australia

Future Plans for expeditions and analysis will be determined by the reconstituted CoML Australia Committee. Activities will include continued Australian participation in Census of Antarctic Marine Life and CReef Ocean Realm projects, continued development of a Regional Australian node for OBIS and other activities identified by CoML Australia Committee.

Report from the Canadian Census of Marine Life

National Regional Implementation Committee

The national steering committee to help organize and direct Canada's research efforts on Census of Marine Life issues, is currently chaired by P. Snelgrove and includes representatives from academia, DFO, and other agencies. The committee was formed in the Fall of 2002 and was charged with developing a proposal strategy over the ensuing months in consultation with other members of the scientific community. Unfortunately, the funding climate in Canada during the following few years was not strong, and there were no opportunities to develop a major national initiative as envisioned by the steering committee. Thus, the Canadian NRIC has operated since that time without funding, and efforts within Canada with respect to the Census have focused on smaller initiatives developed by subsets of the NRIC and other dedicated individuals. A proposal to the Natural Sciences and Engineering Research Council of Canada (NSERC) to form a national marine biodiversity network (see below) only became possible within the last year, and if that proposal is funded Canada will actually have administrative support and a secretariat to formally engage with CoML. For the time being, the Canadian NRIC therefore offers an "Executive Summary" of CoML-relevant activity within Canada.

The current report focuses primarily on activities in Atlantic Canada. Although there are major activities across Canada in terms of Census projects such as POST and FMAP, initiatives that are linked to the Canadian NRIC have evolved more quickly in eastern Canada as a result of several opportunities, key individuals, and the Centre for Marine Biodiversity. The development of a west coast counterpart to CMB named Pacific Marine Analysis and Research Association (<http://www.pacmara.org/>) may provide new opportunities for Census activity and the pending NSERC Network proposal would ensure coordinated activities in the Canadian Pacific, Arctic, and Atlantic.

The Discovery Corridor Initiative

The Discovery Corridor Concept and its Applicability to the Gulf of Maine

A biodiversity discovery corridor is defined as a swath of ocean bottom and the water column above it, encompassing a variety of ecologically interlinked seascapes or habitats that may support a range of biodiversity and previously unknown species and processes. Corridors represent connected areas and locations, a variety of seascapes, a range of productivity, gradients in physical environment and disturbance, the ability to study scaling of processes within boundaries, cross-

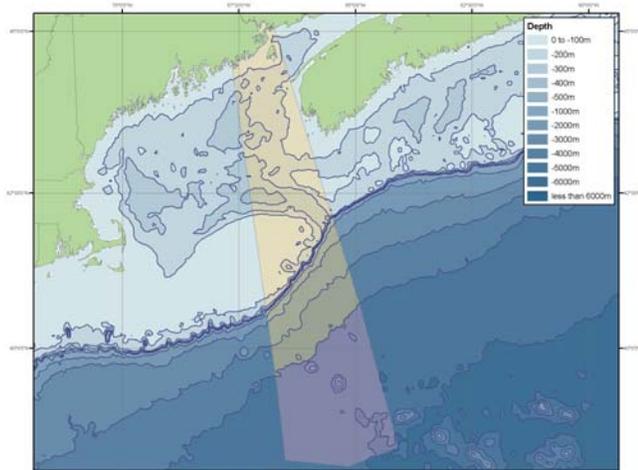


Fig. 1: The Gulf of Maine Pilot Corridor in relation to general bathymetry

disciplinary potential, and the focusing of research efforts.

The Gulf of Maine Pilot Corridor developed through several regional workshops held from September 2003 to October 2004, contains diverse biogeographic regions (*Fig. 1*), potential for Canadian and US research involvement, significant existing data, considerable outreach potential, and important management linkages. This initiative, which has now linked to the Gulf of Maine Project, was spearheaded by the Centre for Marine Biodiversity, which is housed within Canada's Department of Fisheries and Ocean. Through the leadership of DFO scientists and opportunities to utilize DFO oceanographic vessels, and the complementary efforts of academic scientists at Atlantic Canadian universities to secure additional operating funds, several successful research cruises have focused on the Discovery Corridor and adjacent areas of the Atlantic Canada continental slope.

A Discovery Corridor Workshop (St. Andrews, NB, Canada, March 2007), reported on preliminary results and ongoing analyses of cruises conducted in 2005 and 2006, and provided a forum to discuss ecological informatics infrastructure for the Discovery Corridor initiative covering curatorial practices and linkage to Barcode of Life programs in Canada, and Canadian OBIS. (Program principals: P. Lawton (Chair, Discovery Corridor Steering Committee), P. Snelgrove, E. Kenchington, A. Metaxas, B. Branton, L. van Guelpen, G. Pohle, A. Cooper). This workshop helped to maintain a focus on the Discovery Corridor and to link PIs working in the region.

Canada's Discovery Corridor – E&O Summary

The major E & O effort from Canada's Discovery Corridor project was to popularize the project in Canadian Department of Fisheries and Oceans publications, regional print media, and video media.

"Revealing a Hidden Realm - Canada's First Marine Biodiversity Corridor" was produced in-house at DFO, featuring both coastal (diving-based) and offshore (ROPOS deepwater ROV) footage from project activities conducted in 2005-2006. The DVD was presented at a national DFO Science meeting in Nov. 2006, to various regional science, public and educator meetings in 2007. Three downloadable versions of the DVD (different resolutions) were recently placed on the Centre for Marine Biodiversity [web site](#).

There has been considerable interest in using excerpts from the video. The Montreal Science Museum is using a 3-minute segment profiling the ROPOS for a new display on Canadian technological innovation. The Ontario Science Museum has been provided with a copy of the DVD and may use this in a new deep ocean science exhibit.

The DVD was designed with the informed public in mind, but principally directed at science managers. The DVD has been used in several national (broad-spectrum) science and technology forums. Copies will be available at the OBI 07 conference in Halifax, and the video will also form part of a display at the upcoming public open house at the Bedford Institute of Oceanography.

Other Discovery Corridor products include:

Lawton, P. 2007. **What Lies Beneath: Exploring the Gulf of Maine Biodiversity Discovery Corridor**. Gulf of Maine Times Vol. 11(2), p. 7. Contribution to Science Insights Section.

2-page article on the Discovery Corridor produced for public display area at DFO's Biological Station, and the Huntsman Marine Science Centre, Saint Andrews, NB.

Discovery Corridor products in progress:

Through 2007, discussions have been underway between P. Lawton and P. MacWhirter (artist and independent film producer based in Halifax, NS, and a participant on the 2006 ROPOS cruise) on production of a 1-hr long documentary film on the Discovery Corridor, as a lens through which to communicate various aspects of the CoML research in the Gulf of Maine area. We anticipate a formal proposal to be developed by the end of 2007. MacWhirter has also proposed a second 1-hr film, which would build from the corridor/Gulf of Maine area focus of the first production to incorporate aspects of the international realm projects. As the GoMA project develops its renewal proposal to Sloan we will include consideration of these film production proposals. Depending on outcomes of discussion, the GoMA project may act as a sponsor of the film proposal from MacWhirter, through an independent proposal he may submit for funding consideration by Sloan.

The Discovery Corridor concept has been incorporated into a new national Canadian research proposal on marine biodiversity described below. This multi-investigator proposal (42 academic investigators; 25 DFO investigators), if funded, will conduct research across Canada's three oceans and expand the Discovery Corridor concept to the Pacific and Arctic Oceans.

Ocean Tracking Network

The Ocean Tracking Network (OTN), led by Ron O'Dor, was created by the Canada Foundation for Innovation's recent commitment of \$35M to an International Joint Venture Project. The OTN will make Canadian technology the standard for the Intergovernmental Oceanographic Commission's Global Ocean Observing System for acoustically communicating, free-standing observing nodes that record the passage of animals tagged with unique acoustic codes, as well as physical and chemical information about the water the animals experience. Nodes relay information acoustically through seawater or transfer information to satellites and cabled systems like NEPTUNE. They can be located on the sea bottom, buoys, gliders and large animals. The CFI OTN project envisions a global system of nodes transferring information about ocean inhabitants and conditions the way BlackBerries store and transfer information about human activities. Partners around the world listed in the table below have committed over \$100M to deploy the CFI and keep it operational as an IOC GOOS Pilot Project.

NSERC has committed an additional \$10M to maintain the Canadian Ocean Tracking Network (COTN) to test cutting-edge technologies in the Arctic, Atlantic and Pacific "Arenas", to inform researchers and students about Canada's three oceans and keep Canadians at the forefront in developing new ways to use the system. Two existing Census of Marine Life projects in the Pacific Arena provide advanced knowledge, trained personnel and tested technology to allow rapid advances. Dozens and perhaps hundreds of highly migratory species from juvenile salmon to blue whales will reveal the secrets of their habitats and interactions, expanding our knowledge of ocean ecology, identifying conservation areas and creating the basis the Department of Fisheries and Oceans needs for Ecosystem Based Management of ocean

resources. Regional researchers will conduct similar ecosystem studies in the Atlantic and Arctic Arenas with additional focuses on specific technologies – automated synchronous oceanography and ocean models on the Halifax Line and free-ranging glider and “bioprobe” nodes under the Arctic ice.

Each Arena will develop special areas of excellence for new approaches that will be incorporated into the global system as it develops. Based on the large existing tagging programs and databases of the COML’s Tagging of Pacific Predators (TOPP) and Pacific Ocean Shelf Tracking (POST) projects, the Pacific Arena will focus on interactions at oceanic biodiversity hotspots, oceanic models and dynamic data display. Cooperative projects with NEPTUNE and VENUS will develop the capability for real-time monitoring by linking OTN nodes to their extensive cable systems. The Atlantic Arena will focus on oceanographic data needed to improve coastal oceanographic models in collaboration with DFO. Curtains in the Arctic Arena will monitor 20-year coded tag movements as animals change their migrations in relation to climate. Both bioprobes and gliders will be tested to gather information about conditions and species under the ice.

NAGISA Atlantic Canada Regional Office

An Atlantic Ocean (AO) regional office of NaGISA was formally established in January 2007 (<http://www.nagisa.coml.org/region/ao/atlantic>), with the Huntsman Marine Science Centre in St. Andrews, New Brunswick, taking on the role of coordinating and participating in NaGISA activities. The regional PI and manager are Gerhard Pohle and Lou Van Guelpen, respectively. The AO office is one of 10 regional offices (<http://www.nagisa.coml.org/jurisdiction>) world-wide with coastal waters of the Northwest Atlantic and western Africa within its area of mandate. In 2007 activities focused in getting partnerships and monitoring sites up and running.

Key accomplishments included:

- the establishment of key science US-Canada partnerships with Suffolk University (Thomas Trott), University of Southern Maine (Lewis Incze), Department of Fisheries and Oceans (Peter Lawton), University of New Brunswick (Gary Saunders) and Acadia University (Glenys Gibson);
- securing funding for scientific activities from agencies (HMAP-HNS, New Brunswick Environmental Trust Fund; Department of Fisheries & Oceans);
- outreach activities to high schools and scientific meetings (e.g. Biodiversity Corridor Workshop);
- the determination of three monitoring sites based on pilot field work, completion of field work at sites in US and Canada, combined with an on-site protocol training workshop, R. Rigby from NaGISA HQ instructing. Laboratory sample analysis is currently underway.

Graduate and undergraduate students, technicians and scientists partook in field and lab activities on both sides of the Canada-US border. This work will result in the generation of important baseline information from the nearshore within the Gulf of Maine, to be used for hindcasting analyses using historical data (HNS, Suffolk and Acadia universities) and for

comparison when re-sampling in the future. Data will form a key component from Canada for a global synthesis planned for 2009-2010.

UPCOMING CENSUS-RELATED WORKSHOPS

OBI07 Workshop (hosted at Bedford Institute of Oceanography)

The Centre for Marine Biodiversity and the Bedford Institute of Oceanography (BIO) will host the Ocean Biodiversity Informatics (OBI) International Conference on Marine Biodiversity Data Management at the Main Auditorium of the Bedford Institute of Oceanography, Dartmouth, N.S., Canada, on October 2-4, 2007.

This conference is co-organized by International Ocean Data and Information Exchange (IODE), the International Council for Exploration of the Sea (ICES) and the Ocean Biogeographic Information System (OBIS) and is intended to focus on biological data quality issues and the value of cross-disciplinary interchange.

Overall facilitator for the conference: Bob Branton, Registration: Victoria Clayton, Publications: Tana Worcester / Mary Kennedy

Seamount Ecology Workshop

Funding (\$25K) to hold this workshop has been provided through DFO's International Governance of High Seas Fisheries - High Seas Unfunded Science Priorities Component.

This is intended to be scoping workshop:

- To review current status of knowledge on seamount systems in the North-west Atlantic;
- To identify unresolved science/management issues which might require a response by the Canadian marine science community, potentially working in collaboration with US researchers;
- To inventory appropriate scientific resources (research groups, vessel platforms, survey technologies) and planning forums/timetables implicated in conducting new research on one or more seamount systems.

The workshop is proposed to be held at the Bedford Institute of Oceanography, Dartmouth, NS (George Needler Boardroom) in January 2008. The workshop will involve one full day (08:20 – 17:00) followed by a half day (08:20 – 13:00). This will allow travel the day prior, and return on the third day (2 night's accommodation). Assuming three ½ d sessions:

A list of potential invitees was developed from initial contacts during proposal development and suggestions that came in for additional experts to invite. The current plan includes 19 names of which 7 are Canadian government; 6 Canadian University/NGO; 2 US Government; and 4 US University/NGO.

The administration of the workshop will be undertaken through the Centre for Marine Biodiversity. Victoria Clayton, Administrative Officer for CMB will coordinate the local arrangements and travel approvals/claims. The organising committee for the workshop includes: Peter Lawton (Chair), Victoria Clayton (Administration), Lou Van Guelpen, Paul Snelgrove, Ellen Kenchington

PENDING INITIATIVES IN SUPPORT OF CoML

Scientific Criteria for Conservation & Sustainable Usage of Marine Biodiversity in Canada's Oceans

A proposal to the Natural Sciences and Engineering Research Council of Canada (NSERC) led by P. Snelgrove, P. Archambault, K. Juniper, A. Metaxas, D. Schneider and V. Tunnicliffe (Submitted May 2007 for November 2007 decision)

In 2000, the Department of Fisheries and Oceans (DFO) established the Centre for Marine Biodiversity (CMB) to address biodiversity issues. A workshop in 2002 included scientists from DFO, other government agencies, and universities to identify broad objectives for Canadian research in marine biodiversity and conservation. A report entitled “Three Oceans of Biodiversity: A Canadian National Plan 2004-2009” was the major output of that meeting. Subsequently, P. Snelgrove (MUN) and M. Sinclair (BIO/DFO) co-organized a workshop (Ottawa, October 2004) of 55 participants that included many highly-regarded Canadian marine ecologists to plan a coordinated program for Canada in the international initiative Census of Marine Life (CoML). Funding for the workshop was provided by an NSERC Special Research Opportunities Grant, the Department of Fisheries and Oceans (DFO), and the Alfred P. Sloan Foundation. The agenda included a historical context of marine biodiversity initiatives in Canada, presentations on current CoML-related projects in Canada, and group discussions to identify research priorities for a major new initiative that would represent collaborative research between university and government scientists. Efforts to develop a major proposal were delayed by a moratorium on major new NSERC initiatives, although smaller projects (2-4 PIs) based on these activities are underway. In spring 2006, a subset of university and DFO scientists from the Ottawa workshop (the lead PIs on this proposal – Snelgrove, Archambault, Juniper, Metaxas, Schneider, Tunnicliffe) submitted a pre-proposal to NSERC, based on the research themes identified in the earlier workshops, in June 2006. That preproposal was one of 14 submissions from across Canada in all sciences approved to move to a full proposal, which is summarized below. If this proposal is funded it will represent Canada’s core activity in the Census of Marine Life through 2010 and beyond, and will provide a secretariat for the Canadian NRIC.

The Canadian Healthy Oceans Network is a proposed strategic partnership between university researchers and government – predominantly Fisheries and Oceans Canada (DFO). CHONe (pronounced Ko-Nee) is also a marine worm that occurs in all of Canada’s three oceans and characterizes healthy benthic habitats. This network is about aligning Canadian marine science capacities to respond to research challenges and knowledge gaps in frontier oceanic environments. In developing this proposal, we have convened Canada's leading marine scientists to define the set of research challenges, and identify research activities through which this community can commence working towards national outcomes.

CHONe will address a need for *scientific criteria for conservation and sustainable use of marine biodiversity resources*. The research themes (Figure 1) have three broad foci: Marine Biodiversity, Ecosystem Function and Population Connectivity. Multiple themes will be present in each of Canada's three oceans. The scientific objective of **Theme Marine Biodiversity** is to *understand functional and species biodiversity in*

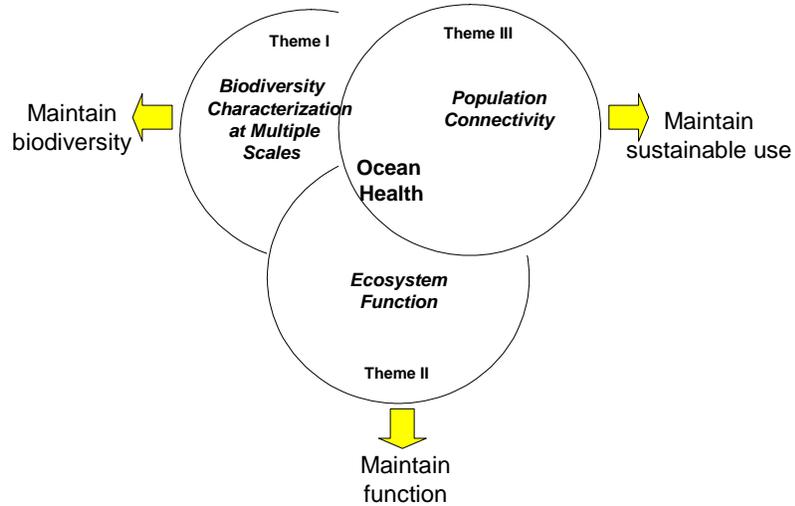


Figure 1. Schematic representation of CHONe themes and structure

relation to habitat diversity. Specific goals are to (1) Test hypotheses that link functional and species biodiversity to habitat diversity especially in frontier areas such as the Arctic and deep water; and (2) Explore diversity at multiple taxonomic levels (including cryptic diversity) and as a function of time as revealed by genetic barcode and morphological data. Within this goal, we will establish benchmarks in biotic diversity at key locations in the ocean prior to expected changes in ocean chemistry and climate, characterize cryptic diversity, and uncover ecological and evolutionary relationships of organisms to understand how biodiversity of Canada's Oceans has changed over evolutionary time and may change in the future. The scientific objective of **Theme Ecosystem Function** will determine how ecosystem function and health link to biodiversity and agents of disturbance, including natural and anthropogenic sources. Specific goals are to (1) Understand and predict the role of biodiversity in marine ecosystems by quantifying links between biodiversity and ecosystem function measures, and to provide predictive models to help minimize anthropogenic impacts on ecosystem services and health; and (2) Provide quantitative tools for managing ecosystem health such as survey tools to collect data more efficiently, and new tools for ecosystem modeling and design of conservation strategies. The scientific objective of **Theme Population Connectivity** is to *understand how dispersal influences patterns of diversity, resilience, and source/sink dynamics of species and communities*. Specific goals are to (1) Evaluate the role of larval dispersal in regional source-sink species dynamics using existing management areas as model systems. Within this goal, we will determine how the movement of reproductive propagules, which represent the major dispersal phase for many marine organisms, influences the geographic distribution of populations; another aspect is to establish which of these metapopulations are the major suppliers of successful recruits to future generations; and (2) Compare estimates of metapopulation connectivity of marine populations using different metrics of larval dispersal potential. Within this goal we will compare multiple metrics of dispersal to evaluate their relative strengths and weaknesses, and combine studies of biology, physics, passive tracers, genetics, and statistical modeling to understand how metapopulations of key species are interconnected. Finally, **Ocean Health Integration** will assemble the outcomes of each of the

goals to draw a synthesis across the Network. Throughout the lifetime of the Network, data and models will feed across themes to build an interactive process of inquiry.

The overall approach requires interaction with an alien environment, often in the poorest known regions of Canadian waters. Canada is a world leader in ocean technology. We will push that technology to the limits to explore our frontiers and to implement manipulative studies. We will use ships, submersibles, seafloor observatories and feet on the seashore. Our students will be foremost among those explorers as we train a new generation of marine scientists and learn from them about Internet interactivity to maintain a true Network. Data integration will feed modeling projects that will also guide initial sample designs. Novel tools will be tested across themes and deployed in later stages.

Fully engaging CHONe network participants in major expeditions into frontier oceanic environments will logically follow if this proposal is funded. From coastal to shelf break to Arctic environments, we have described an initial research program that we can deliver only through CHONe. Nonetheless, with CHONe in place, our scientists will be well-positioned to respond to additional strategic national and international opportunities related to issues such as coastal development, Arctic sovereignty, deep ocean resources, and climate change, and to secure additional funding to expand the research approaches articulated in this proposal.

A summary of the proposed budget is provided below, and includes cash and in-kind contributions from partner organizations. The total cost of the project will exceed \$8.6 million over its 5 year lifetime. There are additional contributions in the form of oceanographic equipment and space that are not included in the budget projections but would add another ~ \$1 million to the total.

(A summary of the proposed budget is available upon request.)

Cross-shelf Barriers to Gene Flow in Ecologically Important Species

A proposal to the Department of Fisheries and Oceans led by Dr. E. Kenchington and Prof. P. Bentzen. In addition to 20k of in-kind support from Dalhousie and ~\$40k in ship time from DFO through the CHONe network (see above), this proposal seeks \$25k/year from DFO for operations and materials.

ArcticNet II LOI on Arctic Benthic Biodiversity and Human Impacts

This letter of intent co-led by P. Archambault and J. Juniper, will be related to the CHONe proposal described above and to CoML. They propose to undertake a research program that will, i) describe and compare the biodiversity and secondary productivity of benthic community in areas of enhanced and reduced (“hot spots” and “cold spots”) productivity and diversity, ii) establish a clear baseline against which to judge future change from anthropogenic activities and reduction of ice cover, iii) identify potential sentinel sites for the establishment of benthic monitoring programs, and iv) document the past ecological changes through chemical and geological signatures and marine carbonate skeletons in sediment deposits.

Caribbean Regional Implementation Committee

Chairperson

Patricia Miloslavich

Universidad Simón Bolívar

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AUGUST 2007

1. 2007 ACCOMPLISHMENTS & SCIENTIFIC HIGHLIGHTS

NaGISA: (Responsibles Patricia Miloslavich and Juan Cruz, USB, Venezuela)

Three NaGISA workshops took place in 2006 involving the Caribbean researchers, two joining the Caribbean-South American regions and one in the Indian Ocean

1. January: Universidad Simón Bolívar, Venezuela: Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Jamaica, Peru, Uruguay, and Venezuela. Instructors: Brenda Konar and Patricia Miloslavich
2. June: Discovery Bay Marine Laboratory, Jamaica: Jamaica, Curacao, Trinidad, San Andrés Island (Colombia), Venezuela and Chile. Instructors: Juan José Cruz and Norman Quinn.
3. June: KEMFRI (Kenyan Marine Fisheries and Research Institute Mombasa, Kenya: Kenya, the Seychelles, Tanzania and Zanzibar, Mauritius, Mozambique, Egypt, South Africa, India, Comoros. Instructors: Patricia Miloslavich and Edward Kimani.

Several abstracts and papers were submitted to the NaGISA World Congress held at Kobe, Japan in October 2006, some of these papers are now in press at the Journal of the Seto Marine Laboratory, Japan. Other publications are 2 chapters and one box in “National Geography in Shore Areas (NaGISA) Practical Guide to Coastal Ecological Sampling”. In press. Kyoto University Press

The Venezuelan NaGISA team (P. Miloslavich and J.J. Cruz) submitted a grant to Chevron seeking for funds to carry out the NaGISA protocol as a marine biodiversity monitoring program in the east region of the Venezuelan coast, which was approved for 2007 -2009 (Amount: \$ 645,000). Chevron had already granted the Venezuelan team an amount of \$5,000 in 2006.

TO DO: Involve more countries in the region (Central America and the north of the Caribbean), as well as in the Gulf of Mexico. Mexican institutions will be consulted thru Elba Escobar and Unai Markaida. The idea is to write joint, regional proposal to obtain funds (main limitation for laboratory work).

OBIS: (Responsibles Adriana Gracia and Julio Bohorquez, INVEMAR, Colombia)

The “Sistema de Información de Biodiversidad Marina” (SIBM) of the Museo de Historia Natural Marina de Colombia (MHNMC) at the Instituto de Investigaciones Marinas y Costeras (INVEMAR), Santa Marta, made an agreement with CoML-Caribbean to incorporate the SIBM database into OBIS by:

- (1) Georeferencing the collections of fishes, mollusks, echinoderms and cnidarians of the MHNMC
- (2) Establishing and generating the software filters required to select the biological records that will be made available to the OBIS users, using a client server connected to INVEMAR.
- (3) Developing the necessary software to integrate the SIBM system to the OBIS network in consultation with user groups.

For this, a temporal coverage between 1956 and 2007 was obtained, representing about 2.350 species with 16.661 distributional records for fishes, mollusks, echinoderms and cnidarians. The habitat coverage includes seashores (littoral), sublittoral seabed, mangroves, seagrasses, coral reefs, azooxanthellate coral communities, and continental margin soft bottoms. In the System, data bases in multimedia electronic format of the species stored in the MHNMC, as well the related information of their capture and identification according to standards already established, are combined. The SIBM is a key tool of access to scientific, technical and public levels on the marine and coastal Colombian biodiversity. This is a model of a Caribbean database accessible on-line and demonstrably useful

integrated to OBIS. INVEMAR presented a proposal to the CoML-Caribbean for a second phase of the project which will include crustaceans and algae. This proposal has been approved by the SSC and will be funded by CORE.

We have also established a first contact with the Mexican database UNIBIO of the Universidad Nacional Autónoma de México (UNAM) through its director Dr. Tila María Pérez Ortiz. The person at the UNAM that will coordinate a proposal to join the UNIBIO to OBIS is Dr. Fernando Alvarez Noguera. In Venezuela, the collection of the Agenda Morrocoy, inter-institutional, multidisciplinary project 2000-2003 will be incorporated to OBIS. At this moment, the datasheets of molluscs and small crustaceans (peracarids) are almost ready to be sent to the Southamerican OBIS node (F. Lang). Other identified databases in Venezuela potentially to be incorporated to OBIS are from the Orinoco Delta and the Atlantic Front.

TO DO:

- To continue strength the MHNMC collection (→ biodiversity projects).
- To continue integrating information of MHNMC to SIBM → OBIS (e.g. crustaceans, bryozoans, sponges, worms, platyhelminthes, macroalgae....).
- To get funds in order to strength the system.
- To achieve new developments to SIBM database.
- To support (technical) national and international institutions in integrating information to OBIS → Methodology.
- To get funds in order to develop “CMAR C-Squares Mapper for plots dataset in maps” in SIBM-OBIS database
- To integrate OCEANOGRAPHIC DATASETS of Invemar (REDCAM, Manglares, etc.) to brand new OBIS proposals.

Urgent need: To identify more databases in the Caribbean and put them in digital format (most are in hardcopy format, and without GIS specifications).

HMAP: (Responsibles Andrzej and Magdalena Antczak, USB, Venezuela)

Edition of the proceedings of the Workshop Early Human Impact on Mollusks workshop (EHIM) held at Isla de Margarita, Venezuela. September, 2005. Andrzej Antczak and Roberto Cipriani (eds) (USB). British Archaeological Report Series, Archaeopress, Oxford. Countries: Japan, New Guinea, India, South Africa, Brazil, Chile, Venezuela, Panama, USA, Canada, Denmark, England and Israel. (17 papers).

Preparation of proposal and its presentation at the HMAP-PI meeting (Roskilde University, Denmark February 2007): EHIM Global Initiative Project. A. Antczak, R. Cirpiani, M.M. Antczak

Objectives: to integrate, standardize and synthesize the data on early human impact on marine mollusks in a global perspective. This project argues that sustained efforts of interdisciplinary teams that may fully address mollusc exploitation in a historical perspective will allow formulating new hypotheses, generating explanatory models, and provide independent means to test and assess generalizations about the status of natural populations of molluscs before, during and after the long standing prehistoric harvesting. To assist the scientists and students around the world interested in the above mentioned themes, they introduce HMID (Human/Molluscs Interaction Database), the product of the CoML-HMAP programs, that consists of a WWW-available, WIKI, peer-reviewed, professionally maintained, free public accessed, worldwide referenced and comprehensive database, containing high quality historical data, descriptions, and interpretations of worldwide events, patterns, processes, and products resulting from the interactions between humans and molluscs through time.

CARICORAL (Responsibles Ernesto Weil, Puerto Rico, Carolina Bastidas, Venezuela, Jorge Cortés, Costa Rica)

Dr. Ernesto Weil, Universidad de Puerto Rico and Dr. Jorge Cortés, Universidad de Costa Rica have acted as consultants to the Coral Reef Project of the CoML. We aim to include the Caribbean at long term in the larger proposal. At the SSC-Caribbean NRIC at Panama, the CARICORAL team have formulated a plan of action to validate and synthesize the existing reef literature in the region and established a potential budget of \$50,000 to carry out this plan:

1. Update and summarize available taxonomic information in the region

2. Digitize all information (after reviewed and summarized and synonymies clarified. Produce electronic database (OBIS).
3. Use this information to identify taxonomic gaps (the unknown - which groups are understudied).
4. Design approach to do a rapid and efficient census/sampling to increase our knowledge of the unknown and produce updated species lists of these groups for the wider Caribbean

The expected outcomes of this project are:

1. Updated reference list, including gray literature, in digital format to be available in the CoML webpage.
2. Updated list of Caribbean coral reef taxa – verification of doubtful species – synonymies, etc.
3. Incorporate all data that is geo-referenced into OBIS – those records that have taxonomic verification and GIS coordinates.

The CARICORAL team prepared a short sub-proposal to the SSC, in which these objectives and activities will be carried out in two countries, Venezuela and Costa Rica and will include as taxonomic groups the corals, molluscs, sponges (for Venezuela) and corals and probably echinoderms (for Costa Rica). This sub-proposal had a first approval by the SSC and is under revision.

CoMarge: (Responsible Elba Escobar-Briones, UNAM, Mexico)

- E. Escobar Briones and Myriam Sibuet have established an action plan between CoMarge-UNAM:
- Link the database from Caribbean Sea and Gulf of Mexico (Intra-Americas Sea)
 - Available data from cruises
 - Published data
 - Report data
- Participation in workshops
 - 2007 large scale / 2008 small scale
- Discuss future cruises in the Caribbean Sea and Gulf of Mexico (Intra-Americas Sea)

- Contribute to taxonomic workshops and expand to CEDAMAR and other programs (Eg. Scientific Experts' Workshop on Biogeographic Classification Systems in Open Ocean and Deep Seabed Areas Beyond National Jurisdiction, January 2007, Mexico)

ICOMM (Responsible Felipe Artigas, UDL, France)

Felipe Artigas has been moving forward the implementation of a Latin American and Caribbean ICoMM (LACAR- ICoMM): Puerto Rico, Mexico, Colombia, Venezuela, F. Guiana. Their discussions have been focused on:

- Identification on possible complementary know-hows, connections and possibilities of working together in common projects to be proposed.
- The need to focus on human resources and capacity building. Workshops, master classes, technical classes are to be encouraged (marine microbial experts from both our region and from abroad to come to our laboratories to share their knowledge and methodologies, as well as their experience).
- Organization of an International meeting on Marine Microbial Ecology and Biodiversity in Latin America and Caribbean Sea, to further the idea of integrating marine microbial knowledge in both regions.

TO DO:

The ICoMM group also discussed about the possibility of including sampling for microbial diversity analysis in different already existing projects, as well as the possibility of identifying a cross-region and basin-scale program that could answer an important scientific question : influence of South American Continental Inputs (Amazon and Orinoco estuaries) in structuring Caribbean ecosystems (both pelagic and benthic) and in defining dynamics of marine microbes (primary producers, micro-heterotrophs) within these ecosystems and food webs. Variability of this influence in a perspective of a Global Change? The group also envisions to include this initiative in the CLME GEF program and in a more biodiversity study in this cross-region basin-scale section, from Brazil to the Gulf of Mexico?

CAML (Responsible Patricia Miloslavich)

The Venezuelan government is advancing an agreement with the Uruguayan government for a joint expedition to the Antarctica. In December 2006, the CoML was invited by the Venezuelan army to join the expedition on board the Uruguayan vessel “Vanguardia”, however, this expedition was not a reality. This year, these two entities are working together again to organize an expedition in December 2007. Venezuela will participate in the CAML workshop that is going to be held in late September at Brazilia, Brazil.

Ocean Tracking Network (Responsible Unai Markaida, CFS, Mexico)

TO DO:

Establish a formal link to the OTN in Mexico (Colegio de la Frontera Sur, Unai Markaida) and Cuba (Universidad de la Habana, Manuel Ortiz)

Possible locations of coastal curtains of hydrophones to detect fish and vertebrate migrations from the Caribbean and the Gulf of Mexico (between Cuba and Yucatán Peninsula and between Cuba and Florida).

Other activities and initiatives of the Caribbean NRIC:

(1) Support of the project: **Electronic Guides with databases on neotropical fish identification, biology and zoogeography**. Ross Robertson (STRI) and Juan Posada (USB, Venezuela).

Goal: to have a complete survey of fishes by sampling remote and unexplored zones in the greater Caribbean, accessed by the web.

Guide to Eastern Pacific fishes: ready, available by CD and the web.

Caribbean: working on field trips (Venezuela/Cuba). Scanning of all literature and georeferencing collections. Ready probably in about 1 year.

The main questions of this project are:

How does species richness vary throughout the region? How much variation in a biogeographic zone?

Where we need to look (Deep, Islands, Unusual Shallow environments)

Need of funds to digitalize literature and georeference collections.

(2) Initiated contact with “**The Coastal Zone Management Unit**” (Barbados), which was established in 1995 with a long-term objective to develop and implement a Coastal Zone Management Plan for the Island. The projects of the MRS (Marine Research Section) potentially linkable to CoML:

- Temporal Changes in Coral Reef Communities
- Coral Bleaching & Mortality Study
- Coral Disease Study

The linkages with CoML can also assist in increasing our knowledge base of coral reefs & associated ecosystems (eg. NaGISA).

(3) **Establishment of partnership with the CLME:** The Caribbean Large Marine Ecosystem (CLME) Project: Engaging Partners for Effective Transboundary Living Marine Resource Governance. The areas (subprojects) in which there is a potential partnership to CoML are:

- Biological cycling of flying fish in the Lesser Antilles(CRFM)
- Pan-caribbean lobster fishery in Central America Concern in adult and larval dispersal (identification of larvae is an issue) (OSPESCA)
- Reef fisheries resources in Central Caribbean (Jamaica, Haití, Dominican Republic) and the archipiélagos of San Andrés and Providencia).

This last subproject has a potential direct link to CARICORAL. Juan Manuel Díaz (Humboldt Institute, Colombia) participated in the CLME meeting held at Cartagena, Colombia (June, 2007) to better define the letter of agreement between both entities (CLME and CoML-Caribbean).

(4) **Participation in the 59th Gulf and Caribbean Fisheries Institute Meeting**, held in Belize (November 6-10, 2007). Special Session: Historical Perspectives for Gulf and Caribbean Fisheries. Abstract presented: A contribution to the history of marine turtle exploitation in Venezuela, by Antczak et al.

(5) **Organization of a special Census of Marine Life session at the 33rd Conference of the Association of Marine Laboratories of the Caribbean (AMLC)**, held at St. Thomas, US Virgin Islands (June 4-8, 2007). Oral talks presented:

- Miloslavich, P. The Census of Marine Life in the Caribbean: a biodiversity program.

- Weil, E. Coral reef biodiversity in the wider Caribbean – new records of corals and the goals of the Census of Marine Life
- Shirley, T. C. Bulletin 89n Redux: Biodiversity of the Gulf of Mexico
- Antczak, A. A global perspective of human – mollusk interaction through history: the HMID Project
- Osorno, A. Implementación del protocolo NaGISA en praderas de pastos marinos (*Thalassia testudinum*) del Caribe Colombiano durante los años 2006 y 2007
- Artigas, F. Towards a Latin American and Caribbean international census of marine microbes: overview of some research directions
- Antczak, M. Insights into the Queen Conch (*Strombus gigas*) symbolism in the Caribbean: the claim for the contextual approach
- Gracia, A. Main results in the integrations of the marine biodiversity information system (SIBM) to OBIS
- Cruz-Mota, J.J. Natural geography in shores areas: the Venezuelan experience

2. COMMITTEE STRUCTURE, MANAGEMENT & INTERNAL COMMUNICATION

The Caribbean CoML committee is conformed by:

Patricia Miloslavich (Chair)	Juan Cruz (Nagisa)	Norman Quinn (AMLC)
Andrzej Antczak (HMAP)	Diana Gómez (OBIS-INVEMAR)	Elba Escobar-Briones (Comarge)
Ernesto Weil (CARICORAL)	Jorge Cortés (CARICORAL)	Lorna Inness (IOCARIBE, CZMU)

3. 2007 EDUCATION & OUTREACH EFFORTS

The NaGISA project funded by Chevron has a strong outreach and education component directed specifically to university students and the local communities at the sampling sites. On the other hand, the Caribbean committee has actively participated in the Framework Committee of the CoML.

4. GEOGRAPHIC EXPANSION

To reach more scientists in the Caribbean and get them involved in the CoML activities and projects has always been a goal of the Caribbean committee. In the last year, the CoML has extended an invitation within the AMLC community (Association of Marine Laboratories of the Caribbean) to join and participate in Census-related projects. The AMLC, as presented by Dr. Norman Quinn at the Caribbean and SSC meeting in Panama (February 2007) constitutes a network of laboratories and scientists in the Caribbean and the Gulf of Mexico established 50 years ago. The AMLC publishes a newsletter and has bi-annual scientific meetings with the possibility of special sessions, which can be published as proceedings at the Revista de Biología Tropical (Costa Rica). The past meeting (June 2007), celebrated the 50th Anniversary of the organization was held at the University of the Virgin Islands (St. Thomas) and was focused on the topic “50 years of Caribbean marine research: changing science, changing environments, changing perspectives”.

5. PARTNERSHIPS & COLLABORATION

a. Partnerships

Organization Name	Point-of-Contact (Name)	Nature of Relationship
Chevron	José Durán	Sponsor
CLME	Lucia Fanning	Partnership
CARICOMP	Ernesto Weil and Jorge Cortés	Collaboration
AMLC	Norman Quinn	Collaboration
SERPENT ("Scientific and Environmental ROV Partnership using Existing Industrial Technology")	Juan Cruz / Daniel Jones (Southampton, UK)	Collaboration initiated

b. Links to CoML Ocean Realm Projects

As stated earlier, our committee participates in: NaGISA, HMAP, OBIS and Comarge, and has initiated activities within C-reefs, ICOMM, and CAML. We expect and hope to establish a more formal relationship and broaden our participation in these last 3 projects.

c. Links to other CoML National and Regional Implementation Committees (NRICs)

NRIC	Liaison or Cross-over personnel	Nature of Relationship
Australia		
Canada		Collaboration: OTN
Caribbean		
China		
Europe	XX	Collaboration: Comarge / Chess
Indian Ocean	XX	Collaboration: NaGISA
Indonesia		
Japan	XX	Collaboration: NaGISA (?)
South America	XX	Collaboration: NaGISA, ICOMM, CAML, OBIS
Sub-Saharan Africa		
USA		
Arabian Sea (Oman workshop)		

d. Liaisons to CoML Cross-Cutting Groups

Project Name	Liaison Name & Institution	Nature of the Relationship
OBIS		
HMAP	Andrzej Antczak, USB	Steering Committee of HMAP
FMAP		
SCOR Tech Panel		
E&O		
Barcoding		
Visualization		

e. Effectiveness of the Partnerships and collaborations

I believe that the committee has proved its effectiveness in relating to other NRICs and/or CoML Ocean Realm Projects. These relationships, however, can always be improved. The key to obtain this is constant communication and interaction with the overall of the CoML community, not just at the local or regional level. In the case of the Caribbean, it is my opinion that the joint meeting between the CoML-Caribbean group and the SSC held at Panama was fundamental to bring up more enthusiasm in the people involved and therefore, increase our expectations of collaboration on both sides.

It would be of great benefit to organize the All Program Meeting in an even more broader way, and perhaps include a marine biodiversity conference/meeting in which more scientists would be tempted to attend and be able to find financial support to do so. In this joint APM + conference/meeting, besides the programmed discussions within the CoML program, some relevant CoML scientific results could be presented along with those of other people working on related subjects that might still not be aware of the potentiality of “being” or “belonging” to the Census. These new scientists could represent a huge benefit if they joined efforts with the CoML, increasing our potentiality in many ways.

Chinese National Implementation Committee

SUN Song

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1. 2007 ACCOMPLISHMENTS & SCIENTIFIC HIGHLIGHTS

Publications

- (1) Summer reproduction of the planktonic copepod *Calanus sinicus* in the Yellow Sea: influences of high surface temperature and cold bottom water, Guangtao ZHANG, Song SUN and Bo YANG, *Journal of Plankton Research*, 2007, 29(2): 179-186.
- (2) Differences of Reproduction of *Calanus sinicus* fed with two species of algae, LI Jie, PU Xinming, ZHANG Zhan, LI Chaolun, SUN Song, *Marine Fisheries Research*, 2007, 28(1): 38-44.(in Chinese)
- (3) Feeding habits of *Calanus sinicus* (Crustacea: Copepoda) during spring and autumn in the Bohai Sea studied with the herbivore index, Guangtao ZHANG, Chaolun LI, Song SUN et al., *SCIENTIA MARINA*, 2006, 70(3): 381-388.
- (4) Effects of single and mixed diatom diets on the reproduction of copepod *Calanus sinicus*, Jie LI, Song SUN, Chaolun LI et al., *ACTA HYDROCHIM. HYDROBIOL.*, 2006, 34: 117-125.
- (5) Seasonal changes in abundance of small copepod *paracalanus parvus* in the Yellow Sea, Fang ZHANG, Song SUN, Bo YANG, Peng JI, *OCEANOLOGIA ET LIMNOLOGIA SINICA*, 2006, 37(4): 322-329.(in Chinese)
- (6) *Calanus sinicus* photosensitivity to visible light and UV-B and UV-B induced mortality, Zhencheng TAO, Wuchang ZHANG, Song SUN, *OCEANOLOGIA ET LIMNOLOGIA SINICA*, 2006, 37 Supp. 280-287.(in Chinese)
- (7) Effects of illumination on grazing and reproduction of *Calanus sinicus* (Copepoda: Calanoida), Zhencheng TAO, Wuchang ZHANG, Song SUN, *OCEANOLOGIA ET LIMNOLOGIA SINICA*, 2006, 37 Supp. 288-296.(in Chinese)
- (8) The effect of different diets on the survival and development of copepod nauplii, Jie LI, Song SUN, Chaolun LI et al., *Marine Sciences*, 30(12): 13-20. (in Chinese)

Workshops

- (1) The 4th International Zooplankton Production Symposium, May 28-June 1, 2007, Hiroshima, Japan
Oral Presentation: Spatial and seasonal variations in distribution and abundance of net zooplankton functional groups on the continental shelf of the Yellow Sea, Song SUN, Yuanzi HUO, S5-3398
Oral Presentation: Dominant zooplankton species shift in the Changjiang River Estuary: possible causes, Guangtao ZHANG, Song SUN et al. S3-3394.
Poster: Distribution and biomass of large jellyfish assemblages and association with oceanographic features in the Yellow Sea and northern East China Sea, Fang ZHANG, Song SUN, S3-3353.

- Poster: Reproductive responses of *Calanus sinicus* to food availability in Jiaozhou Bay, China, Chaolun LI, Shiwei WANG, Song SUN, S7-3358.
- (2) Early Career Scientists Conferences: New Frontiers in Marine Science, 26-29 June, 2007, Maryland, USA
Oral Presentation: SEASONAL VARIATIONS IN REPRODUCTION OF A PLANKTONIC COPEPOD *CALANUS SINICUS* RELATED TO THE PHYSICAL AND BIOLOGICAL ENVIRONMENTS IN THE YELLOW SEA, CHINA, Chaolun LI, Shiwei WANG, Song SUN, Bo YANG, pp. 26.
- (3) International Conference on Long-Term Ecological Research, 20-21 August, 2007, Beijing, China
Oral Presentation: Dominant zooplankton species shift in the Changjiang River Estuary: possible causes, Guangtao ZHANG, Song SUN et al.
- (4) The 2nd Global Conference on Large Marine Ecosystems, 11-13, Sep. 2007, Qingdao, China
Poster: Eco-region of zooplankton functional groups in the southern Yellow Sea, China, Song SUN, Chaolun LI, Yuanzi Huo
Poster: Census of Marine Life in China, Song SUN, Xiaoxia SUN

Cruises

6 cruises for zooplankton research in the Yellow Sea and the East China Sea have been carried out, in February, March, April, May, June, August 2007 respectively.
5 cruises were conducted in April, June, August, October, November in 2006 in the same sea area.
1 cruise on benthic biodiversity research in the cold water of the Yellow Sea was carried out in June, 2007
1 comprehensive cruise on Chinese offshore investigation and assessment will be conducted in the South China Sea in October
1 cruise from China to the Southern Ocean will be conducted from Nov. 2007 to Mar. 2008.

Lab projects

New project: Indicating role of the fatty acid in the trophical dynamics of the marine zooplankton, Grant from NSFC, 2008-2010, Chaolun LI.

Ongoing projects:

Role of zooplankton functional groups in food production process, 973 project, Song SUN, 2006-2010

Zooplankton population dynamics in the Yellow Sea and East China Sea, key program from NSFC, Song SUN, 2007-2010

Biodiversity and community structure of the benthos in the cold water of the Yellow Sea, from Chinese Academy of Sciences, J. Y. Liu, 2007-2009

Interaction of diatom and copepod in the Yellow Sea, NSFC, Chaolun LI, 2006-2008

Life history of macro-jellyfish *Stomolophus meleagris* in the East China Sea and its role on zooplankton, NSFC, Fang ZHANG, 2007-2009

Chinese Offshore Investigation and Assessment, 908 project, Song SUN, 2007

Collating and digitization of marine specimens from polar area, from the Ministry of Science and Technology, Song SUN, 2007

2. COMMITTEE STRUCTURE, MANAGEMENT & INTERNAL COMMUNICATION

The Chinese CoML Committee is composed by 17 members from ocean institutions and universities of China, being chaired by Prof. SUN Song currently. The secretariat is in Institute of Oceanology, Chinese Academy of Sciences, with responsibility for information distribution, project and fund management, report preparation etc. Annual meeting was held for committee members regularly. At present, the management and communication in the committee work smoothly. With the expansion on the projects, research field, funding and collaboration, maybe need additional management to meet synthesis and other goals through 2010.

3. 2007 EDUCATION & OUTREACH EFFORTS

Training: Dr. Chaolun LI was awarded a POGO-SCOR fellowship on “Usage of molecular methods in the study of zooplankton diversity” in Prof. Ann Bucklin Lab during Feb 6, 2007 – April 26, 2007.

Events for students: A popular science exhibition hall, including contents of zooplankton, was established in IOCAS, which is open to students of various levels regularly.

Public education: 28 June, 2007, on the public day of Institute of Oceanology, Chinese Academy of Sciences, the zooplankton relevant resource and achievements were open to the public.

Media relations: An article “Deep sea life: we need to know more” by Prof. Song SUN was published on the Chinese popular newspaper on science, **Sciences Times**, May 31, 2007.

4. GEOGRAPHIC EXPANSION

Five projects were initiated in 2007 in the scope of Chinese Committee:

(1) Biodiversity and community structure of the benthos in the cold water of the Yellow Sea. The first cruise was finished (June 15-30, 2007). Samples of benthos collected from 76 stations from the Yellow Sea are being identified.

(2) Chinese Offshore Investigation and Assessment. The cruise is in preparation and will begin in October, 2007. Sea area: the South China Sea.

(3) Collating and digitization of marine specimens from polar area. Description of a part of specimen had been finished in 2006, collating and digitization of more specimen is ongoing.

(4) Zooplankton population dynamics in the Yellow Sea and East China Sea. The first cruise was finished (June 15-30, 2007). Samples of plankton collected from the Yellow Sea are being analyzed.

(5) Life history of macro-jellyfish *Stomolophus meleagris* in the East China Sea and its role on zooplankton, Samples were collected from the Yellow Sea and the East China Sea.

5. PARTNERSHIPS & COLLABORATION

a. Partnerships

Organization Name	Point-of-Contact (Name)	Nature of Relationship
Yellow Sea Fishery Research Institute	Qisheng TANG	Project collaboration

South China Sea Research Institute	Liangmin Huang	Project collaboration

b. Links to CoML Ocean Realm Projects

Project Name	Liaison or Cross-over personnel	Nature of Relationship
CMarZ	SUN Song	CMarZ SSC member
NaGISA	J . Y . Liu	Chinese Committee member, wish to participate

c. Links to other CoML National and Regional Implementation Committees (NRICs)

NRIC	Liaison or Cross-over personnel	Nature of Relationship
Australia		
Canada		
Caribbean		
China		
Europe		
Indian Ocean		
Indonesia		
Japan		
South America		
Sub-Saharan Africa		
USA		
Arabian Sea (Oman workshop)		

d. Liaisons to CoML Cross-Cutting Groups

Project Name	Liaison Name & Institution	Nature of the Relationship
OBIS	SUN Xiaoxia , Institute of Oceanology, Chinese Academy of Sciences	Member of OBIS Managers' Committee
HMAP		
FMAP		
SCOR Tech Panel	SUN Song , Institute of Oceanology, Chinese Academy of Sciences	Member of SCOR Panel on New Technologies for Observing Marine Life
E&O	SUN Song , Institute of Oceanology, Chinese Academy	Chairman of Chinese CoML Committee

	of Sciences	
Barcoding	SUN Song , Institute of Oceanology, Chinese Academy of Sciences	Chairman of Chinese CoML Committee
Visualization		

e. Effectiveness of the Partnerships and collaborations



European Regional Implementation Committee

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1. 2007 ACCOMPLISHMENTS & SCIENTIFIC HIGHLIGHTS

This should be a summary of significant work, results, and conclusions. Please describe the activities completed in the past year (for example, cruises, data, workshops, major reports, program development and sponsorship). What were the key scientific, political or administrative results of these activities, and how do they contribute to (1) our overall understanding of marine biodiversity and its role in ocean ecosystems (for scientific activities) or (2) recognition for marine biodiversity research leading to funding or political support (for administrative or program development activities)? Please include activities you anticipate to have occurred by the end of calendar year 2007.

Overview

The European Census of Marine Life has continued to develop during the past 12 months. There have been several high profile meetings where key note talks, given by committee members, have raised scientist's awareness of CoML e.g. several keynote presentations were made at the recent joint Italian Association for Limnology and Oceanography and Italian Society of Ecology Congress highlighting EuroCoML and CoML. EuroCoML has continued to fund workshops and has strengthened the links with a number of CoML Ocean Realm projects; Dr Bhavani Narayanaswamy is an Associate member of CoMargE. There have been a number of developments with regards to education and outreach including collaboration with project officers from some ocean realm projects as well as European funded programmes (see below for further information).

There has been continued funding from national and pan-European funding organisations. Within the last 12 months the UK's Natural Environmental Research Council (NERC) funded ECOMAR coordinated by Professor IG Priede of the University of Aberdeen. ECOMAR is a sub-project of the CoML realm project MAR-ECO and will continue to investigate the Mid-Atlantic Ridge, and in particular the Charlie Gibbs Fracture Zone. Parts of the Mid-Atlantic Ridge and fracture zone have been proposed as a Marine Protected Area. Another project funded by NERC has been the ChEsSo

programme (2007-2011) looking at hydrothermal vents in the Southern Ocean. This project is coordinated by Professor Paul Tyler of the University of Southampton.

Ecosystem Functioning and Biodiversity in the Deep Sea (EuroDEEP) was successfully funded through the European Science Foundation. Four projects have been funded investigating 1) chemosynthetic environments, 2) the Mid-Atlantic Ridge, 3) microbes and 4) faunal diversity in the Mediterranean and it is anticipated that they will request affiliation to EuroCoML and/or a CoML related Ocean Realm project. Many other programmes that have been funded by the European Commission e.g. through the Framework 6 and 7 programmes, are requesting affiliation either to EuroCoML or to European led CoML projects.

Existing links with Marine Biodiversity and Ecosystem Functioning (MarBEF) and Hotspot Ecosystem Research on the Margins of European Seas (HERMES) projects are continually strengthened both with EuroCoML and with the different realm projects e.g. continental margins. EuroCoML is working closely with the project officers of these two programmes particularly with regards to outreach and education as well as with the Marine Life Information Network (MarLIN) based in the UK.

The number of researchers from Europe participating in CoML projects either directly or through affiliation has increased in the past 12 months. The vast amount of expertise that they have will add value to the aims and objectives of CoML.

Proposals

The main outcome of the alien invasive species workshop that EuroCoML funded last year has been the submission of a proposal to the EU FP7. The proposal "*Biosecurity strategy to protect European biodiversity from aquatic alien species - BIOSECURAL*" was submitted by the coordinators, Sergej Olenin (Lithuania) and Stephan Gollasch (Germany), to the first call and they are currently waiting for the outcome.

Workshops

EuroCoML has continued to fund workshops throughout 2007. The workshops have been extremely successful with participants from throughout Europe meeting to discuss how to take forward important and exciting areas of research. The workshops have generated a series of research proposals that are currently being assessed by national and international funding bodies e.g. The European Framework 7 Programme, with regards to financially supporting them.

February 2007. Arctic Ocean Diversity – International Polar Year cluster meeting held in Frankfurt, Germany and organised by Rolf Gradinger, Bodil Bluhm and Russ Hopcroft, the ArcOD coordinators. ArcOD was selected as the cluster lead project for the Arctic Marine Biodiversity by the IPY Joint Committee. The proposal brings together about 20 Expressions of Interest that focus on Arctic biodiversity questions.

The primary aim of the meeting was to bring together investigators of biodiversity-focused IPY projects to facilitate synergies, identify overlap, to discuss cluster goals and products and to develop a 'cluster' identity. The discussions focussed on suggestions for tasks/products that could be achieved by the cluster group and related projects ranging from taxonomic keys to a network of standardise samples to preparing cruise lists with dedicated sampling for biodiversity analysis.

Forthcoming Workshops

A further two workshops have been supported and will be held after this reporting period. The first is "Novel modelling approaches to relate biodiversity of marine sediments to ecosystem functioning" co-funded by MarBEF, EuroCoML and CoML. This is being coordinated by Carlo Heip (the Netherlands) and will be held in Amsterdam, the Netherlands in mid-October. The second workshop is on "Ribosomal RNA Technology" and is being coordinated by Frank Oliver Glöckner (Germany). The workshop will take place in Bremen, Germany in early 2008.

Other workshops funded through individual CoML projects

HMAP: A MarFISH/HMAP workshop on "Long term spatial impact of natural variability and human induced changes in marine ecosystems" was held at Roskilde University, Denmark (February 2007) in collaboration with IFREMER. The workshop aimed at bringing together multiple disciplines, time series and spatially resolved data spanning the last millennia, with the intent to gain new insights into the driving forces of marine resource exploitation. The workshop consisted of presentations, group discussions and introductory papers on interdisciplinary challenges of historical ecology and marine environmental history.

CeDAMar: Funded three workshops during 2007 on meiofauna, isopods and polychaetes. These workshops have been extremely important in bringing together specialist taxonomists to aid in the identification of new species.

CoMargE: Workshop on habitat classification and mapping of deep-water continental margins was held in Southampton, UK (June 2007). A second workshop on squat lobsters was held at the beginning of September 2007 in Wellington, New Zealand. A third workshop on Nematoda will be organised by Dr Ann Vanreusel, University of Ghent, in February 2008. This workshop is intended to be a globalisation of the workshop initiated by the project Manuela in the MarBEF framework.

ChEss: Meeting in Galapagos (June 2007) to celebrate 30 years since the discovery of hydrothermal vents in the ocean. This was an important meeting for ChEss (CoML) scientific community that addressed a number of issues including the final synthesis required by 2010.

History of Marine Animal Populations highlights

A study conducted by Brian MacKenzie (Technical University of Denmark) in collaboration with the late R Myers (Dalhousie University) found that Bluefin tuna were present in the Norwegian Sea, North Sea, Skaggeak, Kattegat and Øresund many decades before a major industrial fishery started in the 1950's. These research findings are contributing and helping solve the question as to why the Bluefin tuna disappeared from the area in the 1960's/1970's. These results made the headlines world wide.

Arturo Morales (Spain) and colleagues from Russia and Spain undertook an ichthyoarchaeological survey of the ancient fisheries from the Northern Black Sea coast from the 7th century BC to the 4th century AD. Initially the report was to make findings from the Russian literature more accessible to the community, but reports in English and German were incorporated to provide a complete and coherent picture of the fish samples. A comparative overview was taken to gain a better understanding of the economic fish assemblages and to try and find reasons for the onset of the industrial fishing enterprises in the region.

Cruise highlights from CoML Projects in European waters

Biogeography of Deep-Water Chemosynthetic Ecosystems – ChEss

ChEss have continued to develop and expand their field programme, with the main developments in the past 12 months occurring in the Arctic, Atlantic Equatorial Belt and in New Zealand.

Researchers on an expedition to the Mid Atlantic Ridge (March 2007) led by D Desbruyères (Ifremer), discovered and explored the deepest vent field at a depth of 4100m. They also found that the vent fauna were unlike faunal communities found at other vent sites.

In the summer of 2007 a second cruise went to explore the Gakkel Ridge and associated vents in the eastern Arctic. The cruise was a success with a number of achievements including detailed mapping of water column plumes as well as discovering potential chemosynthetic microbial mats covering the volcanoes in the region.

Census of the Diversity of Abyssal Marine Life – CeDAMar

CeDAMar has had a productive year with two further cruises being organised under the CeDAMar umbrella. The first cruise went to the eastern part of the Mediterranean and took place from 28 December 2006 – 15 January 2007, looking to investigate the biodiversity of the deep eastern Mediterranean Sea and factors that might control it, such as water depth, distance to land, and nutrient availability. A second cruise heading towards the Southern Oceans (ANtarctic benthic DEEP-sea biodiversity: colonisation history and recent community patterns - SYSTem COUpling) will begin in late November 2007 finishing at the end of February 2008. This will build on the results of ANDEEP I-III. The project will build on the findings of the ANDEEP cruises I-III and will involve scientists from different disciplines, e.g. atmospheric sciences, climatology, to shed light on atmospheric-pelagic-benthic coupling processes.

Continental Margin Ecosystems on a worldwide scale – CoMargE

Several cruises have been undertaken on continental margins around the world either directly through CoMargE or as affiliated projects. A huge amount of research has been undertaken on margins in Europe compared to other regions, and still new species are being discovered. Below are brief outlines of the expeditions that have taken place in the past year ranging from the Arctic through to the Mediterranean.

Arctic

The benthic fauna of the margin region (100 – 500m) of the Kara Sea will be sampled in the autumn of 2007. The cruise is organised by the P.P. Shirshov Institute of Oceanology (Moscow).

Atlantic

a) HERMES and UNESCO/IOC – Mud volcanoes: Mud volcanoes, ranging in depth from 300 – 2400m, in the Gulf of Cadiz were explored during the summer of 2007. The cruise was part of the European Framework 6 Programme ~ HERMES looking at hotspots on the European continental margin and the UNESCO/IOC Training-Through-Research programme. An ROV was used to do high resolution mapping, video transect and faunal sampling. To date several new species have been identified.

b) HERMES – Canyons: Investigations into canyons were also part of the HERMES cruise in the summer of 2007. The main focus was on deploying experimental equipment to look at benthic food webs as well as functional ecology.

c) HERMES – oyster banks: The Chapelle Bank on the Celtic margin was surveyed in June 2007 investigating a newly mapped deep-water oyster bank. The ROV used by Ghent University found large communities of giant oysters at 700m water depth. This cruise was also part of the HERMES programme.

d) Instituto Español de Oceanografía – African deep-sea surveys: Megabenthic surveys off Eastern and Western African coasts have been undertaken by Dr Ana Ramos of the Instituto Español de Oceanografía. Since 2002, researchers at the Spanish Institute have carried out several trawling surveys off Morocco, Namibia and Mozambique. Diversity patterns were seen to be quite variable.

Mediterranean

a) PROMETO project: Different habitats (canyons and slope) in the western Mediterranean will be studied during a series of four cruises during different seasons in 2008. The project, *Prometeo*, funded by the Spanish Ministry of Science and Education, will amongst other things look at establishing a relationship between the spatial-temporal structure of mega-, macro- and meiofaunal populations and abiotic conditions.

b) MEDECO project: A variety of habitats ranging from canyons to mud volcanoes will be investigated in the Mediterranean in the autumn of 2007. A series of multi-disciplinary experiments and sampling regimes will be undertaken at various spatial scales to describe the various benthic communities and their trophic interactions.

c) ENVAR project: The Var canyon in the NW Mediterranean has been monitored over a two-year period to investigate the influence it has on benthic communities. The macro- and meiofaunal communities have been sampled on a regular basis and as part of the MEDECO cruise (autumn 2007) an ROV will be used to investigate the megafauna. This project, is contributing greatly to both the HERMES and CoMargE programmes in terms of descriptions of fauna in canyons.

Mid-Atlantic Ridge Ecosystems – MAR-ECO

The main cruise to the Mid-Atlantic Ridge (summer 2007) was coordinated by Professor I.G. Priede, University of Aberdeen through the ECOMAR project, which is funded by the UK's Natural Environment Research Council (NERC). ECOMAR is a sub-project of MAR-ECO. A further two cruises to the mid-Atlantic ridge will take place in 2008 and 2009.

2. COMMITTEE STRUCTURE, MANAGEMENT & INTERNAL COMMUNICATION

Please describe how your committee is managed. Is this process for management and communication working smoothly? Indicate whether additional management structure is needed to meet synthesis and other goals through 2010.

EuroCoML has two committees (see below for list of members); an Executive Committee and a Scientific Steering Committee (SSC).

The members of the SSC represent their own country and region at the EuroCoML Regional Implementation Committee level. They promote CoML to scientists, funding agencies and the general public, particularly within their region and report back at the annual SSC meeting. They also seek to identify new areas for CoML expansion.

The Scientific Steering Committee is a group of representatives, comprising

- Members of the Executive Committee
- Appropriate scientific representatives
- Representatives from key stakeholders such as the Marine Board – ESF, the European Commission and relevant NGO's
- Observers from Census of Marine Life projects with a strong European lead

The Executive Committee is a small group of representatives that cover a wide spectrum of disciplines within marine science. The committee in the light of discussion at Scientific Steering Committee meetings will:

- Be responsible for the allocation of EuroCoML funds
- Stimulate areas for development that EuroCoML can become involved with
- Collectively promote projects which, are in EuroCoML's best interests

- Liaise with the International CoML SSC and report to it appropriately
- Promote EuroCoML and its projects to international/national funding agencies
- Ensure that the activities of EuroCoML are properly communicated to all those interested, including the scientific community, the media and the general public.

Dr Bhavani Narayanaswamy, the project officer, meets with Professor Graham Shimmield, the chair of the Committees, on a fortnightly basis. At these meetings various issues are discussed including queries that have been sent into the project office. Dr Narayanaswamy passes on relevant information to the members of the committees. The system works well as there is a dedicated project officer. As long as funding is awarded to EuroCoML to keep the project office running, it is not felt that additional management structure is needed in order to meet the goals of CoML by 2010.

Committee Members

Executive Committee:

Graham Shimmield – EuroCoML Chairman, Director Scottish Association for Marine Science, Scotland, UK

Roberto Danovaro – Polytechnic University of Marche, Italy

Anastasios Eleftheriou – Institute of Marine Biology, Crete (HCMS), Greece

Stratis Georgakarakos – University of the Aegean, Greece

Carlo Heip – Netherlands Institute of Ecology, the Netherlands

Alasdair McIntyre – % University of Aberdeen, Scotland

Henn Ojaveer – Estonian Marine Institute, Estonia

Isabel Sousa-Pinto – Centre for Marine and Environmental Research, Portugal

Bhavani Narayanaswamy – EuroCoML Project Officer, Scottish Association for Marine Science, Scotland, UK

Scientific Steering Committee:

Niamh Connolly – ESF Marine Board, France

Nicole Dubilier – Max Planck Institute of Marine Microbiology, Germany

Jean-Pierre Féral – Centre d’Oceanologie de Marseille, France

Josep Gasol - Institut de Ciències del Mar-CMIMA, CSIC, Spain

Andrey Gebruk – P. P. Shirshov Institute of Oceanology, Russia

Pedro Martinez Arbizu – DZMB, Forschungsinstitut, Germany

Jan Mees - Flanders Marine Data and Information Centre, Belgium

Miguel Nuevo-Alarcon - European Commission, Belgium

*Francesc Pagès - Institut de Ciències del Mar-CMIMA, CSIC, Spain

Nelli Sergeeva - Institute of Biology of the Southern Seas, Ukraine

David Starkey – University of Hull, UK

* Francesc Pagès – agreed to become a Scientific Steering Committee member earlier this year, however he passed away in May of this year.

Ex Scientific Steering Committee Members:

Ahmet Kideys – Institute of Marine Sciences, Turkey

Per Nilsson – Göteborg University, Sweden

Piia Tuomisto – European Commission, Belgium

Edward Vanden Berghe – Flanders Marine Data and Information Centre, Belgium

We also invite a number of Observers to attend our annual Scientific Steering Committee meetings. The coordinators of CoML projects which are European led are invited as are coordinators of some of

the most closely related EU Framework 6 programmes e.g. HERMES. As Framework 7 programmes become funded, we will look to include them on the list of observers. The Science coordinators of ICES and HELCOM, as well as the biodiversity coordinator for the European Commission, are also invited. We hope that this will increase the coordination of research being undertaken in Europe.

3. 2007 EDUCATION & OUTREACH EFFORTS

Please describe Education & Outreach activities associated with your committee for the previous 12 months. Indicate the target audience for each, as well as the level of success of each effort. Please include activities you anticipate to have occurred by the end of calendar year 2007. Target audience (TA) category codes: GP, General Public; S, scientists; C, children; PM, policy maker; NGO, Non-Governmental Organisation; M, Media

Greater communication with the wider scientific community, funding agencies and public has been sought and continues to be undertaken. The chairs of the different ICES working groups have all been contacted requesting them to raise awareness and highlight the activity of EuroCoML to their members. A number of non-governmental organisations have also been contacted in order to raise awareness of EuroCoML.

EuroCoML Activities

Website

The website www.eurocoml.org has been extremely popular. On average, in one 12 month period there are approximately 700,000 hits on the website and 70,000 visitors. In the past two months there has been a dramatic increase in the number of visits from 3,000 - 4,000 visitors per month to over 14,000 visits in July 2007. In the past year a lot more information has been added to the website, there is now a large area for Education and Outreach and a specific area for children where screensavers, jigsaw puzzles and posters can be downloaded. This will be added to over the next couple of months. There is also a designated teacher's area where a variety of lesson plans for different age groups can be downloaded. (TA: all categories – highly successful)

Video

On the promotional side, a film crew have gone out on a Mediterranean cruise to film researchers at work. This will be made into a short documentary (~25 minutes) which will be shown to the different stakeholders, and a shorter 2-3 minute version will be available for the media as soon as it is finished. (TA: GP, C & M – on track)

Promotional Items

Fridge magnets of five different designs have been produced and are being handed out at various events, particularly where the general public will be attending. Similarly 300 T-shirts bearing the EuroCoML logo have been printed and are being distributed at meetings, workshops and public events. (TA: GP & C – highly successful)

Flyers

A flyer promoting EuroCoML has also been produced and these have been distributed at all the meetings attended including the International Council for the Exploration of the Sea Annual Science Conference in Maastricht, the Netherlands, and at the Mediterranean Science Commission (CIESM) Annual Congress in Istanbul, Turkey. (TA: S, NGO & PM – highly successful)

Newsletter

A tri-annual newsletter has also been developed with the first two issues being well received. It is sent out by e-mail to a group of over 250 people including mailing lists which in turn send the newsletter on to approximately another 500 people each. (TA: All categories – highly successful)

Exhibition

Bhavani Narayanaswamy has also initiated links with the project officers of two European FP6 programmes MarBEF and HERMES as well as the Marine Life Information Network (established by the Marine Biological Association, UK). The outcome has been a large, exciting and interactive exhibition first displayed at the British Association Festival of Science, York, UK in September 2007. The exhibition highlighted the different types of animals found from the shore to the deep sea and was a huge success with visitors coming back time and again to learn more. The exhibition will be translated into Spanish to be displayed at the first World Marine Biodiversity conference in Valencia, Spain 2008. (TA: GP & C – highly successful)

Additional Funding

Argyll and Islands Enterprise continue to financially assist EuroCoML which supports the continued role of the web master. The web master also helps with the design of posters, flyers and other promotional EuroCoML material.

Scientific Meetings

This year (2007) EuroCoML will be highlighted at several wide-ranging events including the Italian Society of Ecology and the Italian Association of Limnology and Oceanography joint congress – Ancona, Italy, the Biannual Congress of Greek Ichthyologists – University of the Aegean, Greece, the Oban Highland Games, Oban, UK. EuroCoML will also be represented at the CoML All Programme meeting which is being held in Auckland, New Zealand in November 2007.

EuroCoML has also agreed to contribute to the World Marine Biodiversity Conference in conjunction with MarBEF, CoML, ICES, CIESM, SCOR, UNESCO IOC, Network of European Marine Research Stations MARS, DIVERSITAS, DG Research, European Environment Agency, Marine Board of the European Science Foundation and the Scientific Council for Antarctic Research. This is the first conference of its kind and it will be held in Valencia, Spain in November 2008 and it is hoped that over 400 people will attend. Professor Graham Shimmiel is on the Scientific Committee and Dr Bhavani Narayanaswamy is on the outreach committee.

Selection of other outputs:

- G Shimmiel and B Narayanaswamy (September 2007) “*The European Census of Marine Life - Recent Discoveries and Exciting Opportunities*” keynote talk at the joint Italian Society of Ecology and the Italian Association of Limnology and Oceanography congress – Ancona, Italy
- C Heip (September 2007) “*Marine Biodiversity and Ecosystem Functioning*” keynote talk at the joint Italian Society of Ecology and the Italian Association of Limnology and Oceanography congress – Ancona, Italy
- R O’Dor (September 2007) “*Censusing Marine Life – Diversity, Distribution and abundance, focussing on dynamic distributions*” keynote talk at the joint Italian Society of Ecology and the Italian Association of Limnology and Oceanography congress – Ancona, Italy
- Advances in Ecology, Limnology and Oceanography – Dedicated to Myers. A session on FMAP results and dedicated to R Myers was held at the joint Italian Society of Ecology and the Italian Association of Limnology and Oceanography congress – Ancona, Italy
- H Ojaveer co-chair Theme session on “Marine Biodiversity: a fish and fisheries perspective” at the ICES Annual Science Conference 2007

- B Narayanaswamy was invited to give a presentation on “*The Census of Marine Life and its role in Europe*” to the Scottish Executive of the Environment and Rural Affairs Department (May 2007)
- H Ojaveer was interviewed by one of the two main national Estonian newspapers on the most recent new alien species the Chinese mitten crab in the Baltic Sea (*Mnemiopsis leidyi*) which has caused both ecological and economic damage in the Black Sea.
- History of marine animal populations and their exploitation in northern Europe (in press). *Special Issue of Fisheries Research*. Eds. H Ojaveer and BR MacKenzie
- B Narayanaswamy (in press). The European Census of Marine Life. *Ocean Challenge*
- A Gebruk is an invited co-editor of a thematic MAR-ECO issue of *Marine Biology Research* and is almost in press. Scheduled to be published by end of 2007. The issue includes 9 papers with results of benthos studies in MAR-ECO
- R O’Dor is a member of the Scientific Implementation Panel (SIP) for the 6th Framework HERMES project. He participated in their Annual meeting in the Algarve, Portugal 25-31 March 2007. He also took part in a side meeting for planning the laying of an Ocean Tracking Network (OTN, www.oceantrack.org) acoustic receiver curtain across the Strait of Gibraltar. The Gibraltar Curtain will be funded from a \$35M grant from the Canada Foundation for Innovation. OTN plans to merge and expand the acoustic and archival tracking technologies of the COML POST and TOPP projects globally as an IOC GOOS Pilot Project. The Gibraltar Curtain will detect movements of highly migratory species such as bluefin tuna from what OTN refers to as the "Atlantic Arena" to the Mediterranean using uniquely coded acoustic tags lasting for up to 20 years. It would also be integrated with a wider European detection system and ultimately, it is hoped that this will help bring together other European tagging projects developing in MAR-ECO and EUTOPIA.

The Deep-Sea Education and Outreach group (DESEO)

Book

DESEO comprises project officers from EuroCoML, CeDAMar, ChEss, CoMargE and MAR-ECO. All have been working hard to produce a book called “Deeper than Light”. The book has been written and edited by all the project officers and is aimed at the general public. It describes almost all the major deep-sea ecosystems from margins to abyssal plains and from chemosynthetic environments to the mid-Atlantic ridge and includes an introduction by Paul Tyler and a perspective section written by Peter Boyle. The book is nearing completion and will be showcased alongside the CoML’s MAR-ECO travelling exhibition. It has also been translated into 4 other languages (French, German, Spanish and Norwegian); EuroCoML funded the initial workshop in 2006 and further support for the production of the book has been awarded by Fondation Total. In the next six months other joint activities will be developed. (TA: GP & C – on track)

Expansion of the Exhibition – “Deeper than Light” exhibition

Long term, DESEO aims to expand the Deeper than Light exhibition to include modules for all the CoML deep-sea projects, with the expectation of showcasing the exhibition at one of the large Natural History Museums e.g. the London Natural History Museum of the Smithsonian, for the 2010 CoML finale. The group will also expand to include the CenSEAM. (TA: GP & C – on track)

CoMargE

An exhibition is currently in preparation highlighting different aspects of the continental margins. The outline of the exhibition has been written in conjunction with Claire Nouvian (the author of “The Deep: The Extraordinary Creatures of the Abyss”) and will be displayed at the Institut Océanographique, Paris in 2008. (TA: GP & C – on track)

MAR-ECO

Deeper than Light Exhibition

MAR-ECO has showcased its highly successful travelling exhibition, "Deeper than Light". The exhibition includes deep-water specimens in suspended animation, photographs and art work by the highly credited David Shale and Ørnulf Opdahl, and video footage of scientists at sea. The exhibition was launched at UNESCO House, Paris in the spring of 2007. With the help of EuroCoML the exhibition moved to "Planeta Mar" in Porto, Portugal, and not only did it open in a new location but was the main feature of the museum's grand opening. The exhibition will move to Essen, Germany in autumn 2007 followed by Aberdeen, UK in 2008. (TA: All categories – highly successful)

4. GEOGRAPHIC EXPANSION

Describe how your committee has helped increase the geographic scope of CoML's future findings. This includes (1) new participation by local scientists in the ongoing CoML projects; (2) "spin off" projects initiated by your committee using or based on CoML project methodologies or approaches; and (3) Affiliated Projects endorsed or approved by your committee. Please list both ongoing and planned activities. Is there anything that the SSC or Secretariat can do to facilitate these activities?

The acceptance by Professor Nelli Sergeeva from the Institute of Biology of the Southern Seas in the Ukraine has ensured that a greater number of researchers working in the Black Sea region are aware of the CoML programme. Also the recent affiliation of a European Framework 6 Programme based in the Mediterranean (see below) will ensure that there is an increasing awareness of CoML in southern Europe. The co-funding of the ArcOD-IPY workshop in February 2007 brought together European researchers working in Arctic regions within the framework of CoML.

The number of scientists from Europe participating in the CoML programme whether through ongoing CoML projects, "spin off" projects or affiliated programmes has increased over the past 12 month period. However, it is not possible for the European project office to keep track of each new scientist joining the CoML programme.

Affiliation

To date three projects have requested affiliation to EuroCoML – brief details on each are given below.

SESAME

Southern European Seas: Assessing and Modelling Ecosystem changes (SESAME) is a European Framework 6 Programme. The project is looking at the effect of ecosystem variability on key goods and services with high societal importance like tourism, fisheries and ecosystem stability though conservation of biodiversity and mitigation of climate change. New and existing observations will be used to validate and upgrade mathematical models to predict responses of ecosystems to changes in climate and anthropogenic impacts.

ECOMAR

Ecosystems of the Mid-Atlantic Ridge at the Sub-Polar Front and Charlie-Gibbs Fracture Zone (ECOMAR) is a UK project funded by NERC to understand how physical and biogeochemical factors influence the distributions and structure of deep-sea communities, focusing on the fauna of the Mid-Atlantic Ridge at 4 sites in different environmental settings. The four sites are located on either side of

the MAR and to the north and south of the Charlie Gibbs Fracture Zone (CGFZ), which coincides with the Sub-Polar Front. ECOMAR is also a subproject of MAR-ECO.

BIOFUN

BIOFUN - BIOdiversity and ecosystem FUNctioning in contrasting southern European deep-sea environments: from viruses to megafauna has been funded by the European Science Foundation EuroCORES programme on Ecosystem Functioning and Biodiversity in the Deep Sea (EuroDEEP). The long term goal of BIOFUN is to characterise, under an ecosystem approach, two deep-sea habitats the mid-slope and abyssal plain. For the first time this will include wide-ranging analyses from viruses to megafauna in order to understand the linkages between biodiversity patterns and ecosystem functioning in relation to environmental conditions.

5. PARTNERSHIPS & COLLABORATION

a. Partnerships

Please identify any organizations, government agencies, science programs, and non-CoML projects with which your CoML committee has an affiliation or collaboration and briefly describe the nature of each relationship.

Organization Name	Point-of-Contact (Name)	Nature of Relationship
ECOMAR affiliated project	Graham Shimmield IG Priede	Principal Investigator Coordinator
European Federation of Marine Science and Technology Societies	Graham Shimmield & Roberto Danovaro	Vice presidents
SESAME affiliated project	Evangelos Papathanassiou Roberto Danovaro	Coordinator of SESAME Participant
BIOFUN affiliated project	Francesc Sarda/Eva Ramirez Roberto Danovaro	Coordinators of BIOFUN Participant
CIESM (Task force on Deep Sea Research)	Roberto Danovaro	Programme coordinator for deep sea research
International Council for the Scientific Exploration of the Baltic Sea	Henn Ojaveer	Study Group on Baltic Fish and Fisheries Dynamics
INCOFISH (Integrating Multiple Demands on Coastal Zones with Emphasis on Aquatic Ecosystems and Fisheries) – EU FW6 STREP	Henn Ojaveer Lotta Jarnmark	Collaborator Workpackage leader
MARBEF	Carlo Heip	Coordinator
International Council for the Scientific Exploration of the Mediterranean Sea	Anastasios Eleftheriou	Working group member
Atlantic Frontier Environmental Forum	Alasdair McIntyre Graham Shimmield	Chairman Vice Chair
SeaweedAFRICA	Isabel Sousa-Pinto	Collaborator
European Platform for Biodiversity Research Strategy	Isabel Sousa-Pinto	Steering Committee
DFG (Germany)	Nicole Dubilier	Collaborations in North and South MAR research
MomarNet (EC)	Nicole Dubilier	Principle Investigator
DiWood: sunken wood and associated organisms (CNRS and	Nicole Dubilier	Chemosynthetic fauna on sunken wood (2006-2009)

MPI Bremen)		
InterRidge	Nicole Dubilier	Steering Committee member
InterRidge Biology Working Group	Nicole Dubilier	Co-Chair
International Symbiosis Society	Nicole Dubilier	Councillor
Marine Board - European Science Foundation	Niamh Connolly	EuroCoML Scientific Steering Committee
HERMES	Phil Weaver Myriam Sibuet Vikki Gunn	Coordinator Investigator Education & outreach collaborator
OSPAR Code of Conduct Correspondence Group	Bhavani Narayanaswamy	Member of working group
Atlantic Frontier Environmental Network	Bhavani Narayanaswamy	Member of working group
HELCOM	Juha-Markku Leppanen	Professional Secretary
ICES	Adi Kellerman	Head of Science Programme
NERC (UK)	Paul Tyler	ChEsSo programme (2007-2011)
Russian Ministry of Natural Resources	Andrey Gebruk	Collaboration with one of the institutes in this system, VNII Okeangeologia (St.-Petersbourg) in studies of hydrothermal vents

b. Links to CoML Ocean Realm Projects

Please identify the CoML Realm Projects with which your committee participates (or wishes to participate). Identify any crossover personnel or liaisons.

Project Name	Liaison or Cross-over personnel	Nature of Relationship
CeDAMar	Pedro Martinez S Keller, B Ebbe	Coordinator Outreach & Education
MAR-ECO	Odd Aksel Bergstad Andrey Gebruk J Høyer	MAR-ECO coordinator SSC member Outreach & Education
ChEss	Paul Tyler N Dubilier, A Gebruk M Baker, E Ramirez	ChEss coordinator, ChEss SSC members Outreach & Education
CMarZ	Ahmet Kideys Annelies Pierrot-Bults	EuroCoML SSC member Invited EuroCoML observer
ICOMM	Jan de Leeuw	Joint coordinator of ICOMM
CoMargE	Myriam Sibuet B Narayanaswamy, A Gebruk, R Danovaro, L Menot	Coordinator of CoMargE Associate Members Outreach & Education
NaGISA	Carlo Heip Isabel Sousa-Pinto	Participants
CenSeam	Andrey Gebruk	Taxonomist working group
DESEO	Bhavani Narayanaswamy	Deep-sea outreach and education activities
ArcOD	A Gebruk, P Martinez B Narayanaswamy	SSC members Workshop participant

c. Links to other CoML National and Regional Implementation Committees (NRICs)

Please identify any other CoML NRICS with which your committee has collaborated or wishes to collaborate because of regional overlap or increased benefit from joint activities or proposals. Identify any liaisons or crossover personnel.

NRIC	Liaison or Cross-over personnel	Nature of Relationship
Australia		
Canada		
Caribbean		
China		
Europe	-	-
Indian Ocean		
Indonesia		
Japan	Bhavani Narayanaswamy	Potential joint proposals
South America	Bhavani Narayanaswamy	Potential joint proposals
Sub-Saharan Africa		
USA		
Arabian Sea (Oman workshop)		

d. Liaisons to CoML Cross-Cutting Groups

If applicable, please identify the person within your committee who is designated as the liaison to the following CoML cross-cutting projects and groups.

Project Name	Liaison Name & Institution	Nature of the Relationship
OBIS	Jan Mees, Flanders Marine Data and Information Centre, Belgium	Coordinator of EurOBIS (EuroCoML SSC member)
HMAP	David Starkey, University of Hull, UK Henn Ojaveer, Estonian Marine Institute, Estonia	HMAP coordinator (EuroCoML SSC member) PI of Baltic HMAP (EuroCoML Exec member)
FMAP	Carlo Heip, NIOO, Netherlands	Workshop coordinator (EuroCoML Exec member)
SCOR Tech Panel	-	-
E&O	Bhavani Narayanaswamy, SAMS, Oban, UK	EuroCoML Project Officer
Barcoding	Annelies Pierrot-Bults, University of Amsterdam, the Netherlands	Invited EuroCoML Observer

e. Effectiveness of the Partnerships and collaborations

Please identify any issues with the effectiveness of your committee's relationship to CoML Cross-Cutting Groups, other NRICs and/or CoML Ocean Realm Projects.

EuroCoML has worked hard with a number of the CoML projects being led from Europe, in particular the deep water projects. It is hoped that these relationship will develop as CoML enters its synthesis

phase and that the projects use EuroCoML to help them draw together and combine their results in a cohesive way to make it accessible to stakeholders ranging from other scientists through to policy makers as well as the general public.

EuroCoML has also been working to help build national and regional programmes that address the environmental and societal needs of the European governments.

**Brief summary of the work carried out under IO-CoML
June 2006 to May 2007**

Contents

A. Main activities supported by IO-CoML

- | | |
|----------------------------------------------------------------------|------------------------|
| 1. Invitation of Dr Tapas Chatterjee | 01 -14/6/07 |
| 2. International training on DNA barcoding of marine life at Lucknow | 16-21/-4 2007 |
| 3. A workshop on DNA Marker technologies at Kochi | 21/02/2007 to 03/03/07 |
| 4. Establishment of the first NaGISA site in India | 04/12/2006 |
| 5. SSC meeting of CoML at NARA and NAGISA congress at Kobe Japan | /10/06 |
| 6. Steering Committee of IO-CoML at Dar es Salaam- | 9/9/2006 |

B. Indobis

- | | |
|---------------------------------------------------------------------|---------------|
| 1. Workshop on Biogeography Information System for Indian Ocean | 25-26/09/06 |
| 2. Workshop on Andaman and Nicobar Biogeographic Information System | 15-16/02 2007 |
| 3. Workshop on Bay of Bengal Biogeographic Information System | 19-20 Feb2007 |

C. Meetings attended by other scientists from IO(NIO) region

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1. Scientific steering committee meeting of CeDAMAR, at Hereklion, Greece. | 19-21/10 2006 |
| 2. 3rd SCOR Panel meeting on New technologies International workshop of the CoML's new project for Observing Marine Life at Kobe Japan | 18-20/10 2006 |
| 3. Continental Margin Ecosystem (COMARGE) held at Institut Oceanographique, Paris, | 6-7/7 2006 |

D. CMarZ activities in Indian during 2006-2007

A.

1. Dr. Tapas Chatterjee visit to NIO.

Dr. Tapas Chatterjee, Indian School of Learning, Dhanbad Jharkahand was invited to NIO as an expert to identify Marine Halacarids. During his stay at NIO, from 10 to 14 June 2007, Dr Chatterjee not only identified about 10 species of Halacarids (Acari) but also gave live demonstrations to research students of Benthic Ecology.

2. International training on DNA barcoding of marine life (16-21 April 2007).

IO-CoML along with NBFGR I organized a hands-on training on DNA bar-coding, mainly of CO1 gene, to a select group of marine scientists in the IO region. This was the first ever such training on barcoding in the world. The participants brought their own samples (~40 identified species) and worked with them. There were 18 participants in all, and 14 were from India and 4 from IO countries. As barcoding involves the participation of both the traditional and modern taxonomists a combination of the two was maintained. Among these there were 11 basic taxonomists and 7 were biochemists. Of these 9 belonged to national labs, 7 to universities.

The break up of participants was as follows:

- A. Taxonomists – 11; biochemists – 7
- B. National labs – 9; universities – 7; others -1
- C. Senior level scientists (= professors) – 5; middle level – 8; beginners – 5
- D. Food fishes – 6; microbiology – 3; ornamental fishes – 3; venomous gastropods -1; edible bivalves – 1; crabs -1; lobsters -1; corals -1; sponges and soft corals –

The sponsorship was as follows:

IO-COML 12 participants
Western Indian Ocean Marine Science Association (WIOMSA) – 3 participants (travel only)
Sub-Saharan Africa CoML – one participant (travel only)
National Institute of Oceanography, Goa -1
Fisheries Survey of India – 1

6 senior scientists, 3 post-doctoral students and 5 graduate students from NBFGR
Dr. Dirk Steinke, University of Guelph, Canada
Dr. Bronwyn Holmes, CSIRO, Australia

(CoML provided travel to Dr. Steinke and Dr. Bronwyn. IO-CoML provided local hospitality (hotel, DSA and incidentals).

Organization of the training:

The training was a blend of lectures, demonstrations and hands-on experience, beginning from DNA extraction and passing through DNA purification, DNA amplification, sequencing and culminating in interpretation of the sequences. This covers the totality of what is required for graduation in bar-coding of marine life.

The inaugural session was presided over by Dr. Ayyappan, Dy. Director General, Indian council of Agricultural Research. Dr. S.A.H. Abidi, former member of Agricultural Scientist Recruitment Board, presided over the concluding session. Both Dr. Ayyappan and Dr. Abidi are eminent scientists in marine fisheries and biodiversity research in India. An important highlight of the training was the 2-h long lecture delivered by Dr. Lalji

singh from the Centre for Cellular and Molecular Biology, Hyderabad, India on the use of DNA fingerprinting for forensic and judicial applications, amply illustrated with examples from paternity suits, murder cases and the assassination of former Prime Minister of India.

Responses from participants:

1. ranging from very good to very useful
2. more interest in lesser-studied taxa, apart from fishes
3. more interest in coral reef organisms
4. recognition that this requires team work and hence a willingness to work together
5. agreement to develop a network in the region

Shortcomings:

1. Impression of some trainees was that the training was too tight and forced to fit within a week's time – could have been a bit more stretched out.
2. Samples brought by participants could not be completely processed for want of time.
3. Training Manual, though prepared, could not be distributed to the participants for reasons beyond the scope of this report (I shall have a PDF version sent to all participants in due course).

3. The training programme on "*DNA Marker Technologies: Principles & Applications*" was held at NBGRF Cochin unit, CMFRI Campus, Kochi-Kerala during 21 February – 03 March 2007. The training imparted theoretical and practical knowledge on various DNA based markers and on the recent developments in the field. NBGRF has recently developed molecular markers for different fish species.

A total of 31 participants attended the course representing prominent research institutes like National Institute of Oceanography-Goa, Kerala Forest Research Institute, School of Industrial Fisheries-Kochi, Rajiv Gandhi Centre for Aquaculture, Tamil Nadu. Professors and lecturers from a number of colleges viz; U.C. College-Aluva, University of Kerala, Christ College-Irinjalakuda, College of Fisheries-Panangad, Kerala etc.. were also present. The training imparted theoretical and practical knowledge on various DNA based markers and on the recent developments in the field. NBGRF has recently developed molecular markers for different fish species. The training enlightened the participants with basic concepts in molecular biology and provided insights on the application of the molecular markers like microsatellites, RAPD and mitochondrial DNA profiles to a variety of organisms like sponges, fungi, bacteria, etc...The analysis of molecular genetic data using commonly used data analysis softwares like GenePop, PopGene, Arlequin were also shown. The training also highlighted the need for DNA Barcoding which is now widely used as a taxonomic tool for unknown specimens.

A number of invited lectures were also conducted during the course of the programme enlightening the participants on the recent trends in taxonomic identification of marine mammals, molecular diagnosis of shrimp diseases with special reference to detection of white spot syndrome virus etc. The training helped to generate interest in lesser-studied taxa like fungi, marine sponges, coral reef fishes among the participants. The theoretical knowledge, detailed training manual prepared by the organizers, lab demonstrations and motivation from the faculty members encouraged the participants to initiate application of the technique for the identification of species of interest.

The faculty consisted of the following resource personnel:

Dr. A. Gopalakrishnan, NBGRF Cochin unit.

Mr. V.S. Basheer, NBGRF Cochin unit.

The faculty members were assisted by research fellows from the NBGRF Cochin unit.

4. Establishment of the first NaGISA site in India Dec 2006

As agreed during the training workshop on protocol for NaGISA observations at Mombasa (Kenya) in June 2006, India had established the first NaGISA site in a seagrass bed of the Kavaratti Atoll in Lakshadweep (10° 33' N; 72° 38' E).

Sampling and documentation of species was assigned to Miss Terenia Anne Berlie under the supervision of Dr. B. Ingole, an expert on meiofauna and Indian Ocean benthos. Miss Berlie carried out her observations in December 2006, as part of a dissertation for Master's degree in marine science from Goa University.

5. SSC meeting of CoML at NARA Nagisa Congress at Kobe Oct 2006

M. Wafar, chairperson of IO-CoML attended the SSC meeting of the CoML at Nara (Oct 2006), Japan where he presented the past activities of IO-CoML and the future ones planned for. He also participated in the discussions during the 3 days' SSC meeting on topics of general interest.

After the SSC meeting, he attended the first NaGISA congress at Kobe, Japan. The Congress had presentations from different participants on what was their work on Nagisa sites and what difficulties they encountered. MW also had discussions with Robin Ringy and Dr. Edward Kimani on mechanisms of implementation of NaGISA in the IO region.

6. Steering Committee at Dar es Salaam- Sept 2006

The first meeting of the Steering Committee of the Indian Ocean – Census of Marine Life (IO-CoML) was held at University of Dar Es Salaam on 9th Sep 2006. This was held in conjunction with the SC meeting of the Sub-Saharan Africa CoML. Prof. Yunus Mgaya, Faculty of Aquatic Sciences and Technology, University of Dar es Salaam, who is also a member of the Sub-Saharan Africa CoML, was our local host and coordinator. The

principle aim of the meeting was to review the activities undertaken so far and plan for future work. The meeting was mainly to give direction to current activities, strengthen them and explore what new initiatives can be taken up. The meeting was also held along with the Sub-Sahara CoML group in order to facilitate collaboration in overlapping geographical areas like East African Countries and West Indian Ocean islands.

Minutes of the joint IO-CoML and Sub-Sahara CoML held at Faculty of Aquatic Sciences and Technology, University of Dar es Salaam on 9th Sep 2006

Members Present:

Dr. Mohideen Wafar
Prof. Charles Griffiths
Dr. P.A. Lokabharathi
Dr. D. Chandramohan
Prof. Yunus D. Mgya
Dr. Mitrasen Bhikajee

Invitees:

Dr. Edward Kimani, Coordinator, Indian Ocean NaGISA
Dr. Greg Wagner, Chairman, IO-GOOS coastal projects

Minutes:

1. Prof. Mgya welcomed the participants. After customary introductions, Dr. Wafar and Prof. Griffiths gave brief accounts of what has been happening in their respective CoML units. Dr. Chandramohan's role as liaison between IO-CoML and the SSC was acknowledged and appreciated. His suggestion that the RICs should become more proactive in getting the countries in the region involved in existing field projects and the proposed new initiatives was taken note of.

Action: RIC chairs

2. Brief presentations of all CoML field projects were made. The discussion following these took into account imbalances in human capacities of the countries within the regions, differences in the level of technological development of the region and the rest of the world, and the need for a new field project suited to the region vs. more involvements in existing field projects. It was agreed that both RICs should provide support in every possible way (capacity building, techniques, participation in cruises, especially for abyssal and continental margin studies, provision of samples to scientists capable of studying them even if they have no means of collecting them, assistance in establishing NaGISA sites etc) for the countries within the regions to get involved in field projects. Taking note of the presentation by Dr. Wagner on joint IO-GOOS and IO-CoML project on participatory monitoring of keystone ecosystems and acknowledging the suggestion from Dr. Loka Bharathi that a new initiative suitable for the region could be rewarding, it was agreed that development of such a project could be envisaged.

Action: RIC chairs, Dr. Loka Bharathi

3. The question of how much the region can get involved in all field projects was also discussed, especially in the context that some of them could be highly technology-dependent. Dr. Wafar suggested that projects like NaGISA and Census of Marine Microbial Life where prospects of data generation are excellent and cost of involvement is minimal should be advocated and supported. Dr. Chandramohan pointed out that some technologies such as needed for bar-coding of life could be made available to the region at low cost and that this should be explored and taken advantage of. It was agreed that RICs could also take steps to enable scientists to participate in various field projects, like preparation of lists of deep-sea biologists, publicize opportunities in multi-institutional projects like CoMarge in their websites, opportunities for training in technology etc. Websites of RICs could be focal points to post needs and capabilities.

Action: RIC chairs, Dr. Chandramohan, secretariats

4. Prof. Griffiths pointed out the need to rationalize the composition of the committees. It was agreed that the main committee may be comprised of regional coordinators and that each such coordinator interacts with national coordinators within his/her region. Such a composition could give a geographic balance as well as cost-effectiveness in function. It was also agreed that the composition of the committees can be reviewed every 2-3 years.

Action: RIC chairs

5. Dr. Bhikajee suggested that some of the objectives could be easily achieved by out-sourcing. He cited as an example compilation of studies on tagging of migratory animals in the region as a contribution to projects like TOPP when they are taken up regionally.

Action: RIC chairs?

6. Dr. Kimani spoke on steps he is taking to have NaGISA implemented in the IO region. The RICs agreed to provide all support within their reach including token support for establishment of sites in countries where such support is needed and also in CB needs. The RICs also suggested to Dr. Kimani that maintenance of NaGISA sites should be built into teaching programs (ex. Dissertations for M.Sc. courses) in order to ensure continuity.

Action: Dr. Kimani

7. Dr. Wafar presented the concept of affiliated projects and mentioned that this is a good concept where data of the CoML nature can be accessed at minimal cost. After having evaluated the merits of this, the members agreed that attracting affiliated projects to CoML-fold could be pursued.

Action: RIC chairs

8. Guidelines for utilizing the grants the RICs received from Sloan Foundation were discussed, in reference to the mail sent out earlier by Dr. Wafar to members. It has been tentatively agreed that the funds at hand could be utilized in equal proportions to meet

expenses related to participation in meetings, attracting affiliated projects, support to capacity building and maintenance of the secretariat.

Action: Respective secretariats

9. Prof. Griffiths mentioned that looking after CoML activities is demanding on his time, especially when he has tight schedules in teaching responsibilities (see also action indicators against each heading above). He was of the view that a full time scientific assistant to the chair (different from the Secretary who is at a level higher than a paid assistant) is a must. Dr. Wafar concurred with his observations, since he also has to share his time between his duties in the laboratory and his role as chairperson of IO-CoML. The members considered the requirement of a full time assistant as deserving and conceded that the chairs could take steps towards this.

Action: RIC chairs, Secretariats

10. On the question of when and where to hold the next meeting of the SC, Prof. Griffiths suggested that next meeting could be convened when there are serious issues to be discussed and that until then, electronic mail and the websites could be relied upon for exchange of views and information.

11. The suggestion that PERSGA (Program for the Environment of the Red Sea and Gulf of Aden), the Regional Organization for Conservation of the Environment of the Red Sea and Gulf of Aden, that they could be the regional contact for Gulf countries was discussed. Prof. Griffiths said that he has already been in touch with Dr. Michel Claereboudt at Sultan Qaboos University in Oman. It was decided that the regional co-ordinator among these two can be identified during the regional meeting of CoML at Oman in January 2007.

12. Having transacted all the items in the Agenda and having no other matter presented to the committees for discussion, the sessions were concluded with a vote of thanks from the local host, Dr. Yunus Mgaya.

B.

INDOBIS

Workshop on Biogeographic Information System for Indian Ocean, NIO, Kochi, 25-26 September 2007

The Indian Ocean Biogeographic Information System (IndOBIS) is one of the seven regional nodes established by the OBIS. IndOBIS is responsible for the collection, collation and dissemination of data and information about the biodiversity in the Indian Ocean region through its portal <http://www.indobis.org>

Workshop on Biogeographic Information System for Indian Ocean was held on 25 -26 September 2007 at Regional Centre, National Institute of Oceanography, Kochi.

30 Participants from different R & D institutions and universities participated in the workshop. During the course of the workshop, several experts on biodiversity informatics interacted with the participants on areas related to;

- Biodiversity of Indian Ocean
- Ocean Biogeographic Information System
- Indian Ocean Census of Marine Life (IO-CoML)
- Tools, Protocols, Standards in Marine Biodiversity Informatics
- IndOBIS Electronic Catalogue of Life
- IndOBIS Specimen Digitization
- Identification of IndOBIS Partners
- Enlisting of IndOBIS Data Providers

The workshop provided an opportunity to those concerned with the Indian Ocean biodiversity to discuss all the relevant issues and to familiarize with the advancement made in biodiversity informatics.

Workshop on Andaman and Nicobar Biogeographic Information System, Hotel Megapode Nest, Port Blair 15-16 February, 2007

Workshop on Andaman and Nicobar Biogeographic Information System was jointly organized by the National Institute of Ocean Technology (NIOT), National Institute of Oceanography (NIO), and National Chemical Laboratory (NCL), at Hotel Megapode Nest, Port Blair during February 15-16, 2007. Workshop was attended by over 30 delegates - 15 institutes working on various aspects of A&N biodiversity. Brainstorming at workshop culminated in conceptualization of "Andaman and Nicobar Ocean Biogeographic Information System (ANOBIS)" as sub-node of IndOBIS, Indian Ocean Node of OBIS. Workshop also came up with Port Blair Declaration of ANOBIS, announcing the intention of establishing ANOBIS to document known, knowable and unknown biotic diversity of Andaman and Nicobar Seas. More details are accessible at <http://www.indobis.org/> click on ANOBIS.

Workshop on Bay of Bengal Biogeographic Information System, CASMB, Parangipettai, 19-20, February 2007

Workshop on Bay of Bengal Biogeographic Information System was jointly organized by the Centre for Advanced Studies in Marine Biology (CASMB), Parangipettai, National Institute of Oceanography (NIO), and National Chemical Laboratory (NCL), at Parangipettai during February 19-20, 2007. Workshop was attended by over 30 delegates 15 institutes working on various aspects of Bay of Bengal biodiversity. Brainstorming at workshop culminated in conceptualization of "Bay of Bengal Biogeographic Information System (BoBIS)" as sub-node of IndOBIS, Indian Ocean Node of OBIS. Workshop also came up with Parangipettai Declaration of BoBIS, announcing the intention of establishing BoBIS to document known, knowable and unknown biotic diversity of A Bay of Bengal. More details are accessible at <http://www.indobis.org/> click on BoBIS.

D. Meetings attended by other NIO scientists

1. Scientific steering committee meeting of CeDAMAR, at Hereklion, Greece, 19-21 October, 2006 Dr. Nagender Nath from National Institute of Oceanography, India,

attended Scientific steering committee meeting of CeDAMAR, a 10-year field project of CoML at Hereklion, Greece as a Member of the scientific steering committee from 19-21 October, 2006. He gave the demonstration of EIA data base available on NIO web site. During the discussion on time series, it was found that only few deep-sea sites have time series benthic data (collected data at same area several times), such as Porcupine abyssal plain and the Central Indian Basin (NIO/DOD). It was proposed to have a workshop somewhere during next year on the time-series data sets with key participation from NOC and NIO (probably Nath and Ingole) and others from US and Europe.

2. 3rd SCOR Panel meeting on New technologies for Observing Marine Life at Kobe , Japan 18 - 20 October 2006

D. Elgar Desa from National Institute of Oceanography attended 3rd SCOR Panel meeting on new technologies for Observing Marine Life at Kobe, Japan from 18 to 20 Oct 2006 in his capacity as Chair of the Panel. He presented a paper “Application of AUVs with Optics to CoML projects”

A significant step in developing a small AUV called MAYA was undertaken by a team of scientists and a group of young Project Assistants in the Marine Instrumentation Division of the National Institute of Oceanography, Goa

Autonomous underwater vehicles are basically robots to acquire in-situ oceanographic data with minimum disturbance to the parameter under measurement. These robots are equipped to reach difficult locations and achieve the mission tasks independent of the mother vessel. Effectively AUVs enhance the research vessels capability to spatially sample the ocean in three dimensions.

MAYA – the small AUV has been designed and tested to address the above scientific needs. MAYA’s navigation in 3D is a combination of vehicle payload data and controls designed and implemented on a mission controller. GPS sensor on surface provides the initial reference point while Doppler Velocity Log, AHRS and a pressure sensor are used for dead reckoning underwater. A UHF communication link ensures constant contact when MAYA is on surface.

AUV (MAYA) is programmed to dive and maintain control at any given depth layer in a water, measure sensor variables while in motion, do YoYo in the water column, perform mission transects below sea surface and avoid obstacles.

The Maya AUV has many applications in oceanography. She can collect standard oceanographic data in confined areas; carry out shallow water bathymetry using acoustic methods; detect blooms with the help of optical radiometers; and also work as a test platform for new sensor technologies. It can also measure Vertical dive profiles of Dissolved Oxygen, Chlorophyll, Turbidity, Temperature.

Maya can be used in number of applications like:

- Monitoring of Coral Reefs
- Hydrothermal vents and Seamounts
- Seabed photography

3. Continental Margin Ecosystem (COMARGE) held at Institut Océanographique, Paris, during 6-7/7 2006

Dr. Baban Ingole attend the international workshop of the CoML's new project Continental Margin Ecosystem (COMARGE). The workshop hosted by the Institut Océanographique in Paris was the second international workshop organized by COMARGE after the Rio Meeting. The Paris workshop was meant to introduce the objectives of COMARGE to a larger audience of about 40 scientists from almost all countries that had expertise in margin studies in terms of taxonomy and ecology and further discuss those objectives. The general aims were to share interest and agree on a list of major scientific questions in order to plan the future actions in a collaborative way.

The workshop allowed i) defining four themes that should be addressed by COMARGE in the future, ii) planning actions for years 2006-2008 in order to progress on each of these themes and iii) identifying leaders for each action. Dr Baban Ingole led the theme on Anthropogenic impacts on margins. The actions identified were 1) to look for information/data available on impact intensities and effects 2) To map impact intensities for selected kind of human activities 3) To map Marine Protected Areas on continental margins

CMarZ activities in Indian during 2006-2007

As a Member of CMarZ Steering Group Dr. Vijayalakshmi R. Nair attended the SG meeting held at Ocean Research Institute, University of Tokyo, Tokyo, Japan from November 6-8, 2006. Dr. Nair reported on the progress in the Indian Ocean sector to implement the goals of CMarZ emphasizing the challenges and plans to overcome them. Plans on zooplankton studies of the Indian Ocean for the year ahead were also presented. During the IndOBIS workshop at RC of NIO, Kochi, from September 25-26, 2006, Dr. Nair was invited to make a presentation on CMarZ. She talked about the objectives, responsibilities and accomplishments of CMarZ to the participants of the workshop. Dr. Nair published an article in Science Reporter (May 2006) on "Exploring Marine Life" elaborately discussing on the efforts of CMarZ on global scale biodiversity of zooplankton.

On the initiative of Dr. Nair, Dr. Saramma U. Panampunnayil, Scientist, RC of NIO, Kochi and Dr. C.B. Lalithambika Devi, Consultant, RC of NIO, Kochi were invited to Woods Hole Oceanographic Institute (WHOI), USA as zooplankton taxonomic experts in Mysidacea and Fish larvae to participate in an NOAA sponsored CMarZ cruise from 10-30 April 2006 to assess the zooplankton biodiversity of tropical/ subtropical Atlantic Ocean waters. Dr. Rosamma Stephen, Consultant, RC of NIO, Kochi visited Alfred-Wegener Institute for Polar and Marine Research (AWI), Bremerhaven, Germany in July 2006 as recommended by Dr. Nair to share her expertise in Copepoda. She also visited WHOI to work on the creation of species page for CMarZ.

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

**Report of the International training on DNA barcoding of marine life
(16-21 April 2007)**

Genesis:

Having recognized the value of barcoding in describing marine biodiversity, IO-CoML made a decision in November 2006 to impart a hands-on training on DNA bar-coding, mainly of CO1 gene, to a select group of marine scientists in the IO region. After having explored several institutions where this training could be organized, the [National Bureau of Fish Genetic Resources \(NBFGR\)](#) at Lucknow, India, was chosen. Though not realized at that time, this WAS the first ever such training on barcoding anywhere in the world (sic Dr. Dirk Steinke). This also gains an additional distinction in that the participants brought their own samples (~40 identified species) and worked with them.

Total number of participants: 18 (list appended).

Indian – 14; Other IO countries - 4

Choice of participants:

As the work requires expertise in classical taxonomy as well molecular and biochemical techniques, I strived to maintain the composition as a blend of these two groups. Besides, I also tried to give representation to diverse taxonomic groups, besides fishes.

Break-up of participants:

- A. Taxonomists – 11; biochemists – 7
- B. National labs – 9; universities – 7; others -1
- C. Senior level scientists (= professors) – 5; middle level – 8; beginners – 5
- D. Food fishes – 6; microbiology – 3; ornamental fishes – 3; venomous gastropods -1; edible bivalves – 1; crabs -1; lobsters -1; corals -1; sponges and soft corals -1

Sponsors:

IO-COML for 12 participants

Western Indian Ocean Marine Science Association (WIOMSA) – 3 participants (travel only)

Sub-Saharan Africa CoML – one participant (travel only)

National Institute of Oceanography, Goa -1

Fisheries Survey of India – 1

Faculty:

6 senior scientists, 3 post-doctoral students and 5 graduate students from NBFGR

Dr. Dirk Steinke, University of Guelph, Canada

Dr. Bronwyn Holmes, CSIRO, Australia

(CoML provided travel to Dr. Steinke and Dr. Bronwyn. IO-CoML provided local hospitality (hotel, DSA and incidentals)).

Organization of the training:

The schedule of the training program is appended to this report. As could be seen from this, the training was a blend of lectures, demonstrations and hands-on experience, beginning from DNA extraction and passing through DNA purification, DNA amplification, sequencing and culminating in interpretation of the sequences. This covers the totality of what is required for graduation in bar-coding of marine life.

The inaugural session was presided over by Dr. Ayyappan, Dy. Director General, Indian Council of Agricultural Research. Dr. S.A.H. Abidi, former member of Agricultural Scientist Recruitment Board, presided over the concluding session. Both Dr. Ayyaappn and Dr. Abidi are eminent scientists in marine fisheries and biodiversity research in India. An important highlight of the training was the 2-h long lecture delivered by Dr. Lalji singh from the Centre for Cellular and Molecular Biology, Hyderabad, India on the use of DNA fingerprinting for forensic and judicial applications, amply illustrated with examples from paternity suits, murder cases and the assassination of former Prime Minister of India. Dr. Singh travelled 2600 km (to and fro) at the request of Dr. Lakra, Director, NBFGR specifically to deliver this lecture to the participants.

Responses from participants:

1. ranging from very good to very useful
2. more interest in lesser-studied taxa, apart from fishes
3. more interest in coral reef organisms
4. recognition that this requires team work and hence a willingness to work together
5. agreement to develop a network in the region

Training costs:

About 6,50,000 INR (~15,000 US \$) that covers course fees to NBFGR, working lunch, snacks and tea/coffee, accommodation, food, out-of-pocket allowances, travel for Indian participants, hotel and DSA and other allowances for the 2 resource persons from abroad, incidentals for participants from Africa, vehicle hire for transport of participants from hotel to NBFGR and other miscellaneous expenses. NBFGR hosted 3 dinners during the week.

Reduced per trainee, this works out to about 850 US\$ per person (all inclusive).

Recommendations from participants and faculty:

1. Another such training could enhance manpower pool for barcoding of marine life
2. Time is ripe to form the network.

Scientific options for the network:

1. A 3-tiered organization, with a network of taxonomists supplying identified specimens, another network of biochemists extracting and amplifying DNA and a third Institution, carrying out sequencing.
2. A pair of taxonomist and biochemist, working together on identification of species and DNA extraction and a third Institution carrying out sequencing.

Administrative options:

1. NBFGR is developing a network of barcoding for fishes in India. Integration into this could be practical. Constraints are:

1. The network is national and not for IO region.
2. IO-CoML (and by extension, CoML) would receive less credit.
3. Relying on a single institution is restrictive for growth.

2. Development and management of the network be entrusted to one of the 18 participants (Some expressed interest and willingness).

3. IO-CoML secretariat runs the network

Budget and targets for network:

To be worked out after feedback from SSC (or the CoML Secretariat) on the scientific and administrative options. Informal talks with participants place target number of species for 2007 at about 200 (considering teething problems) at a cost of 50\$ per specimen. The latter is higher than what CBOL normally claims per specimen but here sequencing is done on payment of about 30\$ per specimen. To this should be added the organizational expenses.

Shortcomings:

1. Impression of some trainees was that the training was too tight and forced to fit within a week's time – could have been a bit more stretched out.
2. Samples brought by participants could not be completely processed for want of time.
3. Training Manual, though prepared, could not be distributed to the participants for reasons beyond the scope of this report (I shall have a PDF version sent to all participants in due course).

Establishment of the first NaGISA site in India

As agreed during the training workshop on protocol for NaGISA observations at Mombasa (Kenya) in June 2006, India had established the first NaGISA site in a seagrass bed of the Kavaratti Atoll in Lakshadweep (10° 33' N; 72° 38' E).

Sampling and documentation of species was assigned to Miss Terenia Anne Berlie under the supervision of Dr. B. Ingole, an expert on meiofauna and Indian Ocean benthos. Miss Berlie carried out her observations in December 2006, as part of a dissertation for Master's degree in marine science from Goa University.

Please [click here](#) for the location of the site and [here](#) for environmental characteristics and species composition of the site.

It is expected that an arrangement would be made with the Goa University to have a M.Sc. student assigned sampling of this NaGISA site every year as dissertation work.

Inauguration of Census of Marine Life in Indonesia (CoML Indonesia)

Summary Report

CoML Indonesia was successfully launched on 24 July 2007 at a meeting held at the Department of Marine Affairs and Fisheries' Agency for Marine and Fisheries Research, Jakarta, Indonesia. Following opening statements by the meeting Chair-person, Prof. Dr. Indroyono Soesilo (Chairman of Agency Marine and Fisheries Research), Dr. Hery Haryono (Deputy Director of Earth Science - Indonesian Institute of Science (LIPI)) and Dr Ian Poiner (CoML), there were presentations about the Census and Indonesian marine biodiversity and fisheries research. Prof. Dr. Indroyono also briefed the meeting about the World Ocean Science Conference (WOC) to be held in Indonesia in 2009 (www.woc2009-manado.net). Marine mega biodiversity and the impacts of global climate change on the ocean are two of the five issues for the Conference.

Following the presentations there were lively discussions about marine biodiversity research in Indonesian and the opportunity that the CoML could provide to help progress it. As one of the 19 mega-biodiverse countries on earth Indonesia is an astonishingly rich centre of global marine biodiversity. In the 65 million years since the Gondwanan break-up, Indonesia has evolved a biological diversity that equals or exceeds the top biodiverse countries on Earth and remains one of the world's biodiversity hotspots for new species discoveries.

Prof. Dr. Indroyono highlighted the opportunity the CoML provides to Indonesia to make accessible, via OBIS, the nation's marine biodiversity data. This would demonstrate Indonesia's place as one of the world's mega biodiverse nations. Of particular interest were the fifteen national data sets highlighted in Dr. Victor Nikijuluw presentation which included geo-referenced species by abundance data for several groups e.g. sharks and rays and deep-water species, and species check lists for a number of areas in Indonesia. The data sets discussed by Dr. Nikijuluw included the following:

1. Malaka Strait - (GTZ-Indo survey, 1974)
2. Red Snapper - (Indo-Australia project, 2002-2004)
3. Karubar Expedition – (Indo France 1992-1993)
4. Cendrawasih Bay Expedition (ARMP 1992)
5. Demersal Fish on Java Sea Survey (GTZ-Indo 1974)
6. Check List Arafura Sea Survey, 2002-2006
7. Mamalia laut – Survey 2004
8. Shark (Indo-Australia collaboration project, 2002-2004)
9. Deep Sea Fish Survey. (Japan/OFCF-Indo 2004-2005)
10. Check List Fish in Western Coast of Aceh (Indo Norway Expedition 2005-2006)
11. Check List South China Sea (SEAFDEC-Indo Joint Survey 2005)
12. Check List Demersal Fish in Indian Ocean (GTZ-Indonesia : 1982-1983)
13. Snellius II Expedition (Netherland – Indonesia, 1984)
14. Fritjof Nansen Expedition 1980
15. Check List South China Sea, (Indo-GTZ 1974)

Several of the data sets are already digitized and probable could be quickly incorporated into OBIS. Prof. Dr. Kurnaen Sumadhiharga highlighted LIPI research relevant to the

Census and provided and update on the development of the Indonesian Marine Life Information System (Indo-MarLinS) which is planned to be operational by 2009 and could be an enduring portal to interface with OBIS.

Dr Tonny Wagey briefed the meeting on the plans for CoML Indonesia and its initial three goals:

1. Establish a CoML Indonesia National Implementation Committee (NIC);
2. Incorporate existing accessible Indonesian marine biodiversity data for the Arafura and Timor Seas (ATS) into the CoML Ocean Biodiversity Information System (OBIS); and,
3. Undertake a marine biodiversity review (MBR) of what used to live, what currently lives, and what might live in the ATS.

In summarizing the meeting, Prof Dr Indroyono noted that he would be the inaugural chair of the CoML Indonesian NIC and that it would be convened by AMFR and LIPI but involve other key marine Indonesian institutions and universities. Dr Indroyona proposed the following five immediate actions for CoML Indonesia:

1. CoML Indonesian RIC to meet in August 2007.
2. CoML Indonesian and the Arafura Timor Sea Experts Forum to instigate the ATS MBR by August 2007.
3. CoML Indonesian will identify existing Indonesian marine biodiversity data that can be made available to OBIS immediately. Ian Poiner will discuss this with OBIS to identify a contact person for CoML Indonesia to work with to overcome any technical issues and facilitate the link.
4. CoML Indonesia to present the results of the ATS MBR, and a synthesis and review of Indonesia's marine biodiversity at the WOC in 2009. The plan is to have a CoML session at the conference focused on marine mega biodiversity. Ian Poiner will investigate CoML sponsorship opportunities with the CoML Executive.
5. AMFR will seek additional resources from Indonesia to facilitate and enhance CoML Indonesia's work program.

Representatives from CoML Indonesia are planning to attend the All Programs meeting in Auckland New Zealand and this will provide an opportunity to update the CoML community on development in Indonesia and to investigate links to CoML projects. For example, an existing satellite shark tagging program in Indonesia may be able to be linked to TOPP activities. Appendix 1 provides the agenda for the meeting and Appendix 2 a list of attendees.

Ian Poiner
26 July 2007

Inauguration Meeting *Census of Marine Life (CoML)* Indonesia
Chaired by Chairman of the Agency for Marine and Fisheries Reserach



Inauguration of CoML Indonesia
Agency for Marine and Fisheries Research
 Jakarta, Indonesia
 Tuesday, July 24, 2007

AGENDA/PROGRAMME

Time	Description
09:30	Opening Remarks/Introduction of the Meeting. Opening Statements: <ol style="list-style-type: none"> 1. Prof. Dr. Indroyono Soesilo, Chairman of Agency Marine and Fisheries Research 2. Dr. Hery Haryono, Deputy of Earth Science - Indonesian Institute of Science (LIPI) 3. Dr. Ian Poiner, CEO, Australian Institute of Marine Science & Vice-Chair SSC CoML
10:45	Presentations: <ol style="list-style-type: none"> 1. Dr. Ian Poiner –CoML Overview 2. Prof. Dr. Kurnaen Sumadhiharga - Director of National Project Implementing Unit – Coral Reef Information & Training Center COREMAP, LIPI 3. Dr. Victor Nikijuluw – Director of Research Center for Capture Fisheries, AMFR
11:15	Discussion
12:00	Closing
12:30	Lunch

LIST OF ATTENDEES

1. Prof. Dr. Indroyono Soesilo – Chairman of Agency Marine and Fisheries Research (AMFR)
2. Drs. Asep D. Muhammad, Msi – Secretary of Agency Marine and Fisheries Research
3. Dr. Ian Poiner – CEO, Australian Institute of Marine Science / Vice-Chair SSC CoML
4. Dr. Terry Done – Australian Institute of Marine Science / COREMAP
5. Dr. Hery Harjono – Deputy of Earth Science ,Indonesian Institute of Science, LIPI
6. Dr. Victor Nikijuluw – Director of Research Center for Capture Fisheries, AMFR
7. Dr. Budhi Sayoko – Head of Environment Unit, UNDP
8. Prof.Dr. Kurnaen Sumadhiharga – Director of NPIU-CRITC COREMAP, LIPI
9. Dr. Zainal Arifin – Head of Ocean Dynamics Division, LIPI
10. Dr. Subhat Nurhakim – Senior Research, BRKP
11. Dr. Ngurah Wiadnyana – Head of Technical Services Division, Research Center for Capture Fisheries, AMFR
12. Dr. Augy Syahailatua – Head of Marine Resource Division, P2O LIPI
13. Ir. Elvy Wijayanti - Head of Research Communication and Cooperation Division-AMFR
14. Drs. Tito Setiawan, MM, Sub.Head of Research Cooperation, AMFR
15. Dr. Tonny Wagey – Regional Coordinator, ATSEF Indonesia
16. Ir. Theresia Lolita N – Finance Office, ATSEF Regional Indonesia
17. Ivonne Rawis – Secretary, ATSEF Regional Indonesia
18. Sitti Hamdiyah, S.Pi, M.Si - Staff KSKR AMFR
19. Staff at Research Communication and Cooperation Division-AMFR

South America Regional Implementation Committee

Chairperson

Diego H. Rodríguez

Departamento de Ciencias Marinas

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1. 2007 ACCOMPLISHMENTS & SCIENTIFIC HIGHLIGHTS

The Venezuela NAGISA team led by Drs. Patricia Miloslavich and Juan J. Cruz was awarded to use the project protocol as a monitoring program in the east region of the country by Chevron (US\$ 645,000; 2007-2009). During 2007 main activities were focused on sampling locations of Venezuela (6), Colombia (1), Brazil (1), Argentina (2) and Ecuador (1); the areas included seagrass (*Thalassia testudinum*) beds and rocky shores. A complete set of samples included several marine phyla and are currently under analysis. Planned activities include further sampling fieldwork during late 2007 and efforts to improve sampling coverage. Non-active NAGISA sites in South America include locations in Brazil (1), Uruguay (1), Chile (2) and Perú (1), with the main problems identified as poor weather conditions, team implementation or lack of funding. A detailed NAGISA South America Report was submitted to CoML by the Chairperson, Dr. Patricia Miloslavich.

Research activities to study shelf and slope reducing settings off south-central Chile are linked to COMARGE. The project is led by Dr. Juan Díaz-Naveas (PUCV) and connected with COPAS through Dr. Javier Sellanes, with planned cruises to the study of benthic habitats subjected to the influence of the Eastern Pacific Oxygen Minimum Zone (OMZ) and methane seepage. In cooperation with University of Magallanes (Chile) and Scripps Institution of Oceanography (US) recently discovered methane seep area located off El Quisco (~33°S, 350 m depth), a couple of mud volcanoes and the Concepción Methane Seep Area CMSA; (~36°S, 700-1500 m depth) will be studied, and also the vicinities of Mocha Island (~37°S, 1500 m depth) will be surveyed. Dr. Helena Passeri Lavrado is leading a deep-sea environment project supported by the state oil company of Brazil (Petrobras), and plan to coordinate activities in the future in the framework of COMARGE.

Dr. Cristián E. Hernández Ulloa, from Universidad de Concepción (Chile) proposed the affiliation of a new PhD Program on Systematics and Biodiversity to CoML. The proposal was officially presented at the CoML SSC meeting in Quito (June 2007) and it was agreed to consider as a key element for the graduate education on marine biodiversity in South America. This program will be officially launched in October 2007, and it will intend to coordinate activities and courses with the CoML activities in South America.

The first All Birds Barcoding Initiative (ABBI) and FishBOL Neotropical Working Group Meeting have taken place at the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" in Buenos Aires, in March 2007.

More than 50 participants from South America, USA, Canada and the UK attended the meeting, with partial financial support of the SA-RIC. The activities involved presentations of the advances in the barcoding of particular geographic areas and taxonomic groups, and the discussion of several issues related to the design of a regional strategy. These issues included the availability of tissue samples, the regional capacity for producing barcodes, the restrictions and policies for obtaining collection, import and export permits, and the optimization of sampling efforts. The closing session, on the morning of March 16, brought the two groups together and promoted their interaction and set short, medium and long term goals. The first results of marine taxa barcoding were presented at the Second International Barcode of Life Conference in Taipei, September 2007. A total of 327 unambiguous bidirectional barcode sequence records were generated for a total of 87 species of marine fishes from Argentinean waters, and presented by the FishBOL South America Working Group Chair, Dr. Juan Martín Díaz de Astarloa. The results demonstrate that DNA barcodes are effective in

Discriminating all species surveyed. The molecular assisted recognition of cryptic diversity (highlighted by the existence of deep genetic divergences within taxa), fuelled subsequent efforts in integrative alpha taxonomy. Result included the description of a new species of Longnose skate (*Dipturus argentinensis*) and the recognition of the Brazilian cusk eel (*Genypterus brasiliensis*) as a valid species; additionally, the pattern of diversification implied by the molecular data among eight *Bathyraja* species implies the presence of a phylogenetic constraint acting on the physiological plasticity of these species with respect to their differing habitat preferences.

The International Census of Marine Microbes (ICoMM) together with the Steering Committees of South America and Caribbean supported the initiative of launching a regional ICoMM node in South & Central America and in the Caribbean (LACar ICoMM). Two meetings of marine microbiologists took place simultaneously with the SA-RIC (Mar del Plata, Argentina, September 26-29 2006) and the Caribbean CoML and the CoML SSC meetings (Panamá City, Panamá, February 12-14, 2007) that brought together representatives from different South American and Caribbean countries. Discussion focused on marine microbial studies currently carried at the both the South American and the Caribbean region, existing scientists, resources and possible orientations aimed at improving our knowledge of marine microbes and their biodiversity in the next years. As a result, there was a first attempt to build up a South American-Caribbean network within the frame of marine microbial ecology and biodiversity. The basic commitments of the group was to produce a complete list of collaborators, to achieve consensus about the best protocols for the sampling, conditioning and delivery of samples for further analysis, to organise methodological workshops and short-time training courses, and to establish a strong partnership with ICoMM. The initial network included 18 researchers from 10 countries, including Latin America, Spain and US. Results from this initial stage of LACar ICoMM were communicated in April 2007 at both the IV International Plankton Symposium (Joao Pessoa, Brazil) and the XII Latin American Congress of Marine Sciences (COLACMAR; Florianopolis, Brazil).

After the first South Atlantic MAR-ECO workshop, convened by Drs. J. Angel Pérez and Fernando L. Diehl at Balneário Camboriú (Brazil) on September 2006, a draft proposal with the concepts of MAR ECO in South Atlantic was submitted to MAR Eco Steering Committee in January 2007. The interim Steering Committee of South Atlantic MAR ECO convened for the first time at the XII Latin American Congress of Marine Sciences (COLACMAR; Florianopolis, Brazil), with the presence of 5 members from Brazil (Drs Alvarez Perez and Pires), Uruguay (Dr. Muniz Maciel), Portugal (Dr. Santos) and New Zealand (Dr. Clark), plus representatives of International MARECO (Dr. Porteiro), CoML Secretariat (Dr. O'Dor) and Sub Saharan RIC (Dr. Lilende); invited participants included 8 researchers and 5 Governmental officers from Brazil. Efforts were made in the direction of combining both the Government and SA MAR-ECO agendas, with the first steps made in that direction. The Steering Committee introduced the discussion of the SA MAR-ECO formal science proposal defining the need for the establishment of component themes, proposing the establishment of working groups on Demersal and Pelagic Nekton, Zooplankton, Macrobenthos, Microbiology, Bioprospection, Environment, Data Mining and Vessels. In June 2007 the MAR ECO renewal proposal (2007 – 2010) was approved by the P. Sloan Foundation, with the South Atlantic initiative being funded for planning actions. The conclusion of the complete science/field plan has been expected to January/February 2008 as the result of a workshop to be organized to that end. A Brazilian leadership of SA MAR-ECO was proposed and supported by members of MARECO, and it was convened to increase the participation of scientists of South America (mainly Argentina and Uruguay)

and West Africa. Associations with ongoing actions of the programs CenSEAM and COMARGE were emphasized as to increase the efficiency of SA MAR-ECO, considering the 2007 – 2010 milestones.

The OBIS structure in South America is operated by the tropical and subtropical southwest Atlantic node (<http://obissa.cria.org.br/>; hosted by Universidade do Sao Paulo (Brazil) and chaired by Dr. Fabio Lang) the temperate southwest Atlantic node (<http://arobis.cenpat.gov.ar/>; hosted by Centro Nacional Patagónico (Argentina) and chaired by Dr. Mirtha Lewis) and the Tropical and Subtropical Eastern South Pacific OBIS RON (ESPOBIS; hosted by Center for Oceanographic Research in the eastern South Pacific (<http://ron.udec.cl/>) and chaired by Dr. Rubén Escribano). The tropical-subtropical Atlantic node integrate three main sources (REVIZEE Program, Paranaguá Bay and SinBiota/FAPESP), mainly focused on invertebrates (pelagic and benthic) and fish (demersal and pelagic); the current on-line records are approximately 30,000 of about 2,450 species. Two new databases on Ichthyoplankton and Zooplankton from the REVIZEE Score Central were integrated in early 2007. The CEBIMAR (Universidade de Sao Paulo) hosted the 6th OBIS Managers Committee Meeting in April 2007, with the presence of representatives of 8 regional nodes (Africa, South America, Australia, Canada, Korea, Europe, US and New Zealand) and OBIS Secretariat. A potential cooperation with the Inter American Biodiversity Information Network (IABIN) arise during the 5th meeting in Punta del Este (Uruguay, May 2007), with the presence of 29 countries from 34 focal points in America. OBIS committed to cooperate in the development of Thematic Networks on Species and Specimens (SSTN) and Ecosystems (ETN); this cooperation will be based on South America data sharing in SSTN portal to be launched in mid 2007.

The regional OBIS South Atlantic full node (AROBIS) integrates 10 institutional databases and centralizes information about the distribution of vertebrates and invertebrates from the coastal areas of South-western Atlantic Ocean and the distribution of resident vertebrates which emigrate to the Southern Ocean and the Pacific. Currently serves 200,000 records of 1,387 species of marine mammals, seabirds, fish and invertebrates. The portal in Spanish contains the most important text pages from the OBIS, with about 60% of the visits coming come from Spanish speaking countries. AROBIS is closely working with local and international NGOs which focus on a certain aspect of the ecosystem conservation, to attract more records and to develop the knowledge of the resources in the Atlantic Ocean. The node staff recently participated in the GBIF Georeferencing Training Workshop in collaboration with CONICET, Argentine Network of Biological Collections (RNCB), Argentine Museum of Natural Sciences (MACN) and CYTED Iberoamerican Network for the Conservation and Digitization of Biological Collections.

ESPOBIS include Foraminifera, Phytoplankton, Benthic invertebrates and zooplankton corresponding to five databases, and include about 28,000 records of the Eastern South Pacific. Two new databases are currently being processed to be included in the RON: the Instituto Oceanográfico de la Armada del Ecuador (INOCAR, Ecuador) database of fish and planktonic species (< 1000), and the Catholic University of North of Chile, with a significant number of records (>10,000-) on intertidal species of the northern and central/southern region of Chile. Conversations are currently underway with researchers from INOCAR, Universidad Nacional Mayor de San Marcos (Peru), Instituto del Mar del Perú, Museo Nacional de Historia Natural (Chile), Universidad Arturo Prat (Chile), Universidad de Antofagasta (Chile), Universidad de Concepción (Chile), and Universidad Católica del Norte (Chile) to gain access to their data bases on marine biodiversity.

The 2nd Meeting of the Latin American Office of the Census of Antarctic of Marine Life (OLA CAML) was convened in Brasilia (Brazil) by Drs Lúcia Campos, Manuela Bassoi, Cristina Nakayama and Diego Rodríguez, with the attendance of 31 scientist representatives from all the six countries that have Antarctic Programmes (Brazil, Perú, Chile, Argentina, Ecuador and Uruguay) with the addition of Venezuela. Other representatives included the ICSU Regional Director for Latin America and Caribbean (Dr. Alice Abreu) and representatives of Brazil Ministry of Environment, National Council for Scientific and Technological Development, OBIS and CCAMLR. Funding for this meeting was supplied via a “seed grant” by CoML SSC. Three working groups (Benthic and Pelagic realms and Top Predators) were established to identify the potential theme projects, study areas for cooperation and available time series, to establish strategies for regionalising efforts in Antarctic work and to strengthen the educational components of their activities. All working groups identified areas (i.e.

Gerlasche-Bransfield) of common activities, with also a great overlap in methodologies and studies subject to further cooperation. It was agreed to coordinate efforts to seek for funds for capacity building, personnel training and coordination activities. It was highlighted the need of continuing monitoring and time-series programmes, also as the need of logistic coordination in order to optimise the use of research stations and vessels. A roughly estimate of U\$ 3 million invested in logistics and research from South American countries was identified, with a high potential contribution to CAML.. Following the II OLA CAML two direct actions were taken. Dr.Lúcia Campos met the Latin American Antarctic Administrator Meeting (RAPAL) and presented a brief of the results, and a commitment of supporting the CAML activities was reach. In the following days a proposal for establishing a regional network was submitted to the PROSUL initiative of the National Research Council of Brazil (CNPq). The next OLA CAML meeting is intended to be organised in Uruguay in April 2008, to present the results of the IPY activities and future planning to establish the network.

2. COMMITTEE STRUCTURE, MANAGEMENT & INTERNAL COMMUNICATION

The Alfred P.Sloan Foundation awarded Universidad Nacional de Mar del Plata (Argentina; Grant 2006-5-7-CML; U\$ 45,000) to strengthen the activities of the South America RIC for the period 2006-2007; an extension till December 2007 was recently awarded.

The CoML South America Regional Implementation Committee (SA-RIC) is formed by a representative of nearly all (with the exception of Suriname and Guyana) coastal countries, plus representatives of all the South America OBIS RONS. The field of expertise is varied, ranging from microbial (Artigas, Escribano), benthic ecology (Miloslavich, Muniz, Couto, Tarazona, Diaz, Cruz), plankton ecology (Escribano), cnidarians (Lang) and marine mammals (Lewis, Rodríguez). Recent changes in national representation involved Chile and Uruguay. There are no specific responsibilities assigned to the different members. Although the SA-RIC cover a vast region, communication is smooth between members and maintained mainly by email.

Regional meetings are scheduled annually, and maintained since 2002. It was agreed to convene the next SA-RIC meeting in Ilheus (Brazil) hosted by Universidade Federal de Santa Cruz on March-April 2008. Considering the rapid growth in South American participation in several field projects and SSCs, a reformulation of SA-RIC is needed. It is desirable that an extended participation also include leading scientists of each field project and formally assign an E&O member. The inclusion of people dealing with a daily activity in a SSC will much ensure a better dynamic (in terms of goals, funding, methods) of the SA-RIC. Keeping in mind the mutual interest of cooperation with the sub-Saharan RIC, an invitation to a member will also be desirable.

3. 2007 EDUCATION & OUTREACH EFFORTS

Unfortunately little advances were achieved during this year, mainly because of the expanding research activities and the lack of a group of key persons to take this task. It was agreed with CoML E&O groups to begin actions during 2008.

4. GEOGRAPHIC EXPANSION

No geographic expansion is in consideration.

5. PARTNERSHIPS & COLLABORATION

a. Partnerships

Organisation Name	Point-of-Contact (Name)	Nature of Relationship
Universidade de San Pablo: Departamento de Zoologia and Departamento de Oceanografia Biológica (Brazil)	Fabio Lang	RON host institution Data provider
CRIA (Centro de Referência em Informação Ambiental) (Brazil)	Fabio Lang	Freeware development
Programa REVIZEE (Brazil)	Fabio Lang	Data provider
Paranagua Bay (Brazil)	Fabio Lang	Data provider
SinBiota/FAPESP (Brazil)	Fabio Lang	Data provider
Centro Nacional Patagónico-CONICET (Argentina)	Mirtha Lewis	RON host institution Data provider
Proyecto Modelo del Mar (Argentina)	Mirtha Lewis	Associated research program
Foro para la conservación del Mar Patagónico y Areas de influencia	Mirtha Lewis	Associated NGO
Universidad Nacional de Mar del Plata (Argentina)	Mirtha Lewis	Data provider
Instituto Nacional de Investigación y Desarrollo Pesquero (Argentina)	Mirtha Lewis	Data provider
COPAS (Chile)	Rubén Escribano	RON host institution Data provider
Universidad Nacional Mayor de San Marcos (Peru)	Rubén Escribano	Data provider
Instituto Oceanográfico de la Armada (Ecuador)	Rubén Escribano	Data provider
Instituto del Mar del Perú	Rubén Escribano	Data provider
Museo Nacional de Historia Natural (Chile)	Rubén Escribano	Data provider
Universidad Arturo Prat (Chile)	Rubén Escribano	Data provider
Universidad de Antofagasta (Chile)	Rubén Escribano	Data provider
Universidad de Concepción (Chile)	Rubén Escribano	Data provider
Universidad de Concepción (Chile)	Cristián Hernández Ulloa	PhD Program

b. Links to CoML Ocean Realm Projects

Project Name	Liaison or Cross-over personnel	Nature of Relationship
CAML	Diego Rodríguez	SSC Member
CAML	Lucia de Siqueira Campos	SSC Member
COMARGE	Helena Lavrado	SSC Member
COMARGE	Javier Sellanes	SSC Member
NAGISA	Patricia Miloslavich	Regional Coordinator
CoML SSC	Víctor Ariel Gallardo	Member
IcoMM	Felipe Artigas & V.A.Gallardo	Regional Committee established
MAR-ECO	Angel Perez	Regional Committee established

c. Links to other CoML National and Regional Implementation Committees (NRICs)

NRIC	Liaison or Cross-over personnel	Nature of Relationship
Caribbean	Patricia Miloslavich	NRIC chairperson
Sub-Saharan Africa	Fabián Acuña	Professional cooperation with NRIC chairperson

d. Liaisons to CoML Cross-Cutting Groups

Project Name	Liaison Name & Institution	Nature of the Relationship
OBIS	Mirtha Lewis	RON coordinator
OBIS	Fabio Lang da Silveira	Regional coordinator
OBIS	Rubén Escribano	RON coordinator
Barcoding	Juan Martín Díaz de Astarloa	FISHBOL regional coordinator
Framework	Patricia Miloslavich	Member

e. Effectiveness of the Partnerships and collaborations

A good interaction was started during the last year, mainly due to the very active participation of South American scientists in the above mentioned projects.



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1. 2007 ACCOMPLISHMENTS & SCIENTIFIC HIGHLIGHTS

2007 was a year of continued growth and programmatic maturation for the U.S. National Committee (USNC). The USNC elected a new chair and vice-chair, while adding an energy and policy consultant, and economist, and outreach coordinator, and a fisheries manager to its already diverse membership. In order to manage the emerging topics considered critical by the USNC, the committee created four (4) subgroups. These groups each undertake a very different, but critical action in an overall effort to continue the development and implementation of the U.S. CoML program into 2010, the end of the First Census, and beyond. Specifically, these subgroups are:

- 1) Code of Conduct for Scientific Collections Subgroup whose task is to review practices according to a newly developed code for doing CoML Research within the United States and to provide assistance to CoML researchers to promote outreach with regional communities;
- 2) Legislative/ Capitol Hill Liaison Subgroup whose task is to monitor legislative activity, look for legislative opportunities to support CoML, with a particular focus to the future of CoML post 2010;
- 3) OBIS USA Advisory Subgroup whose task is to guide the implementation of the OBIS USA strategy (Appendix IV), determine data priorities, clarify user groups, and provide guidance to the U.S. RON manager;
- 4) CoML post 2010 Strategy Subgroup whose task is to determine a course of action for the future of CoML, examine possibilities for future funding, develop a cohesive, overall legacies strategy, and create a framework that preserves the unique attributes of CoML.

The USNC remained committed to organizing workshops again in 2007. This year, the U.S. Program Office produced a report and submitted a scientific article to *Frontiers in Ecology and the Environment* in an effort to reach an even more broad and diverse audience. These were direct outcomes from a September, 2006 USNC sponsored workshop titled, “Approaches for Researching the Roles of Marine and Coastal Biodiversity in Maintaining Ecosystem Services.” The workshop report was distributed to a wide diverse audience including federal agency and congressional staff.

On January 14-15, 2008 in Washington, DC, the USNC will host their next major workshop titled “Biological Ocean Observing: Exploring components of IOOS from the perspective of Census of Marine Life.” This workshop will bring together experts from academia and management agencies (including the Integrated Ocean Observing System, or IOOS, regional associations) to share information and stress the importance of including the biological data collected by CoML and contained in OBIS in an ocean observing system. (e.g., they help to identify sentinel species that enhance our ability to predict and evaluate changing climate and environmental conditions). Support for this workshop will be provided by NOAA Fisheries, the NOAA IOOS Program office, The Gordon and Betty Moore foundation, and the Alfred P. Sloan foundation.

This past year, and going forward, a priority of the USNC is supporting the continued development of the OBIS and the U.S. OBIS Node as a resource for United States ocean science, management and education needs. In addition to this upcoming workshop, the USNC will hold a post-workshop meeting to explore ways that OBIS can support regional ocean observing efforts, and develop partnerships with the Regional Associations and the academic community to expand the utility of the U.S. OBIS Node as part of the data management component of IOOS on a regional basis.

In 2007, the U.S. Program office continued to build upon its relationships with the U.S. federal agencies through a variety of activities, partnerships, and joint workshops. Specifically the U.S. Program Office:

- held a twenty-one part CoML seminar (webcast) series in the Washington, DC area in partnership with NOAA’s Office of Ocean Exploration which highlighted accomplishments and activities relevant to NOAA’s mission, from every CoML Ocean Realm project, the HMAP and FMAP projects, OBIS, the Gulf of Mexico (GoMx) affiliated project, the DNA Barcode of Life, the Ocean Tracking Network (OTN), and the Canadian National Committee. This event is considered by the USNC a critical step towards aligning CoML research priorities and building additional partnerships;
- provided input into the Ocean Research Priority Plan and Implementation Strategy (ORPPIS) which will direct marine research funding for the next decade and which resulted in \$143 million for FY 08 for new funding for ocean research priorities. USNC input ensured that CoML projects and interests, such as the role of biodiversity in ecosystem based management, were recognized within the plan’s priorities; and,
- hosted a luncheon panel during the NOAA National Marine Sanctuaries Foundation sponsored Capital Hill Ocean Week (CHOW) entitled “Census of Marine Life: Incorporating Biological Data in Ocean Observatories.” The panel discussed how biological data are essential to understanding the overall health and sustainability of our Nation’s ocean ecosystems, as well as the entire global marine

ecosystem. The panel was moderated by Dr. Paul Sandifer (NOAA National Ocean Service), and featured presentations by Dr. Churchill Grimes (POST), Dr. Steven Bograd, (TOPP), and Dr. Mark Luther (Ocean Observing). The USNC believes that CHOW provides an important opportunity to showcase CoML to a diverse audience of policy makers, congressional staff, federal agency participants, scientists, and interested public.

Some of the most important USNC accomplishments for 2007 have resulted from a renewed focus on Education and Outreach efforts. These activities are described in detail under the *2007 Education and Outreach* heading.

2. COMMITTEE STRUCTURE, MANAGEMENT & INTERNAL COMMUNICATION

The USNC appointed Dr. Andrew Rosenberg (Professor, Institute for the Study of Earth, Oceans, and Space, University of New Hampshire) as the new USNC Chair, and Dr. Wes Tunnell (Associate Director, Harte Research Institute for Gulf of Mexico Studies/ Director of the Center for Coastal Studies, Texas A&M-Corpus Christi) as the initial USNC Vice-chair.

The U.S. National Committee is composed of 16 individuals, plus a liaison representing the CoML International SSC and an Ex-Officio member from the US Regional OBIS Node. The US Program Office ensures that the USNC consists of members who geographically represent all areas of the United States and who come from all sectors including research institutions, industry, government and non-government organizations. The full committee meets two times a year, spring in Washington D.C., and fall in another U.S. region, hosted by a committee member. These meetings are generally two to three days in length. As discussed above, in 2007 four sub-groups of the committee were created to each undertake a different, but critical action in the development and implementation of the US CoML program. These groups focus on their specific task between full committee meetings and communicate through email and conference calls.

Day to day management of the program is handled by the U.S. National Committee Program Office, housed at the Consortium for Ocean Leadership in Washington D.C. The Program Coordinator, Michael Feldman, works with the Chair, Dr. Andy Rosenberg, recently appointed Vice-Chair Dr. Wes Tunnell, and Nina Young, USNC advisor and outreach coordinator on all activities of the U.S. National Committee. Other Program Office team members include Dr. Jerry Miller, CORE Division Research and Technical Director, who helps to oversee the program, a dedicated program assistant and External Affairs staff who help to coordinate outreach activities, particularly relating to U.S. legislative issues. With the creation of the new sub-committees and dedicated staff members in the program office, support of the U.S. CoML Program is dedicated and consistent. Continued support to the U.S. Committee Program Office should ensure that the U.S. CoML Program achieve its 2010 synthesis goals.

3. 2007 EDUCATION & OUTREACH EFFORTS

Many important steps were taken this year by the U.S. National Committee in an effort to expand its Education and Outreach component. In 2007 the USNC, in conjunction with Paula Keener-Chavis, (Director of the NOAA Ocean Exploration Education Program), planned a one day exploratory workshop titled "*Developing a National Education Component for the Census of Marine Life.*" This workshop was held September 18, 2007 in Washington DC. The workshop goal was to assess and determine the best course of action towards further developing an education component as part of the entire CoML program. 23 people participated in the workshop and a report is currently being generated by the USNC Program Office. Using the workshop results as a starting point, the direction of the Education and Outreach program will be a topic of discussion at the October USNC meeting in Portsmouth, NH.

The U.S. Program Office has continued, to great success, to widely distribute a quarterly newsletter as a means to inform the U.S. ocean community on relevant U.S. CoML activities and overall program progress. It provides a more user-friendly forum to learn about CoML and USNC activities, trends on Capitol Hill, and general marine issues of importance. Every issue includes a candid interview with a CoML/Marine relevant personality, a highlighted education effort by an individual CoML project, and a YouTube clip of the quarter. All issues, past and present, are available at www.coml.us/Dev2Go.web?Anchor=us_newsletter.

As a constant means of outreach, the U.S. CoML website (www.coml.us) is continuously updated to provide a view of the U.S. component of the CoML program. In 2007, the website was completely overhauled, re-organized and re-populated. These significant changes were part of an effort to improve overall website effectiveness and to attract a larger, more diverse audience to U.S. CoML efforts. Highlights include a simplified home page, an expanded news sections, and a new education section, featuring a monthly education spotlight and a fun and games section (http://coml.us/?anchor=coml_us_ed).

4. PARTNERSHIPS & COLLABORATION

a. Partnerships

Organization Name	Point-of-Contact (Name)	Nature of Relationship
National Biological Information Infrastructure (USGS)	Mark Fornwall	NBII is home to the US RON
NOAA Office of Exploration	Margot Bohan, Reg Beach, Paula Keener-Chavis	Funders, Collaborators
OBIS SEAMAP	Pat Halpin	USNC Member
National Geographic	Terry Garcia	USNC Member, developed partnership, major outreach initiatives planned
Conservation International	Sylvia Earle	USNC Member
Sea Grant	Penny Dalton	USNC Member
Shirley Pomponi	ORRAP	Access to an interagency face panel that advises the agency-head level of the Federal Government
NOAA	Paul Sandifer, George Sedberry	NOAA employees

b. Links to CoML Ocean Realm Projects

Project Name	Liaison or Cross-over personnel	Nature of Relationship
ArcOD	Vera Alexander	USNC Member
CRreefs	Jo-Ann Leong	USNC Member
GoMx	Wes Tunnell	USNC Member

c. Links to other CoML National and Regional Implementation Committees (NRICs)

Though currently no direct links, a central task for the USNC is to take the necessary steps to identify and maintain CoML's lasting legacy. This task involves increased focus in a number of areas including improved

coordination with other key NRICs, especially among the USNC, EuroCoML, the Canadian National Committee, and the Australian National Committee. The USNC feels that consistent communication between these primary CoML developed countries is essential to combine efforts and increase the overall impact of the global CoML message. A representative from the Canadian National Committee was invited to the Fall USNC meeting in Portsmouth, NH, but unfortunately had to cancel at the last second. The USNC plans to continue to invite other NRIC leaders to regular committee meetings.

d. Liaisons to CoML Cross-Cutting Groups

Project Name	Liaison Name & Institution	Nature of the Relationship
OBIS	Daphne Fautin, Pat Halpin, Mark Fornwall	International OBIS Steering Committee member, OBIS-SEAMAP Project PI, U.S. OBIS Node Manager
HMAP	Andrew Rosenberg	HMAP Project PI
FMAP	Andrew Rosenberg	
E&O	Michael Feldman	Maintains consistent communication
Visualization	Pat Halpin	2010 Visualization lead

e. Effectiveness of the Partnerships and collaborations

The USNC has stepped back from regular involvement with the CoML Ocean Realm projects, as they already report to the international CoML Secretariat and maintain a high level of self-sufficiency. Instead, the USNC sees its role as improving awareness of CoML and its activities within the U.S., establishing a sustained U.S. CoML Program beyond 2010, and supporting OBIS as a resource for U.S. ocean science, management and education needs. To these ends, the USNC will seek to increase partnerships and collaboration with other NRICs and Projects as the opportunity or need arises.

5. APPENDICES

a. Future Plans for Expeditions & Analysis

As CoML approaches 2010, priority will focus towards these three goals:

- 1) Promote CoML, its scientific findings, and the value of biodiversity research within the United States;
- 2) Establish a sustained marine biodiversity program, in the spirit of CoML, as a key part of ocean science within the United States beyond 2010 (end of the first Census); and,
- 3) Support the continued development of the OBIS and the U.S. OBIS Node as a resource for United States ocean science, management and education needs.

The priorities for the program in the coming year center around building community support for CoML and its research activities and promoting the value of biodiversity research. It is the goal of the U.S. CoML Program that a sustained, marine biodiversity program, in the spirit of CoML, can be established as a key part of ocean science within the United States beyond 2010 (end of the first Census). Specifically, the U.S. CoML program focus is on:

- Securing long-term financial support for the Ocean Biogeographic Information System (OBIS), the US component of OBIS. Integrate the OBIS and CoML biodiversity data into the Integrated Ocean Observing System (IOOS);
- Building support on Capitol Hill and within Federal Agencies (NOAA, USGS, NSF)

- Find a public champion for CoML and OBIS;
- Identifying legislative opportunities to secure CoML's legacy, in conjunction with the stand alone CoML bill to establish a federal CoML program within NOAA.;
- Coordinating and developing a strategy to align the CoML program with U.S. federal agency missions and the near-term priorities in the Ocean Research Priorities Plan (ORPP);and,
- Following up on recommendations from the education workshop. Seeking partnerships and activities to support a national education component for CoML.