



**Sea Around Us Project  
A Five-Year Retrospective  
1999 to 2004**

2000



*SEA AROUND US*  
FIVE-YEAR  
RETROSPECTIVE

*Sea Around Us: A Five-Year Retrospective 1999 to 2004*

*Sea Around Us* Five-Year Retrospective 1999 to 2004  
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THE *SEA AROUND US* PROJECT REPORT  
2005  
*SEA AROUND US: FIVE YEAR RETROSPECTIVE*

TABLE OF CONTENTS

FOREWORD.....	2
PREFACE.....	3
INTRODUCTION.....	4
TOP 10 ACCOMPLISHMENTS OF THE <i>SEA AROUND US</i> , 1999-2004.....	5
CONCEPTUAL FRAMEWORK OF THE <i>SEA AROUND US</i> .....	6
Table 1a. Summary of <i>Sea Around Us</i> processes and products (1-5).....	7
Table 1b: Summary of <i>Sea Around Us</i> processes and products (6-15).....	9
PROJECT OUTPUTS.....	10
Table 2: Geographic focus of <i>Sea Around Us</i> outputs, 1999 to 2004.....	10
<i>SEA AROUND US</i> TEAM MEMBERS AND COLLABORATORS.....	11
Team members (as of December 2004).....	11
Former team members.....	18
Project collaborators.....	18
Graduate students funded by the <i>Sea Around Us</i> .....	18
PROJECT IMPACT.....	19
Table 3. <i>Sea Around Us</i> impacts, by ‘question’.....	19
THE <i>SEA AROUND US</i> WEBSITE.....	20
The catch challenge.....	20
Features to be added in 2005 and beyond.....	22
THE FUTURE OF THE <i>SEA AROUND US</i> .....	24
APPENDICES’.....	25
Appendix I: Conferences and workshops convened by the <i>Sea Around Us</i> Project including Ecopath with Ecosim modeling workshops.....	25
Appendix II: Presentations made by the <i>Sea Around Us</i> project team members.....	26
Appendix III: Publications by the <i>Sea Around Us</i> project team members.....	30
Articles in peer reviewed journals.....	30
Books, conference proceedings and technical reports.....	32
Chapters in books, conference proceedings and technical reports.....	34
Miscellaneous publications.....	42
Posters.....	43
Appendix IV: Media ‘hits’ by the <i>Sea Around Us</i> project team members.....	44

## FOREWORD

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The following pages contain a description of the first five years of the *Sea Around Us*, a research project that has contributed some of the most insightful and influential information on global fisheries of the last several years. Staffed by a world-class team of marine scientists housed at the Fisheries Centre of the University of British Columbia, Vancouver, the *Sea Around Us* was initiated and has been principally supported by The Pew Charitable Trusts, a U.S. foundation that maintains a very active program in applied fisheries science.

If one were to measure the productive output of the *Sea Around Us* by the sheer number of peer-reviewed publications in world-class journals that the project's research staff have produced over the past five years, the initiative would have been singularly successful. However, the true measure of the project's contribution was never intended to be gauged by its publications record. Rather, its goal was and remains one of helping to create a more accurate perception of the impact of fishing on the world's marine ecosystems, providing a factual and balanced base of information for policymakers and managers to make sound decisions regarding the management of both national and global fishery resources, and helping to improve conditions in the water for fish and other marine life.

The project has happily fulfilled, and in many instances exceeded the expectations of its designers and supporters, a particularly welcome feat given the urgent need throughout the world for more accurate and comprehensive information on the status of world fisheries and the broader ecosystems of which they form a part.

The results of this project have helped to better inform, and to correct major misperceptions regarding the status of global fisheries and the impact of fishing on the marine environment. To the extent that the future of fisheries management is hopefully one where science plays a stronger role in guiding management decisions, the prior contributions of the *Sea Around Us*, as well as those yet to come, will help make that future a brighter one for fish and all living marine resources throughout the world, in addition to those who depend on such resources for a living.

JOSHUA REICHERT  
Director, Environment Division  
The Pew Charitable Trusts  
Philadelphia, Pennsylvania

## PREFACE

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It is my pleasure to introduce this report on the accomplishments of the *Sea Around Us*, a research project at the Fisheries Centre, University of British Columbia, Vancouver, initiated and supported by the Pew Charitable Trusts, Philadelphia, and devoted to assessing the impact of fisheries on the world's marine ecosystems.

The project started in mid 1999, but 'ramping up' its large range of activities took half a year. This report, therefore, covers about 5 years of research. As the reader will see, the *Sea Around Us* was extremely productive, precluding the need for 'padding'. Thus, we present our work through brief tabular summaries (Tables 1-3), and point to the *Sea Around Us* list of conferences we organized (Appendix I), to public lectures (Appendix II), especially to our list of publications (see Figure 18B, p. 23 and Appendix III) and media hits (Appendix IV) for details. Please also visit our website ([www.seaaroundus.org](http://www.seaaroundus.org)) for another set of important *Sea Around Us* outputs.

We look forward to the next phase of the *Sea Around Us*, for which we present our vision, and which we anticipate will be even more productive than its first phase.

Finally, we thank all of those who helped us realize the work documented here, and especially the Director of the Trusts' Environment Program, and the Trustees of the Trusts for ... trusting us.

DANIEL PAULY  
Principal Investigator  
*Sea Around Us*  
Vancouver, British Columbia

## INTRODUCTION

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The *Sea Around Us* looks back rather proudly at its first five years, devoted to its mission of assessing the impact of fishing on the world's marine ecosystems, and to identify and encourage ways to mitigate this impact. This mission was articulated for us in the form of six questions by Dr. Joshua Reichert, Director of the Environment Program of the Pew Charitable Trusts:

- What are the total fisheries catches from marine ecosystems, including reported and unreported landings and discards at sea?
- What are the biological impacts of these withdrawals of biomass for the remaining life in the ecosystems?
- What would be the likely biological and economic impacts of continuing current fishing trends?
- What were the former states of these ecosystems before the expansion of large-scale commercial fisheries?
- How do the present ecosystems rate on a scale from 'healthy' to 'unhealthy'?
- What specific policy changes and management measures should be implemented to avoid continued worsening of the present situation and improve the 'health' of ecosystems?

The answers we provided (Table 2) are based on novel methodologies developed for the purpose (Table 1), and whose various ramifications are now being explored by us and a large number of collaborators throughout the world. The questions were first applied to the ecosystems of the North Atlantic, owing to the long tradition of marine and fisheries research, and the large amount of primary data available in the surrounding countries. Having provided a proof of concept, we then expanded our research to the Central and South Atlantic, the North Pacific and finally to the tropical Indo-Pacific. Based on these regional reviews, we are now completing the first round of global reviews on the state of global marine resources.

The *Sea Around Us* was extremely successful in reaching a number of audiences (Table 3). We reached the scientific community through articles in *Science*, *Nature* and other leading peer-reviewed journals (Appendix III), workshops and conferences that we organized (Appendix I) and/or at which we presented our results (Appendix I, II, III). We reached broader audiences through public interest magazines such as *Scientific American* (USA), *Natuur, Wetenschap & Techniek* (The Netherlands) and *La Recherche* (France), a huge number of interviews with newspapers, magazines, and radio and TV programs (Appendix IV), and through extensive lecturing to groups ranging from members of the US House of Representatives' Ocean Caucus to Pacific Island high school students in New Zealand (Appendix II). These efforts have been widely recognized in the press, through scientific recognition by our peers, and by an increasing number of NGOs and government agencies.

We are therefore optimistic that the next phase of the project, which will emphasize the annual issuance of status reports on the state of marine resources, by country, and a ranking of their success at mitigating the ecosystem effects of fishing, will be as successful as the first phase of our work. We look forward to support and collaboration from all those interested in this work.

## TOP 10 ACCOMPLISHMENTS OF THE *SEA AROUND US*, 1999-2004.

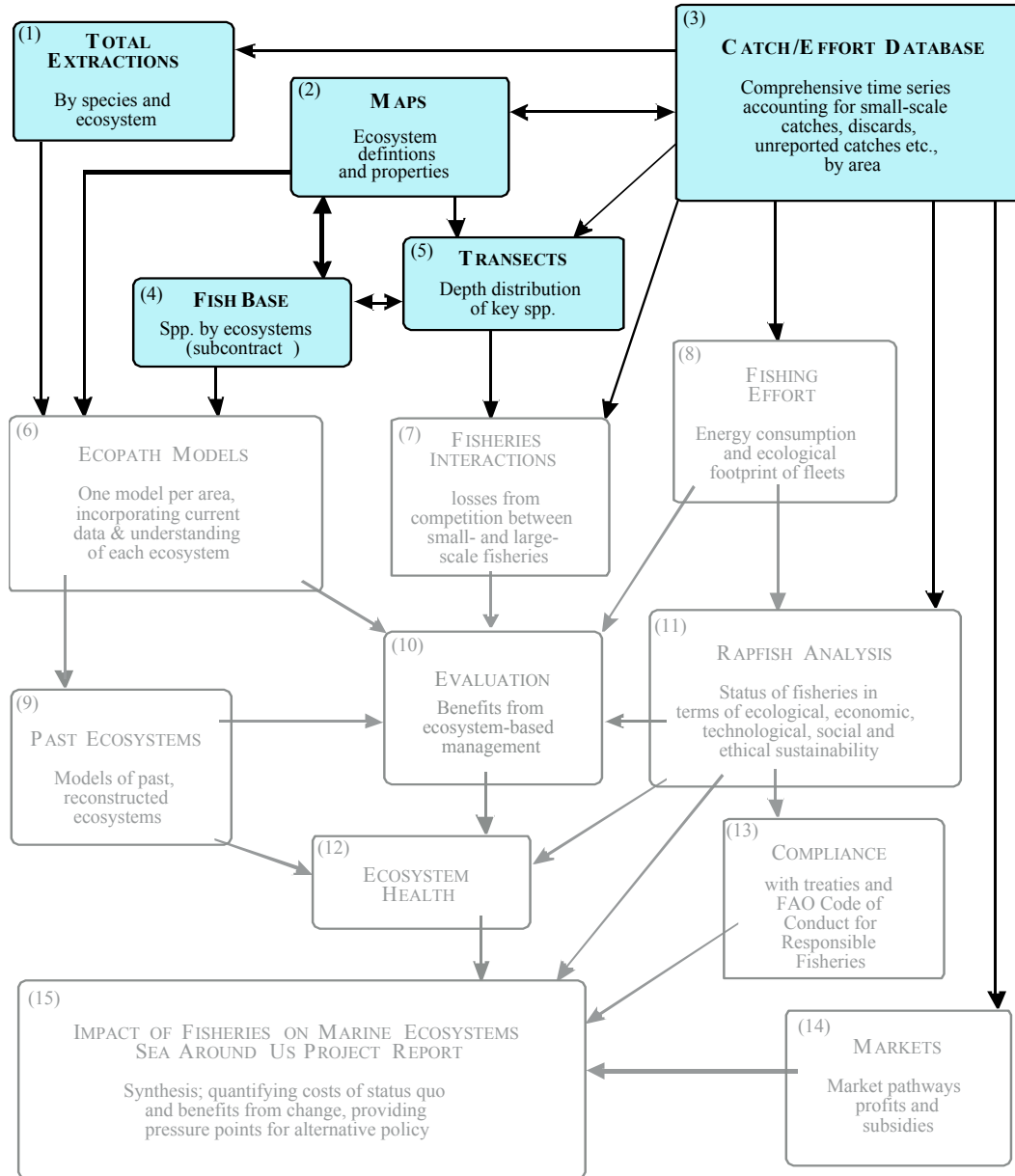
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1. Mapped global marine fisheries catches since 1950 using a novel methodology, and established in the process that China, by over-reporting its catches, had masked a global decline of fisheries catches that started in the late 1980s. The publication, by *Nature*, of these results, which injected a dose of healthy skepticism about reported fisheries catches and improvements in reporting methods, fuelled a media storm whose impact is still being felt in the fisheries world.
2. Demonstrated a dramatic decline in fish biomass in the North Atlantic. The maps documenting this were reproduced widely, from *Science* to postcards distributed by WWF, and form the core of an extremely well-received book by D. Pauly and J. Maclean, titled '*In a Perfect Ocean*', describing the work of the *Sea Around Us*.
3. Validated the use of mean trophic level of fisheries landings as an indicator of ecosystem health, to the extent that the over 190 member countries of the Montreal-based Convention on Biological Diversity (CBD) endorsed this 'Marine Trophic Index' as one of the 8 indicators that will be used to monitor global marine biodiversity. Also, the *Sea Around Us* serves in an advisory capacity to assist the CBD in the dissemination and use of this index.
4. Demonstrated, based on global maps of fisheries catches and food consumption by all (115) species of marine mammals, that their interactions are limited, and that 'culling' of marine mammals would not increase global fisheries catches, as asserted by nations who want to resume industrial whaling. Presentation of these results at the 2004 meeting of the International Whaling Commission, in Sorrento, Italy, helped towards the decision to continue banning such whaling.
5. Taught the use and documented applications of the 'Ecopath with Ecosim' software package to the extent that it is now widely perceived as 'the' standard tool for evaluating policies in the context of ecosystem-based fisheries management.
6. Created the first web site in the world that provides fisheries data pertaining to the specific areas from which catches are taken (e.g., the Exclusive Economic Zones of specific countries, or Large Marine Ecosystems). The *Sea Around Us* website ([www.seaaroundus.org](http://www.seaaroundus.org)), anticipated to become the key source of spatialized fisheries information for the international scientific and environmental communities, has been featured in *Science* and *Marine Policy*; and is accessed by thousands of users a month.
7. Initiated and co-sponsored in 2002, in Dakar, West Africa, the first international fisheries symposium in that region. It was the first of its kind to lead to a consensus statement, much covered by the international media, on the dire state of the marine resources, and the need for the European Union to reform the manner in which it negotiates its 'fisheries access agreements' with West African countries.
8. Led the coverage of ocean ecosystems by the Millennium Ecosystem Assessment, by providing the coordinating authors of its Marine and Coastal Chapters and numerous co-authors, and by developing scenarios to explore the future of fisheries, documented in a *Science* article.
9. Had its principal investigator, Dr. Daniel Pauly, widely recognized professionally (e.g., 2003: selection by *Scientific American* as one of the top 50 scientists; 2004: American Fisheries Society Award of Excellence in Fisheries, and IOC/UNESCO's Roger Revelle Medal). This has made him an effective and much-consulted spokesperson for ocean conservation, as attested in the numerous media 'hits' documented on the project website.
10. Overall, these accomplishments, all firmly rooted in the scientific literature (see Figure 18B, p. 23), have made the *Sea Around Us* a genuine force in fisheries (as was evident, e.g., during the Fourth World Fisheries Congress, held in Vancouver in May 2004), in the transition toward ecosystem-based management of marine fisheries in particular, and in marine conservation in general.



## CONCEPTUAL FRAMEWORK OF THE *SEA AROUND US*

The methodology developed by the *Sea Around Us* is represented here by boxes (1-5), each with an explanation in an adjacent table (here Table 1a, on adjacent page, for boxes 1-5 in Figure 1a).

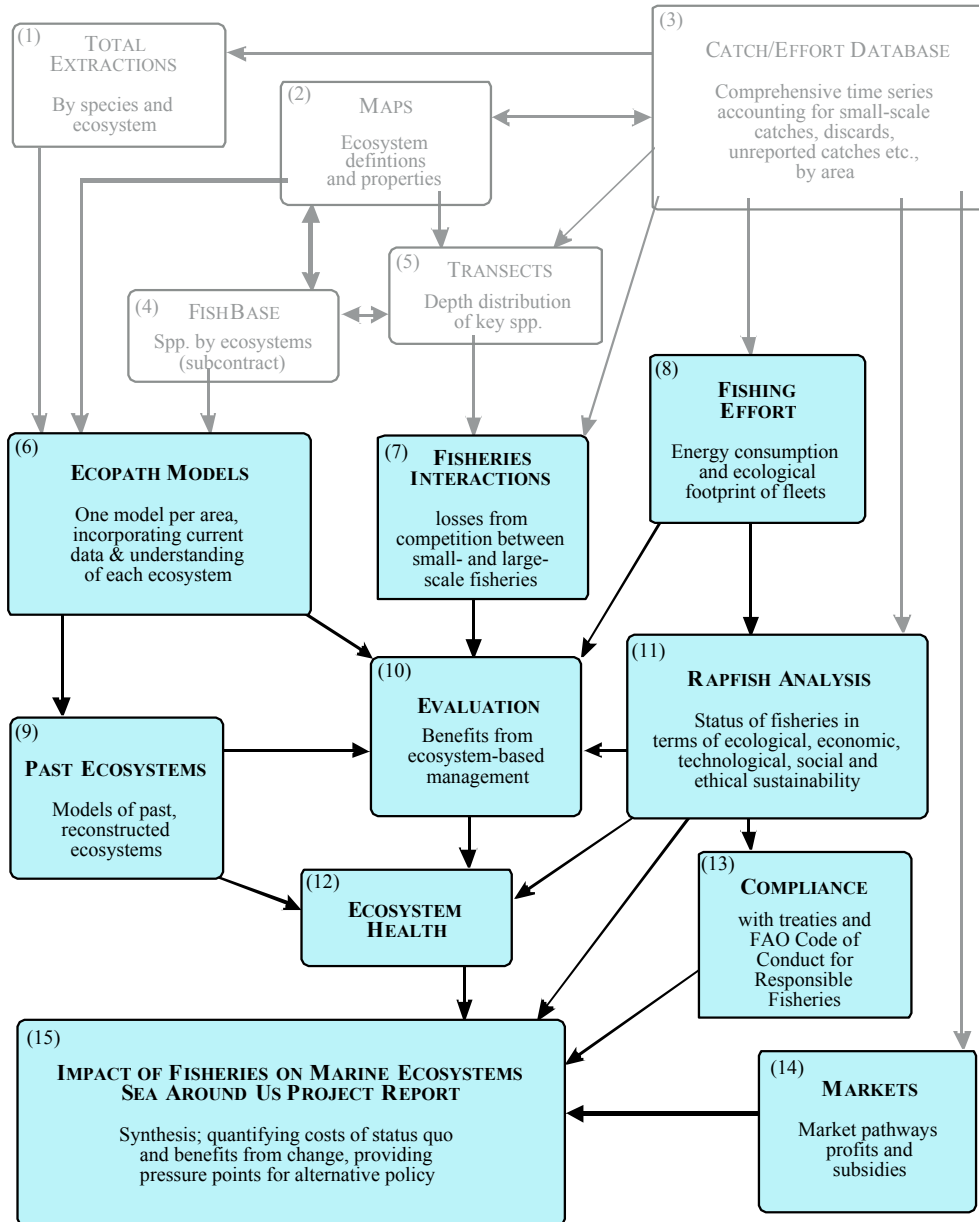


**Figure 1a.** Conceptual diagram (originally published in 2000) illustrating the relationships of the methodological elements (1 to 5) of the *Sea Around Us*.

**Table 1a. Summary of *Sea Around Us* processes and products (1-5)**

Methodological Elements	Process and/or Product	Status
(1) Total extractions	Spatialized catch database (1950 to present), incl. landings (adapted from FAO) + discards + illegal catches available at <a href="http://www.seaaroundus.org">www.seaaroundus.org</a> .	Initial reviews and maps completed for entire world. Revisions will improve coverage of developing countries and small-scale fisheries.
(2) Maps	<p>Maps of the catches in (1) available online, by species. Maps can be zoomed to the EEZ of specific countries, or Large Marine Ecosystems, etc.</p> <p>Maps of high-trophic level fishes biomass change for North Atlantic (1900-2000), West Africa (1960-2000) and Southeast Asia (1960-2000).</p> <p>Analysis of international access agreements and operations of Distant Water Fleets (DWF), especially from the EU and Japan.</p> <p>Maps of overlap between fisheries and marine mammals (and seabirds).</p>	<p>Ongoing updates; see web site. Maps serve as backbone for numerous studies, e.g., spatial distribution of biomass, fishing effort, fuel consumption, etc.</p> <p>Maps published to great acclaim in numerous outlets, notably Science and Scientific American. Global biomass mapping underway.</p> <p>Completed and presented at 4th World Fisheries Congress; Global mapping of Japanese DWF (from a MSc thesis) still to be published.</p> <p>Marine mammal work (from a PhD thesis) presented at International Whaling Commission meeting (with U.S. Humane Society). Seabirds (MSc thesis) to be completed in 2005.</p>
(3) Catch/effort database	<p>Mapping of global distribution of industrial fishing effort from 1950 on (in million of horsepower days).</p> <p>Mapping of global fuel consumption by global fishing fleets.</p> <p>Small scale fisheries catches and number of small-scale fishers.</p> <p>Databases of species abundance changes.</p> <p>Global database of Illegal, Unreported and Unregulated (IUU) catches.</p>	<p>Ongoing as part of a PhD thesis. Expected completion: late 2005/early 2006.</p> <p>To be published in mid 2005 (with supporting press releases).</p> <p>First estimate of global catches by small-scale fisheries in press (4th World Fish. Congr.); catch reconstruction for Eastern Caribbean published; U.S. Pacific Territories to be fully covered in mid 2005 (for West. Pac. Fish. Manage. Council).</p> <p>Initiated in late 2003 to serve as basis for biomass reconstruction. Will go online in 2005.</p> <p>Ongoing. Several contributions on IUU published, including one by the OECD.</p>
(4) FishBase	Improved coverage of commercial species and fish biodiversity (contracted out).	Ongoing effort, required to improve catch and biomass maps.
(5) Transects	<p>Depth ranges for all commercial species on <i>Sea Around Us</i> website.</p> <p>Seamount species and fisheries.</p>	<p>Depth ranges available online and used for catch and biomass mapping. Also: 1 journal article.</p> <p>Their vulnerability documented in <i>Fish. Cent. Res. Rep.</i> 12(5), 78 p., 2004 (for NRDC)</p>

The description of methodology developed by *Sea Around Us* is completed here by boxes 6-15 in Figure 1b, with details in Table 1b (see adjacent page).



**Figure 1b.** Conceptual diagram (originally published in 2000) illustrating the relationships of the methodological elements (6 to 15) of the *Sea Around Us*.

**Table 1b: Summary of *Sea Around Us* processes and products (6-15)**

Methodological Elements	Process and/or Product	Status
(6) Ecosystem Models	Numerous North Atlantic, esp. North Sea models (1880-2000).	Used widely for modeling North Atlantic biomass trends (see above).
	Numerous West African and Southeast Asian models (1960-2000).	Completed, presented at symposia and described in Fisheries Centre Research Reports.
	Database with key information on all published Ecopath models.	Available at <a href="http://www.ecopath.org">www.ecopath.org</a> , and via <a href="http://www.seaaroundus.org">www.seaaroundus.org</a> . To be used in global biomass reconstruction (2005).
(7) Fisheries interactions	Quantification of competition between small- and large-scale fisheries (incl. indirect interactions, e.g., via subsidies).	One report chapter published on North American example; to be re-initiated upon completion of catch/effort analyses in (3).
(8) Fishing effort	See item (3).	See item (3).
(9) Past ecosystems	See item (6).	See item (6).
(10) Evaluation	Quantifying benefits from ecosystem-based fisheries management.	North American case study to be completed in early 2005 (with Oceana). Global application pending.
(11) Rapfish analysis	Multi-attribute evaluation of fisheries.	North Atlantic and Gulf of Thailand case studies completed; further work not pursued.
(12) Ecosystem health	Evaluated mainly using biomass changes and changes in mean trophic levels (TL). Also: creation of first global database of Marine Protected Areas to provide metric of ecosystem rebuilding efforts.	Biomass approach validated through enthusiastic public reception; will continue. Mean TL approach officially adopted by over 180 countries (i.e., Parties of the CBD), MPA database online.
(13) Compliance	Performance analysis of regional fisheries bodies.	North Atlantic case study published in <i>Marine Policy</i> .
	Creation of a database of illegal catches, and analysis of illegal fishing activities.	See item (3).
(14) Markets	Global ex-vessel fish price database; value of national and international fisheries.	To go online in early 2005; formal launch at fisheries economists' conference in Vancouver (May '05).
	Amount, types, and impacts of fisheries subsidies.	North Atlantic case study published. Global study initiated in mid 2004 (MSc thesis).
(15) Impacts of Fisheries on Marine Ecosystems (Global)	Global syntheses and trade-off analyses. Ranking of countries by status of their marine resources, and seriousness of their mitigation efforts.	Numerous publications, incl. in <i>Science</i> and <i>Nature</i> . Detailed Gulf of Thailand case ( <i>Bull. Mar. Sci.</i> 2004) study to serve as model for other areas. Also 'marine' and 'coastal' chapters and scenario evaluations for the Millennium Ecosystem Assessment. Rankings to be conducted and published annually from 2005 on.

## PROJECT OUTPUTS

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The lists of workshop/conferences, presentation and publications in Appendix I-III summarize our work, as does Table 2, which emphasizes the geographic sequence of our research focus.

**Table 2: Geographic focus of *Sea Around Us* outputs, 1999 to 2004**

Year	Focus	Outputs	Key Products/Events
1. Fall 99- June 00	Start Up and Methodologies	Preliminary FAO catch decomposition Design of spatial database framework Collation of datasets commenced	<i>Fisheries Centre Research Reports</i> 8(9), 195 p. ('00); start of <i>Sea Around Us Newsletter</i> .
2. July 00- June 01	North Atlantic and testing of methodologies	Catch and biomass maps Fisheries agreements assessment Construction of North Atlantic ecosystem models Quantification of subsidies	<i>Fisheries Centre Research Reports</i> 9(4), 344 p. ('01); 'China paper' ( <i>Nature</i> '01); paper in <i>Marine Policy</i> ('02) and book ( <i>In a Perfect Ocean</i> ; '03).
3. July 01- June 02	Central and South Atlantic	Catch maps and composition graphs Trophic level maps West African Models Caribbean catch reconstructions	'Towards Sustainability in World Fisheries' ( <i>Nature</i> '02); <i>Fish. Cent. Res. Rep.</i> 11(6), 264 p. ('03); numerous papers.
4. July 02- June 03	Central and South Atlantic (cont.); North Pacific	Dakar Symposium and analysis of West African fisheries access agreements MA Marine & Coastal Workshop, and Scenario modeling study North Pacific modeling workshops and studies	Dakar Symposium ('02), with a CD-ROM and related papers incl. in <i>J. Sust. Dev.</i> Also 'Fisheries for 2050' ( <i>Science</i> '03). Numerous papers in ref. journals, and broader outlets, incl. <i>Scientific American</i> ('03).
5. July 03- June 04	Tropical Indo- Pacific	Critical habitats – corals, estuaries, seamounts; primary production maps High seas catches and governance U.S. Territories inshore fisheries study	'Seamounts: Biodiversity and Fisheries'. <i>Fish. Cent. Res. Rep.</i> 12(5) 78 p.; paper for OECD on illegal fishing; launch of website <a href="http://www.seaaroundus.org">www.seaaroundus.org</a> at 4th World Fisheries Congress.
6. July 04- June 05	Global analyses	Marine mammal vs. fisheries interactions Prices database Expeditions database First global database on marine protected areas Use of fish distributions for global warming studies First global database on small scale fishers Start of work on country performance rankings	Report presented at International Whaling Commission; two chapters in <i>Condition and Trends</i> vol. of Millennium Ecosystem Assessment; adoption of Marine Trophic Index by the Convention on Biological Diversity. Numerous reports and papers in peer-reviewed journals.

SEA AROUND US TEAM MEMBERS AND COLLABORATORS

TEAM MEMBERS (AS OF DECEMBER 2004)

Jackie Alder



Much of the work Jackie Alder has completed since 1999 is focused on using the data generated by the *Sea Around Us* to assess policy implications for managing fisheries as well as coastal and ocean policy. Where possible she uses quantitative methods based on sound statistical analyses; for other cases, she has developed rule-based approaches as well as indicators to provide, at a minimum, relative assessments. This work has been instrumental in highlighting the weaknesses in the implementation of international fisheries agreements in the North Atlantic, the impact of Distant Water Fleets in West

Africa, in particular Ghana, and the impacts (positive and negative) of trade in the fisheries sector at the global level (Figure 2). Much of this work has been synthesized and incorporated in the marine and

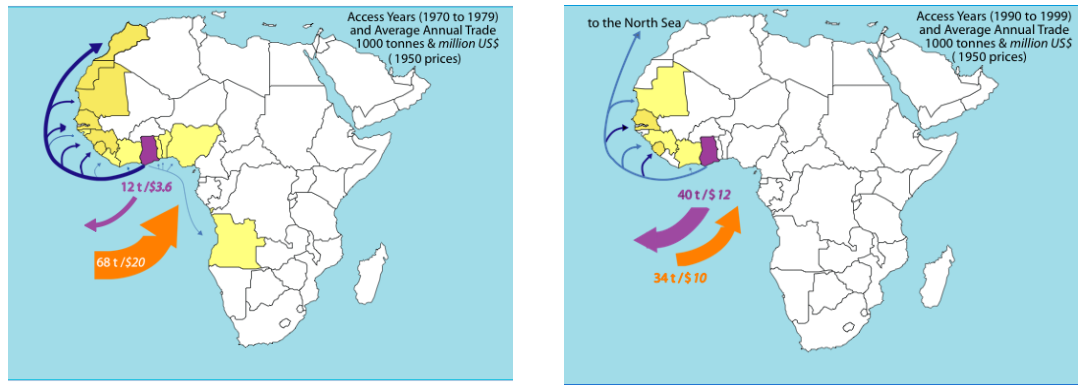


Figure 2. Impact of established EEZs on Ghana’s distant water fleet between the 1970s and the 1990s

coastal chapters of the Millennium Ecosystem Assessment, a global initiative to demonstrate the linkages between ecosystem services and human well-being. Her enhancement of FAO’s database of fisheries access agreements through updating it with new information, as well as filling in historical information gaps, now enables researchers to know who was fishing in which countries, when, and, in many cases, for what number of species.

Jordan Beblow



Jordan is a research assistant who works with Villy Christensen on building a global database of biomass trends for exploited marine populations. The database (Figure 3) will provide empirical background for the biomass reconstruction work of the *Sea Around Us*, and is expected to be available

online in 2005.

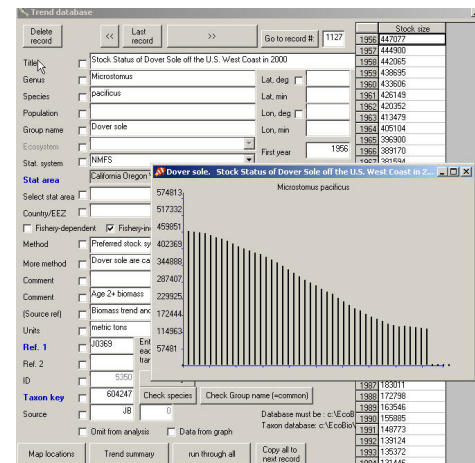


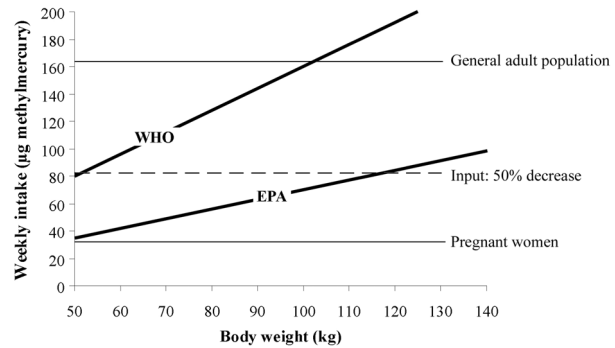
Figure 3. Creation of a database of time series of abundance of fish.

### Shawn Booth



Shawn Booth assists Dirk Zeller in the catch reconstruction work, much of the ecosystem modeling and the West African database development. More recently, Shawn has used his background in environmental science to apply

Ecotrace, a pollutant tracing routine as part of the ecosystem modeling approach 'Ecopath with Ecosim', to an assessment of the human health impacts of mercury pollution in the Faroe Islands in a trophic ecosystem context (Figure 4). Currently, the focus of his work is to use this modeling approach to investigate the effects of global production and wind-driven distribution of dioxins on the marine food web as part of the 'forage fish project' examining global industrial fisheries of small pelagic species.



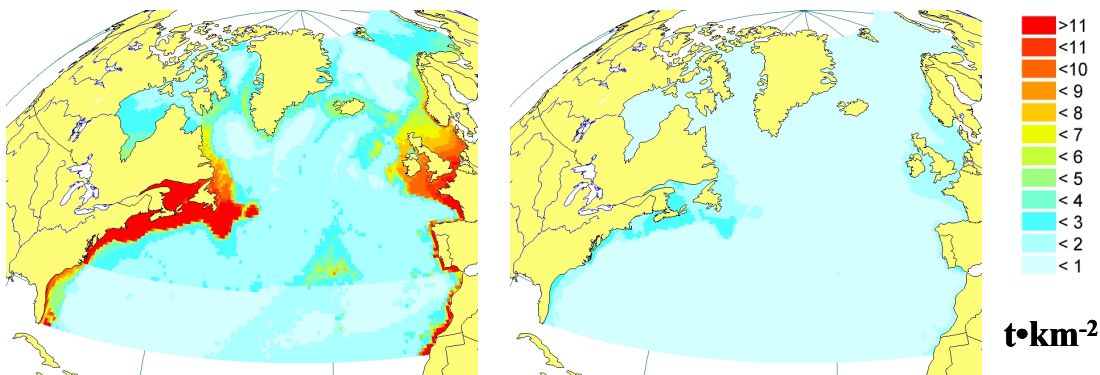
**Figure 4.** Weekly intake of methylmercury for the general adult population and pregnant women in the Faroe Islands, based on the average consumption of pilot whale and Atlantic cod; compared to the Tolerable Weekly Intake levels set by the World Health Organization and the US Environmental Protection Agency.

### Villy Christensen



Villy Christensen has been with the *Sea Around Us* Project since its initialization in 1999. He serves as coordinator for the ecosystem modeling activities in the project, as well as for the development of the 'Ecopath with Ecosim' (EwE, [www.ecopath.org](http://www.ecopath.org)) modeling approach and software (see Appendix I). EwE is the world's *de facto* standard for ecosystem modeling of fisheries resources, and more than half of all ecosystem modeling publications globally are based on the approach. As part of the *Sea Around Us*, Villy Christensen has focused on the development of ecosystem models to describe a variety of

ecosystems, and to study management options for ecosystems. Further, he has developed methodologies for evaluating ocean-scale biomass trends for marine systems – initially applied to the North Atlantic to produce maps showing the biomass distributions for 'table fish,' and how they developed over the last century (Figure 5). The methodology has since been applied to West Africa and to the South China Sea, similarly demonstrating the notable effect of exploitation on marine ecosystems. Villy Christensen is presently focusing on developing biomass assessment methodologies, and as part of this, is leading the development of a database covering biomass trends of marine populations globally.



**Figure 5.** Biomass of high-trophic level fishes in 1900 and 2000, showing depletion in the North Atlantic.

### Robyn Forrest



Robyn Forrest, a PhD student studying Australian coastal fisheries, is the editor of the *Sea Around Us* newsletter, which has been published every two months since December 1999. Robyn began work as editor in July 2002, taking over from Melanie Power. The newsletter is usually 4-8 pages

long and contains articles on the latest news and events from the project (Figure 6).

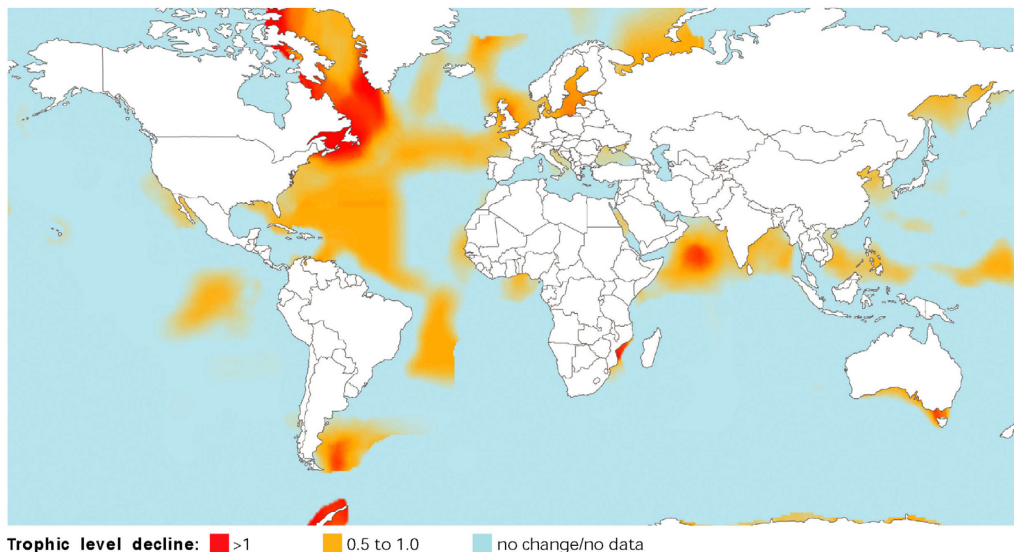


**Figure 6.** Distributed with *FishBytes*, UBC Fisheries Centre newsletter; the *Sea Around Us* newsletter has >1,000 registered print subscribers worldwide ([www.searounds.us/NewsletterF.htm](http://www.searounds.us/NewsletterF.htm)).

### Adrian Kitchingman



Adrian has a key role in the development, management, including updates, and documentation of the *Sea Around Us*' spatial catch allocation model and the pre-processing of its numerous underlying datasets, as well as in the administration, development and maintenance of local and distributed database systems. He is also responsible for the development of programmatic solutions to counter efficiency- and error-issues with various data manipulation and analysis processes within the *Sea Around Us*.

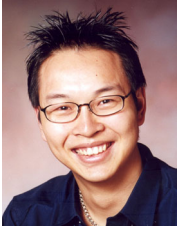


**Figure 7.** Change (1950 vs. 2000) of the mean trophic level of fisheries catches.

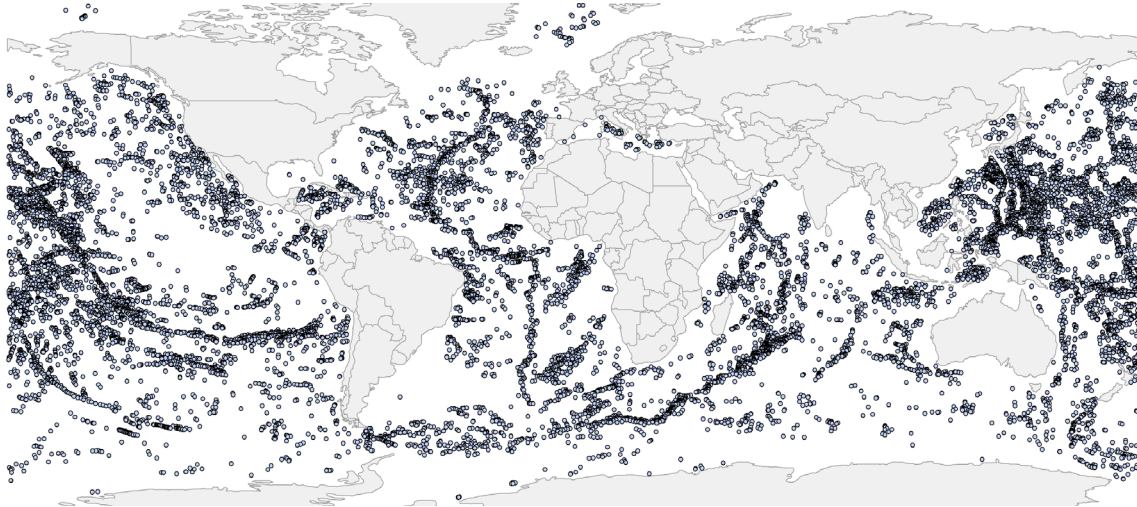
His GIS expertise is invaluable in collating and maintaining baseline spatial datasets used by the *Sea Around Us* as well as the analysis and presentation of spatial data for publications (Figure 7). He also assists and advises staff and students in the use, manipulation and analysis of spatial data using GIS. His most recent achievement was in the co-development and documentation of a novel, unpublished approach to detecting seamounts from bathymetric data.



### Sherman Lai



Sherman is a computer scientist who serves as coordinator for a proposed initiative aimed at developing software and methodology for a series of high-profile workshops, where high-level participants can cooperate to seek sustainable solutions to fisheries issues and their ecosystem impacts. Sherman also works with Villy Christensen on developing a new generation of the 'Ecopath with Ecosim' software, and he looks after many of our web-based activities. He has established and made available online a global primary production database, and studied seamounts (Figure 8).



**Figure 8.** Global distribution of large seamounts ( $\leq 1000\text{m}$  from sea floor) from the *Sea Around Us* website

### Grace Ong



Grace administers the financial aspects of the project. Her responsibilities include tracking accounts, preparing financial reports and budget proposals, coordinating the principal investigator's schedule and travels, and otherwise supporting project activities. She was instrumental in organizing the *Sea Around Us* Project booth during the Fisheries Centre open house in February 2003 (Figure 9).



**Figure 9.** Grace Ong (far left) at the *Sea Around Us* booth during the Fisheries Centre open house, 20 February 2003, with Fisheries Centre staff and students.

### Maria Lourdes Palomares



Maria Lourdes Palomares started as the *Sea Around Us* project member in charge of coordinating the integration of fish-related data generated by members of the *Sea Around Us* project (and of the Fisheries Centre in general) into the appropriate FishBase tables. This ensures that the fish-related project's results become immediately available to the public, as well as enabling comprehensive analyses by other project members. In the same capacity, she collaborated with one of our main partners, the Muséum National d'Histoire Naturelle in Paris, France in enhancing the museum's electronic fish catalog with geo-referenced localities, notably for old specimen records obtained by the various French expeditions during the period of European scientific expansion (Figure 10). This led to the creation of a stand-alone database on historic expeditions, humanity's first source of biodiversity data. She received the Tegner Memorial Grant in 2004 for a proposal devoted to assembling and coding abundance records from these historic expeditions, and thus devoted to pushing our baseline of biodiversity as far back in time as possible. This work is documented on the *Sea Around Us* website, [www.seararoundus.org](http://www.seararoundus.org). Eventually she was charged with biodiversity-related issues, which, with the assistance of graduate students, resulted in the creation of several relevant databases, notably on commercial invertebrates. These will be made available online through the project's website in 2005.



**Figure 10.** Our poster on 'Pushing back the baseline: using geo-referenced specimens from early oceanographic expeditions and scientific surveys'.

### Daniel Pauly



Daniel Pauly, Professor of Fisheries and Director of the University of British Columbia Fisheries Centre, is the Principal Investigator of the *Sea Around Us*, for which he wrote the initial proposal in 1998. He initiates and/or actively participates in many of

the publications of the *Sea Around Us*, and also acts as its main spokesperson with the media through his frequent travels in Canada, the U.S., Europe and other parts of the world (Figure 11). His work has been honored by a number of prestigious awards.

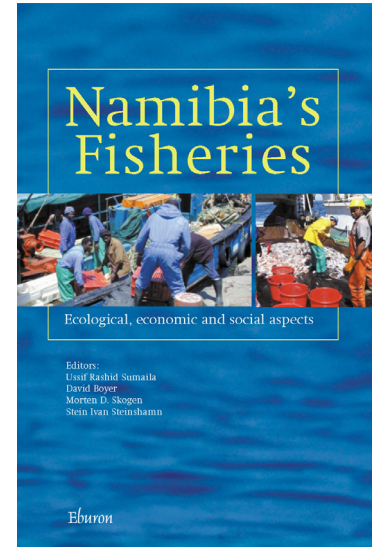


**Figure 11.** Opening ceremony of the International Symposium on 'Marine fisheries, ecosystems and societies in West Africa: half a century of change,' held in Dakar, Senegal, 26-28 June 2002.

### Ussif Rashid Sumaila



Rashid Sumaila is the *Sea Around Us* economist. He has contributed to the project's work in a number of areas: First, he coordinated the compilation of our global (ex-vessel) fish price database, which is now linked to the catch database. This will provide the team, and other researchers, with a useful tool for the economic and social analysis of fisheries at different temporal (1950 to the present) and spatial (from a country's EEZ to the globe) levels (Figure 12). Current collaborators on this task are graduate students Dale Marsden, Louise Teh and Stephanie McWhinnie. Second, Rashid has developed, in collaboration with Fisheries Centre project collaborator Carl Walters, a new concept known as intergenerational discounting, which is gaining traction, and will have a significant impact on how we view the use of environmental and natural resources. Third, Rashid and his collaborators at UBC (Gordon Munro and Colin Clark) have been analyzing the effects of fisheries subsidies on the sustainable use of fisheries resources, and have produced interesting quantitative and theoretical results. Fourth, working together with Jackie Alder, Dale Marsden and Ratana Chuenpagdee, he assesses how international trade may affect the ecological, economic and social conditions of fisheries and fishing communities. Finally, Rashid contributes to the work of the *Sea Around Us* by exploring the economic drivers of illegal fishing activities.

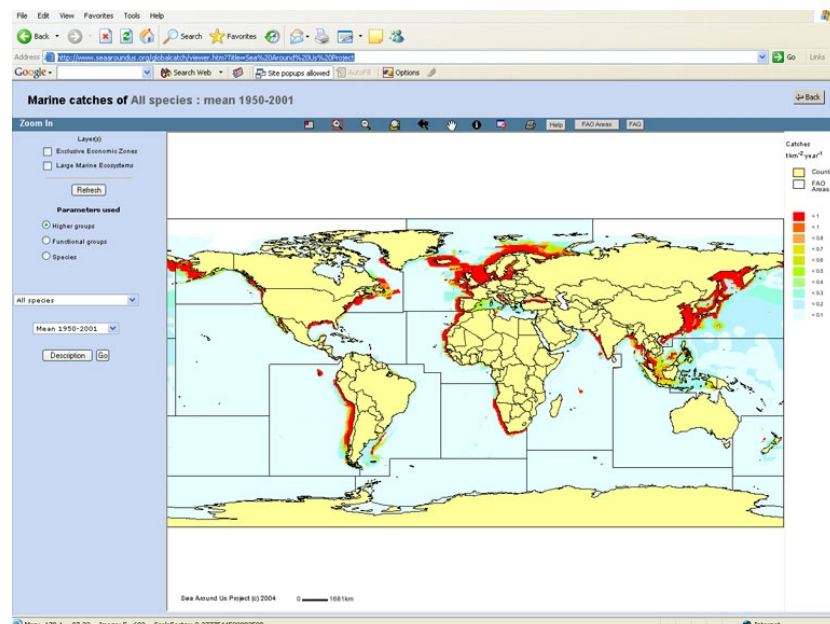


**Figure 12.** An example of an in-depth study of the marine fisheries and ecosystems of a country.

### Fred Valdez



Fred Valdez is the computer programmer responsible for the *Sea Around Us* website, an increasingly important face of the project; see [www.searounds.org](http://www.searounds.org). Figure 13 from the *Sea Around Us* website, illustrates one of his creations.



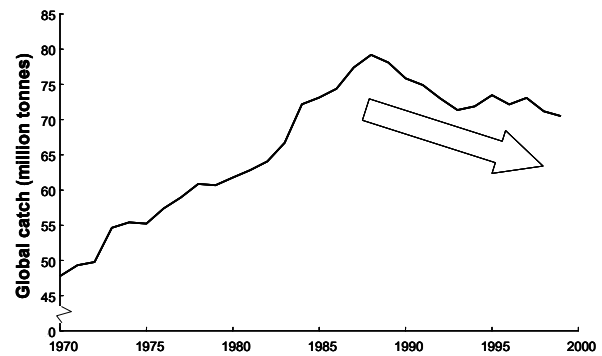
**Figure 13.** The distribution of all commercial species are available on the *Sea Around Us* website ([www.searounds.org](http://www.searounds.org)).

### Reg Watson



Reg Watson initiated the use, by the *Sea Around Us*, of a system of 30-minute by 30-minute spatial cells and the allocation of spatially coarse fisheries data to this grid using a rule-based procedure utilizing databases we developed which describe the distribution of all commercial species and the fishing patterns and trends of all countries. This is based on Reg's efforts to secure global fisheries data from a wide range of sources, and devise and employ ways of correcting data deficiencies. He has developed databases and analytical techniques that have helped to develop the project's web pages with visitation

levels increasing over time. His data and mapping efforts are the foundation of the work of the project. He also supports and supervises graduate students, and supervises other professionals working with catch data and mapping. Reg Watson's work was instrumental in demonstrating that gross exaggeration of Chinese landings had distorted world figures masking a serious downward trend in global catches (Figure 14). Published in *Nature*, this work drew considerable attention to the project. Recently completed work with Kristin Kaschner on the global overlap in the diet of marine mammals and the take of commercial fisheries has impacted on whaling policy with the IWC. His collaboration with Peter Tyedmers at Dalhousie University produced maps of fuel use by the fishing industry, the trophic level of aquaculture and other global findings. In collaboration with the World Resources Institute, he mapped changes in the global use of fishing gears, including trawling in sensitive areas. Most recently, he produced global maps of fisheries value with a team led by Rashid Sumaila. The mapping techniques he developed contribute significantly to providing empowering data to a wide range of NGOs concerned with marine conservation.



**Figure 14.** Trend in world fisheries catches.

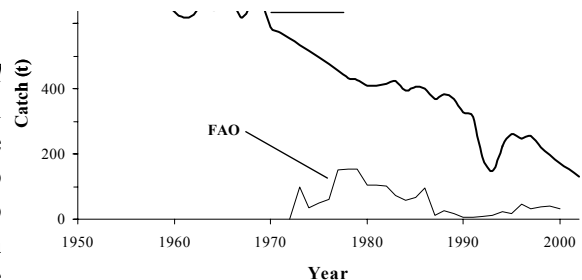
### Dirk Zeller



In the initial years of the *Sea Around Us*, Dirk Zeller used spatial visualization to conceptualize life history patterns of fishes, while also collaborating with local colleagues to develop ecosystem models in Norway, Greenland and the Faroe Islands.

This resulted in a local Faroese workshop, a presentation at the "Placing Fisheries in their Ecosystem Context" conference and peer-reviewed publications.

Dirk has also spent considerable time reconstructing regional and national historic catch statistics in areas such as the Baltic, Mediterranean, South Atlantic, Caribbean, Iran's Persian Gulf and the U.S. associated islands in the Pacific (Figure 15). He has also developed ecosystem models for the Western Central Atlantic, and supported the case for improving the FAO database of fisheries statistics in the Caribbean Region. Dirk is also associated with research on strategic ocean governance issues regarding the revision of the Law of the Sea, ecosystem based fisheries management and policy, as well as assessing the impact of declining levels of discarding in fisheries on global fisheries catch trends. Dirk also has a major role in contributing to and editing Fisheries Centre Research Reports.



**Figure 15.** Catch reconstruction for coral reef fisheries of American Samoa, showing the 15 fold difference between official reported catches (FAO) and reconstructed catches, and illustrating the 80% decline in likely coral reef fisheries catches between 1950 and 2002.

## FORMER TEAM MEMBERS

**T.J. Pitcher**, Professor of fisheries and the former Director of the Fisheries Centre (FC), was instrumental in helping set up the *Sea Around Us* within the Fisheries Centre. Notably, he chaired its Steering Committee, set up in the first two years of the project to support the principal investigator. Dr. Pitcher's work for the project (since Oct. 2004 on a consulting basis) focuses on Illegal, Unreported and Unregulated (IUU) fisheries.

**Nigel Haggan**, a Research Associate with the Fisheries Centre, was our first project coordinator (to June 2004). His input was crucial to the successful ramping up of the project, and the management of its numerous interactions with UBC, consultants, students and other partners.

**Sylvie Guénette** applied her modeling expertise to the construction of ecosystem models in various parts of the Atlantic, and edited an important volume documenting an early phase of the project's work. **Sheila Heymans** and **Lore Ruttan** also contributed to the early success of our work, and we thank them, and all earlier named, for their contribution.

## PROJECT COLLABORATORS

The *Sea Around Us* has a large number of formal and informal collaborators. Over the years, collaboration with the following colleagues has been most intensive:

Nancy Baron of SeaWeb ([www.seaweb.org](http://www.seaweb.org)) assisted us in targeting our publications to various mass media, resulting in their wide dissemination; Ratana Chuenpagdee, presently with the International Ocean Institute at Dalhousie University, Halifax, Canada, works on tropical small-scale fisheries, especially in Southeast Asia; Rainer Froese, the Germany-based FishBase coordinator, continues to adapt FishBase to the needs of the *Sea Around Us*, and to collaborate on related publications; Gordon Munro, Professor Emeritus at the Fisheries Centre; Peter Tyedmers, Assistant Professor at Dalhousie University, Halifax, Canada, works with us on energy issues (fuel consumption of fisheries, energy lost via fishmeal, etc.); Carl Walters, a Fisheries Centre Professor, and Pew Fellow in Marine Conservation, advises the *Sea Around Us* on ecosystem modeling, mainly through his close collaboration with Villy Christensen.

## GRADUATE STUDENTS FUNDED BY THE *SEA AROUND US*

**William Cheung** (Hong Kong, China, PhD): Species mapping and vulnerability; **Katia Freire** (Brazil, PhD): Reconstruction of Brazilian fisheries; **Ahmed Gelchu** (Ethiopia, PhD): Mapping global industrial fishing effort; **Vasiliki Karpouzi** (Greece, MSc): Overlap of seabirds and fisheries; **Kristin Kaschner** (Germany; PhD, completed 2004): Overlap of marine mammals and fisheries; **Dale Marsden** (Canada, PhD): Effects of international trade and fisheries management on marine fisheries: an empirical analysis; **Elizabeth Mohammed** (Trinidad and Tobago, PhD): Reconstruction of Caribbean fisheries; **David Preikshot** (Canada, PhD): Modeling North Pacific ecosystems; **Dawit Tesfamichael** (Eritrea, PhD): Modeling East African ecosystems; **Wilf Swartz** (Japan, MSc, completed 2004): Growth of Japanese fisheries and fish consumption; **Colette Wabnitz** (France and Germany, PhD): Global seagrass distribution and the ecological function of green sea turtles (*Chelonia mydas*): defining conservation reference points; **Louisa Wood** (United Kingdom, PhD): Global analysis of Marine Protected Areas (with WWF).

As well, numerous other UBC graduate students received small work contracts from the *Sea Around Us*; in many cases they also became co-authors of the resulting publications (Appendix III).

## PROJECT IMPACT

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This section answers the question “So what?” for the *Sea Around Us*. The success of the project is best measured by how the outcomes and products of the project have influenced other organizations and institutions in how fisheries and marine ecosystems are managed. Six questions were posed regarding the North Atlantic in 1999, which, if answered, could help to influence fisheries and marine conservation not only in that area, but globally. How well the project has addressed these questions, and the impact it is having are summarized in Table 3.

**Table 3. *Sea Around Us* impacts, by ‘question’**

<b>Question</b>	<b>Answer(s)</b>	<b>Outcome and outlook</b>
What are the total fisheries catches from the ecosystems, including reported and unreported landings and discards at sea?	Mapping of official catches by EEZ and other areas from 1950 to present; reconstruction of missing catches; studies on illegal fishing.	This analysis revealed China’s under-reporting, which raised awareness of the serious state of global fisheries throughout the world and highlighted the need to improve the reporting systems for fisheries. The <i>Sea Around Us</i> online database provides the only accessible catch database with global coverage, and is likely to become a major resource for conservation NGOs.
What are the biological impacts of these withdrawals of biomass for the remaining life in the ecosystems?	Mapping biomass decline over time, and change in size composition. Analysis of trophic level changes. Studies of fisheries overlaps with marine mammals and seabirds.	Documentation of biomass declines in North Atlantic had huge public impact. Similar declines off West Africa were used by NGOs to lobby the EU for better fisheries access arrangements in the region. Global marine mammals vs. fisheries study was presented at 2004 International Whaling Commission to counter Japanese arguments that marine mammals consume fish that would otherwise be available to us. Similar work on seabirds is pending. The Convention on Biological Diversity officially adopted the ‘Marine Trophic Index’ we developed (i.e., mean TL) as one of its 8 biodiversity indicators.
What would be the likely biological and economic impacts of continuing current fishing trends?	Mill. Ecosyst. Assessm. (MA) scenarios now based on trade-off approach we developed for Gulf of Thailand fisheries, and other sites (USA, West Africa).	MA scenario work will influence policy makers globally. Also, Oceana contracted a project member to evaluate potential benefits from ecosystem-based management (incl. establishment of MPA); other environmental NGOs are expected to follow suit.
What were the former states of these ecosystems before the expansion of large-scale commercial fisheries?	Modeling (reconstruction) of past ecosystems (biomass, biodiversity).	North Atlantic and other areas indicated declines by a factor of about 10 for large fishes, a number now widely accepted. Global reconstruction (of 1950 conditions) by 180,000 spatial cells to be presented in 2005.
How do the present ecosystems rate on a scale from ‘healthy’ to ‘unhealthy’?	Question seemed difficult at first, but turned out to be easy to answer, given observed changes in biomass and trophic levels.	Trophic level (and related ‘Marine Trophic Index’, see above) now widely accepted, along with biomass declines, as indicating state of ecosystem health, and providing a metric to evaluate rebuilding efforts. Work to refine these indicators will continue.
What policy changes and management measures should be implemented to avoid continued worsening of the present situation and improve the ‘health’ of marine ecosystems?	Pew and U.S. Ocean Commissions (and similar Royal Commission in the UK) relied in part on our publications and direct inputs, as do the Millennium Ecosystem Assessment and many environmental NGOs.	<i>Sea Around Us</i> will make more of its research results accessible to policy makers, and intensify work in the policy arena, based on now-completed global fish price database, a key requirement in the valuation of fisheries and ecosystems. Also, ranking of countries in terms of their ecosystem management performance will allow use of ‘name and shame’ to push for improvements.

## THE SEA AROUND US WEBSITE

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If ‘better knowledge’ means ‘better policy’ in the field of marine resource management then surely a wide dissemination of information means an informed constituency, one better prepared to make changes and adapt to change. Some of the world’s oldest and grandest fisheries like that for Atlantic cod have faltered and closed, and, with time, will fade from memory, together with the knowledge we have gained from this failure. Examination of global fisheries suggests that considerable change is required to avoid the failures of the past.

Investigating the impacts of fishing on the marine environment requires, amongst other things, time-series of catch data with a spatial precision suitable for use in food web models of ecosystems. Therefore, at the very least, all interested parties should be able to examine easily what catch has been extracted from a given stretch of coastline or from a country’s exclusive economic zone. Various logbook and observer programs have been initiated in recent years in an effort to improve catch data; however, we cannot sit back and wait for these to bear fruit. We urgently need to examine sufficiently long time-series to assure ourselves of what the longer-term trends are. Moreover, we do not require this only for a few selected fisheries, but rather we need this for all the world’s oceans. For, as we have been shown recently, massive change is upon us – global fisheries are declining rapidly. Perfect information is a goal to strive for, but we must use existing data in new and admittedly braver ways. We must collect supporting evidence across disciplines such as biology, economics, and the other social sciences to help decipher what some of the vague catch records of the past really mean. In situations where the location of catches was left intentionally vague, we must use all means at our disposal to probe deeper into the statistical records.

### THE CATCH CHALLENGE

The *Sea Around Us* Project has taken such an approach to look at the impacts of fishing on the marine environment. To facilitate this we have assembled databases of the global distribution of all commercial marine species. An even greater challenge was assembling a database of fishing access agreements and observed fishing as far back as 1950, building upon what the Food and Agriculture Organization of the United Nations (FAO) had assembled. Our database documents agreements that control the access of fishing fleets to the waters of other countries, and includes observations of such activities even when no agreement is known, or when fishing occurred before EEZs had been established. Taken together, these two databases, one describing where commercial species can be found, and the other where fishing fleets actually fished, allow existing catch data to be ‘reverse engineered’ to determine with much greater precision where the catch was taken, and by whom.

This new form of catch data is a powerful tool for uncovering large spatial trends that cannot be seen in the context of standard catch statistics, or which reach beyond the geographic scales that restrict the interest of most national agencies. For example, we have been able to show that global distortions in catch statistics fueled humanity’s optimism about future catch increases. We have also shown worrying reductions in the mean size and trophic level of global catches.

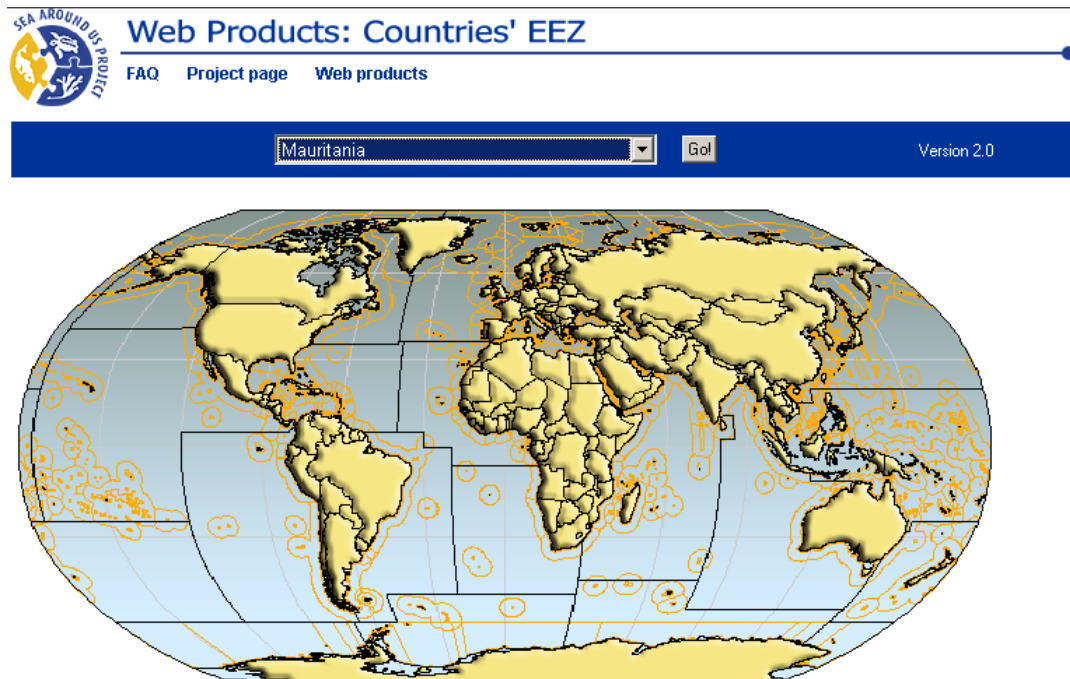
So how are we to begin to reverse these trends? Foremost, we would argue, we have to create a constituency that has easy access to the fisheries statistics, and related data, in a way that allows them to interpret these data for themselves, to correct them where they might be in error, and to eventually ‘own’ them. With wide support, action becomes more likely. One obvious constituency is the scientists and informed public who use the worldwide web. Thus, a major goal for the *Sea Around Us* Project has been making our information available to this diverse audience as rapidly and readily as possible.

It is our belief that even though excellent information is available from websites maintained by the FAO and others, it does not allow viewers to see what catch was actually taken from the waters claimed by various countries. Nor does it present the information by the most widely accepted, ecologically based,

divisions of the world's oceans, the Large Marine Ecosystems. We created web pages to provide a user-friendly interface to access this information with a wealth of cross-links to maps, taxonomic lists and other useful information.

Figure 16 shows an example of the page (available via [www.seaaroundus.org](http://www.seaaroundus.org)) that allows access to information on any coastal country by a few mouse-clicks. Other pages exist for Large Marine Ecosystems, the high seas and various themes such as information by species, marine catch maps etc.

Here we use an example where we are seeking information on the waters of Mauritania. Once chosen, a page opens such as shown in Figure 17a. There is a simple table showing the area of Mauritania's EEZ and its shelf area. Its percentage of the world's known coral reefs and seamounts is shown, as is the average primary productivity of its waters (important attributes of its marine production potential).



**Figure 16.** Selecting a country from the webpage shown will allow access to a range of statistics including graphs showing catch since 1950 for the EEZ selected

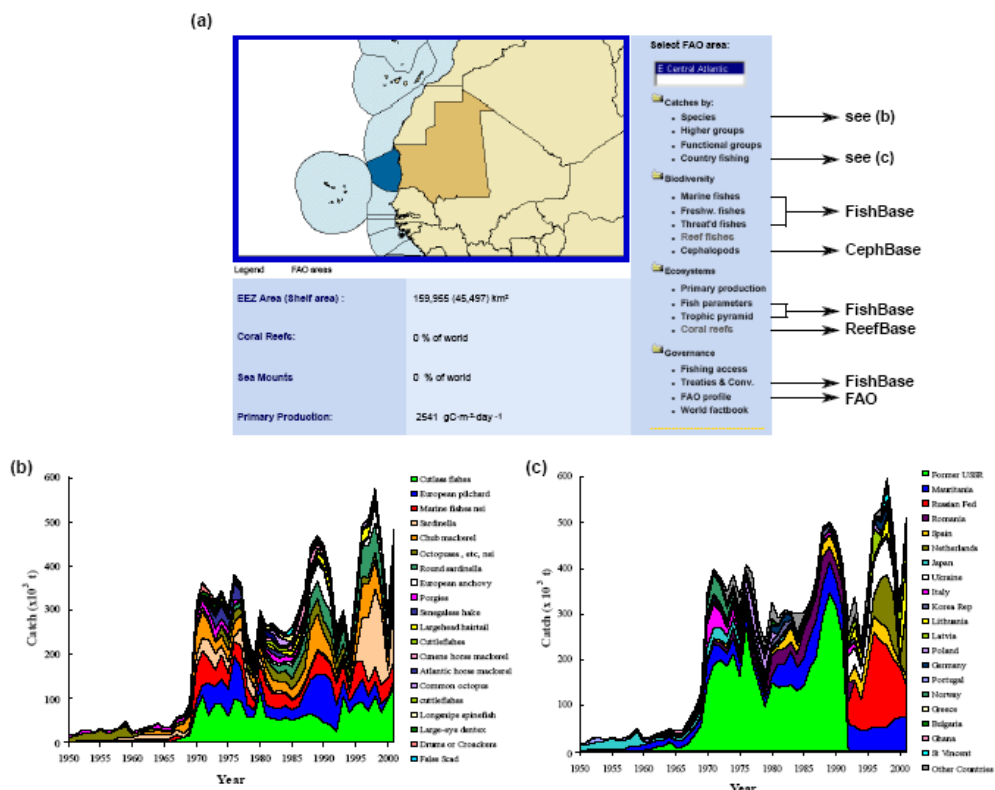
In the section called 'Catches by' there is easy access to graphs of fisheries catch for Mauritania from 1950 to 2001 (the last year for which data is currently available). What is unique here is that this graph shows the catch taken from within the dark blue area of the map in Figure 17a, that is, the catch taken from within the EEZ of Mauritania. Most other data sources can only show what catches were reported for 'Mauritania', regardless of where these catches were taken. These graphs are not only available for species (Figure 17b), but also for other useful groupings of species. The graph in Figure 17c shows which countries have taken this catch within Mauritania's EEZ. Tables supplied with the graphs allow links to other data on the biology of the species involved, and offer maps of global distributions and notes on data quality by FAO and other sources. You can even toggle between common and scientific names.

Under the 'Biodiversity' section you can find lists of fish (freshwater and marine) found in Mauritanian waters (via a link to FishBase, the online encyclopedia of fishes, and one of our research partners), and lists of cephalopods (squids, octopus etc. via a link to CephBase, another research partner). There are also links to lists of threatened species from these waters (via FishBase).

In a section called 'Ecosystems', there are links to important habitat and ecosystem related information for the waters of Mauritania, including animated maps of primary productivity, key biological parameters for



the fishes found there (including mortality and growth rates as required for ecosystem models), and even a trophic pyramid which, through FishBase, shows fishes at different levels in the food web for this area. For all tropical countries with coral reefs, there is also information on the key features of the reefs via ReefBase, an online database on coral reefs.



**Figure 17.** An example of information available for a selected countries exclusive economic zone, in this case Mauritania, including a) general statistics and links, b) a graph showing catch since 1950 by species, and c) a graph showing catch by country taken in the EEZ of Mauritania

Under the ‘Governance’ section, we provide links to our database of fishing access agreements, which also includes observations of countries fishing in the waters of other countries. There is a section on treaties and conventions relevant to each country including Mauritania, our example here. We also provide access to online country profiles provided by FAO and others.

## FEATURES TO BE ADDED IN 2005 AND BEYOND

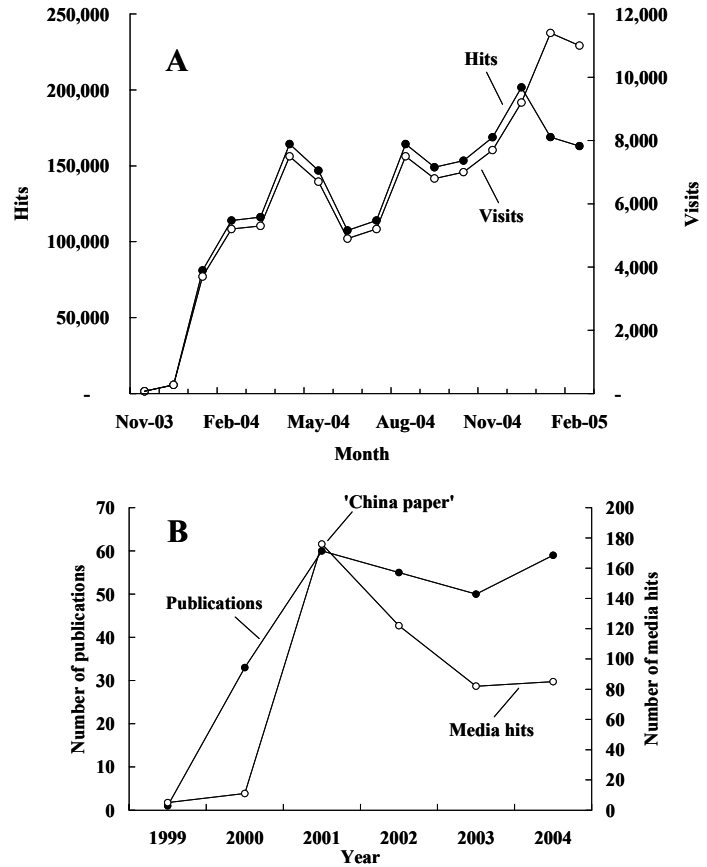
In the near future the database will present price data for all the fish landed in the world, thus enabling catch data to be turned into estimates of the ‘value’ of fisheries, as required for the socioeconomic studies of global fisheries that we plan to intensify in 2005 and beyond. As well, the biodiversity links will include additional groups such as marine reptiles, marine plants, echinoderms and others as well as a list of historic expeditions and scientific surveys which obtained geo-referenced specimens from a given area and country.

Our ecosystems links will include links to estuaries, seagrass, seamounts, mangrove, and other habitats relevant to the country of interest, and to all ecosystem (food web) models published so far. As well, we will present a database of all marine protected areas (MPA), thus providing the data for research on one of the key issues of our times (access to a global MPA database is already incorporated).

Finally, and importantly, we will present, for each country, a summary of key indicators of their performance in managing their marine fisheries and ecosystems, to support the country rankings mentioned elsewhere in this report.

For the 33 countries with catches in excess of 0.5 million tonnes per year, a detailed evaluation of their compliance with the FAO Code of Conduct for Responsible Fisheries will be made available in 2005. For most areas and countries, an estimate of unreported catch will be supplied.

Currently, throughout the pages, we provide opportunities for feedback (corrections, suggestions, and additions) to these pages. In addition, we have begun to methodically contact experts in all countries to ask for their help in reviewing and improving our coverage of their countries' marine fisheries and ecosystems. Sometimes these exchanges reinforce the need for these pages because local experts admit that there is simply no information available that can be used to check our lists and figures. Our efforts have been well received by a global constituency that needs information to assess what has been going on in their oceans (more than 200,000 'hits' monthly, due to about 12,000 visitors; see Figure 18A). This is the first step in generating change.



**Figure 18.** A: Trends in hits and visits to the *Sea Around Us* website ([www.seaaroundus.org](http://www.seaaroundus.org)); B: Publications (n=258) and media coverage (n=481) by members of the *Sea Around Us* from 1999 to 2004; includes peer-reviewed journal articles, chapters in books and technical reports, authored and edited books but excludes newsletter articles; TV, radio, print and online media.

## THE FUTURE OF THE *SEA AROUND US*

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The achievements of the *Sea Around Us* Project over the last five years are considerable. One reason, presumably, is the healthy balance we were able to maintain between doing credible science, and disseminating it to various publics such that this science would become widely known and applied.

We plan to build on these achievements, and to move further into the policy arena by building on the work done so far, and on its wide acceptance. This will be pursued along two related tracks:

1. Following our ‘first pass’ in covering fisheries impact on the world oceans, we will refine our evaluations at smaller scales by reconstructing more accurate time-series of catches (including discarded by-catch and illegal catches) for the many countries for which such information is lacking. Based thereon, and on previous modeling work, we will then reconstruct cell-specific biomass in the sea (for all of the 180,000 cells of the world’s oceans by ½ degree) for the period 1950 to the present. These refinements and extensions of the database will be presented through our website, [www.seaaroundus.org](http://www.seaaroundus.org), which has become a major information source for the staff of conservation NGOs and other groups interested in fisheries world-wide. The data presented therein, which now emphasize time-series of the biological aspects of fisheries, and their underlying biodiversity, will be expanded to cover the wide range of socio-economic indices, including measures of fishing effort, of fishing costs, and other metrics allowing bio-economic evaluation of the fisheries and their roles in countries’ economies.
2. The other track will consist of using the country-specific information (biological, economic, social) mentioned above to rank the countries of the world in terms of their performance regarding the management of their fisheries, and the seriousness of their effort to rebuild their marine ecosystems. We hope it will be possible to present the first round of these rankings as part of an ‘Atlas of the world’s marine fisheries and ecosystems’, which would summarize the relevant indicators for each country of the world, based on the information also made available on the *Sea Around Us* website (see above). Subsequent rankings, which would duly ‘name and shame’, will then be published annually, with it is hoped the full attention of the press and other media. (The ranking will be designed such that it will improve when countries take proactive measures to better manage their fisheries and to rehabilitate their ecosystems, even prior to demonstrated success of these measures on the ground).

This work, which must be of the highest standard if it is to be credible, will be done, we hope, in collaboration with several environmental NGOs. As well, the *Sea Around Us* will respond to the increasing number of requests for collaboration or input that are now coming from NGOs and governments, both in developed and developing countries, regarding management of their fisheries and a smooth transition towards ecosystem-based management.

APPENDICES<sup>1,2</sup>**APPENDIX I: CONFERENCES AND WORKSHOPS CONVENED BY THE *SEA AROUND US* PROJECT AND ECOPATH WITH ECOSIM MODELING WORKSHOPS**

- Sumaila, U.R. (Convenor) 2004. Conference on 'Fisheries Economics and Management'. August 5-6, 2004, UBC.
- Pitcher, T.J., et al. (Convenors) 2004. 4th World Fisheries Congress. May 2-6, 2004, Vancouver, British Columbia, Canada. Co-sponsored by the *Sea Around Us*.
- Palomares, M.L.D., Pruvost, P., Pauly, D. (Convenors) 2003. Atelier Ecopath: Elaboration d'un modèle de la zone maritime de Kerguelen. September 29-30, 2003, Muséum National d'Histoire Naturelle, Paris, France. Co-convened by *Sea Around Us* (M.L.D. Palomares and D. Pauly), and MNHN (P. Pruvost).
- Pauly, D., Alder, J. (Convenors) 2003. Millennium Ecosystem Assessment Marine and Coastal Cross-Cutting Issues Workshop. April, 2003, UBC. Co-convened by *Sea Around Us* and Millennium Assessment staffs.
- Pitcher, T.J., Christensen, V. (Convenors) 2003. International workshop on 'Modeling Antarctic Ecosystems'. April 15-17, 2003, UBC.
- The *Sea Around Us* (Convenor) 2003. Presentations of the *Sea Around Us* Project. Open House, February 19-20, 2003, Fisheries Centre, UBC. [7 presentations.]
- Pauly, D., Palomares, M.L.D. (Convenors) 2002. International Symposium on 'Marine fisheries, Ecosystems, and Societies in West Africa: Half a Century of Change'. June 26-28, 2002, Dakar, Senegal. Co-convened by *Sea Around Us* and European and African partner organizations.
- The *Sea Around Us* (Sponsor) 2002. Coastal Zone Asia-Pacific Conference: Improving the State of the Coastal Zone. May 12- 16, 2002, Bangkok, Thailand. Co-sponsored.
- Palomares, M.L.D., Pauly, D. (Convenors) 2002. Ecopath Training Workshop for West African Marine Ecosystems, Fisheries Centre, UBC, Vancouver, Canada, January 2002
- Pauly, D. 2002. (Convenor) Symposium on 'Fisheries-induced changes in Marine Ecosystems', Annual Meeting, AAAS. February 16, 2002, Boston, Massachusetts, USA.
- The *Sea Around Us* (Convenor) 2001. *Sea Around Us* Project Two-Year Review Workshop. April 22-27, 2001, Nanaimo, Vancouver Island, British Columbia, Canada.
- Sumaila, U.R. (Convenor) 2000. International Conference on the 'Economics of Marine Protected Areas'. July 6-7, 2000, Fisheries Centre, UBC.
- The *Sea Around Us* (Convenor) 2000. *Sea Around Us* Methodology Review Workshop. May 1-5, 2000, Swartz Bay, Vancouver Island, British Columbia, Canada.
- Pauly, D. (Convenor) 2000. Atelier Ecopath : Construction d'un modèle de la Baie du Mont Saint-Michel, golfe Normand-Breton. April 17-20, 2000, Département Halieutique, École Nationale Supérieure Agronomique de Rennes, France.
- Christensen, V. (Convenor) 2004. North Pacific Ecosystem Models Workshop 2. May 25-26, 2004, Seattle, Washington, USA.
- Christensen, V., Cury, P. (Convenors) 2004. International Conference on 'Quantitative Indicators for Fisheries Management'. SCOR/IOC, March 31 - April 4, 2004, UNESCO, Paris, France.
- Christensen, V. (Convenor) 2004. Ecopath with Ecosim Modeling Workshop. March 2-5, 2004, La Paz, Baja California Sur, Mexico.
- Christensen, V., Sinclair, M. (Convenors) 2003. North Pacific Ecosystem Models Workshop 1. September 16-18, 2003, Nanaimo, Vancouver Island, British Columbia, Canada. Co-convened by Villy Christensen (*Sea Around Us*) and Michael Sinclair (DFO, Canada).
- Christensen, V. (Convenor) 2002. Enfoque Metodologico para el analisis ecosistemico en la administracion de pesquerias de la zona central de Chile. November 14-15, 2002, Concepcion, Chile.
- Christensen, V. (Convenor) 2002. Modelling Chesapeake Bay. October 22-24, 2002, NOAA Chesapeake Office, Patuxent, Maryland, USA.
- Christensen, V. (Convenor) 2002. Ecopath with Ecosim Modeling Workshop. May 13-14, 2002, Virginia Institute of Marine Science, Gloucester Point, Virginia, USA.
- Christensen, V. (Convenor) 2002. Ecopath with Ecosim Modeling Workshop. May 8-10, 2002, Smithsonian Environmental Research Center, Edgewater, Maryland, USA.
- Christensen, V. (Convenor) 2002. Ecopath with Ecosim Modeling Workshop. April 29 - May 3, 2002, University of Florida, Tallahassee, Florida, USA.
- Christensen, V. (Convenor) 2002. Hecate Strait Modeling Workshop. April 9-10, 2002, Nanaimo, Vancouver Island, British Columbia, Canada.
- Christensen, V. (Convenor) 2002. Ecopath with Ecosim Modeling Workshop. February 19-20, 2002, Annapolis, Maryland, USA.
- Christensen, V., Pauly, D. (Convenors) 2000. APEC Workshop on 'Marine Ecosystem Modeling and Analysis'. August 8-10, 2000, Academia Sinica, Taipei, Taiwan.

<sup>1</sup> FCRR = Fisheries Centre Research Reports, Fisheries Centre, University of British Columbia, Vancouver (British Columbia, Canada); available online at <http://www.fisheries.ubc.ca/publications/reports/fcrr.php>.

<sup>2</sup> UBC = University of British Columbia, Vancouver, British Columbia, Canada.

## APPENDIX II: PRESENTATIONS MADE BY THE *SEA AROUND US* PROJECT TEAM MEMBERS

### Presentations by the Principal Investigator, Daniel Pauly

- Stockholm, Sweden. December 6, 2004. Pauly, D. 2004. Using FishBase to Map Global Fisheries Trends. 'Främmande Fiskar': A FishBase Symposium. Naturhistoriska Riksmuseet.
- Bremerhaven, Germany. December 1, 2004. Pauly, D. 2004. Können wir die Meere nachhaltig nutzen? Vortrag des Alfred-Wegeners Instituts im Deutschen Schiffahrtsmuseum, [Also in Stalsund, December 2.]
- Hamburg, Germany. November 29, 2004. Pauly, D. 2004. Fisheries impacts on global marine biodiversity and ecosystems: Inferences from large heterogeneous data sets. Ocean Biodiversity Informatics: An International Conference on Marine Biodiversity Data Management.
- Seattle, Washington, USA. November 15, 2004. Pauly, D. 2004. Interactions of fisheries in ecosystems over time. Improving Fisheries Management Conference. University of Washington.
- Ottawa, Ontario, Canada. October 7, 2004. Pauly, D. 2004. Reverting to the Ocean's Primordial Ooze: A fresh look at global fisheries. 4th World Conference of Science Journalists.
- Merida, Mexico. October 5, 2004. Pauly, D. 2004. Global fisheries trends and their implications for Latin America and the Caribbean. COASTFISH: Coastal Fisheries in Latin America and the Caribbean.
- Auckland, New Zealand. August 17, 2004. Pauly, D. 2004. Major Trends in Global Fisheries. Auckland Girls Grammar School (and similar lectures in Wellington, Christchurch and Kaikoura, to August 21).
- London, United Kingdom. July 21, 2004. Pauly, D. 2004. Trends in Global Fisheries: Implications for food security. Public lecture sponsored by the Royal Society. Carlton House Terrace.
- Sorrento, Italy. July 19, 2004. Pauly, D. 2004. Competition between marine mammals and fisheries: Food for thought. International Whaling Commission meeting, [Presentation and Press Conference.].
- Monterey, California, USA. July 16, 2004. Pauly, D. 2004. Endangered Ocean Life: Should International Baccalaureate Students care? Annual Regional Conference, International Baccalaureate North America.
- Paris, France. June 23, 2004. Pauly, D. 2004. The Upper Trophic Levels in Ocean Basin Ecosystems. Roger Revelle Award Lecture, Intergovernmental Oceanographic Commission. UNESCO.
- Washington, D.C., USA. June 8, 2004. Pauly, D. 2004. Keynote Lecture: The Crisis in the Fisheries Sector. Global Fisheries Workshop on International Cooperation in Fisheries. The World Bank.
- Vancouver, British Columbia, Canada. May 2-6, 2004. Pauly, D. 2004. Grand Keynote presentation: Reconciling fisheries with conservation: The challenge of managing aquatic ecosystems. 4th World Fisheries Congress.
- Washington, D.C., USA. April 28, 2004. Pauly, D. 2004. The Global Fisheries Crisis: Will the U.S. lead the reform, or follow the others into the abyss? A presentation to the U.S. House of Representative Ocean Caucus. Pew Institute for Ocean Science and Library of Congress.
- Montréal, Québec, Canada. April 26, 2004. Pauly, D. 2004. Mapping marine fisheries: Implications for biodiversity and ecosystem monitoring. Secretariat of the Convention on Biological Diversity.
- Portland, Oregon, USA. April 6, 2004. Pauly, D. 2004. The future of fisheries. Environment Matters Lecture Series. ILLAHEE.
- Paris, France. April 3, 2004. Pauly, D. 2004. Mapping indicators of the state of the world's marine ecosystems. International SCOR/IOC Symposium on Quantitative Indicators for Fisheries Management. UNESCO Headquarters.
- Los Angeles, California, USA. March 22, 2004. Pauly, D. 2004. Declining Fisheries. Hollywood Ocean Night: A Town Hall for the Ocean. Shifting Baseline Project and WWF USA.
- San Juan, Puerto Rico. March 8, 2004. Pauly, D. 2004. Fisheries impact on marine ecosystems: Food security and health implications. Pew Scholars Program in the Biomedical Sciences/Pew Latin American Fellows Program.
- Ann Arbor, Michigan, USA. January 26, 2004. Pauly, D. 2004. Fisheries impact on marine ecosystems: A global assessment, and the implications for food security. Science, Society and Technology Program. University of Michigan.
- Boston, Massachusetts, USA. December 9, 2003. Pauly, D. 2003. Fisheries and the State of the Oceans. Environmental Entrepreneurs' 'Ocean EcoSalon'. World Trade Center.
- San Diego, California, USA. November 15, 2003. Pauly, D. 2003. The March of Folly as a metaphor for the recent history and the future of fisheries. Marine Biodiversity: Using the Past to Inform the Future. Scripps Institution of Oceanography.
- Ottawa, Ontario, Canada. November 7, 2003. Pauly, D. 2003. Fisheries impact on marine ecosystems, and their implications for global food security. Gerhard Herzberg Lecture. Carleton University.
- Narragansett, Rhode Island, USA. October 27, 2003. Pauly, D. 2003. Marine Fisheries: Global Trends and Ecosystem impacts. Michael P. Metcalf Institute for Marine & Environmental Reporting. University of Rhode Island Graduate School of Oceanography.
- San Francisco, California, USA. October 21, 2003. Pauly, D. 2003. Fisheries and the State of the Oceans. Environmental Entrepreneurs' 'Ocean EcoSalon'. St. Francis Yacht Club.
- Blaine, Washington, USA. October 18, 2003. Pauly, D. 2003. Oceans in the Balance: How the Sea Around Us Project Seized the Time. Annual Meeting, Pew Fellows in Marine Conservation. Semiahmoo Resort.
- Québec, Canada. August 11, 2003. Pauly, D. 2003. Keynote Lecture: Worldwide declines of fish populations. American Fisheries Society, 133rd Annual Meeting.
- Ottawa, Canada. June 23, 2003. Pauly, D. 2003. Fisheries as Commons. Presentation at Panel on 'Beyond Borders: The Commons'. Environmental Grantmakers Association 2003 Fall Retreat. Fairmont Chateau Laurier Hotel.

- New York, USA. June 13, 2003. Pauly, D. 2003. Marine Fisheries and their Ecosystem Impact. Session on Protection of Vulnerable Marine Ecosystems of the 'United Nations Open-ended Consultative Process on Oceans and the Law of the Sea.' 4th Meeting. United Nations Plaza.
- Honolulu, Hawaii, USA. June 11, 2003. Pauly, D. 2003. Ensuring fisheries sustainability through marine reserve and ocean zoning. Western Pacific Regional Fisheries Management Council.
- Zürich, Switzerland. March 23, 2003. Pauly, D. 2003. Keynote Lecture: Trends in Global Marine Fisheries 5th International Conference on Environmental Future. Foundation for Environmental Conservation. Eidgenössische Technische Hochschule.
- Denver, Colorado, USA. February 17, 2003. Pauly, D. 2003. Technological restraint and the transition toward sustainable fisheries. Contribution to the Symposium on 'Shifting Gears: Bycatch and Habitat Impacts of Fishing.' Annual Meeting, American Association for the Advancement of Science.
- Seattle, Washington, USA. January 30, 2003. Pauly, D. 2003. Assessing the global impact of fisheries on marine ecosystems: The first three years of the Sea Around Us project. Bevan Lecture Series on Sustainable Fisheries. School of Aquatic and Fisheries Science, University of Washington.
- Woods Hole, Massachusetts, USA. November 22, 2002. Pauly, D. 2002. Global trends in fisheries and ecosystem health and their implications for ocean governance. Distinguished Scientist Seminar. Woods Hole Oceanographic Institution.
- Rimouski, Québec, Canada. November 15, 2002. Pauly, D. 2002. Tendances globales des pêcheries marines: Impacts sur les écosystèmes et la sécurité alimentaire. L'importance des océans dans l'équilibre écologique et économique de la planète. 27ème Congrès annuel, Association des biologistes du Québec.
- Montréal, Québec, Canada. September 30, 2002. Pauly, D. 2002. Global Trends in Marine Fisheries: Impacts on Ecosystems and Food Security. Public lecture sponsored by the Canadian Parks and Wilderness Society. Meakins Amphitheatre, McGill University.
- Brussels, Belgium. July 4, 2002. Pauly, D. 2002. The State of North Atlantic and West African Fisheries Ecosystem: Implications for European Policy. The European Policy Centre.
- New York, USA. June 5, 2002. Pauly, D. 2002. The global state of fisheries: Implications for conservation. Presentation to the Board and Headquarter Staff of the Natural Resources Defense Council.
- Bangkok, Thailand. May 13, 2002. Pauly, D. 2002. Plenary Keynote Lecture: Ecosystem-Based Approach for Coastal Zone Management. Coastal Zone Asia-Pacific Conference: Improving the State of the Coastal Zone.
- Washington, D.C., USA. April 12, 2002. Pauly, D. 2002. The State of Marine Ecosystems Worldwide: Lessons for the US? Briefing to the House of Representatives' Oceans Caucus Staff.
- Pacific Grove, California, USA. April 9, 2002. Pauly, D. 2002. Invited lecture: The Unfolding Collapse of Global Fisheries: Implications for Food Security. The Friends of Hopkins Marine Station.
- Corvallis, Oregon, USA. April 8, 2002. Pauly, D. 2002. Invited lecture: Mapping Fisheries onto Marine Ecosystems: A new tool for inference on basin-scale ecology and global food security. Oregon State University.
- New York, USA. March 7, 2002. Pauly, D. 2002. Invited lecture: The Crisis in Fisheries and Marine Biodiversity. Conference on 'Sustaining Seascapes: The Science and Policy of Marine Resources Management'. American Museum of Natural History.
- San Diego, California, USA. March 4, 2002. Pauly, D. 2002. Troubled Seas: The Fisheries Crisis. Distinguished Speaker Series: Nature and Society – Putting Knowledge to Work. University of California.
- College Station, Texas, USA. February 19, 2002. Pauly, D. 2002. Global marine fisheries and their ecosystem impacts. Texas A&M 125th Anniversary Celebration Symposium on 'A sustainable Gulf of Mexico: Research, Technology and Observations, 1950 to 2050s.
- Boston, Massachusetts, USA. February 15, 2002. Pauly, D. 2002. Setting a Baseline: Fisheries and Ecosystems in 1900. Symposium on 'Restoring the Richness of the Sea – Unrealized Potentials.' Annual Meeting, American Association for the Advancement of Science.
- Paris, France. December 4, 2001. Pauly, D. 2001. Marine Fisheries and Mariculture at Rio+10. Global Conference on Oceans and Coasts at Rio+10: Toward the 2002 World Summit on Sustainable Development.
- Miami, Florida, USA. November 26, 2001. Pauly, D. 2001. The Global Status of Marine Fisheries: Limping into the 21st Century. World Conference on Scientific and Technical Bases for the Sustainability of Fisheries. Rosenstiel School of Marine and Atmospheric Science. University of Miami.
- Gloucester Point, Virginia, USA. September 28, 2001. Pauly, D. 2001. The State of the North Atlantic Fisheries and their Supporting Ecosystems: A Map-based Approach. Seminar Series. Virginia Institute of Marine Science.
- Reykjavík, Iceland. September 24, 2001. Pauly, D. 2001. Session Keynote Lecture: Ecological geography as a framework for a transition towards responsible fishing. Iceland-FAO Conference on Responsible Fisheries in the Marine Ecosystem.
- Hamburg, Germany. July 27, 2001. Pauly, D. 2001. Fischerei und Naturschutz: Wege zum Ausgleich der Interessen. Festveranstaltung, 100 Jahre Deutsche Wissenschaftliche Kommission für Meeresforschung. Altonaer Museum.
- Kiel, Germany. June 29, 2001. Pauly, D. 2001. The Importance of Thinking Big: Recent Developments in Ecosystem Modeling. Meereskunde Kolloquium. Marine Science Institute, Kiel University.
- Rockport, Maine. June 12, 2001. Pauly, D. 2001. Fisheries impacts on marine ecosystems: They are worse than you thought. Pew Ocean Commission.
- Washington, D.C., USA. June 5, 2001. Pauly, D. 2001. Mapping fisheries as a tool to evaluate their ecosystem impacts. Marine Fish Conservation Network, Second Annual Meeting.
- San Francisco, California. February 18, 2001. Pauly, D. 2001. Down with Fisheries, Up with Aquaculture: Implications of global trends in the mean trophic level of fishes. Symposium on 'The Aquaculture Paradox: Does fish farming supplement or deplete world fisheries?' Annual Meeting, American Association for the Advancement of Science.

- Woods Hole, Massachusetts, USA. February 2, 2001. Pauly, D. 2001. The Importance of Thinking Big: Addressing large-scale and global change issues through marine and fisheries biological research. A Lecture to Honor Black History Month. Woods Hole Oceanographic Institution.
- Seattle, Washington, USA. October 10-12, 2000. Pauly, D. 2000. Wooster Lectures in Ocean and Fishery Sciences. A series of three lectures sponsored by the College of Ocean and Fishery Sciences. University of Washington.
- Brugge, Belgium. September 27, 2000. Pauly, D. 2000. Open Lecture: Fisheries and Conservation: A Program for their Reconciliation. International Council for the Exploration of the Seas (ICES): Annual Science Meeting.
- Kerkyra, Corfu, Greece. July 26, 2000. Pauly, D. 2000. Approaches for dealing with sources of bias when studying the fishing down marine food web phenomenon. CIESM Workshop on Trophic levels and state of fisheries resources in the Mediterranean Sea.
- Washington, D.C., USA. July 17, 2000. Pauly, D. 2000. Fishing down the food web: Some policy implications. International Ocean Science Day, American Association for the Advancement of Science/House of Representatives' Ocean Caucus.
- Akureyri, Iceland. April 6, 2000. Pauly, D. 2000. Fisheries impacts on North Atlantic food webs. Conference on Competitiveness within the Global Fisheries. University of Akureyri.
- Washington, D.C., USA. February 21, 2000. Pauly, D. 2000. Simulating fisheries impacts on aquatic ecosystems: The state of the art, what it can and cannot do. Symposium on 'Back to the Future: Restoring Ecosystems impacted by Fisheries.' Annual Meeting, American Association for the Advancement of Science.
- Pacific Grove, California, USA. February 14, 2000. Pauly, D. 2000. Extracting patterns on shark biology from electronic databases, or: One down and one more to go. International Pelagic Shark Workshop, Asilomar Conference Center.
- Potsdam, Germany. October 3, 1999. Pauly, D. 1999. Fisheries science and its elusive search for sustainability. IOC/SCOR/SCOPE Assessment Workshop 'Oceans 2020: Science for Future Needs'.

### **Presentations by other team members**

- Kaschner, K., Watson, R., Christensen, V., Trites, A.W., Pauly, D. 2005. Invited Lecture: Modelling and mapping resource overlap between marine mammals and fisheries on a global scale. Institutskolloquium, February 2005, Forschungs- und Technologiezentrum BÜsum, BÜsum, Germany.
- Kaschner, K., Froese, R., Rius, J. 2004. Mapping distributions of marine organisms using environmental envelopes: Introduction of a preliminary prototype. Mapping Species Distributions of Marine Organisms, IncoFish Workshop, December 2-3, 2004, IfM-Geomar, Kiel, Germany.
- Kaschner, K., Watson, R., Trites, A.W., Pauly, D. 2004. Mapping global distributions of marine mammal species using a relative environmental suitability model. Ocean Biodiversity Informatics: An International Conference on Marine Biodiversity Data Management, November 29 - December 1, 2004, Hamburg, Germany.
- Watson, R., Kaschner, K. 2004. Invited Lecture: Mapping global fisheries indicators and potential conflicts. Fisheries Ecosystem Symposium, Australian Society for Fish Biology 2004, September 20, 2004, Adelaide, Australia.
- Palomares, M.L.D. 2004. Early European explorations: Source of fish biodiversity information. XI Congress of European Ichthyologists, September 6-12, 2004, Tallinn, Estonia.
- Bhathal, B. 2004. Common names of Indian fishes. 5th FishBase Consortium Annual Meeting, September 1-3, 2004, Muséum National d'Histoire Naturelle, Paris, France.
- Marsden, A.D., Sumaila, U.R. 2004. Fisheries effects on Canadian marine ecosystems: Implications of international trade. International Institute of Fisheries Economics and Trade, July 29, 2004, Tokyo, Japan.
- Kaschner, K., Watson, R., Christensen, V., Trites, A.W., Pauly, D. 2004. Modelling and mapping trophic overlap between marine mammals and fisheries on a global scale: Implications for fisheries management. 4th World Fisheries Congress, May 2-6, 2004, Vancouver, British Columbia, Canada.
- Rizzo, Y., Coombs, A., Bhathal, B., Freire, K.M.F., Gelchu, A., Hunter, A., Karpouzi, V.S., Kaschner, K., Poon, A., Preikshot, D.B., Swartz, W., Tesfamichael, D., Wood, L., Pauly, D. 2004. Studying fisheries on large scales: Challenges and opportunities. 4th World Fisheries Congress, May 2-6, 2004, Vancouver, British Columbia, Canada.
- Tesfamichael, D., Pitcher, T.J. 2004. Multidisciplinary evaluation of the sustainability of Red Sea Fisheries using Rapfish. 4th World Fisheries Congress, May 2-6, 2004, Vancouver, British Columbia, Canada.
- Karpouzi, V.S., Watson, R., Pauly, D. 2004. Seabird population dynamics as indicators of ecosystem change. International Symposium on Quantitative Ecosystem Indicators for Fisheries Management, March 31 - April 4, 2004, UNESCO, Paris, France.
- Palomares, M.L.D., Pauly, D. 2004. A biodiversity-based data quality indicator for fisheries catch statistics. International Symposium on Quantitative Ecosystem Indicators for Fisheries Management, March 31 - April 4, 2004, UNESCO, Paris, France.
- Kaschner, K., Watson, R., MacLeod, C., Pauly, D. 2003. Invited Lecture: Use of stranding data to test a GIS approach for mapping large-scale distributions of poorly known marine mammal species: An example using the family Ziphiidae. Quantitative Seminar Series, University of Washington, Seattle, Washington, USA.
- Zeller, D., Russ, G.R. 2003. From Mare Liberum to Mare Reservarum: Why Canada needs to change concepts and approaches to ocean use. OMRN National Conference, 2003, Canada.
- Zeller, D., Watson, R., Christensen, V., Alder, J., Palomares, M.L.D., Pauly, D. 2003. Towards sustainable fisheries: Mapping regional and global trends in abundance and catches. ICES Annual Science Conference, 2003, Estonia.

- Kaschner, K., Watson, R., MacLeod, C., Pauly, D. 2003. Use of stranding data to test a GIS approach for mapping large-scale distributions of poorly known marine mammal species: An Example Using the Family Ziphiidae. Society of Marine Mammalogy Biennial Conference, December 14-19, 2003, Greensboro, North Carolina, USA.
- Kaschner, K., Watson, R., Trites, A.W., Pauly, D. 2003. A generic large-scale model to predict global marine mammal distributions & relative environmental suitability (RES) based on physical oceanography. 3rd workshop on the Use of Geomatic Technologies for Marine Mammal Scientists, Society of Marine Mammalogy Biennial Conference, December 14-19, 2003, Greensboro, North Carolina, USA.
- Kaschner, K., Watson, R., Christensen, V., Trites, A.W., Pauly, D. 2003. Invited Lecture: Assessing trophic overlap of marine mammals and fisheries on a global scale. Institutskolloquium, July, 2003, Bundesanstalt für Fischereiforschung, Institut für Seefischerei, Hamburg, Germany.
- Sumaila, U.R. 2003. An economic indicator for monitoring fishing pressure on marine ecosystems. Sustainability Indicators EcoFish Workshop, June 2003, Dakar, Senegal.
- Karpouzi, V.S., Pauly, D. 2003. Food consumption of seabirds and overlap with fisheries in the Antarctic and adjacent waters. International workshop on modeling Antarctic Ecosystems, April 15-17, 2003. UBC.
- Kaschner, K., Gregr, E., Ban, S. 2003. Habitat prediction of marine mammals: Models and applications. Fisheries Centre Advisory Committee Meeting, February, 2003, Fisheries Centre, UBC.
- Kaschner, K. 2003. Modelling large-scale distributions of Antarctic marine mammal species. Modelling Antarctic Ecosystems Workshop, January, 2003, Fisheries Centre, UBC.
- Kaschner, K., Watson, R., Christensen, V., Trites, A.W., Pauly, D. 2002. Invited Lecture: Assessing trophic overlap of marine mammals and fisheries on a global scale. Institutskolloquium, December, 2002, Forschungs- und Technologiezentrum Büsum, Büsum, Germany.
- Zeller, D. 2002. Invited Lecture: Ecospace and the Faroe marine ecosystem. Ecosystem modelling of Faroese waters Workshop, 2002, Faroe Islands.
- Zeller, D. 2002. Marine Reserves: Time for a Global Perspective. World Congress on Aquatic Protected Areas, 2002, Australia.
- Mohammed, E. 2002. A Preliminary ecosystem model for the EEZ, reef and shelf areas of a small island state: A case study for Grenada and the Grenadines. Joint Meeting of the CARICOM Regional Fisheries Management Large Pelagic; Reef and Slope; and Small Coastal Pelagic Fisheries Working Groups, November, 2002, St Vincent and the Grenadines.
- Mohammed, E., Finlay, J, Rennie, J. 2002. Quantifying the impacts of fishing on marine resources by analysis of reconstructed fisheries time series data: A case study for Grenada and the Grenadines. Joint Meeting of the CARICOM Regional Fisheries Management Large Pelagic; Reef and Slope; and Small Coastal Pelagic Fisheries Working Groups, November, 2002, St Vincent and the Grenadines.
- Armstrong, C.W., Sumaila, U.R., Erastus, A. 2002. An assessment of the benefits and costs of the Namibianisation of Namibian fisheries International Symposium on Transformation of South African Fishing Industry, October, 2002, Cape Town, South Africa.
- Mohammed, E. 2002. Preliminary ecosystem models for the southeastern Caribbean: A case study for Grenada and the Grenadines with Recommendations for Project GCP/RLA/140/JPN. Project Planning Workshop: GCP/RLA/140/JPN Ecosystem-based Management in the Lesser Antilles, including interactions with Marine Mammals, October, 2002, Barbados.
- Buchary, E.A., Cheung, W.W.-L., Sumaila, U.R., Pitcher, T.J. 2002. Coastal fisheries management in the South China Sea: An ecosystem approach. Coastal Zone Asia-Pacific Conference: Improving the State of the Coastal Zone, May 12-16, 2002, Bangkok, Thailand.
- Kaschner, K. 2001. Evolutionary and ecological impacts of cetaceans on fish populations. Predator-prey workshop, Society of Marine Mammalogy Biennial Conference, December 3, 2001, Vancouver, British Columbia, Canada.
- Kaschner, K., Watson, R., Christensen, V., Trites, A.W., Pauly, D. 2001. Modeling and mapping trophic overlap between marine mammals and commercial fisheries in the North Atlantic: Implications for fisheries management. Society of Marine Mammalogy Biennial Conference, November 28 - December 3, 2001, Vancouver, British Columbia, Canada.
- Kaschner, K., Watson, R., Trites, A.W., Pauly, D. 2001. A spatially explicit model of marine mammal food consumption in the North Atlantic. Incorporation of habitat preferences using GIS. 2nd Workshop on the Use of Geomatic Technologies for Marine Mammal Scientists, Society of Marine Mammalogy Biennial Conference, November 28, 2001, Vancouver, British Columbia, Canada.
- Kaschner, K., Watson, R., Trites, A.W., Pauly, D. 2001. Modelling trophic overlap between marine mammals and fisheries in the North Atlantic. 'Sea Around Us' Project methodology workshop, May, 2001, Nanaimo, British Columbia, Canada.
- Buchary, E.A., Cheung, W.W.-L., Sumaila, U.R., Pitcher, T.J. 2001. Back to the Future in Hong Kong: Discounting and inter-generational equity in the use of ecosystem resources. Marine Biological Association of Hong Kong seminar series, April 4, 2001, Hong Kong, China.
- Kaschner, K. 2000. Invited Lecture: Nahrungskonkurrenz zwischen Fischerei und Meeressäugern, eine globale Abschätzung: Vorstellung eines Dissertationsprojektes. Institutskolloquium BFA, December, 2000, Bundesanstalt für Fischereiforschung, Hamburg, Germany.
- Zeller, D. 2000. Ecosystem based fisheries management: Modelling the effects of closed areas and effort restrictions in a temperate marine ecosystem of the north-east Atlantic. Placing Fisheries in their Ecosystem Context, European Commission conference, 2000, Galapagos Islands, Ecuador.



### APPENDIX III: PUBLICATIONS BY THE *SEA AROUND US* PROJECT TEAM MEMBERS

#### Articles in peer-reviewed journals

- Ainsworth, C.H., Sumaila, U.R. [In press]. Intergenerational valuation of fisheries resources can justify long-term conservation: A case study in Atlantic cod (*Gadus morhua*). *Canadian Journal of Fisheries and Aquatic Science*.
- Booth, S., Zeller, D. [In press]. Mercury, food webs and marine mammals: Implications of diet and climate change on human health. *Environmental Health Perspectives* 113(5).
- Cheung, W.W.-L., Pitcher, T.J., Pauly, D. [In press]. A fuzzy logic expert system for estimating the intrinsic extinction vulnerabilities of marine fishes to fishing. *Biological Conservation*.
- Clark, C.W., Munro, G.R., Sumaila, U.R. [In press]. Subsidies, buybacks, and sustainable fisheries. *Journal of Environmental Economics and Management*.
- Cury, P., Shannon, L.J., Roux, J.-P., Daskalov, G., Jarre, A., Pauly, D., Moloney, C.L. [In press]. Trophodynamic indicators for an ecosystem approach to fisheries. *ICES Journal of Marine Science* 62.
- Marsden, A.D., Sumaila, U.R. [In press]. Tracking flows of fisheries products: The case of Pacific halibut in the Canadian economy. *Fisheries Research*.
- Morato, T., Pitcher, T.J. [In press]. Ecosystem simulations of management strategies for data-limited seamount fisheries.
- Pauly, D., Palomares, M.L.D. [In press]. Fishing down marine food web: It is far more pervasive than we thought. *Marine Science Bulletin* 74(3, supplement).
- Pauly, D., Watson, R. [In press]. Background and interpretation of the 'Marine Trophic Index' as a measure of biodiversity. *Philosophical Transactions of the Royal Society: Biological Sciences*.
- Pitcher, T.J., Ainsworth, C.H., Buchary, E.A., Cheung, W.W.-L., Forrest, R.E., Haggan, N., Lozano, H., Morato, T., Morissette, L. [In press]. Strategic management of marine ecosystems using whole-ecosystem simulation modelling: The 'Back-to-the-Future' policy approach.
- Sumaila, U.R., Walters, C.J. [In press]. Intergenerational discounting: A new intuitive approach. *Ecological Economics*.
- Ussif, A.M., Sumaila, U.R. [In press]. Modeling the dynamics of regulated resource systems: A fishery example. *Ecological Economics*.
- Vidal-Hernandez, L., Pauly, D. [In press]. Integration of subsystem models as a tool toward describing feeding interactions and fisheries impacts in a Large Marine Ecosystem, the Gulf of Mexico. *Ocean and Coastal Management*.
- Zeller, D. [In press]. From *Mare Liberum* to *Mare Reservarum*: Canada's opportunity for global leadership in ocean resource governance. *Ocean Yearbook* 19.
- Zeller, D., Pauly, D. [In press]. Good news, bad news: Global fisheries discards are declining, but so are total catches. *Fish and Fisheries*.
- Pauly, D., Watson, R., Alder, J. 2005. Global trends in world fisheries: Impacts on marine ecosystems and food security. *Philosophical Transactions of the Royal Society: Biological Sciences* 360(1453): 5-12.
- Pitcher, T.J. 2005. 'Back To The Future': A Fresh Policy Initiative For Fisheries And A Restoration Ecology For Ocean Ecosystems. *Philosophical Transactions of the Royal Society: Biological Sciences* 360: 107-121.
- Watson, R., Alder, J., Kitchingman, A., Pauly, D. 2005. Catching some needed attention. *Marine Policy* 29: 281-284.
- Zeller, D., Froese, R., Pauly, D. 2005. On losing and recovering fisheries and marine science data. *Marine Policy* 29(1): 69-73.
- Alder, J., Sumaila, U.R. 2004. Western Africa: A fish basket of Europe past and present. *Journal of Environment and Development* 13(2): 156-178.
- Atta-Mills, J., Alder, J., Sumaila, U.R. 2004. The decline of a regional fishing nation: The case of Ghana in West Africa. *Natural Resource Forum* 28: 13-21.
- Christensen, V., Pauly, D. 2004. Placing fisheries in their ecosystem context, an introduction. *Ecological Modelling* 172: 103-107.
- Christensen, V., Walters, C.J. 2004. Ecopath with Ecosim: Methods, capabilities and limitations. *Ecological Modelling* 172: 109-139.
- Christensen, V., Walters, C.J. 2004. Trade-offs in ecosystem-scale optimization of fisheries management policies. *Bulletin of Marine Science* 74(3): 549-562.
- Chuenpagdee, R., Pauly, D. 2004. Improving the state of coastal areas in the Asia-Pacific region. *Coastal Management*: 3-15.
- Froese, R., Garthe, S., Piatkowski, U., Pauly, D. 2004. Trophic signatures of marine organisms in the Mediterranean as compared with other ecosystem. *Belgian Journal of Zoology* 134(1, supplement): 25-32.
- Heymans, J.J., Shannon, L.J., Jarre, A. 2004. The Northern Benguela Ecosystem: Changes over three decades (1970, 1980 and 1990). *Ecological Modelling* 172: 175-195.
- Kavanagh, P., Newlands, N.K., Christensen, V., Pauly, D. 2004. Automated parameter optimization for Ecopath ecosystem models. *Ecological Modelling* 172: 141-149.
- Pauly, D. 2004. Much rowing for fish. *Nature* 432: 813-814.
- Salas, S., Sumaila, U.R., Pitcher, T.J. 2004. Short-term decisions of small scale fishers selecting alternative target species: A choice model. *Canadian Journal of Fisheries and Aquatic Science* 61: 374-383.
- Shannon, L.J., Christensen, V., Walters, C.J. 2004. Modelling stock dynamics in the southern Benguela ecosystem over the last twenty five years. *African Journal of Marine Science* 26: 179-196.
- Sumaila, U.R. 2004. Intergenerational cost benefit analysis and marine ecosystem restoration. *Fish and Fisheries* 5: 329-343.
- Talde, C.M., Mamaril Sr.A.C., Palomares, M.L.D. 2004. The diet composition of some economically important fishes in the three flood plain lakes in Agusan Marsh Wildlife Sanctuary. *Sri Lanka Journal of Aquatic Science* 9: 45-56.

- Watson, R., Kitchingman, A., Gelchu, A., Pauly, D. 2004. Mapping global fisheries: Sharpening our focus. *Fish and Fisheries* 5: 168-177.
- Zeller, D., Pauly, D. 2004. The future of fisheries: From 'exclusive' resource policy to 'inclusive' public policy. *Marine Ecology Progress Series* 274: 295-303.
- Zeller, D., Reinert, J. 2004. Modelling spatial closures and fishing effort restrictions in the Faroe Islands marine ecosystem. *Ecological Modelling* 172: 403-420.
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**APPENDIX IV: MEDIA ‘HITS’ BY THE SEA AROUND US PROJECT TEAM MEMBERS**

<b>Date</b>	<b>Event/Title</b>	<b>Author</b>	<b>Medium</b>
<b>2004</b>			
December 3	“Overfishing behind Ghana’s wildlife decline”	Staff writer	afrol News
November 18	“Fangfrisch ab Fabrik”	Beate Kittl	<i>Facts (Zürich)</i>
November 11	“New study links low fish supply to increased bushmeat hunting”	Sarah Yang	Eurek Alert
November 11	“Reduced fish stocks linked to increased bushmeat trade”	Michelle Cook	EurekAlert
November 11	“African bush-meat trade linked to EU overfishing”	James Owen	<i>National Geographic News</i>
November 11	“Study Links Low West African Fish Supply to increased Bushmeat Hunting”	David McAlary	VOA News
November 8	“Fisch in Seenot”	Gottfried Derka	<i>Profil (Wien)</i>
November 8	“Não acredito que a pesca, tal como a conhecemos, continue a existir daqui a 30 anos”	Clara Barata	<i>Ciências</i>
November	“Op=op: Straks eten we kwal”	Marcel Crok	<i>Natuur Wetenschap &amp; Techniek</i>
November	“Sink or swim”		<i>Nature</i>
October 9	“Nets leave a trail of death in the sea”	Catherine Masters and Michael Richardson	<i>The New Zealand Herald</i>
September 26	“Tales of the sea: Catch-22”	Michael Raffael	<i>The Observer</i>
September 11	“Caught in the quota Sustainable fish for dinner”	Sarah Boyd	<i>The Dominion Post (Wellington, New Zealand)</i>
August 28	“Books; Who's Reading What: Daniel Pauly”	Staff	<i>New Scientist</i>
August 26	“Bill Brownell: Marine reserve won't make much difference to Barrier”		<i>The New Zealand Herald</i>
August 21	“Call for fishing exclusion zones”	Colin Patterson	<i>The Dominion Post (Wellington, New Zealand)</i>
August 20	“Fish habitats must be protected, expert warns Wellington”		<i>New Zealand Press Association</i>
August 19	“Save the seas”		<i>The Dominion Post (Wellington, New Zealand)</i>
August 18	“Expert to talk on overfishing”		<i>The Press (Christchurch, New Zealand)</i>
August 17	“Fish Expert sounds warning on stocks”	Peter Jessup	<i>The New Zealand Herald</i>
August 15	“Fade to blue: A Tribune Special Report”	Paul Salopek	<i>Chicago Tribune</i>
August 10	“World fisheries expert to visit New Zealand”		<i>New Zealand Press Association</i>
August 10	“World fisheries expert visits New Zealand”		<i>Scoop</i>
August 10	“World fisheries expert to visit New Zealand”		<i>Stuff</i>
July 27	“Whales are no competition”		<i>Malaysia Star</i>
July 20	“Whales do not compete with humans for fish”	Robin Pomeroy	Environmental News Network
July 20	“Whales cleared of competing with fishermen”	Amanda Leigh Haag	<i>Nature</i>
July 20	“Japan loses bid for secret vote on whaling ban”	Trisha Thomas	<i>Philadelphia Inquirer</i>
July 20	“Whaling meeting gets under way in Italy”	Trisha Thomas	<i>Seattle Post-Intelligencer</i>
July 20	“International meeting votes down Japan's pro-whaling tactic”		<i>Star Tribune</i>
July 19	“Whales 'absolved' on fish stocks”	Alex Kir	BBC News
July 19	“Whales do not compete with humans for fish”	Robin Pomeroy	Reuters
July 17	“Fishing for the future”	Peter Calamai	<i>Toronto Star</i>
July 17	“World's Appetite for Tuna Threatens Supply”	Mort Rosenblum	Yahoo! News

<b>Date</b>	<b>Event/Title</b>	<b>Author</b>	<b>Medium</b>
July 15	“A fishy name game”	Margaret Munro	<i>Montreal Gazette</i>
July 14	“World's appetite for tuna poses threat to supply in under-policed seas”	Mort Rosenblum	Environmental News Network
July 9	“Hauling In Better Catch Data”		<i>Science</i>
July 8	“Satellite data could save fish”	Alex Kirby	BBC News
July 6	“Press Conference Deep Sea Conservation Coalition”		<i>Deep Sea Conservation Coalition Press Release</i>
June 23	“Cientistas querem acabar com a pesca de arrasto”	Nélia Câmara	<i>Diario Acores</i>
June 22	“Estudo científico dá conta da ameaça do arrasto de fundo sobre os montes submarinos”	João Filipe Pestana	<i>Diário de Notícias da Madeira</i>
June 20	“Pesca arrasa com vida ainda desconhecida”	Ana Fernandes	<i>Publico</i>
June 7	“Conservation coalition seeks UN resolution to halt destruction of deep-sea biodiversity”		World Wildlife Fund
June 3	“Jellyfish for lunch?”		<i>UBC Reports</i>
May 17	“Robben und Wale konkurrieren nicht mit Fischern”		<i>Spiegel Online</i>
May 15	“Whales, seals and fishermen rarely take same prey”	Bob Holmes	<i>New Scientist</i>
May 14	“An A-Z of advanced research in British Columbia”	Nicholas Read	<i>Vancouver Sun</i>
May 13	“Marine mammals are 'not competing' with humans.”		<i>Liverpool Echo</i>
May 11	“Dwindling Fishery Resources”	Sohn Hong-keun	<i>Korean Times</i>
May 4	“There are sharply different views on the effect of fish farms on wild salmon”		<i>Broadcast News</i>
May 4	“Jellyfish sandwich, anyone?”		<i>Grand Rapids Press</i>
May 4	“Jellyfish for lunch - It's no joke”	Robert McClure	<i>Seattle Post Intelligencer</i>
May 4	“Unintentional catch wreaks havoc on oceans”	Larry Pynn	<i>Vancouver Sun</i>
May 4 and 19	Rafe Mair Show	Rafe Mair	Local radio
May	“The New Elite”		<i>BC Business</i>
May	“The Bluewater Revolution”	Charles C. Mann	Wired
April/May	“Salmon farms are factory farms”	Kenneth R. Weiss	<i>The Healing Journal</i>
April 30	“Fully in Tact: Remember what you've seen here”	Sabrina Noble	<i>Arizona Daily Wildcat</i>
April 22	“Arrantzaleek sare pelagikoen arriskuez ohartarazi dute”		<i>Gara</i>
April 21	“El fondo marino puede esconder la solución para el sida o el cancer”	Ana Martínez	<i>Entorno</i>



<b>Date</b>	<b>Event/Title</b>	<b>Author</b>	<b>Medium</b>
April 21	“A call to save troubled oceans”	Maggie Fox	<i>Philadelphia Inquirer</i>
April 20	“U.S. oceans report says coastal areas in peril”	Maggie Fox	Reuters AlertNet
April 19	“U.S. Must Act Immediately and Decisively on National Oceans Report”		Environmental News Network
April 9	“Des outils pour decrire l'etat de sante de l'ocean”	Marion Francoual	<i>Le Marin</i>
April 8	“Before you sink your teeth into that burger...”	David Boyd	<i>Globe and Mail</i>
April 2	“The Future of World Fisheries”	Illahee	<i>Tidepool</i>
April 2	“An ocean of information”	Glenn Bohn	<i>Vancouver Sun</i>
March 31	“Marine Biologists Dramatise Ocean's Destruction”	Kevin Allardice	<i>Santa Monica Mirror</i>
March 22	“Hollywood Ocean Night”		<i>Shifting Baselines</i>
March	Book Review: In a Perfect Ocean”	Kenneth T. Frank and Jae S. Choi	<i>Fisheries Oceanography</i>
February 23	“Farmed Salmon Even Enviros Can Swallow”	Jared Ferrie	<i>The Tyee</i>
February 19	“Trawlers Destroying Deep-Sea Reefs”	John Pickrell	<i>National Geographic</i>
February 16	“Deep-sea corals protection call”	Jonathan Amos	BBC News
February 16	“Stop deep-sea trawls to protect coral”		CBC News
February 15	“1,136 scientists call for protection of deep-sea corals”		EurekAlert
February 4	“3 Ocean Books Reviewed: No Good News and a Fair Amount of Bad”	Ben Neal	<i>Working Waterfront</i>
January 12	“Salmon farming industry reeling”	Peter Kennedy	<i>Globe and Mail</i>
January 12	SqueezePlay at ROB TV	Amanda Lang and Kevin O'Leary	Local TV
January 9	“Farmed salmon a health hazard”	Tom Spears	canada.com
January 9	“Carcinogens found in farm-raised Atlantic salmon raise health alarms”	Tom Spears	<i>Edmonton Journal</i>
January 9	“Farmed salmon a health hazard”	Tom Spears	<i>Ottawa Citizen</i>
January 6	“Multiplication Problem Threatens Stock of Sturgeon”	Christopher Pala	<i>New York Times</i>
January/February	“Can We Have Our Fish and Eat Them Too?”	Phillip Levin	<i>American Scientist</i>
January	“Book Review: In a perfect ocean”	F.T. Manheim	<i>Choice</i>
<b>2003</b>			
December 9	“Shifting Baselines: Opening the Ocean to Minorities”	Travis Smiley	National Public Radio Programming
December 8	“China to punish officials for statistics fraud”		<i>Xinhuanet</i>
November 21	“Bleak future for fisheries”	Alison Auld	<i>London Free Press (Ontario, Canada)</i>

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
November 21	“World's fish can be gone by 2050”		<i>National Post</i>
November 21	“Worldwide fish stocks in danger”	Alison Auld	<i>Portage Daily Graphic (Manitoba, Canada)</i> <i>Canadian Press Newswire</i>
November 20	“Worldwide fish stocks in danger of depletion as fisheries expand out to sea”	Alison Auld	
November 20	“Worldwide fish stocks in danger of depletion”	Alison Auld	<i>The Associated Press</i>
November 15	“UBC professor honoured”		<i>Vancouver Sun</i>
November 10	“Scientific American names director of UBC's Fisheries Centre a world leader in research”		<i>UBC Reports</i>
November 3	“The empty seas: It's time to stop devouring the most overfished and worst-managed seafoods”	John Demont	<i>Maclean's</i>
November 3	“UBC fisheries prof dubbed one to watch”		<i>Vancouver Province</i>
November	“The Leading Edge: Innovation in BC I: Environment”		Knowledge Network Programming
October 30	“Researcher warns of local fishing crisis”	Edward Ortiz	<i>Providence Journal-Bulletin (Rhode Island)</i>
October 29	“Oceans a national treasure at risk”	Boston EcoSalon	<i>Environmental Entrepreneurs Update</i>
October 29	“Oceans depleting the bountiful sea”	San Francisco EcoSalon	<i>Environmental Entrepreneurs Update</i>
October 23	“Talk slated on impact of fisheries”		<i>South County Journal</i>
October 19	“Scientist to discuss declining fish stocks”		<i>Providence Journal-Bulletin (Rhode Island)</i>
October	“Quebec wrap-up: Parlez-vous poissons?”		<i>Fisheries</i>
September 11	“Net losses: Overfishing in the north Atlantic Ocean has left fish stocks in peril”	John Shepherd	<i>Nature</i>
September 4	“How can we tackle falling fish stocks?”	William Reville	<i>The Irish Times</i>
September 2	“21-Day fishing trawler chase ends”	Eve Savory	CBC Television
August 30	“Even endless ocean has its limits”	William J. Broad and Andrew C. Revkin	<i>The Toronto Star</i>
August 29	“Trawlers ‘bulldozing’ sea mountains”	Stephen Leahy	<i>IPS-Inter Press Service</i>
August 24	“The dead seas”		<i>Edmonton Journal</i>
August 19	“Fished Out”		CBC Television
August 19	“A new way to feed the world”		<i>The Economist</i>
August 17	“Taking stock”		<i>Montreal Gazette</i>
August 12	“Fisheries expert calls for end of ‘subsidies’”	Kevin Dougherty	<i>Canwest News Service</i>
August 12	“Fish stocks need Star Wars defense”	Kevin Dougherty	<i>Montreal Gazette</i>
August 12	“Trendy seafoods called threat to stocks”	Les Perreux	<i>The Globe and Mail</i>
August 12	“Taste for unusual dishes latest threat to fish stocks”		<i>The Record (Kitchener-Waterloo, Ontario)</i>
August 11	“New tastes for fish increase pressure from bottom of food chain”	Les Perreux	<i>Canadian Press Newswire</i>
August 11	“Marine reserves needed to protect cod stocks: scientist”		CBC News
August 11	“‘Dirty fishing’ emptying oceans”	Sharon Guynup	<i>National Geographic</i>
August 10	“Éliminer les subventions à la pêche”	Judith LaChapelle	<i>La Presse</i>
August 10	“Les leçons de la morue”	Judith LaChapelle	<i>La Presse</i>
August 9	“A new way to feed the world”		<i>The Economist</i>
August 2	“The dead seas”	William J. Broad and Andrew C. Revkin	<i>Montreal Gazette</i>
August	“The Leading Edge: Innovation in BC I: Environment”		Knowledge Network Programming
July 31	“Plumbing the depths, there's less to plumb”	William J. Broad and Andrew C. Revkin	<i>International Herald Tribune</i>
July 29	“Has the sea giving up its bounty?”	William J. Broad and Andrew C. Revkin	<i>New York Times</i>
July 26	“Catch News: What can be done as marine ecosystems face a deepening crisis?”	Ben Harder	<i>Science News</i>
June 22	“To The Best of Our Knowledge”		Wisconsin Public Radio
July 12	“Genetic analysis revises tally of past whale populations”		<i>Scientific American</i>
July 12	“Scaling down”	Creg Callaghan	<i>Weekend Australia</i>

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
June 13	“World Summit on Salmon considers salmon population”	Jeff Bernard	Citizen Review Online
June 11	“Summit explores ecosystem approach to salmon”		CBC News
June 9	“Eating your bait”		Earthwatch Radio
June 9	Cover story: “Fished Out”	Thomas Hayden	<i>U.S. News &amp; World Report</i>
July 6	“What happened to Newfoundland's cod?”	John Spears	<i>Toronto Star</i>
June 5	“Panel calls for sea change to fisheries policy”	Virginia Gewin	<i>Nature</i>
June 5	“Controversy continues over the Atlantic Dawn fishing vessel”		RTÉ News: Prime Time
June 4	“Seas drained of fish by north's subsidies”	Stephen Leahy	<i>IPS-Inter Press Service</i>
May 30	“Swimming Scallops”		CBC Radio One
May 30	“Ending protection of endangered animals is good politics, not science”	Eric Ernst	<i>Sarasota Herald-Tribune (Florida)</i>
May 27	“Oceans in Peril”		<i>New York Times</i>
May 17	“Old men of the sea have all but gone”	Staff	<i>New Scientist</i>
May 15	“Big ocean fish decline dramatic”		<i>Florida Times-Union (Jacksonville, FL)</i>
May 15	“Industrial fishing is wiping out big species”	Glennnda Chui	<i>San Jose Mercury News (California)</i>
May 15	“Giants of the ocean 'facing extinction”	Mark Henderson	<i>The Times (London)</i>
May 14	“Fished Out: A new study finds the world has a history of overfishing”		CBC Television
May 14	“Ocean's great fish all but gone”	Bob Holmes	<i>New Scientist</i>
May 14	“Study shows 90 percent decline in stocks of big oceangoing fish”	John Heilprin	<i>The Associated Press</i>
May 13	“Study of nature provides startling new evidence that 90 percent of large fish are gone”		<i>AScribe Newswire</i>
May 8	“Fishing ban extended to boost stocks in key areas”	Staff Reporter	<i>South China Morning Post (Hong Kong)</i>
April 30	“The cod's gone, yet the deadly dragger boats remain”	Mitchell Anderson	<i>Globe and Mail</i>
April 19	“Fishery on edge”	Kelly Shiers	<i>Halifax Herald</i>
March 27	“Ocean Fishing Ban”		Sciencentral News
March 6	“Scientist predicts ocean fisheries disaster”	Hilary Thomson	<i>UBC Reports</i>
March	“The Leading Edge: Innovation in BC I: Environment”		Knowledge Network Programming
February 24	“Groundbreaking research released on the economics of marine protected areas”		<i>Life Science Weekly</i>
February 22	“Turtle power”		<i>The Economist</i>
February 17	“Scientists urge managers to limit use of destructive fishing gears”		<i>AScribe Newswire</i>
February 17	“Base de données mondiale”		<i>La Presse</i>
February 17	“Le chercheur «prophète» a la passion de l'égalisation”		<i>La Presse</i>
February 17	“Un cri d'alarme pour les poissons de la planète”		<i>La Presse</i>
February 6	“Fishery prof an iconoclast”		<i>UBC Reports</i>
February 5	“Not many fish in the sea?”		<i>The Globe and Mail (Vancouver)</i>
February 3	“The dollars and sense of protecting the ocean”		<i>AScribe Newswire</i>
January 25	“Deep crisis: fishy figures”		<i>Scientific American</i>
January 21	“Iconoclast looks for fish and finds disaster”	Carol Kae Suk Yoon	<i>New York Times</i>
January	“EU fisheries policy under fire”	Tina Adler	<i>Frontiers in Ecology and the Environment</i>
January	“Le sort de la pêche dans les filets des statistiques”	Marie-Laure Moinet	<i>Science &amp; Vie</i>
Date not available	“Empty Oceans, Empty Nets”		<i>Habitat Media (San Rafael, CA)</i>
Date not available	“Book review: the balance and conservation of the North Atlantic ecosystems ?”	K. Stergiou	<i>Reviews in Fish Biology and Fisheries 13:455-457</i>

Date	Event/Title	Journalist	Medium
<b>2002</b>			
December 29	“Learning from errors or not?”		<i>The Seattle Times</i>
December 19	“Ekkert eftir nema marglytta”		<i>Morgunblaðid</i>
December 12	“Faut-il baisser fortement les quotas de pêche?”	Jean Meilhaud	<i>L'Usine Nouvelle</i>
December 9	“Fish farms become feedlots of the sea”	Kenneth R. Weiss	<i>LA Times</i>
December 7	“Tall tales from anglers could wipe out fish”	Bob Holmes	<i>New Scientist</i>
December 4	“Zones sinistrées”	Jean-Marc Salvat	<i>La Presse</i>
December 1	“Environmental assessments are all relative”	Randy Olson	<i>Alameda Times-Star (Alameda, CA)</i>
December 1	“Environmental assessments are all relative”	Randy Olson	<i>The Oakland Tribune</i>
November 27	“A planet of badly shifting baselines”	Randy Olson	<i>The Times Union (Albany, NY)</i>
November 25	“Is fish farming safe?”	Terry McCarthy	<i>Time</i>
November 17	“Slow-motion disaster below the waves”	Randy Olson	<i>Los Angeles Times</i>
November 16	“Last chance for cod”	Per Snaprud	<i>Dagens Nyheter</i>
November 16	“Ultimate solution: fermer une partie des océans”	Carl Thériault	<i>Le Soleil/La Presse</i>
November 2	“Gestion des pêches - Les océans sont-ils au bord de l'abîme?”	Claude Lafleur	<i>Le Devoir</i>
October 18	“Alone and skewered”	Jerry Fraser	<i>National Fisherman</i>
October 17	“How many more fish in the sea?”	Quirin Schiermeier	<i>Nature</i>
September 9	“Africa's lost fish”		<i>Newsweek</i>
September 7	“They came from the deep”	Richard Askwith	<i>Australian Magazine</i>
September 2	“Africa's lost fish”	Ismaila Dieng	<i>Newsweek</i>
August 8	“Sustainability of world fisheries”		<i>Radio-Canada</i>
August 8	“The future on a plate: organic farming will not solve the crisis in food production”	Henry Gee	<i>The Guardian (London)</i>
August 7	“They came from the deep”	Richard Askwith	<i>The Independent (London)</i>
August	“Global warming is good (if you like calamari)”		<i>Australasian Science</i>
July 31	“Squid on the rise”	Simon Benson	<i>Hobart Mercury (Australia)</i>
July 24	“La pesca destruye la relación entre las especies”	Alicia Rivera	<i>El País</i>
July 15	“L'Europe écume les eaux africaines”	Yves Miserey	<i>Le Figaro</i>
July 13	“African fisheries on brink of collapse”	Debora MacKenzie	<i>New Scientist</i>
July 9	“Fisheries in trouble”		<i>European Policy Centre</i>
July 9	“Le casse-tête de la politique commune de la pêche”	Anne Bauer	<i>Les Echos</i>
July 6	“What happened to Newfoundland's cod?”	John Spears	<i>Toronto Star</i>
July 3	“West African Fish Stocks Halved by Foreign Fleets”		<i>ENS News</i>
July 2	“The European Union must prevent a catastrophic collapse of West African fish stocks”		<i>M2 Presswire</i>
July 1	“Surexploitation de nos ressources halieutiques”	Aliou Ba	<i>Le Soleil</i>
July 1	“Surexploitation des ressources halieutiques: des experts sonnent l'alerte”	Aliou Ba	<i>Le Soleil</i>
June 28	“L'allarme è stato lanciato oggi, nel corso di una conferenza stampa che si è tenuta a Dakar”		<i>WWF Italia</i>
June 25	“Pêches maritimes, écosystèmes et sociétés: le poids d'un demi-siècle de changements”	Moustapha Sene	<i>Le Soleil</i>
June 25	“The European Union must prevent a catastrophic collapse of West African fish stocks”		<i>World Wildlife Fund</i>
June 15&16	“Marine biomass and marine protected areas”		<i>Earth and Sky</i>
May 29	“EU's fishing crisis: the dark night of the shoal”	Richard Ingham and Annick Chapoy	<i>EU Business</i>
May 27	“Fische in Seenot”	Philip Bethge	<i>Der Spiegel Online</i>
May 24	“China overreporting fish catches”	Stephanie Mann	<i>Green Nature</i>
May 6	“Le poisson disparaît de l'Atlantique Nord”	Jean-Michel Bader	<i>Le Figaro</i>
May 6	“Jellyfish 'blooms' could be sign of ailing seas; glut in some locations harms other marine life”	Cheryl Lyn Dybas	<i>The Washington Post</i>
May	“Editors Corner: Huge subsidies destroying earth's marine fisheries”		<i>Biodiversity</i>
April/May	“North Atlantic study claims food fish catches have declined by half despite tripled fishing effort...”		<i>Ocean Update</i>
April 30	“China's fishing fleet facing massive reduction”		<i>Fishing Boat World</i>
April 30	“Data points: fish tales” p. 30		<i>Scientific American</i>

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
April 19	“Going to the edge to protect the sea”	David Malakoff	<i>Science</i>
April 17	“Scientists urge huge reduction in North Atlantic fishing fleet”	Portland Press Herald	<i>Worldcatch</i>
April 13	“State of marine ecosystems”		CSPAN-2 Cable Programming <i>New York Times</i>
April 10	“In Mexico, greed kills fish by the seaful”		<i>Victoria Advocate</i>
April 7	“Technology blamed for fish decline”	Bijal P. Trivedi	<i>Grad Tidings</i>
April	“Fisheries Centre researchers make waves”		<i>Irish Times</i>
March 14	“Something fishy about the figures”	Dr William Reville	<i>The new West Indian</i>
March 14	“Déclin de la pêche mondiale”		<i>Vineyard Gazette</i>
March 13	“Studies show collapsing fishery wasteland”	Mark Alan Lovewell	<i>Business Week</i>
March 4	“Overfishing threatens ocean’s future”	Paul Raeburn	<i>The Grocer</i>
March 2	“Fish: Sustainability”		<i>American Scientist</i>
March/April	“Skewed skepticism”		<i>National Geographic</i>
February 26	“Cold war technology helps deplete ocean fisheries”	D.L. Parsell	<i>National Geographic</i>
February 25	“Cold war military technologies have devastated global fish populations”	Bijal P. Trivedi	<i>National Geographic</i>
February 25	“Declining fish stocks demand urgent action. To leave marine deserts would be a sin against our children”		<i>Vancouver Sun</i>
February 24	“Fish stories”	Jerry Miller	<i>New Hampshire Sunday News</i>
February 23	“All fished out”	Paul Raeburn	<i>Business Week</i>
February 23	“The effects of our past and current fishing practices on the future of the fisheries industry”		Epress.ca
February 23	“Earthweek - a diary of the planet”		<i>Vancouver Sun</i>
February 22	“Earthweek - a diary of the planet”		<i>Victoria Times Colonist</i>
February 22	“Biomass reductions in the North Atlantic on Discovery Canada”	Jay Ingram	Discovery Channel
February 22	“Fish food facts”	Kellyn Bett	<i>Environmental Science &amp; Technology</i>
February 21	“Fischbestände des Nordatlantik bedroht”	Franz	<i>agwelt.de</i>
February 21	“Commercial fishing industry is fast on its way to wiping out all the food fish in the sea”	Sheila Rogers	CBC This Morning
February 21	“Dead in the water”		<i>The Economist</i>
February 20	“Sandwich with jellyfish. Fish stocks of North Atlantic will have been collapsed by the year 2010”		<i>Eleftheria Trikalwn (Freedom of Trikala)</i>
February 20	“Ciências Pescas no Atlântico Norte podem entrar em colapso em 2025”	Ana Fernandes	<i>Publico</i>
February 20	“Fish Catches Have Declined by Half”		<i>SynEarth</i>
February 20	“R. Watson and the effects of weather on fisheries”	Oga Nwobosi	Weather Network
February 18	“Experten Nordatlantik katastrophal leergefischt”		<i>Berliner Morgenpost</i>
February 18	“North Atlantic fishery is collapsing”	Michael Smith	<i>Chicago Sun-Times</i>
February 18	“High Tech Methods Decimating Fish Populations”	Cat Lazaroff	<i>Environment News Service</i>
February 18	“International economy. Fish stocks face global collapse”	Clive Cookson	<i>Financial Times</i>
February 18	“High Tech Methods Decimating Fish Populations”		<i>Florida Museum of Natural History</i>
February 18	“Complete collapse of North Atlantic fishing predicted”	Kurt Kleiner	<i>FutureTalk</i>
February 18	“Global fish stocks” from the Financial Times		<i>Jubilee Press Review</i>
February 18	“Le poisson disparaît de l'Atlantique Nord”	Jean-Michel Bader	<i>Le Figaro</i>
February 18	“Nordatlantik völlig überfischt”		<i>meiBerlin</i>
February 18	“Cut fleet numbers to help fish stocks recover”		<i>National Post</i>
February 18	“Get ready for jellyfish sandwiches”	Margaret Munro	<i>National Post</i>
February 18	“Complete collapse of North Atlantic fishing predicted”	Kurt Kleiner	<i>NewScientist</i>
February 18	“Leere Meere: Nordatlantik überfischt”		<i>n-tv.de</i>
February 18	“Researchers Reveal Massive Reduction In Productivity Of The North Atlantic”		<i>Science Daily</i>
February 18	“Fish stocks in dire straits”	Michael Smith	<i>Vancouver Sun</i>
February 18	“Quallensandwiches”		<i>Weekly Whale News</i>

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
February 17	“North Atlantic fish stocks fading”	Beth Daley	<i>Boston Globe</i>
February 17	“Fish species facing extinction. Scientists losing battle to manage stocks”	Michael Smith	<i>Calgary Herald</i>
February 17	“Fish stocks face global collapse”	Clive Cookson	<i>Financial Times</i>
February 17	“Atlantic fishing fleets must be cut. Jellyfish may soon be the only thing left to catch”		<i>Halifax Daily News</i>
February 17	“Scientists urge huge reduction in North Atlantic fishing fleet”		<i>Portland Press Herald</i>
February 17	“Fish collapse spans Atlantic. New study calls for fleet reduction”		<i>St Johns Telegram</i>
February 17	“Fish stocks facing collapse”		<i>Toronto Star</i>
February 17	“Fishing in North Atlantic must be reduced”		<i>Zinhua General News Service</i>
February 16	“Fish 'massacre' in North Atlantic”	Jonathan Amos	<i>BBC News</i>
February 16	“Study calls for serious reduction in North Atlantic fishing fleet”		<i>Canadian Press News Wire</i>
February 16	“Ocean-wide collapse within 10 years”		<i>Earth Crash Earth Spirit</i>
February 16	“North Atlantic study reveals food fish catches have declined by half”		<i>Eureka Alert!</i>
February 16	“Le poisson disparaît de l'Atlantique Nord”		<i>La Presse</i>
February 16	“Study calls for serious reduction in North Atlantic fishing fleet”		<i>The Associated Press State and Local Wire</i>
February 16	“North Atlantic fishery collapsing”		<i>The United Press International</i>
February 16	“North Atlantic fishery collapsing”	Michael Smith	<i>Washington Post</i>
February 16	“Nordatlantik bald leergefischt?”		<i>Wissenschaft</i>
February 16	“Northwest Atlantic Ocean Needs More Protection”		<i>World Wildlife Fund</i>
February 6	“Fishy figures cast doubts on state lines”	David Wilder	<i>South China Morning Post (Hong Kong)</i>
February	“Massive Decrease in North Atlantic Fish, Researchers Report”	Coimbra Sirica	<i>American Association for the Advancement of Science</i>
February	“Complete Collapse of North Atlantic Fisheries Predicted”		<i>American Cetacean Society</i>
February	“Let the big one get away”		<i>New Zealand Federation of Freshwater Anglers</i>
February	“North Atlantic Study Reveals Food Fish Catches Have Declined by Half”		<i>Sustainable Development International</i>
January/February	“Study provides evidence of declines in global fisheries since late 80s”	Kieran Mulvaney	<i>Ocean Update</i>
January 21	“China's statistics are fishier than their oceans”	Adam Piore and Paul Mooney	<i>Newsweek</i>
January 7	“Troubled seas”		<i>New York Times</i>
January 5	“Zanimljivosti o ljudskom mozgu”		<i>Vecernjilist</i>
January 2	“Tackling the tough stuff”	Patricia Unterman	<i>The San Francisco Examiner</i>
January	“Global supply of seafood in question”	Steven Hedlund	<i>Seafood</i>
<b>2001</b>			
December 31	“Major fish stocks are in decline”	David Suzuki	<i>The Sun Herald (Biloxi, MS)</i>
December 28	“The dangers of bad fish accounting”	Reg Watson	CT Now
December 26	“Overfishing could lead to future without fishermen”	Joshua Reichert	<i>Baltimore Sun</i>
December 26	“Fischfangstatistiken entsprechen der Richtigkeit”		China Internet Information Centre
December 26	“Troubling questions on fisheries”		<i>Victoria Times</i>
December 20	“Bad fish accounting revealed”	Reg Watson	<i>Bangor Daily News (OpEd)</i>
December 20	“Statistics for China's Fishing Output Credible”		<i>Fish Chain</i>
December 19	“Statistiko pri fishkvanto de Chinio estas fidinda”		<i>China Interreta Informa Centro</i>
December 19	“China denies allegation of exaggerating fisheries catch”		China Online

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
December 18	“Fishery statistics accusation challenged	Qin Chuan	<i>China Daily</i>
December 18	“Fishing Statistics “Basically Correct”		Chinese Embassy
December 18	“Fishery statistics accusation challenged”		China-Project.com
December 18	“China rejects report of masking catches”	Joe McDonald	ESPN Outdoors
December 18	“China rejects report ...”		<i>Muzi</i>
December 18	“Statistics for China’s Fishing Output Credible”		<i>People’s Daily</i>
December 18	“China rejects claim it misreported fish catches”	Joe McDonald	<i>The Associated Press</i>
December 18	“China rejects fishing report”	Joe McDonald	<i>The Associated Press Online</i>
December 18	“China rejects claim it misreported fish catches”	Joe McDonald	<i>The Associated Press State and Local Wire</i>
December 18	“China rejects claim it misreported fish catches”	Joe McDonald	<i>The Associated Worldstream</i>
December 18	“Estadísticas sobre la producción pesquera de China”		spanish.peopledaily.com
December 18	“Official Disputes Accusation Of Misreported Fish Catches”		UN Wire
December 18	“Fishery Statistics Accusation Challenged”		Xinhua News Agency
December 17	“Innovations	Otis Port	<i>Business Week</i>
December 17	Chinese Rebuttal		NetEase
December 17	“China disputes claim it overreports fish catch”		Worldcatch News Network
December 16	“Need for effective fisheries management clear”	David Suzuki	<i>Environmental News Network</i>
December 16	“Letting the big one get away	David Suzuki	<i>St John’s Telegram</i>
December 15	“You should have seen the one that got away...!”		Access Asia
December 14	“Fréttir Rf”		Icelandic Fisheries Laboratories
December 12	“Letting the big one get away”	David Suzuki	<i>CNews Science</i>
December 12	“Over-reporting of Global Fisheries Catch ...”		<i>European Water Management</i>
December 12	“Fishing treaty takes effect	John Heilprin	<i>LA Times</i>
December 12	“A future without fish?”	Joshua S. Reicher	<i>San Francisco Chronicle</i>
December 12	“Treaty setting standards for fishing on high seas takes effect	John Heilprin	<i>The Associated Press</i>
December 11	“New study reveals underreporting of fish catch decline”		IUCN
December 10	“All the fish in China”	Thomas Hayden	US News & World Report
December 8	“China misreporting masks decline in fish catches”		Brainerdispatch.com
December 7	“Over-reporting of global fisheries catch ...”		Edie news
December 7	“Inflated Chinese Fisheries Data Masks Global Fish Decline”		Global Environment and Trade Study
December 6	“New study reveals significant decline in fish catches”		<i>Bridges Trade BioRes</i>
December 6	“Underreporting Of Fish Catch Decline”		International Centre for Trade and Sustainable Development
December 6	“Canadian Scientists Blame China for Overfishing Errors”		<i>Oceanspace</i>
December 5	“Declines in global fisheries since late '80s”		SciTecLibrary
December 5	“Fisheries reports deserve wide public debate ...”		<i>Vancouver Sun</i>
December 4	“Wild fish in danger zone - overfishing must stop”	Knut Eirik Olsen	<i>Angling News</i>
December 4	“UNESCO oceans conference underway in Paris”	Ken Coons	ITN
December 4	“Fish Numbers Decline Hidden By Inflation”	from ens.lycos.com	pl.net
December 4	“Empty oceans?”	Michael Zuzel	<i>The Columbian</i>

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
December 4	“Gone means gone, empty oceans?”	Editorial writers	<i>The Columbian (Vancouver, WA)</i>
December 3	“New evidence of declines in global fisheries since late 80s”		American Fisheries Society Mailing List
December 3	“False Reporting Throws Doubt on FAO Fisheries Forecasts”		<i>Aquafeed news</i>
December 3	“Worldwide catches declining in spite of UN estimates”	Damon Franz	Greenwire
December 3	Interview with Daniel Pauly		Fairchild Radio (AM 1479)
December 3	“Fish Catch Reports Questioned”	Rob Stein	<i>The Washington Post</i>
December 3	“Science: notebook”		<i>The Washington Post</i>
December 2	“Ocean fish catches have declined dramatically”	John Heilprin	<i>Augusta Chronicle</i>
December 2	“Le poisson chinois fausse le filet de pêche mondial”	Sylvie Briet, Denis Delbecq	<i>Liberation (Paris)</i>
December 2	“China skewing fish statistics by overreporting catches”	John Heilprin	<i>Milwaukee Journal Sentinel (Wisconsin)</i>
December 1	“China's whopper of a fish tale”	Erik Eckholm	<i>International Herald Tribune</i>
December 1	“Fish out of water”	Mark Schroppe	<i>New Scientist</i>
December 1	“Fishy data hid decline in global catch”		<i>Science News</i>
December 1	“Fishy figures”		<i>The Economist</i>
December 1	“Size of the catch turned out to be fishy”	Erik Eckholm	<i>The Sydney Morning Herald</i>
December 1	“China's whopper”		<i>The Times-Picayune</i>
December 1	“UNH dean suspects China's inflated catches mask overfishing”		<i>University of New Hampshire Alumnus News</i>
December	“Scientists predict 50% drop in global fish stocks by 2015”		Beach-caster.com
December	“R. Watson discussing global distortions of reported catch”	Kathleen Perry	CBC NewsWorld
December	“China challenges fish stocks reporting research”		unknown source
November 30	“Fishy stats hide global decline”	Anna Salleh	Australian Broadcasting Corporation Science Online
November 30	“Curses, scrubbed again”		<i>Cowlix</i>
November 30	“Fish catch figures fishy”		Cyberdiver News Network
November 30	“Inflated Chinese fisheries masks global fish decline”		Earths.net
November 30	“Fishy stats hide global decline”	Anna Salleh	Environment News
November 30	Interview with Daniel Pauly		Fairchild Radio (AM 1479)
November 30	“Natur und Wissenschaft”		<i>Frankfurter Allgemeine Zeitung</i>
November 30	“New evidence of declines in global fisheries”		<i>Infoterra</i>
November 30	“China's fishy figures conceal drop in ocean catches”		<i>San Francisco Chronicle</i>
November 30	“Over-reporting by China 'hides declining catches”	Ray Cheung	<i>South China Morning Post</i>
November 30	“World Fisheries Assessments may be Statistically Flawed”		<i>Sublegals</i>
November 30	“Statistics on catches fishy”	Claire Miller	<i>The Age</i>
November 30	“Bad data by China inflated global fishing yields”	Erik Eckholm	<i>The New York Times</i>
November 30	“Kurz gemeldet: Fischerei belastet Fischbestand stärker als vermutet”	Brigitte Kranz	<i>Wissenschaft Online</i>
November 29	Grist	Untitled	AnimalNET
November 29	“Global fish catches declining”	John Heilprin	Australian Broadcasting Corporation Radio
November 29	“China's overstatement masks decline in global fish stocks”	Simon Lauder	BBC News
November 29	“China blamed for over-fishing errors”		BBC News Asia Pacific
November 29	“China's fishy figures belie state of world's oceans”	Amy Carter	
November 29	“Chinese catch figures seem fishy to analysts”		<i>Calgary Herald</i>



<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
November 29	“Chinese misreporting masks dramatic decline in ocean fish catches”	John Heilprin	Californiainfish.org
November 29	“Chinese misreporting masks dramatic decline in ocean fish catches”		Cosmiverse
November 29	“Global fish stock is falling”		Cosmiverse News
November 29	“World's fish stocks inflated due to China's reporting”	Cassandra Szklarski	<i>Edmonton Journal</i>
November 29	“Chinese misreporting masks dramatic decline in ocean fish catches”	John Heilprin	Environment News Network
November 29	“Chinese misreporting masks dramatic decline in ocean fish catches”	John Heilprin	Environment News Service
November 29	“Inflated Chinese fisheries data masks global fish decline”		Environment News Service
November 29	“Inflated Chinese fisheries data masks global fish decline”		Eparka.com
November 29	“World's fish catches in dramatic decline”	John Heilprin	ESPN Outdoors
November 29	“U.N. data on fisheries wrong”	John Heilprin	<i>Fishing Report</i>
November 29	“Chinese misreporting masks dramatic decline in ocean fish catches”	John Heilprin	<i>Food Market Exchange</i>
November 29	“Inflated Chinese Fisheries Data Masks Global Fish Decline”		Greens NZ Regional Report for fourth week of Nov. 2001
November 29			<i>Grist</i>
November 29	“Study: China inflates fish numbers”		<i>Halifax Daily News Briefs</i>
November 29	“Catch figures fishy”	Helen Pearson	<i>Maldives Culture</i>
November 29	“World Fisheries in Dramatic and Unexpected Decline”		MarineConservation.net
November 29	“British Columbia: Fish stocks overstated: report”		<i>National Post</i>
November 29	“Controversy over the world's fishing stocks”	Bob Edwards, David Kestenbaum	National Public Radio's (NPR) Morning Edition
November 29	“Catch figures fishy”	Helen Pearson	<i>Nature Science Update</i>
November 29	“Global fisheries: Stock taking”		<i>Nature</i>
November 29	“Fish numbers decline hidden by inflation”		PlaNet
November 29	“Crisis in world fish stocks”		PlanetSave.com
November 29	“Study says bad data by China inflated global fishing yields”	Eric Eckholm	Probe International's Three Gorges Dam Campaign
November 29	“Something Fishy About Fishery Figures”		Quick Frozen Foods International News
November 29	“Chinese report hid dramatic decline in ocean fish stock”	John Heilprin	<i>South Coast Today</i>
November 29	“False reporting exaggerates fish stocks”	Cassandra Szklarski	<i>St Johns Telegram</i>
November 29	“China's inflated numbers distort worldwide fish statistics”	John Heilprin	<i>Tampa Tribune Online</i>
November 29	“Fishy numbers mask seafood decline”	John Heilprin	<i>The Advocate (Baton Rouge, Louisiana)</i>
November 29	“Fishy figures”	Natasha Loder	<i>The Economist</i>
November 29	“China's fishy tale puts global food supply in danger”	Charles Arthur	<i>The Independent</i>
November 29	“Bad data by China inflated global fishing yields”	Erik Eckholm	<i>The New York Times</i>
November 29	“Misreporting masks decline in fish catches”		<i>The Olympian</i>
November 29	“China skewing global catch?”	John Heilprin	<i>The Record</i>
November 29	“Fishy data puts China on hook”		<i>The Toronto Star</i>
November 29	“China falsifying fish figures”		<i>Vancouver Province</i>
November 29	“China accused of distorting fish catch data”	Larry Pynn	<i>Vancouver Sun</i>
November 29	“China faking fishery numbers, researchers say”		<i>Victoria Times Colonist</i>
November 29	“Chinese misreporting masks dramatic decline in ocean fish catches”	John Heilprin	Wildlife Action Group
November 28	“Fish stocks: the future is the net”		<i>Agence France Presse</i>

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
November 28	“Startling evidence of declines in global fisheries since late ‘80s”		<i>Ascribe Newswire</i>
November 28	“Chinese misreporting masks decline in ocean fish catches”	John Heilprin	<i>Associated Press</i>
November 28	“Fewer fish are being caught”	John Heilprin	<i>Associated Press Online</i>
November 28	“Global fish catches declining”	John Heilprin	<i>Associated Press Online</i>
November 28	“Chinese misreporting masks decline in ocean fish catches”	John Heilprin	<i>Associated Press State and Local Wire</i>
November 28	“Chinese misreporting masks decline in ocean fish catches”	John Heilprin	<i>Associated Press Worldstream</i>
November 28	“Startling evidence of declines in global”	from Ascribe Newswire	<i>Boston Globe</i>
November 28	“Fish stocks greatly exaggerated by false reporting from China”	Cassandra Szklarski	Canadian Press Newswire
November 28	“New Evidence of Declines in Global Fisheries Since Late ‘80’s”		Coastal and Marine Resources Newswire Mailinglist
November 28	“China masking trends in ocean-catch decline” from the Associated Press		<i>Deseret News (Salt Lake City)</i>
November 28	“Global seafood catch dramatically declined by almost 800 million pounds per year during 1990s.”		<i>Earth Crash Earth Spirit</i>
November 28	“New Evidence of Declines in Global Fisheries Since Late ‘80’s”		EurekAlert
November 28	“Slippery statistics mask declining worldwide fish population”	John Heilprin	Garden State EnvironNet
November 28	“Chinese misreporting masks decline in ocean fish catches”		King5.com
November 28	“China, UN challenged over fish”	Miguel Llanos	MSNBC (China)
November 28	“Global fish catches declining”	John Heilprin	Muzi.com
November 28	“NRDC Calls for Prompt Ratification and Implementation of International Fishing Treaty”	Statement of Lisa Speer	Natural Resources Defense Council
November 28	“UN overestimates world fish count”	Jeff Burnside	NBC Miami, ecowatch Online
November 28	“Chinese misreporting masks decline in ocean fish catches”		NorthWest Cable News
November 28	“Overreported-Fish”		RPW Broadcast News
November 28	“Slippery statistics mask declining worldwide fish populations”	John Heilprin	<i>Sacramento Bee</i>
November 28	“Response to Nature report on catch statistics”	Rod Moore	West Coast Seafood Processors Association
November 28	“Chinese misreporting masks decline in ocean resources”	from the Associated Press	WorldCatch News Network
November 28	“Fish stocks greatly exaggerated by false reporting from China”	Cassandra Szklarski, Canadian Press Newswire	Yahoo News
November 28	“Global Fish Catches Declining”	John Heilprin	Yahoo News
November 28	“Valse cijfers China maskeren dramatische dalende visstand”		YourNews
November 27	“Scientists gather for conference on resource sustainability”	Ken Thomas	<i>St Johns Telegram</i>
November 26	“Scientists gather to world conference on sustainable fisheries”	Ken Thomas	<i>The Associated Press State and Local Wire</i>
November 11	“Chinese misreporting masks decline in ocean fish catches”	John Heilprin	<i>Associated Press State and Local Wire</i>
October 1	“Le poisson chinois fausse le filet de pêche mondial”	Yves Miserey	<i>Le Figaro</i>
September 20	“Honour roll: Daniel Pauly”		<i>UBC Reports</i>
September 10	“Deep trouble”	Thomas Hayden	<i>US News and World Report</i>
September 8	“Stalking the mock turtle”	Joe Roman, Brian Bowen	<i>New Scientist</i>
May 28	“Fast forward”	Kurt Loft	<i>Tampa Tribune (Florida)</i>
May 6	Anglers slow to jump on bag-limit bandwagon	Chris Niskanen	<i>Saint Paul Pioneer Press (Minnesota)</i>
May 3	“Giving wild fish a break”	Robert C. Cowen	<i>Christian Science Monitor (Boston, MA)</i>

<b>Date</b>	<b>Event/Title</b>	<b>Journalist</b>	<b>Medium</b>
March 4	“Diesel crackdown survives opposition”	John J. Monahan	<i>Sunday Telegram (Massachusetts)</i>
February 23	“Aquaculture business booming, but at what cost?”	Margot Higgins	<i>Environmental News Network</i>
February 21	“Aquaculture may be fishing for trouble”	Cat Lazaroff	<i>Environment News Service</i>
February 20	“La pêche au bord de l’effondrement partout sur la planète”	Mathieu Perrault	La Presse.ca
February 19	“Fish farms looked upon as a better way to produce fish”	Bob Edwards, John Nielsen	National Public Radio (NPR) Morning Edition
January 27	“Cod’s last gasp”	Debora MacKenzie	<i>New Scientist</i>
Date not available	“Pesci in declino”		<i>Enel</i>
Date not available	“China Blamed For Over-Fishing Errors”		<i>Marine Environment News</i>
Date not available	“New Evidence of Declines in Global Fisheries Since Late 80’s”		Marine Fish Conservation Network
Date not available	Ecowatch		NBC Miami
Date not available	“China’s Fishy Tale Endangers Global Food Supply”	Charles Arthur	<i>Ready Meals Info</i>
Date not available	“Chinese reporting masks decline in ocean resources”		<i>Recreational Fishing Alliance</i>
Date not available	“Vast over-reporting by China to United Nations has masked falling catches”		Sport Fishing Online
<b>2000</b>			
December	“Fishing places, fishing people”	Bocking, Stephen, REV; Ommer, Rosemary E; Newell, Dianne, ED	Canadian Historical Review, University of Toronto Press, Journal Dept.
September (Issue no. 36)	“The Open Lecture at the 2000 ASC will be given by Daniel Pauly”		<i>ICES-CIEM Information (Copenhagen, Denmark)</i>
August 29	“Eating more fish”		<i>The Globe and Mail (Vancouver)</i>
August 28	“Swordfish embargo working”	William Mullen	<i>San Jose Mercury News</i>
June 23	“Trawling for survival”	Douglas Todd	<i>The Vancouver Sun</i>
June 6	“Underwater refuge and the future of fish”	Nancy Baron	<i>The Vancouver Sun</i>
May-June	“Lost Eden”	Thomas Okey	<i>E Magazine (Ohio)</i>
March 13	“Dean’s list linebacker”	Sandra Nicol	<i>Paradigm (UBC, Vancouver)</i>
March 10	“Fisheries managers predict what effect their fishing practices may have on the stocks”		Breaking News (Television)
March 9	“Computer modeling could hold answers to fishery woes”	Michael Vatalaro	<i>Environment News Service</i>
<b>1999</b>			
November 5	“Looking for bigger fish to fry”	Nancy Baron	<i>Vancouver Sun</i>
Fall	“The <i>Sea Around Us</i> Project funded by Pew Charitable Trusts of Philadelphia”		<i>Gratidings (UBC, Vancouver)</i>
September 2	“Expert to reel in facts on fishing’s ecological effects”	Andy Poon	<i>UBC Reports</i>
August 11	“Too many fishing boats on the water”	André Veniot	<i>New Brunswick Telegraph Journal</i>
August 10	“Three million for the fish”	Eric Jandciu	<i>The Ubysey (UBC, Vancouver)</i>
July 24	“UBC Fisheries Prof Gets \$2.1 Million Grant”	Andy Poon	<i>Vancouver Sun</i>

An underwater scene with a large school of fish swimming in clear blue water. A prominent white curved line, resembling a page curl, sweeps across the middle of the image from the bottom left towards the top right. The fish are mostly silver and blue, with some showing vertical stripes.

[www.searoundus.org](http://www.searoundus.org)

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