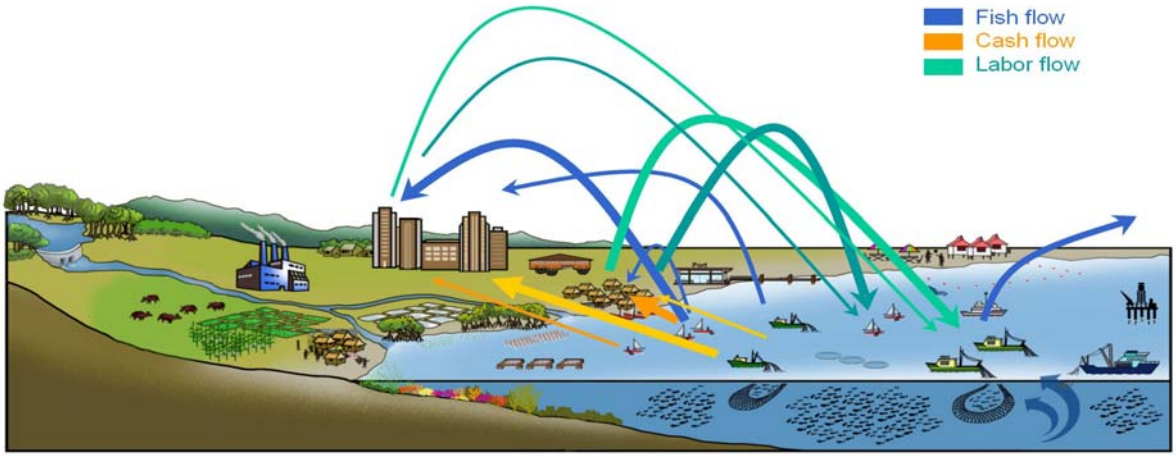

CTAM visualization tool at http://fishbase.sinica.edu.tw/report/t/page1/default.htm

Project no: INCO 003739

Project acronym: INCOFISH

Project title: Integrating Multiple Demands on Coastal Zones with Emphasis on Aquatic Ecosystems and Fisheries

Instrument: Specific Targeted Research Project (STREP)

Final Activity Report

Period covered: 01 May 2005 to 30 April 2008

Date of preparation: May/June 2008

Start date of project: 01/05/2005

Duration: 3 years

Project coordinator name: Dr. Rainer Froese

Project coordinating institution: Leibniz Institut für Meereswissenschaften an der Universität Kiel

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Publishable executive summary

incofish conducted specifically targeted strategic research towards reconciling multiple demands on coastal zones with special emphasis on developing countries. It evaluated and integrated data, tools and concepts suitable to contribute to the goals set by the World Summit for Sustainable Development in Johannesburg, such as restoring healthy fish stocks and ecosystems by 2015.

INCOFISH focused its research activities on the following issues in Integrated Coastal Zone Management (ICZM): documenting historical performance of ecosystems to deal with the 'shifting baselines' syndrome and provide sound reference points for resource restoration; providing electronic maps for all coastal species to establish authoritative species inventories and explore scenarios of global change and invasive species; creating spatial ecosystem models for the coastal systems treated in this project as a basis for understanding the resource; providing guidelines and tools for best sizing and placement of marine protected areas; researching impacts of ecotourism on coastal ecosystems and providing best-practice guidelines; identifying suitable simple indicators to promote and monitor sustainable fisheries; providing valuation of coastal ecosystem products and services resulting from different management regimes; evaluating legal instruments with regard to their usefulness for sustainable fishing in coastal zones; revisiting coastal transects as a tool for structuring and understanding multiple demands on coastal zones; and providing an archive and web portal for public access to all data and tools relevant for ICZM.

Tools and concepts resulting from INCOFISH research were tested in real-world scenarios in several large marine ecosystems around the world. To provide for maximum synergy between work packages, all INCOFISH tools and concepts have been applied in the following four ecosystems: North and Central Gulf of California, Benguela Current, Gulf of Thailand and North Sea.

Specifically, INCOFISH has accomplished the following main achievements during its three years of operation:

A user-friendly one-stop Internet portal to all data, tools, models, documents and partners in the context of INCOFISH has been launched in May 2006 at www.incofish.org. The portal has been under constant expansion and maintenance. In April 2008 portal statistics stood at 13,341 visitors per month who downloaded 13,6 GB of information. The Seafoodguide for mobile phones had over 1,500 visits per month. A Google search for “INCOFISH” returned 38,000 pages, with 15,800 pages citing the seafood guide and 1,150 citing the “Fisch im Handy” (German version of the mobile seafood guide). Google Scholar listed 66 scientific publications that cited INCOFISH. Main user countries were Brazil, Canada, France, Germany, Italy, Mexico, Philippines, Singapore, South Africa, South Korea, Sweden, Thailand, Turkey, UK, USA, reflecting INCOFISH campaigns such as the fish rulers and the mobile seafood guide in Germany, but also take-up by non-INCOFISH countries (USA, Turkey, South Korea, France), and a good take-up by developing countries. After the Services page, the glossary of ICZM terms and the International sea food guide were the most popular pages.

Highlights by workpackage are the following:

Outreach: All concepts, tools and databases produced by INCOFISH are fully available on the INCOFISH portal at www.incofish.org. and attracted well over 10,000 visitors per month.

Shifting baselines: A database with historic catch & effort data has been made available online and a special edition of a journal was dedicated to the analysis of historic data sets.

Biomapping: An online atlas with standardized electronic maps for over 8,000 species (including all commercial fishes, all marine mammals, and many invertebrates) has been created, see www.aquamaps.org. Clicking anywhere in the oceans creates a list of local species, complete with common names, scientific names, pictures and maps. Also, potentially invasive species can be shown for every spot in the Oceans. A new 'Biodiversity transects' tool allows exploring transects anywhere in the Oceans, see for example a first-ever biodiversity transect along the equator across the Indo-Pacific (Fig. 1.3). In collaboration with the workpackage on marine protected areas (MPAs) a tool for best placement of MPAs was developed.

Ecosystem modelling: 153 existing ecosystem models from all around the world were standardized and made available online. In addition, 11 new ecosystem models were created to assist in better understanding of aquatic food webs and best sizing and siting of MPAs.

MPAs: In collaboration with WP Biomapping, a new online tool has been developed that facilitates selection of best MPA placement based on the selection of species that are to be protected.

Coastal transects: An advanced version of the CTAM online tool has been developed for visualization and analysis of flows of fish, cash or labor in the coastal zone. This tool has been applied to 400 coastal areas in 35 countries worldwide.

Simple indicators: In the context of the campaign against fishing of immature fishes, fish rulers have been launched in Peru, Senegal and the Philippines. Senegal has meanwhile adopted new minimum legal landing sizes above size at first maturity, and the Philippines has started an official assessment towards the same goal. Also, an international seafood guide for mobile phones was released, accompanied by intensive media coverage. Finally, contact with large retailers was established in Germany and a Retailer's Seafood Guide was produced.

Valuation of ecosystem services: Highlights of this workpackage were the many scientific publications with uptake by the media and related impact, culminating in a briefing of the G77 group of developing countries at the United Nations Meeting on 3rd October 2007, on how to achieve and maintain sustainable fisheries.

Impact of Ecotourism: A Code of Conduct and an evaluation tool was established and made available online. Both have been adopted by a large network or marine parks, the Marine Corridor of the Eastern Tropical Pacific (CMAR).

Legal Instruments: In-depth analyses of the legal framework applying to fisheries in Europe and in six developing countries were completed, leading to a new 'legal clinic' approach towards solving the many apparent contradictions and shortcomings. To assure wide availability, these results will be published in a book distributed by IUCN.

In summary, INCOFISH outputs have exceeded expectations in most areas and media impact and uptake by NGOs and Governments has been strong. New areas of research have been opened and will be followed up in future projects.

All INCOFISH members have contributed in various ways to the successful dissemination of knowledge on ICZM, documented in 83 articles in peer-reviewed journals, 9 books, 16 book chapters, 24 scientific reports, 39 conference contributions, 6 posters, 53 online publications, 10 fish rulers, 3 newsletter article, 1 code of conduct, and at least 60 media appearances (see Annex I and II). In summary, INCOFISH has not only met but in many aspects exceeded its ambitious goals.

The incofish Consortium

The INCOFISH consortium was composed of 35 academy, private non-commercial and private commercial partners (12 European, 12 Latin American, 6 Asian, 5 African) from 22 countries worldwide, see list below.

List of INCOFISH participants (organisation name, country):

- Leibniz Institut für Meereswissenschaften (IfM-GEOMAR), Germany
- Açoes Para Preservaçao dos Recursos Naturais e Desenvolvimento Economico Racional (APRENDER), Brazil
- Empresa de Consultoria y Inversiones (CABAL, S.A.), Nicaragua
- Coastal Development Centre (CDC), Thailand
- Charles Darwin Foundation for the Galapagos Islands (CDF), Ecuador
- The Centre for Environment, Fisheries and Aquaculture Science (CEFAS), United Kingdom
- Centro Interdisciplinario de Ciencias Marinas del IPN (CICIMAR), Mexico
- Centro de Referencia em Informaçao Ambiental (CRIA), Brazil
- Centre de Recherches Oceanographiques de Dakar Thiaroye (CRODT), Senegal
- Direccion Nacional de Recursos Acuaticos (DINARA), Uruguay
- East China Normal University (ECNU), China
- Universität Bremen (Uni Bremen), Germany
- FishBase Information and Research Group, Inc. (FIN), Philippines
- Instituto del Mar del Peru (IMARPE), Peru
- International Governance Solutions Ltd. (IGS), United Kingdom
- Universita degli Studi di Padova (UNIPAD), Italy
- Marine and Coastal Management Branch of Environmental Affairs and Tourism (MCM DEAT), South Africa
- Estonian Marine Institute (MEI), Estonia
- University of Hull, Maritime Historical Studies Centre (UHULL), United Kingdom
- Nanjing Institute of Environmental Sciences (NIES), China
- Naturhistoriska Riksmuseet (NRM), Sweden
- PRIMEX Foundation for the Alternative Management of the Environment (PRIMEX-FAME), Philippines
- Prince of Songkla University (PSU), Thailand
- Fundacion Malpelo y Otros Ecosistemas Marinos (Fundacion Malpelo), Colombia
- Universidad Nacional de Colombia (UNAL), Colombia
- University of Namibia (UNAM), Namibia
- Universidad de Concepcion (Uni Concepcion), Chile
- The University of Newcastle upon Tyne (UNEW), United Kingdom
- Universitetet i Tromsoe (UiT), Norway
- University of the Western Cape (UWC), South Africa
- The University Court of the University of Aberdeen (UNIABDN), United Kingdom
- Corporacion de Promocion Universitaria /Universidad San Francisco de Quito (USFQ), Ecuador
- Kenya Sea Turtle Conservation Committee (KESCOM), Kenya
- Instituto Oceanográfico da Universidade de Sao Paulo, Brazil
- Roskilde Universitetscenter (RUC), Denmark

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Extended information on project structure and results are available at www.incofish.org.

Section 1 – incofish Objectives, Achievements and Products

The goal of INCOFISH was to conduct specifically targeted strategic research suitable to contribute to the goals set by the World Summit for Sustainable Development in Johannesburg, such as restoring healthy fish stocks and ecosystems by 2015.

The scientific and technological objectives of INCOFISH are best grouped in relation to the 11 work packages (WPs) and their objectives, achievements and products may best be summarised as follows:

Overcome the 'Shifting Baseline' Syndrome (WP2)

> To resolve the "Shifting Baseline" Syndrome in Fisheries, i.e., the fact that each generation has an increasingly distorted view of what constitutes healthy fish stocks, historical data on catch and effort, biomasses, length-frequencies, maximum sizes, size and age at maturity, growth rates, natural mortality, etc. are being assembled, collated and analysed to establish baselines against which the current status and restoration goals of key aquatic resources can be assessed. Likewise, historical data on catch and effort, production, biomasses, predator-prey interactions, flows, and habitat change will be assembled, collated and analysed to establish baselines against which the current status and restoration goals of selected marine ecosystems can be assessed.

Contractors involved: UHULL - UK (WP2 leader); CDF – Ecuador; CEFAS - UK; RUC – Denmark; IMARPE – Peru; MEI –Estonia; UNAL – Colombia: UNIABDN – UK.

INCOFISH Workpackage 2 has assembled historical data relating to fish stocks and fisheries in 10 large marine ecosystems (LMEs) across the globe. These have been validated, edited and entered into datasets, which, together with supporting documentation and metadata, are openly available on the INCOFISH WP2 Data Pages at http://www.hull.ac.uk/incofish.

One highlight are the data on stocks of Peruvian hake in the Humboldt Current LME collected and processed by IMARPE. Comprising WP2 Dataset 55, these data are presented visually by virtue of a summary "BackFlash" file (flash animation) constructed in conjunction with WP1 (see below). This is readily accessible on the INCOFISH website at http://incofish.org/Workpackages/WP2/backflash_spatial.php.

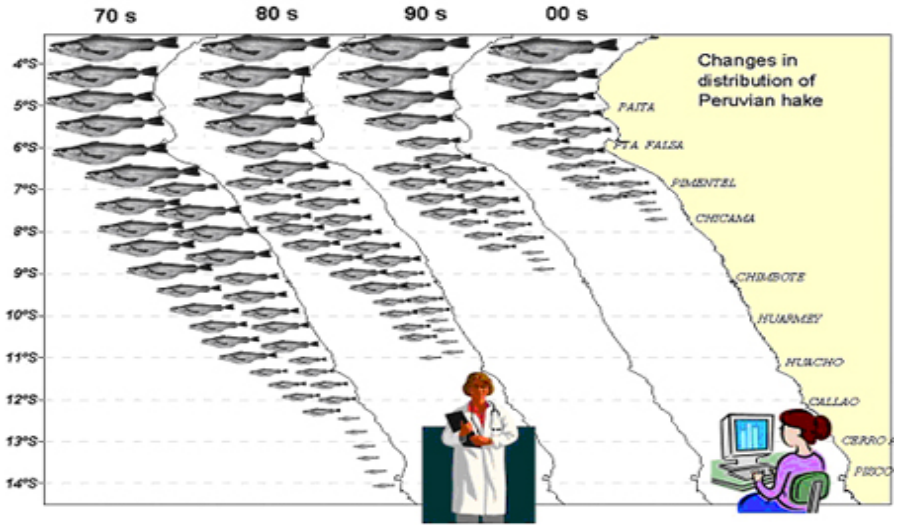


Figure 1.1: Changes in Peruvian Hake abundance and distribution from 1970-1990.

Provide Authoritative Species Inventories (WP3)

INCOFISH used biogeographic niche modelling to define the preferred environmental conditions for key marine coastal-zone species. This specific niche information was then being used to create standardised electronic maps of predicted distributions for all coastal zone species. The maps and related tools are freely available on the Internet with an easy-to-use interface.

Contractors involved: NRM – Sweden (WP3 leader); CDF – Ecuador; CEFAS – UK; DINARA – Uruguay; KESCOM – Kenya.

The Biodiversity Mapping has been successful in combining a large dataset of marine occurrences made available by FishBase, GBIF, and OBIS, to document actual and model predicted distribution of more than 8,000 species of finfish, aquatic mammals, and invertebrates. Models also describe predicted change according to a climate change model provided by the IPCC for 2050, seasonal variation, and invasiveness. The algorithm used (AquaMaps) has been thoroughly tested against other niche modelling algorithms. AquaMaps outputs compare well to the existing methods tested and inclusion of expert knowledge results in a general improvement in model outputs. The transparency, speed and adaptability of the AquaMaps system, as well as the existing online framework in which expert changes can be saved are proposed as additional benefits for public and research use alike. The graphical interface also provides all background data, including environmental parameters, and lists of species occurring at each point.

Clicking anywhere in the oceans creates a list of local species, complete with common names, scientific names, pictures and maps. Also, potentially invasive species can be shown for every spot in the Oceans.

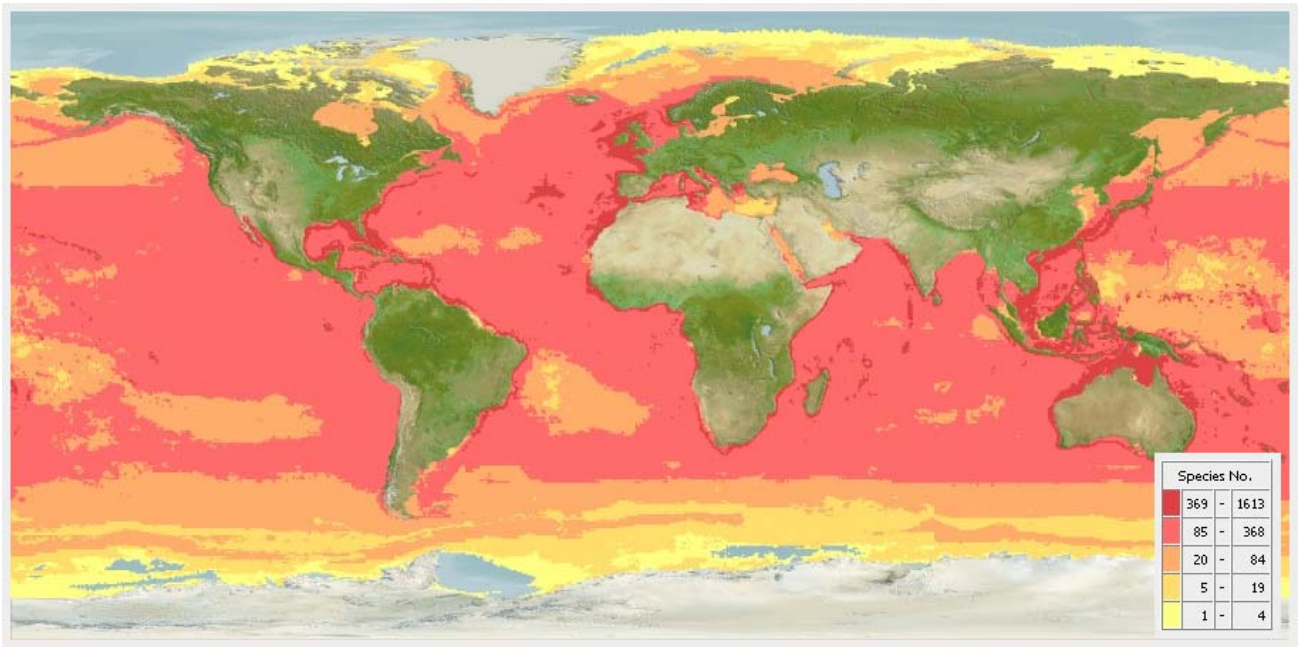


Fig 1.2: Global fish biodiversity map produced by the Biodiversity Mapping Workpackage and available from www.aquamaps.org

A new 'Biodiversity transects' tool allows exploring transects anywhere in the Oceans, see for example a first-ever biodiversity transect along the equator across the Indo-Pacific (Fig. 1.3).

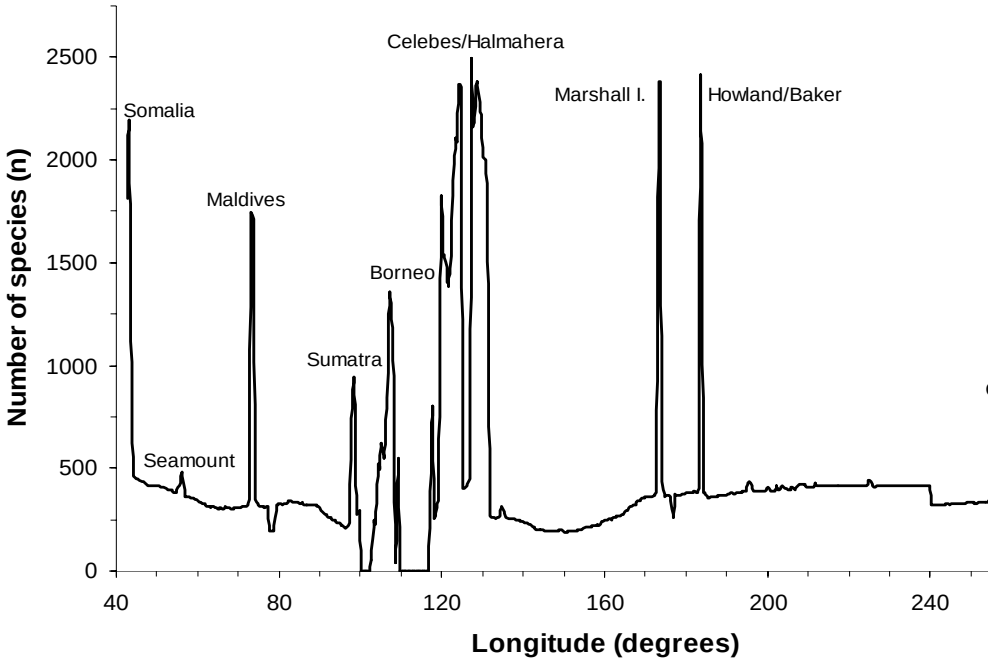


Figure 1.3: Preliminary species richness transect across the Indo-Pacific Ocean along the equator.

Provide Ecosystem Models (WP4)

INCOFISH provided multispecies models as well as the underlying data for more than 10 strategically selected large marine ecosystems with a focus on Asia, Africa and South-America. These models draw on INCOFISH data such as species inventories and biomasses; in return they provide crucial inputs for sizing and siting of protected areas.

Contractors involved: CICIMAR – Mexico (WP4 leader); CEFAS – UK; CRODT – Senegal; ECNU – China; IOUSP – Brazil; MCM-DEAT – South Africa; UNIPAD – Italy; Uni Concepcion – Chile; UNEW – UK; UNIABDN – UK.

A collection of 153 Ecopath models were made available on the INCOFISH portal at www.incofish.org/Workpackages/WP4/WP4Downloads.php.

Deep analysis of modelling of ecosystem dynamics through Ecosim was carried out particularly with regard to the fitting process, including both validation and sources of variation. One publication on this topic was submitted and further collaboration focusing on climate change was suggested.

Consistent advances were made with spatial modelling through Ecospace. Formal applications were compared for about 15 ecosystems. The placement and sizing of marine protected areas was incorporated (by WP5) and hypotheses tested. A relevant issue was model validation since this approach was intended to make models robust for practical applications.

One of the main contributions was made with regard to the supply-demand balance concept which was strongly expanded and applied to a number of ecosystems. Two approaches were developed, one based on internal flows of energy (using about 50 ecosystem models), and the second based on holistic ecosystem attributes (based on 100 models). The theory behind this concept was strongly supported and practical applications for the near future were also discussed.

A number of ecosystem indicators have been proposed for trophic networks in the literature, some based on topological properties of ecosystems, others on functional aspects (thermodynamics), but also those originating from information theory. We initiated a strong effort on their characterization based on robustness and comparative analysis underlying ecosystem processes.

Assist in Sizing and Siting of Marine Protected Areas (WP5)

> INCOFISH aimed at providing best-practice concepts as well as tools for improved planning of MPAs, with a view of reconciling conflicting demands.

Contractors involved: UNEW – UK (WP5 leader); CEFAS – UK; CICIMAR – Mexico; NIES – China.

WP5 examined optimal size and placement of MPAs through (1) review of existing MPAs in four prominent Large Marine Ecosystems and (2) use of ecological models.

(1) Despite theoretical benefits, implementation of MPAs can be problematic. Size, location and regulations of MPAs can be watered down through lobbying prior to MPA designation and non-compliance with MPA regulations is common. A simple population model shows how 'bad' MPAs will fail to fully achieve their objectives (Le Quesne, submitted). Both the socio-economic and bio-physical aspects of design need attention to ensure successful MPA implementation.

(2a) Single species population modelling revealed that optimal use of MPAs for single species fishery management depends on behavioural and life-history characteristics of the target species and on the nature of the fishery. Whilst MPAs are often not considered part of an optimal strategy for single species management, when mortality of below minimum-landing-size individuals was introduced into simulations MPAs were always predicted to be part of optimal management (Le Quesne et al. 2007).

(2b) Under different levels of fishing mortality, optimal MPA size can vary between 0 and 80% coverage depending on the extent of mobility and mortality. Thus, in a multi-species fishery, small MPAs can enhance low mobility stocks while little impacting more mobile species, however the reverse is not true (Le Quesne and Codling, submitted).

(2c) Spatial ecosystem modelling outputs ranged from win-win to lose-lose effects on fisheries, diversity and ecosystem structure. The system of trade-offs associated with MPAs was more complex than generally considered, including conflicts not only between fisheries and conservation but also between different sectors within fisheries and among conservation objectives (e.g. conserving a specific threatened species vs. maximising system wide biodiversity).

This work has found that whilst much of the promise of MPAs may hold true in some circumstances it will not always be the case that MPAs can provide consistent benefits, and supports the observation that optimal MPAs will have to be designed on a case by case basis.

In collaboration with WP3 a tool for best placement of MPAs was developed (see www.aquamaps.org/tools/aquamaps/tools/mpa_wizard/details.htm).

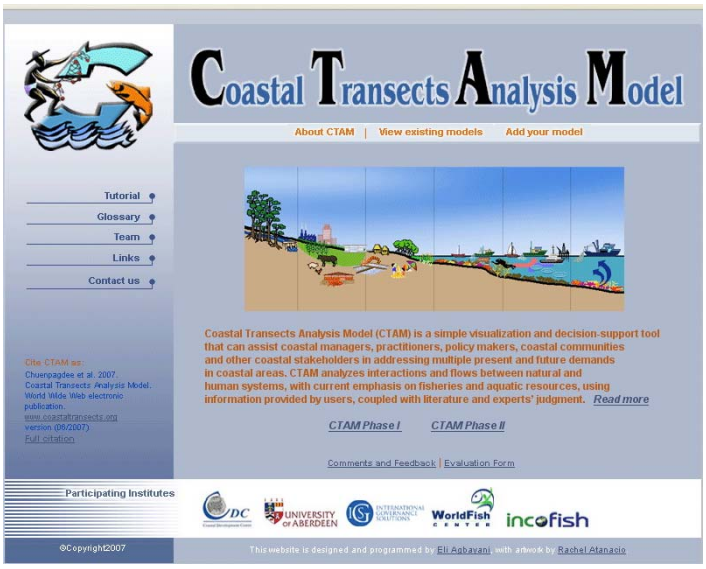
Provide Framework and Tools for Analysis of Interactions and Flows in the Coastal Zone (WP6)

> INCOFISH aimed at developing a framework for compilation and analysis of data relevant to the understanding of interactions, impacts and flows in the coastal zone from mountains

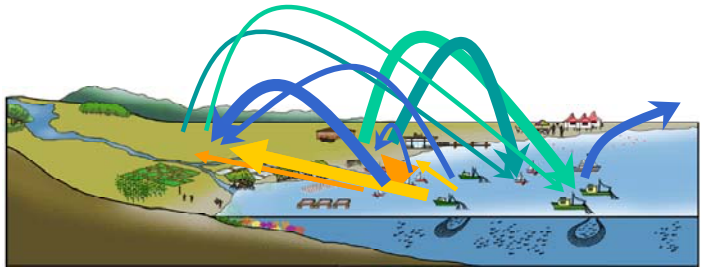
to the continental shelf. The ultimate goal was to provide coastal managers with a decision-making framework and communication tool for integrated coastal zone management.

Contractors involved: CDC – Thailand (WP6 leader); IGS – UK; UNIABDN – UK.

CTAM, the Coastal Transect Analysis Model, is the main product of WP6. CTAM is an on-line, interactive tool for the analysis of coastal interactions and flows. Currently, there are over 400 models for 35 countries in the database: 42% are beach, 17% are estuary, 14% are lagoon, 10% are delta, and the rest are other coastal types. These models are available for anyone to view and download. Users with detailed information can proceed to Phase II, and after data input, they will get a figure showing the interactions and flows of biomass, cash and labor. A 'governability index' is being added to the software to provide an analysis of how governable a coastal area is, based on the extent of habitats, fishing and other coastal activities. For example, areas with few habitats, heavy fishing and lots of other activities will be difficult to govern. This implies that special care is required in the management and governance of resources, thus the 'red light' (see bottom of Figure 1.4). On the other hand, it will be easier to manage areas with lots of habitats, light fishing and few activities. Habitats, in this case, are considered as contributing to making the area productive and thus more resilient to high fishing pressure and other coastal demands.



CTAM Homepage
www.coastaltransects.org



Final figure showing interactions and flows

Governability index

Figure 1.4: Coastal Transect Analysis Model

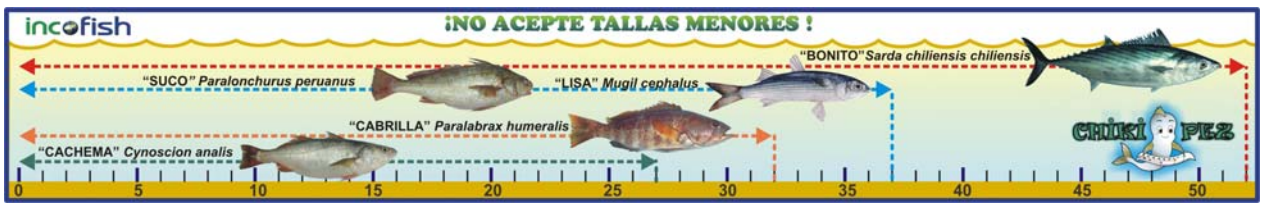
Provide Simple Indicators for Sustainable Resource Use (WP7)

> INCOFISH aimed at providing indicators such as degree of resilience to exploitation or natural disturbances. The goal was to focus on simple indicators that allow participation of the public in resource management and that have the potential to end overfishing.

Contractors involved: IfM-GEOMAR – Germany (WP leader); CABAL S.A. – Nicaragua; CDF – Ecuador; CRODT – Senegal; IMARPE – Peru; MCM-DEAT – South Africa; PSU – Thailand; UNIABDN – UK.

INCOFISH Workpackage 7 developed, publicized, and made public "fish rulers," illustrating the minimum sizes to be respected when purchasing fish in order to discourage the trade in juvenile fish at the market. Fish rulers were developed in Germany, Peru, Senegal, and the Philippines, and an online "Fish Ruler tool" was made available on the INCOFISH web portal. Later, an "International Seafood Guide" was developed, and redesigned for a mobile phone interface in cooperation with WP1. The International Seafood Guide is a compilation of all available seafood advice, brought to mobile phone using seafood lovers in one easy to use tool. Integrated into this tool is also the "Fish Ruler tool" for species where the necessary size information is available. Also, there are links back to the original sources of the seafood advice and FishBase, for more information on the seafood species in question.

The fish ruler concept and products were great successes for WP7, sparking both applause and controversy, both indications that people were indeed taking notice of the message we were aiming to convey. The public, fish industry, and NGO conservationist communities were all supportive and contributed to the success.
Tools such as the International sea food guide, Don´t eat baby´s tool, ‚Retailer´s sea food guide (especially designed for sea food retailers) may be found at the service page of the INCOFISH portal (www.incofish.org).



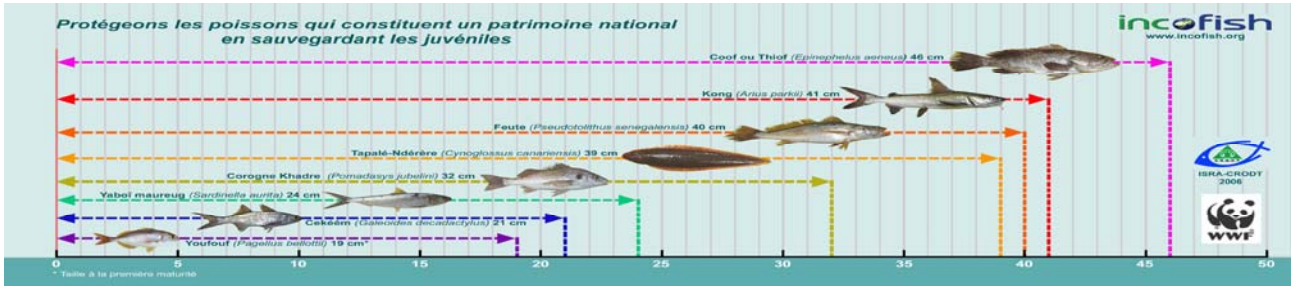


Figure 1.5: Examples of fish rulers (on top – Fisch-O-Meter / Germany, middle – Chikipez / Peru, bottom – Panukat Isda / Philippines)

Figure 1.6: International seafood guide for mobile phones at www.seafoodguide.mobi.

The International Seafood Guide for mobile phones, compiles all available seafood advisories and allows consumers to access them through an easy-to-use mobile phone interface. With just a few clicks, users can get advice on whether a certain seafood can be enjoyed without jeopardizing its future as a food source or harming the environment. Clicking on the ruler icon will alert users to the smallest acceptable size for the seafood (whole, headless, or fillet) to be respected in order to assure the fish was not caught before it could spawn. The tool addresses consumers in 17 countries (see flags).

Valuation of Coastal Ecosystem Services (WP8)

INCOFISH employed state of the art methodologies to assign values to products and services of coastal ecosystems. This allowed valuation of sustainable versus unsustainable management regimes and thus provided the public and politicians with the information needed to combat unsustainable management.

Contractors involved: UNAM – Namibia (WP8 leader); CDC – Thailand; PRIMEX-FAME – Philippines; UiT – Norway; UWC – South Africa.

WP8 is glad to say that it has more than met all its objectives. For instance, it has produced 40 papers compared to 5 papers set in the project objectives.

Some key findings, policy implications drawn from the work of WP8 are:

Even today, fisheries development simply means more boats and more people out fishing. Instead of this, we suggest that modern fisheries development should be seen in terms of maintaining and rebuilding overfished stocks such that they can continue to produce benefits to both current and future generations in a sustainable manner. Modern fisheries management should seek to optimize the net benefits (in a broad sense) from each unit of fish taken from the ocean, that is, we should focus on quality rather than the current emphasis on the quantity of fish caught. We proposed three foundations of modern fisheries development to be (i) know the state of your fish stocks and ecosystems; (ii) know the value (in a broad sense) of your fishery resources; and (iii) strengthen

fisheries management, especially, monitoring, control and surveillance. Without these three foundations, fishing nations, especially developing countries, cannot hope to sustainably manage the fishery resources in their waters (Sumaila, 2007);

We developed an ex-vessel global fish price database, which was used to determine spatially-specified landed values for all commercially traded fish caught by all maritime countries of the world from 1950 to the present (Sumaila et al., 2007). From this study, we discovered that global fish values peaked in the mid 1980s, and have since been declining.

We developed a number of indicators of fisheries mismanagement including fisheries subsidies (Khan et al., 2006; Sumaila et al., 2007; Sumaila and Pauly, 2007). From this work we derived the following policy implications: the use of subsidies to stimulate fishing is still prevalent in many coastal fishing countries. The effect of most of these subsidies is to encourage overfishing, with the attendant threat to the sustainability of the resource. Subsidies to the fishing sector used to make some sense when the oceans were full of fish, which is no more the case. Hence, the resources devoted to subsidies will be more beneficial to society if they were used to, for example, strengthen the education of fishers so they will be equipped to find land-based alternative means of livelihood. The main message here is that fishing nations should refrain from giving harmful subsidies that lead to overfishing.

All results and products of WP8 are available at
www.incofish.org/Workpackages/WP8/WP8Downloads.php.

Evaluate Pros and Cons of Ecotourism (WP9)

> INCOFISH analysed benefits and problems associated with ecotourism in selected MPAs in order to produce best-practice guidelines for what may be termed 'sustainable ecotourism.'

Contractors involved: CDF – Ecuador (WP9 leader); Fundacion Malpelo – Colombia; USFQ – Ecuador.

Workpackage 9 (WP9), Impact of Ecotourism proposed a hierarchical Criteria and Indicator System (C&I) composed of four main aspects integrated by Principles, Criteria and Indicators.

These aspects refer to: (a) Conservation of Biodiversity, (b) Visitor Experience, (c) Socioeconomic benefits and (d) Management Capacity and they are extracted from a definition for Marine Ecotourism proposed by WP9 at the very beginning of the process:

Ecotourism is a tourism alternative specialized in marine and coastal areas. Its entertainment goal is based on interpretative and educational activities, seeking to satisfy visitors through the observation of organisms and the interaction with landscapes under precautionary principles and adaptive management. It constitutes an opportunity for conservation as it generates sustainable socioeconomic alternatives for local actors and financial benefits for the management of the marine areas.

The C&I system was created as a framework for conservation and management purposes not only of marine protected areas but for marine areas in general. It is expected, however, that the definition can be wide enough to represent the principles of the Ecosystem Scope (UNESCO 2000), which exalts ecotourism as a mechanism in which people and management practices are at the center of decision-making processes, and balance between conservation and use of biological diversity are mandatory in the middle of multiple users.

The C&I System integrates five principles, six criteria and 12 indicators. Indicators were selected after testing them through their application in four Marine Protected Areas of the Eastern Tropical Pacific: Machalilla National Park and Galapagos Marine Reserve, in Ecuador, as well as Sanctuary of Fauna and Flora Malpelo and Gorgona National Natural Park, in Colombia.

Information for each indicator was collected through monitoring protocols and indicators were evaluated individually according to pertinence, feasibility, clarity, comparability and reliability, using a standard evaluation form. The information for the indicators was collected during 10 months in 2007. Improvements to the protocols were made after their application.

A step-by-step tool (www.incofish.org/Workpackages/WP9/Tourism_Impact.php) was developed as a practical element of the C&I System directed to marine area administrators worldwide. It provides improved protocols to users and allows them to evaluate the performance of any specific marine area in the world in terms of quality of its ecotourism management system by analyzing the performance of the 12 indicators against threshold values to be determined for each marine area. The application of this tool allows users to determine the level of accomplishment for each aspect and the quality of the management system in the system in terms of its sustainability. This quality is expressed as Ecostars (0 to 5). The C&I System and its tool allow comparisons at spatial and temporal levels.

Review Legal Instruments Relevant for Sustainable Coastal Resource Use (WP10)

> INCOFISH analysed and evaluated the legal framework relevant for sustainable resource use, taking account of legal structures that may increase pressure on resources, relate to the management of the resource, or provide for sharing of benefits from the resource.

Contractors involved: UniBremen – Germany (WP10 leader); APRENDER – Brazil; UNAM – Namibia.

WP10 elaborated five in-depth country reports studying and evaluating fisheries management in countries bordering the major oceans of the earth, including Mexico, Brazil, Namibia, the European Union, Kenya, and Indonesia. The country reports are designed to instigate legal and political debates on reforming fisheries management within the respective countries. In addition, a study focussing on the substance and national implementation of international standards relating to EEZ fisheries was produced. Building on this material an analytical tool was developed for what we call 'legal clinic for fisheries management,' i.e., a methodology of diagnosing drawbacks in existing management systems and developing proposals for reform. Twelve rules of good fisheries governance are suggested as guidance for the legal clinic exercise.

Figure 1.7

Provide Access to Relevant Data, Tools, and Concepts (WP1)

Data, tools, and concepts created by INCOFISH or otherwise relevant to integrated coastal zone management were made accessible through a user-friendly web portal.

Contractors involved: FIN – Philippines (WP1 leader); CRIA – Brazil.

The Workpackage 1 "Data, Tools, and Outreach" provided data, tools, and Internet outreach services for the other INCOFISH workpackages. Most of this is available from the search page (see Figure 1.8 below) of the project portal at http://www.incofish.org/.

The tools developed for INCOFISH cover a wide range of applications, from management assessment tools such as CTAM and data providers such as Shifting Baselines search engines to layman user-friendly International Seafood Guide available through Internet enabled cell phones. Some examples are given below. For a full overview of available tools see Annex I under "Online publications and tools" or go to http://www.incofish.org/Results/Tools.php.

International Seafood Guide –
The International Seafood Guide compiles all available seafood advisories and allows consumers to access them through an easy-to-use mobile phone interface. Users can get advice on whether certain seafood can be enjoyed without jeopardizing its future as a food source or harming the environment. Clicking on the ruler icon will alert users to the smallest acceptable size for the seafood (whole, headless, or fillet) to make sure the fish was not caught before it could spawn.
http://www.incofish.org/isfg.php
http://seafoodguide.mobi/

Species Information Service
The Species Information Service provides a wide window to search and verify the validity of scientific names. Using valid names ensures that accurate and appropriate biological and ecological information (all that is known and published) are associated to the correct species. The user is provided with a summary page and thematic data currently available in FishBase, including photos and distribution maps. Thus, the information delivered by this service translates to meaningful and significant analysis for conservation management, biodiversity inventories, trade, nomenclatural studies and others. This service draws its information from the Catalogue of Life Annual Checklist www.catalogueoflife.org for the scientific and common names, and from FishBase www.fishbase.org for all biological and ecological information known for the species. http://www.incofish.org/Results/Speciesinfo.php.

CTAM
Coastal Transects Analysis Model (CTAM) is a simple on-line visualization and decision-support tool that can assist coastal managers, practitioners, policy makers, coastal communities and other coastal stakeholders in addressing multiple present and future demands in coastal areas. CTAM focuses on the interconnectedness between fisheries and aquatic ecosystems and humans using three main flows (i.e. biomass, cash and labour).
http://www.incofish.org/CTAM/default.htm

Aquamaps
AquaMaps is an approach to generating model-based, large-scale predictions of where marine species are currently known to occur naturally. Species distribution maps, currently including fishes, invertebrates and marine mammals, are constructed from estimates of species environmental tolerances for depth, salinity, temperature, primary productivity, and their association with sea ice or coastal areas. The maps are color-coded to show the relative likelihood of a species to occur in a global grid of half-degree latitude / longitude cell dimensions. This corresponds to a cell area of about 3000 km^2 near the equator. Predictions are generated by

matching species tolerances, termed environmental envelopes, against local environmental conditions to determine the relative suitability of a specific area in the ocean for a given species. http://www.aquamaps.org.

Fish rulers
The Panukat Isda (Fish ruler in Pilipino) is one example of the simple, user friendly tool for advanced fisheries management called fish ruler. In its simple way it helps sustainable fisheries development by highlighting the importance of allowing fish to grow to adulthood and reproduce before they are caught. At spawning age fishes have grown to a certain length called the "length at first maturity", this length varies for different fish species. Fish that are shorter than length at first maturity have not yet spawned since they haven't reached maturity. To ensure future supply of fish, the need is grave to make sure no catches of immature fish are made, that is; fish shorter than the length at first maturity. If the fish have no children, your children will have no fish.
http://www.incofish.org/Workpackages/WP7/WP7Fishrulers.php

Fish ruler wizard
One step by step tool to Fisheries management is the fish ruler wizard, „Don't eat babies" where users may construct their own fishruler, selecting species and drawing data on their length at first maurity from the background database. Images are also provided from the database and the result is a prototype fish ruler that users may utilize.
http://www.incofish.org/DontEatBabies.php

Bringing it All Together (WP11)

> A combination of accommodating coordination with strong leadership was to ensure that the components of INCOFISH came together and formed a comprehensive package with the potential to improve integrated coastal zone management.

Contractors involved: IfM-GEOMAR – Germany (WP11 leader).

On the scientific side, good coordination and leadership was confirmed by the high level of scientific accomplishments reflected in 83 articles in the primary literature. On the administrative side, good housekeeping in a project involving 35 contractual partners in 22 countries worldwide was confirmed by efficient and flexible distribution of resources, resulting in all deliverables being achieved and well over 90% of the available funds being spent on projected tasks. Meanwhile INCOFISH has been rated a 'star' project by EC officers, and a special feature on INCOFISH has been produced by EuroNews Futuris, with 22 broadcasts in 7 languages. Also, INCOFISH was one of the few projects show-cased by the Commission at the Conference on Biological Diversity in Bonn on 19 May 2008, because of the demonstrated link between basic and applied research with respect to sustainable use of ecosystem services.

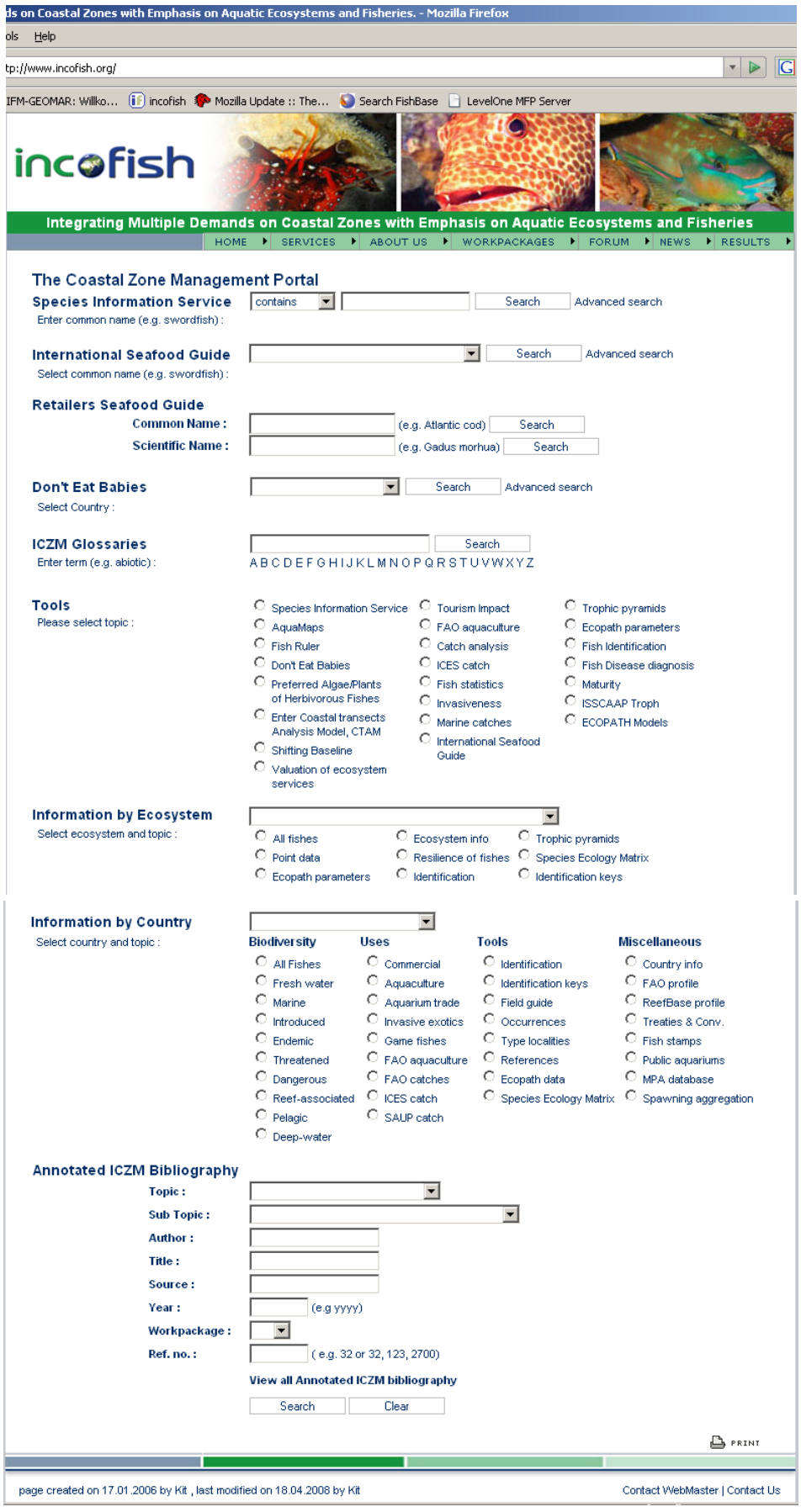


Figure 1.8: The “Services” page on the INCOFISH portal.

Figure 1.9: INCOFISHers at the Mid-Term workshop in La Paz, Mexico, in March 2007.

Section 2 – INCOFISH Impact

Measuring impact at the end of a project that lasted only for three years is not a trivial matter, because much of the impact will show up only after a time-lag of 2-3 years. So here is what can be deducted from data available in early June 2008:

1. A search in Google for 'INCOFISH' results in 37,500 pages containing that term, including obviously pages from our own portal and web pages of INCOFISH members, but that can not account for the high number. Many other citations stem from partners, other ICZM web pages, and take-up of INCOFISH tools and themes by the media and by web pages run by lay persons.
2. A search in Google Scholar results in INCOFISH citations in 66 scientific publications, again mostly by INCOFISH members but also already by other colleagues.
3. The INCOFISH portal has over 10,000 visitors per month, in addition to several thousand monthly users of main INCOFISH products such as AquaMaps and the mobile Seafood Guide.
4. A large Internet company that is not to be named here (non-disclosure agreement) has contacted INCOFISH and expressed interest in inclusion of AquaMaps products (list of species for any spot in the Oceans) for their geographic information service. Respective negotiations are underway.

5. The German consumer agency (Verbraucherzentrale) has picked-up the fish ruler idea and has produced several thousand copies for distribution through their outlets in all major German cities.
6. After a successful fish ruler campaign in Senegal the responsible minister signed a decree setting size at first maturity as the minimum legal landing size for the main commercial species. After a similar campaign in the Philippines, the authorities there are pursuing a similar path. In Peru an NGO picked up the production of fish rulers for five regions.
7. The association of German retailers (HDE) invited a presentation of INCOFISH and asked for guidance in purchasing fish from sustainable fisheries. In response we developed the Retailer's Seafood Guide available at www.incofish.org.
8. The Coastal Transect Analysis Model has been adopted by the Ecosystem-Based Management Tools Network (www.ebmtools.org).
9. The invasive species tool has been incorporated into the Global Invasive Species Information Network (GISIN, see http://www.gisinetwork.org/).
10. Iceland is considering a funding proposal through INPESCA and Ramsar to take over the monitoring of the INCOFISH indicators and continuing the work at Bluefield Bay (Atlantic coast) in Nicaragua. The baseline we have established for the biological, ecological and socio-economic aspects of sustainable artisanal fishery management have been incorporated into the Bluefields Bay Ramsar Management Plan that is being coordinated by the Bluefields Municipal Environmental Unit and the INPESCA delegation for Bluefields.
11. Our Code of Conduct has been officially distributed to guides and ship owners by the Galapagos Marine Park Authorities. Also, based on our Code of Conduct, the Fundacion Malpelo in Colombia has developed a 'Code of Good Practise' for the fauna and flora of the Malpelo sanctuary.
12. The Criteria and Indicator System for sustainable Ecotourism is now being implemented in Coco´s Island Marine Conservation Area, Costa Rica, as part of the requirements for members of the Eastern Tropical Pacific Corridor (CMAR). The part of the INCOFISH website relevant to Ecotourism, with all its information and the step-by-step tool, will be shifted to the CMAR portal and will be available for administrators of marine areas worldwide.
13. The direct impact of INCOFISH members on other scientists, politicians and the public through over 60 media events is documented in Annex I.

Benefits to SMEs

There were two key benefits for the involvement of SMEs in the INCOFISH project. Firstly, the interaction with leading professionals and institutions in the field of ICZM on a global scale. This allowed the free exchange of ideas and knowledge between project participants ensuring that the latest trends and issues in the field became known. Second, the interactions allowed SMEs to innovate through the application of lessons learned from INCOFISH to be applied to commercial projects being undertaken by the company.

Appendix 1 – Plan for using and disseminating the knowledge

Section 1 - Exploitable Knowledge and its Use

Most of the knowledge in the form of data, tools and concepts developed by INCOFISH has potential for commercial exploitation in consulting companies specializing in, e.g., restoration of depleted fisheries, planning of marine protected areas, establishing or improving marine parks, restructuring the legal framework of fisheries, improving integrated coastal zone management, or providing training in these areas. Such companies can either use data, tools and concepts directly as published in the scientific literature and in the INCOFISH portal, or they can contact the respective authors or work package leaders if more direct assistance is required. The respective INCOFISH partners have not expressed interest in pursuing commercial exploitation themselves.

AquaMaps
One exception from this general outcome are the concepts, tools and databases developed in the context of WP Biomapping. Here, the involved INCOFISH partners are seeking partnership with industry to develop a variety of new services described below. Basically, the portal developed by the WP Biomapping partners (www.aquamaps.org) provides a proof-of-concept to predict, for any place in the global Ocean, (i) the species that occur there, (ii) the species than can persist there if introduced, and (iii) the species that may occur there in the future if current climate trends continue.

Exploitable knowledge in AquaMaps
The exploitable knowledge in AquaMaps are (i) the algorithm for creating range maps, (ii) the required source databases, (iii) and the various tools that draw on this information for a variety of purposes, such as prevention of invasive species or planning of marine protected areas.

Exploitable products or services
AquaMaps currently focus on marine organisms, but the approach can be applied directly to terrestrial systems, as has already be shown in several examples. Here, a set of new services can be provided through mobile phones, around the general theme of (re)connecting people with the living World. Modern mobile phones are aware of the current locality of its user. They have colour screens with Internet connectivity and can upload photos, videos and sound-bits with date, time, coordinates, and additional information provided by the user. All of this can easily be handled by any phone user with a basic understanding of the device. We therefore have all necessary building blocks for an interactive global species information system running on cellular phones, providing unprecedented, real-time, accurate information about the species that are likely to occur around the cell phone user, and at the same time receiving information from the user to further improve the system.

Services Provided by a Global Species Information Service for Mobile Phones
The system described so far can provide the following new services:

1) *What species are currently around me?*
A realistic real-time prediction of the most common species that a mobile phone user may see or hear, with photos, sounds, maps, general info, etc.

2) *What species is this?*
A simple system to identify species (flowers, insects, birds, ...) and learn about their properties (is this plant poisonous?).

3) *Where can I see a squirrel?*
A guide to the next locality where a certain species may be found in the wild.

4) *I want to report this species!*
A simple system where photos, sounds, videos and identifications can be uploaded with minimal effort, as input for scientists who monitor occurrences of species, and as core for user groups around their favourite species.

Technically, all of the above is already doable with modern mobile phones and there are sites like MySpace, Facebook, flickr, ovi etc. offering what looks like similar services. However, providing an online interface will not suffice to have the described services emerge purely from user interactions. Species have many names and are easily misidentified. Information attached to the wrong species is misinformation, worse than no information. We therefore believe that a scientific backbone such as established by AquaMaps is required to provide above services and make them more than guess-work.

Sectors of Application
We believe that natural partners for developing the above services would be one or several mobile phone companies, such as Nokia, Sony-Ericsson, O2, or Vodafone. Alternatively, we could also imagine large IT companies such as SAP running not only the accounting systems of large companies, but also of the living World. Basically, we are looking for one or several major sponsors who would show as the 'brought to you by' sponsor whenever the services are used. We estimate annual cost for the services at €1- 5 million. We believe that the benefits for the sponsor gained from positive branding will far outweigh these costs.

Timetable for commercial use
The service for marine species is basically ready (June 2008) and can be made available from mobile phones within 6 months. A first simple service for the best-known terrestrial species can be developed within 12 months. A more sophisticated service including less-common species will take 2-4 more years, depending on funding. We are aiming for a long-term partnership of, e.g., 10 years.

Patents or other IPR protection
We consider the AquaMaps algorithm as open source code. We are not concerned about misuse or pre-emptive use by others because the unique underlying biological databases which are essential for the algorithm are developed and maintained by us and are under a Creative Commons CC-By-NC licence, i.e., no commercial use without explicit consent from us. Duplicating theses databases would take years.

For example, the copyright of FishBase reads: "Copyright (CC-BY-NC): You are welcome to include text, numbers and maps from FishBase in your own web sites for non-commercial use, given that such inserts are clearly identified as coming from FishBase, with a backward link to the respective source page. Photos and drawings belong to the indicated persons or organizations and have their own copyright statements. Photos and drawings with CC-BY or CC-BY-NC copyrights can be used without further permission, with full attribution to the person or organization and the indication 'from FishBase'.

Partners involved
Main partners in the development of AquaMaps data, tools and concepts were the overall Coordinator, IFM-GEOMAR Germany, NRM Sweden and FIN Philippines. Contact for inquiries is the Coordinator, Rainer Froese, IFM-GEOMAR, rfroese@ifm-geomar.de.

Section 2 – Dissemination of knowledge

All INCOFISH members have contributed in various ways to the successful dissemination of knowledge on ICZM, documented in 83 articles in peer-reviewed journals, 9 books, 16 book chapters, 24 scientific reports, 39 conference contributions, 6 posters, 53 online publications, 10 fish rulers, 3 newsletter article, 1 code of conduct, and over 60 media appearances (see Appendix 2 and 3).

The foreseen persistence of INCOFISH data, tools and concepts beyond the end of the project has been described in Section 3 of the main text above. Completed as well as future activities with their actual or planned date are shown in the table below.

Appendix Table 1: Dissemination of knowledge

The Table below gives an overview on dissemination activities of each workpackage (1st year, 2nd year, 3rd year, beyond end of project).

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
1	Project web-site	Public, scientific	International	5000	IfM-GEOMAR	11
3	Article mentioning Fish Ruler in "Luebecker Nachrichten" [1]	General Public	Northern Germany	?	IfM-GEOMAR	7
4	Conference contribution (see Annex I: conference contributions).	Research	26 countries	86	CEFAS	3
5	Article on Fish Ruler in German Press [2]	General Public	Germany		IfM-GEOMAR	7
5	Spawning season fact sheet for European fish [3]	Fish wholesalers	Europe	?	IfM-GEOMAR	7
5 and 7	Fish Ruler [4]	General Public	Germany/Europe, other sites TBA	?	IfM-GEOMAR, eventually all WP members	7
7	Communicating European Research Conference [5]	Press and Scientists	Europe	Over 3000 at conference	IfM-GEOMAR	7
7	Indicators review paper [6]	Scientists, Policy Makers, general public	International (on INCOFISH portal)	?	IfM-GEOMAR with collaboration from CDF, MCM-DEAT, UNIABDN and CABAL	7
8	WP6 overview presented at the CDC project website http://cdc.fish.ku.ac.th/wp6/about_CT.htm	General public	n/a	n/a	CDC	6
8 - 13	Fish Ruler outreach project with High School in Kiel	Pupils and General Public	Germany	Fish consumers in Kiel # unknown	IfM-GEOMAR	7
9 - 11	Press releases in newsletter of IOUSP	General public	Brazil	?	IOUSP	4
10	WP 10 web-site, integrated within the FEU web-site, http://www-user.uni-bremen.de/%7Efeu/frame.html	(Environmental) Jurists	Coastal states	?	UNI HB	10
11	Presentation of Aquamaps	Research	UK	?	NRM	3
11	Oral presentation to 40th Annual Conference of the California-Nevada	Researchers, fisheries managers and government	USA	35	CICIMAR	5

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	Chapter of the American Fisheries Society titled 'Conservation and exploitation in the northern Gulf of California: temporal and spatial simulations of the ecosystem'	agency representatives				
11	Oral presentation to 6 Postgraduate Week of South Baja California titled 'Conservación y explotación en el norte del Golfo de California: simulaciones temporales y espaciales del ecosistema'	University researchers	Mexico	70	CICIMAR	5
12	Presentation of Aquamaps	Students	Sweden,	20	NRM	3
12	Presentation of Aquamaps	Students	Brazil		NRM	3
12	Media briefing – University Press agency	General public	Brazil	ND	IOUSP	4
12	Conference (two contributions, see Annex I: conference contributions)	Industry, Fishers, Managers. MPA representatives, Federal and state governments, Federal Senate members, scientists, representatives of the ministries of fishing and ecology	Mexico	~ 30 persons	CICIMAR	4
12 + 13	Publications: Two book chapters	Research and Public in general but with technical contents	Mexico	ND	CICIMAR	4
12	Workshop: FAO Workshop on assessment of small pelagics in Northwest Africa	Research	Mauritania, Marocco, Senegal, Gambia, Holland, Russia	20	CRODT	7
3 - 12	Web-site links	WP members, Partners, Researchers, NGOs, Managers and the Public	Thailand and Namibia	Global, Thailand and Namibia in particular	Contractors responsible for linking the INCOFISH web site to theirs	8
Continuous	AquaMaps presented to scientists through personal contact to determine user needs and feedback	Research	Multiple	?	NRM	3
Year 1	Conference	Coastal resource managers in the Benguela countries of Namibia, South Africa and Angola	Namibia, South Africa and Angola	?	UNAM	8

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
Year 1	Primary publications	Global	Namibia; Global	Managers, NGOs, stakeholders	CDC, UNAM	8
Year 1	Project web-site	WP9 members, Partners Technical comittee	Costa Rica, Panamá, Colombia, Ecuador	Eastern Tropical Pacific Initiatives.	ECOLAP, Fundación Malpelo, CDF, Parque Nacionales de Colombia	9
Year 1	Direct e-mailing	Government Environmental Authorities, (Marina Mercante, Subsecretaria de Medio Ambiente, Subsecretaria de Turismo)	Ecuador	Local Authorities	ECOLAP/CDF	9
Year 1	Workshops	National Parks Stakeholders, Government Environmental Authorities, National NGO participants	Bi-national (Colombia – Ecuador)	Local stake-holders of NP- Marine – Coastal resources	CDF, ECOLAP, Fundación Malpelo	9
12 - 34	Publications of deliverables on the INCOFISH web-site	Jurists, administrative staff, fisheries managers	Coastal states	ND	UNI HB, APPRENDER UNAM, KESCOM, CABAL S.A.	10
13	Launching of portal at www.incofish.org	Researchers, stakeholders, public	Global	Global	FIN	1
13	Project website: www.hull.ac.uk/incofish	General public	Multiple		UHULL	2
13	Presentation at Galapagos National Park Conference	International scientists and managers	Ecuador	60	CDF	2
13	Two presentations of Aquamaps	Students	Brazil		NRM	3
13	Conference presentation on the “small-scale fisheries database”, developed initially for ‘Thinking Big: A Global Look at Fisheries Science’, a symposium to honour Professor Daniel Pauly, for the 13th International Cosmos Prize & his 60th birthday, May 2, 2006, Vancouver, BC, Canada.	Scientists and students	Global	100	CDC	6
13	Workshop in Pattaya-Bangkok	WP6&8 members plus invited guests	Thailand and Namibia	Local Authorities	All	8
14	Conference Talk ‘The implications to	Researchers and managers	International	100	UNEW	5

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	management of the relationship between the spatial extent of MPAs and management regime outside of MPAs'. - International Conference on Coastal Ecosystems, Campeche, Mexico.					
14	Conference Poster 'Towards an integration of the Campeche Bank ecosystem dynamics for ecosystem based fisheries management' – International Conference on Coastal Ecosystems	Researchers and managers	International	100	CICIMAR	4
14	Conference presentation on "Fishermen's perception about government support and attitudes towards management" (Pita, C., Pierce, G. & Theodossiou, I.) at ICES Symposium on Fisheries Management, Galway, Ireland, 27-30 June 2006.	Scientists, students, managers, general public	Global		UNIABDN	6
14	Internet Wizard for Maturity indicators at www.incofish.org	General Public	International	?	IfM-GEOMAR and FIN	7
14	WP 10 workshop	WP members, WP 11, ECOST members, external specialists	Brazil, Nicaragua, Namibia, Kenya, Indonesia, EU,	17	UNI HB (responsible) APPRENDER UNAM, KESCOM,	10
15	Conference: Can the knowledge society turn around 500 years of overfishing? Presented at IIFETT conference, Portsmouth UK	Research, Industry, Managers, Public	International	40	IFM-GEOMAR	7
16	Conference	Research	26 countries	86	CEFAS	3
16	Launching of the 'Coastal Transects Analysis Model' and CTAM poster presentation at the Coastal Zone Asia-Pacific Conference (CZAP 2006), Batam, Indonesia, August 29 to September 2, 2006.	Scientists, coastal managers and practitioners	Global	300	CDC, IGS, FIN	6,1
17	Conference poster 'Using MPAs to control the age groups targeted by a	Researchers	International	120	UNEW	5

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	fishery; can yield be increased?'- 41st European Marine Biology Symposium					
17	Conference poster 'Temporal and spatial ecosystem scenarios towards conservation and exploitation conciliation in the northern Gulf of California' - 41st European Marine Biology Symposium	Researchers	International	120	CICIMAR	4,5
17	Conference poster 'Towards an MPA strategy on the Campeche Bank for ecosystem based fisheries management'- 41st European Marine Biology Symposium	Researchers	International	120	CICIMAR	4,5
17	Technical report on 'Visualization of Coastal Areas using Coastal Transects Analysis Model' (available on INCOFISH portal and CDC website).	Scientists, students, managers, general public	Global		CDC	6
17	E-mail invitation to publicized CTAM was sent widely to coastal practitioners and scientists (including INCOFISH members) and also posted in e-newsletter.	Scientists, coastal managers and practitioners	Global		CDC, IGS, UNIABDN	6
17	Conference presentation on "The importance of including social concerns when designating and implementing marine protected areas" (Pita, C., Pierce, G. & Theodossiou, I.) at the 41st European Marine Biology Symposium. Cork, Ireland, 4-8 September 2006.	Scientists, students	International		UNIABDN	6
17	Fish Ruler: Der Fisch-O-Meter officially launched by Verbraucherzentrale Hamburg	Public, Media, Industry	Germany	thousands	IFM-GEOMAR	7
18	Update of DINARA Web site and link to INCOFISH	General public	Uruguay / multiple	?	DINARA	3
18	Publication	Research	Multiple	?	NRM/CEFAS	3
18	Interview by a Brazilian TV Program called "Mar sem Fim", TV Cultura Channel	General public	Brazil	nationwide	IOUSP	4

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
18	WP6 website was updated with the summary of the WP6 & 8 workshop, coastal database, CTAM poster and PowerPoint presentations at CZAP06.	Scientists, students, managers, general public	Global		CDC	6
18	Poster: A common sense approach to ecosystem-based fisheries management. Presented at the Bergen conference on the ecosystem approach to fisheries management.	Research, industry	International	50	IFM-GEOMAR	7
19	2 Posters presented at Humboldt Current Conference, 27 November - 1 December 2006, :Lima, Peru. 1 MS, submitted for publication in the Conference Proceedings (Progress in Oceanography), February 2007, 1 MS in prep for publication.	Research, Fishing industry, managers	International	300	MCM-DEAT	7
19	Conference: The Humboldt Current System International Conference. Presented “Overfishing and environmental change cause male reproductive failure in Peruvian Hake, Merluccius gayi peruanus”	Research	International	300	IMARPE	7
20	Fish Ruler: “Chikipez” officially launched by IMARPE in Lima, Peru. Media briefing ChikiPez	Public, Media, Industry	Peru	50 at press conference	IMARPE	7
20	Interview by GLOBO RURAL magazine	General public	Brazil	nationwide	IOUSP	4
21	Publication	Research	Multiple	?	CEFAS/NRM	3
21	A one-day expert consultation workshop was held at CDC.	Scientists and researchers	Thailand	10	CDC	6
21	Jannike Falk Petersen: Participated in the Arctic Frontiers conference and PhD workshop, Tromsø. Poster presentation"Ecosystem-based modelling for management of the Barents Sea benthos and related fisheries". PhD workshop presentation "Arctic	Research	Arctic countries	30	UiT	8

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	ecosystems -are they vulnerable?"					
21	Claire Armstrong: Participated in the Norwegian Economists Annual Conference (Forskermøtet), Tromsø. Presentation: Effects of foreshortening of transferred quota in an ITQ market.	Research	Norway	30	UiT	8
22	Sumaila gave two talks, one at the 2007 AAAS Annual Meeting in San Francisco, on subsidies to deep sea fisheries: http://www.aaas.org/meetings/Annual_Meeting/. The second at the Woodrow Wilson Centre for International Scholars: http://www.wilsoncenter.org/ on globalization and fisheries in developing countries,	Research, policy makers, media, general public	Global	Large	UNAM	8
22	Press release, ISFG	General public	Global	>1Million	FIN	1
22	Conference, Seafood summit	Research, Industry	N & M America	150	FIN	1
22	Exhibition, ISFG at Seafood summit	Industry (food, aquaculture and fisheries)	N & M America	100	FIN	1
22	HELCOM Workshop: Represented INCOFISH WP7 and brought simple indicator use for fisheries management in the Baltic to the table.	Research	Estonia, Latvia, Lithuania, Poland, Finland, Sweden, Germany	17	MEI	7
23	Conference, Seaweed symposium, Japan	Research, public	Japan, Asia	200	FIN	1
23	Exhibition, Seaweed symposium, Japan	Research, public	Japan, Asia	200	FIN	1
23	Presentation	Research	UK	20	NRM	3
23	Oral presentation to 40th Annual Conference of the California-Nevada Chapter of the American Fisheries Society titled 'Conservation and exploitation in the northern Gulf of California: temporal and spatial simulations of the ecosystem'	Researchers, fisheries managers and government agency representatives	USA	35	CICIMAR	4,5
23	Oral presentation to 6 Postgraduate	University researchers	Mexico	70	CICIMAR	4,5

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	Week of South Baja California titled 'Conservación y explotación en el norte del Golfo de California: simulaciones temporales y espaciales del ecosistema'					
23	Seminar on CTAM was given at the joint Biology-Geography seminar series, Memorial University of Newfoundland, St. John's.	Scientists, researchers and students	Canada	50	CDC	6
23	Presentation: Fisheries Sustainabiltiy and sustainable seafood (in German). To the heads of the University cafeterias of Schleswig-Holstein, Germany	Industry, Public	Germany	10	IFM-GEOMAR	7
23	Rashid convened two special sessions, one on discounting and the other on fisheries subsidies at the North American Association of Fisheries Economists (NAAFE) conference,	Research	Mainly North America	Over 100	UNAM	8
24	Presentation at COLACMAR Conference, Brazil	International scientists and managers	South America	200	UNAL	2
24	2 Presentations of Aquamaps	Students	Sweden,	20	NRM	3
24	Seminar on CTAM was given as part of the 'Coastal Matters' lecture series, held in Corner Brook, Newfoundland	Scientists, researchers and students	Canada	15	CDC	6
24	Newspaper article[11] Western Star, local newspaper in Corner Brook published an article about CTAM	General	Canada		CDC	6
24	EU FP 6 project Profet Policy workshop: Represented INCOFISH WP7 and brought simple indicator use for fisheries management in the Baltic to the table	Research, industry	Estonia, Latvia, Lithuania, Poland, Finland, Sweden, Germany, Russia, Denmark	70	MEI	7
2006	Publication: Fairweather TP, Hara M, van der Lingen CD, Raakjaer Nielsen J, Shannon LJ, Louw GG, Degnbol P, Crawford RJM (2006a) The knowledge base for management of the capital-intensive fishery for small pelagic fish off	Research, Fishing industry, managers	International	?	MCM-DEAT	7

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	South Africa. African Journal of Marine Science 28: 645-660					
2006	Publication: Fairweather TP, van der Lingen CD, Booth AJ, Drapeau L, van der Westhuizen JJ (2006b) Indicators of sustainable fishing for South African sardine (Sardinops sagax) and anchovy (Engraulis encrasicolus). African Journal of Marine Science 28: 661-680	Research, Fishing industry, managers	International	?	MCM-DEAT	7
1st quarter 2007	Due to communication between WP10 and IUCN, the IUCN web-site provides links to the INCOFISH portal.	Professionals and general public	Multiple	?	UNI HB	10
Year 2	Conferences and exhibitions	Primary and secondary schools, guides courses	Ecuador/ Colombia	Local Communities	ECOLAP/CDF/ Fundacion Malpelo	9
Year 2	Media briefing aiming at strengthening common tourism research in Eastern Pacific bioregion	Local authorities and technical and scientific partners	Seascape/ INCOFISH/ other international projects	unknown	ECOLAP/CDF Parques Nacionales/F. Malpelo	9
Years 2&3	Workshops and publications as planned		Namibia, South Africa and Angola	Global	UNAM, UiT, UWC, CDC	8
25	Press release CRIA Mapping tools	Media, Public, Research	International	4000	WP1, CRIA	1
25	Advertisement Parliament Magazine Advertorial CTAM	Media, EU Governance, EU Commission, EU Parliament	EU	200	WP1, WP11, WP7	1
25	2 Presentations of Aquamaps	Students	Brazil	20	NRM	3
25	Presentation to Marine Sciences resreach group University of Essex ‚A comparison of no-take zones and traditional fishery management tools'	Scientific researchers	UK	15	UNEW	5
25	Lecture at University of La Laguna, Tenerife, Canary Islands	University students, professors, researchers	Spain	40	CDC	6
25	Lecture at the ECOSUMMER, Marie Curie Training Program, in Heraklion, Crete	University students, researchers	Global	20	CDC, UNIABDN	6

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
25-36	Direct e-mailing	Government Environmental Authorities, guides and tour operators	Ecuador	Local at the level of Galapagos and Machalilla	CDF, ECOLAP	9
25	Side-workshop to the European Conference on Maritime Policy: 'Sea-Use Planning in the EU Coastal and Exclusive Economic Zones'	Professionals (IOs, academics and administrative staff)	Belgium, Germany, Netherlands, Portugal, UK	50	UNI HB	10
25	Presentation at the conference 'Sustainable Development in National and International Law. 20 years after Brundtland', held in Oslo on May 2 and 3	Academics, professionals	USA, Canada, Norway, Denmark, Sweden, Germany	50	UNI Oslo	10
26	Publication (testing modelling system outputs)	Research	Multiple	Global	NRM/CEFAS	3
26	CTAM website update (with Phase II)	University students, professors, researchers, government, managers, environmental organizations, general public	Global		CDC, FishBase, WP1	6
26	Publication (testing modelling system outputs)	Research	Multiple		NRM/CEFAS	3
26	Launching of Fishruler Senegal	Public, resource managers, government	Senegal	>700	CRODT, IfM-GEOMAR, FIN	1,7
26	Fish size poster for Gulf of Thailand launched	Public, Industry, Media	Thailand	50	PSU	7
27	Conference Coastal Zone CZ'07 CTAM II	Research	N &M America	200	WP1, WP6, WP8	1
27	Exhibition Coastal Zone '07 CTAM, INCOFISH Poster	Public, scientific	USA, Canada, Mexico	200	FIN, CDC, UNAM	1,6,8
27	Conference presentation, People and the Sea IV Conference in Amsterdam	University students, professors, researchers	Global	35	CDC	6
27	Presentation, Coastal Zone'07 Conference in Portland, Oregon	University students, professors, researchers, environmental organizations	Global	45	CDC	6
27	MARE People and the Sea Conference, Amsterdam, NL	Research (mostly social-science)	International	25	IfM-GEOMAR	7

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
28	Press release, Aquamaps	General public	Global	>1Million	FIN, NRM	1,3
28	A stakeholder consultation workshop will be organized in Krabi Province, south of Thailand to discuss CTAM model for Ban Don Bay.	Fishers, coastal stakeholders, scientists and managers	Thailand	15	CDC	6
28	CTAM will be presented at the national conference on 'Coastal Habitats and Resource Management,' as part of the EU-funded project, CHARM.	Fishers, coastal stakeholders, scientists	Thailand	250	CDC	6
28	Our recent paper on ex-vessel prices (Sumaila et al. in *Journal of Bioeconomics*) was cited by Steven D. Levitt the famous co-author of *Freakonomics*: see http://freakonomics.blogs.nytimes.com/2007/08/30/shrimponomics/	Research, policy makers, general public	Global	Large	UNAM	8
28	Abbie Trinidad presented work non market values at the Coastal Zone 2007 Conference in Portland. She has also been developing a draft paper on the same.	Research	Global, mainly North America	Over 100	PRIMEX-FAME	8
28	Ratana Chuenpagdee presented her work on indicators and *CTAM* at Coastal Zone 2007 Conference in Portland.	Research	Global, mainly North America	Over 100	CDC	8
29	Press release MPA evaluation tool	General public	Global	>1 Million	FIN, CDF	1.9
29	Fishruler Philippines	Public, resource managers, government	Philippines	>700	FIN, IfM-GEOMAR	1,7
29	Presentation at MPA Symposium, Spain	International scientists and managers	Europe	200	UNIABDN	2
29	Conference talk Croatia	Research	Multiple	50	NRM	3
29	Conference talk Belgium	Research	Multiple	60	NRM	3
29	Conference talk-Spatial simulations of fishery management scenarios of the East China Sea	Scientists, policy officers and fisheries managers	International	50	ECNU	5
29	Conference talk-Simulating a MPA as a strategy for ecosystem-based fishery	Scientists, policy officers and fisheries managers	International	50	CICIMAR	5

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	management of the red grouper in the Campeche Bank, Mexico					
29	Conference talk-The use of marine protected areas as part of ecosystem based management in Namibia	Scientists, policy officers and fisheries managers	International	50	SAMS	5
29	Conference talk-Managing mobile species with MPAs; the interaction between mobility and fishing mortality	Scientists, policy officers and fisheries managers	International	50	UNEW	5
29	Conference talk-Are bad MPAs any good, or just a new way of making old mistakes	Scientists, policy officers and fisheries managers	International	50	UNEW	5
29	Conference talk: “An evaluation of existing and proposed MPAs in the North Sea using Ecospace”, “	Scientists, policy officers and fisheries managers	International	50	CEFAS	5
29	Conference presentation, European Symposium on Marine Protected Areas. Murcia, Spain	University students, professors, researchers	Global	40	UNIABDN	6
29	Paper: Global Cost of Overfishing	Research, Public, Industry	International	?	IFM-GEOMAR	7
29	Paper: case studies applying simple indicators to fisheries with different management and data availability	Research, Public, Managers, Industry	International	?	IFM-GEOMAR with all WP7 partners	7
29	Oral Presentation in the II Latin American Congress of Protected Areas, Bariloche, Argentina.	Guides and tour operators	International Ecuador	International, mostly Latin Americans	CDF, ECOLAP	9
30	Media briefing, Teachers day	Higher education	EU, Philippines	5000	FIN, IfM-GEOMAR	1,7
30	Press release ISFGII	General public	Global	>1 Million	FIN, IfM-GEOMAR	1,7
30	Update of DINARA Web site and link to INCOFISH	General public	Uruguay/multiple		DINARA	3
30	Publication (book chapter)	Research	Multiple		DINARA	3
30-32	Publications	Research	Multiple		NRM/all	3
30	Marine Protected Areas as a tool for ecosystem conservation and fisheries management”, “Towards a coherent network of MPAs”.	MPA managers, government officials and scientists	UK	60	CEFAS	5
30	Seminar, Marine Affairs Program, Dalhousie University, Halifax	University students, professors, researchers, environmental	Global	30	CDC	6

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
		organizations				
30	Public lecture, Canada Research Chair Lecture Series, Memorial University of Newfoundland, St. John's	University students, professors, researchers, environmental organizations, general public	Canada	85	CDC	6
30	Claire Armstrong: Presented; Habitats and fisheries; A missing link? At the SINTEF workshop; Value Creation in the Nordic Countries of Fisheries and Aquaculture in Akureyri, Iceland,	Research	Global: mostly developing countries	80	UiT	8
30	Rashid Sumaila: Gave a briefing to the G77 at the United Nations, Oct. 3; 2007. See attachments; presentation at a workshop on the Economics of Ecosystem Based Fisheries Management, Washington, D.C,	Developing country ambassadors and representatives at the UN	Developing countries	50	UNAM	8
30	Rashid Sumaila, contributed to the cover article for the most recent issue of Conservation Magazine (a publication of the Society for Conservation Biology): see http://www.conbio.org/CIP/article30713.cfm;	Research, policy makers	**Global**	Large	UNAM	8
30	Seminar 'Introduction to the law of the seas'	PhD students of Graduate School 'Global Change in the Marine Realm' (GLOMAR), University of Bremen	World-wide	15	UNI HB	10
31	Press release Shifting Baselines	Media, Public, Research, NGO	International	1 Million	WP, WP2, CoML	1
31	Conference CoML '07 Backflash files INCOFISH Poster	Media, Public, Research, NGO	International	200	WP, WP2, CoML	1
31	Census of Marine Life All Program Meeting Auckland, New Zealand	International scientists General public	global	1500	UHULL WP1	2
31	Conference talk Sweden	Multiple	Sweden	120	NRM	3
31	Press release	Multiple	Multiple		NRM	3
31	Conference talk: 'Can marine protected	Scientists	International	50	SAMS	5

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	areas be used to enhance fisheries in Namibia', workshop on 'Biogeochemical processes and fish dynamics in food web models for end-to-end conceptualisation of ecosystems', held in Trieste, Italy in conjunction with the European Conference on Ecological Modelling					
31	Conference talk: 'INCOFISH adventures with Ecospace' workshop on 'Biogeochemical processes and fish dynamics in food web models for end-to-end conceptualisation of ecosystems', held in Trieste, Italy in conjunction with the European Conference on Ecological Modelling	Scientists	International	50	UNEW	5
31	Conference talk: 'Abundance and trophic interactions in North Sea fishes' at the European Conference on Ecological Modelling, Trieste, Italy	Scientists	International	50	CEFAS	5
32	Press release Fisch im Handy	Media, Public, Industry, Research, NGO, Govt.	Germany	1 Million	WP1, WP7	1
32	WP2 Project website (http://www.hull.ac.uk/incofish)	General public, researchers, scientists and managers	global		UHULL	2
32	CTAM on EBM Tools Network	University students, professors, researchers, government, managers, environmental organizations, general public	Global		CDC	6
32	www.seafoodguide.mobi launched and made public	Public, Media, Industry	International	?	IfM-GEOMAR, FIN, UNIABDN, CRODT	7
33	Press release Seafoodguide.mobi	Media, Public, Industry, Research, NGO, Govt.	International	1 Million	WP1, WP7	1
33	Event Seafood Summit '08 Seafoodguide.mobi Media coverage	Media, Donors, Industry; Seafood prod. NGOs, Research	International	>250	WP1, Seafood Choices alliance	1
33	Lecture at University of Aberdeen, U.K.	University students	U.K.	15	UNIABDN	6
33	Radio Interview: Radio interview with	Public	Germany	100s	IfM-GEOMAR	7

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
	German radio station about Mobile seafood guide and the INCOFISH project in general.					
34	WP2 Flyers and posters	General public, maritime history students	Maritime Historical Studies Centre, Hull, UK	200+	UHULL WP1	2
34	Interview for Audobon Magazine	Public, Conservationist	USA and other English Speaking	?	IfM-GEOMAR	7
34	**Size Matters: How Precautionary Single-Species Management Can Contribute To Ecosystem-based Fisheries Management**	Research	International	?		7
35	Advertorial Parliament Magazine Project website	Media, EU Governance, EU Commission, EU Parliament	EU	200	WP1, WP11	1
35	Advertorial Parliament Magazine Seafoodguide.mobi	Media, EU Governance, EU Commission, EU Parliament	EU	200	WP1, WP11	1
35	Press release Panukat Isda	Media, Public, Research, Resource managers, Govt. NGO, LGU	EU, Philippines	4000	WP1, FIN	1
35	Press conference Panukat Isda	National Media	Philippines	25	WP1, FIN	1
35	Exhibition Panukat Isda; INCOFISH tools	Public, Research, Resource managers, Govt. NGO, LGU	Philippines	100	WP1, WP7, FIN, WFC PO, BFAR, CI, WWF	1
35	CTAM website update	University students, professors, researchers, government, managers, environmental organizations, general public	Global		CDC, FishBase, WP1	6
35	Presentation and consultancy at international conference on the evaluation of fisheries on seahake, 24-28 March 2008, Lima, Peru	Academics, professionals	Peruvian and international	50	IMARPE Lima	10
36	Workshop WWF, Panukat Isda	Research, NGO, LGU	Philippines	50	WP1, WP7, FIN, WFC PO, WWF	1
36	Panukat Isda campaign, CI	Research, NGO, LGU	Philippines	250	WP1, WP7, FIN, WFC	1

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
					PO, CI	
36	Training workshop BAS	Research, NGO, LGU	Philippines	20	WP1, WP8, NFRDI, BAS	1
36	Internet Online Toolset launch	Research scientists, marine biologists and managers	global	global	UHULL WP1	2
36	Event Fishruler Senegal	Public, resource managers, Govt.	Senegal	>700	CRODT, WWF	7
36	Public Television Interview on behalf of launching of fish ruler for Senegal	Public	Senegal	?	CRODT	7
25-36	Workshops	Scientists	South Africa, Mexico, Italy, Chile	*8*	UNIConcepcion, CICIMAR, MCM DEAT, CRDOT, ECNU	4
25-36	Scientific meeting contributions	Scientists	Mexico, Brazil, Moroco, Germany, Spain, USA, China, Sweden, Chile, Finland, Jordan, Italy, Dominican Republic, France	*46*	WP4 partners	4
25-36	Teaching: Lectures and courses	Students	Uruguay, Mexico, Chile	*6*	UNIConcepcion, CICIMAR, CEFAS, USP, MCM DEAT, UNIPAD	4
25-36	Formation of students: MSc PhD PostDoc	Students	China, United Kingdom, Brazil, Mexico, South Africa, Italy, Chile	17 8 1	EUCN, CEFAS, USP, CICIMAR, MCM DEAT, UNIPAD, UNIConcepcion	4
25-36	Direct e-mailing	Government Environmental Authorities, guides and tour operators	Ecuador	Local at the level of Galapagos and Machalilla	CDF, ECOLAP	9
Year 3	Conference	Coastal resource managers in the Benguela countries of Namibia, South Africa and Angola	Namibia, South Africa and Angola	?	UNAM	8

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
Continuous	AquaMaps presented to scientists through personal contact to determine user needs and feedback.	Research	Multiple		NRM	3
Beyond Month 36	WP 10 web-sites at http://www.feu.uni-bremen.de/en/projects.html	(Environmental) jurists, academics, fisheries managers	Coastal states	*?*	UNI HB, Fishbase	10
Beyond Month 36	Contribution accepted for upcoming scientific conferences	Scientists	Spain, Italy, Japan	*3*	WP4 Partners	4
Beyond Month 36	Publication: Diagnosis of the state of exploitation of some demersal species in Senegalese waters.	Research, Government	Senegal, other Western Africa	*?*	CRODT, IFM-GEOMAR	7
Beyond Month 36	The 'Shifting Baselines' work will continue through the 'History of Marine Populations' network (www.hmapcoml.org) ; the respective tools and databases are already available from one of their members (http://www.hull.ac.uk/incofish).	Multiple	Global	*?*	UHULL	2
Beyond Month 36	The 'Biomapping' work will continue as part of the FishBase (www.fishbase.org) and SeaLifeBase (www.sealifebase.org) work; both projects have adopted AquaMaps as their standard maps. Also, the Biomapping team is actively searching for suitable calls to continue the leading work on impact of climate change on species distributions. They are also searching for sponsors to develop the AquaMaps routines into a new service on mobile phones: "What species are currently near me?"	Multiple	Global	*?*	IfM-GEOMAR, NRM, FIN	3
Beyond Month 36	The standardized ecosystem models compiled and produced by the 'Ecosystem Modelling' team will find a new home with the ECOPATH portal (www.ecopath.org).	Multiple	Global	*?*	UBC	4
Beyond Month	The MPA planning tool will remain	Multiple	Global	*?*	IfM-GEOMAR, FIN	1,5

Actual / Planned Dates (Month of project)	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved	WP no.
36	available from the AquaMaps web page (www.aquamaps.org) and also from FishBase and SeaLifeBase.					
Beyond Month 36	The Coastal Transects Analysis Model has been included in the database of the Ecosystem-Based Management Tools Network (www.ebmtools.org).	Multiple	Global	?	CDC	6
Beyond Month 36	The data and tools produced by the 'Simple Indicators' Team will remain available through the FishBase and SeaLifeBase web portals, in addition to uptake by NGOs and Government agencies.	Multiple	Global	?	IfM-GEOMAR, FIN, UBC	7
Beyond Month 36	The databases developed by the 'Valuation of ecosystem services' team will be hosted by the Sea Around Us portal, UBC, Canada (www.seaaroundus.org).	Multiple	Global	?	UBC, UNAM	8
Beyond Month 36	The Code of Conduct for sustainable ecotourism and the step-by-step tools for assessment of marine parks will be hosted and further developed by the Eastern Tropical Pacific Corridor (CMAR) consortium (www.cmarpacifico.org).	Multiple	Global and specifically the countries of the Eastern Tropical Pacific Corredor	?	CDF, USFQ, Fundacion Malpelo	9
Beyond Month 36	The 'Legal Instruments' results will be published by IUCN in form of a 500 pages book.	Multiple	Global	?	Uni Bremen	10
Beyond Month 36	The INCOFISH portal itself (www.incofish.org) will be maintained by IFM-GEOMAR for at least two more years.	Multiple	Global	?	IfM-GEOMAR, FIN	1,11

[1] Fish Ruler: "Der Fischmax" and "The Fishermin" were printed for distribution in Germany and other countries bordering the North Sea and the Baltic, showing size at maturity (also for fillet and headless lengths) so the ruler can be brought to the fish market by consumers to make sure the fish they buy have had the chance to reproduce. The material of the rulers is a flexible and washable PVC. As of January, 2006, the Verbraucherschutzzentrale (consumer rights center) in Hamburg has taken over the design and distribution of these rulers in Germany, which are now called "Fisch-o-Meter" and plan to distribute them at their offices Germany-wide. In the third phase of WP7, we will create and test similar rulers in partner countries in the tropics.

[2] Spawning season fact sheet for European fish: A printed sheet for fish wholesalers with spawning seasons and maturity weights for common food fish. The wholesalers can refer to this sheet when buying fish from fishermen to ensure they only buy mature fish.

[3] Article in German press about fish rulers: The German wire service wrote an article about the threatened Cod stocks in the North Sea and featured the Fisch-Max as a tool the public can use to help combat this problem. Over 100 newspapers and magazines ran this story and there was much public enthusiasm generated.

[4] Communicating European Research Conference: Rainer presented FishBase and the Fishermin ruler at a press conference, and fish rulers were handed out at a booth shared with ENBI. There were 3000 registered attendees at the conference and ca. 500 rulers were handed out.

[5] Indicators Review: Deliverabe 7.1 was to review existing indicators and choose suitable simple ones for implementation by the workpackage. This work was made into a review paper that was published on the INCOFISH website. It will be used also as a basis for a future paper to be published in the peer-reviewed literature.

[6] Fish Ruler outreach project: As part of the German Nat-Working program, in which High School science classes are paired with research institutions in the country, Three students from Gymnasium Wellingdorf in Kiel conducted a research project using the Fisch-Max. They visited 12 markets in Kiel where fish are sold, and measured the fish in order to determine how many undersized fish are for sale. Additionally, they interviewed fish buyers to find out their perceptions and knowledge of problems facing fish stocks in their area and assess their willingness to participate in using the ruler and buying only mature fish. Their final results are still pending.

Section 3 - Publishable results

Data, tools and concepts for ICZM

INCOFISH has produced a variety of databases, tools and concepts that will proof useful to consultant companies in the fields of restoration of depleted fisheries, planning of marine protected areas, establishing or improving marine parks, restructuring the legal framework of fisheries, improving integrated coastal zone management, or providing training in these areas. Such companies can use these data, tools and concepts as published in the scientific literature and made available from the INCOFISH portal at www.incofish.org. Contact emails for the respective experts are also available from there.

What species are near me?

The AquaMaps portal developed by INCOFISH (www.aquamaps.org) provides a proof-of-concept to predict, for any place in the global Ocean, (i) the species that occur there, (ii) the species than can persist there if introduced, and (iii) the species that may occur there in the future, if current climate trends continue. AquaMaps currently focus on marine organisms, but the approach can directly be applied to terrestrial systems, as has already be shown in several examples. Here, a set of new services can be provided through mobile phones, around the general theme of (re)connecting people with the living World. Modern mobile phones are aware of the current locality of its user. They have colour screens with Internet connectivity and can upload photos, videos and sound-bits with date, time, coordinates, and additional information provided by the user. All of this can easily be handled by any phone user with a basic understanding of the device. We therefore have all necessary building blocks for providing unprecedented, real-time, accurate information about the species that are likely to occur around the cell phone user, and at the same time receiving information from the user to further improve the system.

The system described so far can provide the following new services:

1) What species are currently around me?

A realistic real-time prediction of the most common species that a mobile phone user may see or hear, with photos, sounds, maps, general info, etc.

2) What species is this? A simple system to identify species (flowers, insects, birds, ...) and learn about their properties (is this plant poisonous?).

3) Where can I see a squirrel?

A guide to the next locality where a certain species may be found in the wild.

4) I want to report this species!

A simple system where photos, sounds, videos and identifications can be uploaded, as input for scientists who monitor occurrences of species, and as core for user groups around their favourite species.

Technically, all of the above is already doable with modern mobile phones and there are sites like MySpace, Facebook, flickr, and ovi offering what looks like similar services. However, providing an online interface will not suffice to have the described services emerge purely from user interactions. Species have many names and are easily misidentified, and information attached to the wrong species is misinformation. A scientific backbone such as established by AquaMaps in collaboration with a global network of partners is required to provide above services and make them more than guess-work.

We believe that natural sponsors for developing the above services would be one or several mobile phone companies. Alternatively, we could also imagine large IT companies getting involved as 'bookkeepers the living World'. Basically, we are looking for one or several major sponsors. Their logos would show as the ‘brought to you by’ sponsor whenever the services are used. We estimate annual cost for the services at €1- 5 million. We believe that the benefits for the sponsor(s) gained from positive branding will far outweigh these costs.

The service for marine species is basically ready (June 2008) and can be made available from mobile phones within 6 months. A first simple service for the best-known terrestrial species can be developed within 12 months. A more sophisticated service including less-common species will take 2-4 more years, depending on funding. We are aiming for a long-term partnership of, e.g., 10 years.

Appendix 2

INCOFISH Publications by 30th April, 2008

Publications (published / in press) in peer reviewed journals:

1. Abdallah, P.R. and Sumaila, U.R. (2007). A historical account of Brazilian policy on fisheries subsidies. Marine Policy 31, 444-450.
2. Ainsworth, C.H. and U.R. Sumaila, 2005. Intergenerational valuation of fisheries resources can justify long-term conservation: a case study in Atlantic cod (*Gadus morhua*). Can. J. Fish. Aquat. Sci. 62: 1104–1110.
3. Araújo, J., Mackinson, S and Hart, P.J.B. 2008. Exploring fisheries strategies for the western English Channel using an ecosystem model. Ecological Modelling 210: 465-477.
4. Armstrong, C.W. and J. Falk-Petersen (in press). Habitat-fisheries interactions. A missing link? ICES Journal of Marine Science.
5. Armstrong, C.W. (2007). A note on the ecological-economic modelling of marine reserves. Ecological Economics 62, 242-250.
6. Arreguín-Sánchez F., M. Ramírez-Rodríguez, M. Zetina-Rejón and V.H. Cruz-Escalona. 2008. Natural hazards, stock depletion, and decision making in the southern Gulf of Mexico pink shrimp (*Farfantepenaeus duorarum*) fishery. Mitigating Impacts of Natural Hazards on Fishery Ecosystem. Amer. Fish. Soc.in press
7. Arreguín-Sánchez F., M. Zetina-Rejón, M. Ramírez-Rodríguez. 2008. Exploring ecosystem-based harvesting strategies to recover the collapsed pink shrimp (*Farfantepenaeus duorarum*) fishery in the southern Gulf of Mexico. Ecological Modelling accepted.
8. Bager, M, and M. K. Søndergaard, 2007. The Danish Baltic Sea fisheries c.1875-1911. Fisheries Research 87 (2-3).
9. Bailey, M., Rotinsulu, C., and Sumaila, U.R. (2008) The Migrant Anchovy Fishery in Kabui Bay, Raja Ampat, Indonesia: Catch, Profitability, and Income Distribution. Marine Policy, 32, 483-488.
10. Berman, M. and U.R. Sumaila (2006). Discounting, amenity values and marine ecosystem restoration. Marine Resource Economics 21 (2) 211-219.
11. Bundy, A., Chuenpagdee, R., Jentoft, S., and Mahon, R. 2008. If science is not the answer, what is? An alternative governance model for the world's fisheries. Frontiers in Ecology and the Environment 6(3):152-155.
12. Casal, C.M.V. 2006. Global Documentation of Fish Introductions: the Growing Crisis and Recommendations for Action. Biological Invasions. 8(1): 3-11.
13. Charles, T., Salas, S., Chuenpagdee, R., Seijo, J.C. 2007. Preface: Evaluation and Management of Coastal Fisheries in Latin America and Caribbean. Fisheries Research 87(1): 1-4.
14. Chuenpagdee, R. and Jentoft, S. 2007. Step zero for fisheries co-management: What precedes implementation? Marine Policy 31: 657-668.
15. Chuengpagdee, R., Preikshot, D., Ligouri, L. and Pauly, D. (2006) A public sentiment index for ecosystem management. Ecosystems 9, 463-473.
16. Cheung, W. and Sumaila, U.R. (in press). Trade-off between conservation and socio-economic objectives in managing a tropical marine ecosystem. Ecological Economics.
17. Clark, C.M., Munro, G., and Sumaila, U.R. (2007). Buyback, subsidies, the time consistency problem and the ITQ alternative. Land Economics, 83(1), 50-58.
18. Ding, H., Xu, H., Wu, J., Le Quesne, W.J.F., Sweeting, C.J., Polunin, N.V.C., (accepted) An overview of spatial management and marine protected areas in the East China Sea. Coastal Management.

19. Duarte, L.O. In press. Status of coastal ecosystems in Colombia: Bottom-up vs. Top-down Pressures, in Coastal Ecosystems: Hazards, Management and Rehabilitation (NAM S&T Centre).
20. Eero, M, B. R. MacKenzie and H. Karlsdottir, 2007. Dynamics of international fisheries for cod (*Gadus gaumiga*, *R. morhua*) in the Eastern Baltic Sea during 1880-1938. Fisheries Research 87 (2-3).
21. Enghoff, I. B., B. R. MacKenzie and E. E. Nielsen, 2007. The Danish fish fauna during the warm Atlantic period (ca. 7000 - 3900 BC): Forerunner of Future Changes?' Fisheries Research 87 (2-3).
22. Fairweather TP, Hara M, van der Lingen CD, Raakjaer Nielsen J, Shannon LJ, Louw GG, Degnbol P, Crawford RJM (2006a) The knowledge base for management of the capital-intensive fishery for small pelagic fish off South Africa. African Journal of Marine Science 28: 645-660.
23. Fairweather TP, van der Lingen CD, Booth AJ, Drapeau L, van der Westhuizen JJ (2006b) Indicators of sustainable fishing for South African sardine (*Sardinops sagax*) and anchovy (*Engraulis encrasicolus*). African Journal of Marine Science 28: 661-680.
24. Froese, R., A. Stern-Pirlot and K. Kesner-Reyes. 2008. Out of new stocks in 2020: a comment on "Not all fisheries will be collapsed in 2048". Accepted by Marine Policy. PDF <http://filaman.ifm-geomar.de/ifm-geomar/rfroese/NoStocksJMPO-D-08-00017.pdf>.
25. Froese, R., A. Stern-Pirlot, H. Winker and D. Gascuel. 2008. Size Matters: How Single-Species Management Can Contribute To Ecosystem-based Fisheries Management. Fisheries Research (In press, DOI 10.1016 / j.fishres.2008.01.005)
26. Froese, R., A. Stern-Pirlot, D. Pauly (in Press). "Out of new stocks in 2020: a comment on "Not all fisheries will be collapsed in 2048"" Marine Policy.
27. García, C. B., L. O. Duarte, J. Altamar and L. M. Manjarrés, 2007. Demersal fish density in the upwelling ecosystem off Colombia, Caribbean Sea: Historic outlook. Fisheries Research 85 (1-2), p. 68-73.
28. Gaumiga, R., G. Karlsons, D. Uzars and H. Ojaveer. 2007. Gulf of Riga (Baltic Sea) fisheries in the late 17th century. Fisheries Research, 87(2-3):120-125.
29. Graham, M. H.; Kinlan, B. P.; Druehl, L. D.; Garske, L. E. and Banks, S. 2007. Deep water kelp refugia as potential hotspots of tropical marine diversity and productivity. Proceedings of the National Academy of Sciences of the USA. 104(42) 16576-16580.
30. Hearn A & MV Toral-Granda (2007). Reproductive biology of the red spiny lobster *Panulirus penicillatus* and the slipper lobster *Scyllarides astori* in the Galápagos Islands. Crustaceana 80 (3): 297–312.
31. Howard. J.E., Jarre, A., Clark, A. and Moloney, C.L. 2007. Application of the sequential t-test algorithm for analyzing regime shifts to the southern Benguela ecosystem. African Journal of Marine Science 29(3)
32. Jiang, H., Cheng, H.Q., LeQuesne, W.J.F., Xu, H.G., Wu, J., Ding, H., And Arreguín-Sánchez, F. Ecosystem model predictions of fishery and conservation trade-offs resulting from marine protected areas in the East China Sea. Environmental Conservation (accepted).
33. Jiang H., Cheng H.Q., Xu, H.G., Arreguín-Sánchez F. & LeQuesne, W.J.F. 2008. Impact of large jellyfish bloom on the pelagic pathway of the East China Sea ecosystem. Marine Environmental Science. (in Chinese with English abstract).
34. Jiang H., Cheng H.Q., Xu H.G., Arreguín-Sánchez, F., Manuel J. Zetina-Rejón, P. del Monte-Luna & Le Quesne, W.J.F. 2008. Trophic controls of jellyfish blooms and links with fisheries in the East China Sea. Ecological Modelling, 202: 492-503.
35. Lajus, J., Henn Ojaveer and Erki Tammiksaar. 2007. Fisheries at the Estonian Baltic Sea coast in the first half of the 19th century: What can be learned from the archives of Karl Ernst Baer? Fisheries Research, 87(2-3):126-136.
36. Le Quesne, W.J.F., Codling, E.A. (accepted) Managing mobile species with MPAs; the interaction between mobility, larval dispersal and fishing mortality. ICES J. Mar Sci.
37. Le Quesne, W.J.F. (accepted) Are bad MPAs any good, or just a new way of making old mistakes? ICES J. Mar Sci.

38. Le Quesne, W.J.F., Hawkins, S.J., Shepherd, J.G. (2007). A comparison of trophic controls and traditional fishery management tools for managing site attached species with a mixed larval pool. Fish and Fisheries 8: 181-195.
39. Lercari D. and F. Arreguín-Sánchez. 2008. An ecosystem modelling approach to deriving viable harvest strategies for multispecies management of the Northern Gulf of California. Aquatic Conservation.
40. Lopez-Rocha J. A. and F. Arreguín-Sánchez. 2008. Spatial distribution of red grouper Epinephelus morio catchability on the Campeche Bank of Mexico. Journal of Applied Ichthyology.
41. Liu, Y. and Sumaila, U.R. (2008). Can farmed salmon production keep growing? Marine Policy, 32, 497-501.
42. Liu, Y. and Sumaila, U.R. (2007) Economic analysis of netcage versus sea-bag production Systems for salmon aquaculture in British Columbia. Aquaculture Economics and Management., 11:413–437.
43. MacKenzie, B. R. and R. A. Myers, 2007. The development of the northern European fishery for north Atlantic bluefin tuna (*Thunnus thynnus*) during 1900-1950. Fisheries Research 87 (2-3).
44. MacKenzie, B.R., Maibritt Bager, Henn Ojaveer, Kenneth Awebro, Ulla Heino, Poul Holm and Aadu Must. 2007. Multi-decadal scale variability in the eastern Baltic cod fishery 1550–1860—Evidence and causes. Fisheries Research, 87(2-3):106-119.
45. Martell, S., Walters CW, Sumaila UR (in press) Industry-funded fishing licence reduction good for profits and conservation. Fish and Fisheries.
46. Medina, M., H. Arancibia & S. Neira. 2007 Un modelo trófico preliminar del ecosistema pelágico del norte de Chile (18°20'S-24°00'S) (A preliminary trophic model of the pelagic ecosystem off northern Chile). Investigaciones Marinas, Chile, 35(1):25-38.
47. Ojaveer, H. and B.R. MacKenzie. 2007. Historical development of fisheries in northern Europe—Reconstructing chronology of interactions between nature and man. Fisheries Research, 87(2-3): 102-105. Pablico, G.T., N. Bailly, R. Froese and C. Elloran. 2007. Seaweeds Preferred by Herbivorous Fishes. Journal of Applied Phycology.
48. Ojaveer, H., Kenneth Awebro, Hrefna M. Karlsdóttir and Brian R. MacKenzie. 2007. Swedish Baltic Sea fisheries during 1868–1913: Spatio-temporal dynamics of catch and fishing effort. Fisheries Research, 87(2-3):137-145.
49. Paterson, B., Jarre, A., Moloney, C.L., Fairweather. T.P., van der Lingen, C.D., Shannon, L.J. and Field, J.G. 2007. A fuzzy-logic tool for multi-criteria decision making for the pelagic fishery in the southern Benguela. Marine and Freshwater Research 58 (11):1056-1068.
50. Perry, R.I. and Sumaila, U.R., (2007). Marine ecosystem variability and human community responses: the example of Ghana, West Africa. Marine Policy 31(2) 125-134.
51. Pierce, G.J., M.B. Santos, C. Smeenk, A. Saveliev and A.F. Zuur. 2007. Historical trends in the incidence of strandings of sperm whales (*Physeter macrocephalus*) on North Sea coasts: An association with positive temperature anomalies. Fisheries Research, 8
52. Pinnegar, J. K., T. Hutton and V. Placenti, 2006. What relative seafood prices can tell us about the status of stocks. Fish and Fisheries 7, p. 219-226.
53. Pinnegar J.K., Hutton T.P. & Placenti V. (2006) 'What relative seafood prices can tell us about the status of stocks', Fish and Fisheries 7 (3): 219-226.
54. Pinnegar & Engelhard 'Taking the long view: the 'shifting baseline' phenomenon revisited' Reviews in Fish Biology & Fisheries.
55. Pinnegar, J. K. and G. H. Engelhard, 2007. The “shifting baseline” phenomenon: a global perspective. Reviews in Fish Biology & Fisheries, (online 2007, doi: 10.1007/s11160-007-9058-6).
56. Poulsen, B. and P. Holm, 2007. A fishery of historical magnitude. Reconstructing the 17th-19th centuries catches of herring, eel, whitefish and plaice in Limfjorden. Denmark’ s Fisheries Research 87 (2-3).
57. Poulsen, R. , A. Cooper and P. Holm, 2007. The importance of historical baselines to fisheries management - an abundance estimate of ling (*Molva molva*) and cod (*Gadus morhua*) the northeastern North Sea, 1872. Fisheries Research 87 (2-3).

58. Poulsen, B., P. Holm and B.R. MacKenzie, 2007. A long-term (1667-1860) perspective on impacts of fishing and environmental variability on fisheries for herring, eel, and whitefish in the Limfjord, Denmark. Fisheries Research, 87(2-3), 181-195.
59. Salas, S., Chuenpagdee, R., Seijo, J.C., and Charles, A. 2007. Challenges in the assessment and management of small-scale fisheries in Latin America and the Caribbean. Fisheries Research 87 (1): 5-16.
60. Shannon L.J., Coll M. and Neira S. Understanding the behaviour of ecological indicators using food web models fitted to time series of abundance and catch data. Ecological Indicators March 2008.
61. Shannon, L.J., Cury, P.M., Nel, D., van der Lingen, C.D., Leslie, R.W., Brouwer, S.L., Cockcroft, A.C. and Hutchings, L. 2006. How can science contribute to an ecosystem approach to pelagic, demersal and rock lobster fisheries in South Africa? African Journal of Marine Science 28(1): 115-157.
62. Sharp, R. and U.R. Sumaila (in press). Quantification of U.S. Marine Fisheries Subsidies. North American Journal of Fisheries Management.
63. Stern-Pirlot, A and R. Froese (2006) Can the knowledge society turn around 500 years of overfishing? 10 pages. In: Proceedings of the Thirteenth Biennial Conference of the International Institute of Fisheries Economics and Trade, July 11-14, 2006, Portsmouth, UK: Rebuliding Fisheries in an Uncertain Environment. Compiled by Ann L. Shriver. International Institute of Fisheries Economics and Trade, Corvallis, OR, USA, 2006. CD ROM. ISBN 0-9763432-3-1
64. Sumaila, U.R., Marsden, D., Watson, R., and Pauly, D. (2007) Global ex-vessel fish price database: construction and applications. Journal of Bioeconomics, 9, 39-51.
65. Sumaila, U.R., L. Teh, R. Watson, P. Tyedmers and D. Pauly (in press). Fuel Price Increase, Subsidies, Overcapacity and Resource Sustainability. ICES Journal of Marine Science.
66. Sumaila, U.R., D. Zeller, R. Watson, J. Alder and D. Pauly (2007). Potential costs and benefits of marine reserves in the high seas. Marine Ecology Progress Series 345: 305–310.
67. Sumaila, R. and F. Arreguin-Sanchez. 2007. “Experts Describe Challenges Facing Marine EBM” In: Marine Ecosystems and Management. International news and analysis on marine ecosystem-based management. Marine Affairs Research and Education. Vol. 1, No. 1.
68. Sumaila, U.R., and D. Pauly (2007). All fishing nations must unite to end subsidies. Nature (correspondence), 450: 945.
69. Sumaila, U.R., Khan, A., Watson, R., Munro, G., Zeller, D., Baron, N., Pauly, D. (2007) The World Trade Organization and global fisheries sustainability. Fisheries Research, 88, 1-4.
70. Sumaila, U.R., Munro, G., and Sutinen, J. (2007). Recent developments in fisheries economics: An introduction. Land Economics, 83 (1), 1-5.
71. Sumaila, U.R. and Walters, C. (2007). Making future generations count: Comment on “Remembering the future”. Ecological Economics 60(3), 487-488.
72. Sumaila, U.R., Volpe, J., and Liu, Y. (2007). Potential economic benefits from sablefish farming in British Columbia. Marine Policy 31(2) 81-84.
73. Sumaila, U.R. and C.W. Armstrong (2006). Distributional and efficiency effects of marine protected areas: A study of the Northeast Atlantic cod fishery. Land Economics 82 (3): 321-332;
74. Sumaila, U.R., L. Teh, Watson, R., P. Tyedmers, D. Pauly. 2006. Fuel subsidies to fisheries globally: Magnitude and impacts on resource sustainability. Fisheries Centre Research Reports 14(6), pp. 39-49.
75. Sumaila, R.S. 2005. Differences in economic perspectives and implementation of ecosystem-based management of marine resources. Mar. Ecol. Prog. Ser. 300: 241–296.
76. Teh, L. and U. Rashid Sumaila (in press) Malthusian Overfishing in Pulau Banggi? Marine Policy.
77. Teh, L., William WL Cheung, Andy Cornish, Clarus Chu and U. R. Sumaila (in press). A Survey of Alternative Livelihood Options for Hong Kong's Fishers. International Journal of Social Economics.

78. Teh, L., Zeller, D., Cabanban, A.S., The, L., and Sumaila, U.R. (2007) Seasonality and Historic Trends in the Reef Fisheries of Pulau Banggi, Sabah, Malaysia. Coral Reefs, 26, 251-263.
79. Teh, L., and Sumaila, U.R. (2007) Malthusian Overfishing in Pulau Banggi? Marine Policy, 31, 451-457.
80. Toral M.V. & P. Martinez (2007) Reproductive biology and population structure of the sea cucumber *Isostichopus fuscus* (Ludwig, 1875) (Holothuroidea) in Caamaño, Galápagos Islands, Ecuador. Marine Biology.
81. Watermeyer, K.E., Shannon, L.J., and C.L. Griffiths. Long-term effects of human activities on trophic structure in the northern Benguela. African Journal of Marine Science (in press).
82. Watermeyer, K.E., Shannon, L.J., Roux, J.-P. and C.L. Griffiths. Long-term effects of exploitation on ecosystem structure and function in the southern Benguela. African Journal of Marine Science (in press).
83. Hearn A & JC Murillo (2008) Life history of the red spiny lobster *Panulirus penicillatus* (Olivier, 1791) (Decapoda: Palinuridae) in the Galapagos Marine Reserve, Ecuador. Pacific Science 62 (2).

Books

1. Conand, C. and Muthiga, N. (eds) 2007. Commercial sea cucumbers: A review for the Western Indian Ocean. WIOMSA Book Series No. 5 v + 66.
2. López-Ferrerira, C., G. de la Cruz-Aguero and F. Arreguin-Sánchez. 2008. Atlas Oceanográfico del Banco de Campeche, México. Instituto Politécnico Nacional.
3. Markus, T., Promotion and management of marine fisheries in the European Union, Europa Law Publishing (Groningen), 250 pages, in press.
4. Markowski, M., International requirements national implementation of offshore fisheries management, Europa Law Publishing (Groningen), 230 pages, in press.
5. Pestke, S., Die Zulassung von Offshore-Windenergieanlagen (The legal regime of offshore wind energy installations), Nomos Verlag (Baden-Baden) 2008, 280 pages.
6. Starkey, D. J. (ed.), in press. *A History of the North Atlantic Fisheries from Early Times* (Bremerhaven, DSM).
7. Wille, D., Rechtsprobleme des Integrierten Küstenzonenmanagement (Legal Aspects of Integrated Coastal Zone Management), Nomos Verlag (Baden-Baden) in press.
8. Winter, G., *A fundament and two pillars.* (2008). The concept of sustainable development 20 Years after the Brundtland Report, in: Hans-Christian Bugge, Christina Voigt (eds.) Sustainable development in international and national law, Europa Law Publishing (Groningen), pp. 25-45.
9. Winter G., Marion Markowski, Till Markus (eds.) A legal clinic for marine fisheries management. With case studies on Brazil, Mexico, EU, Namibia, Kenya, and Indonesia. IUCN (Bonn), 500 pages, 2 volumes, in press.

Book chapters

1. Arreguín-Sánchez, F. 2006. Pesquerías de México, 13-36p. In: Pesca, Acuacultura e Investigación en México, Guzmán-Amaya P. and D. Fuentes-Castellanos (eds.). Centro de Estudios para el Desarrollo Rural Sustentable y la Soberanía Alimentaria. Cámara de Diputados, LIX Legislatura / Congreso de la Unión, México. 384p.
2. Brugnoli, E.; Muñiz, P.; Venturini, N.; and Burone, L. 2007. Environmental Perturbation and Coastal Benthic Biodiversity in Uruguay. *In*: Irma C Willis. (Org.). Progress in Environmental Research. 1 ed. New York: Nova science Publishers Inc., 2007, v. 1, p. 1-52.
3. Bundy, A., Coll, M., and Shannon, L.J. 2007. Ecosystem Modelling using the Ecopath with Ecosim Approach. In Megrey, B. and Moksness, E. Computers in Fisheries, Second Edition.

4. Chuenpagdee, R. Social research for sustainable fisheries: evaluating global impact of small scale fisheries. In: Christensen and Maclean (eds). Thinking Big about Ecosystem-based Management. Cambridge University Press (Status: revised and accepted).
5. Chuenpagdee, R. and Juntarashote, K. 2008. Challenges in Sustainable Management of Coastal Fisheries: Case Studies of Southeast Asia. In: Krishnamoorthy et al. (Eds). Integrated Coastal Zone Management – The Global Challenge. Research Publishing Services: Singapore.
6. García, C.B. and J. P. Caldas, in press. Grenadier fishes (Gadiforms: Macruridae) from the Colombian Caribbean: what do we know?. Chapter in a forthcoming American Fisheries Society (AFS) Book.
7. Gaumiga, R., Karlsons, G., Uzars, D., Ojaveer, (2007). H. Fisheries of the Gulf of Riga (Baltic Sea) in the late 17th century. Chapter in American Fisheries Society (AFS) Book.
8. Jarre, A., C.L. Moloney, L.J. Shannon, P. Fréon, P., C.D. van der Lingen, H. Verheye, L. Hutchings, J.-P. Roux and P. Cury. 2006. Detecting and forecasting long-term ecosystem changes., p. 239-272. In L.V.Shannon, G. Hempel, P. Malanotte-Rizzoli, C.L. Moloney, and J. Woods (eds.) Benguela: Predicting a large marine ecosystem, Elsevier, Amsterdam. 410 p.
9. Lajus, J., Ojaveer, H., Tammiksaar, E. (2007). Fisheries on the northeast coast of the Baltic Sea in the first half of the 19th century: what can be learned from the archives of Karl Ernst von Baer. Chapter in American Fisheries Society (AFS) Book.
10. MacKenzie, B. R., Bager, M., Ojaveer, H., Awebro, K., Heino, U., Holm, P., Must, (2007). A. Multi-decadal scale variability in the eastern Baltic cod fishery 1550-1860: evidence and causes. Chapter in American Fisheries Society (AFS) Book.
11. Ojaveer, H., Awebro, K., Karlsdottir, H. M., MacKenzie, B. R. (2007). Swedish Baltic Sea fisheries during 1868-1913: spatio-temporal dynamics of catch and fishing effort. Chapter in American Fisheries Society (AFS) Book.
12. Ojaveer, H., MacKenzie, B. R. Introduction: historical development of fisheries in northern Europe - reconstructing chronology of interactions between nature and man. Chapter in American Fisheries Society (AFS) Book.
13. Pierce, G. J., Santos, M. P., Smeenk, C., Saveliev, A., Zuur, A. F. (2007). Historical trends in the incidence of strandings of sperm whales (Physeter macrocephalus) on North Sea coasts: an association with positive temperature anomalies. Chapter in American Fisheries Society (AFS) Book. Sumaila, U.R. and K. Stephanus (2006). Declines in Namibia's pilchard catch: the reasons and consequences. In Rognvaldur Hannesson, Manuel Barange and Samuel F. Herrick Jr. Climate Change and the Economics of the World's Fisheries- Examples of small pelagic stocks. Edward Elgar, Cheltenham, UK, pp. 205-214.
14. Ponce-Díaz, G., F. Arreguín-Sánchez y L.F. Beltrán-Morales. 2005. Indicadores de sustentabilidad y pesca: casos en Baja California Sur, México. In: Beltrán-Morales L.F. (ed.). Desarrollo sustentable y construcción de indicadores. CIBNOR, México.
15. Shannon, L.J., Coll, M., Neira, S., Cury, P.M., and Roux, J.-P. The role of small pelagic fish in the ecosystem. In Checkley, D.M., C. Roy, J. Alheit, and Y. Oozeki (eds.), Climate Change and Small Pelagic Fish.
16. Sumaila, U.R. and K. Stephanus (2006). Declines in Namibia's pilchard catch: the reasons and consequences. In Rognvaldur Hannesson, Manuel Barange and Samuel F. Herrick Jr. Climate Change and the Economics of the World's Fisheries- Examples of small pelagic

Scientific Reports

1. Alder, J., S. Hopkins, W. W. L. Cheung and U. Rashid Sumaila (2006). Valuing Marine Habitats: Fantasy or Fact? Fisheries Centre Working Paper #2006-03, The University of British Columbia, Vancouver, BC, Canada.
2. Arancibia, H. and S. Neira. 2008. Overview of the stock of hake (Merluccius gayi) and forecast of its biomass including jumbo squid (Dosidicus gigas) prey-predator relationship in central Chile (33°S - 39°S). CalCOFI. Rep.

3. Arancibia, H. and S. Neira. 2007. Assessing the potential role of predation by jumbo squid (Dosidicus gigas) and fishing on small pelagics (common sardine *Strangomera bentincki* and anchovy Engraulis ringens) and Chilean hake (Merluccius gayi) in central Chile, 33-39ºS. In: Olson, R.J. and J. W. Young (eds.) The role of squids in open ocean ecosystems. Report of a GLOBEC-CLIOTOP/PFRP Workshop, 16-17 November 2006, Honolulu, Hawaii, USA : 68-70.
4. Arancibia, H. and S. Neira. 2006. Assessing the potential role of predation by jumbo squid (Dosidicus gigas) and fishing on small-pelagics (common sardine Strangomera bentincki and anchovy Engraulis ringens) and common hake (Merluccius gayi) in central Chile, 33° - 39° S. Global Ocean Ecosystem Dynamics. GLOBEC Report N° 24. The role of squid in open ocean ecosystems. Report of a GLOBEC-CLIOTOP/PFRP Workshop (November 16-17), Honolulu, Hawaii, USA: 68-70.
5. Arreguín-Sánchez, F. and E. Arcos-Huitrón. Fisheries Catch Statistics From Mexico. *Fisheries Centre Research Reports* (in press).
6. Arreguín-Sánchez F, P. del Monte-Luna, J.G. Díaz-Uribe , M. Gorostieta, E.A. Chávez and R. Ronzón-Rodríguez. 2007. Trophic model for the ecosystem of La Paz bay, Southern Baja California Peninsula, Mexico. Fish, Centre Res. Rep
7. Arreguín-Sánchez, F. and E. Arcos-Huitrón. 2007. Fisheries Catch Statistics From Mexico. Fisheries Centre Research Reports 15(2):81-104.
8. Barausse, A., Duci, A., Mazzoldi, C., Artioli, Y. and Palmeri, L. 2007. Trophic model of Northern Adriatic sea, an eutrophic and highly-exploited ecosystem. Fish. Centre Res. Rep.
9. Barros, M.E., S. Neira and H. Arancibia. 2007. Trophic interactions in the upwelling ecosystem of northern Chile, year, 1997.
10. Cheng, H.Q., Jiang, H., Xu, H.G., Wu, J., Ding, H., Le Quesne, W.J.F. & Arreguín-Sánchez, F. 2007. Spatial resources and fishery management framework in the East China Sea. In: INCOFISH Ecosystem Models: Transiting from Ecopath to Ecospace, ed. Le Quesne, W.J.F., Arreguín-Sánchez, F. & Heymans S.J.J., Canada: University of British Columbia, Fisheries Centre Research Reports 15(6): 87-97.
11. Chuenpagdee, R., Liguori, L., Palomares, M.L.D., and Pauly, D. 2006. Bottom-up, Global Estimates of Small-Scale Fisheries Catches. *Fisheries Centre Research Report* 14(8). 110p. (Available at http://www.fisheries.ubc.ca/publications/)
12. Del Monte-Luna, P., F. Arreguín-Sánchez and D. Lluch-Belda. 2007. Marine ecosystem analyses: BAC meets Ecopath. Fisheries Centre Research Report, UBC, Canada.
13. Gasalla, M.A., Velasco, G., Rossi-Wongtschowski, C.L.D.B., Haimoivi, M. & Madureira, L.S.P. 2007. Modelo de equilíbrio de biomassas do ecossistema da região Sudeste/Sul do Brasil entre 100 e 1000 m de profundidade. Série Documentos Revizee - Score Sul. São Paulo: Instituto Oceanográfico – USP: 61p
14. Khan, A., Sumaila, U.R., Watson, R., Munro, G., Pauly, D., 2006. The nature and magnitude of global non-fuel fisheries subsidies. Fisheries Centre Research Reports 14(6) , p. 1-34.
15. Le Quesne W.J.F., Arreguín-Sánchez F., Albañez-Lucero M., Cheng H.Q., Escalona V.H.C., Daskalov G., Ding H., Rodríguez E.G., Heymans S.J.J., Jiang H., Lercari D., López-Ferreira C., López-Rocha J.A., Mackinson S., Pinnegar J.K., Polunin N.V.C., Wu J., Xu H.G. and M.J. Zetina-Rejón. 2008. Analysing Ecosystem Effects of Selected Marine Protected Areas With Ecospace Spatial Ecosystem Models. Canada: University of British Columbia, Fisheries Centre Research Reports 16(2) 67 pp.
16. Lercari D., F. Arreguín-Sánchez, and W. Le Quesne. 2007. An ecosystem simulation model of the Northern Gulf of California. Fish, Centre Res. Rep.
17. Mackinson, S and Daskalov, G. 2007. An ecosystem model of the North Sea for use in research supporting the ecosystem approach to fisheries management: description and parameterisation. Cefas Science Series Technical Report 142. 200p.
18. Neira S. and H. Arancibia. Modelling the food web in the upwelling ecosystem of central Chile (33ºS-39ºS) in the year 2001. 2007. Fisheries Centre Research Reports.
19. Nel, D.C. and Petersen, S.L. 2007. Risk Assessment for Sustainable Fisheries (RASF) Workshop for the South African Large Pelagic Fishery. 21 pp.

20. Nel, D.C. and Petersen, S.L. 2007. Risk Assessment for Sustainable Fisheries (RASF) Workshop for the South African Squid Fishery. 22 pp.
21. Nel, D.C., Cochrane, K., Petersen, S.L., Shannon, L.J., van Zyl, B. and Honig, M.B. (Editors) 2007. Ecological Risk Assessment: a tool for implementing an ecosystem approach for southern African fisheries. WWF South Africa Report Series - 2007/Marine/002. 203pp.
22. Salcido-Guevara L. A. and F. Arreguín-Sánchez. A benthic ecosystem model of the Sinaloa continental shelf, Mexico. Fish. Centre Res. Rep.
23. Samb, B. 2007. Spatial Modelling of Senegambian Ecosystem. Fisheries Centre Research Report, UBC, Canada.
24. Sumaila, U.R., L. Teh, Watson, R., P. Tyedmers, D. Pauly. 2006. Fuel subsidies to fisheries globally: Magnitude and impacts on resource sustainability. Fisheries Centre Research Reports 14(6), pp. 39-49.
25. Sumaila, U.R., Khan, A., Teh, L., Watson, R., Tyedmers, P., Pauly, D. 2006. Subsidies to high seas bottom trawl fleet and the sustainability of deep sea benthic fish stocks. Fisheries Centre Research Reports 14(6), pp. 47-51.

Conference contributions:

1. Albañez-Ñucero M.O. y F. Arreguín-Sánchez. Tipos de fondo y distribución espacial del mero (Epinephelus morio) del Banco de Campeche. XII Congreso Latinoamericano de Ciencias del Mar, Florianópolis, Brasil, Abril 2007.
2. Albañez-Lucero M.O. Distribución espacial del mero (Epinephelus morio) del Banco de Campeche, México: consideraciones para el manejo de la pesquería. 7a Semana de Posgrado en Baja California Sur, México. 26 al 30 de Marzo del 2007.
3. Arancibia, H. and S. Neira. 2005. Modelling predation of common hake (Merluccius gayi) by jumbo squid (Dosidicus gigas) in central Chile (33-39° S). Proceedings of the III International Symposium Internacional on Squids in the Pacific Ocean. Instituto del Mar del Perú, November 28-30, Lima, Perú.
4. Arreguín-Sánchez F., M. Ramírez-Rodríguez, M. Zetina-Rejón & V.H. Cruz-Escalona. Natural hazards, stock depletion and decision making process of the pink shrimp, Farfantepenaeus duorarum, fishery in the Southern Gulf of Mexico. Symposium on Mitigating Impacts of Natural Hazards on Fishery. Annual meeting of the American Fisheries Society and the National Sea Grant College. 2-6 September 2007, San Francisco, USA
5. Arreguín-Sánchez, F., M. Albañez-Lucero, J. A. López-Rocha. 2007. Type of bottoms and catchability spatial distribution as basic criteria to identify a potential MPA to recover the red grouper, Epinephelus morio, stock in the Campeche Bank, Mexico. MPA Symposium. Murcia Spain, September 25-28, 2007.
6. Arreguín-Sánchez F., P. del Monte-Luna, J.G. Díaz-Uribe, V.H. Cruz-Escalona and J. Elorduy-Garay. Simulated impacts of fishing reserves in the ecosystem of La Paz Bay, in the southern Baja California Peninsula, Mexico. European Symposium on Marine Protected Areas. 25 – 28 September 2007.
7. Arreguín-Sánchez F., M. Albañez-Lucero & J.A. López-Rocha. Type of bottoms and catchability spatial distribution as basic criteria to identify a potential MPA to recover the red grouper, Epinephelus morio, stock in the Campeche Bank, Mexico. European Symposium on Marine Protected Areas. 25 – 28 September 2007.
8. Arreguín-Sánchez. F. Impacto de la pesca en el Golfo de California: ¿que nos dice la tendencia del cambio en los niveles tróficos de las capturas de las últimas cinco décadas?. Reunión Bianual de la Sociedad Mexicana de Pesquerías: Retos de las Ciencias Acuáticas y Pesqueras en México. 2-4 Mayo 2007, La Paz, Baja California Sur, México.
9. Arreguín-Sánchez, F. y P. del Monte-Luna. Evaluación del impacto potencial en el ecosistema de la apertura de una pesquería de arrastre ribereña de camarón en Bahía de La Paz, México. XII Congreso Latinoamericano de Ciencias del Mar, Florianópolis, Brasil, Abril 2007.

10. Arturo Tripp Valdez, Francisco Arreguín Sánchez, Manuel Zetina Rejón y Víctor Cruz Escalona. Análisis de la estructura de la ictiofauna de fondos blandos de las costas de Nayarit, México. Reunión Bianual de la Sociedad Mexicana de Pesquerías: Retos de las Ciencias Acuáticas y Pesqueras en México. 2-4 Mayo 2007, La Paz, Baja California Sur, México.
11. Arturo Tripp Valdez, Francisco Arreguín Sánchez, Manuel Zetina Rejón y Víctor Cruz Escalona. Análisis de la estructura de la ictiofauna de fondos blandos de las costas de Nayarit, México. XI Congreso de Investigadores del Mar de Cortés y el "V Simposium Internacional sobre el Mar de Cortés. 17 al 20 de Abril del 2007, Hermosillo, Sonora, Mexico.
12. Arturo Tripp Valdez. Análisis de la estructura de la ictiofauna de fondos blandos de las costas de Nayarit, México. 7a Semana de Posgrado en Baja California Sur, México. 26 al 30 de Marzo del 2007.
13. Barausse, A., A. Duci, C. Mazzoldi, Y. Artioli & L. Palmeri. Northern Adriatic sea mass-balance model: trophic structure of a highly-fished and eutrophic ecosystem. EMBS 07.
14. Barausse, A., Artioli, Y., Palmeri, L., Duci, A., Mazzoldi, C. 2007. Northern Adriatic sea ecosystem model: trophic network analysis, time simulation and spatial dynamics. Proceedings of the 6th European Conference of Ecological Modelling, 27-30 November 2007, Trieste.
15. Barausse, A., Duci, A., Mazzoldi, C., Artioli, Y., Palmeri, L. 2007. Northern Adriatic sea mass-balance model: trophic structure of a highly-fished and eutrophic ecosystem. Proceedings of the 42nd European Marine Biology Symposium. Kiel 27-31 August 2007.
16. Barros, M., H. Arancibia, A. Milessi & S. Neira. 2006. XXVI Congress of Marine Science in Chile. Chilean Society of Marine Science - Universidad Arturo Prat, Iquique, May 22-26, 2007: 145.
17. Bello, B. & H. Arancibia. 2007. Modelling of the benthic ecosystem in the protected area of Los Chonos de Guanín in southern Chile . Proceedings of the XXVII Congress of Marine Science in Chile. Chilean Society of Marine Science - Universidad Arturo Prat, Iquique, May 28 to June 01, 2007: 83.
18. Cheng He-Qin, Jiang Hong, Xu Hai-Gen, Wu Jun, Ding Hui, Will Le QUESNE, Francisco Arreguín-Sánchez. European MPA-Symposium 2007. 25 to28 Sep. 2007, Murcia, Spain
19. Cheng He-Qin, Jiang Hong, Xu Hai-Gen, Wu Jun, Ding Hui, Will Le QUESNE, Francisco Arreguín-Sánchez. The Second Global Conference on LMEs. Qingdao, China, 11 to 13 Sep. 2007
20. Cheng He-Qin and Jiang Hong "Preliminary Study on Fishery Impact by Trophic Structure and Flow analysis in the East China Sea" published in the proceeding of the ICEC-2006. Hong had given a 15 minutes oral presentation in the conference to introduce our INCOFISH work.
21. Chuenpagdee, R, Sumaila, R., Trinidad, A., and Jentoft, S. 2007. Coastal Connections: Innovative approaches and tools for creating liveable coastal communities. Proceedings of Coastal Zone 07, Portland, Oregon, July 22-25, 2007.
22. Cubero-Pardo P., H. Zambrano-León, L. Chasqui-Velasco, C. Martínez-Iglesias, P. Herrón-Pérez y G. Reck, in press. Contribución al manejo de turismo en ecosistemas marinos: Criterios e Indicadores para Evaluar el Impacto del Ecoturismo en Áreas Marinas Protegidas. Proceedings of the II Congreso de Parques Nacionales y otras áreas Protegidas. Bariloche, Argentina, 2007.
23. Giacaman, J., S. Neira & H. Arancibia. 2006. A trophic model for a benthic community in a protected area off central Chile. Proceedings of the XXVI Congress of Marine Science in Chile. Chilean Society of Marine Science - Universidad Arturo Prat, Iquique, May 22-26, 2007: 89.
24. IMARPE: "Changes in the distribution area of Peruvian hake: effect of fisheries". Presented at the International Conference about the Humboldt Current System (Nov. 7th –Dec. 1st , 2006).
25. IMARPE: "Overfishing and environmental change cause male reproductive failure in Peruvian Hake, Merluccius gayi peruanus" presented at the Humboldt Current System International Conference.

26. Jiang, H., Cheng, H.Q., Xu, H.G., Arreguín-Sánchez, F., LeQuesne, W.J.F. (2006). Preliminary Study on Fishery Impact by trophic structure and flow analysis in the East China Sea. Proceeding of the Second International Conference on Estuaries and Coasts. 27th-30th Nov. 2006, Guangzhou, China. Guangdong Economic Publishing House, Guangdong, China. pp. 537-543.
27. Järnmark, L..: The "Herbivores Tool" on the INCOFISH portal. Presented at ISS Kobe, Japan, March 2007.
28. Jiang H., Cheng H.Q., Shen F., Xu, H.G., Arreguín-Sánchez F. & LeQuesne, W.J.F. 2006. Preliminary Study on Fishery Impact by trophic structure and flow analysis in the East China Sea. Proceeding of the Second International Conference on Estuaries and Coasts. 27th-30th Nov. 2006, Guangzhou, China. Guangdong Economic Publishing House, Guangdong, China. pp. 537-543.
29. Juntarashote, K. 2007. Introduction to Coastal Transects Analysis Model. Proceedings of CHARM's Workshop on 'Successes and Lessons Learned for Future Coastal Resource Management', Krabi, Thailand, August 22-24, 2007.
30. Kaschner, K., J. S. Ready, E. Agbayani, J. Rius, K. Kesner-Reyes, P. D. Eastwood, A. B. South, S. O. Kullander, T. Rees, C. H. Close, R. Watson, D. Pauly, and R. Froese. 2008 AquaMaps. *Ocean Biodiversity Informatics 2007 Conference Proceedings*
31. López-Rocha J. A. and F. Arreguín-Sánchez. Seasonal patterns of movement of the red grouper Epinephelus morio on the north continental shelf of the Yucatan Peninsula, Mexico. Proceedings of the 60th annual meeting of the Gulf and Caribbean Fisheries Institute. Punta Cana, Dominican Republic, November 5-10, 2007.
32. López-Rocha J. A. and F. Arreguín-Sánchez. 2007. Patrones de variación espacio temporal de la capturabilidad en la pesquería del mero Epinepuelus morio en el banco de Campeche, México: implicaciones para el manejo. COLACMAR, Brasil. 15-19 de abril, 2007.
33. Neira, S., C. Moloney, P. Cury & H. Arancibia. 2006. Analysis of changes in the upwelling ecosystem off central Chile (period 1970-2004) using ecotrophic modelling. XXVI Congress of Marine Science in Chile. Chilean Society of Marine Science - Universidad Arturo Prat, Iquique, May 22-26, 2007: 109.
34. Salcido Guevara, L.A. Estructura y flujos de biomasa en un ecosistema bentónico explotado en el sur de Sinaloa, México (avance final). 6a Semana del Posgrado en Baja California Sur. La Paz, Baja California Sur, del 27 al 31 de marzo de 2006.
35. Stern-Pirlot, A.: "Can the knowledge society turn around 500 years of overfishing?" Presented at IIFETT conference Portsmouth UK in July 2006.
36. Sumaila, U.R. (*in press*) Getting values and valuation right: A must for reconciling fisheries with conservation. Proceedings of the American Fisheries Society Conference.
37. Sumaila, U.R. (2007). Getting Values and Valuation Right: A Must for Reconciling Fisheries with Conservation. American Fisheries Society Symposium, 49:587-592.
38. Zetina-Rejón M.J., F. Arreguín-Sánchez, V. Cruz-Escalona, M. Albañez-Lucero, Jorge A. López-Rocha and César López-Ferreira. Simulating a MPA as strategy for the red grouper ecosystem-based fishery management in the Campeche Bank, Mexico. European Symposium on Marine Protected Areas. 25 – 28 September 2007.
39. Zetina-Rejón, M. J.; Cruz-Escalona, V. H.; Arreguín-Sánchez, F.; Arcos-Huitrón, E. Análisis comparativo de las razones isotópicas de peces demersales dominantes en el sur Golfo de Mexico. XII Congreso Latinoamericano de Ciencias del Mar, Florianópolis, Brasil, Abril 2007.

Online Publications and Tools at www.incofish.org

1. Annotated Bibliography
2. Annotated Legal Links List
3. Aquamaps presented at the 2007 meeting of the Brazilian Society of Ichthyologists in Itajaí, Santa Catarina, Brazil. (see www.ebi2007.com/index.php)

4. Aquamaps marine biodiversity map: click on the map to obtain local species list for that area.
5. Backflash files. The Backflash files are four studies that show how historical recognization of fisheries stock baseline has shifted with time.
6. Before – After maps with predicted distribution before and after a certain point in time
7. Bycatch Database
8. Chuenpagdee, R., Agbayani, E., Atanacio, R., Juntarashote, K., Kay, R., Pierce, G., Pita, C., Traesupap, S., Wang, J. 2007. Coastal Transects Analysis Model. World Wide Web electronic publication. www.coastaltransects.org, Version 06/2007.
9. Coastal Transects Analysis Model, CTAM

Country reports and profiles on national fisheries legislation for

10. Brazil (.pdf, 468KB),
11. India (.pdf, 378KB),
12. Indonesia (.pdf, 378KB),
13. Kenya (.pdf, 835KB),
14. Mexico (in Spanish) (.pdf, 348KB),
15. Mexico (in English) (.pdf, KB),
16. Namibia (.pdf, 776KB),
17. Russia (.pdf, 492KB),
18. South Africa (.pdf, 416KB),
19. Sri Lanka (.pdf, 408KB)
20. CRIA Species Mapper
21. CRIA Mapping Tools
22. CRIA openModeller
23. Database search engine
24. Dynamic maps where species distribution is predicted from the occurrence of the respective niche in space and time as predicted by physical models of the oceans.
25. Ecopath Model Collection list
26. Ecopath WP4 Models list
27. Ecotourism valuation tool at www.incofish.org/Workpackages/WP9/Tourism_Impact.php
28. FishBase Identification tools
29. Fish buying guide “Don´t eat babies” (www.incofish.org/donteatbabies.php).
30. Fisheries Organisations, Coastal Institutions by Country
31. Fish Rulers
32. Herbivores tool. Presented at ISS, Kobe, Japan, March 07.
33. ICZM Links
34. International Seafood Guide. Presented at Seafood summit, FL, USA January 2007,
35. Invasive exotics
36. Kaschner, K., J. S. Ready, E. Agbayani, J. Rius, K. Kesner-Reyes, P. D. Eastwood, A. B. South, S. O. Kullander, T. Rees, C. H. Close, R. Watson, D. Pauly, and R. Froese. 2007 AquaMaps: Predicted range maps for aquatic species. World Wide Web electronic publication, www.aquamaps.org, Version 08/2007.
37. Kaschner, K., J. S. Ready, E. Agbayani, J. Rius, K. Kesner-Reyes, P. D. Eastwood, A. B. South, S. O. Kullander, T. Rees, C. H. Close, R. Watson, D. Pauly, and R. Froese. 2008 AquaMaps Environmental Dataset: Half-Degree Cells Authority File (HCAF). World Wide Web electronic publication, www.aquamaps.org/data, Version 01/2008.
38. Legislation guide to ministries
39. Maps with predicted seasonal distribution
40. MPA Planning Tool at www.aquamaps.org/tools/aquamaps/tools/mpa_wizard/details.htm
41. Maturity indicators spreadsheet tool (see www.incofish.org/Workpackages/WP7/WP7Downloads.php)
42. Outreach toolkit
43. Panukat Isda (Philippine fish ruler)
44. Press kit
45. Retailers guide
46. Seafoodguide.mobi

47. Species Information Service
48. Standardized electronic maps with predicted distribution (likelihood of occurrence)
49. Subsidies database Defining fisheries subsidies and making distinction between "Good, Bad and Ugly" subsidies.
50. Sumaila, U.R., Ratana Chuenpagdee, Patricia Susan Alexander, Claire Armstrong, Jannike Falk-Petersen, Sheila J.J. Heymans, Moenieba Isaacs, Kevin Stephanus, and Annabelle Cruz Trinidad (2007). Global Fisheries Socio-economic Database. Online publication at www.incofish.org/Workpackages/WP8/WP8Downloads.php.
51. Sumaila, U.R., Ratana Chuenpagdee, Patricia Susan Alexander, Claire Armstrong, Jannike Falk-Petersen, Sheila J.J. Heymans, Moenieba Isaacs, Kevin Stephanus, and Annabelle Cruz Trinidad (2007). Ecosystem values. Online publication at www.incofish.org/Workpackages/WP8/WP8Downloads.php.
52. Sumaila, U.R., Claire Armstrong, Annabelle Cruz Trinidad, Ratana Chuenpagdee, Jannike Falk-Petersen2, Kevin Stephanus, Patricia Susan Alexander and Moenieba Isaacs (2007). Indicators of fisheries mismanagement. Online publication at www.incofish.org/Workpackages/WP8/WP8Downloads.php
53. Values, prices database

Posters

1. ECNU: East China Sea Ecopath modelling had been shown on the 41st European Marine Biology Symposium hosted by University College Cork, Ireland, during 4th to 8th September, 2006.
2. IFM-GEOMAR: A common sense approach to ecosystem-based fisheries management. Presented in October 2006 at the Bergen conference on the ecosystem approach to fisheries management.
3. IMARPE: "Comparative analysis of the demersal community structure and trophic relations of the Peruvian hake *Merluccius gayi peruanus* and its by-catch of the years 1985 and 2001." Presented at the International Conference about the Humboldt Current System (Nov. 7th –Dec. 1st , 2006).
4. MCM-DEAT: Jarre, A., Paterson, B., Moloney, C.L., Miller, D.C.M., Field, J.G., Starfield, A.M. 2006b. Knowledge-based systems as decision support tools in an ecosystem approach to fisheries: comparing a fuzzy-logic and a rule-based approach. Poster No. 055, Humboldt Current Conference, 27 November - 1 December 2006, :Lima, Peru. MS, submitted for publication in the Conference Proceedings (Progress in Oceanography), February 2007.
5. MCM-DEAT: Paterson, B., Moloney, C.L., Jarre, A., Fairweather, T., Shannon, L.J., van der Lingen, C.M., Field, J.G. (2006). A fuzzy spin on fishy problems: a fuzzy-logic tool for multicriteria decision-making in the Southern Benguela. Poster No. 056, Humboldt Current Conference, 27 November - 1 December 2006, :Lima, Peru. MS in prep for publication, March 2007.
6. NRM (and other WP3 members) presented Aquamaps (http://www.incofish.org/Results/Maps.php) to the Brazilian Society of Ichthyologists at their meeting in Itajaí, Santa Catarina, Brazil, in Jan/Feb 2007 (see www.ebi2007.com/index.php).

Guides

1. Cubero-Pardo P. 2008. Code of Conduct for Ecotourism Activities in Visit Sites of the Galápagos Marine Reserve. Official Document of the Galapagos National Park Direction directed to Operators, Guides and Visitors. Charles Darwin Foundation. Pp. 25. (English digital version and Spanish Printed Version).

Newsletter articles

1. Gasalla, M. In - Newsletter: "Diario de bordo – Publicação trimestral do Instituto Oceanográfico, Universidade de São Paulo." Año 2, numero 7 – jul / ago / sept 2006.
2. Sumaila, U.R.. 2007. Briefing at the United Nations on global fisheries. SAUP Newsletter.
3. Sumaila, U.R: 2007. Fisheries Centre at the World Trade Organization. Fishbytes.

Outreach Material

- Fish ruler Baltic
- Fish ruler North Sea
- Fish ruler Peru (for 5 regions)
- Fish ruler Philippines (Panukat Isda)
- Fish ruler Senegal
- INCOFISH brochure (English and German)
- Information flyers for all tools
- T-Shirt prints, caps, bags

Appendix 3: INCOFISH in the media

INCOFISH participants can look back on a long series of media appearances while the Project was running and there is more to come after the end of the Project (see below). To get a complete overview on INCOFISH media appearances throughout its duration please go to www.incofish.org/News/IncoMed.php and to media appearances of WP8.

Year 2008

1. June 2008: Pacific Nations Ban Tuna Boats to Stop Cod-Like Stock Collapse
   Conservation areas along migratory routes and near sea mounts, where tuna spawn and feed, will help replenish stocks, Ussif Rashid Sumaila, Director of the ... more ...
2. June 6, 2008: **INCOFISH Star International Cooperation Project EC** (.pdf 14.4 KB)
   INCOFISH EuroNews video presentation
   http://www.euronews.net/en/article/06/06/2008/fishing-for-tomorrow/
3. June 3, 2008: mapCRIA, **New GBIF portal launched**
   GBIF (Global Biodiversity Information Facility) has launched its new portal
   http://www.gbif.org/News/NEWS1212503794
   GBIF are providing a new tool to create a niche model. They are using openModeller, a framework for niche modeling that is being developed through a project funded by Fapesp, coordinated by CRIA, INPE (Instituto Nacional de Pesquisa Espacial) and Poli
   http://openmodeller.sourceforge.net/
   INCOFISH has financed part of the development of openModeller. The framework today has 8 algorithms and one is AquaMaps:
   http:// www.aquamaps.org
   Users may select a marine species and specify to run a model using an environmental model within the ocean, ocean layers provided by INCOFISH. Through collaborative work with INCOFISH workpackage 3, pre and post analysis tools were also introduced. The interface that is being used by GBIF was developed through a collaboration between the University of Colorado and CRIA.
4. May 11 2008, The Observer How the world's oceans are running out of fish.
5. April 10, 2008: Sharkwater, NDR Germany Interview with Rob Stewart, Dr. Rainer Froese IFM-GEOMAR and more Download : Sharkwater.mp3 (6MB)
6. March 18, 2008: Overfishing Impact: Interview with Dr. Ussif Rashid Sumaila. Dr. Sumaila, director of the Fisheries Economics Research Unit at the University of British Columbia Fishery Center, talks about overfishing, its impact on the Ghanaian economy, and the global ramifications of a fish shortage in Africa. See video on YouTube:
   http://www.youtube.com/watch?v=6Bfmyw-3yys?
7. March 3, 2008: Globe and Mail WTO weighs if EI for fishermen is an unfair subsidy.
8. Google - INCOFISH Seafood guide - Hits 15800
9. Google - “Fisch im Handy” – 1150 Hits
10. March 2008: Fisch im Handy in "Bild der Wissenschaft" (pdf, 476 KB)
11. March 2008: Fisch im Handy - Slow Food (pdf, 387KB)
12. March 2008: Fisch im Handy - Ökologisches Wirtschaften (pdf, 612KB)
13. March 2008: AAAS related release on tuna management
14. February 20, 2008, Regina Leader Post Tuna could see cod-like collapse
15. February 20, 2008, The National Post World's tuna stocks under seige, say scientists
16. February 20, 2008, The Vancouver Sun Conservation measures needed to save tuna: experts
17. February 20, 2008, Innovations report
    Germany Learning from cod collapse to save tuna
18. February 18: UBC.ca UBC scientist invokes future generations to save tuna populations from collapse

19. January 2008 Slow Food: Fisch im Handy (pdf, 1MB)
20. January 11, 2008, HR1 Flossentiere, ökologisch korrekt – Einkaufstipps vom Forscher im Internet (pdf, KB)
21. January 03, 2008, RBB Kulturradio Korrekter Fisch per Handy

Year 2007

22. December 2007, Kieler Nachrichten Fisch im Handy (pdf, 1,661KB)
23. December 14, 2007, n-tv.de Entscheidung an der Theke Fisch im Handy (pdf,123 KB)
24. December 13, 2007, Pressrelease IFM-Geomar Fisch im Handy (pdf, 36KB)
25. December 12, 2007, Eurekalert Ancient fish bones reveal the impacts of global warming beneath the sea (pdf,225 KB)
26. December 12, 2007 Nature All fishing nations must unite to cut subsidies (Sumaila and Pauly) (pdf,69 KB)
27. October 31, 2007, CurrentResults.com Escaped Fish Destroy Native Ecology
28. October 06, 2007 Gefahr aus der Fishfarm, (pdf, 194KB)
29. July/August 2007 Fisheries Centre at the World Trade Organization (pdf,319KB)
30. July/August 2007 The Sea Around Us Project Ne Newsletter (pdf,288KB)
31. June 5, 2007 BBC Fishing destabilizes Black Sea (.pdf, 936KB)
32. May 2007, Pottkieker 05 Love Fish, Mensa streicht bedrohte Fischarten aus dem Speiseplan (.pdf, 644KB)
33. May 26, 2007 Globe and Mail A dose of global cod-liver oil (.pdf 24KB)
34. April 23, 2007, The Parliament Magazine The INCOFISH Project, Incofish advertorial (pdf, 90KB)
35. April 14, 2007, Radio Einz: Freitags gibt es Fisch – aber wie lange noch?
36. April 04 2007, The Western Star: Research chair working on simpler approach to coastal management. (pdf, 326KB)
37. March 1, 2007, Newsblaze Tip Of The Tongue:
38. February 22 2007, ECSP Events: Globalized Trade and the Macroeconomics of Capture Fisheries
39. Fevrero 2007, IMARPE al día: Chikipez, una alternativa para salvar nuestra reserva de peces.
40. Feb 19 (ANI), Daily India.com: Deep-sea trawling neither environmentally nor economically sound
41. February 19 2007, BBC News: Call to halt deep sea 'plunder'
42. February 18 2007, Mongabay.com: Government subsidies drive deep-sea fish depletion
43. Jan 29 2007, Timesonline: The cod's off, but fishermen are hoping that squid's in.
44. Jan 10 2007, Shetland Marine News: Why not targeting squid? Project generic website
45. Jan 01 2007, ZDFmediathek: Alarm in den Meeren

Year 2006

46. Dec 23, 2006, Süddeutsche Zeitung: Sind die Fischstäbchen vom Aussterben bedroht? (.pdf, 727KB)
47. Dec 12 2006, NOAA celebrates 200th anniversary Top ten Breakthroughs: Ecopath...
48. Dec 19 2006, ZDFmediathek: Geringere Fangquoten gegen Überfischung?
49. Nov 17 2006, Vancouver Sun: Fuel subsidies keep trawlers 'strip-mining' sea, report says. "If we could get rid of the subsidies, it would be huge in terms of saving the deep sea," says Rashid Sumaila, lead author of the report released Thursday.
50. Oct 30 2006 Stiftung Warentest, Tipps zum Fischkauf: Nicht alle in den Einkaufswagen (.pdf, 95 KB)
51. Oct 18 2006, ZDFmediathek: THUNFISCH BALD NUR NOCH IM AQUARIUM?
52. Sep 6 2006, Leipziger Internet Zeitung: Keine kleinen Fische: Fischlineal der Verbraucherzentralen setzt Zeichen gegen Überfischung der Meer
53. Aug 23 2006 , Kieler Nachrichten: Andere Netze verwenden (.pdf)
54. Jul 20 2006, Zweites Deutsches Fernsehen, ZDF: Thunfisch, Eine begehrte Ware
55. Jul 19 2006, Die Kieler Nachrichten: Der Fisch ist weg oder Quallen an die Macht

56. Jul 17, 2006 NDR Fernsehen:
    Kleine Fische - große Wirkung: Überfischung
57. 1 Jul 2006 Segeberger Zeitung:
    Lineal „Fisch-O-Meter" soll beim bewussten Einkauf helfen (.pdf)
58. 1 Jul 2006, Die Tageszeitung: Baby-Mörder zur See (.pdf)
59. Jun 1, 2006 Hamburger Abendblatt:
    Fische nach Maß (.pdf)
60. 1 Jun 2006, Leipziger Volkszeitung Ratgeber, Schollen sollten mindestens 39 Zentimeter groß sein (.pdf)
61. Mai 31, 2006, Yahoo Nachrichten:
    Fischlineal „Fisch-O-Meter" soll Baby-Fische retten (.pdf)

Year 2005

62. Dec 7, 2005 El Pais:
    Nos faltan unas 6.000 especies de peces para tenerlas todas en Fishbase" (.pdf)
63. Jul 29, 2005 Luebecker Nachrichten: Kieler wollen Fishe retten (.pdf)