

## REPORT OF SCIENCE BOARD

3

3

The Science Board met on October 12, 2003 (13:00-14:30), to review the agenda and discuss initial items relating to the coming PICES scientific sessions. Science Board met again on October 17 (08:30-18:00) to deal with the remainder of the agenda, including items with financial implications for 2004 and beyond. Dr. Stewart M. (Skip) McKinnell served as rapporteur for both meetings. (See *SB Endnote 1* for list of participants).

### October 12, 2003

The Science Board Chairman, Dr. Ian Perry, welcomed members and called the meeting to order. The agenda was discussed and adopted as presented, with the addition of an item under "Other business" pertaining to a recent request for scientific advice received from the United States (*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 XII, Committee Chairmen, with the help of the Secretariat, identified potential "young scientists" (younger than 35 years). Science Board decided on a revised procedure to determine the Best Poster Award. Each Committee would nominate one member to serve on a Poster Award Committee, which would provide Science Board with the name of the winning poster. For PICES XII, the Poster Award Committee consisted of Drs. Susan E. Allen, Richard D. Brodeur, Jeffrey M. Napp, Elizabeth A. Logerwell, David L. Mackas and Dong-Beom Yang.

Science Board noted the difficulties in determining young scientists for Best

Presentation Awards, and therefore recommends that the Secretariat include a checkbox on the Registration Form to help identify scientists under 35 years of age (*e.g.*, "If you wish to be eligible for presentation awards, and the work is primarily yours, and you are less than 35 years of age, and you are the presenter, please check this box").

It was reiterated that the Closing Session would consist of Best Presentation Awards, a brief review of highlights from PICES XII, and a look towards PICES activities in the coming year, including the theme and possible Topic Sessions for the upcoming 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 XII.

### **Governing Council decisions and Science Board recommendations from PICES XI (Agenda Item 5)**

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

### October 17, 2002

Dr. Perry opened the second Science Board meeting, and welcomed the participation of Dr.

Suam Kim, the CCCC Co-Chairman elect. Science Board extended thanks to the outgoing CCCC-IP Co-Chairman, Dr. Makoto Kashiwai, for his much appreciated service to PICES. A certificate was presented to Dr. Kashiwai at the Closing Session of PICES XII in recognition of his long and outstanding service.

### **Reports of Committees and Programs under Science Board, and items with financial implications for 2004 and beyond (Agenda Item 6)**

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 6a)

Science Board notes the following membership changes:

- BIO: Hidehiro Kato replaces Atsushi Tsuda as Japanese member  
FIS: Elizabeth A. Logerwell replaces Anne B. Hollowed as US member  
MEQ: Joan Kean-Howie replaces Steve Samis as Canadian member

Science Board recommends the following Chairmanship changes:

- BIO/MBM-AP: William J. Sydeman (U.S.A.) to replace Douglas F. Bertram (Canada)  
MEQ: John E. Stein (U.S.A.) to extend term for 1 additional year (to October 2004)  
CCCC-IP: Suam Kim (Korea) to replace Makoto Kashiwai (Japan)  
CCCC/BASS: Kerim Aydin (U.S.A.) to replace Gordon A. McFarlane (Canada)  
CCCC/MONITOR: Phillip Mundy (U.S.A.) to replace David L Mackas (Canada)  
CCCC/REX: Douglas E. Hay (Canada) to replace William T. Peterson (U.S.A.).

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.

In addition, Science Board advises Governing Council that a large turnover of Science Board members is scheduled for 2004 (6 of 8 Chairmen).

#### Existing and proposed new subsidiary bodies (Agenda Item 6b)

Science Board recommends that:

- WG 14 on *Effective sampling of micronekton* continue its activities and produce a final report in 2004;
- WG 15 on *Ecology of harmful algal blooms in the North Pacific* be disbanded (see recommendation on the HAB Section below);
- WG 16 on *Climate change, shifts in fish production and fisheries management* continue its activities and produce a final report in 2004.

The following are recommended by Science Board as new subsidiary bodies:

Science Board discussed the joint proposal from FIS and MEQ for a Working Group on ecosystem-based management (*MEQ Endnote 5*). After discussion, it concluded that the proposal, as presented, was not sufficiently focused to allow Science Board to recommend establishing a Working Group. However, recognizing the potential importance of the topic, Science Board recommended establishing a Study Group on *Ecosystem-based management science and its application to the North Pacific*, jointly under FIS and MEQ. The Terms of Reference for this Study Group are described in *SB Endnote 5*.

Science Board discussed the joint proposal from MEQ and FIS to form a Working Group on marine aquaculture (*MEQ Endnote 6*). After some modifications to the proposed Terms of Reference, Science Board recommended the formation of a Working Group on *Mariculture in the 21<sup>st</sup> century – The intersection between ecology, socio-economics and production*,

jointly under MEQ and FIS. The Terms of Reference are provided in *SB Endnote 6*.

Science Board discussed the proposal from MEQ to form a Section under MEQ on harmful algal blooms (*MEQ Endnote 4*), and recommended that a Section on *Harmful algal blooms and their impacts* be formed with the Terms of Reference described in *SB Endnote 7*. This also implies that WG 15 on *Ecology of harmful algal blooms in the North Pacific* will be disbanded.

The CCCC-IP Executive Committee proposed that the BASS and REX Task Teams be concluded in 2004, culminating with a joint workshop on “Linking open ocean and coastal ecosystems II” at PICES XIII. A new Task Team would then be formed with new Terms of Reference and membership to conduct the combined work of the former BASS and REX Task Teams. The name of this new Task Team is proposed to be “Climate Forcing and Marine Ecosystem Response” (CFAME). Science Board is in general agreement with this suggestion, and recommends that CCCC-IP discuss this issue and report to Science Board with a proposal, possibly at the 2<sup>nd</sup> interim Science Board meeting in spring 2004. Implementation of this recommendation would then take place at PICES XIII.

In addition, the CCCC-IP Executive Committee proposed that the MONITOR Task Team be removed from the CCCC Program and elevated to a Technical Committee, similar to TCODE. The justification is that the function of MONITOR extends beyond the duration of the CCCC Program. MONITOR has assumed the primary responsibility of the evaluation (and perhaps future versions) of the North Pacific Ecosystem Status Report, as well as providing guidance for present and future monitoring programs in the North Pacific. Should this recommendation be approved, it is suggested that each scientific committee (BIO, FIS, MEQ, POC) the other Technical Committee (TCODE) and each scientific program (CCCC) designate one official representative to the new MONITOR Technical Committee. Science Board noted that this change would be cost

neutral, except for an additional member added to Science Board. Science Board recommended this change to Governing Council, and if accepted, that revised Terms of Reference and membership be developed for discussion by Science Board, possibly at the 2<sup>nd</sup> interim Science Board Meeting.

#### Proposed sessions and workshops for PICES XIII (Agenda Item 6c)

Proposals for scientific sessions and workshops at PICES XIII were discussed, and are presented below under Agenda Item 7 (PICES XIII Annual Meeting).

#### Inter-sessional workshops, Working Group and CCCC Program meetings (Agenda Item 6d)

Meetings to be convened in 2003 and 2004:

- A PICES/CoML *Regional marine life expert* workshop, November 17-19, 2003, Victoria, Canada;
- A PICES/PaCOS/AOOS/GEM workshop on “Development of pilot coastal monitoring program(s) in the NE Pacific”, November 20-22, 2003, Victoria, Canada;
- A IOCCP/PICES workshop on “Ocean surface p(CO<sub>2</sub>), data integration and database development”, January 14-17, 2004, Tsukuba, Japan (POC/WG 17);
- A PICES-IFEP workshop on “*In situ* iron enrichment experiments in the eastern and western subarctic Pacific”, February 11-13, 2004, Victoria, Canada (approved in 2002);
- A Canada-SOLAS/PICES-IFEP Session on “Response of the upper ocean to mesoscale iron enrichment” at the TOS/ASLO 2004 Ocean Research Conference, February 15-20, Honolulu, U.S.A. (BIO);
- A SCOR/IOC/PICES/GLOBEC Symposium on “Quantitative ecosystem indicators for fisheries management”, March 31-April 3, 2004, Paris, France (approved in 2002);
- A NOAA/GCP/PICES workshop on “Understanding North Pacific carbon-cycle change: Data synthesis and modeling”, June 2004, Seattle, U.S.A. (POC/WG 17);
- Co-sponsor a NEAR-GOOS Workshop in conjunction with the 6<sup>th</sup> WESTPAC

Symposium, April 19-23, 2004, Hangzhou, China (POC, MONITOR);

- A MODEL workshop on “The development of a model on coupled responses of lower and higher trophic levels for climate variability in the North Pacific” (partial funding from Japan Fisheries Research Agency), August 2004, Seattle, U.S.A. Purpose is to document and distribute the NEMURO model code, and to edit *Ecological Modeling* manuscripts;
- A PICES/NOAA workshop to discuss issues relating to the request for advice to PICES from the United States, June 2004, likely in U.S.A. (see Agenda Item 15).

Proposals for beyond 2004:

- Co-sponsor with GLOBEC a symposium on “Climate variability and sub-Arctic marine ecosystems”, spring 2005, Victoria, Canada (tentatively). Science Board recommends at minimal costs to PICES.
- A CREAMS/PICES workshop on “Japan/East Sea circulation: What we know and how well can we forecast?”, summer 2005, near Vladivostok, Russia (POC). Purpose is to develop closer links between models and observations in this region, to assess available models, and to provide training.
- Co-sponsor with NPAFC a Symposium on “State of Pacific salmon and their role as indicators of the health of North Pacific ecosystems”, fall 2005, Korea (FIS). NPAFC is expected to be the lead organization. Science Board recommends that a Steering Committee be formed including the Chairmen of NPAFC/CSRS and PICES Science Board, plus additional members drawn from relevant Committees (*SB Endnote 8*). Travel costs and possibly shared facility costs are expected.
- Co-convene a 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 in September 2005, Aberdeen, Scotland. Dr. Douglas E. Hay is suggested as the PICES co-convenor.

- Co-sponsor with ICES a symposium on “Marine bioinvasions”, proposed for spring 2006, likely on the east coast of the United States (*SB Endnote 9*). ICES is expected to take the lead. Science Board believes this is an important global issue which would benefit from collaboration with ICES (MEQ).
- A 3-day symposium on CCCC Synthesis April 2006, Honolulu, U.S.A.
- Co-sponsor a 4<sup>th</sup> International Zooplankton Production Symposium, spring 2007, Hiroshima, Japan (likely with GLOBEC and ICES) (BIO).

Proposed publications (Agenda Item 6e)

PICES Scientific Report Series, 2004:

- Report for the Census of Marine Life on “Marine life in the North Pacific Ocean: The known, unknown and unknowable”;
- Report from the MONITOR workshop on “Examine and critique a North Pacific Ecosystem Report”;
- Final report of WG 14 on *Effective sampling of micronekton*;
- Proceedings of the 3<sup>rd</sup> PICES workshop on “Okhotsk Sea and adjacent areas”;
- Guide of best practices for oceanic CO<sub>2</sub> measurements and data reporting (WG 17);
- Reports from the 2004 IFEP workshop.

PICES Scientific Report Series, 2005:

- Final report of WG 16 on *Climate change and fisheries management*.

Special issues of primary journals in 2004 and beyond:

- *Journal of Oceanography* - invited papers on JGOFS North Pacific synthesis (jointly with JGOFS);
- *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”;
- *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”;

- *ICES Journal of Marine Research* - selected papers from the ICES/PICES/GLOBEC Zooplankton Production Symposium on “Role of zooplankton in global ecosystem dynamics: Comparative studies from the world oceans”;
- *Ecological Modelling* (2005) – selected papers on NEMURO and NEMURO.FISH models.

Other:

- North Pacific Ecosystem Status Report;
- Book on *History of PICES*.

Travel support requests (Agenda Item 6f)

PICES XIII:

- Science Board: approximately \$5,000 per Committee and the CCCC Program for invited speakers at PICES XIII.

In addition:

POC: 2 invited speakers to the PICES/CLIVAR workshop;

CCCC: 2 invited speakers to the workshop on “Linking open ocean and coastal ecosystems II” (high priority);

CCCC: 2 invited speakers to the CCCC Topic Session on “The impacts of large-scale climate change on North Pacific marine ecosystem” (high priority).

Inter-sessional meetings:

- Science Board: 1 invited PICES speaker to the symposium on “Quantitative ecosystem indicators for fisheries management”, April 2004 (high priority);
- POC: 2 scientists to participate in the joint IOCCP/PICES workshop on “Ocean surface p(CO<sub>2</sub>) database and data integration”, January 2004, Tsukuba, Japan;
- POC: 1 scientist to participate in the joint NOAA/GCP/PICES workshop on “Understanding North Pacific carbon cycle change: Data synthesis and modeling”, June 2004, Seattle, U.S.A.;
- CCCC: MONITOR Co-Chairman to represent PICES at POGO-5, November 18-20, 2003, Tokyo, Japan (no cost to PICES);
- CCCC: 1 scientist 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”, August 2004, Seattle, U.S.A. (some funding support may be available from APN proposal if it is successful);

- CCCC: Co-Chairmen of CCCC-IP to participate in the 2<sup>nd</sup> interim Science Board meeting, spring of 2004;
- POC: 2 scientists to participate in the CREAMS/PICES workshop on “Japan/East Sea circulation: What we know and how well can we forecast?”, summer 2005, near Vladivostok, Russia.

- Trust Fund travel requests:

BIO: 1 Russian scientist to attend the MBM-AP workshop on “Combining data sets on diets of marine birds and mammals II” at PICES XIII, to alleviate concerns about a lack of Russian participation;

MEQ: 1 Russian and 1 Chinese scientist to attend the workshop on “Developing a North Pacific HAB data resource II” at PICES XIII, to build capacity for HAB reporting in these countries;

TCODE: 1 Russian scientist to participate in the meeting of the ICES Study Group on “Development of Marine Data Exchange Systems using XML”, May 2004, Oostende, Belgium.

- Science Board Chairman requests funding to attend:
  - Symposium on “Quantitative ecosystem indicators for fisheries management”, March 31-April 3, 2004, Paris, France;
  - 2<sup>nd</sup> interim Science Board Meeting;
  - ICES Annual Science Conference, September 2004, Vigo, Spain;
  - PICES Thirteenth Annual Meeting, October 14-24, 2004, Honolulu, U.S.A.

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.

Other items with financial implications (Agenda Item 6g)

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

- BIO Advisory Panel on *Micronekton sampling gear intercalibration experiment* is planning two experiments (cruises in 2004 and 2005); funds to be requested from the North Pacific Research Board;
- CCCC/MODEL has submitted a grant proposal to the Asia Pacific Network. One component of this proposal is a training workshop prior to PICES XIII. This includes a commitment from PICES to support travel of 2 Canadian scientists to this workshop (if APN grant approved).

High priority projects (Agenda Item 6h)

No such projects were discussed.

Relations with other organizations and programs (Agenda Item 6i)

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 10* 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.

Science Board recommends that Dr. Hidehiro Kato be appointed as the PICES observer to the International Whaling Commission meetings.

Additional proposed recommendations (Agenda item 6j)

- POC noted the difficulties that the North Pacific Data Buoy Advisory Panel is having with participation, in particular from Asia. An Asian Co-Chairman might help, and is urgently needed. Science Board requests Governing Council's help in finding an appropriate Co-Chairman.
- Plans are being developed for CREAMS III, this time to include biological activities. CREAMS requests PICES help with organizing this program (*e.g.*, a western PaCOS project). A proposal is to be developed and presented at the 2<sup>nd</sup> interim Science Board meeting.
- Science Board invites NPAFC to 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 6k)

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

Other items (Agenda Item 6l)

Science Board agrees with the BIO and CCCC recommendation to support the initiative for a workshop to "To identify global synchrony in fluctuations of zooplankton populations" (*SB Endnote 11*).

Science Board agrees with MEQ that IOC/ICES should be invited to co-sponsor the workshop on “Developing a North Pacific HAB data resource II” and the Topic Session on “Natural and anthropogenic introduction of marine species” at PICES XIII. Science Board also supports the proposal from POC that the International Ocean Carbon Coordinated Project (under IOC and SCOR) be invited to co-sponsor the Topic Session on “Impacts of climate change on the carbon cycle in the North Pacific”.

### **PICES Thirteenth Annual Meeting (Agenda Item 7)**

The following list of sessions and workshops to be convened at (or in conjunction with) PICES XIII was endorsed:

Science Board Symposium ( $\frac{3}{4}$  day)  
*Beyond the continental slope - complexity and variability in the open North Pacific Ocean* (SB Endnote 12)

MEQ Workshop (1 day)  
*Developing a North Pacific HAB data resource - Phase II* (MEQ Endnote 9)

CCCC Workshop (2 days)  
*Linking open ocean and coastal ecosystems II* (BASS Endnote 4)

CCCC/REX Workshop (1 day)  
*Seasonal cycles of plankton and nutrients around the North Pacific Rim* (REX Endnote 3)

CCCC/MODEL Workshop (4 days)  
This is a proposal to APN for “International 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”. Funding should be known by April 2004.

CCCC/MODEL Workshop (1 day)  
This workshop will prepare a strategy and products for future NEMURO and NEMURO.FISH training sessions. If the APN proposal is successful, this workshop will not be necessary.

MBM-AP Workshop (1 day)  
*Combining data sets on diets of marine birds and mammals - Phase II* (MBM-AP Endnote 4)

PICES/CLIVAR Workshop (2 days)  
*Scale interactions of climate and marine ecosystems* (POC Endnote 5)

BIO contributed papers ( $\frac{1}{2}$  day)

BIO Topic Session (1 day)  
*Mechanisms that regulate North Pacific ecosystems: Bottom-up, top-down, or something else?* (BIO Endnote 6)

BIO Topic Session ( $\frac{1}{2}$  day)  
*Role of gelatinous zooplankton in coastal and oceanic ecosystems* (BIO Endnote 7)

FIS contributed papers ( $\frac{1}{2}$  day)

FIS/BIO Topic Session (1 day)  
*Hot spots and their use by migratory species and top predators in the North Pacific*

MEQ Topic Session (1 day)  
*Natural and anthropogenic introduction of marine species* (MEQ Endnote 7)

MEQ Topic Session ( $\frac{1}{2}$  day)  
*Marine protected areas* (MEQ Endnote 8)

POC Topic Session (1 day)  
*Impacts of climate change on the carbon cycle in the North Pacific* (POC Endnote 7)

POC/MONITOR Topic Session (1 day)  
*Application of Global Observing Systems to physics, fisheries and ecosystems* (POC Endnote 6)

TCODE E-poster Session  
*Data visualisation of open ocean processes*

CCCC Topic Session (1½-days)  
*CCCC, GLOBEC, and GLOBEC-like results: First steps toward a synthesis of impacts of large-scale climate change on North Pacific marine ecosystems* (CCCC Endnote 3)

CCCC/MODEL Topic Session (½ day)  
*Modelling approaches that integrate multiple spatial scales and trophic levels between shelf and open oceans* (MODEL Endnote 3)

### **Selection of PICES XIV Theme (Agenda Item 8)**

Science Board decided that the theme for PICES XIV (October 2005, Vladivostok, Russia) should be “Mechanisms of climate and human impacts on ecosystems in marginal seas and shelf regions” (see description in *SB Endnote 13*).

### **Report from Study Group on PICES Capacity Building (Agenda Item 9)**

Science Board had a brief discussion of this report, as not all Committee members had seen the report. Comments were generally favourable, and the funding issue was widely recognized. CCCC-IP suggested requesting Governing Council to increase the annual dues of the Contracting Parties, with increases going towards PICES capacity building. Additional comments included concern that academic scientists must find their own funds to participate in PICES; the need to encourage participation by young and senior scientists (often with few funding opportunities) and Program Funding Managers; to support extended training visits, and to hold “summer courses”. Further comments were requested by the end of November. Subsequent to the Science Board meeting, the Study Group report (*SB Endnote 14*) was approved by correspondence. Science Board thanked the Chairman of the Study Group, Dr. Warren Wooster, and its members for the fine report and their work on behalf of this issue.

Science Board further recommends that a proposal be developed for a Young Scientists Workshop that would bring together “early career” scientists from around the North Pacific (a wider geographic focus is possible with co-sponsorship from ICES). External funding would need to be sought for this activity. Concerns were expressed regarding abilities in

English for young Asian scientists. The selection process must be carefully considered.

### **North Pacific Ecosystem Status Report (Agenda Item 10)**

A “Draft for Discussion” North Pacific Ecosystem Status Report was presented to the MONITOR workshop, where it received good discussion. The report of this workshop is expected to recommend a process for future production of this report. Comments on the Ecosystem Status Report from the Scientific Committees were requested by the end of November 2003.

### **Report from Study Group on PICES Strategic Issues (Agenda Item 11)**

The report of this Study Group arrived too late for sufficient discussion in most of the Committees. Comments have therefore been requested by the end of November 2003.

### **PICES web site revisions (Agenda Item 12)**

All committees appreciated the efforts by the Secretariat to improve the PICES web site. Comments were requested by the end of October.

### **Inter-sessional Science Board meeting (Agenda Item 13)**

Science Board considers the 1<sup>st</sup> inter-sessional Science Board meeting to have been a success. Several current items warrant further discussion, Science Board therefore recommends that a 2<sup>nd</sup> inter-sessional Science Board meeting be held in spring 2004 (dates and location to be decided). Potential agenda items include:

- PICES Draft Strategic Plan - Action Plans
- Update on US request for advice
- BIO: Update on MIE-AP experiment and NPRB proposal
- POC: CREAMS III and PICES support
- CCCC:
  - Terms of Reference and details of membership for the CFAME (Climate



- Forcing and Marine Ecosystem Response) Task Team
- MONITOR Task Team's move out of the CCCC Program to become a Technical Committee - membership and Terms of Reference reconsideration
- Update on APN proposal
- Dissolve CCCC-IP
- Results from the PICES/PaCOS workshop
- Discussion on how to develop next major PICES program, and to include human dimensions
- Issues of participation and Committee membership renewal
- Report from Study Group on *PICES Capacity Building*, and a Young Scientist workshop
- NPAFC – PICES Symposium

**Discussion of steps towards next major program (Agenda Item 14)**

This item was deferred until a possible 2<sup>nd</sup> interim Science Board meeting.

**Other business (Agenda Item 15)**

A request for scientific advice was received from the United States (*SB Endnote 15*). Science Board recommends that PICES accept this request, and that it will be beneficial to PICES. Science Board suggests the following process for responding to this request:

- Form a Study Group under Science Board titled “Potential implications of recent regime shifts in the North Pacific for fisheries”, with a 1-year duration.
- The Study Group would assess the request, and then begin to assemble the information and data relevant to responding to this

request, and develop a draft document for discussion. It would also develop plans for a workshop to be held in late June 2004 to discuss this document and to gather broader input.

- Following the workshop, the Study Group would finalize the report. This report would then be circulated within PICES for review. It would be completed and delivered to the United States by PICES XIII in October 2004.

The proposed Terms of Reference for this Study Group to address are:

- Examine the request and clarify what can be delivered by PICES;
- Gather appropriate information to respond to the request, develop a draft document for discussion, and develop plans for a June workshop;
- Conduct the workshop and provide a final written report by summer 2004, for review by PICES.

Potential Chairman: Dr. Jacquelynn R. King (Canada).

**Best Presentation and Poster Awards**

Dr. Lawrence Hamilton (U.S.A.) won the Best Presentation Award in the Science Board Symposium for his presentation entitled “Ecosystem-society interactions in the North Atlantic: Human dimensions of fishery collapses”.

The Best Poster Award went to Mr. Dong-Hwa Sohn for her poster titled “Stock identification of chum salmon (*Oncorhynchus keta*) using trace elements in otoliths” (co-authored by S. Kang, and S. Kim).

## SB Endnote 1

### Participation List

#### Members

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

#### Invited observers

Ming-Yuan Zhu (invited, China) (October 17 only)  
Suam Kim (Co-Chairman-elect, CCCC-IP) (October 17 only)  
Susan E. Allen (representing POC, AM October 17 only)  
Stewart (Skip) M. McKinnell (Deputy Executive Secretary, PICES, rapporteur)

## SB Endnote 2

### Science Board Agenda

#### **October 12, 2003 (13:00 – 14:30)**

1. Welcome and opening remarks
2. Adoption of agenda
3. Review of procedures for best presentation awards and closing ceremonies
4. Review of procedures to enhance documentation of PICES scientific sessions
5. Completion of PICES XI and interim meeting decisions and recommendations by Governing Council and Science Board

#### **October 17, 2003 (08:30 – 18:00)**

6. 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 groups' activities in the past year
  - b) Proposed list of any future groups along with Terms of Reference and a list of potential members
  - c) Proposed Topic Sessions, Symposia and Workshops for the next Annual Meeting, including draft session descriptions and proposed Convenors
  - d) Inter-sessional meetings proposed for 2004 and beyond
  - e) Proposed publications for 2004 and beyond

- f) Travel support requests
- g) Other items with financial implications
- h) High priority projects
- i) Relations with other international programs/organizations
- j) Proposed recommendations and draft text on other items to be included in the Science Board report to Council
- k) Documentation of PICES science
- l) Other items
7. PICES Thirteenth Annual Meeting
  - a) PICES XIII theme and Science Board Symposium
  - b) PICES XIII draft schedule of sessions and workshops
8. Selection of PICES XIV theme
9. Discussion of report from Study Group on *PICES Capacity Building*
10. Discussion of draft North Pacific Ecosystem Status Report
11. Discussion of report from Study Group on *PICES Strategic Issues*
12. Discussion of PICES web site revisions
13. Possible interim Science Board meeting
14. Discussion of steps towards next major PICES scientific program(s)
15. Other business
  - Request for scientific advice from the United States
16. Adoption of the Science Board report and recommendations to Council

### SB Endnote 3

#### Review of procedures to enhance documentation of PICES scientific sessions

(From: PICES Annual Review 2001, 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 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 Eleventh Annual Meeting in 2002. 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.

### SB Endnote 4

#### Completion of PICES XI decisions and recommendations

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

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

- A 4-day MODEL Workshop to “Embed NEMURO and NEMURO.FISH into a 3-D circulation model” (co-sponsored by Nakajima Foundation), March 3-6, 2003, in Yokohama, Japan;

- A 5-day international inter-comparison on “Underway and drifting/mooring-based pCO<sub>2</sub> measurement systems” (co-sponsored by several Japanese agencies/institutes), March 10-14, 2003, in Hazaki, Japan;
- A 3-day interim meeting of Science Board/Governing Council, April 7-9, 2003, Victoria, Canada;
- A 4-day PICES/GLOBEC/ICES Zooplankton Production Symposium on “The role of zooplankton in global ecosystem dynamics: Comparative studies from the World Oceans” (co-sponsored by SCOR), May 20-23, 2003, in Gijón, Spain;
- A 1-day Workshop on “Climate variability, zooplankton abundance and distribution – comparative opportunities from the world’s oceans” was held immediately prior to the Zooplankton Production Symposium to develop suggestions for follow-up collaborative projects with ICES and GLOBEC, May 19, 2003, in Gijón, Spain;
- A 3-day Third PICES Workshop on “Okhotsk Sea and adjacent areas” (co-sponsored by TINRO-Center and CoML), June 4-6, 2003, in Vladivostok, Russia;
- A 3-day “North Pacific Ecosystem Status Report” Workshop, August 25-27, 2003, Victoria, Canada.

The following workshops were held in conjunction with the PICES Twelfth Annual Meeting in Seoul, Republic of Korea:

- A 2-day Workshop on “Status of Yellow Sea and East China Sea ecosystems” (co-sponsored by CoML), October 9-10, 2003;
- A 2-day MONITOR Workshop to “Examine and critique a North Pacific Ecosystem Status Report” (co-sponsored by EVOS/GEM), October 10-11, 2003;
- A 1½-day WG 15/TCODE Workshop on “Harmful algal blooms - harmonization data” (co-sponsored by IOC), October 10-11, 2003;
- A 1-day MBM-AP Workshop on “Combining data sets on distribution and diets of marine birds and mammals”, October 10, 2003;

- A 1-day BASS Workshop to “Examine linkages between open and coastal systems”, October 15, 2003;

Preparation and arrangements are in progress for:

- A 3-day PICES/CoML “Regional marine life expert” Workshop, 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 EVOS/GEM, SWFSC/NMFS), November 20-22, 2003, Victoria, Canada;
- A 4-day MODEL Workshop on “Summary and synthesis of contributions from NEMURO and NEMURO.FISH” (funded by a grant from Japan Fisheries Research Agency), December 14-18, 2003, Yokohama, Japan;
- A 5-day IOCCP/PICES Workshop on “Ocean surface pCO<sub>2</sub>, data integration and database development” (co-sponsored by several Japanese agencies), January 13-17, 2004, Tsukuba, Japan;
- A 3-day IFEP Workshop on “*In situ* iron enrichment experiments in the eastern and western subarctic Pacific”, February 10-12, 2004, Victoria, Canada;
- A 1-day joint Canadian-SOLAS/PICES-IFEP session on “Response of the upper ocean to mesoscale iron enrichment” at the TOS/ASLO Ocean Research Conference, February 15-20, 2004, Honolulu, U.S.A.;
- A 4-day International Symposium on “Quantitative ecosystem indicators in fisheries management”, March 31-April 3, 2004, in Paris, France.

## 02/S/2: Travel support

- Drs. Ian Perry (Science Board Chairman) and Makoto Kashiwai (CCCC Co-Chairman) participated in the International Open Science Meeting on “Ocean biogeochemistry and ecosystems”, in Paris, France, in January;

- Dr. F.J.R. “Max” Taylor (WG 15 Co-Chairman) represented PICES at the annual meeting of the ICES/IOC/IMO Study Group on *Ballast waters and other ship vectors*, in Vancouver, Canada, in March;
- Dr. John Stein (MEQ Chairman) represented PICES at the annual meeting of the ICES WG on *Introductions and transfers of marine organisms*, in Vancouver, Canada, in March (paid by NMFS);
- Dr. Phillip Mundy (MONITOR member) represented PICES at three sequential ICES meetings (Regional Ecosystem Study Group for the North Sea, the ICES-EuroGOOS Planning Group on the North Sea Pilot Project, the ICES/IOC Steering Group for GOOS) related to monitoring activities in Nantes, France, in April;
- Dr. Ian Perry (Science Board Chairman) and two members of the Science Board attended the PICES Interim Science Board/Governing Council Meeting, in Victoria, Canada, in April;
- Dr. Elizabeth Logerwell (FIS member) represented PICES at the NPAFC Research Planning and Coordinating Meeting, in Seattle, U.S.A., in May;
- Drs. Ian Perry and David Mackas (invited speaker) traveled to Gijón, Spain, in May, for the PICES/GLOBEC/ICES Zooplankton Production Symposium;
- Partial travel support was provided to 27 scientists from countries with “economies in transition” (11 paid by the Trust Fund and 16 by a SCOR travel grant) to attend the PICES/GLOBEC/ICES Zooplankton Production Symposium;
- Full or partial travel support was provided to 11 participants (1 from Canada, 1 from China, 3 from Japan, 3 from Korea, 2 from U.S.A. and 1 from Mexico) to attend the “North Pacific Ecosystem Status Report” Workshop, in Victoria, Canada, in August;
- Dr. Vladimir Radchenko (Science Board Vice-Chairman) represented PICES at the 36<sup>th</sup> SCOR Executive Committee, in Moscow, Russia, in September (paid by Russian government);
- Dr. Ian Perry represented PICES at the 2003 ICES Annual Conference, in Tallinn, Estonia, in September;
- Dr. Ian Perry travelled to Seoul, Republic of Korea, in October, for PICES XII;
- Full or partial travel support (paid by PICES and co-sponsoring programs and organizations) was provided to 3 invited speakers for the Science Board Symposium, and 15 invited speakers for scientific sessions and workshops at PICES XII, in Seoul, Republic of Korea, in October;
- Partial travel support (paid by the Trust Fund and a SCOR travel grant) was provided to 33 scientists (1 Canadian, 11 Chinese, 1 Japanese, 4 Korean, 15 Russian and 1 U.S.) to attend PICES XII. The majority of these scientists are younger than 35 year of age;
- Dr. Elizabeth Logerwell will represent PICES at the NPAFC Eleventh Annual Meeting, in Honolulu, U.S.A., in October;
- Dr. Sei-ichi Saitoh (MONITOR Task Team Co-Chairman) will represent PICES at the POGO Fifth Annual Meeting, in Tokyo, Japan, in November;
- Full or partial travel support will be provided to 2 scientists to attend the workshop on “Development of pilot coastal monitoring program(s) in the NE Pacific”, in Victoria, Canada, in November;
- Full or partial travel support will be provided to 2-3 scientists to participate in the PICES/CoML “Regional marine life expert” Workshop, in Victoria, Canada, in November.

### **02/S/3: Publications**

Publications produced after the Eleventh Annual Meeting include:

#### PICES Reports:

- PICES 2002 Annual Report;
- PICES Scientific Report No. 24 (July 2003): *CO<sub>2</sub> in the North Pacific*; this report is the final effort of PICES WG 13 and summarizes the research and technical activities that have been conducted by member nations of PICES to synthesize CO<sub>2</sub>

data in the North Pacific, and provides a comprehensive picture of the distribution of anthropogenic CO<sub>2</sub> in this region;

- PICES Scientific Report No. 25 (July 2003): *Climate Change and Carrying Capacity Program / Report of BASS/MODEL on Trophic models of the subarctic Pacific basin ecosystems*;
- PICES Scientific Report No. 26 (in progress, November 2003): *Climate Change and Carrying Capacity Program / Report of the 2003 MODEL workshop to “Develop a marine ecosystem model of the North Pacific Ocean including pelagic fishes”*;
- PICES Scientific Report No. 27 (in progress, December 2003): *Climate Change and Carrying Capacity Program / Report of the 2002 MONITOR Workshops on “Requirements and methods for early detection of ocean change and Monitoring from moored and drifting buoys”*;
- PICES Scientific Report No. 28 (in progress, December 2003): *Marine life in the North Pacific Ocean: The known, unknown and unknowable* (report for the Census of Marine Life).

#### Special issues of primary journals:

- *Canadian Journal of Fisheries and Aquatic Sciences* (December 2002, section in Vol. 59, No. 12) - selected papers from the 2001 FIS Topic Session on “Migration of key ecological species in the North Pacific Ocean” (Guest editor: J. Irvine); the section includes 4 papers by authors from Canada, Japan and Mexico;
- *Deep-Sea Research Part II* (December 2002, Vol. 49, Nos. 24-25) on “North Pacific Biogeochemical Processes” - a collection of contributed papers from JGOFS-related field programs in the North Pacific (Guest editors: T. Saino, A. Bychkov, C.T.A. Chen and P. Harrison); the issue includes an overview and 27 papers by authors from Canada, Japan, Russia and China-Taipei, but majority of papers (21) are from Japan;
- *Journal of Oceanography* (August 2003, Vol. 59, No. 4) - selected papers from the 2002 PICES Symposium on “North Pacific

transitional areas” (Guest editors: S. McKinnell, M. Kishi, D. Lluch-Belda, A. Miller and Y. Watanabe); the issue includes 10 papers by authors from Japan, Mexico, U.S.A. and PICES;

- *Progress in Oceanography* (September 2003, Vol. 57, Nos. 3-4) - selected papers from the 2001 BIO Topic Session on “Plankton size classes, functional groups and ecosystem dynamics” dedicated to the memory of the late Prof. Michael M. Mullin (Guest editors: A. Peña and A. Bychkov); the issue includes 11 papers by authors from Canada, Chile, Japan, Korea and U.S.A.;
- *Marine Environmental Research* (September 2004, Vol. 57, Nos. 1-2) - papers resulting from the 1999 MEQ Practical Workshop (Guest editor: R. Addison); the issue includes 9 papers from all PICES member countries;
- *Fisheries Oceanography* (September 2003, Vol. 12, Nos. 4-5) – papers resulting from the 2002 GLOBEC/PICES joint Symposium (2nd GLOBEC Open Science Meeting), Qingdao, China, October 2002.

Peer-review process was initiated for four special issues to be published in 2004:

- *Progress in Oceanography* - selected papers from the 2002 PICES/CREAMS workshop on “Recent progress in studies of the Japan/East Sea ecosystem” (Guest editors: S. McKinnell, K.-R. Kim, M. Terazaki and A. Bychkov); 13 papers have been submitted by authors from Japan, Korea, Russia and U.S.A.;
- *Journal of Oceanography* – a collection of invited papers on *JGOFS North Pacific Synthesis* (Guest editors: T. Saino, A. Bychkov, C.T.A. Chen and P. Harrison);
- *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 topographies” (Guest editors: R. Brodeur and J. Dower); 5 papers have been submitted by authors from Israel, Japan, Mexico and U.S.A.;

- *ICES Journal of Marine Research* - selected papers from the PICES/GLOBEC/ICES Zooplankton Production Symposium on "Role of zooplankton in global ecosystem dynamics: Comparative studies from the world oceans" (Guest Editors: R. Harris, T. Ikeda, S. McKinnell, L. Valdes and W. Peterson); 42 papers have been submitted.

#### PICES Press - Newsletters

- Vol. 11 No. 1 – a joint PICES/GLOBEC issue focused on the results from PICES XI and the 2<sup>nd</sup> GLOBEC Open Science Meeting

held sequentially in Qingdao, People's Republic of China, in October 2002;

- Vol. 11, No. 2 – regular issue.

#### **02/S/4: Future of current Working Groups and Scientific Programs**

- Working Groups and the CCCC Program are continuing.

#### **02/S/5: New PICES Groups**

- No new groups were formed at PICES XII.

### **SB Endnote 5**

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

**Proposal:** Study Group under FIS & MEQ

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

**Short title:** SG-EMB

**Duration:** November 2003 - October 2004 (with possible 1 year extension)

#### **Terms of Reference:**

1. To review and describe existing and anticipated ecosystem-based management initiatives in PICES member nations and the scientific bases for them.

2. To identify emerging scientific issues related to the implementation of ecosystem-based management.
3. To develop recommendations for a Working Group to focus on one or more issues identified in (2) above.
4. To report the results to Science Board at PICES XIII.

Recommended Co-Chairmen for the Study Group are Drs. Glen Jamieson (Canada) and Chang-Ik Zhang (Korea).

### **SB Endnote 6**

#### **Proposed Working Group on *Mariculture in the 21<sup>st</sup> Century – The intersection between ecology, socio-economics and production***

**Proposal:** Working Group under MEQ & FIS

**Title:** *Mariculture in the 21<sup>st</sup> Century – The intersection between ecology, socio-economics and production*

**Short Title:** WG on *Marine aquaculture*

**Duration:** November 2003 to October 2006

#### **Terms of Reference:**

1. To review and report on the current status and projected trends in aquaculture in marine and estuarine regions of PICES that

substantively contribute to world aquaculture.

2. To develop an overview of current and emerging issues, with respect to environmental and ecosystem function, sustainability of production (*e.g.*, carrying capacity of ecosystems), and socio-economics.
3. To convene a workshop on "Scientific issues for sustainable aquaculture in the PICES

region”. A product from the workshop would be recommendations for a PICES Action Plan on scientific issues of mariculture.

Recommended Co-Chairmen for the Working Group are Drs. Ik-Kyo Chung (Korea), Carolyn Friedman (U.S.A.), and a scientist suggested by Chinese delegates.

## SB Endnote 7

### Proposal for a Section on *Harmful algal blooms and their impacts*

**Proposal:** Section under MEQ

**Title:** Harmful algal blooms and their impacts

**Short title:** HAB-S

**Terms of Reference:**

1. To develop and implement annual bloom reporting procedures that can be consistent with ICES procedures and therefore incorporated into HAE-DAT and used to update the North Pacific Ecosystem Status Report. This will be important in assessing impacts of HAB events and as a research tool to understand patterns that will eventually lead to an increased prediction capability.
2. To exchange national reports of HAB incidents and development in order to inform PICES of new toxins, new developments, and new approaches. Both toxin producing and nontoxic (but harmful) algal species should be included.
3. To focus on specific needs for scientific advice among PICES member countries by identifying topics of interest, and providing syntheses of the available scientific information on those selected topics. Example topics for discussion and synthesis might include:
  - a. Mitigation practices to reduce the impact of HABs;
  - b. Numerical model development of harmful algal bloom initiation and transport for predictions and forecasts;
  - c. Relationship between oceanographic processes and HAB formation (*e.g.*, how the physics of nutrients, trace metals tie into bloom formation);
  - d. Organism identification using molecular biological techniques;
  - e. Discussion of possible changes to certain monitoring techniques (for example, cell numbers *vs.* toxin levels);
  - f. Species introductions including issues of anthropogenic sources (*e.g.*, ballast water) or natural systems (*e.g.*, species range extension).
4. Together with TCODE, to develop a meta-database that describes HAB monitoring and research efforts in each PICES member country.
5. Support the harmonization of methods for identifying HAB species. This could include intercalibration workshops co-sponsored by PICES and ICES.
6. Development of early warning systems for the detection of HABs. This could include discussion of ocean observing systems and techniques.
7. To educate the community (managers, students) about biology and ecology of HAB organisms. For example, an in-depth study and documentation of selected HAB species (“top ten”) could include information about physiology, taxonomy, etc. of each of the species.

Recommended Co-Chairmen: Drs. Hak-Gyoon Kim (Korea) and Vera Trainer (U.S.A.).

Note: A “Section” represents a sub-committee under a Scientific Committee that has a longer lifespan than a Working Group. Its purpose is to provide input to the parent Scientific Committee on specific issues for which expertise may be lacking in the parent committee. Sections should be reviewed periodically to ensure they continue to meet their objectives.



## **SB Endnote 8**

### **Joint NPAFC–PICES Symposium on “State of Pacific salmon and their role as indicators of the health of North Pacific ecosystems”**

A 2-day joint BASS/NPAFC workshop on the role of salmon and associated species in linking open ocean and coastal systems was originally proposed for immediately prior to PICES XIII (Honolulu, U.S.A.). The new suggestion is, instead, to hold a major joint-symposium in 2005, with the working title “State of Pacific salmon and their role as indicators of the health of North Pacific ecosystems”. The proposed location would be Korea, in conjunction with the

NPAFC Annual Meeting. Development of the symposium (if approved) objectives and key questions to be addressed will take place in early 2004, and the final organization will occur at NPAFC and PICES Annual Meetings in 2004. A Steering Committee should be formed consisting of representatives from NPAFC and PICES. The symposium would be planned for 3 days, and the proceedings would be published.

## **SB Endnote 9**

### **Invitation from ICES to co-sponsor a 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 symposium on “Marine bioinvasions” will be held at a location to be decided on the east coast of the United States for 3 days 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 10**

### **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. 2003 additions to the list are

AOOS (Alaska Ocean Observing System), PaCOS (Pacific Coastal Observing System), and PNW-IOOS (Pacific North West Integrated Ocean Observing System). This list will be used in part to assist the Executive Secretary and Science Board in decisions regarding travel to the 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*	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
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
WOCE	World Ocean Circulation Experiment

## SB Endnote 11

### **Invitation to participate in a proposal for a workshop to identify global synchrony in fluctuations of zooplankton population**

Submitted to:

ICES (Zooplankton Working Group)

PICES (Biological Oceanography Committee and Climate Change and Carrying Capacity Program)

GLOBEC (Focus I Working Group on Time Series and Retrospective Analyses)

by:

R. Ian Perry

(Fisheries & Oceans Canada, Pacific Biological Station, Nanaimo, B.C., Canada. V9T 1H8)

[perryi@pac.dfo-mpo.gc.ca](mailto:perryi@pac.dfo-mpo.gc.ca)

Harold P. Batchelder

(College of Oceanic & Atmospheric Sciences, Oregon State University, Corvallis, OR 97331-5503,

U.S.A.) [hbatchelder@coas.oregonstate.edu](mailto:hbatchelder@coas.oregonstate.edu)

David L. Mackas

(Fisheries & Oceans Canada, Institute of Ocean Sciences, Sidney, B.C., Canada. V8L 4B2)

[mackasd@pac.dfo-mpo.gc.ca](mailto:mackasd@pac.dfo-mpo.gc.ca)

September 9, 2003

## **Background**

Analyses of the influences of climate variability on local zooplankton populations and those within ocean basins are relatively recent (past 5-10 years). What are lacking are comparisons of zooplankton population variability among the world's oceans, in contrast to such global

comparisons of fish populations. At the 3<sup>rd</sup> International Zooplankton Production Symposium held in May, 2003, in Gijón, Spain, we hosted a workshop titled "Climate variability, zooplankton abundance and distribution – comparative opportunities from the world's oceans", whose purpose was to begin to look at the opportunities for comparing

zooplankton population globally to identify synchrony, and potential driving processes.

The workshop discussed:

- *Key Questions*, such as “Does global synchrony in zooplankton populations exist?” It is also important to note that the workshop recognized the synchrony of zooplankton populations may involve much more than abundance or biomass;
- *Capabilities* for such comparisons, *e.g.*, representative long-time plankton observation programs that could contribute to such comparisons;
- *Impediments* to such comparisons, including the data access issues, methodological differences, structural constraints regarding funding of international comparisons, and lack of understanding and interest on the part of decision makers with regards to the importance of zooplankton to the sustainability of marine ecosystems; and
- *Recommendations* for moving forward with such a comparison.

A manuscript with the results and recommendations from the workshop has been submitted to the *ICES Journal of Marine Science* issue devoted to the Gijón meeting, and is in review.

The workshop agreed that what was needed was to develop a single graph (if possible) that compared zooplankton changes in key regions around the world, similar to the “Kawasaki diagram” which showed global synchrony in sardine populations and has been very important at simulating research on this topic for small pelagic fishes. Even if a single graph cannot be developed, it was felt that the exercise would be worthwhile and would stimulate considerable new interest.

## Proposal

We are seeking the support of ICES, PICES, and GLOBEC (which supported the basic concept of this proposal during its recent meeting in June 2003) for this initiative. At present we are seeking expressions of interest and a willingness to participate in this exercise at a future date. Sponsorship eventually might include monetary support for the meeting logistics, travel of participants, publications resulting from the meeting, etc.

We are proposing one workshop, which would involve a relatively small number of people (*e.g.*, 20-25 scientists) representing the key zooplanktonologists around the world. The meeting would be a hands-on working session, with considerable preparation of data and analyses before the workshop. Key regions expected to be represented include those with long-time series observational programs, such as the Benguela Current system, the Humboldt Current system off Peru, and the waters of the North Pacific (PICES) and North Atlantic (ICES). The target date for such a workshop is presently proposed as 2005, in order to allow time to solicit funding, participants, data sources, etc.

At present, therefore, we are seeking the interest of your organization for this initiative, and a willingness to support it with preparation, expressions of interest to help organize it, data, etc. At some future date we would like to work with you to develop a solid proposal and to identify potential costs and funding sources. We believe that such a workshop would be successful and would represent a significant advance to our understanding of whether there is, and what might drive, global synchrony of zooplankton populations.

## **SB Endnote 12**

### **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 Ocean is in the pelagic realm, beyond the major currents and marginal seas that border the continents. This oceanic region has often been perceived as physically homogeneous and stable with low biological productivity. In reality, it is a spatially and temporally dynamic environment of high complexity. The diversity and structure of open ocean ecosystems are influenced by both horizontal and vertical structure of the ocean's physical and biological properties and by their seasonal cycles. Sharp contrasts in oceanic bottom topography caused by seamounts and islands add additional structure and complexity. In spite of its relatively low primary productivity, the region supports complex ecosystems with high biodiversity, and is home to many endangered species. Marine resources are important to the peoples of the North Pacific and are fished by fleets from many Pacific Rim nations. This session seeks to improve our understanding of the physical, chemical and

biological structure and dynamics of North Pacific oceanic waters far beyond the continental shelf, with particular emphasis on the subtropical gyre. The symposium will consider how these complex subtropical oceanic ecosystems are structured and maintained, in light of their generally low productivity. It will provide opportunities to compare and contrast these areas with neighbouring regions of higher productivity. How important are small and meso-scale features, such as fronts and eddies, to the growth, survival and distribution of upper trophic level species? How do ecosystems in the open ocean respond to changes in vertical and horizontal structure? How have sub-tropical waters been affected by 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?

## **SB Endnote 13**

### **Theme for PICES XIV (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 the symposium are the members of Science Board.

## SB Endnote 14

### A PICES strategy for capacity building (Final report from the Study Group on *PICES Capacity Building*)

At PICES XI, Governing Council approved the proposal to establish a Study Group on *PICES Capacity Building* under the direction of the Science Board, with the following Terms of Reference:

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

Members of the Study Group are: Warren Wooster (Chairman), Paul J. Harrison (BIO), Gordon H. Kruse (FIS), Alexander Tkalin (MEQ), C.S. Wong (POC), Igor I. Shevchenko (TCODE), Harold P. Batchelder (CCCC), David W. Welch (CCCC) and Alexander S. Bychkov (PICES Secretariat).

#### Background

To support its goals of promoting and coordinating marine scientific research, PICES must recognize the importance of capacity building, a process intended to make it possible for all PICES member countries and their scientists and institutions to participate fully in, and benefit fully from, the cooperative programs developed by PICES.

Cooperative marine research depends on the combined efforts and continuing involvement of all member countries. This requires the sharing of basic and specialized skills as well as of experience and infrastructure. A central element of capacity building is education and training, for example in methods and skills in data management, modeling, and environmental monitoring. Other elements include the building of appropriate national and regional institutional support structures, the strengthening of

infrastructure elements, and the development of communication networks for exchange of data and information.

Of course, each of the member countries of PICES has modern marine scientific institutions and its own educational programs in the field. In addition, the scientific activities of PICES, including its scientific sessions and the work of its scientific committees and other subsidiary bodies, are important contributions to capacity building. PICES has focused in particular on the development of young scientists, helping to increase their exposure to the exchange of scientific information at international scientific meetings and involving them in other activities of the organization. This may now be an appropriate time to consider other possibilities and to develop a more explicit PICES strategy for capacity building.

That strategy should include the elements listed below. Their success, as will then be discussed, will depend on provision of adequate funds, and on coordination of efforts at the national level.

#### Training and education

Training courses on selected topics could be specified and developed by the Science Board and its committees. These could involve scientists from member and other countries and might take place in different places as requested and supported by countries. In addition, PICES could develop a current web-based compendium of training and education opportunities including graduate student assistantships, post-doctoral fellowships, and visiting scientist positions.

#### Sharing of methodologies, information, and data

The common use of agreed observational methods is essential for the pooling of data resulting from cooperative programs. The inter-comparability of methods and training in their

use can be improved through the development of methodological workshops. Exchange of scientists on research cruises can also contribute to this goal.

PICES meetings and publications and the PICES web page are important means for sharing information. Sharing of data among PICES countries is being organized by TCODE. That Committee should explore the proposal to create, through a communication network, a common working environment, including data, techniques, methods, software tools, mathematical models, and computing power for sharing among all scientists involved.

#### Enhanced participation in PICES activities

A goal for PICES should be the full involvement of junior and senior scientists from its member countries in its meetings, workshops, committees, and other subsidiary bodies. Participation in annual meetings of scientific program officers from national funding agencies should also be encouraged. In most cases, this participation should be at national expense and thus its extent will depend primarily on actions at the national level (see below). Full participation could also be promoted by PICES

in its practices for establishing membership of these bodies, for example by requiring rotation. An expanded intern program could include scientific as well as administrative assignments.

#### Bases for a program of capacity building

The PICES budget is stringent, with national contributions, less than half a million US dollars per year, sufficient only to maintain a small secretariat and a limited meeting and publication schedule. Any significant increase in activities that contribute to capacity building will require increased priority at the national level and increased financial support for the organization. Such additional resources could include extra-budgetary contributions from member states and in special cases, grants from international organizations and private foundations.

Full participation of national scientists must include not only increased national priority for such activities, but also the involvement of all relevant national institutions (government, academic, private) and coordination at the national level of their PICES-related activities, so that support for PICES and the accompanying investment of national resources can be optimized.

### **SB Endnote 15**

#### **Request for scientific advice received from the United States**

Dr. Vera Alexander  
School of Fisheries & Ocean  
Science  
University of Alaska  
245 O'Neill Building  
Fairbanks, AK 99775-7220

Dear Dr. Alexander:

Members of the fishing industry on the west coast of the United States are concerned over the effect of a climate regime shift on the economic viability of their businesses. Following the strong 1997-1998 El Nino, the North Pacific climate underwent a rapid and striking transition. Upwelling-favorable winds strengthened over the California Current (CC), and the Pacific Decadal Oscillation (PDO) reversed sign and remained negative through the summer of 2002. In the northern CC, the zooplankton biomass doubled and switched from a prevalence of warm water species to cold water species. Coho and chinook

salmon stocks rebounded, and anchovy and osmeriid stocks increased. In contrast, ocean conditions in the Bering Sea and Sea of Okhotsk did not show a strong 1997-1998 shift. In these regions the major shift in climate forcing occurred in 1988-1989. Persistent changes in atmosphere and upper ocean fields along with changes in ecosystem structure suggest that a regime shift may have occurred, similar to shifts observed in 1925, 1947 and 1976; or perhaps, there are alternative explanations for the observed changes. Such shifts can seriously affect the fishing industry and consumers.

These phenomena have given rise to the following questions: 1) has the North Pacific shifted to a different state or regime since the late 1980s? 2) what is the nature of the new state? 3) what are the ecosystem responses? 4) how long can the shift be expected to last? 5) is it possible to predict when the regime will shift back and what indicators should be used to determine when it happens? and 6) what are the implications for the management of marine resources? The United States is requesting that PICES provide it with advice on these issues. It is proposed that a workshop be held on the west coast of the United States in June of 2004. The purpose for convening a PICES workshop is to produce an international consensus on issues relevant to resource management.

The United States hopes that this request is considered favorably by the PICES Governing Council at its upcoming Annual Meeting. The United States as the requesting party is prepared to support the workshop by providing facilities, United States scientists working within the PICES framework, and funds if necessary.

Sincerely,

Richard Marasco  
United States Delegate

cc: a.bychkov  
i.perry  
g.boehlert  
w.fox  
m.sissenwine  
m.tillman