

PICES Press



Newsletter of the North Pacific Marine Science Organization (Published semi-annually)



The state of PICES science – 2003

PICES “Year-in-Review” 2003

PICES continued building a mature marine science organisation in 2003, upon its three pillars for success: scientific excellence, scientific capacity, and scientific advice.

Scientific excellence: Papers presented at PICES scientific sessions were published in dedicated issues or special sections of international journals such as *Canadian Journal of Fisheries and Aquatic Sciences* (from the 2001 FIS Topic Session on “Migration of key ecological species in the North Pacific Ocean”); *Deep-Sea Research II* (“North Pacific biogeochemical processes”); *Journal of Oceanography* (from the 2002 Symposium on “North Pacific transitional areas”); *Progress in Oceanography* (from the 2001 BIO Topic Session on “Plankton size classes, functional groups and ecosystem dynamics” which was dedicated to the memory of the late Prof. Michael Mullin); and *Marine Environmental Research* (studies from the 1999 MEQ Practical Workshop on “Interdisciplinary assessment of marine environmental quality in Vancouver Harbour”). In addition, two reports were published in the PICES Scientific Report Series: from Working Group 13 on *CO₂ in the North Pacific* to summarize the research and technical activities that have been conducted by member nations of PICES, and to synthesize CO₂ data and provide a comprehensive picture of the anthropogenic CO₂ distribution in the North Pacific;

and from BASS and MODEL Task Teams of the CCCC Program to summarize efforts on trophic modelling of the Subarctic Pacific Basin ecosystems. An external review of the PICES publication program counted 65 publications (14 peer-reviewed) in six different publication series over the 12-year history of PICES and concluded that this was exceptional, in particular for such a small Secretariat staff.

Scientific capacity: Fifteen workshops and meetings were held by PICES over the past year, in addition to the Twelfth Annual Meeting in Korea. Among the longer and more detailed meetings were a MODEL workshop to *Embed NEMURO and NEMURO.FISH into a 3-D circulation model*, which took place in Japan and was co-sponsored by the Nakajima Foundation; a 5-day inter-comparison workshop on *Underway and drifting/moored pCO₂ measurement systems* also in Japan, which was co-sponsored with other Japanese agencies; a major symposium on *The role of zooplankton in global ecosystem dynamics: comparative studies from the world oceans*, held in Spain with the co-sponsorship of GLOBEC and ICES; the 3rd PICES workshop on the *Okhotsk Sea and adjacent areas*, held in Russia; a *North Pacific Ecosystem Status Report* workshop, a PICES/Census of Marine Life workshop, and a MONITOR workshop to develop a west coast of North America marine observation program, all of which were held in Canada.



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|---|---|
| 1 The state of PICES science – 2003 | 24 KORDI/PICES/CoML Workshop on “Variability and status of the Yellow Sea and East China Sea ecosystems” |
| 4 2003 Wooster Award | 27 PICES/IOC Workshop on “Harmful algal blooms – Harmonization of data” |
| 6 The state of the eastern North Pacific through summer 2003 | 29 From physics to predators: Monitoring North Pacific ecosystem dynamics |
| 8 The Bering Sea: Current status and recent events | 32 Toward a coast-wide network of Northeast Pacific coastal-ocean monitoring programs – a brief workshop report |
| 11 The state of the western North Pacific in the first half of 2003 | 35 PICES publications |
| 13 The status of oceanic zooplankton in the eastern North Pacific | 36 PICES calendar |
| 16 The precautionary approach to the PDO | |
| 18 Photo highlights of PICES XII | |
| 20 William G. Pearcy: Renaissance oceanographer | |

PICES continued to build strong relationships with other international marine science organisations by promoting collaborative activities. These organisations included the International Council for the Exploration of the Seas (ICES), the Intergovernmental Oceanographic Commission (IOC), the International Geosphere-Biosphere Program (IGBP), the Scientific Committee on Oceanic Research (SCOR), the North Pacific Anadromous Fish Commission (NPAFC), and the Climate Variability (CLIVAR) program of the World Climate Research Program (WCRP).

Scientific advice: In October 2003, PICES received a formal request from a member nation for scientific advice on the issue of recent regime-like changes in conditions in the North Pacific and their implications for fisheries. This represents an important step in the evolution of PICES, towards providing formal advice on issues of broad concern to North Pacific marine science. This is different than providing short-term advice on particular fisheries management issues such as catch quotas, which has never been part of the PICES mandate. The major effort to produce a status report of the marine ecosystems in the North Pacific represents another method of providing advice. This project progressed very well in 2003, hosting workshops in Russia on the status of the Sea of Okhotsk, and in Korea on the status of the Yellow Sea / East China Sea, as well as the synthesis workshop mentioned earlier. The draft ecosystem status report was the topic of much discussion at the Annual Meeting in Korea. Publication of the final report is hoped for in early 2004.

Highlights from the Annual Meeting

The Twelfth Annual Meeting of PICES, held October 10-18, 2003, in Seoul, Korea, hosted 326 registered participants, 11 scientific sessions, 6 workshops, and several Working Group, Task Team and Advisory Panel meetings. There were 170 oral presentations, 172 posters and 12 electronic posters.

The keynote lecture, titled “Application of otolith chemistry to interpret some issues of oceanic variability and fisheries”, was presented by Prof. Suam Kim of Pukyong National University, Busan, Korea. He reviewed the major processes driving global changes in fisheries, and those in Korea in particular, and discussed how examination of the chemical constituents of the ear bones of fish (otoliths) can be used to tracer the migrations and ocean conditions experienced by fish during their lifetimes.

This presentation was followed by the theme session for PICES XII, titled “Human dimensions of ecosystem variability”. Papers dealt with the human factor in marine ecosystems, including the impacts of marine ecosystem changes to fisheries management systems and to human societies in general (each of which was presented by a social scientist, new to PICES), and of course the impacts that humans have on marine ecosystems. Most innovative was a presentation by Hidetada Kiyofuji *et al.* from Japan, who

examined the potential impacts of high intensity squid jigging lights on fuel use and carbon inputs to the atmosphere. Important points that arose were the bi-directional nature of these interactions (*i.e.* environmental



Dr. Ian Perry summarizing PICES scientific achievements of 2003 at the PICES XII Opening Session.



Prof. Suam Kim giving the Keynote Lecture at the PICES Twelfth Annual Meeting.



Attentive audience at the Science Board Symposium on “Human dimensions of ecosystem variability”.

changes and impacts to humans, and how human responses in turn impact the marine environment), and the difficulty in distinguishing natural from anthropogenic effects on marine systems. The session on “Latitudinal differences in the responses of productivity and recruitment of marine organisms to physical variability” identified important themes such as: the role of strong local gradients (fronts, meanders, eddies) in regulating distributions and seasonal and interannual variability of migratory and advective transport pathways; life stage transitions, and the use of different ocean regions during different parts of the life cycles of key species; and physiological rates and constraints and how these affect population response to spatial and temporal gradients. A very successful session on “Management of eel resources” reflected the broad range of research on the genetics, behaviour, physiology, and ecology of eels that is being conducted in East Asian countries and elsewhere, and which is providing valuable new information about eels. Many of these studies also highlighted the need to gain a greater understanding of the mysterious life cycle of eels in terms of their oceanic spawning, larval migration, recruitment, and the choice that eels make to live in either coastal, estuarine or freshwater habitats. Other sessions included: “Physical and biological responses of coastal ocean ecosystems and estuaries to inputs of freshwater”; “Influence of fishing and/or invasive species on ecosystem structure in coastal regions around the Pacific Rim”; “Aquaculture in the ocean ecosystem”; “Comparison of modeling approaches to describe ecological food webs, marine ecosystem processes, and ecosystem response to climate variability”; “Ecosystem-based management science and its application to the North Pacific”; “GIS/Geographic-based applications to marine systems” (Electronic Poster Session); and general paper sessions of the Physical Oceanography and Climate (POC) and Fisheries Science (FIS) Committees. Workshops were convened to examine and critique a North Pacific Ecosystem Status Report (see article elsewhere in this Newsletter); to combine data sets on distributions and diets of marine birds and mammals; to harmonize data relating to harmful algal blooms (see article elsewhere in this Newsletter); to plan a micronekton sampling gear inter-calibration experiment; to examine linkages between open and coastal systems; and to discuss the status of Yellow Sea and East China Sea ecosystems (see article elsewhere in this Newsletter). Sincere thanks are due to all the convenors for their hard work at making each of these scientific sessions and workshops a success.

The Best Paper Award for the Science Board Symposium went to Lawrence Hamilton (U.S.A.) for his presentation entitled “Ecosystem - society interactions in the North Atlantic: Human dimensions of fishery collapses”. The Best Poster Award went to Dong-Hwa Sohn (Korea) for her poster titled “Stock identification of chum salmon (*Oncorhynchus keta*) using trace elements in otoliths” (co-authored by S. Kang and S. Kim). The other 2003 winners are: the BIO Award - Sachihiko Itoh (Japan) for his paper

“Effect of eddy transport and blocking on the migration of small pelagic fishes” (co-authored by T. Sugimoto); the FIS Award - Yuki Minegishi (Japan) for her paper “Definitive identification of all species of the genus *Anguilla* using the complete mitochondrial genome” (co-authored by J. Aoyama, J. Inoue, M. Miya, M. Nishida and K. Tsukamoto); the MEQ Award - Sung-Il Lee (Korea) for his paper “Ecosystem-based management of fisheries resources in the Tongyeong marine ranching area in Korea” (co-authored by C.I. Zhang and J.-M. Kim); the POC Award - Sung-Hyun Nam for his paper “The corrections of the high-frequency (2-20 days) fluctuation effects on the TOPEX/POSEIDON altimeter data in the East (Japan) Sea” (co-authored by S.-J. Lyu and K. Kim); the CCCC Award - Rolf Ream (U.S.A.) for his paper “Oceanographic influences on Northern Fur Seal migratory movements” co-authored by J. Sterling and T. Loughlin); and the TCODE Award - Kimberly Bahl (U.S.A.) for her E-poster “North Pacific Ecosystem Theme Page and Metadatabase: A collaborative research tool for fisheries-oceanography and ecosystem investigations” (co-authored by B. Megrey and S. A. Macklin).

Up-coming highlights for 2004

Highlights to look forward to in 2004 include several scientific sessions and workshops: an Iron Fertilisation Experiment Panel workshop on *In situ iron enrichment experiments in the eastern and western subarctic Pacific* (February, Victoria, Canada); a Canadian-SOLAS/PICES Topic Session on *Response of the upper ocean to mesoscale iron enrichment* at the ASLO/TOS 2004 Ocean Research Conference (February, Honolulu, U.S.A.); the international symposium on *Quantitative ecosystem indicators for fisheries management* (April, Paris, France, co-sponsored by SCOR and IOC); a GCP(Global Carbon Project)/PICES/NOAA Workshop on *Understanding North Pacific carbon-cycle change: data synthesis and modelling* (June, Seattle, U.S.A.); and a MODEL Workshop on *The development of a model on coupled responses of lower and higher trophic levels for climate variability in the North Pacific* (funding from Japan Fisheries Research Agency) in June, also in Seattle. The PICES Thirteenth Annual Meeting will be held October 15-23, 2004, in Honolulu, with the theme “Beyond the continental slope – complexity and variability in the open North Pacific Ocean”.

We hope that you will watch the PICES web site for announcements of these and other meetings and scientific sessions, and plan to join us in Hawaii.

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