



## Book review

### *The balance and conservation of the North Atlantic ecosystems?*

Daniel Pauly and Jay MaClean, *In a Perfect Ocean – The State of Fisheries and Ecosystems in the North Atlantic Ocean*. Island Press (Washington/Covelo/London), 2003. \$25 pbk (175 pages, 28 figures in color) ISBN 1-55963-324-7

There is an increasing global concern, both at the societal and scientific level, on the direct and indirect effects of fishing on marine ecosystems. This is indicated by the increasing frequency of articles appearing in the press and the number of recent, thorough, scientific books reviewing the available literature on this topic. The authors of the book *In a Perfect Ocean* also tackle this hot issue for the North Atlantic ecosystems and their supported fisheries. Yet, unlike others, they do so not by reviewing the available literature but by spotlighting the results of the “Sea Around Us Project” (SAUP, [www.seaaroundus.org](http://www.seaaroundus.org)), which conceptually is the mature product of Pauly’s 30-year research career. Now within the framework of SAUP, Pauly and his colleagues use FISHBASE ([www.fishbase.org](http://www.fishbase.org)), ECOPATH with ECOSIM ([www.ecopath.org](http://www.ecopath.org)), rule-based processes and other cutting-edge tools, in a synergetic fashion, to transform available, sometimes “cheap”, diverse information (e.g. global catch data, hydrographic databases) into knowledge and answer “high order questions” (and see CIESM 2003). And all these are compendiously presented in a book clearly written in a refreshing, simplified style, targeting the sensitization of the public at large.

The book is structured in six main sections (Introduction, Chapters 1–4, Notes). In the Introduction (10 pages), the first half of which is written in a literary, often cinematographic style, the authors introduce fisheries terms (e.g. by-catch, discards, species extinctions, fishing practices, ships of convenience, subsidies, technological evolution) to the non-scholar reader. They elegantly relate all these to the motion picture *The Perfect Storm*, and explain “what drove the Andrea Gail” farther from Gloucester and eventually to be “swallowed” by the North Atlantic “instead

of simply being retired”. The second half of the introduction outlines the scope of the book and the approach used (that is, large spatiotemporal scales and mapping).

In Chapter 1 (*A Brief History of the North Atlantic and its Resources*, 21 pages, 3 figures), the authors outline the main oceanographic processes and biomes of the North Atlantic and explain how Longhurst’s (1998) biogeochemical provinces can be merged with Sherman and Duda’s (1999) “Large Marine Ecosystems” for building the ecosystem framework of the work described in the book. Consequently, the authors discuss the past abundance of North Atlantic resources, the development of the NE and NW Atlantic fisheries as well as the technological changes that took place and resulted in the North Atlantic being “a single, giant fishing ground”. They end by pointing out the importance of establishing past ecosystem states against which the present one can be evaluated.

In Chapter 2 (*The decline of the North Atlantic fisheries*, 40 pages, 20 figures, 4 boxes), the most data-rich based chapter, the authors introduce in more details, yet leaned from their technicalities, the methodology on which SAUP was based. They further present maps of reported total fisheries catches, fishing intensity and biomass of table fishes for different periods (i.e., 1900s, 1950s, 1970s and for 1999), discuss discards, illegal and unreported catches, and show examples of declining trends in the economic performance of different fisheries. The message from the exemplary, colorful maps is unquestionably simple: fishing intensity sharply increased during the last 100 years accompanied by a 90% decline in the biomass of predatory fish. The authors continue by expanding on the effects of fishing on the North Atlantic food webs. Finally, they compare food consumption by marine mammals with fisheries catches and map the overlap between the organisms consumed by marine mammals and those caught by fishing fleets. Based on these, they argue convincingly that the use of marine mammals as “scapegoats” by fishers and fisheries managers is groundless. The

chapter ends with a health card report showing that North Atlantic is indeed at peril.

In Chapter 3 (*How Did We Get There?*, 28 pages, 4 figures, 1 table, 1 box), the authors argue, among other things, on how (and why) the failure of the “maximum sustainable yield” concept, subsidy-driven overcapacity of fishing fleets, ineffective governance at all operational levels (i.e., local, national, international) and strong lack of political will, all in a synergetic fashion, led North Atlantic to be in such a bad shape. In Chapter 4 (*What to Do?*, 30 pages) the authors focus on what must be done in order to reverse the observed trends. They extensively discuss, using a plethora of examples, ways to reduce fishing effort, paying particular attention to marine protected areas, ways to transform the market (e.g. consumer’s education, accounting for future generations), and how to improve governance. The chapter ends up with five specific recommendations (which I will not mention here for reasons of suspense). The feeling one gets after reading chapters 3 and 4 is that humans, after moving away from their natural “predatory” role, can get the last fish from the sea by exploiting high technology and legal loopholes.

Chapter 4 is followed by a 31-page long section of *Notes*, arranged by chapter (a total of 195 notes, 31 pages). These notes, many of which can be read as stand-alone, explain concepts, or discuss in more detail and in a more formal scientific way, various issues raised in the corresponding chapters. The book ends with 162 references, a two-page long list of acronyms, and a nine-page long index.

A charisma of the book, which together with the refreshing style is responsible for its high immediacy to the reader, is the diffused humor, sometimes reminding of Woody Allen’s style (see, e.g., *Without Feathers*), throughout the chapters. The following few examples suffice. “A few more decades of long-lining will resolve the problem, as extinct sharks cannot be finned and discarded.” (*Introduction*, p. xxiii). Figure 3 and its legend (p. 19). “You cannot go lower than that in terms of fishing down marine food webs: sea cucumbers eat dirt.” (p. 127, Note 41). But then again, Pauly is known for his humoristic tendencies in his writings (see, e.g., many chapters in Pauly, 1994).

I will sum up my review using Pauly and MacLean’s report card approach:

Subject	Grade
Central big questions addressed	A
Wealth of supporting data	A
Methodology	A
Imaginatin of the approach	A
Multidisciplinarity	A
Liveliness of writing style	A
Humor	A
Getting the message across readership	A
Artistic layout	A
Bookbinding (not very practical)	B

When I read *In a Perfect Ocean*, during a long overseas flight, I was really impressed by the imaginative approach and the well-documented evidence the authors present for the status of the North Atlantic ecosystems. And I totally agreed with the reviews in the back cover of the book that read: “...destined to be a classic scientific work...” that “...will change the way we look at the North Atlantic...” Yet, the main reason I decided to write a review of this book was not the book *per se*. It rather was that the work on which this book is based takes fisheries (and ecological) science a big leap forward. In general, it is the large space and time scales that are related to the most interesting questions in ecology (Pimm, 1991). And this book is based on data spanning many decades and covering large spatial scales – many ecosystems – thus revealing the “invisible present” (*sensu* Magnuson, 1995) and the “invisible place” (*sensu* Swanson and Sparks, 1990). And by Pimm’s (1991) standards, this work is in essence an essay on marine conservation, being the counterpart of *The Balance of Nature?* – dealing mainly with terrestrial ecosystems – for marine ecosystems. In fact, the work of Pauly and his colleagues as well as that of other leading teams (Myers and Worm, 2003, Baum et al., 2003), which although based on different datasets and methods, agree with the results of SAUP, contribute to the maturation of fisheries science and the up-scaling of the discipline as a whole. And such works also greatly contribute in bridging the gap between marine and terrestrial ecology (*sensu* Steele, 1995). I look forward to read the forthcoming books of this new series of Island Press (i.e., *The State of the World’s Ocean Series*) on Central and South Atlantic.

In conclusion, I strongly believe that this book addresses a very wide readership ranging from students, academic teachers and specialists on fisheries, ecology, geography, conservation and management, to practitioner managers, politicians and anyone having an interest on general environmental and conservation issues. Non-scholar readers will find this book easy to follow and comprehend. An added bonus to this kind of book is the very affordable price.

## References

- Baum, J.K., Myers, R.A., Kehler, D.G., Worm, B., Harley, S.J. and Doherty P.A. (2003) Collapse and conservation of shark populations in the Northwest Atlantic. *Science* **299**, 389–392.
- CIESM (2003). Mediterranean Biological Time Series. CIESM Workshop Monograph Series 22, 142 p., CIESM publications, Monaco (available online at [www.ciesm.org/publications/split03.pdf](http://www.ciesm.org/publications/split03.pdf)).
- Longhurst, A.R. (1998) *Ecological Geography of the Sea*. Academic Press, San Diego.
- Magnuson, J.J. (1995) The invisible present. In: Powell, T.M. and Steele, J.H. (eds.), *Ecological Time Series*. Chapman and Hall, New York, pp. 448–464.
- Myers, R.A. and Worm, B. (2003) Rapid worldwide depletion of predatory fish communities. *Nature* **42**, 280–283.
- Pauly, D. (1994) *On the Sex of Fish and the Gender of Scientists: A Collection of Essays in Fisheries Science*. Fish and Fisheries Series 14, Chapman and Hall, London.
- Pimm, S.L. (1991) *The Balance of Nature? Ecological Issues in the Conservation of Species and Communities*. University of Chicago Press, Chicago.
- Sherman, K. and Duda, A.M. (1999) An ecosystem approach to global assessment and management of coastal waters. *Mar. Ecol. Prog. Ser.* **190**, 271–287.
- Steele, J.H. (1995) Can ecological concepts span the land and ocean domains? In: Powell, T.M. and Steele, J.H. (eds.), *Ecological Time Series*. Chapman and Hall, New York, pp. 5–19.
- Swanson, F.J. and Sparks, R.E. (1990) Long-term ecological research and the invisible place. *BioScience* **40**, 502–508.

KONSTANTINOS I. STERGIU  
 Aristotle University of Thessaloniki  
 School of Biology  
 Department of Zoology  
 Laboratory of Ichthyology  
 PO. Box 134, GR-54006 Thessaloniki  
 Greece  
 (E-mail: [kstergio@bio.auth.gr](mailto:kstergio@bio.auth.gr))