Paris by day
Symposium on "Quantitative ecosystem indicators for fisheries management"

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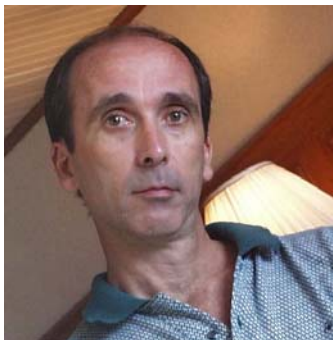


Dr. Villy Christensen (top) is a fisheries scientist specializing in ecosystem approaches to fisheries management. He has been central to the development of the ECOPATH ecosystem modelling approach and software, which is used extensively throughout the world. He is part of the Sea Around Us project funded by the Pew Charitable Funds, and is an associate professor at the University of British Columbia, Vancouver, Canada.

Dr. Philippe Cury (bottom) is Director of the Centre de Recherche Halieutique Méditerranéenne et Tropicale. He is also a Senior Research Scientist and Director of Research, IRD. He has published several theories on linkages between climate and fisheries and on the functioning of marine ecosystems.

Spring in Paris helped to attract 250 participants from 43 countries to a symposium in early April this year. The symposium on *"Quantitative ecosystem indicators for fisheries management"* was hosted by the Intergovernmental Oceanographic Commission (IOC) at the UNESCO headquarters next to the Eiffel Tower. Years of preparation were over and the stage was set for a programme of 40 presentations and close to 150 posters.

The topic of the symposium reflects the growing understanding that exploited fish populations must be considered as integral components of ecosystem function instead of phenomena that operate independently of their environment. Internationally, there has been wide recognition of the need to move toward an ecosystem approach to fisheries, a development spearheaded by FAO (UN Food and Agriculture Organization) through the Code of Conduct for Responsible Fisheries, and supported by many regional and national institutions as well as academia, NGOs and the public-at-large. Intergovernmental organizations such as PICES, require meaningful indicators that adequately reflect the state of marine ecosystems.

As we move to embrace an ecosystem perspective, we need new measuring sticks. Ecosystem approaches to fisheries include consideration of the inter-dependent way we utilize ecosystems. At a minimum, these components include ecological, economical, social, technological, as well as governance aspects. When considering the ecosystem, we must include not only the target species, but also their effects on dependent, competitor, and non-target species, as well as on the habitats shared by these species. An important question thus arises, related to trade-offs. Management interventions directed at one target species may have consequences for many other species, including species that are targets of other fisheries. How do we evaluate the trade-offs involved, and how do we determine what direction we, as a society, should take?

To evaluate such questions, it is important to form our decisions based on well-founded science as well as on information about societal priorities. At the Paris Symposium, the focus was on the scientific aspects of ecosystem approaches to fisheries, with the intention to provide information and guidelines about how to develop, test and apply indicators, or frameworks of indicators.

Internationally, the first major initiative related to the use of ecosystem indicators for sustainable fisheries development was taken by the Government of Australia in cooperation with FAO, through a Consultation in Sydney in January 1999, involving 26 experts from 13 countries. The consultation resulted in Technical Guidelines No. 8 for the FAO Code of Conduct for Responsible Fisheries: Indicators for Sustainable Development of Marine Capture Fisheries. The Guidelines were produced to support the implementation of the Code of Conduct; they deal mainly with the development of frameworks, and they set the stage for using indicators in the decision-making process.

The Guidelines do not, however, discuss the properties of indicators, nor how they are used and tested in practice. Instead, this became the task of an international Working Group, formed jointly by the Scientific Committee on Oceanic Research (SCOR) and the Intergovernmental Oceanographic Commission (IOC). SCOR/IOC Working Group 119 on *Quantitative Ecosystem Indicators for Fisheries Management* was established in 2001, with 32 members drawn from a large number of countries. The Working Group was designed to support the scientific aspects of using indicators for an ecosystem approach to fisheries, to review existing knowledge in the field, to demonstrate the utility and perspectives for new indicators reflecting the exploitation and state of marine ecosystems, as well as to consider frameworks for their implementation.

The Working Group met first in October 2001, in Reykjavik (Iceland), to plan and report on progress; and then in December 2002, in Cape Town (South Africa), to organize its efforts with a series of task forces working in parallel on:

- Environmental indicators including habitat changes
- Species-based indicators
- Size-based indicators
- Trophodynamic indicators
- Integrated indicators
- Selection criteria
- Data sets and reviews, and
- Frameworks for implementing indicators.

As part of their work, the task forces reviewed the current status of using indicators for ecosystem approaches to fisheries, as well as seeking to develop new theory, applying it, and evaluating the performance of indicators. The major results of these endeavours formed the core of the presentations at the Paris Symposium. More than 200 abstracts were submitted for presentation at the Symposium. The Programme Committee of the Symposium thus faced a very difficult task in selecting oral and poster presentations when they met at the PICES Secretariat in November last year. This was, however, a wonderful problem when planning a symposium, and it clearly indicated that the timing was perfect for evaluating the role of indicators for an ecosystem approach to fisheries. This is also clear from the very generous and enthusiastic support the Symposium received from a number of organizations – the list includes SCOR, IOC, FAO, NOAA, Institut Français de la Biodiversité, the UBC Sea Around Us, South Africa's Department of Environmental Affairs and Tourism, ICES, IRD, IFREMER, GLOBEC and last, but not least, from PICES. Indeed, PICES supplied logistical support to get the Symposium organized by handling registrations, submission of abstracts, producing the book of abstracts, staffing the Symposium Office during the event, as well as supporting the participation by some colleagues from PICES member countries.

Press conference for the symposium: Philippe Cury, Serge Garcia, Ian Perry, Patrick Cayre and Daniel Pauly are on the host panel.

Villy Christensen, Pat Livingston, Skip McKinnell and Franz Mueter chat at the poster session.

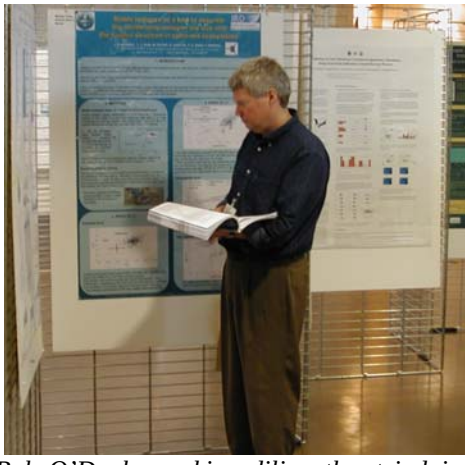
Neils Daan, editor of the symposium proceedings, collects manuscripts from Julia Yazvenko of PICES.

Looking back at the Symposium, it is clear that we have moved a long way toward ecosystem approaches to fisheries within a relatively short time span. The presentations outlined a vast array of well-defined indicators for fisheries management, described their properties, and evaluated how they can be used at the ecosystem-level to describe the impact of fisheries, as well as to evaluate the relative contribution of environmental and fisheries impact. Given the number of available indicators that have been developed and applied, it is also

clear that emphasis has to be directed toward methodologies for selecting indicators, and evaluating how capable indicators are of detecting trends in a noisy environment. While these topics were treated at the Symposium, it is yet too early to draw clear conclusions. It is noteworthy though, that by being dealt with explicitly as part of the Symposium, it is clear from the very onset of using indicators as part of ecosystem approaches to fisheries, that what we are aiming for is not to find the 'best' indicator, but rather a suite of indicators with known properties, and that this includes methodologies for selecting indicators as an integral part of the effort. Guidelines for how to test indicators and develop frameworks for their application is thus of essence.

The conclusion of the Symposium as expressed through a final panel discussion is clear: we have the science in place with regards to ecosystem indicators that is needed to make an ecosystem approach to fisheries operational. We anticipate that the special issue of the ICES *Journal of Marine Science*, due within a year, will present the major findings from the Symposium and will underline that the science is ready, and we are sure the special issue will become a reference publication for the scientific aspects of using ecosystem indicators as part of an ecosystem approach to fisheries. What is needed now are guidelines for how to implement ecosystem approaches for fisheries, and how to operationalize the role of ecosystem indicators.

Symposium organizers relax over lunch after the symposium (from left: J. Yazvenko, V. Christensen, I. Perry, P. Cury, J. Field, G. Hempel, D. Pauly, E. Gross, C. Chiu).



Bob O'Doyle working diligently at judging the posters for the Best Poster Awards.

After the hard work - Bob O'Doyle, Villy Christensen and Philippe Cury present Best Poster Awards to the winners at the Closing Session.

Closing Panel Discussion (from left: Daniel Pauly, Marie-Joelle Rochet, Poul Degnbol, Gottlief Hempel, Renato Quiñones, Jake Rice, Nico Willemse, Serge Garcia).