

The Sea Around Us Project: July 2001 to April 2002

By Daniel Pauly

Although still young - it started in July 1999 - the Sea Around Us Project (SAUP) is now having a strong impact on the fisheries science and marine conservation communities. During the first two years of the project, we developed a method for mapping global fisheries catches, which was meant to allow the visualisation of catch trends in a manner radically different from any previous attempt, and at a much larger scale (Pauly and Pitcher 2000). It was hoped that this mapping, combined with other innovative analyses of fisheries, would not only allow to gain new insights about their impact of the underlying ecosystems, but also allow communicating the resulting insights to a wide range of audiences.

Mapping global fisheries initially was a vision, outlined in the proposal that led to the creation of the project. Then it became a plan. In November 2001, it became reality when we published the first paper based exclusively on that

methodology, entitled "Systematic distortions in world fisheries catch trends" (Watson and Pauly 2001). This study had a huge scientific and media impact (including e.g., an editorial in the New York Times), though opinions differ on how to interpret its key finding, i.e., that China over-reports its marine fisheries catches sufficiently for world catch trends to be distorted (going up in the 1990s, rather than down, as they did in reality). We have actively participated in this debate and we will continue to do so; interested readers might want to visit our web site (www.fisheries.ubc.ca/projects/saup) for a documentation in media such as television, radio, newspaper and magazines.

In the fall of 2001, we were informed, as well, that a proposal had been approved that we had submitted to the American Associations for the Advancement of Science (AAAS), suggesting that we hold a symposium devoted to 'Fisheries-induced

changes in marine ecosystems' during the AAAS meeting held in Boston in mid-February 2002. As well, AAAS offered to organise a much-coveted 'press briefing' on our behalf (see article by Reg Watson, this issue). Jointly with a well-attended press briefing, this symposium generated yet another media outburst, this time about the status of the North Atlantic, whose fish biomass we showed to have been declining for the last fifty years. This finding, beautifully mapped in the presentation by Villy Christensen, was supported by other studies initiated by the SAUP, documenting declines in the fuel efficiency of the fishing fleets, massive level of subsidisation and other pathologies.

The strong evidence we presented, combined with the excellent collaboration with COMPASS (Communication Partnership for Science and the Sea), notably Ms. Nancy

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...a rather stunning butterfly, with beautiful colour maps on its wings...

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Baron, led a number of journalists, e.g., from *The Economist*, to pick up what they saw as a good story; thus, we even 'made' the cover page of the *Boston Globe* (see our webpage and *FishBytes* 8(3) (May/June 2002) for a documentation of the extensive coverage of these events). In addition to this broader outreach, much energy was devoted to targeted briefing of decision makers, notably the Pew Ocean Commission, the U.S. Ocean Commission and, on April 12, the US House of Representatives' Ocean Caucus. Other outreach activities include the start of work on a contribution to appear in *Scientific American* and other widely read magazines, and the completion and submission of a commissioned review of global

fisheries to *Nature*, where it should appear as part of an 'insight' section devoted to issues of sustainability and food security. Also, the SAUP will participate in the work of the Millennium Ecosystem Assessment (MA), as this author has been invited to become one of the MA's 'Co-ordinating Lead Authors.'

Our analytic work on the North Atlantic, however, is gradually entering a new, calmer phase, where the contributions documenting our work and included in Fisheries Centre Research Reports (all of which can be downloaded from our website) are gradually turned into submissions for primary journals. Also a book entitled *In a Perfect Ocean: Fisheries and Ecosystems in the North Atlantic* by Daniel Pauly and Jay Maclean has been submitted for publication by Island Press. At the same time, project staff have begun working on the rest of the Atlantic, notably the Caribbean (see article by Dirk Zeller and Elizabeth Mohammed, this issue) and in West Africa, where an international symposium involving a number of African and European partners and

initiated by the SAUP will be held in late June (see the SAUP website and *FishBytes* 8(3) (May/June 2002) for details).

Though the third year of the SAUP is not yet completed, we can already see that this will be later viewed as the year in which we metamorphosed from a drab, caterpillar-like research project, peacefully munching on the rich growth of marine fisheries data, into what I frankly think is a rather stunning butterfly, with beautiful colour maps on its wings.

References cited:

- Pauly, D. and T.J. Pitcher. 2000. Assessment and mitigation of fisheries impacts on marine ecosystems: a multidisciplinary approach for basin-scale inferences, applied to the North Atlantic. p. 1-12 In: Pauly, D. and T.J. Pitcher (eds.). *Methods for Evaluating the Impacts of Fisheries on North Atlantic Ecosystems*. Fisheries Centre Research Reports 8(2).
- Watson, R. and D. Pauly. 2001. Systematic distortions in world fisheries catch trends. *Nature* 414: 534-536.

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The Sea Around Us website may be found at www.fisheries.ubc.ca/projects/saup, 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 runs a successful marine symposium at AAAS

By Reg Watson

On February 16th of this year, the Sea Around Us Project (SAUP) organised a symposium at the annual American Association for the Advancement of Science in Boston. As part of the overall theme of 'Science in a connected world,' the SAUP symposium focused on 'Fisheries-induced changes in marine ecosystems.' Contributors came from around the North Atlantic, with most, however, having strong links with the Project. The symposium presented evidence of impacts of fishing on marine ecosystems as well as the means to mitigate these impacts, and to rebuild these systems. One of the overall aims was to identify management policies that reconcile the extraction of living resources for food with the conservation of biodiversity and the maintenance of ecosystem services. The symposium presented multidisciplinary scientific results on how to return marine ecosystems to healthy states which is vital to achieving sustainability in the global economy.

Daniel Pauly was the convener, and hence introduced the symposium and its contributors. The first talk was by Reg Watson, on "A rule-based approach to construction of fisheries catch distribution maps". This was illustrated with a number of maps showing changes in catches in the North Atlantic since 1900. Reg also presented a figure showing

changes reductions in the amount of seafood per capita for the North Atlantic region since 1950 to the present (Figure 1, overleaf), a trend earlier demonstrated to occur on a global scale (Figure 2, overleaf). Reg also presented data from Peter Tyedmers' work (formerly at UBC and now at Dalhousie University in Halifax) showing reductions in the energy extracted from harvested seafood, compared to that required to harvest them. Reg also summarized key results of work by Rashid Sumaila and Gordon Munro showing the extent of subsidies in North Atlantic and explained how we allow failing fisheries to continue.

Alida Bundy from Canada's Department of Fisheries and Oceans' Bedford Institute of Oceanography presented "The ecosystem of northern cod: pre and post collapse". This included insights into changes in the ecosystems and diets of fishes which may explain this major fishery failure, a fact noted in a subsequent write-up by *The Economist* (21st February), which also commented on the issue of subsidies raised addressed in Rashid Sumaila's work.

Hreidar Thor Valtysson from the University of Akureyri in Iceland, a former student of Carl Walters at the Fisheries Centre, presented "A century of change of Icelandic fisheries and ecosystems". This talk demonstrated the wealth of

data that Iceland has collected for more than a century but revealed that there are now problems with their important cod fishery, notably a clear trend of declining trophic levels, indicating that Iceland is not immune to 'fishing down marine food webs'.

Villy Christensen presented "Long-term fisheries-induced changes in vertebrate biomass in the North Atlantic". This talk, based on integrated ecosystem studies and modelling, presented graphic evidence of biomass changes in higher trophic level fishes in the North Atlantic since the 1900s, but also showed a huge increase in fishing mortality over the same time period.

Rashid Sumaila presented a talk on the "Economics of overfishing and rebuilding North Atlantic ecosystems". He introduced a novel and very important insight into how discounting calculations can explicitly consider future generations when development and mitigation plans are evaluated.

Andy Rosenberg from the University of New Hampshire summarised most of the issues presented earlier in his "Ecosystem rebuilding: prospects for regional and national fisheries management plans". Andy was able to use his experience as a former senior manager with the U.S. National

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Marine and Fisheries Service to put changes in North Atlantic fisheries into perspective. He stressed that, unfortunately, some recent improvements in the status of a few stocks in the Northeastern US appear quite small compared to the long time decline that has preceded them.

Daniel Pauly then led a lively discussion period. Following the symposium Daniel, Andy and Reg attended a packed press briefing, expressing considerable media interest in the findings of the symposium. See the SAUP website for the resulting media coverage.

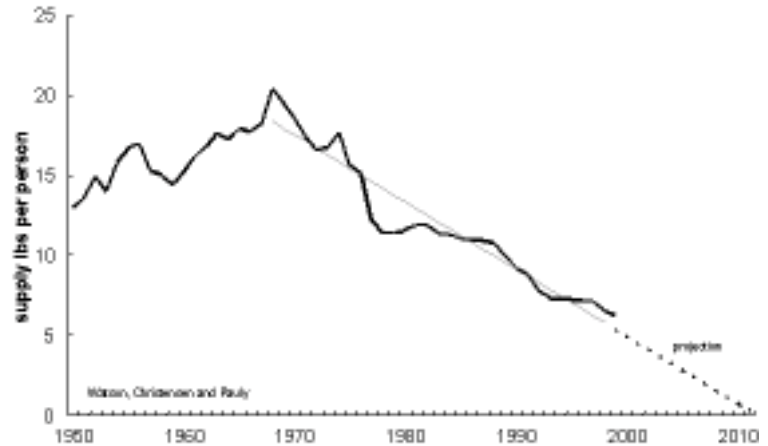


Figure 1. Supply of tablefish (finfish of trophic level 3.75 or higher) since 1950 for the North Atlantic basin based on FAO catch statistics and population projections from the U.S. Bureau of Census. These are the most sought after fish species and include cod, saithe, haddock, hake and tuna (This graph was part of the material distributed at the SAUP press briefing held February 16, 2001, during the AAAS Meeting).

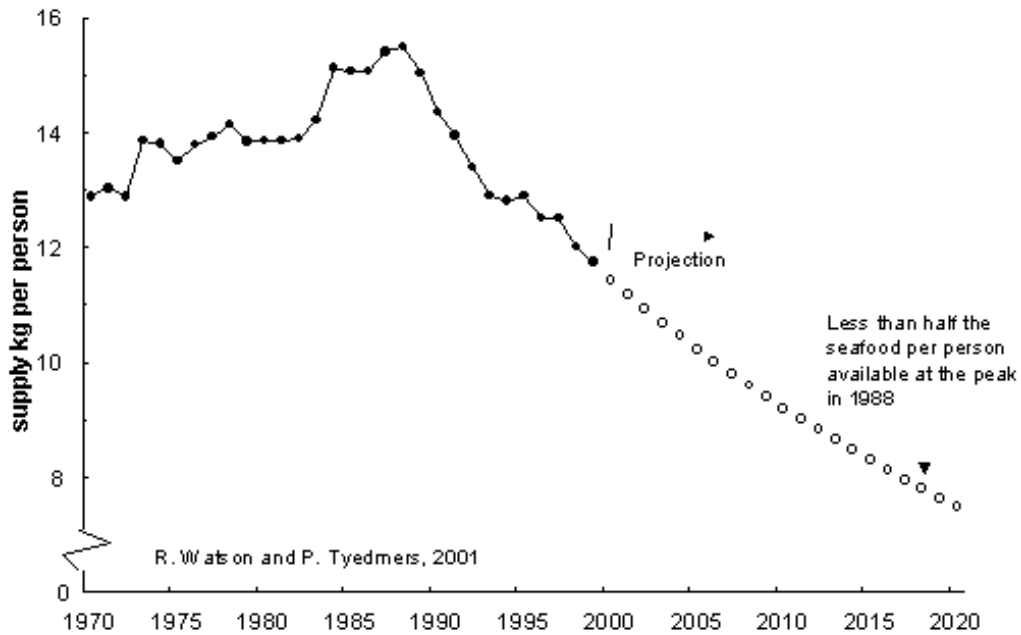


Figure 2. Global seafood per person since 1970 based on population projections by the U.S. Census Bureau and changes in fish landings (with Peruvian anchoveta) presented in Watson and Pauly in Nature (November, 2001). This graph was part of the press release prepared by COMPASS in November 2001 to highlight the results in that contribution.

The Sea Around Us project in hot water

By Dirk Zeller and Elizabeth Mohammed

The Sea Around Us project has now entered, among many other things, the hot waters of the Caribbean ('hot' compared to the generally frigid waters of the North Atlantic). With a background in tropical marine ecology and coral reef fisheries research Dirk Zeller is again feeling 'at home', coordinating the project's efforts in the Central Western Atlantic region (FAO Area 31) with the able assistance of Shawn Booth. Hailing from sunny Trinidad, Elizabeth Mohammed is pursuing research toward a PhD thesis on the history of the fisheries of the island chain of the southeastern Caribbean, including St Lucia, St Vincent and the Grenadines, Grenada, Barbados, and Trinidad and Tobago. Other countries in the region feature also prominently in the Caribbean area, among them Cuba, Venezuela, Columbia, Belize, the Turks & Caicos Islands, and Bermuda.

Several key collaborators in the region are associated with the project. In Cuba, Julio Baisre, the Director of Fisheries Management, Ministry of Fisheries, has been instrumental, by providing and assisting with the analysis of the outstanding long-term series of Cuban fisheries catches which have also formed the foundation for his FAO report chronicling Cuban fisheries catches from 1935-1995 (Baisre 2000). Furthermore, the excellent documentation on the 'Ecology of the Marine Fishes of Cuba' in Claro *et al.* (2001), has given us the opportunity to

improve our accounting of shrimp fisheries by-catch. We are also exchanging ideas and data with Ian Joyce of Douglas College, Greater Vancouver, B.C., who works on the history and performance of the Cuban shelf fisheries (Joyce 1997, 1999). In Venezuela, we are working closely with Jeremy Mendoza, from the Universidad de Oriente, a long term Ecopath collaborator. Jeremy, having co-authored a volume on fisheries resources and catches in Venezuela (Novoa *et al.* 1998), is collaborating with us on the reconstruction and spatial allocation of Venezuelan fisheries catches. While the period since 1985 is well documented, we are in the process of extracting earlier time periods from local library and database sources. Camilo Garcia in Columbia has obtained independent national funding to reconstruct Colombian catch time series, and we are collaborating with his group in this endeavour. Murray Rudd, formerly of UBC and now working for the Canadian Department of Fisheries and Oceans, is authoring a report on fisheries in the Turks & Caicos Islands. Even Bermuda, located at the northernmost margin of both coral reef distribution and of FAO Area 31, presents an interesting case. Brian Luckhurst, from the Bermuda Fisheries Division, is providing us with interesting time series of catches going back to the 1970s.

Liz Mohammed is focusing her research on reconstructing

fisheries catches and fishing effort for the island chain of the Southeastern Caribbean, from 1950 to the present. Using the reconstructed data the impacts of fishing on both the inshore (reef and shelf) and offshore (large migratory pelagic) resources are quantified. While the time coverage of available catch data is different for the respective islands, the reconstructed catches turn out to be very useful as input and validation time series to a marine ecosystem model for the region.

The primary data sources are the Fisheries Departments of the respective islands, and a large number of people are collaborating with Liz, e.g., Ann Marie Jobity (Director of Fisheries) and Christine Chan-A-Shing (Fisheries Officer) in Trinidad; Arthur Potts (Director of Fisheries) and Alexander Thomas (Data Collector) in Tobago; Stephen Willoughby (Ag. Director of Fisheries) and Christopher Parker (Fisheries Officer) in Barbados; James Finlay (Director of Fisheries) and Justin Rennie (Fisheries Officer) in Grenada; Leslie Straker (Fisheries Officer) and Cheryl Jardine (Data Manager) in St Vincent; Vaughn Charles (Chief Fisheries Officer) and Williana Joseph (Fisheries Officer) in St Lucia. General fisheries information useful for interpreting observed trends in reconstructed data was also available from Fisheries Departments, and additionally from people at various national and regional organisations and

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institutions: The Organisation of Eastern Caribbean States in St Lucia, Resource Management Unit: Peter Murray, Data Manager; The CARICOM Fisheries Resource Assessment and Management Program: Susan Singh-Renton, CARICOM Biologist, based in St Vincent; The University of the West Indies St Augustine and Barbados campus libraries; The National Archives of St Lucia, St Vincent and Trinidad; and the library of the Bellairs Research Institute in Barbados: Bruce Downey, Director. Specific individuals who have been helpful in providing information and direction to other information sources were Boris Fabres (former Fisheries Officer, Trinidad, now with the FishBase project, at ICLARM, and another collaborator); Keverne Cochrane (FAO, responsible for Area 31); Bissessar Chakallal (FAO Regional Fisheries Officer for the Caribbean, Barbados) and Robin Mahon, (Fisheries and Environmental Consultant, Barbados).

However, despite all this new activity in the Central Western Atlantic, much work from the previous phase is still ongoing. Many collaborations are continuing, and the output, in the form of papers and reports is gathering pace. Dirk Zeller and Daniel Pauly have published a paper on the visualization of life history patterns of fishes in the journal 'Fish and Fisheries' (Zeller and Pauly 2001), based on the methodology developed for the Sea Around Us project during its initial phase (Zeller and Pauly 2000). Dirk also collaborated with a team led by Jackie Alder, resulting in a publication on management evaluation of marine protected areas (Alder *et al.* 2002). A major component

of the documentation of the work done during the first years of the project is presented in the 250 page Fisheries Centre Research Report documenting catch, effort and regional datasets (Zeller *et al.* 2001). The ecosystem models built during that phase of the project have also been documented, with reports on the Faroe Islands (Zeller and Freire 2002), Norwegian Sea (Dommasnes *et al.* 2001), as well as West Greenland waters (Pedersen and Zeller 2001) now being available.

As the reader can see, the challenge continues, hot water or not.

References cited:

- Alder, J., Sumaila, U.R., Zeller, D. and Pitcher, T.J. 2002. A method for evaluating Marine Protected Areas Management. *Coastal Management* 30(2): 121-131.
- Baisre, J.A. 2000. Chronicle of Cuban marine fisheries (1935-1995): Trend analysis and fisheries potential. FAO Fisheries Technical Paper 394, Rome, FAO, 26 p.
- Claro, R., Lindeman, K.C. and Rarenti, L.R. (eds) 2001. Ecology of the Marine Fishes of Cuba. Smithsonian Institution Press, Washington, 253 p.
- Dommasnes, A., Christensen, V., Ellertsen, B., Kvamme, C., Melle, W., Nøttestad, L., Pedersen, T. Tjelmeland, S. and Zeller, D. 2001. An Ecopath model for the Norwegian Sea and the Barents Sea. *In*: Guénette, S., Christensen, V. and Pauly D. (eds) Fisheries Impacts on North Atlantic Ecosystems: Models and analyses. Fisheries Centre Research Reports 9(4).
- Joyce, I.T. 1997. The spiny-lobster fishery in Cuba. The Geographical Review 87(4):484-503.
- Joyce, I.T. 1999. Socialism and the fishery: A case study of the Cuban shrimp fishery. The Canadian Geographer 43(1):53-69.
- Novoa, D.R., Mendoza, J.H. and Cárdenas, J.J. 1998. El Atlas Pesquero Marítimo De Venezuela. MAC-SARPA y VECEP, Caracas, 197 p.
- Pauly, D. 1998. Rationale for reconstructing catch time series. EC Fisheries Cooperation Bulletin. Vol. 11(2):4-7 [also in French, p. 8-10].
- Pedersen, S. and Zeller, D. 2001. A mass balance model for the West Greenland marine ecosystem. In Guénette, S., Christensen, V. and Pauly D. (eds) Fisheries Impacts on North Atlantic Ecosystems: Models and analyses. Fisheries Centre Research Reports 9(4).
- Zeller D. and Pauly D. 2000. How life history patterns and depth zone analysis can help fisheries policy. In Pauly D. and Pitcher TJ (eds) Methods for assessing the impact of fisheries on marine ecosystems of the North Atlantic. Fisheries Centre Research Reports 8(2): 54-63.
- Zeller D. and Pauly D. 2001. Visualisation of standardised life-history patterns. *Fish and Fisheries* 2(4): 344-355.
- Zeller D., Watson R. and Pauly D. (editors) 2001. Fisheries Impacts on North Atlantic Ecosystems: Catches, effort and national/regional data sets. Fisheries Centre Research Reports 9(3), 254 pp.
- Zeller D. and Freire K. 2002. A preliminary North-East Atlantic Marine Ecosystem Model: Faroe Islands and ICES Area Vb. Fisheries Centre Research Reports 10(2):39-45.

Many collaborations are continuing, and the output... is gathering pace.