Sea Around Us

The Millennium Ecosystem Assessment: links with the *Sea Around Us* project

By Daniel Pauly

One of the conclusions that can be drawn from the recently concluded Earth Summit in Johannesburg is that there is still no clear perception, in the public at large, and among elected politicians, that the Earth's ecosystems are being degraded to such an extent and at such a rate that they will increasingly be unable to supply humanity with the services (*e.g.*, water supply) that have so far been taken for granted.

Global climate change posed a similar challenge a decade ago, but this was overcome by the Intergovernmental Panel on Climate Change (IPCC), which, through a consensus-based process involving thousands of scientists, managed to convince leading politicians in most of the world's countries that climate change is an issue that must be addressed.

A similar task awaits the Millennium Ecosystem Assessment, officially launched in April 2000 by the Secretary-General of the United Nations, Mr Koffi Annan with the statement that "it is impossible to devise effective environmental policy unless it is based on sound scientific information. While major advances in data collection have been made in many areas, large gaps in our knowledge remain. In particular, there has never been a comprehensive assessment of the world's major ecosystems. The planned Millennium Ecosystem Assessment, a major international collaborative effort to map the health of our planet, is a response to this need."

The Millennium Ecosystem Assessment (MA), the brainchild of Dr Walter V. Reid, its present director, is funded by a variety of foundations and international organizations, as reflected in its board and secretariat (see www.millenniumassessment.org) and is organized in a fashion similar to the IPCC. Its key job, *i.e.*, a thorough assessment of the world's ecosystems, is performed by four working groups (WG):

A WG of scientists devoted to defining the 'Framework' of the MA's global and regional assessments;

A WG on 'Condition,' to analyze the present states of ecosystems and historic trends in their delivery of services to humans;

A WG on 'Scenarios,' to assess the impact on service delivery in the coming decades, under different sets of intervention options (do nothing, reverse some of the worse trends, address environmental issues on a broad scale, *etc.*);

A WG on 'Responses,' to evaluate different responses that countries, and humanity as a whole may take to address the issues in (2) based on the scenarios in (3).

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Each of these WG will write a technical report, the last to be released in 2005, when the MA is due to conclude. These reports are drafted, as in the IPCC, by Coordinating Lead Authors (CLA), assisted by Lead and Contributing Authors (LA, CA), all drawn from different parts of the world such as to ensure a regional and gender balance, to ensure a consensus that takes account of a wide range of situations and experiences.

Progress by the four WG has been very uneven so far, though fortunately in terms of the logic of its task, it is the Framework WG which is most advanced. The MA meeting held in Frankfurt, Germany, on August 20-24, which this author attended, was, indeed, to work on a nearly complete draft of the 'Framework' report. Another imbalance is that between terrestrial and marine ecosystems, the former well represented by CLA with backgrounds in agronomy, forestry, hydrology, *etc*., while no CLA had been identified for the ocean until a meeting held in April/May in Frascati, near Rome (yes, members of the MA get to travel to such neat places - though the virtues of the local wine were lost on me).

The MA now has two saltwater CLA, Dr Tundi Agardy for "Coastal Systems," defined as "the interface between oceans and the land, […] whose ecological determinants are largely governed by interactions with land […], for mapping purposes, 20 m above and 50 m below high tide level," and this author, for "Marine Systems," which are "dominated by fisheries, and comprise the productive shallow shelves surrounding the oceans, down to 200m, and the deeper oceanic waters of tropical, temperate and polar areas, in which fishing is the dominant force behind environmental change."

Tundi and I, with assistance from the MA secretariat have since identified a number of potential LA for the coastal and marine system chapters (including several members of the *Sea Around Us* project), who will be formally invited to join the 'Conditions,' 'Scenarios' and 'Responses' WG. Moreover, the MA accepted an invitation I extended, on behalf of the Fisheries Centre and of the *Sea Around Us* project, to host, in the first quarter of 2003, a coastal and marine MA workshop designed to provide an opportunity for a broad selection of members of the coastal and marine science communities to contribute to the MA.

There, the colleagues to be invited to this workshop will be asked to help finalize the draft of the 'Coastal' and 'Marine conditions' chapters that will have emerged until then, as well as to review other MA documents, notably those dealing with crosscutting themes such as the ecosystem services (biodiversity, food, esthetic value, *etc*.).

As well, this opportunity will be taken to present to the participants the methodology for mapping global fisheries catches and related attributes that was developed by the *Sea Around Us* project, which can be expected to be rather useful in the context of the coastal and marine assessments planned by the MA, and which may also turn out to be useful for the assessment of freshwater (inland) fisheries.

The ***Sea Around Us*** project newsletter is published by the Fisheries Centre at the University of British Columbia. Included with the Fisheries Centre's newsletter *FishBytes*, six issues of this newsletter are published annually. Subscriptions are free of charge.

Our mailing address is: UBC Fisheries Centre, 2204 Main Mall, Vancouver, British Columbia, Canada, V6T 1Z4. Our fax number is (604) 822-8934, and our email address is SeaNotes@fisheries.ubc.ca. All queries (including reprint requests), subscription requests, and address changes should be addressed to Robyn Forrest, *Sea Around Us* Newsletter Editor.

The *Sea Around Us* website may be found at saup.fisheries.ubc.ca and contains up-to-date information on the project.

The *Sea Around Us* project is a Fisheries Centre partnership with the Pew Charitable Trusts of Philadelphia, USA. The Trusts support nonprofit activities in the areas of culture, education, the environment, health and human services, public policy and religion. Based in Philadelphia, the Trusts make strategic investments to help organisations and citizens develop practical solutions to difficult problems. In 2000, with approximately $4.8 billion in assets, the Trusts committed over $235 million to 302 nonprofit organisations.

The *Sea Around Us* project goes Down Under

By Dirk Zeller and Reg Watson

In August of this year, the *Sea Around Us* project went Down Under, with Reg Watson and Dirk Zeller attending the ***World Congress on Aquatic Protected Areas***, held in Cairns, Australia. Located next to the Great Barrier Reef World Heritage Area, Cairns was an ideal location for this important topic, drawing approximately 400 delegates from 10 countries. The annual meeting of the Australian Society of Fish Biology was held simultaneously which made for a busy gathering, with seven concurrent sessions over the three-day period.

Given the location, and the distance between Australia and the 'rest of the world', it was inescapable that much of this conference was dominated by Australian issues: tropical to temperate, and marine to freshwater. However, several of the keynote speakers were able to set and maintain large-scale and international perspectives: Elliot Norse (Marine Conservation Biology Institute, USA, "Why marine protected areas?"), Tundi Agardy (Sound Seas, USA, "Optimal design of individual marine protected areas and MPA systems"), Bill Causey (Florida Keys National Marine Sanctuary, USA, "Success factors in the implementation and management of aquatic protected areas"), Jon Day (Great Barrier Reef Marine Park Authority, Australia, "How good are aquatic protected areas – measuring their performance"), and Peter Cullen (University of Canberra, Australia, "The Heritage River Proposal – conserving Australia's undamaged rivers").

Both *Sea Around Us* presentations were well attended. Reg Watson talked about '***Multi-scale decision support for aquatic protected area placement***' in which he presented the large scale mapping approach and findings produced by the SAUP, including the over-reporting in Chinese catch statistics (Watson and Pauly 2001). There was considerable interest in this approach despite the difference in scale at which the SAUP works, compared to many other projects. While we look at whole ocean basins most projects study a single embayment or small collection of coral reefs.

Dirk Zeller gave a presentation entitled '***Marine reserves: time for a global perspective***' in which he outlined the current (unsustainable) state of world fisheries and their causes, and presented the options and potential solutions our project is calling for. These were also recently outlined in a SAUP authored insight review article in *Nature* (Pauly *et al.* 2002). Dirk was able to connect the small-scale, detailed work he has performed on the Great Barrier Reef Marine Park fauna with the global perspective needed to tackle problems of protected area placement in a meaningful way.

Both presentations have been submitted for consideration as full-length contributions in the conference proceedings. One interesting development we became aware of during this conference was the mapping work being conducted as part of Australia's National Oceans Policy. This has resulted in large scale, spatial datasets and databases on marine resources and uses for Australian EEZ waters. This work was presented by James [Larikin] Larcombe from Australia's Bureau of Rural Sciences, and is a development we will continue to watch with great interest. Reg Watson and James spent some time looking at possible collaborations as James' group plans to map all the marine resources of Australia and its impacts on coastal communities. In all, a great conference, Mate!

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References

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CephBase and the *Sea Around Us* project

By Catriona Day

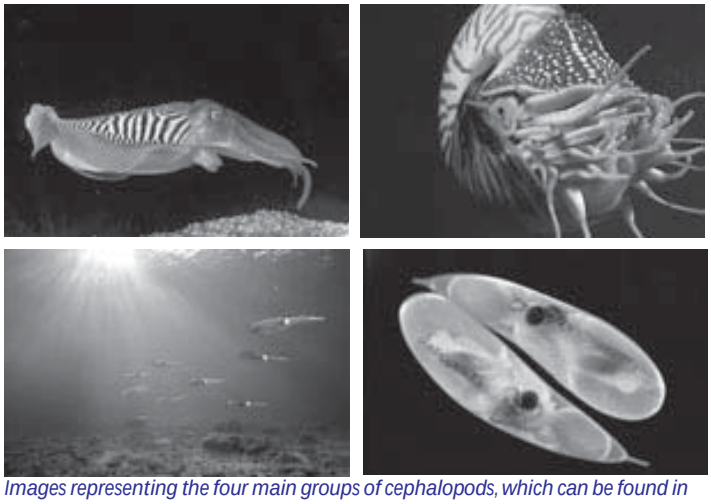
Cephalopods, throughout the world, are an important and valuable component of marine ecosystems. To accommodate a growing need for information on this group, an online database, CephBase (www.cephbase.utmb.edu) was created in 1998. CephBase is a dynamic, relational database-driven web site containing species-level data of all living cephalopods (786 species of octopus, squid, cuttlefish and nautilus). The purpose of CephBase is to provide taxonomic data, images, videos, geographical distribution maps (created in real-time), predator and prey data, scientific contact information and interoperability with other databases (*e.g.*, FishBase, www.fishbase.org) in an easy to access, user-friendly manner. CephBase is well recognized, and has been mentioned twice in *Science* (**282**:587 and **285**:2027).

The purpose of this collaboration is to improve the compatibility of CephBase with the Sea Around Us *project*

Most of the CephBase Team works at the National Resource Center for Cephalopods at the University of Texas Medical Branch, Galveston, Texas. However, as CephBase webmaster, I was previously based at Dalhousie University, Halifax, Nova Scotia. Following an invitation by Daniel Pauly, I am now at the Fisheries Centre, in order to collaborate more effectively with the *Sea Around Us* project.

The purpose of this collaboration is to improve the compatibility of CephBase with the *Sea Around Us* project database, and hence with FishBase and other databases. This consists, in particular, of allocating the geo-referenced, species-specific cephalopod occurrence records in CephBase to 18 FAO statistical areas, 64 Large Marine Ecosystems (LMEs) and the Exclusive Economic Zones (EEZs) of about 200 maritime countries and territories. Also, the geographical distributions of commercial species of cephalopods in Roper et al. (1984) are being mapped onto LMEs and EEZs using a GIS-based approach. This will be complemented by references reporting the occurrence of various cephalopod species in the waters of particular areas (*e.g.*, Voss and Williamson, 1971).

By the end of 2002, this information will have been incorporated into a searchable interface in CephBase, which will thus be able to create maps and lists of cephalopods by FAO areas, LMEs and countries. It is anticipated that this product, required for various analyses by the *Sea Around Us* project team, will also be found useful by other research groups, notably in developing countries.



*Images representing the four main groups of cephalopods, which can be found in CephBase's fully searchable image database. Clockwise from top left: cuttlefish (*Sepia officinalis*); nautilus (*Nautilus pompilius pompilius*); octopus eggs (*Octopus briarius*); and a school of Caribbean reef squid (*Sepioteuthis sepioidea*). Photos by James B Wood, courtesy of CephBase.*

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