

PICES Science – 2009

by John Stein

Highlights of scientific activities and publications

Since the 2008 Annual Meeting in Dalian, China, PICES has been a very active international scientific organization. We co-organized and participated in major international symposia, convened meetings of PICES expert groups and held joint theme sessions and workshops with key partners, such as GLOBEC (Global Ocean Ecosystem Dynamics), ICES (International Council for the Exploration of the Seas), IOC (Intergovernmental Oceanographic Commission of UNESCO), and ESSAS (Ecosystem Studies of Sub-Arctic Seas). Below I highlight key events after PICES-2008.

In 2009, PICES was involved in several major international symposia:

- In June, PICES co-sponsored and assisted in organizing the 3rd GLOBEC Open Science Meeting in Victoria, Canada;
- In August, the 6th International Conference on “*Marine bioinvasions*”, co-sponsored by PICES, ICES, the U.S. National Sea Grant College Program, the Pacific States Marine Fisheries Commission and Portland State University, was held in Portland, Oregon, U.S.A.;
- In September, the OceanObs’09 Conference, endorsed by PICES, took place in Venice, Italy;
- In September, the CIAC’09 Symposium on “*The effects of environmental variability on cephalopod populations*”, co-sponsored by ICES and PICES, was convened in Vigo, Spain;
- In November, an ICES/PICES/UNCOVER Symposium on “*Rebuilding depleted fish stocks: Biology, ecology,*

social science and management strategies” was held in Warnemünde, Germany.

Other joint events included:

- In November 2008, an ICES/PICES/GLOBEC-SPACC Workshop on “*Changes in distribution and abundance of clupeiform small pelagic fish in relation to climate variability and global change*” held in Kiel, Germany;
- In March, the 3rd Argo Science Workshop on “*The future of Argo*”, co-sponsored by PICES and several Chinese organizations, and convened in Hangzhou, China;
- In September, a joint ICES/PICES Theme Session on “*Climate impacts on marine fishes: Discovering centennial patterns and disentangling current processes*” held at the ICES Annual Science Conference in Berlin, Germany.

Several workshops were organized in preparation for the second North Pacific Ecosystem Status Report (NPESR):

- In April, the 11th Salmon Ecology Workshop related to the development of NPESR for the Alaska Current, California Current and Bering Sea, and co-sponsored by PICES, NOAA, Fisheries and Oceans Canada and Douglas Island Pink and Chum Inc., was convened in Juneau, U.S.A.;
- In April, the NPESR Workshop on “*Status and trends in East Asian Marginal Seas*”, co-sponsored by PICES, KORDI, NFRDI and MLTM, was held in Busan, Korea;
- In December, an invitation-only NPESR Synthesis Workshop was convened in Honolulu, U.S.A.



Participants at the 2009 Science Board meeting in Jeju: (left to right) – Skip McKinnell (Secretariat), Mikhail Stepanenko (FIS), Gongke Tan (China), Glen Jamieson (MEQ), Sinjae Yoo (Vice-Chairman), Harold Batchelder (CCCC), John Stein (Chairman), Michael Dagg (BIO), Hiroya Sugisaki (MONITOR), Michael Foreman (POC), Hiroaki Saito (FUTURE), Mitsutaku Makino (SG on Human Dimensions) and Bernard Megrey (TCODE).

Other PICES events included:

- In January, a PICES Harmful Algal Bloom training course organized in Manila, Philippines;
- In April, an invitation-only PICES workshop to develop an Implementation Plan for the new PICES integrative scientific program, FUTURE, held in Qingdao, China;
- In June, a meeting of the PICES/ICES Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish* held in Victoria, Canada;
- In August, the 3rd PICES Summer School on “*Satellite oceanography for earth environments*” co-sponsored by several Korean agencies/organizations, SCOR and NOWPAP/CEARAC, and held in Seoul, Korea;
- In September, a PICES CPR Workshop on “*The Continuous Plankton Recorder survey and long-term observations of plankton ecosystems in the North Pacific*” convened in Yokohama, Japan;
- In October, a PICES Rapid Assessment Survey for non-indigenous aquatic species performed in several ports in Korea.

It was another good year for publishing PICES science stemming from our collaborative and coordinated research on the North Pacific and on key global issues. Selected papers were published from the:

- 2006 International Conference on “*The Humboldt Current system: Climate, ocean dynamics, ecosystem processes, and fisheries*” as a special issue of *Progress in Oceanography* in December 2008 (Vol. 79, Nos. 2–3; Guest Editors: A. Bertrand, R. Guevara-Carrasco, P. Soler, J. Csirke and F. Chavez);
- 2007 ICES/PICES Early Career Scientists Conference on “*New frontiers in marine science*” as a special section in a regular issue of *ICES Journal of Marine Science* in March (Vol. 66, No. 2; Guest Editors: E. North and F. Mueter);
- 2007 NAFO/PICES/ICES Symposium on “*Reproductive and recruitment processes of exploited marine fish stocks*” as a special issue of *Journal of Northwest Atlantic Fishery Science* in April (Vol. 41; Guest Editors: R. Brodeur, M. Dickey-Collas and E. Trippel);
- 2008 PICES/ICES/IOC International Symposium on “*Effects of climate change on the world’s oceans*” as a special issue of *ICES Journal of Marine Science* in August (Vol. 66, No. 7; Guest Editors: K. Brander, J. Church, M. Marcos, W. Peterson and L. Valdés);
- 2007 ICES/PICES Theme Session on “*Comparative marine ecosystem structure and function: Descriptors and characteristics*” as a special issue of *Progress in Oceanography* in August (Vol. 81, Is. 1–4; Guest Editors: B. Megrey, J. Link and E. Moksness);
- 2006 International PICES/CREAMS Workshop as a special issue of *Journal of Marine Systems* in September (Vol. 78, Is. 2; Guest Editors: K.-I. Chang, S.-I. Ito, C. Mooers and J.-H. Yoon);
- 2007 PICES Topic Session on “*Ecosystem approach to fisheries: Improvements on traditional management for declining and depleted stocks*” in a special issue of

Fisheries Research in September (Vol. 100, Is. 1; Guest Editors: G. Kruse, Y. Ishida, E. Perry, V. Radchenko and C.-I. Zhang);

- 2007 PICES Topic Session on “*Decadal changes in carbon biogeochemistry in the North Pacific*” as a special section in a regular issue of *Journal of Oceanography* in September (Vol. 65, No. 5; October 2009, Guest Editor: T. Saino);
- 2007 PICES Topic Session on “*Phenology and climate change in the North Pacific: Implications of variability in timing of zooplankton production to fish, seabirds, marine mammals and fisheries (humans)*” as a theme section in *Marine Ecology Progress Series* in October (Vol. 393; Coordinator: W. Sydeman).

One more volume was published in September in the PICES Scientific Report Series:

- Kashiwai, M. and Kantakov, G.A. (Eds.). 2009. Proceedings of the Fourth PICES Workshop on “*The Okhotsk Sea and adjacent areas*”. PICES Sci. Rep. No. 36, 305 pp.

Two special CD-ROMs were also produced:

- one dedicated to Dr. Warren Wooster, a principal founder and the first Chairman of PICES (“*Warren S. Wooster: The Measure of a Man, 1921–2008*”);
- one containing PICES scientific publications, 1993–2008.

PICES-2009

The PICES Eighteenth Annual Meeting was held from October 23 to November 1, 2009, at the International Convention Center in Jeju, Korea. The meeting was hosted by the Ministry of Land, Transport and Maritime Affairs (MLTM), in coordination with the PICES Secretariat. I am sure that all of you who had the opportunity to attend PICES-2009 would agree that it was an excellent venue, and local arrangements by the Korea Ocean Research and Development Institute (KORDI), the National Fisheries Research and Development Institute (NFRDI) and the government of the Jeju Special Self-Governing Province, made for a very successful meeting. It was truly an Annual Meeting to remember. What became evident to me is that our PICES scientific community is very vibrant, we have strong partnerships and collaborations among scientists from all member countries, and our science is dynamic, cutting-edge and well-recognized.

Nearly 500 scientists and managers from 18 countries attended 12 sessions, 10 workshops and 25 meetings of the committees and expert groups, and presented 280 talks and 135 posters. I also want to mention that the inaugural meetings of the three FUTURE Advisory Panels, AICE (*Anthropogenic Influences on Coastal Ecosystems*), COVE (*Climate, Oceanographic Variability and Ecosystems*), and SOFE (*Status, Outlooks, Forecasts and Engagement*), were held, marking the formal start of the next generation science program of PICES.

We had a number of Topic Sessions convened jointly with other organizations: “*Early life stages of marine resources as indicators of climate variability and ecosystem resilience*” with ICES (International Council for the Exploration of the Sea); “*Outlooks and forecasts of marine ecosystems from an earth system science perspective: Challenges and opportunities*” with IMBER (Integrated Marine Biochemistry and Ecosystem Research); “*State of the art of real-time monitoring and its implication for the FUTURE oceanographic study*” with the International Argo Program and GOOS (Global Ocean Observing System); and “*Marine spatial planning in support of integrated management – tools, methods, and approaches*” with NOWPAP (Northwest Pacific Action Plan). We also convened several joint workshops: “*Integrating marine mammal populations and rates of prey consumption in models and forecasts of climate change—ecosystem change in the North Pacific and North Atlantic Oceans*” with ICES; “*Exploring the predictability and mechanisms of Pacific low frequency variability beyond inter-annual time series*” with CLIVAR (Climate Variability and Predictability Program); “*Marine ecosystem model inter-comparisons*” with ESSAS (Ecosystem Studies in Sub-Arctic Seas); and “*Natural supplies of iron to the North Pacific and linkages between iron supply and ecosystem responses*” with SOLAS (Surface Ocean Lower Atmosphere Study).

Representatives from almost 30 international and regional organizations and programs were present as observers at PICES-2009. Strong collaboration and interaction with these organizations and programs is vital to maintaining a vibrant PICES. This year it was a pleasure to have Dr. Michael Sinclair, new President of ICES, attending the Science Board meeting. It was Dr. Sinclair’s first time at a PICES Annual Meeting, so we very much appreciated his participation and his excellent talk at the Science Board Symposium.



Dr. Michael Sinclair making his presentation at the Science Board Symposium.

The theme of PICES-2009 was “*Understanding ecosystem dynamics and pursuing ecosystem approaches to management*”, and the keynote lecture at the Science Board Symposium was given by Professor Chang-Ik Zhang (Pukyong National University, Korea) on “*Ecosystem-*

based fisheries assessment and management: A step towards the FUTURE implementation of ecosystem approaches to management”. His talk emphasized the progress he and his colleagues, both in Korea and from other PICES member countries, have made in developing a pragmatic ecosystem-based approach for assessing fisheries management. His approach examines fisheries management objectives from the perspective of maintaining sustainability, biodiversity, habitat quality and socioeconomic benefits. Professor Zhang’s presentation highlighted not only the progress to date but also work that lies ahead in taking a full ecosystem approach to management of marine and coastal ecosystems of the North Pacific.



Prof. Chang-Ik Zhang giving the keynote lecture at the Science Board Symposium.

Every year we acknowledge the excellent science and high quality of presentations at our Annual Meetings. The recipient of the award for the best oral presentation in the 2009 Science Board Symposium was Dr. Erlend Moksness from the Institute of Marine Science, Norway, for his talk on “*Major human activities affecting Norwegian coastal marine ecosystems: Present status and challenges*”, that illustrated how the use of models incorporating environmental, social and economic components, when coupled with ecosystem scale research and improved mapping, can be very useful for engaging stakeholders in decision making for marine spatial planning. Clearly, his presentation addressed the theme of PICES-2009, but was also relevant to FUTURE because the model he presented is one of the tools used for communicating our science to key stakeholders.

Congratulations are also in order for the recipients of the best presentation awards given by the Standing Committees. The awards for best oral presentations are given to scientists early in their career, and the recipients were: BIO – Bryan A. Black (U.S.A.), FIS – Hyunjung Kang (Korea), MEQ – I. Nyoman Radiarta (Japan), MONITOR – Kelly J. Benoit-Bird (U.S.A.), and POC – Xiaohui Tang (China). Each Committee also gives a best poster award, which is open to all presenters, and the recipients were: BIO – Tetsuichi Fujiki (Japan), FIS – Tatiana Tunon (Canada), MEQ – Sang Rul Park (Korea), MONITOR – Shin-ichi Ito (Japan), POC – Satoshi Osafune (Japan).



Start of an evening get together at the Poster Session.

For details on the recipients of the Wooster Award and PICES Ocean Monitoring Service Award (POMA), please refer to the 2009 PICES Awards article in this issue.

It is also important to acknowledge service to PICES and changes in leadership. At this Annual Meeting we thanked Dr. Glen Jamieson (Canada) for his leadership of the Marine Environmental Quality Committee (MEQ) since 2006, and welcomed Dr. Steven Rumrill (U.S.A.) as the next Chairman of MEQ. As I enter my last year as Science Board Chairman, we also took a step to ensure continuity in scientific leadership by unanimously electing Dr. Sinjae Yoo (Korea) for this position. His term as Science Board Chairman will start after PICES-2010. I have enjoyed working with Sinjae for several years and am very confident that he will serve PICES well in this capacity.



Dr. Glen Jamieson receiving a PICES certificate of appreciation at the Closing Session.

At the inaugural meetings of FUTURE Advisory Panels, Drs. Thomas Therriault (Canada), Hiroaki Saito (Japan) and Robin Brown (Canada) were recommended and then appointed as Chairmen of AICE, COVE and SOFE, respectively. Science Board is very confident that these three scientists will be excellent Chairmen of the Advisory Panels, and will get FUTURE off to a quick and productive start. It is proposed that the Chairmen serve for 3 years, however, for continuity, two of the Advisory Panel Chairmen will serve for 3 years



An example of PICES/ICES similarities: (left) Hal Bauchelder (PICES) and (right) Jürgen Alheit (ICES).

and one will serve for 4 years, so that we can stagger the transition to new Chairmen. An important initial task for Advisory Panel Chairmen will be to work with their members developing a work plan for review and approval at the next inter-sessional Science Board meeting to be held in Sendai, Japan, in April. I would like to acknowledge and thank Tom, Hiroaki, and Robin for being willing to step up and take the responsibility to lead these FUTURE Advisory Panels, and to note that it is important for all of us, and especially younger members of PICES, to seriously consider opportunities for leadership roles in our Organization. Without individuals willing to actively assume strong leadership roles, PICES will not grow as a valued and integral component of the international science community.

Finally, I would like to point out that through the excellent leadership of Drs. Skip McKinnell and Michael Dagg, good progress is being made on the second PICES North Pacific Ecosystem Status Report (NPESR). At this Annual Meeting, the editorial board met to review the status of the report and the plan for a NPESR Synthesis Workshop to be held in December in Honolulu, U.S.A. The objectives of the Workshop were to review the Regional Chapters, compare regional variability and begin writing the Synthesis Chapter. This report is a major product of PICES, and will be an important contribution and update of our understanding of the status of ecosystems in the North Pacific.

Looking ahead

This next year is looking to be busy, as we will be actively working on developing work plans and starting the initial science activities for FUTURE, completing and publishing NPESR, and continuing collaborative work with ICES and other organizations. I would like to highlight several upcoming joint activities. An initial step was taken in planning for the ICES/PICES Early Career Scientist Conference to be held in Europe in 2012, by nominating 3 young scientists, Bryan Black (U.S.A.), Hanna Na (Korea) and Naoki Yoshie (Japan), as PICES members to the Steering Committee. We also will be initiating a joint

PICES/ICES Study Group on *Developing a Framework for Scientific Cooperation in Northern Hemisphere Marine Science*. Dr. Sinjae Yoo was approved to be an associate member of the new SCOR Working Group on *Patterns of Phytoplankton Dynamics in Coastal Ecosystems*, and Dr. Hiroaki Saito was selected as a PICES co-convenor of the 2nd PICES/ICES/IOC Symposium on “*Effects of Climate Change on the World’s Oceans*” to be held in Yeosu, Korea, in 2012. Last but not least, I must mention that PICES, jointly with ICES and the Food and Agriculture Organization (FAO), is convening a major symposium on “*Climate Change Effects on Fish and Fisheries*” from April 25–29, 2010, in Sendai, Japan. The local host is the Fisheries Research Agency of Japan, and Drs. Anne Hollowed (U.S.A.), Shin-ichi Ito (Japan), and Suam Kim (Korea) are the symposium convenors from PICES. Interest in the symposium has been high, and it will provide an international synthesis of our current understanding of the impacts of climate change on marine ecosystems and the implications of these changes for marine resources and their uses. Our next Annual Meeting, PICES-2010, will be held from October 22–31, in Portland, Oregon, U.S.A., under the theme “*North Pacific ecosystems today, and challenges in understanding and forecasting change*”. Science Board has selected and approved many sessions and workshops that should be of great interest to PICES and the broader scientific community. The U.S. delegation and the PICES Secretariat are hard at work in preparing the meeting, and we look forward to seeing you in Portland. In looking further ahead, planning was also initiated for PICES-2011 to be held in Russia, under the theme “*Mechanisms of marine ecosystem reorganization in the North Pacific*”.

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except for the host country. Instead, the opportunity will be provided to national delegates to make their statements at the first session of the Council meeting. Council also agreed to implement the following recommendations by the Study Group on *Restructuring the PICES Annual Meeting*, starting with PICES-2011: (1) shorten the main part of the meeting from 5 days to 4.5 days, with a possible simultaneous increase in the number of concurrent scientific sessions to a maximum of four; (2) expand the duration of the main Science Board meeting from 1 day to 1.5 days to provide more time for accommodating its new role as the FUTURE Scientific Steering Committee, and to allow for the completion of its report to Council; and (3) hold overture 1.5-hour meetings of Scientific and Technical Committees to examine and confirm the discussion points in preparation for their main meetings.

The 2010 PICES Annual Meeting will be held from October 22–31, at the Oregon Convention Center in Portland, U.S.A. The meeting is hosted by the Government of the United States of America, with logistical support provided by the Pacific States Marine Fisheries Commission. The overall theme for PICES-2010 is “*North Pacific Ecosystems Today, and Challenges in Understanding and Forecasting*

To close, it has been a busy and productive year for PICES science, and it was a particularly gratifying to see the culmination of the hard work we all did in developing FUTURE. As I look into 2010, it is the start of a year of transition as I complete my term as Science Board Chairman, and work with Sinjae for a smooth handoff to him as our next Chairman of Science Board. There is much to do, and I look forward to the opportunities to work with all of you. As we enter the new decade, I see a decade where PICES continues to be recognized globally as a leader in the science of climate change and effects on marine ecosystem; I see FUTURE meeting its goal of building on the success of the Climate Change and Carrying Capacity (CCCC) Program, increasing our focus on coastal ecosystems and providing outlooks and forecasts of how climate and human activities may affect marine species; I also see the next generation of PICEans taking important roles in leading our Organization and positioning it to be responsive, relevant, reliable and respected in addressing the key issues of our member countries and the global challenge to mitigate and respond to climate change. I am optimistic that PICES will continue to step up to the challenge with creativity, innovation and cutting-edge science.



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Change”. The host country has kindly agreed to hold up to four concurrent scientific sessions per day.

PICES-2009 had good weather from the first to the last day. Under warm hospitality and thoughtful arrangements made by the host organization and local organizers, the attendees partook in presentations and discussions at scientific sessions and enhanced their friendship through social events, including a soccer match. Many of the participants also enjoyed scenic and marvellous landscapes of Jeju, such as Mount Hallasan and lava tubes, which were created by volcanic activities and are considered as UNESCO’s World Natural Heritage sites. On behalf of PICES and all attendees, I would like to express our sincere thanks to the organizers for their efforts to make PICES-2009 a success.



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