

Upcoming CoML Cruises: Watch the project websites for cruise diaries!

ChEss cruise to Chilean Margin and OMZ (Aug-Sep 2006)
ChEss cruise to the California/Oregon margin (Sep-Oct 2006)
Santo CReefs-related cruise (6-26 Sep 2006)
OARS GoMA-related cruise (18 Sep - 8 Oct 2006)
CReefs cruise to NWHI French Frigate Shoals (5-25 Oct 2006)

Scientific Steering Committee (SSC)

The **SSC met 22-23 June at the University of Iceland in Reykjavik**, in conjunction with a workshop of the Future of Marine Animal Populations (FMAP) project. The SSC followed up on key management discussions from the previous meeting, including review of program and project milestones, improved communication across the program, and the roles of liaisons between the projects and the SSC or other projects. Improved feedback and recognition were of primary concern. The next meeting will be held 13-14 October in Nara, Japan (with the NRIC Chairs), preceding the NaGISA World Conference and a meeting of the SCOR Technology Panel, which will take place in Kobe from 15-20 October.

SSC Member **David Farmer is one of the Royal Society's newly elected Fellows** from the fields of science, engineering and technology for the year 2006. Fellows are elected for their contributions to science, both in fundamental research resulting in greater understanding, and also in leading and directing scientific and technological progress in industry and research establishments. David Farmer is widely regarded as a world leader in the use of acoustics to study the oceans, through both the development of instrumentation and the interpretation of data. His work has led to new insights on air-sea interaction and gas exchange in storms. For more information and the entire list of Fellows and Members, visit <http://www.royalsoc.co.uk/page.asp?tip=1&id=4700>.

CoML Reporting Framework

The **Reporting Framework Committee held its first meeting**, hosted by committee rapporteur Darlene Crist, on 1-2 May at URI. They identified different target user groups from whom to solicit input on the contents of the 2010 CoML report, in terms of what information and products would be most useful to them. The committee is already working with the CoML projects to answer questions about their anticipated major findings and outputs. Committee members have been assigned as a contact for specific projects:

Patricia Miloslavich: NaGISA, HMAP
Mark Costello: OBIS, CReefs
Paul Snelgrove: CeDAMar, COMARGE, ICoMM
Pat Halpin: GoMA, POST, GoMx
Andrea Ottensmeyer/Boris Worm: FMAP, CMarZ, ChEss
Meryl Williams: MAR-ECO, CenSeam, GBR Seabed Biodiversity
Mike Fedak: TOPP, CAML, ArcOD
Mike Sinclair: Barcode of Life

We thank the projects for their ongoing cooperation over the next 12 months as the committee seeks information to formulate their recommendations.

2007 All Program Meeting

The **3rd CoML All Program Meeting** and related events will be held **at the University of Auckland, New Zealand, during the week of 12-18 November 2007**. The schedule for the week will be similar to that of Frankfurt. The 12th and 13th are reserved for meetings of the individual projects and committees. On Wednesday, 14 November, we will hold a public event for the New Zealand community. The All Program Meeting will take place on 15-16 November. Individual meetings may also be scheduled for the 17th and 18th, when the CoML International SSC plans to meet. The Secretariat will be circulating an early draft agenda to the CoML projects for input on topics and formats that would be most useful to them. We thank our local host, Mark Costello (OBIS Chair) for offering this venue, as well as the New Zealand-based CenSeam team for their offer of support for organization and planning.

Education and Outreach

The **Galatée Films team was most recently filming in the Red Sea and off of Costa Rica**. The upcoming schedule for later this year includes Monterey Bay.

Database: Ocean Biogeographic Information System (OBIS)

OBIS has been recognized as the flagship of a new interdisciplinary area of research called “Ocean Biodiversity Informatics” (OBI). A special theme section of nine papers in the 3 July issue of *Marine Ecology Progress Series* officially launched OBI (see <http://www.int-res.com/abstracts/meps/v316/>). An international OBI conference will be held in Nova Scotia, Canada on 26-28 November 2007.

OBIS has recently **added five new geographical searches** that make it possible for users to generate species lists for a given area of interest. Users can search by: Exclusive Economic Zone (EEZ), International Hydrographic Organization (IHO) Seas, Large Marine Ecosystems (LME provinces), Longhurst maps, and FAO fishing grounds. Once users have initiated a species search, they can further refine their results using these categories, which are listed in a pull-down menu under the “name search” on the return search pages. The OBIS team has been diligently working to improve the functionality of OBIS, and this is another important step in that process.

Oceans Past: History of Marine Animal Populations (HMAP)

HMAP has **established its fourth Centre** at the Asia Research Center, Murdoch University in Western Australia. Malcolm Tull is now the newest member of the HMAP international steering group, and was appointed principal investigator for the new Centre and coordinator for new HMAP initiatives in Southeast Asia. Currently, there are three new HMAP studies in the Southeast Asia region: shark fishing in Indonesia, historical whaling populations in the Philippines, and the evolution and development of the Taiwanese offshore tuna fishery 1923-2006.

Heike Lotze (Dalhousie University) was lead author on a paper featured in the 23 June issue of *Science*. The study tracked human impact on coastal marine ecosystems from Roman time to the present and reported that the decline of global estuaries and coastal seas has accelerated in the last 150-300 years. The study quantified the magnitude and causes of ecological change in 12 estuaries and coastal seas, including Massachusetts Bay, Delaware Bay, Chesapeake Bay, Pamlico Sound, Galveston Bay, Francisco Bay, Western Baltic Sea, Wadden Sea, Northern Adriatic Sea, Southern Gulf of St. Lawrence, Outer Bay of Fundy, and Moreton Bay. The researchers combined palaeontological, archaeological, historical, and ecological records tracing changes in important species, habitats, water quality parameters, and species invasions. For more information, visit: www.hmapcoml.org/Files/Filer/Press_release_Lenfest_Heike_Science.doc.

The Second HMAP-Mediterranean Workshop, “Human-environment interactions in the Mediterranean Sea since the Roman period until the 19th century: an historical and ecological perspective on fishing activities,” will be held on **27-29 September 2006 in Chioggia, Venice, Italy**. Thirty participants are expected. The Call for Papers is online: <http://www.hmapcoml.org/Default.asp?ID=372>.

HMAP and NaGISA are uniting their efforts to look at species richness and abundance in intertidal and subtidal seagrass and rocky shore communities. The goal of this **collaborative project, “History of the Near Shore,”** is to identify specific local sites on which historical (pre-1980) records of biodiversity are available and to resample them under the auspices of the NaGISA project. NaGISA will include these findings in its global nearshore database and ongoing monitoring efforts while assessing the specific regions trends in biodiversity. The Call for Proposals (deadline 1 November 2006) is available at the HMAP website: www.hmapcoml.org/Files/Filer/HNSopencallMay2006.pdf.

A half-day special session dedicated to scientific presentations and discussion of the importance of historical perspective for fisheries science and management in the Gulf and Caribbean will be convened as a part of the **Gulf and Caribbean Fisheries Institute annual conference, 5-10 November 2006 in Belize City, Belize**. The purpose of the symposium is to stimulate investigation of historical data on diversity, abundance and distribution of marine fisheries resources, to present and discuss several case studies from the region, and to lay the groundwork for an interdisciplinary research network.

In March 2006, the New Zealand Ministry of Fisheries **contracted NIWA to undertake a project** in “Long-term effects of climate variation and human impacts on the structure and functioning of New Zealand shelf ecosystems.” This project, funded for NZ\$ 888,000 over the next three years, will determine the effects of climate variation and human activities on the coastal and shelf ecosystem since Polynesians first arrived in New Zealand less than 1000 years ago. The project will be coordinated by Dr. Alison MacDiarmid and involves a team of 25 NIWA and non-NIWA researchers over a wide range of disciplines. The project starts in mid-2006 with a kickoff workshop. For further details of the project contact Alison MacDiarmid at: a.macdiarmid@niwa.co.nz.

New research coordinated by archaeologists at the University of York will spotlight **the earliest development of Europe’s sea fisheries and, given the continuous expansion of sea fishing since the Middle Ages**, the ultimate origin of today’s fishing crisis. The three-year project, financed by the Leverhulme Trust and also supported by HMAP, will involve researchers across northern Europe. Dr. James Barrett of York’s Department of Archaeology is coordinating the project.

Oceans Past conference participant **Andrea Sa’enz-Arroyo of Mexico published a paper** in the July issue of *Fish and Fisheries* (2006, 7: 128-146), entitled “The value of evidence about past abundance: marine fauna of the Gulf of California through the eyes of the 16th to 19th century travellers.” Eyewitness accounts written by early travelers to ‘the new worlds’ provide valuable insights into how the seascape of the Gulf of California and its marine wildlife once looked.

Oceans Future: Future of Marine Animal Populations (FMAP)

FMAP post-doc Camilo Mora (Dalhousie University) was lead author on an analysis of global coral reef Marine Protected Areas (MPAs), reported in the 23 June issue of *Science*. The study began by drawing from OBIS to build a database of MPAs for coral reefs in 102 countries, including satellite imagery of reefs worldwide. The team then surveyed more than 1,000 MPA managers and scientists to determine the conservation performance of MPAs, taking into account

such factors as MPA size and distance to neighboring protected areas. Their analysis assessed protection afforded to coral reefs from such threats as resource extraction, poaching, pollution, coastal development and overfishing. They found that less than 2% of coral reefs worldwide are within MPAs that have regulations on extraction, poaching and other major threats to these ecosystems.

For more information, visit <http://www.fmap.ca/ramweb/media/coral/home.php?sub=13>.

Ocean Realm Field Projects

Near-Shore: Natural Geography In Shore Areas (NaGISA)

The **NaGISA 2006 field season is underway**. In Europe, Lisandro Benedetti-Cecchi and Iacopo Bertocci sampled the Calafuria site on the Italian coast in March. In April, they hosted an all EU Seas NaGISA workshop (more information will be available soon). In Alaska, Brenda Konar, Katrin Iken and their team will be sampling in the Beaufort Sea for two weeks at the end of July.

The **Indian Ocean Region had its first meeting** and protocol workshop in Mombassa, Kenya in June (more information to come).

NaGISA will hold its **first open scientific symposium in Kobe, Japan, 15-18 October 2006**, and all are welcome. The conference will begin with a public lecture on the evening of the 15th, followed by three days of sessions on rocky shore and sea grass bed communities, near-shore taxonomy (macrofauna, macroflora and meiofauna), and an open poster session. Panel discussions on the 18th will address a variety of topics, including the integration of NaGISA into national and regional monitoring programs. For more information and to register online, visit: <http://www.nagisa.coml.org/World%20Conference%202006.htm>.

Congratulations to NaGISA project manager, **Robin Rigby, on her marriage in May!**

Reefs: Census of Coral Reefs (CReefs)

CReefs is preparing for its October 2006 cruise to the Northwestern Hawaiian Islands (NWHI) French Frigate Shoals. The CReefs team will work hard to create strong media coverage. In June, U.S. President Bush declared the NWHI a National Monument, which is excellent news and timing for CReef's work. The cruise will take place 5-25 October 2006 aboard the NOAA research vessel *Oscar Elton Sette*.

CReefs has affiliated with a **new deep reefs component**. The aim of the SANTO 2006 Global Biodiversity Survey, led by Philippe Bouchet (Muséum National d'Histoire Naturelle), is to explore, document, and sample the biodiversity of Santo (or Espiritu Santo), the largest and oldest island in Vanuatu, in all habitats of the island. The survey is innovative because of the range of sampling techniques to be deployed and the size of the research group involved. For ecological representation and logistics, the focus of the marine study will be conducted off the southeastern coast of Santo, its offshore islands and channels, an area known by commercial dive operators to have a mosaic of bottom types and habitats, ranging from mangrove to coral drop-offs, seagrass beds, and various kinds of soft and hard bottoms. The field research will be based at the local Vanuatu Maritime College for shore-based facilities, and will make use of the Nouméa-based research vessel *Alis*. The marine field party will involve 75 scientists, technicians, students and volunteers from 17 countries (European countries, Japan, Taiwan, Singapore, Philippines, Brunei, Australia, and the USA). Santo 2006 project **is certainly one of the most ambitious marine species inventory undertaken**, and it is expected to sample 3-4,000 mollusk species and 500-700 decapod species, of which hundreds will be new species. Digital images will be taken of hundreds of species in their habitat, and 1,500-2000 species will

be barcoded. Two of the objectives of the Santo 2006 marine survey will innovate from past similar expeditions: (1) Sampling deep reefs (60-120 meters), which will be done through both low- and high-tech approaches; (2) Methodological comparison of the results of three approaches to “measuring” biodiversity (rapid assessment, quantitative sampling, and all-species inventory). The three methods are always carried out independently by different research groups at different sites, and Santo will be the first site where the three approaches can be intercalibrated. The marine biodiversity theme of the Santo Project is supported by the Paris-based Total Foundation, as well as the Sloan Foundation, the National Geographic Society Committee for Research and Exploration, and in-kind support from Institut de Recherche pour le Développement (IRD) through the deployment of *Alis*. The Norwegian Academy of Sciences and the French National Research Council are also contributing. Field work will run from 4 August to 24 October, with a cruise 6-26 September.

Megan Moews participated in the Coral Reef Education Project Curriculum Development Workshop, a collaboration between NOAA and Project WET (Water Education for Teachers) International, to work on the development of a Coral Reef Reader and Study Guide and Coral Reef Educator's Guide for middle and high school students.

Regional Ecosystems: Gulf of Maine Area Program (GoMA)

The GoMA project has several related **cruises occurring this summer**. Jon Whitman (Brown University) will lead a cruise to Cashes Ledge to study “Human Impacts on Cod–Dominated Trophic Cascades in the Gulf of Maine. The study will examine 20 years of change in abundance and patterns of cod, wolfish and their prey at two sites on Cashes Ledge. The 2nd annual cruise of the Canadian Discovery Corridor project will take place, focusing on landscape features and possibly also deep seafloor and microbial biodiversity. Lew Incze (University of Southern Maine) and Scott Kraus (NE England Aquarium) will take a second cruise to Platts Bank to study how biophysical coupling influences biodiversity patterns. On a cruise from 18 September to 8 October, Nick Makris will be further testing Ocean Acoustic Remote Sensing (OARS). Discussions are underway to apply this technology in several other regions of the world with CoML partners.

Continental Shelves: Pacific Ocean Shelf Tracking (POST)

POST welcomes **Heather Holden as its new Executive Director**. Heather has a PhD in hyperspectral remote sensing of coral reef ecosystems from the University of Waterloo. Her research has largely been field-based (in Fiji and Indonesia) with an emphasis on collecting a baseline inventory of *in situ* high spectral resolution measurements of diverse substrate types for analysis with such techniques as derivative spectroscopy and principal component analysis. Heather is based at the Vancouver Aquarium. Congratulations to Heather who was **also recently married!**

In June, POST was **awarded renewal funds** to continue the project through 2008. Congratulations to Gerry Kristianson, POST's PI and Management Board Chair, and the entire POST team on this accomplishment.

POST can now **demonstrate precise migration routes** along the continental shelf of different populations of salmon, which raises important questions about conserving biodiversity in behavior and also in understanding how climate change will impact fish resident in different parts of the shelf. The different movements of Cultus & Sakinaw sockeye (one species; two stocks) is a case in point. Of note is the observation that green sturgeon are mostly detected mid-shelf but the Columbia River chinook smolts (Snake & Yakima stocks) are predominantly found where the green sturgeon are not. It is not possible to say that this is cause and effect (potential

prey being selected to steer clear of the region with big predators), but the principle is clear: even on a fairly narrow shelf, POST is again seeing evidence that particular species and stocks are using specific migration paths, and all populations are not doing the same thing.

Integrating POST and TOPP technology, a global **“Ocean Tracking Network”** has formed with the goal to tag a vast range of large and small marine animals with low-cost devices and follow them through an extensive international array of acoustic receivers on the sea floor, as well as to link ecosystems and oceanography within GOOS. This project is one of three selected for a final competition for \$35M from the Canada Foundation for Innovation. For more information, visit www.oceantrack.org.

Continental Margins: Continental Margin Ecosystems on a Worldwide Scale (COMARGE)

In June, COMARGE was **awarded renewal funds** to continue work for the next two years. Congratulations to Myriam Sibuet, Bob Carney, David Billett, Lisa Levin, Helena Passeri Lavrado, Gilbert Rowe, and Lenaick Menot on their hard work!

COMARGE **launched its website** in May. The science section introduces the project. The public section is currently featuring a slide show and movies on cold seeps and associated fauna along the West African margin. Visit the site at: <http://www.ifremer.fr/comarge/en/index.html>.

In June, the Vicking Expedition aboard the RV *Pourquoi Pas?* **explored the Norwegian margin** in the framework of the European project HERMES. Dives of the ROV Victor allowed scientists to visit and sample mud volcanoes, gas chimneys, their associated fauna, and surrounding environments. Visit: http://www.noc.soton.ac.uk/CHD/HERMES/features/vicking_2006.html.

Also in June, the RV *Atlantis* was at the **deep slope of the Gulf of Mexico**. The expedition was funded by the U.S. Minerals Management Service (MMS) and NOAA’s Ocean Exploration, and led by Chuck Fisher (Penn State) and Bob Carney (LSU). Dives on cold seeps, using Alvin, and trawls and cores in the surrounding environments will provide new information on ecosystem interactions in the deep Gulf of Mexico. ChEss participated as well. For more, visit: <http://www.oceanexplorer.noaa.gov/explorations/06mexico/>.

During July 2006, twenty four scientists aboard the *Atlantis*, with the submersible Alvin, **will conduct a paired ecological study of methane seeps and oxygen minimum zones** on the northern California and Oregon margins. Colonization experiments, multi-coring and biogeochemical studies will focus on animal adaptations and evolutionary responses to stress. Modzilla and Marco Polo Films will provide documentation for a film on deep-sea biodiversity. Support is from NOAA (Ocean Exploration and WC Undersea Research Program) and the National Science Foundation.

Forty scientists from 18 countries met at the Institut Oceanographique in Paris on 6-7 July. The aim of the workshop was to **take a first census of past and ongoing studies on continental margins worldwide**, share that information, develop collaborations, and finalize the COMARGE science plan for the next few years.

The Lounsbery Foundation has provided **support to a Census of Philippines Deep-Sea Biodiversity**, led by Philippe Bouchet (Muséum National d’Histoire Naturelle) and Stephen Cairns (Smithsonian National Museum of Natural History), for exploration of the Philippines deep sea that will contribute to COMARGE. This partnership between the Paris and Smithsonian natural history museums will build key partnerships in the region and support for an initial cruise, laying the ground for an expanded 5-year programme beginning in 2007. The programme, based on the Panglao Marine Biodiversity Project of 2004-2005, would include yearly 2-week cruises using the Philippine Bureau of Fisheries and Aquatic Resources (BFAR) oceanographic

research vessel. Each subsequent cruise will target a part of the Philippines with contrasted bottom topography and oceanographic conditions, covering the entire Philippines archipelago.

On the occasion of the centenary of the Albert 1st of Monaco Foundation, **an exhibition recounting 100 years of Oceanography** was opened at the Institut Oceanographique in Paris. Myriam Sibuet introduced the COMARGE project during the press conference celebrating this birthday and the launching of the exhibition.

Abyssal Plains: Census of the Diversity of Abyssal Marine Life (CeDAMar)

The cruise **DIVA 3 to the basins off Brazil and Argentina is now scheduled** firmly for 30 days in December 2008/January 2009.

A **final ANDEEP workshop** will take place in Southampton directly after the Deep-Sea Biology Symposium this month. Participants will discuss scientific results focusing on ecosystem structures rather than pure taxonomy and prepare publications for a second Special Volume of *Deep-Sea Research* in 2007.

The follow-up project of ANDEEP for the International Polar Year, SYSTCO, is entering a final planning phase for the **expedition which is to take place from November 2007 to February 2008**. Flyers and Science Plans are being produced and will be ready for distribution this month. A meeting of the participants of the expedition is planned for the beginning of September in Bremerhaven, Germany to tighten up the scientific program and to allocate berths to SYSTCO and its partner project SCACE.

Many scientists involved in one or more CeDAMar sub-projects will **meet in Southampton at the Deep-Sea Biology Symposium**. CeDAMar's visibility will be high at this meeting because of many posters and oral presentations, as well as E&O activities. A list of talks and posters presented by CeDAMar researchers will be posted on the [CeDAMar homepage](#).

CeDAMar scientists are **screening literature looking for distribution records** of deep-sea organisms. Study of 357 publications so far resulted in 2559 Cumacea, 2176 Tanaidacea, and 1250 Isopoda records from below 2000m. Data from other taxa like Polychaeta, Copepoda, and Nematoda are being collected. The aim is to provide OBIS with the data of every single abyssal organism ever recorded by 2010.

In June, CeDAMar was **awarded renewal funds** to continue the project through 2008. Congratulations to Pedro Martinez, Craig Smith and the CeDAMar team on this accomplishment.

Finally, congratulations to CeDAMar project manager, **Brigitte Hilbig (now Brigitte Ebbe) on her recent marriage!**

Mid-Ocean Ridges: Mid-Atlantic Ridge Ecosystem Project (MAR-ECO)

MAR-ECO held its **annual project workshop in Aberdeen, Scotland on 6-7 July**, with about 50 participants. A full day of scientific presentations was followed by a day of sub-group meetings. An important element was planning for the second field phase, involving cruises by UK (the new RRS *James Cook*) and U.S. vessels in 2007-2009.

Recently a **U.S. National Science Foundation grant was awarded** to a team led by Tracey Sutton at Harbor Branch Oceanographic Institution to study trophic ecology of mesopelagic ridge communities.

All MAR-ECO **fish occurrence data** from the 2004 RV *G.O. Sars* and MS *Loran* expedition to the northern Mid-Atlantic Ridge are **now available in OBIS**.

A 200sq-m traveling exhibition entitled “**Deeper than Light**” is now being produced by the Bergen Museum, Norway, and will be ready for international distribution in the second quarter of 2007. The new CoML sub-group DESEO (Deep Seas Education and Outreach group), formed by ChEss, MAR-ECO, COMARGE and CeDAMar, is in the **process of writing a book** (of the same title) to accompany the exhibition.

MAR-ECO is organizing an **international workshop on 6-7 September 2006 in Brazil** with the aim of stimulating the development of collaborative research efforts on the southern MAR. At the meeting, MAR-ECO will share its strategies and methodologies to study biodiversity along the mid-Atlantic Ridge in the North Atlantic.

Seamounts: Census of Marine Life on Seamounts (CenSeam)

In what promises to be a busy year for CenSeam, **numerous expeditions are in the pipeline or have set sail**. In New Zealand, 12 scientists and 14 crew members recently visited the Graveyard seamount complex aboard the Research Vessel Tangaroa. They revisited seamounts which have had a range of fishing histories, with the aim of monitoring changes over time. Using a combination of video and still photography, as well as sample collection, they examined seamount community composition at depths in excess of 1km. Through maintaining ship to shore logs (see: http://censeam.niwa.co.nz/outreach/censeam_graveyard), participants were able to correspond with taxonomists on shore, share their experiences with the public, and communicate discoveries as they happened, including a **potential new species of carnivorous sponge!** CenSeam scientist Gui Menezes recently returned from a joint cruise with Greenpeace in the Azores, using a drop-cam and a small ROV. Despite some damage to the equipment, preliminary images were very promising (corals, sponges, and many fishes). The survey enabled images to be collected from about 700m, **a first for the Azores region**. In addition CenSeam will fund the participation of seamount researchers and equipment on several legs of an IUCN & DOQ Seamounts voyage in Fiji (suggested name Tui Delai Gau expedition). This expedition will utilize the CenSeam protocols document and will ensure that all samples are treated in such a way that they can be **barcoded in the future**.

A CenSeam mini-grant funded the participation of Canadian researchers Verena Tunnicliffe and John Dower in the NOAA Ring of Fire '06 expedition to **explore submarine volcanoes lying along the Mariana Arc** aboard the R/V Melville. Verena's online account can be read at: <http://oceanexplorer.noaa.gov/explorations/06fire/logs/april30/april30.html>. In total the CenSeam SC awarded \$55,000 to 9 projects; as diverse as recovering data from previous Soviet Union expeditions to the taxonomic analysis of invertebrate samples collected from Antarctic seamounts (January 2006). Many of the projects will feed data into OBIS/SeamountsOnline (which is currently under expansion, the revised version will be available before the end of CenSeam Phase I) as well as include a notable Education and Outreach component.

CenSeam is pleased to report that its **participation has grown further**. The list of CenSeam affiliated taxonomists (nearly 60 individuals) is now available online: http://censeam.niwa.co.nz/science/censeam_science_team. This will ultimately be incorporated into the CoML taxonomy list. CenSeam is additionally compiling a global list of seamount experts which will be posted online in the coming months, as well as inviting scientists to formally affiliate with the CenSeam programme.

CenSeam scientist Bertrand Richer de Forges recently published the **discovery of a new species of shrimp**. Its name is *Neoglyphea neocaledonica*. The Glypheides were well known from the Jurassic and Cretaceous periods and were supposed to be extinct at the Eocene (about 50 million years ago). For invertebrate scientists Bertrand compares this discovery to that of the second

species of coelacanth in Indonesia some years ago. Bertrand talks about this exciting discovery on the CenSeam webpage (http://censeam.niwa.co.nz/censeam_news/new_species).

CenSeam's Data Analysis Working Group (DAWG) is currently preparing the **final drafts of a report** discussing the "Biodiversity and vulnerability of deep-sea corals on seamounts beyond areas of national jurisdiction". The work has been funded by the Netherlands Department of Nature and will be/has been presented to the CBD Secretariat/COP-8 as well as UN DOALOS and, potentially, directly to the UN GA (as an information paper).

Malcolm Clark **represented** CenSeam at the CoML/CBOL DNA Barcoding Workshop (Netherlands, May) and used the opportunity to liaise with experts in the field to ensure that CenSeam is moving in the right direction. CenSeam scientists also **participated** in the International Seabed Authority workshop in Jamaica (March) to examine/evaluate the potential effects of cobalt mining on seamounts. A CenSeam poster was also **presented** at the Seamount Biogeosciences Network (SBN) in San Diego (March) and links made to this programme.

The CenSeam Steering Committee and Secretariat will **meet in Southampton (UK) in July**, associated with the 11th Deep Sea Biology Symposium. There will be a seamount session where many members of the CenSeam team will be giving presentations, and a poster will be presented on CenSeam. The Data Analysis Working Group will also meet this week and formalize their report (see above). Subsequent to the meeting CenSeam will submit its grant proposal (January 2007) for continuation into Phase II.

Vents & Seeps: Biogeography of Deep-water Chemosynthetic Ecosystems (ChEss)

ChEss has had **several cruises recently**:

Discoveries in South MAR: Chris German and the WHOI ABE Team returned (May 06) from a 2nd season at the new vent sites at 5-10°S on the Mid-Atlantic Ridge, where they continued to sample fresh communities for comparison with north Atlantic vent-sites. Along the way, they located a **new vent-site which may be the first ever that is completely un-colonized** by vent-specific organisms (detailed chemical analysis is underway to investigate the reasons to this) and also the **hottest hydrothermal vent ever yet discovered**: 407°C at 3000m water depth. News published in *Nature* 44: 563.

Deep Gulf of Mexico: ChEss participated in the *Atlantis* cruise (noted above under COMARGE) to the Gulf of Mexico (May-June 06). The cruise diary on the NOAA-OE website dedicated a day to ChEss. See: <http://oceanexplorer.noaa.gov/explorations/06mexico/logs/june1/june1.html>.

Costa Rica seeps: cruise with *Atlantis*/Alvin on 14-17 June 2006 (PIs: Hilton, Thurber & Levin)

ChEss also has **several cruises coming up this year**:

Chile margin: cruise to explore and investigate seep habitats on the Chilean margin and OMZ (PI: J. Sellanes), Aug-Sept. 2006

California/Oregon margin: cruise to investigate methane seeps and OMZ with *Atlantis*/Alvin, Sept.-Oct. 2006 (PI: L. Levin), supported by NSF and NOAA-NURP

New Zealand: cruise to explore and study methane seeps in winter 2006 (PIs: A. Rowday & A. Baco; participants: Levin, Smith, Shank, Sievert), NOAA-OE

ChEss has **submitted several proposals** for work in the Antarctic, which are under evaluation, including: to NERC for work on Antarctic chemosynthetic sites (PI: P. Tyler); to NOAA's polar programs (PIs: T. Shank, C. German & G. Klinkhammer) for ABE work in the same study; to NSF within IPY to survey the Weddell Sea (Larsen ice shelf) (PI: CL Van Dover) and includes a barcoding effort. Proposals have also been submitted for work in the: Cayman Trough (NOAA-

OE, 7 day cruise to do CTD surveys to explore for hydrothermal plume signal (PIs: C. German, CL Van Dover & J. Lupton)); SE Pacific off Chile (INSPIRE program – for vent sites on Chile Triple Junction (NOAA-OE and NSF) (PI: C. German), investigation of seep habitats on Chile margin (NOAA-OE) (PI: L. Levin), and whale and wood fall experiments on Chile margin (NOAA-OE) (PI: C. Smith)); Laurentian Fan (to investigate linkages of seep fauna between Laurentian Fan and Blake Ridge through southerly deep-water current, and relationships with Barbados Prism in the ChEss AEB region (PI: C. Van Dover), including a barcoding effort).

Cindy Van Dover and Bob Vrijenhoek are leading a **barcoding effort for ChEss**. The first meeting was held parallel to the Barcelona AEB Workshop (March). Attendees agreed that barcodes could contribute to the ChEss effort by providing a uniform standard of nomenclature across laboratories, especially for undescribed species as new chemosynthetic sites are discovered. They also appreciated the value of barcodes for studies of larval ecology and recruitment and food-web studies. ChEss was charged with **developing a list of species for which barcodes have already been acquired**, which Vrijenhoek agreed to undertake. There are barcodes of 102 species of decapods, molluscs, and polychaetes in GenBank and an additional 49 species for which barcodes are being developed. These barcoded taxa are not part of the Barcode of Life Database, however. Progress is being made toward finding funds to support a barcode lab in the US that could serve as a centre (perhaps one of several) streamlined to accept samples that meet barcode standards in terms of preservation and associated metadata from ChEss participants. A **second preparatory ChEss barcode meeting is being organized** during the Symposium of Deep Sea Biology in Southampton to take this initiative forward from ChEss and within the wider community. Cindy Van Dover also attended the Amsterdam barcoding workshop for CoML and provided a brief synopsis of ChEss interest and plans.

ChEss, through Van Dover, provided the US Ridge 2000 Steering Committee with a 2-page white paper describing the barcoding effort and **successfully solicited their endorsement of the concept of an initial goal of barcoding invertebrates and fish** at the 3 primary study sites of the R2k program, i.e., Lau Basin, 9°N (EPR), Endeavour Field (JdF). This will be circulated through the R2K e-mail newsletter and/or posted on the website. A similar endorsement will be solicited from InterRidge.

In June, ChEss **selected the 3 first TAWNI** (Training Awards for New Investigators) scientists: Kevin Zelnio (Penn State Uni.) for studies of anemones from the LAU basin, Julia Zekely and Sabine Gollner (Uni. Vienna) for studies on vent meiofauna. The profiles and main objectives of the TAWNI awardees can be found in the ChEss web site:

http://www.noc.soton.ac.uk/chess/tawni_winners.php.

The Ridge 2000 programme has just been funded to partake in the GLOBE educational project. ChEss will be involved in this excellent **science education program** that reaches tens of thousands of students worldwide. The initiative will be instrumental in increasing GLOBE students' (i) awareness of important Earth System Science concepts, such as inter-relationships and feedbacks between geological, hydrological and biological processes illustrated by deep-sea systems, and (ii) understanding of the process of scientific inquiry.

ChEss researchers published the discovery of a **new species of crab** in *Zoosystema* earlier this year. It was discovered during a Census expedition led by Bob Vrijenhoek and Cindy Lee Van Dover to the Easter Island Microplate last summer. After careful review, researchers determined that the crab was new to science and belongs to the new family *Kiwaidae*. The strange-looking critter was named *Kiwa hirsuta* *Kiwa*, after the goddess of shellfish in Polynesian mythology. To read the paper, visit http://www.mnhn.fr/museum/front/medias/publication/6892_z05n4a3.pdf.

ChEss members have been and will be **involved the following 2006 workshops and symposia**: AEB workshop (Barcelona, March), HERMES meeting (Mallorca, April), Barcode of Life Meeting (Amsterdam, May), Deep Sea Biology Symposium (Southampton, July), and Polar Ridges Meeting (Italy, September).

Arctic: Arctic Ocean Diversity (ArcOD)

In June, ArcOD was **awarded renewal funds** for three more years, covering the period of the International Polar Year. Congratulations to the Bodil Bluhm, Rolf Gradinger, Russ Hopcroft, Andrey Gebruk, Boris Sirenko, Ksenia Kosobokova, and the rest of the ArcOD team.

ArcOD scientists will receive funding to **continue their work in the RUSALCA program** through 2012. RUSALCA is the Russian American Long-Term Census of the Arctic (<http://www.arctic.noaa.gov/aro/russian-american/>) and is jointly funded by NOAA and the Russian Academy of Sciences. ArcOD-relevant work will continue to investigate pelagic, benthic and fish communities in the Russian and U.S. parts of the Chukchi Sea, with the goal of establishing long-term monitoring-quality data sets to assess climate change in that area. The next cruise is planned within the International Polar Year framework in the boreal summer of 2008, likely on a Russian vessel.

ArcOD's first mini-grant program is now in full swing. **Thirteen small grants were awarded** to researchers from six nations. Geographic areas to be investigated range from the Barents to the Beaufort Sea, and topics cover zooplankton, benthic, and sea ice biodiversity questions. A strong focus is on fostering data compilations for the Arctic node of OBIS, as well as on enhancing taxonomic resolution of existing samples.

Sarah Mincks (previously at University of Hawaii at Manoa, currently at the Natural History Museum London) has been **awarded a UAF presidential International Polar Year post doc fellowship** for 2007-2009. Sarah will be working under the auspices of ArcOD with Bodil Bluhm and Katrin Iken (ArcOD, NaGISA) at the School of Fisheries and Ocean Sciences, University of Alaska Fairbanks.

ArcOD's Russ Hopcroft **participated in the April CMarZ cruise** to the deep Sargasso Sea. He captured several thousand high quality images of zooplankton organisms, and also focused on the taxonomy of pelagic mollusks. Cruise participants supplied numerous samples to the Barcode of Life effort.

ArcOD outreach activities in the last couple of months included **presentations** at the Fairbanks Rotary Club (R. Gradinger) and the Capitol Hill Oceans Week in Washington DC (R. Hopcroft).

Antarctic: Census of Antarctic Marine Life (CAML)

CAML is **going to sea in December 2006**. The first cruise is on the German icebreaker *Polarstern*, led by Julian Gutt of the Alfred-Wegener Institute, Bremerhaven. Julian and his team will focus on the benthic communities beneath the disintegrating ice shelves (Larsen A and B) on the Antarctic Peninsula. These ice shelves are **experiencing among the highest rates of increase in temperature of any region on the planet**. To promote the education and outreach on *Polarstern*, Gauthier Chapelle from the International Polar Foundation will work with the AWI media group and the Cousteau Foundation. The **Cousteau Foundation plans to make a movie in Antarctica** in 2008.

A ship plan will be available next month as an interactive page on the CAML website, offering information about berths and facilities available on research cruises and tourist ships. To date,

about a dozen research vessels are involved in CAML biodiversity studies during IPY, representing a **significant investment in Antarctic research**.

At the recent CAML steering group meeting in Bremerhaven (6-8 June), a videoconference with Sara Hickox and her team at URI set the **direction for publicity during the International Polar Year**. Julian's cruise will be the first event, providing the test run for IPY publicity for CAML, ArcOD and CoML. IPY will also provide a valuable test run for publicity during the synthesis stage of the Census, so CAML is forging strong connections to last for many years.

Also at the CAML steering group meeting, a crew of 23 scientists from 11 countries made **substantial progress towards our milestones** (despite the World Cup festivities). Highlights were a report from Alison Murray on the CAML Microbes Workshop (March, Innsbruck, Austria) including coordination of researchers holding cultures of Antarctic microbes. A cooperative project with researchers from St Petersburg, Russia is providing a rich harvest of circum-Antarctic data from many invertebrate taxa. Innovations in barcoding were relayed from the CoML Workshop (May, Amsterdam, Netherlands). Phil O'Brien presented the high-resolution seafloor swath-mapping from the recent cruise of Italian vessel *OGS Explora*, used to determine sampling locations for CAML projects.

CAML was prominent at the big Antarctic conference SCAR/COMNAP (over 800 delegates, 9-14 July, Hobart, Australia). They **hosted a workshop** *Processes of Colonisation and Dispersal and how they shape Antarctic Marine Ecosystems* and another to discuss forming a *Southern Ocean Observation System*. The conference provided a welcome opportunity for CAML to meet with SCAR's Colin Summerhayes and Marzena Kaczmarek from the office in Cambridge, UK. The CAML steering group also had a short meeting, and many CAML scientists presented research papers and contributed to SCAR's *Evolution and Biodiversity in Antarctica* project.

The CAML **South American Consortium is underway**, led by Lúcia Campos and Diego Rodriguez. A special CAML workshop will precede a two-day symposium on South American Antarctic science on 16-18 August in Concepcion, Chile. The aim is to coordinate the diverse South American biodiversity projects for IPY and beyond. A CAML Top Predators Workshop is scheduled for mid-November in Japan. A CAML writing team led by Claude DeBroyer will consider synthesis and publications; this need was clear from discussions about CAML milestones and the preparation of the project renewal proposal.

The **next CAML SSC Workshop will be held 4-8 June 2007** in Bialowieza, Poland. With its sibling project, the Antarctic portal SCAR-MarBIN (now a regional node of OBIS), CAML is starting to join datasets with a view to synthesis in 2009. The developing toolbox includes powerful software for modeling, analysis and visualization. We intend to build these products early, to maximize the opportunities for data-mining and interpretation of Antarctic biodiversity during the synthesis phase of the project.

Top Predators: Tagging of Pacific Pelagics (TOPP)

Pinnipeds: Several of the San Benitos **elephant seals spent large periods of time exploiting seamounts**. One female and one male spent their entire foraging migration over the Cortes Bank in the Channel Islands off California, **behavior which has not been previously observed**.

Pinniped researchers are now using GPS tags on female elephant seals. These tags are currently producing up to 30 extremely accurate seal locations per day, which equates to a geolocation after every second dive. The increased frequency of geolocation recording will yield a much finer temporal and spatial resolution of feeding behavior than was previously possible.

More in-depth analyses of TOPP California sea lion research shows that, in winter 2003-04, adult male sea lions fed almost exclusively over the continental shelf during trips lasting only 0.8 days. In contrast, during 2004-05 males altered their foraging efforts by spending 2.5 to 3 days at sea searching for prey in waters up to 450 km offshore. These alterations in 2004-05 were associated with unusually warm water, which resulted in delayed upwelling and decreased primary productivity along the coast of California. As a result, **significant shifts in diets were observed**. This season, coastal upwelling has been delayed again and male sea lions have traveled up to 600 km offshore during foraging excursions. Analyses of sea lion diving behavior in 2005-06 are still pending. Two students working on sea lion behavior also completed their Ph.D. dissertations.

Seabirds: Although the spring/summer months are generally quiet for the seabird research team, a **new project is about to get underway** that will focus on tracking albatross fledglings. This life history stage is a real mystery because fledglings leave the remote Hawaiian Islands in June-August with no parental guidance. Therefore, it is unknown where fledglings go, how they use the ocean to find food, or how the physical environment affects where they go. Partnering with the National Geographic Society, TOPP seabird researchers will travel to Midway Atoll in July to deploy satellite tags on black-footed albatross fledglings. They anticipate tracking individual fledglings for up to a year **to unravel the mystery of what these birds do on their maiden voyage** to sea. The tracks of these birds will appear on the [TOPP website](#), so check back soon. In May, albatross researchers met to evaluate the cumulative data collection to date and to determine the future course of tagging work. Also identified were series of planned analyses and subsequent publications.

Sharks: The southern shark team, focusing on blue, mako and thresher sharks, just started their first cruise in the Southern California Bight on the *R.V. David Starr Jordan*. Over the 20-day cruise the team hopes to tag a total of 30 sharks with both PAT and SPOT tags. While the cruise is ongoing we are still tracking two mako sharks from earlier deployments with one tag still providing intermittent transmissions after almost two years. Interestingly the **sharks show some regular seasonal movements**. During most of the year they meander along the coast remaining relatively close to California and Baja Mexico. However in the spring and early summer they make a relatively directed southerly migration traveling as far south as 12 N, before returning to the coast. Additional tag deployments this year will provide further insights into this pattern for mako sharks and allow for more detailed comparisons with the other species using the California Current as a nursery ground.

Two of the 29 PAT tags deployed on white sharks in the winter season of 2005-2006 at Año Nuevo State Park and Farallones National Marine Sanctuary, have released and reported to satellite. As hypothesized, both tags reported in an area half way between California and Hawaii that is increasingly **being identified as potential hot spot region for white sharks**. The first tag released on April 30th and the second on May 29th. This second tag was deployed on November 20, 2005 and programmed for short-term, higher resolution sampling. This tag was placed on a large male white shark already bearing one PAT. At this point, shark researchers have been able to analyze much of the data from this short-term tag, which is providing us with insight into the shark's behavior. Analysis of the maximum and minimum daily temperatures and maximum depth for the animal shows the departure from the continental shelf in a clear and typical manner around February 14th and the subsequent travel on a three-week trip due west. The shark then spent the next 2 months west of 135 longitude with the PAT tag releasing at the end of April. During the coastal period, most of this shark's time was spent between temperatures of 10°C and 14°C, with the animal experiencing rapidly increasing temperatures as it moved offshore. Upon leaving this region some portion of the shark's time was spent in cooler

water (6-8°C) at depth. Further analysis of time at depth indicates that during the coastal period, depths of 10-50m were largely favored. However, the shark was mostly at the surface during the crossing. Once in the hot spot region, the shark spent a significant amount of time in the 50-100m and 300-500m depth ranges. TOPP is hopeful that the second PAT tag deployed on this shark will report on schedule (August 7, 2006) and provide more information related to this animal's journey.

Tunas: Using archival tags, the tuna team has amassed an impressive dataset on yellowfin, bluefin and albacore tuna, having now recovered over 300 tags for the three species including approximately 50,000 days of data on tuna movements in the North Pacific. From these data, a flood of new biological **insights are pouring in about movements and habitat use**. Analyses of the trans-Pacific migrations of bluefin tuna are allowing the tuna researchers **to define their migratory corridor**. The westward migrations, initiated in the winter and early spring, occur on a narrow corridor bounded to the north by the 13°C isotherms and to the south by the chlorophyll a front at the northern edge of the North Pacific Gyre. The bluefin travel rapidly across the Pacific (~ 2,500 nm in 31-45 days) before they slow down just east of Hawaii near the Shatsky and Hess rise. The timing of their arrival in this area corresponds to the spring pulse of productivity. This same area is also popular with loggerheads and albatross.

Kurt Schaefer and Dan Fuller, from IATTC, returned to port in San Diego on May 9, 2006, following a 69-day charter of the live-bait pole-and-line fishing vessel, *Her Grace*, conducting tuna tagging operations in the equatorial eastern Pacific. Geolocating archival tags (Lotek Wireless LTD 2310) were surgically implanted in the peritoneal cavities of 45 yellowfin over a range of lengths between 51 and 64 cm. All specimens in which archival tags were implanted were also tagged with conventional green plastic dart tags. The TOPP program provided the 45 archival tags deployed in order to **expand the distribution of tag deployments from off Baja California, Mexico** by the yellowfin tuna-tagging project. Recoveries in due time should provide a remarkable opportunity for comparative evaluations of the movements, behavior, and habitat utilization of yellowfin from these two unique oceanographic regions within the eastern Pacific.

Humboldt Squid: Studies in the last year on Humboldt squid have utilized PAT tags with a focus on vertical movements in relation to the Oxygen Minimum Layer (OML), which begins at relatively shallow depths of 200-250m in the Sea of Cortez. Three short-term tag deployments (3 days) were made in mid-November 2005, at the end of the commercial fishing season in Santa Rosalia. Two squid showed the expected pattern (based on our previous tagging efforts in early November of 2004), in which they spent nearly all of daytime hours at depths associated with the OML (>200m) and most of the nighttime at depths of <150m. The third squid essentially remained at a depth of about 300m all day and night, with few excursions to shallower depths. This latter pattern had never been seen before and **indicates that the squid can tolerate significant hypoxia** (5% surface oxygen concentration at 300m) for a period much longer than previously observed. Furthermore, **a surprisingly high level of locomotor performance was possible** under these conditions. All three squid migrated northwest towards the San Pedro Martir basin during the three days they were tagged and covered distances of up to 70 miles. These data provide thus provide an estimate of swimming speed during a long-distance migration. They also suggest that some squid may either migrate to the San Pedro Martir basin itself, or that this basin lies on the route to the winter fishing grounds off Guaymas, an area thought to be the destination for the majority of squid migrating from Santa Rosalia at this time of year.

In May 2006, another short-term pop-up deployment (5 days) was made near Santa Rosalia at the beginning of the commercial fishing season. This **squid behaved in way that we have never seen**. During both daytime and nighttime the squid spent the vast majority of its time at depths <150m. Only 25% of the time was spent deeper than 200m, all during the daytime, and the squid thus spent relatively little time in the OML. Although these data are preliminary, they suggest that large seasonal differences may exist in which the way Humboldt squid exploit the OML. Fieldwork planned for July and December 2006 will further examine this idea.

Swordfish: In the fall of 2005 harpooners off Southern California tagged a total of 10 swordfish, more than in any previous season. To date, 4 tags have released from fish and transmitted data to satellite after periods ranging from 74 to 170 days. While most previously tagged swordfish have traveled to the southwest, all four PAT release locations this year are to the south. The most recent tag to release popped up in late February near the tip of the Baja peninsula after 6 months. This difference observed in the migration pattern may be associated with inter-annual variability as has been seen with so many other species. There is also the possibility that the pattern reflects mixing in the California Bight with fish coming from the Central Pacific as well as Mexico and Central America. Interestingly **the swordfish that travel south do not dive as deep as those that go farther offshore**. This may be associated with shifts in the deep scattering layer as well as the shallower oxygen minimum zone off California and Mexico. The remaining 6 PAT tags are scheduled to release and transmit to satellite during July and September. The season is just getting underway again and an additional 14 tags will be deployed this summer and fall.

Sea Turtles: Of the eight tags deployed on leatherbacks over a year ago in Playa Grande, Costa Rica, one tag is still transmitting. This tag is on the turtle that is currently situated between the Pearl Islands and Pinas Bay, Panama. This turtle has remained within the bays and gulfs of Costa Rica and Panama, **engaging in predominantly shallow dives throughout the tracking duration**. The 2006-2007 Leatherback tagging schedule for Playa Grande may involve a deployment in October at the beginning of the internesting period, and a deployment during January during the middle of the internesting period. The deployment dates and the number of turtles to be tagged are yet to be determined.

In addition to the leatherback sea turtles, TOPP research partners **continue to track three of four loggerhead turtles** tagged during the fall of 2005 off Baja California Sur, Mexico. One turtle has moved directly west towards Hawaii after spending some time off Magdalena Bay. The remaining 3 turtles have not traveled far from the initial tagging location and remain within a few miles of each other in the productive waters just to the north of Magdalena Bay.

Leatherbacks tagged on Jamursba Medi, Indonesia **are displaying tremendous diversity in their migration routes and foraging destinations**. One turtle is located in the middle of the tropical Pacific, heading eastward, while another appears to be foraging in temperate waters of the North Pacific transition zone. Three individuals are approaching the West Coast of North America, where there are important foraging areas. One of these three leatherbacks is within 100 miles of San Francisco, nearly completing a trans-Pacific migration of over 13,500 km. This **migration is one of the longest ever recorded for an aquatic vertebrate**. The remaining active transmitter from Jamursba Medi is on a leatherback that has remained in a small area off the coast of Malaysia in the South China Sea for several months.

Education and Outreach: The white shark animation on TOPP's home page was recognized this spring by the judges of the Web Marketing Association's ninth annual Internet Advertising Competition (IAC) Awards as the **best non-profit rich media online ad**. The (IAC) Awards honor excellence in online advertising and recognize the individuals and organizations responsible for the best in Internet marketing. The IAC Awards are the first and only industry-

based advertising award competition dedicated exclusively to online advertising. Other winners included Disney Online, Foote Cone & Belding, Walt Disney Parks and Resorts, America Online, Inc., and Ogilvy Worldwide.

TOPP PI and E&O Liaison, **Randy Kochevar, is leaving his position at the Monterey Bay Aquarium** to start a new job at Ad2, a multimedia, marketing and technology company. Randy's experience will help Ad2 work with organizations dedicated to sharing science and conservation content with a variety of audiences through multimedia tools, and this will help Randy stay connected to TOPP and CoML as well. We wish him the best of luck!

Zooplankton: Census of Marine Zooplankton (CMarZ)

In April, a **CMarZ cruise surveyed zooplankton diversity** – including both at-sea taxonomic analysis and DNA barcoding – in the NW Atlantic (See: www.cmarz.org/CMarZ_Cruise_April). Twenty-eight CMarZ researchers, expert taxonomists, staff, and students from 14 countries were onboard for the cruise led by CMarZ Steering Group member Peter Wiebe (Woods Hole Oceanographic Institution), with funding from the NOAA Office of Ocean Exploration. Sampling was conducted along a transect from the northern Sargasso Sea to the equatorial waters east of Brazil. At five primary stations, environmental data and zooplankton samples were collected as deep as 5,000m using three MOCNESS (Multiple Opening/Closing Nets and Environmental Sensing Systems), as well as by blue water SCUBA diving. More than 7600 animals were identified to over 650 species. Onboard molecular systematic analysis included DNA extraction from ~770 individuals, with **DNA barcodes obtained for nearly 100 species**. In all, more than 1200 specimens of 502 species from 11 phyla were catalogued for DNA sequencing. At-sea lectures and demonstrations provided training in zooplankton morphological and molecular systematic approaches. The cruise received world-wide press coverage, with more than 100 articles in newspapers and magazines.

Seven CMarZ Steering Group members and project managers **participated in the “DNA Barcoding for CoML” workshop** in Amsterdam, the Netherlands, on 15-17 May. Organized by CMarZ PI Ann Bucklin (University of Connecticut), with Paul Hebert (University of Guelph) and Bob Ward (CSIRO), the workshop built new bridges between CoML field projects, OBIS, and the Consortium for the Barcode of Life (CBOL).

The Tansei Maru cruise was conducted in June. The cruise, from Hakodate, Hokkaido, Japan to Tokyo Bay, targeted the North Pacific along the Japanese mainland, including the Oyashio, Kuroshio, and transition zone. **Vertically stratified sampling up to 3000m depth was carried out** to collect meso-zooplankton, Foraminifera, and Radiolaria. Bulk zooplankton samples were also collected for which zooplankton species richness will be tested with further analysis. These samples will be used for taxonomic evaluation with the cooperation of CMarZ Taxonomic Network.

Further cruises were completed this year and **zooplankton samples collected** from the Yellow Sea, East China Sea and along a transect from China to Antarctica by SUN Song (Chinese Academy of Sciences). Sigrid Schiel (Alfred Wegener Institute for Polar and Ocean Research) collected near North Atlantic seamounts and in the NW African upwelling region as well as in the Southern Ocean's Amundsen, Lazarev, and N. Weddell Seas.

Planning is underway for the **CMarZ Steering Group meeting, to be held 6-8 November 2006** in Tokyo, Japan. Hosted by CMarZ co-PI Shuehi Nishida (Ocean Research Institute, University of Tokyo), the meeting will begin with a public symposium on Nov. 6th, and will be followed by an excursion to Mt. Fuji.

Microbes: International Census of Marine Microbes (ICoMM)

The 1st annual ICoMM meeting held was held **12-15 June in Nordwijk, Holland**. Major subjects of the meeting were 454 sequencing, diversity estimation, environmental data, and seamount diversity. Working groups discussed theme areas, such as field investigations (exploratory sampling and low abundance taxa), experimental paradigms (linking technological advances to ecological theory), analytical questions to be addressed with high-throughput molecular data, and database issues. About 50 participants attended from 12 countries.

ICoMM is now **involving experts in visualization** of microbes, such as Jeremy Pickett-Heaps (University of Melbourne), to complement the genetic approaches.

ICoMM will have a **paper coming out shortly in Proceedings of the National Academy of Sciences**, describing newly discovered unfathomable microbial diversity in the deep sea.

National and Regional Activities

Canada

The Canadian Postal Service is **planning a series of postal stamps featuring CoML** scientists and images from the ArcOD project to commemorate the International Polar Year. These will be available in 2007.

China

Websites for CoML China and the OBIS Regional Node in China were established at <http://www.coml.org.cn> and <http://www.iobis.org.cn>, respectively. **About 200,000 records are currently estimated in the Chinese OBIS database**, mainly including the data on marine algae in China Sea and the data on the Chinese National Comprehensive Oceanographic Survey 1958-60 (NCOS). Quality control of these data is being carried out by the experts from various fields of taxonomy in Marine Biological Museum of Chinese Academy of Sciences. Chinese OBIS is preparing for interoperability with the international OBIS portal.

The 22nd Chinese National Antarctic Research Expedition (CHINARE) began last November and returned in March 2006. **Investigation on the structure and function of the Southern Ocean Ecosystem** was carried out during this period. Aboard the vessel *Xue Long*, the main work focused on: 1) high-speed collection of the zooplankton and krill specimen throughout the cruise (122E, 29N - 67E, 67S); 2) investigation on zooplankton and krill in the Prydz Bay; 3) investigation on phytoplankton in the Prydz Bay; 4) collection of the benthos samples in the Prydz Bay; and 5) investigation of zooplankton and phytoplankton in the front of Amery Ice Shelf. Duplicate samples were preserved according to different protocols for regular research and for DNA barcoding, respectively. Analysis will provide new understanding of species diversity, distribution, and abundance in relation to ecosystem structure and function in the Southern Ocean and related areas.



As part of its E&O effort, **CoML China has produced a series of shirts featuring images of Foraminifera**. The designs on the shirt are based on models by Prof. Zheng Shouyi (China CoML, Chinese Academy of Sciences, and Senior Scientist of the Institute of Oceanology). In the photo, the CoML SSC shows off their shirts during the Iceland meeting in June.

Zooplankton biodiversity and ecology in China Sea were studied in conjunction with different national projects: the monthly investigation of marine plankton in Jiaozhou Bay in the Yellow Sea; the investigation of 14 stations in the north area of the South China Sea from 13-26 February 2006; and the investigation in the south area of the Yellow sea and the East China Sea from 8-30 April 2006. These studies are all contributing to CMarZ. CoML China also participated in the CMarZ Sargasso Sea cruise in April.

Europe

EuroCoML is pleased to announce that **Dr. Nicole Dubilier of the Max Planck Institute of Marine Microbiology has agreed to join the EuroCoML Scientific Steering committee**. This will help address the issues of geographic coverage, discipline and gender balance.

Two of the three **EuroCoML funded workshops have now taken place**:

1) “Invasive Alien Species” was held in **Oostende, Belgium in March**. There were 17 attendees from 14 European countries. Henn Ojaveer (Estonia) represented the EuroCoML Executive Committee at the workshop. Participants felt that there was good flexibility in the EuroCoML funding of workshops as it is a **useful way of bringing people together** without having to have concrete terms of reference. Several work packages have been designed and Segej Olenin (Lithuania) and Stephan Gollasch (Germany) were elected as coordinators of future work. A proposal is currently being written and EuroCoML Executive Committee will help in determining which funding streams should be applied for.

2) “Environmental Modulation of Biodiversity and Ecosystem Dynamics (EMBED)” **was held in Pisa, Italy in April**. There were 23 attendees from 7 countries. Invited attendees from the USA included Brenda Konar (of NaGISA) and John Steele (theory of colour noise). Isabel Sousa-Pinto (Portugal) represented the EuroCoML Executive Committee at the workshop. This was another successful workshop that met its aims of developing a **draft research proposal** which will expand the current activities of EuroNaGISA and implement testing of new hypotheses on drivers of change in coastal biodiversity. As with the Invasive Alien Species proposal, the EuroCoML Executive Committee will help support EMBED in finding funding. EuroCoML has funds to sponsor additional workshops.

On 14-15 June, Roberto Danovaro and Jesse Ausubel attended a **press extravaganza in Milan and Venice, Italy** promoting CoML and EuroCoML. The events, hosted by Telecom Italia Progetto Italia, were well attended by the media, including the major daily newspapers Corriere della Sera and Il Giornale, as well as the weekly magazine Panorama. **Thanks to Roberto Danovaro and Fabio Caporizzi** for their creative and effective organization of the events.

Bhavani Narayanaswamy (EuroCoML Project Officer) gave an overview of CoML and EuroCoML work at the first meeting of the International Association of Oil and Gas Producers sub-committee for Marine Protected Areas (31 May-1 June, London). The members were extremely interested to hear about work that is currently taking place and in particular about OBIS.

Indian Ocean

The IndOBIS Catalogue of Life (IndOBIS CoL) is growing steadily. It has currently collated **baseline data for nearly 24,400 species**.

South America

On 22 March, **Lucia Campos (ChEss, CAML)** presented CoML’s work at a symposium entitled, “New frontiers for ABS: Use of genetic resources in the deep seabed and Antarctica.”

The symposium, organized by the United National University Institute for Advanced Studies and UNESCO, was a side event during the Conference of the Parties to the Convention on Biological Diversity (COP-8) in Curitiba, Brazil. The presentation was very well received.

The South American committee will **next meet 27-29 September in Mar del Plata, Argentina.**

Sub-Saharan Africa

Committee Chair Charles Griffiths presented CoML at the Indian Ocean Marine Workshop in Oman this past January. He initiated discussions that are leading to a **potential new CoML regional biodiversity workshop in Oman** to link the CoML programs in southern Africa and the Indian Ocean.

The South African National Research Foundation has provided **funding for a 2006-2010 project to measure and map benthic biodiversity patterns** in the Benguela region. Ship time has been promised in relation to this funding.

USA

The U.S. National Committee welcomes **Michael Feldman as coordinator for the U.S. program office** at CORE.

On June 14th, **CoML scientists took part in a panel discussion** titled “*New Views of Ocean Life: Advances in Visualization from the Census of Marine Life*” and the U.S. Capitol Hill Oceans Week (CHOW) in Washington DC. The session was moderated by Dr. Andrew Rosenberg (HMAP and incoming Chair of the U.S. National Committee) and featured talks by Dr. Patrick Halpin (OBIS- SEAMAP), Dr. Russ Hopcroft (ArcOD), and Dr. Nicholas Makris (Gulf of Maine/NOPP project). The focus of the session was to **highlight CoML’s perspectives on visualization**: (1) observational tools to improve the ways in which we can see what lives in the ocean; (2) how we can visually present that information to enhance understanding. Maps, animations, and other imagery can be powerful tools for showing diversity, distribution, interactions, and trends in marine life that can facilitate ecosystem management, conservation, the development of scientific questions, and public understanding. For more information about CHOW, including copies of their slide presentations please visit:

<http://www.nmsfocean.org/chow2006/>.

The USNC is **organizing a workshop** on “Approaches to researching the role of biodiversity in ecosystem services,” which **will be held on 11-13 September 2006 in Washington, DC**. The purpose of the workshop is to bring together individuals from a variety of scientific disciplines and from management agencies and backgrounds to share information, ideas and data to: understand the roles of marine and coastal biodiversity in sustaining ecosystem function; understand the direct and indirect values of ecosystems services to human populations; devise methods for applying this information to support ecosystem-based approaches to management; identify research priorities; and identify monitoring needs and methods. The workshop steering committee includes Paul Sandifer (NOAA), Jo-Ann Leong (Univ. Hawaii), Lew Incze (Univ. Southern Maine), Michael Fogarty (NOAA), Ben Halpern (Univ. California Santa Barbara), and Stephen Palumbi (Stanford). For more information, including a preliminary agenda, visit: <http://www.coml.us/Dev2Go.web?id=303955>.

The USNC held its **biannual meeting 21-22 March** in Washington, DC. The principal goals of the meeting were to 1) identify and adopt a 2006-2007 outreach strategy for engaging stakeholder groups, and 2) identify and adopt strategies to support the full implementation of a sustained U.S. Regional OBIS Node. Members of the USNC were joined in their discussions by representatives of the Gulf of Maine project, OBIS-SEAMAP project, US Regional OBIS Node,

NOAA's Office of Ocean Exploration, Ocean.US, and the Centers for Ocean Science Education Excellence (COSEE) Network Coordination Office.

The **next meeting** of the U.S. National Committee for the Census of Marine Life will be held on **14-16 November 2006** at the Harte Research Institute for Gulf of Mexico Studies in Corpus Christi, TX, hosted by USNC member Wes Tunnell.

Crosscutting and Other Related Activities

SCOR: Panel on New Technologies & Other Events

The SCOR Panel on New Technologies **will meet 18-20 October 2006 in Kobe, Japan** (in conjunction with the NaGISA world conference). There will be a joint technology session with NaGISA and Techno-Ocean on the 18th.

In December 2006, SCOR will **host a second summit of international large-scale research and observation projects and programs**. The proposed meeting would help CoML to increase its interactions with related efforts, which would benefit both CoML and the other efforts. Areas for cooperation include observational platforms and data management. This is a follow-up to the well received 2004 summit, which took place in Venice.

Barcoding Marine Life

Ann Bucklin (UConn, USA), Paul Hebert (University of Guelph, Canada), and Bob Ward (CSIRO, Australia), **organized a workshop for 15-17 May in Amsterdam** to develop an implementation plan for coordination of a DNA barcoding effort for marine animals and microbes that are the focus of ongoing CoML activities, particularly the Ocean Realm Field Projects. The meeting was very successful and included representatives from each of the CoML Realm Projects. CoML researchers are urged to visit <http://www.barcodinglife.org/views/login.php> and use the barcoding software freely accessible through the site. As of 21 July, 2176 species of fishes have been barcoded.

Funding & Employment Announcements

Information regarding Calls for Proposals and other opportunities (jobs, fellowships, post-docs, etc.) can be found at the CoML Secretariat website: www.comlsecretariat.org, under **"Announcements of Opportunity."**

Calendar of Upcoming Events

August

- 4-8** European Marine Biology Symposium, Cork, Ireland
- 15** Workshop of the Consortium of South American Antarctic Researchers for IPY, Concepcion, Chile

September

- 2-4** Annual HMAP Workshop, Durham, NH
- 6-7** MAR-ECO Southern MAR "globalization" workshop, Brazil
- 6-26** Santo Biodiversity Cruise, Espiritu Santo, Vanuatu
- 11-13** USNC Biodiversity Workshop, Washington, DC
- 18** EuroCoML Full Committee meeting, Maastricht, The Netherlands
- 18-8 Oct** Cruise to further test OARS (Gulf of Maine)
- 19-23** ICES Annual Science Conference, Maastricht, The Netherlands
- 27-29** CoML South American Regional Implementation Committee Meeting, Mar del Plata, Argentina

October

- 5-25** CReefs Cruise to NWHI French Frigate Shoals
- 13-14** CoML SSC Meeting, Nara, Japan
- 13-21** PICES Annual Meeting, Yokohama, Japan
- 15-18** NaGISA International Conference, Kobe, Japan
- 18** SCOR/NaGISA/Techno-Ocean Joint Session, Kobe, Japan
- 18-20** SCOR Technology Panel meeting, Kobe, Japan
- 18-20** Techno-Ocean 2006 Conference, Kobe, Japan
- 23-26** SCOR General Meeting, Concepcion, Chile
- 24-26** Workshop on oxygen minimum systems in the oceans: distribution, diversity and dynamics, Concepcion, Chile

November

- 5-8** CMarZ Steering Group meeting, Tokyo, Japan
- 14-16** USNC Meeting, Corpus Christi, TX, USA

December

- TBD** SCOR Summit of Major International Marine Programs