

## What we did: A very preliminary report of the first two years of the Sea Around Us Project

*By Daniel Pauly*

The existence of the *Sea Around Us* project, as for other large projects of this kind, is the results of a gamble by two groups of players: (1) the members of the project, betting that they *can* do what they said they will, and (2) the decision makers of the funding agency, betting that the project members *will* do what they said they can.

The *Sea Around Us* project held its second major workshop from April 22-27 2001 in Nanaimo, Vancouver Island, to evaluate how our part of our gamble worked out. The Pew Charitable Trusts, which funds our project, had nominated several participants to also assess how their part of the gamble worked out.

This is to report that everybody's gamble worked out: the Project did achieve its goal of quantifying the large-scale impacts of fisheries on

North Atlantic ecosystems, and the only job still at hand now is to complete the documentation of these impacts through various outlets that the workshop helped to identify.

As argued in the proposal that led to the implementation of the *Sea Around Us* project, evaluating fisheries impacts on the North Atlantic as a whole, i.e., at basin-wide scale, is not matter of assembling a number of illustrative case studies from sites deemed representative of the entire basin. (Many such compilations already exist, and they tend to be dismissed, as one can always argue that the examples are not representative.) Rather, the job is to identify key data sets capable of being 'mapped' at large scales, similar to the data-rich weather maps which, while covering entire continents, still allow direct prediction

of the likelihood of sun or rain at any specific locality.

One year ago, the *Sea Around Us* project held a workshop to review, with the help of our partners at FAO and in other institutions, the conceptual toolkit that we thought would help us generate the required maps. (The contributions included in this report are available online at [www.fisheries.ubc.ca](http://www.fisheries.ubc.ca))

During this year's workshop, we got to look at our first set of freshly produced maps (all with a resolution of ½ degree latitude and longitude). These were:

- 1) Maps of fisheries catches, for the world as a whole, and the North Atlantic in particular;
- 2) Maps of North Atlantic catch values;

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- 3) Maps of fish biomass in the North Atlantic
- 4) Maps of dietary overlap between North Atlantic marine mammals and the fisheries.

*...everybody's gamble worked out: the Project did achieve its goal...*

The catch maps were generated using a rule-based algorithm developed by Reg Watson, running on FAO statistics and other data assembled by Ahmed Gelchu and other members of the *Sea Around Us* team. They allow immediate identification of complex patterns, be they due to problems in the underlying database of catch series, or due to forcing by biological, physical or other natural processes. Though they were very well received, we are still a bit coy at showing these maps (and hence this article will not

present any), as they still need some improvements before they are submitted to peer-reviewed journals.

Multiplying catches by their price allows the values of fisheries to be estimated, and these can also be mapped. However, the work required to produce such maps can be daunting. Still such maps did emerge for presentation at our workshop, based on price information assembled by project economist Rashid Sumaila. We expect these maps, once published, to provide a richly patterned, visual complement to the time series commonly used to assess the economic state of fisheries.

Maps of fish biomass are not frequently used to evaluate the status of fish populations, though acoustic, bottom trawl and plankton surveys methods exist which generate spatially structured biomass data. Villy Christensen, assisted by Carl Walters, thus undertook to 'spatialize' the 18 Ecopath models of North Atlantic ecosystems so far available, either produced by earlier projects, or by international teams of project collaborators led by *Sea Around Us* postdocs Sylvie Guénette and Dirk Zeller. (While covering only about ¼ of the North Atlantic, these models cover over ¾ of the shelf areas in the North Atlantic,

and hence the bulk of the fishable biomass).

An elaborate regression model was produced which predicted biomass by trophic level for any ½ degree square in the North Atlantic (since 1950) based on a relationship between established Ecopath models, mapped catch data and other factors such as distance from the coast, depth, year, water temperature, presence of ice, etc. The resulting, rather spectacular maps, document a decline of fish biomass in the North Atlantic, for the period from 1950 to the late 1990s, notably at high trophic levels, and thus provide an illustration, in space, of the 'fishing down marine food webs' phenomenon.

The fourth set of maps we discussed were developed by Kristin Kaschner with assistance from R. Watson, V. Christensen and others; they identify the areas where the food (type, quantity) taken by marine mammals (cetaceans or pinnipeds, or subgroups thereof) overlaps with fisheries catches, and thus leads to competition. (The reason for the increasingly frequent sightings of emaciated marine mammals.)

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The *Sea Around Us* website may be found at [www.fisheries.ubc.ca/projects/saup](http://www.fisheries.ubc.ca/projects/saup), and contains up-to-date information on the

**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.

# SAUP 2001 Workshop – A Milestone

By Yvette Rizzo

In the last week of April the *Sea Around Us Project* (SAUP) team, other fisheries scientists and others from a number of North American conservation-oriented NGOs met in Nanaimo on Vancouver Island to wrap up the first two-year phase of the project. The principal theme was communication – or now that the science is done, how do we send the *Sea Around Us* message to the world?

This was the second meeting on the island since the Fisheries Centre launched this Pew funded venture in August 1999. It was also the second time Amy Poon and myself were rapporteurs together for the SAUP. The methodology review workshop held in May 2000 marked the end of the first year

of the project - a year devoted to developing new tools for ecosystem management and assessment of fisheries that would be applied to the North Atlantic in the second year. In last year's workshop the methodology package central to the SAUP was presented to a group of external scientists.

This year, Jay Maclean, the project's scientific writer, worked hard until late the night before departure-day to finish the first draft of *In a Perfect Ocean*. The book will be published by Island Press early next year. It will put together the main findings of the first phase of the project and translate the science into an illustrated narrative of the environmental consequences of half a century of intensive

fishing in the North Atlantic. The principle target audience is the conservation community. However, it should also be of interest to fisheries scientists, managers and policy makers as well as that part of the general public interested in environmental affairs. The idea for the workshop was for the environmentalists to help the scientists make *In a Perfect Ocean* an effective tool that would be used by the conservation community worldwide to demand major changes in fisheries policy. The task was entrusted to Carl Safina, Vice President for marine conservation in the National Audubon Society, Ms. Nancy Baron from Seaweb, Ms Lisa Speer, a senior policy analyst from the Natural Resources Defense Council and Dr David Allison, President of Fish Forever and co-chair of the Marine Fish Conservation Network. Also present at the workshop were Jay Nelson from the Pew Charitable Trust, fisheries scientists Richard Grainger and Kevern Cochrane from FAO, and Dr Andy Rosenberg from the University of New Hampshire. By bringing together fisheries scientists and environmentalists in this way, the workshop addressed one of the key goals of the Sea Around Us project – promoting integration of and collaboration between these two groups that are too often on opposing sides.

*...now that the science is done, how do we send the Sea Around Us message to the world?*

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Other, equally important project results were presented by Tony Pitcher and Jackie Alder (evaluating the sustainability of North Atlantic fisheries, and the performance of international fisheries management bodies), by Gordon Munro and Rashid Sumaila (evaluating the magnitude and effects of subsidies to the fisheries sector, and the relative performance of small and large scale fisheries), and by Peter Tyedmers (estimating the fuel consumption of North Atlantic fishing fleet). These studies either presented data that will later be mapped, or concepts

that will help interpret these new maps.

We leave it to forthcoming issues of this newsletter to announce the uses and outlets that will be found for these products. What we can already anticipate, however, is that the 'mapping approach' developed by the *Sea Around Us* project should have a strong influence on the way fisheries are perceived to impact marine ecosystems, and on the identification of the scale at which these impacts are best studied.

*Daniel Pauly is Principal Investigator of the Sea Around Us Project.*

Participants arrived in Nanaimo on Sunday evening for a welcome

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dinner. The workshop took off the next morning with a welcome address from the project chair, Tony Pitcher. Jay Maclean then introduced the draft version of *In A Perfect Ocean*, which had been distributed to all participants. In the first three days, the principal investigators of the SAUP presented a summary of the methods and results of the major studies for the North Atlantic. The focus of the workshop was on Wednesday morning with a discussion among all present on the main issues concerning the what, how, when and where of the publication process. Most of the external visitors left soon after that, except for David Allison who stayed on until the end ("This is too much fun!"). The final day of the workshop was an internal team meeting to define the logistical details for the wrapping up of the first

phase of the SAUP. The debate concerned the 'rollout' procedure for the book, how to finish the science, publication of the relevant blue reports, that is Fisheries Centre Research Reports, and scientific papers in primary journals.

After the meeting, which lasted well into the afternoon, we all had a fabulous dinner at a Lebanese restaurant – highly recommended to any visitor in Nanaimo particularly for the delicious rose-water pudding – and prepared to leave for the mainland early next morning, a day earlier than originally planned.

This workshop gave me an insight of what the Sea Around Us Project is all about and I really enjoyed the feeling of being part of a groundbreaking event that prevailed throughout the week. Because what emerged from the workshop was that the

SAUP has a powerful message that ranks as strong as global climate change. It is the first scientifically-based picture, changing in time and space, of the fundamental changes in the marine ecosystems of the North Atlantic that have happened as a result of fishing pressures. It is a concept that can be applied to the world oceans. Just like climate change, the causes are deeply embedded in our material culture. To reverse the trend, as we must, a change in our philosophy of life is required – patchwork solutions won't work.

We hope that the publication of *In a Perfect Ocean* will help.

*Yvette Rizzo is a PhD student at the Fisheries Centre, and, along with Amy Poon, she served as Rapportuer at the April Sea Around Us workshop.*

*...SAUP has a powerful message that ranks as strong as global climate change...*

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## Putting Faces to the Names: Some of the Sea Around Us team



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