

REPORT OF SCIENCE BOARD

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The Science Board met on October 20, 2002 (12:30-13:30), to develop recommendations to the Governing Council from the initial items on the agenda. The second meeting was held on October 25 (08:30-17:30), to deal with the remainder of the agenda, including items with financial implications for 2003 and beyond. Dr. Stewart M. (Skip) McKinnell served as rapporteur for all meetings. (See *SB Endnote 1* for list of participants).

October 20, 2002

The Science Board Chairman, Dr. Ian Perry, welcomed members and observers and called the meeting to order. The agenda was discussed and adopted as presented (*SB Endnote 2*).

Best Presentation Awards and Closing Session (Agenda Item 3)

Dr. Perry reviewed the criteria for Best Presentation Awards and the procedure for the Closing Session, based on the procedures adopted for PICES X. It was restated that young scientists should be the recipients of all but the Science Board Award. At PICES XI, Committee Chairmen would identify potential "young scientists". Science Board decided on a procedure to determine a Best Poster Award. Each Committee would nominate one poster for consideration, and Science Board would meet informally at the Poster Session to determine the winner.

It was reiterated that the Closing Session would consist of Best Presentation Awards to be given by each Committee, the Science Board Chairman describing the theme and possible Topic Sessions for the next Annual Meeting, and a few final words of thanks from the PICES Chairman. Committee Chairmen were reminded to provide a list of Topic Sessions approved by their Committee to the Science Board Chairman before the Closing Session.

Procedures to enhance documentation of PICES scientific sessions (Agenda Item 4)

The procedure to enhance the documentation of PICES scientific sessions was discussed, following the recommendations of last year's Science Board report (*SB Endnote 3*). Science Board members agreed to be responsible for relevant sessions and to ensure that session convenors completed their descriptions prior to the conclusion of PICES XI.

Governing Council decisions and Science Board recommendations from PICES X (Agenda Item 5)

Science Board reviewed and accepted the status report on decisions and recommendations from PICES X, which were of relevance to Science Board (*SB Endnote 4*).

October 25, 2002

Dr. Perry opened the second Science Board meeting and welcomed the newly elected Chairman of FIS, Dr. Yukimasa Ishida.

Science Board extended thanks to the outgoing Chairman of FIS, Dr. Douglas E. Hay, for his much appreciated service to PICES. A certificate was presented to Dr. Hay at the Closing Session of PICES XI in recognition of his service.

Discussion of PICES Review Committee Report (Agenda Item 6)

Science Board prepared a discussion document on the structure of PICES and its ability to serve the Organization over the next decade. This was used as input to the PICES Review Committee established by Governing Council. Science Board had planned to discuss the draft Review Committee report, however, not all members of the Scientific Committees had seen the latest

draft. Committee Chairmen will collect comments from members for use in discussions at the interim meeting of Science Board. Suggestions from the CCCC Program included establishing a position of Vice-Chairman of Science Board, and to consider having biennial PICES science meetings alternating with workshops. The former suggestion was recommended to Governing Council; the latter suggestion was not accepted by Science Board.

Items with financial implications for 2003 and beyond (Agenda Item 7)

Science Board discussed agenda items with financial implications to PICES. The following lists of inter-sessional meetings, publications, travel support requests, and related items were endorsed by Science Board and forwarded to Governing Council for approval.

Inter-sessional workshops, Working Group and CCCC Program meetings (Agenda Item 7a)

Meetings to be convened in 2003:

- A 2-day Fifth Annual Workshop on *Salmon ecology in coastal ecosystem*, hosted by NMFS and co-sponsored by PICES, February 11-12, 2003, Newport, Oregon, U.S.A.;
- A MODEL workshop to *Embed NEMURO and NEMURO.FISH into a 3-D circulation model*, March 2003, Yokohama, Japan;
- An Inter-comparison and Workshop on *Underway and drifting/mooring $p(\text{CO}_2)$ measurement systems*, March 10-15, 2003, Tsukuba, Japan;
- A PICES/CoML *Regional marine life expert Workshop I*, spring 2003, place TBD;
- A 3-day Interim Science Board meeting, March-April 2003, Sidney, Canada;
- A Workshop on *Variability and status of the East China Sea and Yellow Sea ecosystems*, in conjunction with the PAMS/JECSS Workshop, April 14-16, 2003, Hangzhou, People's Republic of China;
- A 4-day ICES/PICES/GLOBEC International Symposium on *Role of zooplankton in global ecosystem dynamics: Comparative studies from the world oceans*, May 20-23, 2003, Gijón, Spain;
- The Third PICES Workshop on *Okhotsk Sea and adjacent areas*, June 2003, Vladivostok, Russia;
- A 3-day *North Pacific Ecosystem Status Report Workshop*, August 2003, Sidney, Canada;
- A 2-day WG15/TCODE Workshop on *Harmonization of HAB data*, October 2003 (immediately prior to PICES XII), Seoul, Korea;
- A 1-day MONITOR Workshop to *Examine and critique a North Pacific Ecosystem Status Report*, October 2003 (immediately prior to PICES XII), Seoul, Korea;
- A 1-day BASS Workshop to *Examine linkages between open and coastal systems*, October 2003 (immediately prior to PICES XII), Seoul, Korea;
- A 1-day MBM Advisory Panel Workshop on *Distribution and diets of marine birds and mammals: Patterns produced by biophysical coupling and lower trophic level dynamics*, October 2003 (immediately prior to PICES XII), Seoul, Korea;
- A PICES/CoML *Regional marine life expert Workshop II*, November 2003, Sidney, Canada;
- An IFEP Workshop on *In situ iron enrichment experiments in the eastern and western subarctic Pacific*, November-December 2003, Sidney, Canada.

Meetings planned or anticipated for 2004 and beyond:

- A 4-day SCOR/IOC/PICES/GLOBEC conference on *Quantitative ecosystem indicators for fisheries management*, March 31-April 3, 2004, Paris, France;
- A BASS/NPAFC Workshop on *Open ocean and coastal systems*, October 2004 (in conjunction with PICES XIII), Honolulu, U.S.A.;
- A PICES/CLIVAR Workshop to further develop interaction with CLIVAR, October 2004 (in conjunction with PICES XIII), Honolulu, U.S.A.;
- A REX Workshop on *The climate shifts of 1977, 1989, and 1999: Differential physical forcing and ecosystem response in the PICES region*, October 2004 (in conjunction with PICES XIII), Honolulu, U.S.A.;

- A major inter-sessional symposium to synthesize the CCCC questions and results, in 2005/6.

Proposed publications (Agenda Item 7b)

PICES Scientific Report Series in 2003:

- Final report of WG 13 on *CO₂ in the North Pacific*;
- Proceedings of the 2002 CCCC Integration Workshop;
- Report of the 2002 MONITOR Workshops;
- Report of BASS and MODEL TTs on *Ecosystem models for the subarctic Pacific gyres*;
- *Marine life in the North Pacific Ocean: The known, unknown and unknowable* (report for the Census of Marine Life).

PICES Scientific Report Series in 2004:

- Final report of WG 14 on *Effective sampling of micronekton*;
- Final report of WG 16 on *Climate change and fisheries management*;
- Report of the 2003 IFEP Workshop in Sidney, Canada;
- Proceedings of the Third PICES Workshop on *Okhotsk Sea and adjacent areas*;
- Guide of best practices for oceanic CO₂ measurements and data reporting (WG 17);
- North Pacific Ecosystem Status Report.

Special issues of primary journals in 2003:

- *Marine Environmental Research* - papers resulting from the 1999 MEQ Practical Workshop.
- *Progress in Oceanography* - selected papers from the 2001 BIO Topic Session on *Plankton size classes, functional groups and ecosystem dynamics*;
- *Journal of Oceanography* - selected papers from the 2002 PICES Symposium on *North Pacific transitional areas*;
- *Fisheries Oceanography* - selected contributions to the GLOBEC Open Science Meeting.

Special issues of primary journals in 2004 and beyond:

- *Journal of Marine Systems* - selected papers from the 2002 BIO/POC/FIS Topic Session

on *The importance of biophysical coupling in concentrating marine organisms around shallow topographic*;

- *Journal of Marine Systems* - selected papers from the 2002 POC/FIS Topic Session on *Detection of regime shifts in physics and biology*;
- *Progress in Oceanography* - selected papers from the PICES/CREAMS Workshop on *Recent progress in studies of physical processes and impact to the Japan/East Sea ecosystem*;
- *Journal of Oceanography* - invited papers on JGOFS North Pacific synthesis (jointly with JGOFS);
- *ICES Journal of Marine Research* - selected papers from the ICES/PICES/GLOBEC International Symposium on *Role of zooplankton in global ecosystem dynamics: Comparative studies from the world oceans*.

Other:

- Book in “Fish and Fisheries” series of Cambridge Press, resulting from the PICES XII session on *Aquaculture within an ocean ecosystem*;
- Book on *History of PICES*.

Science Board endorsed publishing the above items. The Science Board Chairman noted the request by the Secretariat that material from the CCCC Workshops should be submitted to the Secretariat **by February 1, 2003**, to be published in the PICES Scientific Report Series in a timely fashion. Committee Chairmen were reminded to identify Guest Editors and to develop a publication timetable for papers destined for primary journals.

Travel support requests (Agenda Item 7c)

- One invited speaker per Scientific Committee for Topic Sessions at PICES XII. Additional requests for travel support were: TCODE (1), BIO (1), FIS (2), MEQ (2), POC (2), and SB (3) for the SB Symposium;
- Seven scientists to attend CCCC-related meetings: inter-sessional MODEL (1) and IFEP (1) Workshops; BASS (1) and MONITOR (1) Workshops in conjunction

with the PICES Twelfth Annual Meeting; MODEL (1) and REX (1) Topic Sessions at PICES XII, and ICES/IOC Steering Group for GOOS meeting (1);

- Other travel requests include: support for PICES Convenor to attend the Zooplankton Production Symposium (May 2003, Gijón, Spain) and 2-3 scientists to attend the *North Pacific Ecosystem Status Report* Workshop (August 2003, Sidney, Canada);
- Trust Fund travel requests were: 1-2 scientists to attend the Third PICES Workshop on *Okhotsk Sea and adjacent areas*; 1 Russian scientist to attend the meeting of the Marine Birds and Mammals Advisory Panel, and 2 young Chinese scientists to attend FIS sessions at PICES XII;
- Science Board Chairman to attend the IGBP OCEANS Meeting (January 2003, Paris, France), the PICES/ICES/GLOBEC Zooplankton Production Symposium (May 2003, Gijón, Spain), and the ICES Annual Conference (September, 2003, Tallinn, Estonia).

Science Board reviewed the above requests and suggested the following criteria be used by the Science Board Chairman to assist in prioritizing the requests:

- Consider whether the proposed activity will contribute to the strategic plans of PICES;
- Balance travel support requests among PICES Committees and Programs; and
- Use PICES funds to bring people to PICES rather than for sending them to other meetings.

Future of Working Groups and Scientific Programs and proposed membership changes (Agenda Item 8a)

Science Board recommended that:

- WG 14 on *Effective sampling of micronekton* continue its activities and produce a final report in 2003;
- WG 15 on *Ecology of harmful algal blooms in the North Pacific* continue for an additional year to clearly define the terms of reference and items to be addressed in an on-going manner for potential development

as an Advisory Panel or “section” under MEQ;

- WG 16 on *Climate change, shifts in fish production and fisheries management* continue its activities and produce a final report in 2003.

Science Board received the following requests for CCCC membership changes, and recommends their acceptance:

- BASS: Dr. Akihiko Yatsu (Japan) to replace Dr. Andrei S. Krovnin (Russia) as Co-Chairman; Dr. Gordon A. McFarlane (Canada) to continue for one additional year;
- MODEL: Dr. Shin-ichi Ito (Japan) to replace Dr. Bernard A. Megrey (U.S.A.) as Co-Chairman; Dr. Francisco E. Werner (U.S.A.) to continue as Co-Chairman;
- REX: Dr. William T. Peterson (U.S.A.) to remain as Co-Chairman for one additional year until a suitable replacement is found; Dr. Yoshiro Watanabe (Japan) to continue as Co-Chairman.

Science Board noted and appreciated the improved participation in several committees by scientists from China. There is a need for national representatives on Governing Council to revise and update the membership lists of all Committees and Task Teams, and where necessary, appoint new members.

Documentation of PICES Science (Agenda Item 8b)

Summaries of the sessions held at PICES XI are included elsewhere in this Annual Report.

New PICES groups (Agenda Item 8d)

The following new groups were proposed:

- A Study Group under Science Board on *PICES capacity building (SB Endnote 5)*;
- A Working Group under Science Board on the *North Pacific Ecosystem Status Report (SB Endnote 6)*;
- An Advisory Panel on a *Micronekton sampling inter-calibration experiment* be formed under BIO to develop and oversee the implementation of a project to compare

different micronekton sampling devices at sea (*BIO Endnote 4*);

- An *ad hoc* NEMURO Experimental Planning Team (NEXT) to develop the scientific strategy to use ecosystem models to examine the central CCCC hypotheses. This team would work by electronic communication (*SB Endnote 7*).

Science Board recommended that these new groups be approved.

Relations with other organizations and programs (Agenda Item 8f)

The Standing List of International Organizations and Programs facilitates PICES interactions with other programs and indicates high priority organizations/programs to whose meetings PICES should regularly send a representative (See *SB Endnote 8* for the revised list).

PICES Committees and Programs identified the following organizations/programs as having the highest priority:

BIO: ICES/WGZE, GLOBEC, GOOS, IWC
MEQ: ICES, AMAP, SCOR/GEOHAB, APEC/MRC
FIS: AFS/CAR, IPCC, ICES, NPAFC, GLOBEC/SPACC
POC: CLIVAR, Argo, CREAMS, WESTPAC, NEAR-GOOS, JGOFS, GOOS, GCOS, WMO/DBCP;
CCCC: GLOBEC, GOOS, NEAR-GOOS, GEM, SAHFOS, CoML, ICES-GLOBEC, NPAFC, IATTC, IPHC, IGBP/OCEANS; NPRB
TCODE: GLOBEC, GOOS, JGOFS

PICES has worked hard over the past year to establish stronger relationships with ICES, SCOR, IOC, IGBP, NPAFC and GOOS. These efforts are beginning to result in closer collaborations with a number of these organizations. MEQ is proposing to participate in the ICES Working Group sessions on *Ballast water and other vectors and transfers of marine organisms*, to be held in Vancouver, March 24-28, 2003.

PICES XII Annual Meeting (Agenda Item 9)

The following list of Workshops and Sessions to be convened at (or prior to) PICES XII was endorsed:

Science Board Symposium (³/₄-day)

Human dimensions of ecosystem variability (Committee Chairmen will serve as Convenors) (*SB Endnote 9*)

MEQ Workshop (2 days)

Harmful algal blooms – harmonization of data (Convenors: TBD)

MONITOR Workshop (1-day)

Examine and critique a North Pacific Ecosystem Status Report (Convenors: Vyacheslav B.. Lobanov (Russia), David L. Mackas (Canada), Phillip R. Mundy (U.S.A.), .), Sei-Ichi Saitoh (Japan) and William J. Sydeman (U.S.A.)

BASS Workshop (1-day)

Linkages between open and coastal systems (Convenors: Vladimir A. Belyaev (Russia), Gordon A. McFarlane (Canada) and Akihiko Yatsu (Japan))

MBM-AP Workshop (1-day)

Combining data sets on distributions and diets of marine birds and mammals (Convenors: Douglas F. Bertram (Canada) and Hidehiro Kato (Japan))

CCCC (REX) Topic Session (½-day)

Influence of fishing and/or invasive species on ecosystem structure in coastal regions around the Pacific Rim (Convenors: REX Co-Chairmen)

CCCC (MODEL) Topic Session (½-day)

Comparison of modeling approaches to describe ecological food webs, marine ecosystem processes, and ecosystem response to climate variability (Convenors: Michio J. Kishi (Japan), Bernard A. Megrey and Francisco E. Werner (U.S.A.))

BIO/POC/CCCC (REX) Topic Session (1-day)

Latitudinal differences in response of productivity and recruitment of marine

organisms to physical variability, from Subarctic to subtropical waters, in the eastern and western sides of the Pacific (Convenors: Yoshiro Watanabe (Japan), BIO and POC convenors TBD)

BIO/MEQ Topic Session (1/2-day)

Natural and anthropogenic influences on pelagic-benthic coupling in coastal systems. (Convenors: TBD)

MEQ/BIO Topic Session (1/2-day)

Aquaculture within an ocean ecosystem (Convenors: Julia K. Parrish (U.S.A.) and Ik-Kyo Chung (Korea))

MEQ/BIO/FIS Topic Session (1-day)

Ecosystem-based management (to include aspects of carrying capacity and fishing impacts) (Convenors: Glen Jamieson (Canada), BIO and FIS convenors TBD)

POC/BIO Topic Session (1-day)

Physical process impacts on biological and fish populations with variability in freshwater inputs to the ocean (Convenors: Yuri I. Zuenko (Russia), BIO convenor TBD)

FIS Topic Session (1/2-day)

Management of eel resources (jointly with EASEC) (Convenors: Tae-Won Lee (Korea) and Katsumi Tsukamoto (Japan))

FIS Topic Session (1/2-day)

Biology of predatory impacts on and by coastal sharks (Convenor: Gordon H. Kruse (U.S.A.))

FIS contributed paper session (1/2-day)

(Convenors: Yukimasa Ishida (Japan) and Chang-Ik Zhang (Korea))

POC contributed paper session (1/2-day)

(Convenor: Kuh Kim (Korea))

TCODE Electronic Poster Session

GIS/Geographic-based applications to marine sciences (Convenors: Bernard A. Megrey (U.S.A.), others TBD)

It was also recommended to consider having all Committee meetings the day after the workshops

and just before the official opening of PICES XII. Task Team meetings would be held in the morning, Scientific Committee meetings in the afternoon, and the CCCC-IP/EC meeting in the evening. In addition, consideration should be given to keeping one evening available during the meeting for Committees to meet to finalize their reports and/or to confer with other committees. It is expected that Marine Birds and Mammals, Continuous Plankton Recorder, Iron Fertilization Experiment and North Pacific Data Buoy Advisory Panels will also meet during PICES XII.

CCCC Integration Workshop (Agenda Item 10)

Science Board noted that the CCCC Integration Workshop provided needed re-focusing of the Program and congratulated the convenors. Science Board approved the tasks proposed in the Integration Workshop report, in particular the proposal to host a major synthesis symposium in 2005/6. Science Board noted that better communication among the Scientific Committees and the CCCC Program is needed.

North Pacific Ecosystem Status Report (Agenda Item 11)

A "Draft for Discussion" North Pacific Ecosystem Status Report was tabled. It was intended to be a sample of what a final report might look like, to initiate discussions on content and format as well as the process for creating such a report. Formal responses from the Committees were mixed, with some strongly supportive whereas others felt they could not judge the draft report until a summary/synthesis was included. Science Board recommended establishment of a Working Group to proceed with developing the report (*SB Endnote 6*). Science Board also noted that successful completion of the report will require the assistance of all members of PICES.

Theme for PICES XIII (Agenda Item 12)

Science Board decided that, in consideration of the meeting being held in Hawaii, the proposed

theme for PICES XII should be *Beyond the continental slope – complexity and variability in the open North Pacific Ocean (SB Endnote 10)*.

Strategic Plans (Agenda Item 13)

Updates to the Science Board Strategic Plan were deferred to the interim Science Board meeting, when the future directions and activities of PICES are to be discussed.

Inter-sessional Science Board meeting (Agenda Item 14)

An interim Science Board meeting was proposed for late March 2003, to discuss items arising from the PICES Review Committee Report, including new long-term directions for PICES, the Review Committee report itself, capacity building, progress on the North Pacific Ecosystem Status report, TCODE, and progress reports from Scientific Committees.

Other business (Agenda Item 15)

Science Board noted the successful PICES/GLOBEC workshop on *GLOBEC data*

management: Exchange, inventory and archival of GLOBEC data. Science Board requested that PICES Scientific Committees and Programs assist TCODE with refining metadata keywords, identifying sources of GLOBEC metadata, and updating real-time data sources for the North Pacific.

Best Paper and Poster Awards

Ms. Sukyung Kang (Republic of Korea) was awarded the Best Paper Award in the Science Board Symposium for her presentation entitled “*The analysis of trace elements in chum salmon otoliths using laser-ablation technology: Habitat characteristics and stock identification*”, authored by Kang, Kim, Welch, Telmer and Lee.

The Best Poster Award went to Mr. Olav Ormseth (U.S.A.) for his poster titled “*Interannual variability in the distribution of spawning Pacific cod in Alaska: The influence of ocean temperature*”, authored by Ormseth and Norcross.

SB Endnote 1

Participation List

Members

R. Ian Perry (Chairman, Science Board)
Vladimir I. Radchenko (Chairman, BIO)
Douglas E. Hay (Chairman, FIS)
John E. Stein (Chairman, MEQ)
Kuh Kim (Chairman, POC)
Makoto Kashiwai (Co-Chairman, CCCC)
William T. Peterson (for Harold P. Batchelder;
Co-Chairman, CCCC)
Igor I. Shevchenko (Chairman, TCODE)

Invited Observers

Jinping Zhao (invited, China) (October 25 only)
Yukimasa Ishida (Chairman-elect, FIS)
(October 25 only)
Stewart (Skip) M. McKinnell (Assistant Executive
Secretary, PICES, rapporteur)

SB Endnote 2

Science Board Agenda

October 20, 2002 (1230 - 1330)

1. Welcome and opening remarks
2. Adoption of agenda

3. Review of procedures for Best Presentation Awards and Closing Ceremony
4. Review of procedures to enhance documentation of PICES scientific sessions

5. Completion of PICES X decisions and recommendations by Governing Council and Science Board

October 25, 2002 (0830 – 1730)

6. Discussion of PICES Review Committee and Science Board review reports
7. Reports of the Science Board, Scientific and Technical Committees, CCCC IP, Working and Study Groups with regard to items having financial implications for 2002 and beyond:
 - a. Inter-sessional meetings proposed for 2003 and beyond (workshops, Working Group and CCCC Program meetings)
 - b. Proposed publications (PICES Scientific Report series and primary journals) for 2002 and beyond
 - c. Travel support requests
 - d. Other items with financial implications
8. Reports of Science Board, Scientific and Technical Committees, CCCC IP, Working and Study Groups with regard to other items:
 - a. Brief summary report of the group's activities in the past year (including progress with regard to Strategic Plan and "Vision" for the next 5 years), including membership changes
 - b. Tabling of summaries from the PICES XI Scientific Sessions

- c. Proposed titles for Topic Sessions and Symposia for the next Annual Meeting, including draft session descriptions and proposed Convenors
 - d. Proposed list of any future groups along with Terms of Reference and a list of potential members
 - e. High Priority Projects - Ecosystem Status Report
 - f. Relations with other international programs/organizations
 - g. Proposed recommendations and draft text on other items that would be included in the Science Board report to Council (e.g. recommendations for letters of support to various research efforts)
 - h. Other items
9. PICES XII Annual Meeting
 - a. PICES XII theme and Science Board Symposium
 - b. Topic Sessions and draft schedule
 10. CCCC Integration Plan discussion
 11. Ecosystem Status Report discussion
 12. Selection of PICES XIII theme
 13. Updating of Science Board Strategic Plan
 14. Possible inter-sessional Science Board meeting
 15. Other business
 16. Adoption of the Science Board report and recommendations to Council

SB Endnote 3

Review of procedures to enhance documentation of PICES scientific sessions

The last few years, PICES has only included the proposed Topic Sessions for the upcoming year in its Annual Report, and has not provided details regarding the scientific meeting sessions after their conclusion, particularly with regard to any key discussions or recommendations that such sessions might have generated. It became clear to those who are preparing reviews of PICES scientific accomplishments over the last decade, that we have not well-documented the science contained in our Annual Meetings, with the exception of papers that were compiled later

into PICES Scientific Reports or other publications.

If we are to better track the state of our knowledge and future needs for improvement, it seems we should have a better system for documenting our scientific sessions and the discussions and recommendations that come from those. One possible system would be that employed by ICES in their Annual Report. (See a copy of their latest annual report on the web at <http://www.ices.dk/products/AnnualRep/2001annualreport.pdf>). The section devoted to the Annual Science Meeting puts forth the following information:

- keynote lectures and abstracts
- science meeting agenda (session schedules)
- details of each scientific session

The last item, details of each scientific session, contains an organized description of each session that includes:

- purpose of the session (derived from the initial session description);
- details of the content of the papers presented in summary form;
- summary of the discussions and conclusions of the session with regard to: research gaps that need to be filled; recommendations for future sessions or groups, or work; recommendations for other actions; and
- list of the documents (author and title) presented.

PICES has struggled to enhance the discussions at our Topic Sessions, and if we ask convenors

to document the sessions and the discussions, we may see a better organization of Topic Sessions in this regard. We would also have a more organized way to provide scientific recommendations for action to the parent Committee(s) that sponsored the session.

Recommendation: Session convenors be asked to provide a summary of their session that includes the four points listed above, and these summaries be included in the PICES Annual Report. This practice would begin with the PICES 2002 Annual Meeting. Also, session convenors should be requested to include a fixed amount of discussion time at the end of their sessions (15 minutes) in order to provide for proper discussion of the papers and issues raised by the papers.

(From: *PICES Annual Review 2001, SB Endnote 11, p. 52*)

SB Endnote 4

Completion of PICES X decisions and recommendations

01/S/1: Inter-sessional meetings, Working Group and CCCC Program workshops

The following inter-sessional meetings were convened:

- A 4-day MODEL/REX Workshop on *Improvements to the PICES NEMURO Model: To build a nutrient-phytoplankton-zooplankton-fish version of the model* (co-sponsored by Nakajima Foundation and Nemuro-city), January 24-27, 2002, Nemuro/Yokohama, Japan;
- A 2-day meeting of WG 14 on *Effective sampling of micronekton*, February 16-17, 2002, Honolulu, Hawaii, U.S.A. (in conjunction with the Ocean Sciences Meeting);
- A 2-day NPAFC/NASCO/IBSFC/PICES/ICES Symposium on *Causes of marine mortality of salmon in the North Pacific and North Atlantic Oceans and in the Baltic Sea*, March 14-15, 2002, Vancouver, Canada;
- A 3-day MONITOR Workshop on *Voluntary observing ships* (co-sponsored by

EVOS), April 5-7, 2002, Seattle, Washington, U.S.A.;

- A 2-day BASS/MODEL Workshop on *Using models to test hypothesis on effects of climate change on the North Pacific subarctic gyre system*, April 21-22, 2002, La Paz, Mexico;
- A 3-day International Symposium on *North Pacific transitional areas* (co-sponsored by CIBNOR and CICIMAR), April 23-25, 2002, La Paz, Mexico;
- A 3-day meeting of North Pacific Data Buoys Advisory Panel (co-sponsored by WMO and IOC), June 4-6, 2002, Victoria, Canada;
- A 3-day CREAMS/PICES Workshop on *Recent progress in studies of physical processes and their impact to the Japan/East Sea ecosystem*, August 22-24, 2002, Seoul, Republic of Korea;
- Joint meeting of PICES CCCC-MODEL Task Team and GLOBEC F3WG on *Linking biophysical and upper trophic level models*, October 18, Qingdao, People's Republic of

China (in conjunction with PICES XI and GLOBEC OSM);

- A ½-day Workshop of PICES CCCC-MONITOR Task Team and GLOBEC FIWG on *Requirements and methods for early detection of ocean change*, October 19, 2002, Qingdao, People's Republic of China (in conjunction with PICES XI);
- A 1-day PICES/GLOBEC Data Management Workshop on *Exchange, inventory and archival of GLOBEC data*, October 19, 2002, Qingdao, People's Republic of China (in conjunction with PICES XI);
- A 1-day CCCC Integration Workshop, October 20, 2002, Qingdao, People's Republic of China (in conjunction with PICES XI);
- A 1-day PICES/CLIVAR Workshop on *Climate variability in the Pacific and its impact on the marine ecosystem*, October 20, 2002, Qingdao, People's Republic of China (in conjunction with PICES XI);
- A ½-day MONITOR Workshop on *Monitoring from moored and drifting buoys*, October 23, 2002, Qingdao, People's Republic of China (in conjunction with PICES XI);
- A 1-day PICES/CKJORC Workshop on *Regional cooperation and management of the marine environment and resources in the Yellow Sea*, October 25, 2002, Qingdao, People's Republic of China (in conjunction with PICES XI).

01/S/2: Travel Support

Full or partial travel support was provided to:

- Drs. Richard D. Brodeur (U.S.A.) and Kouichi Kawaguchi (Japan) to attend the interim meeting of WG 14 on *Effective sampling of micronekton*, in Honolulu, U.S.A., in February;
- Drs. Douglas E. Hay (FIS Chairman), R. Ian Perry (Science Board Chairman), Skip McKinnell (Convenor) and Alexander Bychkov (Executive Secretary) participated in the Symposium on *Causes of marine mortality of salmon in the North Pacific and North Atlantic Oceans and in the Baltic Sea* (co-sponsored by NPAFC, NASCO,

IBSFC, PICES and ICES) and the NPAFC Research Planning and Coordinating Meeting, in Vancouver, Canada, in March;

- Full or partial travel support was provided to 6 scientists (from Japan, U.K. and U.S.A.) to attend the Workshop on *Voluntary observing ships*, in Seattle, U.S.A., in April;
- Dr. Harold P. Batchelder (CCCC Co-Chairman) participated in the meeting of the ICES Cod and Climate Change Program, in Copenhagen, Denmark, in April;
- Mr. Gordon A. McFarlane (Canada) attended the BASS/MODEL Workshop on *Using models to test hypothesis on effects of climate change on the North Pacific subarctic gyre system*, in La Paz, Mexico, in April;
- Full or partial travel support was provided to 6 invited speakers (from Canada, Japan and U.S.A.), Science Board Chairman and staff of the Secretariat to participate in the International Symposium on *North Pacific transitional areas*, in La Paz, Mexico, in April;
- Full or partial travel support was provided to 7 invited speakers (from Japan, Korea and Russia) to attend the CREAMS/PICES Symposium/Workshop on *Recent progress in studies of physical processes and their impact to the Japan/East Sea ecosystem* (August 2002, Seoul, Republic of Korea). In addition, by request from PICES, the University of Washington allocated partial travel support for 4 Russian scientists to attend the meeting. Dr. McKinnell participated in this meeting as a PICES representative and discussion leader on the status of Japan/East Sea ecosystem;
- Travel support was provided to Drs. Kenneth Denman (Canada) and Nianzhi Jiao (China) to attend a JGOFS/PICES Session on *Synthesis of JGOFS North Pacific Process Study* (during the Japan Oceanography Society meeting organized in conjunction with the 26th SCOR General Meeting), in Sapporo, Japan, in October;
- Drs. Hyung-Tack Huh and R. Ian Perry represented PICES at the 2002 ICES Annual Conference and Centenary, in Copenhagen, Denmark, in October;
- Dr. Alexander Bychkov represented PICES

at the NPAFC Tenth Annual Meeting, in Vladivostok, Russia, in October;

- Dr. Perry attended the 2nd GLOBEC Open Science Meeting held in Qingdao immediately prior to PICES XI;
- Full or partial travel support (paid by PICES and co-sponsoring programs and organizations) was provided to 5 invited speakers for the Science Board Symposium, and 17 invited speakers for scientific sessions at the PICES Eleventh Annual Meeting, in Qingdao, People's Republic of China, in October;
- Travel support (paid by PICES, WCRP and U.S. CLIVAR) was provided to 7 scientists (invited speakers and co-convenors) to attend the PICES/CLIVAR Workshop on *Implementation of CLIVAR in the North Pacific*, October 20, 2002, Qingdao, People's Republic of China (during PICES XI);
- Dr. Stewart M. McKinnell attended the meeting of the SCOR-IOC WG 119 on *Quantitative Ecosystem Indicators for Fisheries Management*, in Cape Town, South Africa, in December.

01/S/3: Publications

List of publications in 2001 includes:

- PICES Scientific Report No. 20: *Climate Change and Carrying Capacity Program / Report of the 2001 BASS/MODEL, MONITOR and REX Workshops, and the 2002 MODEL Workshop*;
- PICES Scientific Report No. 21: *Climate Change and Carrying Capacity Program / Report of the 2002 PICES Workshop on Voluntary Observing Ships*;
- PICES Scientific Report No. 22: *PICES Science: The first ten years and a look to the future* (Proceedings of the PICES X Anniversary Symposium);
- PICES Scientific Report No. 23: *Harmful algal blooms in the PICES region of the North Pacific*;
- Special issue of *Journal of Oceanography* (Vol. 58, No. 5) on *Physics and biology of eddies, meanders and rings in the PICES region* (selected papers from the 2001 POC/BIO/FIS Topic Session; Guest

Editors: William B. Crawford, Alexander S. Bychkov, Stewart M. McKinnell and Takashige Sugimoto);

- Special issue of *Progress in Oceanography* (Vol. 55, No. 1-2) on *Variability of Bering Sea ecosystem* (selected papers from the 2001 CCCC Topic Session; Guest Editors: Allen Macklin, Jeffrey M. Napp, Vladimir I. Radchenko, Sei-ichi Saitoh, Phyllis J. Stabeno and Stewart M. McKinnell);
- Special section of *Canadian Journal of Fisheries and Aquatic Sciences* on *Migration of key ecological species* (Selected papers from the 2001 FIS Topic Session; Guest Editor: James Irvine);
- Special issue of *Deep-Sea Research Part II* (Vol. 49, No. 24-25) on *North Pacific Biogeochemical Processes* (Guest Editors: Toshiro Saino, Alexander S. Bychkov, Chen-Tung A. Chen and Paul J. Harrison);
- The electronic (CD-ROM and web-based) version of the Oceanographic Atlas of the Okhotsk Sea, Bering Sea and Japan/East Sea prepared by the Pacific Oceanological Institute.

01/S/4: Future of current Working Groups and Scientific Programs

- WG 14 on *Effective sampling of micronekton* is continuing its work and is expected to complete its report in 2003.
- WG 15 on *Ecology of Harmful algal blooms (HABs) in the North Pacific* had a split meeting in 2002, and is expected to complete its final report in 2003.
- WG 16 on *Climate change, shifts in fish production, and fisheries management* is expected to complete its final report in 2003.

01/S/5: New PICES Groups

- WG 17 on *North Pacific biogeochemical data integration and synthesis* was formed in 2002 and had its first meeting in October 2002, in conjunction with PICES XI (Qingdao, People's Republic of China).
- *North Pacific Data Buoy* Advisory Panel was formed in 2002 and had its first meeting in June 2002, in Victoria, Canada.

- At their meeting in 2001, FIS proposed that a new WG on *Ecosystem considerations in fisheries management* be established in 2003. At PICES XI, this decision was deferred pending completion of WG 16.

01/S/6: Relations with other organizations and programs

- Drs. Ian Perry and Alexander Bychkov attended the **SCOR** Executive Committee meeting in Mar del Plata, Argentina, in October 2001, to present and discuss programs of common interest and increased collaboration;
- PICES co-sponsored with the **International Research Institute for Climate Change Prediction**, and Drs. Ian Perry and Skip McKinnell participated in, a workshop on *Climate and fisheries: Interacting paradigms, scales, and policy approaches*, held November 14-17, 2001, in Honolulu, U.S.A.;
- PICES collaborated closely with **GLOBEC**, and co-sponsored joint sessions between PICES XI and the GLOBEC 2nd Open Science Meeting, October 14-18, 2002, in Qingdao, People's Republic of China;
- PICES and **WCRP/CLIVAR** co-hosted the workshop held in conjunction with PICES XI on developing CLIVAR in the North Pacific;
- PICES and **Census of Marine Life** are co-sponsoring a project affiliated with the North Pacific Ecosystem Status Report titled *Marine life in the North Pacific: The known, unknown, and unknowable*;

- PICES co-sponsored along with **NPAFC** and other organizations, a workshop on *The causes of marine mortality of salmon in the North Pacific and North Atlantic Ocean and in the Baltic Sea*, held in March 2002, in Vancouver, Canada, as well as participated in the NPAFC Annual Meeting and the meeting of the NPAFC/CSRS Committee;
- **IPHC** and **IATTC** collaborated with PICES by providing information to the pilot North Pacific Ecosystem Status Report;
- **EVOS Gulf of Alaska Ecosystem Monitoring and Research Program (GEM)** is collaborating with PICES in development of the North Pacific Ecosystem Status Report;
- PICES and **ICES** continued to work together to hold the Zooplankton Symposium in Gijón, Spain, in May 2003. They also hosted reciprocal visits and discussions to develop closer links and collaborative programs;
- **Alliance for California Current Ecosystem Observations (ACCEO)**: PICES participated in discussions to develop this fledgling organization, as a regional component of the North Pacific Ecosystem Status Report;
- PICES and **JGOFS** co-sponsored a Workshop on *Synthesis of JGOFS North Pacific Process Study* (with JOS), held October 1-2, 2002, Sapporo, Japan (during the Japan Oceanography Society meeting in conjunction with the 26th SCOR General Meeting).

SB Endnote 5

Proposal for a Study Group on Capacity building

Proposal: Study Group under Science Board

Title: Study Group on Capacity building

Duration: November 2002 - October 2003

Terms of Reference

1. Identify the capacity building needs of PICES;

2. Develop a proposal to address the capacity building needs of PICES, including consideration of possible collaborations with other organizations;
3. Draft report is due to Science Board at their next meeting (tentatively the inter-sessional meeting in April 2003).

Membership

Chairman: Warren S. Wooster

Members: representatives of the Standing Committees and CCCC Program

Secretariat support: Alexander S. Bychkov.

SB Endnote 6

Working Group on the North Pacific Ecosystem Status Report

A proposal was submitted to, and subsequently approved by, the Census of Marine Life for a collaborative PICES - CoML project titled: "Marine life in the North Pacific Ocean: The known, unknown and unknowable". This is to be a co-operative effort with PICES' North Pacific Ecosystem Status Report, and is described as follows:

The Census of Marine Life (CoML) seeks to offer by 2010 a vastly improved description and explanation of the diversity, distribution, and abundance of marine life. The North Pacific Marine Science Organization (PICES) aims to promote international marine research in the North Pacific Ocean region. In several respects, the Organization's goals overlap those of the CoML. A joint, immediate, speedy effort to assess the status of marine life in the North Pacific Ocean on the basis of current information makes sense. Such a study could help define the pattern for reporting in the CoML, especially as it will employ the framework of evaluating what is known, what is unknown and what is unknowable. Moreover, the cooperative effort could also help set priorities for working in the North Pacific during the CoML and lift the chances that the needed work will be conducted.

To this end, PICES proposes a co-sponsored effort to begin the assessment of what lives in the North Pacific Ocean: a synthesis of what is known about the abundance, biodiversity, distribution and production "hot spots" of marine life from plankton to marine birds and mammals (*Status*). The report will also describe what is known to be unknown about taxonomic groups and geographic regions, either because information has been collected but is not yet available, or where critical information is lacking entirely (*Critical Issues*). The report will discuss what might be considered

unknowable about marine life in the North Pacific. Finally, it will identify potential drivers of future changes to marine life in the North Pacific and assess how these drivers of change might impact marine life to forecast future conditions (*Future Trends*).

The major objective of the project is for PICES to produce a report for the CoML that identifies and elaborates on these issues. It will also be a significant contribution to a separate PICES initiative, an Ecosystem Status Report for the North Pacific Ocean. Development of the PICES report to CoML is anticipated to be complete by the end of 2003, if work can begin in mid-2002. Funding of US \$45,000 is requested to support the activities of the project. The PICES report to the CoML will stand alone and its completion will not depend on the progress of the other activity. Moreover, the PICES report to CoML will be of value to the Census for planning future activities in the North Pacific, for placing the initial Pacific field projects of the CoML in context, and for identifying subsequent ways that PICES might participate in the CoML.

Considering this PICES - CoML project, and the draft North Pacific Ecosystem Status Report prepared for PICES XI, the following Working Group under Science Board is proposed to continue work on this project:

Proposal: Working Group under Science Board

Title: North Pacific Ecosystem Status Report

Duration: November 2002 - January 2004

Terms of Reference

1. Prepare the full North Pacific Ecosystem Status Report, for review in October 2003 at PICES XII, and for completion in December 2003.

2. Prepare the report for the PICES - CoML project on “*Marine life in the North Pacific Ocean: The known, unknown and unknowable*”.
3. Recommend mechanisms to facilitate the data management requirements of the North Pacific Ecosystem Status Report.
4. Recommend how to implement production of the North Pacific Ecosystem Status Report as a regular activity of PICES.

Membership

Chairman: R. Ian Perry

Members: Chairmen of the Standing Scientific Committees and Program, invited experts

Secretariat support: Stewart M. McKinnell

SB Endnote 7

Proposal for a NEMURO Experimental Planning Team (NEXT)

Following recommendations of the CCCC Integration Workshop, the CCCC IP/EC proposed establishment of an *ad hoc* NEMURO Experiment Planning Team (NEXT), which will work through e-mail communications, to develop scientific strategy, based on requirements of ecosystem models to be developed, for the series of hypotheses testing workshops.

Terms of Reference

1. To help guide and prioritize requests for modifications, future advancements, extensions, validations, and calibrations of the NEMURO model and its successors.
2. To develop a scientific strategy, based on requirements of ecosystem models to be developed, for a series of workshops for testing hypotheses on the following topics of CCCC Integration:
 - a. Comparison of coastal ecosystems around the North Pacific Rim (and North Atlantic), using zooplankton and small fish as focal species;

- b. Latitudinal comparison of North Pacific ecosystems, using multiple focal species;
 - c. Link basin-scale ecosystem models to coastal ecosystem models in the North Pacific, using salmon and associated species linked trophically to salmon as focal species.
3. To direct the development of advances in NEMURO by considering the scientific importance of the suggestion, the time and resources required to complete the task, and proposed suggestion's relevance to the goals of PICES and the CCCC Program.
4. To develop an outline of hypotheses-testing model experiments during the early half of 2003, mainly through “virtual meetings” such as e-mail and other forms of long distance communication, and report to CCCC-IP/EC for consideration.

Membership

Chairman: Harold P. Batchelder

Members: 2 members from each CCCC Task Team, invited experts

SB Endnote 8

Revised Standing List of International Organizations and Programs

PICES is expanding its relationships with international scientific organizations and programs around the world. At the same time, there is the need to improve integration, coordination, and communication with regional scientific research efforts in the North Pacific that

are aligned with the PICES ecosystem research focus. These regional programs may involve several PICES member countries and cover international areas of high ecological importance. Annually, the Science Board examines and revises the Standing List of International Organizations

and Programs. Additionally, it selects a subset of organizations and programs that are considered to have the highest priority (marked by *) for PICES with respect to scientific cooperation and facilitation in the coming year. 2002 additions to list are the International Whaling Commission (IWC), the new IGBP/OCEANS (Ocean

Biogeochemistry and Ecosystems Analysis) program, and the North Pacific Research Board (NPRB). This list will be used in part to assist the Executive Secretary and Science Board in decisions regarding travel to meetings of other international organizations.

ACIA	Arctic Climate Impact Assessment Program (ACIA of AMAP)
AFSCAR*	American Fisheries Society Program on Climate and Aquatic Resources
AMAP*	Arctic Monitoring and Assessment Program (AMAP)
APEC*	Marine Resources Conservation WG (MRC), Asia Pacific Economic Cooperation
APFIC	Asia-Pacific Fisheries Commission
Argo*	International Program for deployment of profiling floats (linked with GOOS)
CLIVAR*	Climate Variability and Predictability Program
CoML*	Census of Marine Life
CREAMS*	Circulation Research in the East Asian Marginal Seas
DBCP	Data Buoy Cooperation Panel
ECOR	Engineering Committee on Oceanic Resources
FAO	Food and Agriculture Organization
GCOS*	Global Climate Observing System
GEM*	Gulf of Alaska Ecosystem Monitoring and Research Program
GESAMP	Group of Experts on Scientific Aspects of Marine Pollution
GIPME	Global Investigation of Pollution in the Marine Environment
GLOBEC*	Global Ocean Ecosystem Dynamics
GOOS*	Global Ocean Observing System
IASC	International Arctic Science Committee
IATTC*	Inter-American Tropical Tuna Commission
ICES*	International Council for the Exploration of the Sea
ICSU	International Council of Scientific Unions
IGBP*	International Geosphere-Biosphere Program
IGOSS	Integrated Global Ocean Services System
IOC*	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange
IPCC*	International Panel on Climate Change
IPHC*	International Pacific Halibut Commission
IWC	International Whaling Commission
JGOFS*	Joint Global Ocean Flux Study
NAFO	North Atlantic Fisheries Organization
NASCO	North Atlantic Salmon Conservation Organization
NEAR-GOOS*	North East Asian Regional GOOS
NOWPAP	Northwest Pacific Action Plan
NPAFC*	North Pacific Anadromous Fish Commission
NPRB*	North Pacific Research Board
OCEANS	Ocean Biogeochemistry and Ecosystems Analysis
PORSEC	Pacific Ocean Remote Sensing Conference
PSC	Pacific Salmon Commission
PSG	Pacific Seabird Group
SAHFOS*	Sir Alister Hardy Foundation for Ocean Science
SCOPE	Scientific Committee on Problems of the Environment

SCOR*	Scientific Committee on Oceanic Research
SOLAS*	Surface Ocean Low Atmosphere Study
SPC	South Pacific Commission
SPREP	South Pacific Regional Environmental Program
START	South Asian Regional Committee for the System for Analysis, Research and Training
UNEP	United Nations Environment Program
WCRP	World Climate Research Program
WESTPAC*	Cooperative Study of the Western Pacific, IOC Sub Committee for the Western Pacific
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment

SB Endnote 9

Science Board Symposium - PICES XII

Title: *Human dimensions of ecosystem variability*

Co-convenors: R. Ian Perry (SB), Vladimir I. Radchenko (BIO), Yukimasa Ishida (FIS), John E. Stein (MEQ), Kuh Kim (POC), Igor I. Shevchenko (TCODE), Makoto Kashiwai and Harold P. Batchelder (CCCC)

Marine ecosystems are dynamic in terms of climate and physical features, and the species that inhabit them. Human relationships and interactions with the ocean have been long-lasting and changing in their nature and strength over the years. Even though natural variability in marine systems is thought to be large, separating natural climate variability from human-induced sources is an on-going challenge. Physical oceanography, chemistry

and climate indices are being examined in relationship to living marine resource production. *What is our understanding of how these indicators are influenced by global climate warming?* Various human activities have the effect either of removing, altering or adding nutrients or species to areas. *How do these changes in nutrient composition and amounts, fishery removals or discards, habitat alteration, introduction of non-native species or pollutants change ecosystem structure and production? What are the effects of ecosystem change on human societies? What are the implications of fisheries management decisions affecting the nature and functions of ecosystems?* This theme seeks to highlight the many ways that humans interact with marine ecosystems and the scientific efforts to quantify and predict human impacts on such dynamic systems.

SB Endnote 10

Proposed theme for PICES XIII (Honolulu, U.S.A.)

Beyond the continental slope - complexity and variability in the open North Pacific Ocean

Most of the area of the North Pacific consists of the pelagic realm, away from boundary currents and marginal seas. This oceanic region is often perceived as physically homogeneous and stable with low biological productivity. In reality, it is a spatially and temporally dynamic physical environment with high *complexity*. *The open ocean contains horizontal and vertical gradients in physical and biological properties producing*

ecosystem structure and diversity. In the midst of the oceanic realm seamounts and islands add additional complexity. In spite of the low primary productivity, the region supports complex ecosystems, high in biodiversity including many endangered species. The marine resources are very important to the people of the region and are fished by fleets from many Pacific Rim nations. This theme will examine how these complex ecosystems are supported, considering the traditional understanding of the sub-tropical and temperate open ocean as being

low in productivity. It will provide opportunities to compare and contrast these areas with those of higher productivity in the subarctic North Pacific. How important are small and meso-scale features such as fronts and eddies to the survival of upper trophic level species? How do ecosystems in the open ocean respond to vertical and horizontal physical and biological structure? How have sub-tropical waters responded to recent global changes? What are the major factors causing changes to

open ocean ecosystems, particularly in the subtropics? What are the physical and biological links between the subtropical gyre and other regions of the North Pacific? What are the human interactions with these systems? This theme seeks to highlight the *physical and biological* features and dynamic processes of the *oceanic waters far from the influences of the continental shelf with particular emphasis on the subtropical gyre* in the southern parts of the PICES region.

