

REPORT OF SCIENCE BOARD

The Science Board met on October 17, 2004 (from 12:30-13:30 hours), to review the agenda and discuss initial items relating to the coming PICES scientific sessions. Science Board met again on October 22 (from 08:30-18:00 hours), to deal with the remainder of the agenda, including items with financial implications for 2005 and beyond. Dr. Stewart M. (Skip) McKinnell served as rapporteur for both meetings. (See *SB Endnote 1* for list of participants.)

October 17, 2004

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

Report on election of new Committee Chairmen (Agenda Item 3)

This item was deferred to October 22 as Committee meetings took place only after this first Science Board meeting.

Election of new Science Board Chairman and Vice-Chairman (Agenda Item 4)

Dr. Kuh Kim (Korea) was elected as the new Science Board Chairman by acclamation. Science Board members expressed their gratitude to Dr. Ian Perry for his leadership and valuable contribution to PICES activities over the years.

Election of the new Science Board Vice-Chairman was deferred until October 22, after the Committee meetings.

Review of procedures for Best Presentation Awards and Closing Session (Agenda Item 5)

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. Young scientists eligible for the award were identified from information they provided on their registration forms. Science Board used a revised procedure to determine the Best Poster Award. Each Committee nominated one member to serve on a Poster Award Committee, which provided Science Board with the name of the winning poster. For PICES XIII, the Poster Award Committee consisted of Drs. Michael J. Dagg (BIO), Sukyung Kang (CCCC), Jin-Yeong Kim (FIS), C. Michael Watson (MEQ), and Yuri I. Zuenko (POC).

It was reiterated that the Closing Session would consist of a brief presentation by the Chairman (Dr. Jacquelynne R. King) of the Study Group on *Fisheries and ecosystem responses to recent regime shifts* (formed to respond to the request for scientific advice from the government of the United States), a look towards PICES activities in the coming year, including the theme and possible topic sessions for the next Annual Meeting, presentation of Best Presentation Awards and PICES service awards to retiring Science Board members, and final words of thanks from the PICES Chairman, Dr. Vera Alexander. Committee Chairmen were reminded to provide a list of Topic Sessions for PICES XIV approved by their Committee to the Science Board Chairman before the Closing Session.

Procedures to enhance documentation of PICES scientific sessions (Agenda Item 6)

The procedures to enhance the documentation of PICES scientific sessions were 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 XIII.

Governing Council decisions and Science Board recommendations from PICES XII (Agenda Item 7)

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

October 22, 2004

Dr. Perry opened the second Science Board meeting, and welcomed the participation of Drs. Michael J. Dagg (Chairman-elect of BIO), Michael G. Foreman (Chairman-elect of POC) and Phillip R. Mundy (Chairman of MONITOR Technical Committee). Dr. John E. Stein (MEQ) was elected as the new Vice-Chairman of Science Board, for a period of one year. Dr. Vladimir Radchenko (first Science Board Vice-Chairman) was thanked for his contribution to PICES activities.

Reports of Committees and Programs under Science Board, and items with financial implications for 2004 and beyond (Agenda Item 8)

Science Board discussed reports from its Committees and Programs. The following membership changes, new subsidiary groups, inter-sessional meetings, publications, travel support requests, and related items were endorsed by Science Board and forwarded to Governing Council for approval.

Membership changes (Agenda Item 8a)

Science Board recommends the following Chairmanship changes for Committees:

MEQ: Dr. John E. Stein (U.S.A.) to extend his term for one additional year;

TCODE: Dr. Igor I. Shevchenko (Russia) to extend his term for one additional year;

MONITOR: Dr. Phillip R Mundy (U.S.A.) is recommended as the Chairman, and Dr. Sei-ichi Saitoh (Japan) is recommended as the Vice-Chairman for this new Technical Committee; membership is suggested to remain the same as the previous CCCC MONITOR Task Team.

Science Board recommends the following membership changes for the CCCC Program.

MODEL Task Team:

- Dr. Francisco E. Werner to continue as Co-Chairman for one additional year, with Dr. Thomas C. Wainwright (U.S.A.) to serve as Co-Chairman-elect after PICES XIV;
- Drs. Toshio Katsukawa and Hiroaki Saito (Japan) to be replaced by Dr. Goh Onizuka;
- Dr. Hao Wei (China) to join the Task Team as a member;
- Drs. Peter S. Ross (Canada), Jae-Hak Lee (Korea) and Linda Jones (U.S.A.) to formally rotate off the Task Team as they have not participated in recent meetings;
- Additional members from Canada, China, Korea and Russia are needed.

CFAME Task Team:

- Proposed members (pending Governing Council approval) for this new Task Team are: Canada – Drs. Jacquelynne R. King and Gordon A. McFarlane; Japan – Drs. Sanae Chiba, Masahide Kaeriyama, Akihiko Yatsu and Yoshiro Watanabe; Korea – Drs. Hyung-Ku Kang and Sukyung Kang; U.S.A. – Drs. Vera Agostini, Kerim Y. Aydin, Brenda L. Norcross and James E. Overland (a member of POC to facilitate the climate connection); members from Russia and China have yet to be identified.
- Drs. Aydin and Yatsu to serve as initial Co-Chairmen, with a 3-year term and a 2-year term, respectively, to avoid simultaneous rotation of both Co-Chairmen in future years.

Science Board recommends that all membership lists be confirmed prior to each Annual Meeting and be included as Appendices in the Annual Report. This will help maintain a historical record of Committee membership, and may help to improve participation.

Existing and proposed new subsidiary bodies (Agenda Item 8b)

- The Study Group on *Fisheries and ecosystems responses to recent regime shifts* completed its report on time, and it was

presented to the U.S. delegation during PICES XIII. Science Board congratulates the members and Chairman of that group for a job well done, and recommends dissolving the Study Group.

- The Study Group on *Ecosystem-based management science and its application to the North Pacific* submitted its report to the FIS and MEQ Committees, and completed its tasks at PICES XIII. Science Board thanks the Study Group members and recommends the Study Group be concluded, and its report published in the PICES Scientific Report Series.
- The final report of WG 14 on *Effective sampling of micronekton* was accepted by BIO. Science Board recommends that the Working Group be concluded and its members thanked for their participation.
- WG 16 on *Climate change, shifts in fish production and fisheries management* submitted an 85%-complete draft report to FIS. Science Board strongly encourages the completion of this report by the time of PICES XIV.
- WG 17 on *Biogeochemical data integration and synthesis* met at the same time as Science Board. Recommendations from the Working Group are forthcoming for consideration at the third interim Science Board meeting in the spring of 2005.
- WG 18 on *Mariculture in the 21st century - the intersection between ecology, socio-economics, and production* had a very successful first meeting at PICES XIII. Science Board is pleased with its start.
- The *Harmful Algal Bloom (HAB)* Section under MEQ had a very successful 1-day workshop and a 1-day Section meeting at PICES XIII. Science Board is pleased with its progress.
- The Advisory Panel on *Iron fertilization experiment in the subarctic Pacific Ocean* (IFEP-AP; under BASS) continues to be very active. Science Board noted that with the completion of BASS, IFEP-AP needs to have a new parent Committee. It was also noted that another biogeochemistry-related proposal may be forthcoming from WG 17. Science Board recommends that the Science Board Chairman lead an e-mail discussion to identify the most appropriate “home” for such biogeochemistry-related activities in PICES, which might serve as a link with the new IGBP project on *Integrated Biogeochemistry and Ecosystems Research* (IMBER). One possibility might be a joint activity sponsored by POC and BIO. This proposal should be ready for discussion at the inter-sessional Science Board meeting in 2005. Until then, Science Board recommends that IFEP-AP remain under the CCCC Program.
- The Advisory Panel on *Micronekton sampling inter-calibration experiment* (MIE-AP; under BIO) conducted a very successful field experiment off Hawaii immediately prior to PICES XIII. Plans are being developed to carry out another sampling inter-comparison in the northern North Pacific. Science Board is supportive of this activity, pending submission of a written report of the Hawaii experiment and future plans, and encourages participation by PICES countries not yet represented (China, Korea and Russia).
- The Advisory Panel on *Marine birds and mammals* (MBM-AP; under BIO) has been in existence for 5 years, therefore Science Board requested that BIO review activities of the Panel. BIO rated the accomplishments of MBM-AP highly, and recommended continuation of the Panel for another 5-year term. Science Board supported this recommendation, but did not agree to a change in the terms of reference, suggesting that top fish predators be included as MBM-AP sees appropriate, in the context of marine bird and mammal issues. Science Board noted that even though this is a small group, the Panel pursues activities of wide interest, and encouraged PICES countries to be fully supportive of MBM-AP activities. Science Board asks the PICES Secretariat to include on the website the date of the next review for each on-going Panel or Section (review by the parent committee and Science Board is recommended every 5 years).
- The *North Pacific Data Buoy* Advisory Panel (under POC) is continuing its work, but with the long-lasting difficulties related

to funding for Panel members to attend meetings, the need for an Asian Co-Chairman, and two new Panel members to replace retiring members. Science Board noted there may be progress in identifying an Asian Co-Chairman.

- Science Board noted that this was the last meeting of MONITOR as a CCCC Task Team, and its first meeting as a Technical Committee. Science Board recommends: (1) the Advisory Panel on *Continuous Plankton Recorder Survey in the North Pacific (CPR-AP)* continue to be under the MONITOR Technical Committee; (2) a MONITOR Action Plan be developed for activities over the next 3-5 years, which would include proposals and clear terms of reference for a possible Advisory Panel on GOOS, plans for the North Pacific Ecosystem Status Report, and associated technical workshops on methodologies, etc. Science Board requests that this Action Plan be presented for consideration at the inter-sessional Science Board meeting in the spring of 2005. MONITOR's proposal for an Advisory Panel on GOOS was not approved at this time, as the terms of reference were not specific.

The following new subsidiary bodies are recommended by Science Board:

- Science Board accepted the proposal from the Study Group on *Ecosystem-based management science and its application to the North Pacific* to form a Working Group on this topic, under the direction of FIS and MEQ (see *SB Endnote 5* for terms of reference and suggested membership). Terms of reference with additional information can be found in *SGEBM Endnote 4*.
- Science Board accepted the proposal from POC to form an Advisory Panel for a *CREAMS/PICES Program in East Asian Marginal Seas*, with the inclusion of biological and fisheries research (see *SB Endnote 6* for terms of reference). BIO and MONITOR may wish to co-sponsor this group with POC.

Inter-sessional meetings/workshops in 2005 and beyond (Agenda Item 8c)

- A CCCC/CFAME workshop to develop a CFAME work plan and hypothesis set for CCCC synthesis (*CFAME Endnote 5*), late winter/early spring 2005, location in North America to be decided; this workshop might be also convened in conjunction with the ESSAS Symposium in May 2005, in Victoria, Canada;
- A CREAMS/PICES workshop on "East Asian Seas time series", spring 2005, location in Asia to be decided;
- A symposium, co-sponsored with GLOBEC, on "Climate variability and sub-arctic marine ecosystems", May 16-20, 2005, Victoria, Canada (approved in 2003);
- A workshop to plan "An east-west comparative study of lower trophic level pelagic ecology in the subarctic Pacific Ocean" (*BIO Endnote 4*), late spring 2005, Corvallis, U.S.A.;
- A joint ICES/PICES theme session on "Fisheries, ecology and life history of small pelagic fish" (note the focus is on cold-water pelagics rather than sardine and anchovy) at the ICES Annual Science Conference, September 2005, Aberdeen, Scotland (approved in 2003); Dr. Douglas E. Hay (Canada) is recommended as the PICES co-convenor;
- A joint ICES/PICES theme session on "Comparing and constructing the scientific strategies and output of regional ecosystem projects" at the ICES Annual Science Conference, September 2005, Aberdeen, Scotland (approved in 2003); Dr. Phillip R. Mundy (U.S.A.) is recommended as the PICES co-convenor;
- A CCCC/MODEL workshop to extend NEMURO.FISH to fish stocks in other geographic regions (Europe, Africa, Asia, South America), September or October 2005, location in Japan to be decided (pending successful funding from APN and other sources; the pending APN proposal is titled "Toward quantitative understanding of

natural fluctuations of marine coastal fisheries of sardines and anchovies and their impact on fishing-dependent human communities”);

- A joint ORI/PICES workshop to synthesize results from the second *in situ* iron enrichment experiments in the western subarctic North Pacific (SEEDS-II); and to discuss differences in magnitude, biology and export between SEEDS-I and SEEDS-II, October 2005, Tokyo, Japan;
- A joint NPAFC/PICES symposium on “The status of Pacific salmon and their role in North Pacific marine ecosystems”, in conjunction with the NPAFC Annual Meeting, fall 2005, location in Korea to be decided (approved in 2003; *SB Endnote 7*);
- A CCCC symposium on “Climate variability and ecosystem impacts on the North Pacific: A basin-scale synthesis”, April 19-21, 2006, Honolulu, U.S.A.;
- A joint ICES/PICES symposium on “Marine bioinvasions”, spring 2006, location on the east coast of the United States to be decided (approved in 2003; *SB Endnote 8*); Dr. Yasuwo Fukuyo (Japan) is recommended as the PICES co-convenor; Science Board believes that this is an important global issue which would benefit from collaboration with ICES;
- A workshop/symposium celebrating the 50th anniversary of sampling along Line P, summer 2006, Victoria, Canada; a detailed proposal is expected by the inter-sessional Science Board meeting in the spring of 2005;
- A CREAMS/PICES workshop on “East Asian marginal seas circulation: What we know and how well can we forecast?”, summer 2006, near Vladivostok, Russia (approved in 2003; postponed from 2005);
- A 4th International Zooplankton Production Symposium, co-sponsored by GLOBEC and ICES, May 28-June 1, 2007, Hiroshima, Japan; Dr. Michael J. Dagg (U.S.A.) is recommended as the PICES co-convenor and Dr. David L. Mackas (Canada) as a member of the Scientific Steering Committee.

Proposed sessions and workshops for PICES XIV (Agenda Item 8d)

Proposals for scientific sessions and workshops at PICES XIV were discussed, and are presented below under Agenda Item 9.

Travel support requests (Agenda Item 8e)

Travel support requests are listed in priority order (highest to lowest) within each Committee; those marked with * were identified by Science Board to have higher overall priorities. It is also expected that approximately \$5,000 per Committee, CCC Program, and the Science Board theme session will be allocated for invited speakers at PICES XIV.

BIO

- 4 scientists (2 from Asia and 2 from North America) to attend the workshop on “An east-west comparative study of lower trophic level pelagic ecology in the subarctic Pacific Ocean”*;
- MIE-AP members to participate in the next micronekton inter-calibration cruise (request pending formal reports of panel activities and future plans);
- 2 scientists to attend the CREAMS/PICES workshop on “East Asian Seas time series (EAST-I)”*;

FIS

- Dr. Akihiko Yatsu to travel to Canada to work with Dr. Richard J. Beamish to complete the WG 16 report;
- Dr. Douglas E. Hay to convene the joint ICES/PICES theme session on “Fisheries, ecology and life history of small pelagic fish” at the 2005 ICES Annual Science Conference.

MEQ

- Chinese HAB Section member to attend PICES XIV;
- 3 scientists to participate in the HAB Section workshop on “Review of selected harmful algae in the PICES region” at PICES XIV*;

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- 1 scientist to attend the meeting of the ICES/IMO/IOC Working Group on *Ballast waters and other ship vectors*, to be held in March 2005, in Norway; potential attendees include Drs. Yasuwo Fukuyo (Japan) and Mark Wells (U.S.A.).

POC

- A member of POC to attend the 2005 CFAME inter-sessional workshop;
- A POC representative to participate in the NEAR-GOOS meeting, fall 2005*.

TCODE

- A member of TCODE to attend the Ocean Biodiversity Data Symposium, late November 2004, Hamburg, Germany;
- 2 scientists to participate in two workshops of the “Federated metadata project”, to build a demonstration shared metadata system between Korea and the United States (*TCODE Endnote 4*); complete costs are estimated to be US\$16,000, of which PICES is requested to support one-quarter (US\$4,000) on travel*.

MONITOR

- 2-3 invited speakers to the MONITOR workshop on “Filling the gaps in the PICES Ecosystem Status Report” at PICES XIV;
- Dr. Phillip R. Mundy to convene the joint ICES/PICES theme session on “Comparing and constructing the scientific strategies and output of regional ecosystem projects” at the 2005 ICES Annual Science Conference.

CCCC

- 1 invited speaker to the IFEP/MODEL workshop on “Modelling and iron biogeochemistry: How far apart are we?” at PICES XIV*;
- 2 scientists to attend the 2005 CFAME inter-sessional workshop*;
- 2 Canadian scientists to participate in the 2005 APN/MODEL workshop (contingent on APN funding);
- 1 scientist to attend the 2005 NPAFC/PICES Symposium on “State of Pacific salmon and their role as indicators of the health of North Pacific ecosystems”*;

- 1 invited speaker to the 2005 SEEDS-II synthesis workshop.

Science Board also noted the need for the Asian Co-Chairman of the CCCC Program to have national support to attend the third inter-sessional Science Board meeting in spring 2005.

Science Board:

- Funding for the Science Board Chairman to attend the third inter-sessional Science Board meeting and PICES XIV*;
- 2-4 scientists to participate in the NPAFC/PICES symposium on the “State of Pacific salmon and their role as indicators of the health of North Pacific ecosystems”.

Proposed publications (Agenda Item 8f)

PICES Scientific Report Series, 2005:

- Final report of the Study Group on *Fisheries and ecosystem responses to recent regime shifts*;
- Final report of the Study Group on *Ecosystem-based management science and its application to the North Pacific*;
- Micronekton of the North Pacific (Final Report of WG 14 on *Effective sampling of micronekton to estimate ecosystem carrying capacity*);
- Proceedings of the 2004 Workshop on “*In situ* iron enrichment experiments in the eastern and western subarctic Pacific”;
- Guide to best practices for oceanic CO₂ measurements and data reporting (WG 17);
- Final report of WG 16 on *Climate change, shifts in fish production, and fisheries management*.

PICES Scientific Report Series, 2006:

- Findings of the “Data-sharing project for federated metadata on North Pacific ecosystems” (TCODE).

PICES Special Publications, 2004-2005:

- Marine ecosystems of the North Pacific (North Pacific Ecosystem Status Report);
- Report and web page development for the Census of Marine Life on “Marine life in the North Pacific Ocean: The known, unknown and unknowable”.

Special issues of primary journals, 2005-2007:

- *ICES Journal of Marine Science* (2005) – selected papers from the 2004 symposium on “Quantitative ecosystem indicators for fisheries management”;
- *Deep-Sea Research II* (2005) – selected papers from the 2003 CCCC workshop on “Linkages between open and coastal systems”;
- *Ecological Modelling* (2005) – selected papers on NEMURO and NEMURO.FISH models;
- *Progress in Oceanography* (2006) – selected papers from the PICES XIII Topic Session on “Mechanisms that regulate North Pacific ecosystems: Bottom up, top down, or something else?”;
- *Deep-Sea Research II* (2006) – selected papers from the PICES XIII Topic Session on “Hot spots and their use by migratory species and top predators in the North Pacific”;
- A leading international journal (2006 or 2007) – based on the 2003 and 2004 MBM-AP workshops on “Combining data sets on diet of marine birds and mammals”.

Other publications, 2005

- Advisory report on “Fisheries and ecosystem responses to recent regime shifts in the North Pacific” (brochure);
- “The journey to PICES: Scientific cooperation in the North Pacific” (book on the history of PICES).

Other items with financial implications (Agenda Item 8g)

Science Board wishes to draw the attention of Governing Council to the following items:

- The BIO Advisory Panel on *Micronekton sampling gear inter-calibration experiment* is planning another field experiment, pending funding from proposals or other sources.
- The CCCC MODEL Task Team has submitted a second grant proposal to the Asia Pacific Network for a workshop to extend NEMURO.FISH to fish stocks in other geographic regions. They have requested PICES to support travel of 2

Canadian scientists to this workshop (if APN grant is approved).

- Following discussions with the North Pacific Research Board, PICES is planning to submit a proposal to NPRB requesting their funding support for updates to the PICES North Pacific Ecosystem Status Report. Timing of this proposal should be as soon as the report is published.
- PICES agreed to provide funding for one additional member (from the North Pacific) to participate in the SCOR Working Group on *Global comparisons of long-time series zooplankton data*, which will have a 3-year duration starting in early 2005.

High priority projects (Agenda Item 8h)

No such projects were discussed.

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

The *Standing List of International and Regional Organizations and Programs* facilitates PICES interactions with other programs and indicates high priority organizations/programs to whose meetings PICES should regularly send a representative. Science Board recommends the following additions to the List: International Association of Marine Science Libraries, Pacific Science Association and Fisheries Committee of APEC (See *SB Endnote 9* for the revised list).

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

BIO: CLIVAR, GLOBEC, ICES/WGZE, 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, ICES, GOOS (and its regional activities), IGBP/IMBER, CoML, NPAFC, IATTC, IPHC, SAHFOS, GEM, NPRB
 TCODE: IOC, IODE, CoML, GLOBEC, GOOS

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Additional proposed recommendations (Agenda Item 8j)

- Science Board endorsed a request from CFAME that a letter from PICES be sent to Dr. William T. Peterson (U.S.A.) supporting his efforts to develop an international “Year of the euphausiid” study (*SB Endnote 10*). Science Board recommended that Dr. Peterson work with the PICES Secretariat and Science Board Chairman to prepare such a draft letter, so that it can be used to seek funding;
- Science Board endorsed the request by the HAB Section for PICES to send a letter to IOC recommending a formal partnership on the HAE-DAT (Harmful Algal Event – Database) project;
- Science Board supported the request by the HAB Section for PICES to send a letter to the U.S. NCDDC (National Coastal Data Development Center) asking for assistance with the IOC HAB data efforts;
- Science Board suggests that NPAFC regularly present information on the state of Pacific salmon to PICES. Such information could be presented to FIS or MONITOR, and be a contribution to the North Pacific Ecosystem Status Report.

Documentation of PICES science (Agenda Item 8k)

Summaries of the sessions and workshops held at PICES XIII are included elsewhere in this Annual Report.

PICES Fourteenth Annual Meeting (Agenda Item 9)

The theme of this meeting will be “Mechanisms of climate and human impacts on ecosystems in marginal seas and shelf regions”. The following list of sessions and workshops to be convened at (or in conjunction with) PICES XIV was endorsed:

Science Board Symposium (³/₄-day)

Mechanisms of climate and human impacts on ecosystems in marginal seas and shelf regions. (SB Endnote 11)

MEQ/HAB Workshop (1-day)

Review of selected harmful algae in the PICES region: I. Pseudo-nitzschia & Alexandrium; the workshop will be preceded by a ½-day laboratory demonstration (HAB-S Endnote 4)

MEQ Workshop (1-day)

Introductions of marine species in the North Pacific (MEQ Endnote 4)

CCCC/CFAME Workshop (1-day)

East-west comparison of community structure, productivity and biodiversity under climate change scenarios (CFAME Endnote 7)

IFEP/MODEL Workshop (½-day)

Modelling and iron biogeochemistry: How far apart are we? (IFEP-AP Endnote 4)

MONITOR Workshop (1-day)

Filling the gaps in the PICES Ecosystem Status Report (MONITOR Endnote 5)

BIO Topic Session (½-day)

Comparative life history of euphausiids around the Pacific Rim (BIO Endnote 5)

BIO Topic Session (1-day)

Use of top predators as temporal indicators of changes in oceanographic conditions and prey population (MBM-AP Endnote 5)

CCCC/CFAME Topic Session (1-day)

Comparative response of differing life history strategists to climate shifts (CFAME Endnote 6)

CCCC/MODEL Topic Session (½-day)

Modeling climate and fishing impacts on fish recruitment (MODEL Endnote 4; possibly joint with FIS)

CCCC Poster Session

GLOBEC, and GLOBEC-like studies in the North Pacific: observing pattern and inferring process (CCCC-IP Endnote 3)

FIS/CCCC Topic Session (1-day)

Evidence of distributional shifts in demersal fish in relation to short and long term changes in oceanographic conditions (FIS Endnote 3)

FIS Paper Session (1/2-day)MEQ Topic Session (1/2-day)

Ecological effects of offshore oil and gas development and oil spills (MEQ Endnote 3)

MEQ/FIS Topic Session (1-day)

Ecosystem indicators and models (SGEBM Endnote 5)

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

Current and emerging issues of marine and estuarine aquaculture in the Pacific region: Carrying capacity, ecosystem function, and socioeconomics (WG 18 Endnote 5)

POC Paper Session (1-day)TCODE Topic Session (1/2-day)

Data management and delivery systems to support ecosystem monitoring (TCODE Endnote 3)

Selection of PICES XV theme (Agenda Item 10)

Science Board decided that the theme for PICES XV (October 2006, Japan) should be “Boundary Current Ecosystems” (SB Endnote 12).

Discussion of a Vice-Chairman position for each Committee (Agenda Item 11)

Following a brief discussion, there was no consensus on this issue. The issue was referred to the third interim Science Board meeting in the spring of 2005 for a more complete discussion.

Discussion of how Committees will contribute to a PICES Action Plan (Agenda Item 12)

Not all Committees were able to discuss this item at their meetings. Science Board therefore asked that all Committees discuss this issue by correspondence and prepare their draft Plan, which will be presented and discussed at the third interim Science Board meeting in the spring of 2005. The Science Board Chairman should develop and circulate a template (or sample) for such Action Plans so that they contain similar components.

Contributions by Committees to the PICES website (Agenda Item 13)

All Committees were asked to provide scientific and administrative content related to their activities to the Secretariat for posting on the PICES website. A tentative “Web Publications Committee” was formed to review material posted to the website to ensure high quality and common formats (where possible). Members nominated for this *ad hoc* committee are Drs. Harold P. Batchelder (CCCC, and Chairman), Gordon H. Kruse (FIS), Julia Parrish (MEQ), Igor I. Shevchenko (TCODE), Michael J. Dagg (BIO), with members from POC and MONITOR still to be nominated.

PICES capacity building opportunities (Agenda Item 14)

A proposal to organize a PICES/ICES Young Scientists Conference generated considerable discussion regarding participation by young scientists in PICES. All Committees except one were either in favour or strongly in favour of this proposal. Funding was noted as the major constraint to developing further participation by young scientists. Drs. Suam Kim and Sei-ichi Saitoh were recommended as PICES senior scientists to help develop this proposal and raise funds. “Early-career” scientists recommended to serve on the Steering Committee were Drs. Sukyung Kang (Korea) and Franz Mueter (U.S.A.), and Ms. Julie Keister (U.S.A.). It was indicated that the numbers of senior and “early-career” scientists representing PICES on this Symposium Steering Committee should be the same as the number appointed by ICES. “Early-career” scientists are also recommended to be the convenors of sessions and to run the meeting.

Discussion of topics for the next major PICES integrating scientific program (Agenda Item 15)

As not all Committees were able to discuss this issue, it was postponed until the third inter-sessional Science Board meeting in spring of 2005.

**Inter-sessional Science Board meeting
(Agenda Item 15)**

The second inter-sessional Science Board meeting, with the participation of Governing Council, was held at the Hyatt Regency Hotel, Jeju, Korea, from May 6-8, 2004. The report from this meeting is included elsewhere in this Annual Report.

Science Board recommends a third inter-sessional meeting be held in spring 2005. Several items warrant further discussion:

- Principal issue is development of the PICES Draft Action Plans for each Committee;
- Review of MONITOR Strategic and Action Plans, proposals for GOOS and Ecosystem Status Report activities, and integration of other activities;
- Discuss how to develop next major integrating program for PICES (potential topics and possible approaches), and how to include human dimensions;
- Review WG 17 proposals and discuss how best to include biogeochemical issues within PICES (*e.g.*, WG 17 and IFEP-AP);
- Review and discuss recommendations from the PICES/CLIVAR workshop in October 2004;
- A workshop or symposium to celebrate the 50th anniversary of sampling along Line P in the NE Pacific;

- PICES/ICES Young Scientist Conference
- NPAFC/PICES Symposium.

Best Presentation and Poster Awards

Dr. Akihiko Yatsu (Japan) won the Best Presentation Award in the Science Board Symposium for his oral presentation (co-authored with Masatoshi Moku, Hiroshi Nishida, Kaoru Takagi, Norio Yamashita and Hiroshi Ito), titled “Possible ecological interactions between small pelagic and mesopelagic fishes in the Kuroshio – Oyashio Transition Zone and Kuroshio Extension in spring”.

Dr. Oleg Katugin (Russia) received an Honourable Mention in the Science Board Symposium for his oral presentation (co-authored with Gennady Shevtsov), titled “Patterns of distribution and biology of the North Pacific oceanic squid *Berryteuthis anonychus* with implications for the species life cycle”.

The Best Poster Award went to Dr. Katsuya Suzuki (Japan) for his poster (co-authored with Tsutomu Takagi, Shinsuke Torisawa and Kazushi Miyashita), titled “Video analysis of the schooling behavior of Japanese surfsmelt (*Hypomesus japonicus*) under light and dark conditions using a mathematical model”.

SB Endnote 1

Participation List

Members

Harold P. Batchelder (Co-Chairman, CCCC-IP)
Yukimasa Ishida (Chairman, FIS)
Kuh Kim (Chairman, POC)
Suam Kim (Co-Chairman, CCCC-IP)
R. Ian Perry (Chairman, Science Board)
Vladimir I. Radchenko (Chairman, BIO)
Igor I. Shevchenko (Chairman, TCODE)
John E. Stein (Chairman, MEQ)
Jin-Ping Zhao (China)

Invited observers

Michael J. Dagg (Chairman-elect of BIO; October 22 only)
Michael G. Foreman (Chairman-elect of POC; October 22 only)
Phillip R. Mundy (Chairman of MONITOR Technical Committee; October 22 morning only)
Stewart (Skip) M. McKinnell (PICES Deputy Executive Secretary; rapporteur)

SB Endnote 2**Science Board Agenda*****October 17, 2004 (12:30 – 13:30)***

1. Welcome and opening remarks
2. Adoption of agenda
3. Report on elections of new Committee Chairmen
4. Election of new Science Board Chairman and Vice-Chairman
5. Review of procedures for Best Presentation Awards and Closing Session
6. Review of procedures to enhance documentation of PICES scientific sessions
7. Completion of Science Board recommendations Governing Council decisions from PICES XII

October 22, 2004 (08:30 – 17:30)

8. Reports of the Science Board Chairman, Scientific and Technical Committees, CCCC IP, Working and Study Groups with regard to activities, proposals, and items having financial implications for 2004 and beyond:
 - a) Brief summary report of the group's activities in the past year, including membership changes
 - b) Proposed list of any future groups along with terms of reference and a list of potential members
 - c) Inter-sessional meetings proposed for 2004 and beyond (symposia, workshops, Working Group, Section, and CCCC Program meetings)
 - d) Proposed scientific sessions and workshops for the next Annual Meeting, including draft session descriptions and proposed Convenors
 - e) Travel support requests

- f) Proposed publications
- g) Other items with financial implications
- h) High priority projects
- i) Relations with other international organizations and programs
- j) Proposed recommendations and draft text on other items to be included in the Science Board report to Council (e.g., recommendations for letters of support to various research efforts)
- k) Tabling of Summaries from the PICES XIII Scientific Sessions
- l) Other items
9. Develop PICES XIV draft schedule of scientific sessions and workshops
10. Selection of PICES XV theme and description
11. Discussion of developing a Vice-Chairman position for Scientific and Technical Committees
12. Discussion of how Committees will contribute to a PICES Action Plan
13. PICES website: Contributions from each Committee; procedures for the "Web Publications Committee"
14. Discussion of PICES capacity building opportunities and PICES/ICES Young Scientists Conference
15. Discussion of potential topics towards next major PICES integrating scientific program
16. Possible inter-sessional Science Board meeting
17. Other business
18. Adoption of the Science Board report and recommendations to Council

SB Endnote 3**Review of procedures to enhance documentation of PICES scientific sessions**

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

For the last few years, PICES has only included information of the proposed Topic Sessions for the upcoming year in its Annual Report, and has not provided details regarding the actual scientific 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

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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. 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 discussion of the papers and issues raised by the papers.

SB Endnote 4

Completion of PICES XII decisions and recommendations

Inter-sessional meetings and meetings in conjunction with PICES XIII (03/S/1)

The following inter-sessional meetings were convened or co-sponsored:

- A 3-day PICES/CoML workshop on “Marine life in the North Pacific Ocean: The known, unknown and unknowable”, November 17-19, 2003, Victoria, Canada;
- A 3-day workshop on “Development of pilot coastal monitoring program(s) in the NE Pacific” (co-sponsored by PaCOS, EVOS and AOOS), November 20-22, 2003, Victoria, Canada;
- A 5-day MODEL workshop on “Summary and synthesis of contributions from NEMURO and NEMURO.FISH” (funded by the Fisheries Research Agency of Japan), December 4-6, 2003, Yokohama, Japan;
- A 4-day IOCCP/NIES/PICES workshop on “Ocean surface $p(\text{CO}_2)$, data integration and database development”, January 14-17, 2004, Tsukuba, Japan (44 scientists from 12 countries);
- A 2-day meeting of the PICES Study Group on *Fisheries and Ecosystem Responses to Recent Regime Shifts* (FERRRS), February 9-10, 2004, Victoria, Canada;
- A 3-day PICES-IFEP workshop on “*In situ* iron enrichment experiments in the eastern and western subarctic Pacific”, February 11-13, 2004, Victoria, Canada (25 scientists from 3 countries);
- A 1½-day Canada-SOLAS/PICES-IFEP Session on “Response of the upper ocean to meso-scale iron enrichment” at the TOS/ASLO 2004 Ocean Research Conference, February 17-18, Honolulu, U.S.A.;

- A 4-day symposium on “Quantitative ecosystem indicators for fisheries management” (co-sponsored by IOC, SCOR, PICES, ICES, GLOBEC, etc.), March 31-April 3, 2004, Paris, France (250 scientists from 42 countries);
 - A 3-day interim Science Board/Governing Council meeting, May 7-9, 2004, Jeju, Republic of Korea;
 - A 3-day NOAA/GCP/PICES workshop on “Understanding North Pacific carbon-cycle change: Data synthesis and modeling”, June 2-4, 2004, Seattle, U.S.A. (60 scientists from 5 countries);
 - A 3-day meeting of the FERRRS Study Group, June 14-16, 2004, Seattle, U.S.A.;
 - A 4-day MODEL workshop on “The development of a model on coupled responses of lower and higher trophic levels for climate variability in the North Pacific” to document and distribute the NEMURO model code, and to edit *Ecological Modeling* manuscripts (co-sponsored by the Japan Fisheries Research Agency), August 20-23, 2004, Seattle, U.S.A.
 - A 2-day PICES-CLIVAR workshop on “Scale interactions of climate and marine ecosystems”, October 23-24, 2004.
- Preparation and arrangements are in progress for:
- A 5-day GLOBEC symposium on “Climate variability and sub-arctic marine ecosystems”, May 16-20, 2005, Victoria, Canada (PICES is represented on the Scientific Steering Committee and the Local Organizing Committee; PICES Secretariat is responsible for local arrangements for the meeting);
 - A 3-day NPAFC/PICES symposium on “The status of Pacific salmon and their role in North Pacific marine ecosystems”, fall 2005, Republic of Korea;
 - A 3-day PICES/GLOBEC symposium on “Climate variability and ecosystem impacts on the North Pacific: A basin-scale synthesis”, April 19-21, 2006, Honolulu, U.S.A.

Travel support (03/S/2)

The following workshops were convened in conjunction with PICES XIII in Honolulu, U.S.A.:

- A 4-day APN/PICES workshop on “Climate interactions and marine ecosystems” and young investigator training, October 10-13, 2004;
- A 1-day MIE-AP post-cruise workshop on “Micronekton sampling gear inter-calibration experiment”, October 14, 2004;
- A 1-day MBM-AP workshop on “Combining data sets on diets of marine birds and mammals - Phase II”, October 14, 2004;
- A 1-day CCCC/REX workshop on “Seasonal cycles of plankton production in continental shelf waters around the North Pacific Rim”, October 14, 2004;
- A 1-day MEQ workshop on “Developing a North Pacific HAB data resource”, October 15, 2004;
- A 2-day CCCC workshop on “Linking open ocean and coastal ecosystems II”, October 15-16, 2004;
- Full travel support was provided to all members (except NOAA employees) of the FERRRS Study Group to attend the first^t (February 2004, Victoria, Canada) and second (June 2004, Seattle, U.S.A.) meetings of the group;
- Drs. Ian Perry (Science Board Chairman) and Jeffrey Polovina (invited speaker) participated in the Symposium on “Quantitative ecosystem indicators for fisheries management” in March 2004, in Paris, France;
- Partial travel support from the Trust Fund was provided to 2 scientists from the People’s Republic of China, and 1 scientist from the Republic of Korea, to attend the Symposium on “Quantitative ecosystem indicators for fisheries management” in March 2004, in Paris, France;
- Science Board Chairman traveled for the second interim Science Board/Governing Council Meeting (May 2004, Jeju, Republic of Korea) and for PICES XIII (October 2004, Honolulu, U.S.A.);

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- Full travel support was provided to 1 scientist from the Republic of Korea and 1 scientist from Russia to participate in the NOAA/GCP/PICES workshop on “Understanding North Pacific carbon-cycle change: Data synthesis and modeling” in June 2004, in Seattle, U.S.A.;
- Partial travel support was provided to Dr. Francisco Werner (MODEL Task Team Co-Chairman) to attend the MODEL workshop on “The development of a model on coupled responses of lower and higher trophic levels for climate variability in the North Pacific” in August 2004, in Seattle, U.S.A.;
- Full travel support was provided to 2 Canadian scientists to attend the APN/PICES Workshop on “Climate interactions and marine ecosystems: Effects of climate on the structure and function of marine food webs and implications for marine fish production in the North Pacific Ocean and marginal seas” held in conjunction with PICES XIII;
- Full travel support was provided for 1 invited speaker to the REX Workshop on “Seasonal cycles of plankton production in continental shelf waters around the North Pacific Rim”, 1 invited speaker to the MBM-AP Workshop on “Combining data sets on diets of marine birds and mammals - Phase II”, 2 invited speakers to the CCCC Workshop on “Linking open ocean and coastal ecosystems II”, and 9 invited speakers to the PICES/CLIVAR Workshop on “Scale interactions of climate and marine ecosystems” (funding for 5 speakers was allocated by the U.S. CLIVAR and for 2 speakers by WCRP) at PICES XIII;
- Full or partial travel support was provided to 21 invited speakers to scientific sessions at PICES XIII;
- Full travel support from the Trust Fund (funding is allocated by SCOR) was provided to 1 Russian and 1 Chinese scientist to attend the MEQ workshop on “Developing a North Pacific HAB data resource II” at PICES XIII;
- Partial travel support was provided to 1 Canadian, 8 Chinese, 3 Japanese, 6 Korean, 1 Mexican, 12 Russian and 8 U.S. scientists to attend PICES XIII. The majority of these scientists are younger than 35 years of age;
- Dr. Elizabeth A. Logerwell (U.S. member of FIS) represented PICES at the 11th NPAFC Annual Meeting, held in October 2003, in Honolulu, U.S.A.;
- Dr. Sei-ichi Saitoh (Co-Chairman, MONITOR Task Team) represented PICES at the POGO Annual Meeting held in November 2003, in Tokyo, Japan. He will also represent at the 9th NEAR-GOOS Coordinating Committee meeting to be held in November 2004, in Sendai, Japan;
- Dr. Suam Kim (Co-Chairman CCCC Program) represented PICES at the 8th Session of the IOC/WESTPAC Coordinating Committee for the North-East Asian Regional Global Ocean Observing System (NEAR-GOOS-CC) held in December 2003, in Beijing, China;
- Drs. Yasuwo Fukuyo and Mark Wells (Harmful Algal Blooms Section) represented PICES at the meetings of the ICES/IOC/IMO Working Group on *Ballast Waters and Other Ship Vectors* and the ICES Working Group on *Introductions and Transfers of Marine Organisms* held consecutively in March 2004, in Cesenatico, Italy;
- Dr. Phillip R. Mundy (Co-Chairman, MONITOR Task Team) represented PICES at the meeting of the ICES-GOOS Steering Group held in April 2004, in Tenerife, Spain;
- Dr. Gennady Moiseenko (Russian member of TCODE) represented PICES at the meeting of the ICES-IOC Study Group on *Development of marine data exchange systems using XML* held in May 2004, in Oostende, Belgium;
- Dr. Suam Kim (Co-Chairman, CCCC Program) represented PICES at the 7th North Pacific Rim Fisheries Conference held in May 2004, in Pusan, Republic of Korea;
- Dr. Ian Perry represented PICES at the 2004 ICES Annual Science Conference held in September 2004, in Vigo, Spain.

Publications (03/S/3)

Publications produced after PICES XII include:

Special issues of primary journals in 2004

- *Marine Environmental Research* (Vol. 57, Nos. 1-2, Feb.-Mar. 2004) - papers resulting from the 1999 MEQ Practical Workshop (Guest editor: R. Addison);
- *Journal of Oceanography* (Vol. 60, No. 1, Feb. 2004) - invited papers on “Synthesis of JGOFS North Pacific Process Study” (jointly with JGOFS) (Guest editors: Toshiro Saino, Alexander Bychkov, Chen-Tung A. Chen and Paul J. Harrison);
- *Progress in Oceanography* (Vol. 61, No. 2-4, May-June, 2004) - selected papers from the PICES/CREAMS workshop on “Recent progress in studies of physical processes and impact to the Japan/East Sea ecosystem” (Guest editors: Stewart M. McKinnell, Alexander Bychkov, Kyung-Ryul Kim and Makoto Terazaki);
- *ICES Journal of Marine Research* (Vol. 61, No. 1, June 2004) - selected papers from the 3rd Zooplankton Production Symposium (Guest editors: Luis Valdez, Roger Harris, Tsutomu Ikeda, Stewart M. McKinnell and William Peterson);
- *Journal of Marine Systems* (Vol. 50, Nos. 1-2, September 2004) - selected papers from the 2002 BIO/POC/FIS Topic Session on “The importance of biophysical coupling in concentrating marine organisms around shallow topographies” (Guest editors: Richard D. Brodeur and John Dower).

A peer-review process was initiated for three special issues (publication is expected in early 2005):

- *Deep-Sea Research II* – selected papers from the 2003 PICES workshop on “Linkages between open and coastal systems” (Guest editors: Stewart M. McKinnell and Gordon A. McFarlane);
- *Ecological Modelling* – selected papers on NEMURO and NEMURO.FISH models (Guest editors: Shin-ichi Ito, Michio Kishi, Bernard Megrey and Francisco Werner);
- *ICES Journal of Marine Research* – selected papers from the 2004 symposium on “Quantitative ecosystem indicators for fisheries management” (Guest Editor: Neils Daan).

PICES Scientific Report Series

- PICES Scientific Report No. 26 (September 2004): Proceedings of the Third PICES workshop on the Okhotsk Sea and adjacent areas;
- PICES Scientific Report No. 27 (publication is expected in December 2004): PICES-GLOBEC International Program on Climate Change and Carrying Capacity Program - Report of the 2003 MODEL Task Team second workshop to develop a marine ecosystem model of the North Pacific Ocean including pelagic fishes;
- PICES Scientific Report No. 28 (publication is expected in December 2004): Report of the Study Group on *Fisheries and Ecosystem Responses to Recent Regime Shifts*;
- Publication of proceedings from the 2003 MONITOR workshop on “Examine and critique a North Pacific Ecosystem” is cancelled;
- Publications of the proceedings of the 2004 Workshop on “*In situ* iron enrichment experiments in the eastern and western subarctic Pacific”, “Guide to best practices for CO₂ measurements and data reporting”, and the final report of WG 14 are postponed until 2005;
- Publication of the report for the Census of Marine Life on “Marine life in the North Pacific Ocean: The known, unknown and unknowable” is moved to a new series “PICES Special Publications”.

PICES Special Publications

- North Pacific Ecosystem Status Report (pre-publication available on the PICES website);
- Executive summary of the Report of the Study Group on *Fisheries and Ecosystem Responses to Recent Regime Shifts* (publication is expected in December 2004);
- Report on “Marine life in the North Pacific Ocean: The known, unknown and unknowable” (publication of the baseline report and detailed web version is expected in December 2004).

PICES Press – Newsletters

- Two regular issues: Vol. 12, No. 1 (January 2004) and Vol. 12, No. 2 (July 2004).

Future of current Working Groups and Scientific Programs (03/S/4)

Working Groups and the CCCC Program are continuing, with the following changes:

- concluding the BASS and REX Task Teams,
- establishing a new Task Team on *Climate Forcing and Marine Ecosystem Response* (CFAME), and
- moving the MONITOR Task Team outside the CCCC Program to become a Technical Committee directly under Science Board.

New PICES Groups (03/S/5)

- Formation of a Study Group on *Ecosystem-based management science and its application to the North Pacific* jointly under FIS and MEQ;
- Formation of a joint FIS and MEQ Working Group on *Mariculture in the 21st century – The intersection between ecology, socio-economics, and production*;
- Formation of a Section on *Harmful algal blooms and their impacts* under MEQ.

SB Endnote 5

Proposal for a Working Group on *Ecosystem-based management science and its application to the North Pacific*

Proposal: Working Group under FIS & MEQ

Title: Working Group on *Ecosystem-based management science and its application to the North Pacific*

Short title: WG-EBM

Duration: November 2004 - October 2007

Terms of reference:

1. Describe and implement a standard reporting format for ecosystem-based management (EBM) initiatives (including more than fishery management) in each PICES country, including a listing of the ecosystem-based management objectives of each country;
2. Describe relevant national marine ecosystem monitoring approaches and plans and types of models for predicting human and environmental influences on ecosystems; identify key information gaps and research and implementation challenges;
3. Evaluate the indicators from the 2004 Symposium on “Quantitative Ecosystem Indicators for Fisheries Management” for usefulness and application to the North Pacific;
4. Review existing definitions of “eco-regions” and identify criteria that could be used for defining ecological boundaries relevant to PICES;
5. Hold an inter-sessional workshop in Year 2 or 3 of the WG’s mandate that addresses the

status and progress of EBM science efforts in the PICES region, with the deliverable being either a special journal issue or a review article;

6. Recommend to PICES further issues and activities that address the achievement of EBM in the Pacific.

The following scientists are suggested as members of the Working Group based on their experience, qualifications, and active participation to date (key participants are italicized; recommended Co-Chairmen are marked by *):

Canada

*Glen Jamieson**, Robert O’Boyle, Ian Perry

Japan

Tokio Wada

People’s Republic of China

Xian-Shi Jin, Wei Hao

Republic of Korea

Jae-Bong Lee, Inja Yeon, *Chang-Ik Zhang**

Russia

Vladimir Radchenko

U.S.A.

*Patricia Livingston**, Christopher Harvey

SB Endnote 6

**Proposal for an Advisory Panel on
*CREAMS/PICES Program in East Asian Marginal Seas***

Proposal: Advisory Panel under POC (and possibly BIO and MONITOR)

Title: Advisory Panel on a *CREAMS/PICES Program in East Asian marginal seas*

Short Title: CREAMS-AP

Duration: November 2004 to October 2008

Terms of reference:

1. To initiate and oversee a program to study the:
 - a. hydrography, circulation, and biology and their variability in East Asian marginal seas in the PICES area;

- b. effect of climate and long-term changes in the abiotic and biotic environments of this region;
2. To facilitate the establishment of permanent observation and data exchange networks in this region;
3. To convene workshops to evaluate and compare results from the program.

Co-Chairmen and potential members are to be recommended prior to the third inter-sessional Science Board meeting in 2005.

SB Endnote 7

**Joint NPAFC/PICES Symposium on
“The status of Pacific salmon and their role in North Pacific marine ecosystems”**

Title: “The status of Pacific salmon and their role in North Pacific marine ecosystems”

Proposed dates: in conjunction with the NPAFC Annual Meeting, October 2005

Proposed location: location in Korea to be determined

Convening organizations: NPAFC, PICES (others?); NPAFC is expected to take the lead role

Background

Timing is appropriate to hold a joint symposium that integrates Pacific salmon into North Pacific marine ecosystems, and examines the extent to which Pacific salmon, since they return to coastal regions, can be used as indicators of conditions in North Pacific marine ecosystems. Symposium would serve as follow-up to the broader PICES Ecosystem Report.

Symposium organization

Main themes:

1. Status of Pacific salmon, trends in abundance and biological characteristics:

- 1a. What is the current status of Pacific salmon populations throughout the North Pacific?

- 1b. How can changes in ocean conditions be observed using Pacific salmon and other methods?

2. Role of Pacific salmon in the function of North Pacific marine ecosystems:

- 2a. Migration routes, migration timing, and resident areas for populations of Pacific salmon and what they tell us about environmental conditions on small to mid-scales.
- 2b. Spatial scales of salmon and environmental variability (*i.e.*, over what spatial scales and regions do salmon act as indicators of environmental variability?)

3. Pacific salmon as indicators of climate variability in the North Pacific:

- 3a. Observations: what observations of Pacific salmon populations indicate climate variability most clearly?
- 3b. Mechanisms: how is climate variability transmitted to variability in Pacific salmon populations?

With a 3-day meeting, proposal is to have one theme per day, with sub-themes in morning and

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afternoon. First day would additionally have an Opening Ceremony, and last day would have a Closing Ceremony.

Symposium Steering Committee

- Two Co-Chairmen: one from NPAFC (Richard J. Beamish), one from PICES (Vladimir I. Radchenko);

- Scientific Steering Committee with membership from NPAFC: Jack Helle, Ichiro Kanto, Vladimir Karpenko, Chae-Sung Lee, Katherine Myers, Toru Nagasawa and Vladimir Sviridov; and from PICES: Yukimasa Ishida, Suam Kim, R. Ian Perry and John E. Stein.

SB Endnote 8

ICES-PICES symposium on “Marine bioinvasions”

Marine bioinvasions are a recognized and growing threat to our native biodiversity. They are a major threat to marine habitats, and have negatively impacted economic use of marine resources. Scientific understanding is needed to identify, control, and prevent marine bioinvasions. Transport and introduction of non-indigenous species is a world-wide conservation issue, and also represents a fascinating scientific challenge requiring new approaches and techniques. The ICES and PICES scientific communities have a great deal to contribute on this issue, and there are genuine opportunities for partnership with researchers associated with other organizations and programmes.

A 3-day symposium on “Marine bioinvasions” will be held at a location to be decided on the east coast of the United States in early 2006.

Topics to be addressed include:

- patterns and distribution of marine bioinvasions,
- ecological impacts,
- evolutionary consequences,
- transfer vectors and pathways,
- risk assessment,
- molecular approaches,
- biological control, and
- special topics.

This will be a symposium with a limited number of invited keynote or plenary speakers, who will provide perspective, insight, and challenges to the participants. Presentations selected from submitted abstracts will include about 60 20-minute talks. Presenters will be asked to submit papers for publication in a special issue of the *ICES Journal of Marine Science*.

SB Endnote 9

Revised Standing List of International and Regional Organizations and Programs

PICES is expanding its relationships with international scientific organizations of regional and global scale, and with regional scientific and monitoring 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 and Regional 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. The 2004 additions to the list are the Fisheries Working Group of Asia Pacific Economic Cooperation (APEC-FWG), International Association of Marine Science Libraries (IAMSLIC), and Pacific Science Association (PSA). 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) |
| AOOS* | Alaska Ocean Observing System (AOOS) |
| APEC-MRC | Marine Resources Conservation WG, Asia Pacific Economic Cooperation |
| APEC-FWG | Fisheries Working Group, Asia Pacific Economic Cooperation |
| APFIC | Asia-Pacific Fisheries Commission |
| APN | Asia-Pacific Network for Global Change Research |
| 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 of <i>Exxon Valdez</i> Oil Spill Trustee Council (EVOS) |
| 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 |
| IAMSLIC | International Association of Marine Science Libraries |
| 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 |
| IMBER* | Integrated Marine Biogeochemistry and Ecosystems Research (former OCEANS) |
| 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 |
| 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 |
| PSA | Pacific Science Association |
| PaCOS* | Pacific Coast Observing System (PaCOS) |
| PNW-IOOS* | Pacific Northwest Integrated Ocean Observing System |
| 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 |

SB Endnote 10

**Proposal to develop an international “Year of the euphausiid” study: Comparative life history of euphausiids in continental shelf and slope waters around the Pacific Rim
(by William T. Peterson)**

Background

Euphausiids are among the most important links in coastal and oceanic food webs, transferring energy from primary and secondary producers to higher trophic level animals such as salmon, herring, sardines, mackerels, Pacific whiting, sablefish, many rockfish species, auklets, shearwaters, and whales. Given their importance in the food chain, euphausiids may be regarded as a keystone sentinel taxa. Some may find it surprising to learn that we have information on the seasonal cycles of abundance, feeding, and reproduction or growth rates of these animals from only a few places around the Pacific Rim. Far more comparative studies will be needed if we are to understand their trophic status and how climate change may affect their population dynamics.

Many scientists within PICES have made great progress in applying NEMURO and ECOSIM models to the study of ecosystem dynamics, **but estimates of euphausiid biomass and rates in these models represent “best guesses” in most cases.** PICES would greatly benefit from a program that will provide the euphausiid biomass and rates needed to parameterize properly the euphausiid component of these models. Improvements to the models will result in a tool that will allow us to investigate quantitatively the role of euphausiids in food chain dynamics.

At PICES XIII, we have seen the power of NEMURO coupled to 3-D physical models (Komatsu, Yamanaka). Their work is exciting

because it demonstrates that we are close to being able to examine potential impacts of climate variability and climate change on plankton population dynamics. We need to include euphausiids (ZP) in those models.

Both NEXT and CFAME call for efforts to compare life histories of key species in coastal ecosystems around the Pacific Rim. Euphausiids would be a great choice for a comparative study.

Proposal

PICES scientists are uniquely capable of increasing our understanding of euphausiids because many oceanographic transect lines are routinely sampled for hydrography and zooplankton. However sampling of euphausiids is not generally carried out. With some training, PICES scientists could learn how to include sampling of euphausiids and could add measurements of reproduction, molting and growth rates to their monitoring programs.

Standardization of sampling methods will be necessary and that could be accomplished by following written sampling protocols. Training in how to carry out rate measurements can be done during a PICES-sponsored “hands-on” training session at a marine laboratory or at sea, and/or through visits by individual scientists to laboratories where such work is routinely done (*e.g.*, the Peterson lab in Newport, Oregon).

Should PICES agree that it is a good idea to improve our understanding of euphausiids, one

species of euphausiid is of special interest - *Euphausia pacifica*. This species ranges from the cool upwelling regions off Mexico, north through the waters of California, Oregon, Washington and British Columbia, into the downwelling environment of the Gulf of Alaska, and across the Pacific in the Transition Zone, then south through the western Pacific from Russia to China. In the western Pacific this species inhabits regions where temperatures range from sub-arctic to sub-tropical (the Oyashio, the Kuroshiro, the Japan/East Sea, and the East China and Yellow Seas). There are few species that occupy such a wide variety of ecosystems and such a wide range of latitudes. Thus, we ask:

- “What are the unique characteristics of the life history of this cosmopolitan euphausiid species that allows it to not only populate,

but dominate such a wide variety of ecosystems?”

- How do populations in the eastern and western Pacific respond to ENSO and PDO cycles?
- How do individuals manage to survive year-round in the very warm water regions of the Yellow Sea, East China Sea and Japan/East Sea?
- How do they deal with low primary production in winter in the Northern California Current, Gulf of Alaska and Transition Zone?

Finally, members of the genus *Thysanoessa* are key components of coastal systems in cooler regions around the Pacific Rim and thus should be part of a comparative study.

SB Endnote 11

PICES XIV Annual Meeting Theme (Vladivostok, Russia)

“Mechanisms of climate and human impacts on ecosystems in marginal seas and shelf regions”

There are many examples of statistical correlations that demonstrate relations between climate or human impacts and ecosystems. While retrospection may be informative in revealing patterns, it rarely leads to mechanistic understanding required for eventual prediction. This Science Board Symposium instead will focus on physical and biological mechanisms in the marginal seas and shelf regions. Many coastal species have life histories/cycles that rely on specific geographic features and they may be particularly vulnerable to the effects of human activities and climate variability. In order to predict the impacts of climate and human activities we need to understand the mechanisms responsible for shifts in ecosystem structure and function. We will consider “wind to whales” in

this session. This theme will provide opportunities to address questions such as: How widespread is bottom-up control of fluxes? At what spatial and temporal scales are: (i) trophodynamic demands and food supply in balance?, (ii) signals amplified in food webs? and (iii) physical processes most important in impacting marine populations? The human impacts that could be considered include, fishing and fisheries enhancement, changes in biodiversity, petroleum development, eutrophication, mariculture, non-point source pollution, and others.

Convenors of this session are the members of Science Board.

SB Endnote 12

Theme for PICES XV (Japan)
“Boundary Current Ecosystems”

The North Pacific is surrounded by boundary currents (*e.g.*, Kuroshio, Tsushima, Oyashio, California, Alaska, Bering Slope) that support a diversity of ecosystems. These ecosystems are highly variable in space and time due to combinations of climate change, decadal “regime” shifts, ENSO and other interannual variability, seasonal and event meso-scale dynamics. This variability has led to dramatic changes at both low and high trophic levels, including productivity, range extensions and species dominance. This theme will provide opportunities to address questions such as:

- How will climate variation and projected climate change influence the dynamics and variability of boundary currents?

- How will boundary current ecosystems respond to these physical property and transport changes?
- How does human activity (*e.g.*, fishing, hatcheries) alter the sensitivity of boundary current ecosystems to natural environmental forcing?
- What are appropriate management strategies to maintain healthy, sustainable living marine resources in boundary current systems that experience large environmental variations?

Presentations that describe, compare and/or contrast biology, fisheries, physics, and geochemistry of boundary currents and the ecosystems they support are encouraged.