

An Ethic for Marine Science: thoughts on receiving the International Cosmos Prize

by Daniel Pauly

In October 2005, Daniel Pauly travelled to Japan with his wife Sandra to receive, on October 18th, the 13th International Cosmos Prize from the Expo '90 Foundation in Osaka (see FishBytes 11-3). The prize is awarded for research work that has achieved excellence and is recognised as contributing to a significant understanding of the relationships among living organisms, the interdependence of life and the global environment. Also, Dr Pauly gave several seminars in three cities on "Trends in Global Fisheries" and participated in two symposia, in Osaka and Tokyo. We are very pleased to be able to publish Dr Pauly's acceptance speech and some images from this very special occasion.

Ladies and Gentlemen,

I would like to express in Japanese my thanks to the International Cosmos Prize committee and the Expo '90 Foundation for having me here, but I have to do so in English – a foreign language to you, but also to me.

Receiving an award such as the Cosmos International Prize invites serious reflection, and I will share with you some of the thoughts that I have had since that glorious day in early July, when traveling in France, I was informed that I would be this year's prize recipient.

People have good reasons to be worried about the fate of life in the ocean, as we now engage our whole industrial might in chasing and catching, for our food, the top predators of marine

ecosystems. Increasingly, these predators are being depleted, and we now turn to their prey, smaller fishes and

invertebrates, some highly valuable. This phenomenon is now known as 'fishing down marine food webs', and it explains a vast number of observations, which before remained unconnected. Fisheries have been able to move easily from larger to smaller targets, aided by high technology – such as echolocation and Global Positioning Systems – and abetted by a processing technology which can turn even the most improbable sea creatures into tasty morsels.



Life in the ocean, though, was not designed to be ground up by a transoceanic food production machine. In fact, it was not designed at all, but evolved over the eons, and its ability to produce a surplus that we can share, year for year, is an emergent property of marine ecosystems, contingent on their continued existence as complex entities. If the species we target are depleted, and the ecosystems in which they

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are embedded are drastically simplified, this surplus is reduced, and eventually vanishes. This is the situation we have now in many parts of the world ocean. I wish to emphasize this: global catches from marine fisheries are declining, in spite of, or rather because of, increasing fishing effort.

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There are those who believe that the problems of fisheries do not justify speaking of a crisis, and that various technological fixes will suffice for solving these problems. Among these fixes are updated versions of our traditional management schemes, jazzed up to include explicit laying out of the costs and benefits of various options on fishing levels, and the presumed risk attached to each. This would enable 'managers' to make rational choices under a

given set of economic and political constraints. Presently, this approach, which sees this laying out of options as all that scientists can do, and which therefore limits our role to that of vending machines, is very popular in fisheries sciences.

However, our inability to tackle another, much bigger problem – global warming – indicates that we are, as a species, usually unable to make rational decisions to avert long-term harm to ourselves, even if the risks can be estimated, especially if these decisions involve short-term sacrifices. The recent tsunami in South and Southeast Asia, and the even more recent flooding of New Orleans, underline this. In both cases, planning for an eventual catastrophe and working with nature, not against her, would have saved thousands of lives, and avoided immense material damage. Yet, the managers had no plans, and the populations concerned, when they could vote, elected politicians who at best had other priorities, and at worst actively campaigned against such investment for the public good.

This has been similar in all the great collapses of fisheries, where after the catastrophe, in virtually all cases, the voice of prudence – usually that of scientists – was shown to have been ignored by the managers, in favor of the voices of short-

term interests. Where does this put me – one single person – amidst a cacophony of voices? I understand the award of this wonderful prize to be a vindication, and an encouragement to raise the stakes. And the stakes must be raised. We scientists working on environment-related issues have been too meek when managers, lobbyists and politicians have twisted the results of our work to fit their agenda. The main tool they have used to silence us, and to reduce us to vending machines, is the notion that an engagement for the environment would compromise our scientific objectivity. Yet this argument is never evoked in medicine. Indeed, passionate engagement for the patients, against disease-causing agents is not only the norm, but also an essential element of doctors' professional ethics.

This is not the case for environmental scientists, probably because many of us work for governments, and can be easily silenced, or even made to serve a short-term political agenda. Universities, however, are less constrained, and we should expect university researchers to make themselves heard when science is not put to use for the public good. And the public good it must be, because science is a collective venture, ultimately funded by the public, our ultimate master.

There is, presently, in a number of Western countries, an intense public debate about the compatibility of

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The *Sea Around Us* website may be found at saup.fisheries.ubc.ca and contains up-to-date information on the project.



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13th International Cosmos Prize award ceremony



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Photographs clockwise from top left: Sandra and Daniel Pauly with Mr Hajime Toyokura, the Foundation president (L) and Mr Takashi Imai, the Foundation chairperson (R); Daniel Pauly receiving the Cosmos Prize; Daniel Pauly meeting Dr Tatuo Kira, 1995 Cosmos Prize winner; the Cosmos Prize certificate and medal; a commemorative music performance; Daniel with the French consul general in Osaka; and Daniel thanking the Foundation.
Photos by Tsuneo Kano



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science and religion. I believe these to be incompatible, but this a minority view: most people, including many scientists, believe not only that the two can co-exist – both in one's head, and in the public discourse – but that this co-existence can be mutually enriching. If this is so, why is there so much resistance against the co-existence - in the heads of environmental scientists and in their discourse - of two eminently compatible modes of relating to nature, i.e., a 'scientific mode', which describes nature, and a 'conservation mode', which strives to maintain it?

We must learn to combine scientific integrity with taking firm positions, not only on the conservation of the plants and animals about which we have expertise, but also for the continued existence of the ecosystems of which they are parts. Humans have become the

major ecological force on earth, but we can secure continued services from these plants, animals and ecosystems only if we give them the space they need, and the time they need. Most people don't know that. It is the job of scientists working on ecosystems, and on wild flora and fauna to remind politicians and the public of that, and being silent when this is not taken into account is unethical.

As the magazine *Science* sees it, my award of a major scientific prize by one of the most important fishing nations on earth has put squarely in the mainstream the notion that over-fishing is, regrettably, our dominant mode of interaction with ocean life. What is not yet in the mainstream is that the simplest, and most effective approach to re-establish some semblance of abundances past is for humans to withdraw from parts of the ocean, and to let nature, there at least, heal the wounds we have inflicted. Thus,

to be more specific, I will work for the establishment, throughout the world, of more marine protected areas, and similar zones of reduced human impacts. Right now, they cumulatively cover less than 1 % of the world ocean, with about only a tenth of that effectively protected. And not enough new ones are declared for the goals we have set for ourselves to be reached, e.g., protecting 10% of the world ocean by 2010.

I must come to an end. The best way to thank you for this unforgettable afternoon, to thank the International Cosmos Prize committee and the Expo '90 Foundation for this wonderful prize, and to thank the many people- foremost His Highness The Crown Prince - who have welcomed me and my wife in your beautiful country is to continue, with renewed vigor, the research and public speaking for which I was awarded the Cosmos International Prize for 2005.

And so I will. Thank you.



We must learn to combine scientific integrity with taking firm positions

Sea Around Us *working papers*

Available at www.fisheries.ubc.ca/publications/working/

- U. Rashid Sumaila, Lisa Suatoni (2006) Economic Benefits of Rebuilding U.S. Ocean Fish Populations. Fisheries Centre Working Paper #2006-04.
- J. Alder, .Hopkins, W.W.L. Cheung and U. Rashid Sumaila (2006) Valuing US Marine Habitats: Fantasy or Fact? Fisheries Centre Working Paper #2006-03.
- D. Pauly, S. Booth, V. Christensen, W.L. Cheung, C. Close, A. Kitchingman, M.L.D. Palomares, R. Watson, and D. Zeller (2005) On the Exploitation of Elasmobranchs, with Emphasis on Cowtail Stingray *Pastinachus sephen* (Family Dasyatidae). Fisheries Centre Working Paper #2005-07.
- Matthew Berman and U. Rashid Sumaila (2005) Discounting, Amenity Values and Marine Ecosystem Restoration. Fisheries Centre Working Paper #2005-06.
- Dirk Zeller, Shawn Booth and Daniel Pauly (2005) Fisheries Contributions to GDP: Underestimating Small-scale Fisheries in the Pacific. Fisheries Centre Working Paper #2005-05.
- A.C.J. Vincent, A.D. Marsden and U. Rashid Sumaila (2005) Possible Contributions of Globalization in Creating and Addressing Seahorse Conservation Problems. Fisheries Centre Working Paper #2005-04.
- Maria Lourdes D. Palomares, Elizabeth Mohammed and Daniel Pauly (2005) European Expeditions as a Source of Historic Abundance Data on Marine Organisms. Fisheries Centre Working Paper #2005-03.
- U. Rashid Sumaila, Jackie Alder, and Heather Keith (2005) Global Scope and Economics of Illegal Fishing. Fisheries Centre Working Paper #2005-02.
- U. Rashid Sumaila, Dale Marsden, Reg Watson, and Daniel Pauly (2005) Global Ex-Vessel Fish Price Database: Construction, Spatial and Temporal Applications. Fisheries Centre Working Paper #2005-01.