

On the Home Stretch: Millennium Ecosystem Assessment Update 6

by Jackie Alder

A combined Working Group meeting of the Millennium Ecosystem Assessment (MA) was held during October in Prague, Czech Republic with many groups working towards nearly complete draft chapters. The Prague meeting provided a forum for the different working groups (Conditions & Trends, Scenarios and Responses) to link and harmonize various issues and topics covered by the MA including the coastal and marine components. The meeting certainly highlighted the importance of marine environments to human well-being with issues ranging from human diseases to freshwater supplies.

The chapters for the Conditions and Trends Working Group are mostly over 80% complete and this includes the Marine Chapter co-authored by several *Sea Around Us* project members. Most chapters will be available for peer-review in early January. This is quite an

accomplishment, considering the huge task, the time-frame and the broad terms of reference.

Considerable progress was made in the Scenarios working group, with the story-lines described in more detail, differentiating events and interactions that may occur in developing vs developed countries. The *Sea Around Us* project scenario work by Villy Christensen and myself includes using three *Ecopath with Ecosim (EwE)* models: the Gulf of Thailand, the Benguela Current and the Central North Pacific, to look at what might happen to catches and diversity under the four scenarios proposed by the MA.

The four scenarios were developed to give a wide spectrum of possibilities for the future ranging from high protectionism ('Order through Strength') to a very enlightened society where learning would be an important component of managing the environment ('Adapting Mosaics') and two others,

'Technogarden' (technology solves the problems) and 'Global Orchestration' (global trade without barriers) between the two extremes.

The scenario work does show that it is not too late to start to rebuild ecosystems or to change the current downward trends. In the Gulf of Thailand for example, under the four scenarios, landings initially decrease due to the impact of climate change, but as appropriate policies are implemented and technological solutions are applied, landings increase (see figure overleaf). The diversity of the landings, however, varies depending on the scenario, with the diversity of the landings decreasing in all scenarios as fisheries in the Gulf of Thailand shift towards maximizing crustacean landings (high economic value) through the capture fisheries or through aquaculture (see figure).

The *Sea Around Us* project scenario work has also resulted in the recent

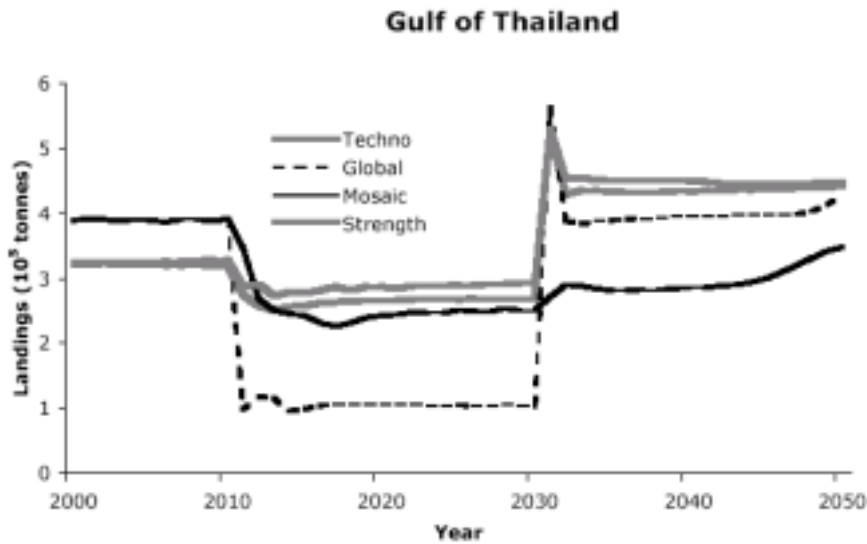
Continued on page 2 - MA

The Sea Around Us Project Newsletter

Issue 20 – November/December 2003

MA - Continued from page 1

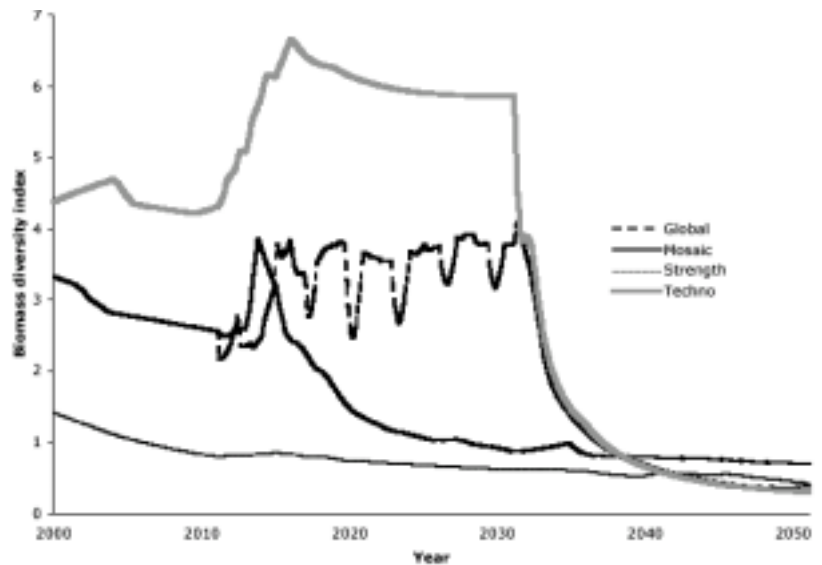
EwE is one of a few modeling tools that researchers can use to look at how ecosystems might change given a specific economic or social policy.



publication of *The Future for Fisheries* (*Science*, November 21 2003). In this article, we described what may be possible in the future based on the United Nations Environment Program's Global Environment Outlook 3 (GEO3)

scenarios. *Ecopath with Ecosim* was also used to simulate various futures resulting from different economic and

environment policies. *EwE* is one of a few modeling tools that researchers can use to look at how ecosystems might change given a specific economic or social policy. The *Sea Around Us* project's work in the MA has led many of our colleagues to realize the power of this software for looking at the future of marine ecosystems and no doubt we will be making greater use of it as we explore other questions such as climate change. So watch this space for further updates on the *Future for Fisheries*.



Top: Simulated change in landings in the Gulf of Thailand from 2000 to 2050 under the four MA scenarios described on p1.

Bottom: Simulated change in the diversity of species for the trophic level > 3 landed from the Gulf of Thailand 2000 to 2050.

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, 2259 Lower 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 www.searoundus.org 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.

Marine Biodiversity Meeting

Using the past to inform the future: the known, unknown and the unknowable

by *Ussif Rashid Sumaila*

This conference was organized by Jeremy Jackson and his group at Scripps Institution of Oceanography in San Diego, California. The meeting took place during November 14-17, 2003. Presentations were by invitation only. There were five sessions each comprising a plenary talk and discussion followed by panel presentations and another open discussion. Topics for the first two sessions focused on fundamental questions about the past: (1) why is the past important? and (2) how do we know about the past? The next two sessions concentrated on case-studies in which knowledge of the recent past plays a crucial role in our understanding of dynamics of the system today: (3) cod and (4) sardines and anchovies. The final session focused on how incorporating knowledge about the past can build a better future for the world's oceans: (5) how can we use the past to inform the future?

Daniel Pauly gave one of the five plenary talks. Using Barbara Tuchman's 'March of the Folly' idea as a metaphor for the recent history and future of fisheries, he set the stage for a lively discussion of 'How do we know about the past?' Other plenary talks were given by the following scientists: Carl Safina of the Blue Ocean Institute; Alec MacCall of

the Southwest Fisheries Science Centre, NOAA; Jeffrey Bolster of the University of New Hampshire; Enric Sala of Scripps; and Steve Palumbi of Stanford University.

I was on the panel for Session 4: *Cod: an extreme case of overfishing*, together with Ransom Myers, Bonnie McCay and Robert Steneck. The Canadian part of the story of the extreme overexploitation of cod was nicely told first by Professor Myers, who clearly demonstrated that northern cod has indeed suffered extreme overexploitation over time, and second by me, with a strong economic explanation of why this pattern of extreme overexploitation had occurred. I laid the blame on both ineffective management of cod and the way the present generation values cod benefits. The latter leads to the 'front-loading' of the benefits from cod, the consequence of which is extreme overexploitation. I suggested that the solution to this problem is for society to cleverly design

and impose management schemes that are based on both rights and responsibilities.

Ratana Chuenpagdee of St Francis Xavier University, a Fisheries Centre Adjunct Professor, gave a panel presentation about her study on the hard choices facing the managers of Chesapeake Bay, if they want a bountiful future for the bay.

A non-academic highlight of the meeting was the presentation of a mini-film on conservation awareness based on Daniel Pauly's 'Shifting baseline syndrome' idea. The film uses humor to educate the public on the need to ensure the long term sustainable use of our natural and environmental resources.



*... the way
the present
generation
values cod
benefits
leads to
'front-
loading' of
the
benefits
from cod,
the
consequence
of which is
extreme
over-
exploitation*

Endangered Marine Fishes

We are pleased to announce that Dr Reg Watson, a senior research fellow with the *Sea Around Us* project, has just been appointed to serve on the Marine Fishes Specialist Sub-Committee of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). This four-year appointment will involve his helping to form recommendations on the status of many marine species, including a number of commercial Pacific rockfishes.


Living on the Coast

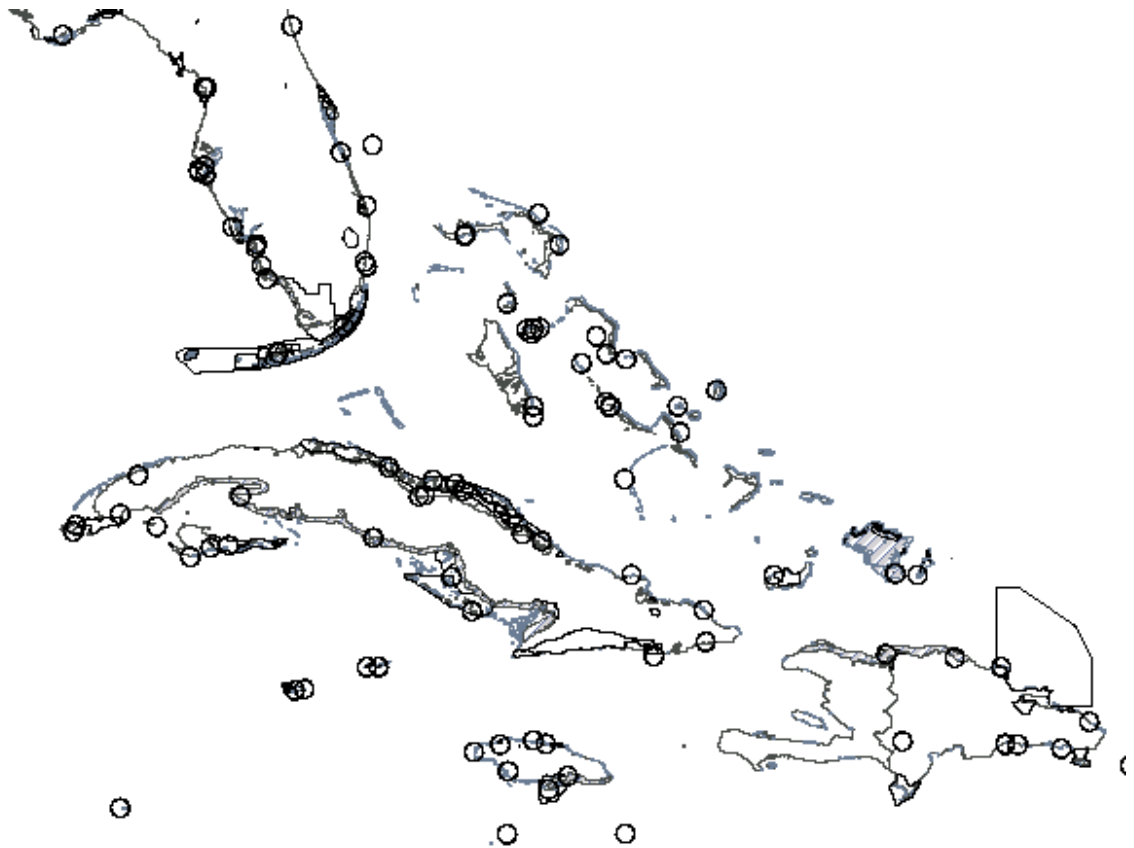
by Jackie Alder and Adrian Kitchingman

The coast is the place to be! Although 38% of the world's population live within a 100km of the coast, the habitable areas of the coast represents a much smaller proportion of the world's total land area. Much of the world's Gross National Product (GNP) is generated along coastlines; in many areas of the world, the infant mortality rate is lower on the coast; and the growth of cities is much greater. Coastal habitats, such as mangroves and estuaries, are also closely linked to communities. For example, 35% of the world's population lives within 100 km of at least one estuary.

35% of the world's population lives within 100 km of at least one estuary

Over the last year the *Sea Around Us* project has accessed several databases including social (population, cities, infant mortality), economic (GNP), ecological (coastal habitats and marine protected areas (MPA)) to study of the importance of marine resources to communities. Geographical information systems (GIS) have been used extensively to study and map the connections between marine systems and human populations. On the opposite page we list some interesting facts about the coast and communities that have been derived from these databases.

The figure below is an example of our efforts to map critical habitats protected in MPAs (Florida and the Caribbean). Estimates of habitats that are included in MPAs globally tend to be underestimated for seagrasses and mangroves since estimates are based on surveys and not all MPAs have been surveyed completely. *Sea Around Us* project members, notably Ms Louisa Wood, in collaboration with Worldwide Fund for Nature (WWF) and United Nations Environment Program –World Conservation Monitoring Centre (UNEP-WCMC) are working to improve this information over the next 12 months. 



Critical habitats such as coral reefs, mangroves and seagrasses (shaded in grey) that are protected by MPAs (circles and polygons) in Southern Florida and the Northeastern Caribbean.

Coastal Factoids

% of the world's population living within 100 km of:

All coasts	38
Coral reefs	12
Estuaries	27
Mangroves	17
Seagrass beds	19
MPAs	19

% of MPAs that include known areas of:

Mangroves	17
Coral reefs	25
Estuaries	17
Seagrass beds	25

Infant Mortality Rate (deaths per 1000 births):

Within 50 km of the coast	23
Inland	41

Approximately 60% of the world's GNP is generated within 50 km of the coast.

FAQ: How much of global catch is taken from the Exclusive Economic Zones of coastal nations?

by Reg Watson and Jackie Alder

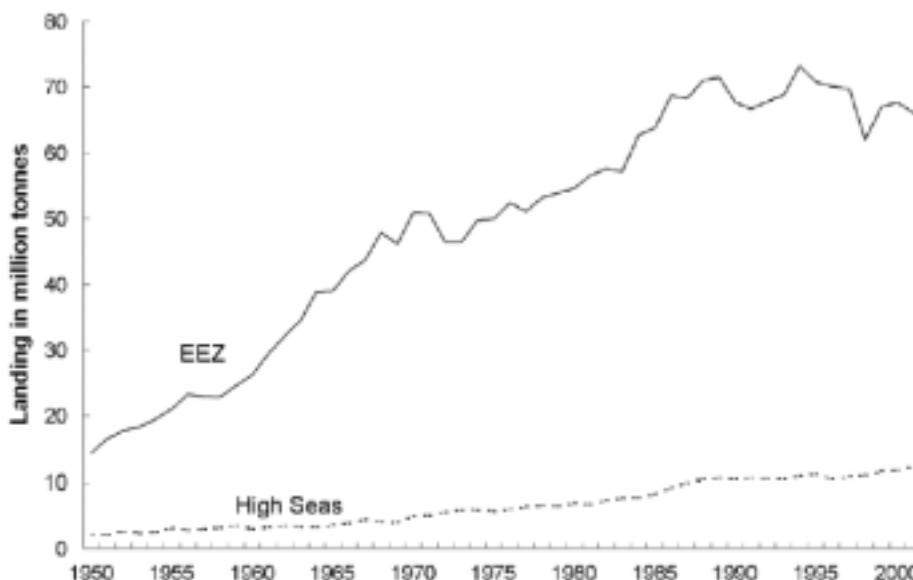
... an average of 89% of global landings come from the areas currently claimed as EEZ

Not surprisingly, the 200-nautical mile buffer most nations claim for their exclusive use encompasses some of the most productive parts of the world's oceans. Here, nutrients from the land are swept into shallow coastal shelves or upwelling of

nutrient-rich water occurs, resulting in high productivity.

The relative success of the huge forage fish fisheries such as the Peruvian anchoveta versus offshore tuna landings cause variations in the proportion of the world's landings that are

taken within EEZ areas. Since 1950, an average of 89% of global landings has come from the areas currently claimed as EEZ (or their counterpart, Exclusive Fishing Zones). This proportion has decreased slightly with the failure of inshore stocks.



Global landing with Exclusive Economic Zone areas in million tonnes.

Source: Spatially allocated landings data from the Sea Around Us project extracted from FAO and other sources.

2003 Ocean Management Research Network National Conference

Ottawa, 13-15 November, 2003

by Dale Marsden and Dirk Zeller

There was a healthy mix of people from academia, government, First Nations, the private sector, and non-governmental organizations.

The Ocean Management Research Network (OMRN) is a Canada-based interdisciplinary group of researchers, managers and policy-makers involved in ocean and coastal management. The major aim of the network, which is jointly funded by Fisheries and Oceans Canada and the Social Sciences and Humanities Research Council of Canada, is to establish links and collaboration and thereby improve the management of Canada's oceans. The OMRN held its second annual national conference in Ottawa in November 2003. The formal proceedings were a mix of paper sessions, a poster session, and a set of 13 concurrent interactive workshops. There were also many opportunities for informal interaction and networking over lunch.

Three members of the Fisheries Centre attended the conference. Nigel Haggan of the *Coasts Under Stress* project argued that the key challenge in oceans management is how to build collective understanding of the productive potential of the marine environment. *Back to the Future* ecosystem models (www.fisheries.ubc.ca/projects/btf/) show that past ecosystem states could sustain much greater flows of economic, ecological and cultural benefits. This makes a compelling case

for reinvestment in natural capital at a time when depletion of wild resources has focussed attention on the revenue potential of oil and gas and salmon farming. The social capital developed through collaboration of multiple interests on model building and valuation increases the likelihood of agreement on rebuilding targets.

Dale Marsden gave a presentation in the Environmental and Coastal Economics workshop (co-produced by the rest of the Fisheries Economics Research Unit: www.feru.org) on research needs in environmental valuation on the West Coast. The non-market values associated with British Columbia's coasts and oceans have not been well-quantified. He suggested that research should be directed toward such valuation, especially as it relates to First Nations treaty negotiations and the potential impacts of aquaculture and oil and gas development. He also presented a poster on the work that he and Ussif Rashid Sumaila are doing on flows of fisheries products and received encouraging feedback from many attendees. The first phase of this work will be published this year.

Dirk Zeller, a member of the *Sea Around Us* Project (www.searoundus.org),

attended the Sustainability Node meeting prior to the conference, and presented a paper entitled "From *Mare Liberum* to *Mare Reservarum*: Why Canada needs to change concepts and approaches to ocean use". Dirk's presentation attracted considerable interest and positive debate. It highlighted the need for Canada to realize and engage in the changes that are required in the way the government manages marine resources and their use. Dirk also attended the Ocean Governance workshop, which involved many stimulating discussions and attracted participants from a wide range of disciplines. The workshop focused on how such a group could contribute to innovative research and policy development in Canada.

Overall, the conference was a good experience. There was a healthy mix of people from academia, government, First Nations, the private sector, and non-governmental organizations. As such, this conference provided a great opportunity to meet and network with people whom fisheries scientists at the Fisheries Centre would not normally encounter.

More information on the OMRN and their National Conference is available at their web site: www.omrn.ca.

