

REPORT OF SCIENCE BOARD

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The Science Board met on October 22 (12:30-13:30), to develop recommendations to the Governing Council on the initial items on the agenda. The second meeting was held on October 25 (18:00-21:00), to work on items with financial implications for the year 2001 and beyond. All remaining issues were discussed on October 27 (15:30-18:00), and October 28 (09:00-10:30). Dr. Skip McKinnell, served as rapporteur for the last two meetings. (See *SB Endnote 1* for list of participants.)

October 22, 2000

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

Review of procedures for Best Presentation Award (Agenda Item 3)

The Chairman reminded Science Board members, CCCC Co-Chairmen and TCODE Chairman of procedures for nominating speakers for Best Presentation Awards, and of the need to identify winners promptly, particularly for sessions end on Friday morning, so that award certificates are prepared in time for the Closing Session.

Committee Chairmen reported that they had difficulty obtaining up-to-date e-mail lists for their members and recommended that the Secretariat update the e-mail address list on the PICES web site as frequently as possible.

Changes to Handbook for Chairmen and Convenors (Agenda Item 4)

Science Board discussed the proposed revisions to the PICES Handbook for Chairmen and Convenors. These included adding a definition of Advisory Panel, extra guidance for posters, clarification that presentation and poster awards

are to be directed toward young scientists, annual meeting themes and advance solicitation of topic sessions, new working group terms of reference, revised terms of reference for the MONITOR Task Team, descriptions of the areas of responsibility of Scientific Committees, more details on the duties of the SB chairman, and a provision for travel payments from the PICES Trust Fund.

Science Board members noted that it might be difficult to give an award for best presentation at the Science Board symposium to a young scientist because these speakers are often more established scientists. Therefore, Science Board recommended that Best Presentation Awards should be only directed toward young scientists speaking at sessions sponsored by Committees and Programs. Because it may be difficult for Committees to decide who qualifies as a young scientist, Science Board also recommended that in future, the PICES abstract submission form should include a check box where contributors could identify whether they wished to be considered for a Best Presentation Award, but also noting that young scientists should be 35 years of age or younger.

BIO made slight changes to the paragraph describing the committee's areas of responsibility. Changes to the Handbook were accepted as proposed and, after approval by Council, will be published in a forthcoming revision of the Handbook.

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

Science Board reviewed the status of PICES VIII Governing Council decisions involving Science Board and Science Board recommendations and accepted the list as written (*SB Endnote 3*).

October 25, 2000

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

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

- a. A WG 13/TCODE CO₂ Data Integration Test Workshop, January 22-24, 2001, Sidney, B.C., Canada;
- b. A BASS/MODEL Workshop on “Quantification of a food web model for the eastern Pacific gyres”, March 5-6, 2001, Honolulu, Hawaii, U.S.A.;
- c. A Workshop on “Impact of climate variability on observation and prediction of ecosystem and biodiversity changes in the North Pacific” (co-sponsored by the Census of Marine Life through the Alfred P. Sloan Foundation, and the International Pacific Research Center), March 7-9, 2001, Honolulu, Hawaii, U.S.A.;
- d. An International Argo Science Team Meeting (co-sponsored by PICES), March 20-22, 2001, Sidney, B.C., Canada;
- e. A WG 13/TCODE CO₂ Data Integration Implementation Workshop, May 14-16, 2001, Tokyo, Japan;
- f. A MODEL Workshop to implement improvements to the PICES NEMURO Model, spring/summer 2001, Japan or U.S.A.;
- g. A NEAR-GOOS/ODC Forecasting Workshop (co-sponsored by PICES), August 2001, Seoul, Korea (in conjunction with the Fifth IOC/WESTPAC Scientific Symposium);
- h. A POC/CREAMS/ONR Workshop on “Recent progress in studies of physical processes and impact to the Japan/East Sea ecosystem”, spring 2002;
- i. An ICES/ICES/GLOBEC International Symposium on “Role of zooplankton in

global ecosystem dynamics: Comparative studies from the World Oceans”, spring 2003.

Travel support requests for 2001 (Agenda Item 6b)

- a. CCCC Program:
 - 2 scientists to attend the inter-sessional BASS/MODEL Workshop;
 - 2 scientists to attend the REX Workshop at PICES X;
 - 1 REX scientist and 2 MODEL scientists to attend the inter-sessional MODEL Workshop;
 - 1 MONITOR scientist to attend the MONITOR workshop at PICES X.

Science Board discussed the CCCC requests and recommended that a total of 5 scientists be supported by PICES for all their workshops. The CCCC Program could decide at a later date which workshops should receive the support.

- b. TCODE/WG 13:
 - 3 scientists (1 Japanese, 2 North American) to attend the CO₂ Data Integration Test Workshop;
 - 2 scientists to attend the CO₂ Data Integration Implementation Workshop.

Science Board discussed the TCODE/WG 13 request and recommended that a total of 4 scientists should be supported by PICES, and the groups could decide how best to allocate the travel between the workshops.

- c. 4 invited speakers to attend PICES X Anniversary Symposium;
- d. 1 invited speaker per Scientific Committee and Program for topic sessions at the PICES X;
- e. 1 invited scientist with expertise in molecular biology of phytoplankton to attend the WG 15 Workshop on “Taxonomy and identification of HAB species”, October 5-6, 2001, in Vancouver, B.C., Canada;

- f. 1 additional invited speaker for the BIO Topic Session;
- g. 2 scientists to attend the NEAR-GOOS/ODC Forecasting Workshop;
- h. 1 WG 16 member to attend the American Fisheries Society Symposium on “Climate and aquatic biological resources”.
- j. Trust Fund travel requests:
 - 2 MBMAP members from Russia to attend the PICES X;
 - 2 WG 15 members to attend PICES X;
 - 1 Russian or Chinese POC member to attend the International Argo Science Team meeting;
 - CCCC - Dr. Nikolai Naumenko (Russia) to attend the REX Workshop at PICES X.

Science Board discussed and endorsed travel requests (items c-j).

Proposed list of publications for 2001 and 2002 (Agenda Item 6c)

- a. PICES Scientific Report Series for 2001:
 - Final Report of WG 8 on Practical Assessment Methodology;
 - Final Report of WG 12 on Crabs and Shrimps;
 - Proceedings of the 2000 CCCC Workshops;
 - Report of the PICES Census of Marine Life Workshop;
 - Report on the 1999 and 2000 PICES CO₂ method inter-comparisons (minor cost to PICES).
- b. PICES Scientific Report Series for 2002:
 - Proceedings of the PICES X Anniversary Symposium;
 - Proceedings of the 2001 CCCC Workshops;
 - Final Report of WG 13 on CO₂ in the North Pacific.
- c. Special journal volumes for 2001:
 - *Progress in Oceanography* - selected papers from the Beyond El Niño Conference.

- d. Special journal volumes for 2002:
 - *Progress in Oceanography* - selected papers from 2001 BIO Topic Session;
 - *Fisheries Oceanography* - papers from the 2000 NPAFC/PICES Juvenile Salmon Workshop;
 - *Marine Environmental Research* - papers resulted from the 1999 MEQ Practical Workshop.

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

Other items with financial implications (Agenda Item 6d)

- a. PICES Wooster Award (*GC Appendix D*);
- b. Logistics support for PICES WG 13 ¹³C/¹²C inter-laboratory method comparison.

Science Board agreed that the both items above should be supported, with a limit of support for item 2 of US\$1,000.

Science Board discussed some non-financial aspects of the Wooster Award and recommended that PICES may not wish to give the award every year, and that the names of individuals who were nominated, but not chosen for the award, would be kept until the following year to maintain a pool of potential candidates.

October 27, 2000

Science Board discussed items relating to working groups, the PICES X program, relations with other programs and other matters.

Future of Working Groups and Scientific Programs (Agenda Item 7b)

Science Board recommended:

- a. WG 8 on Practical Assessment Methodology has completed its work and should be disbanded;
- b. WG 12 on Crabs and Shrimps should remain for one more year to complete its final report in 2001 (no further meetings of the Working Group are required);
- c. WG 13 on CO₂ in the North Pacific should conclude its work in 2001 and prepare a final report for publication in 2002;
- d. WG 14 on Effective Sampling of Micronekton, WG 15 on Ecology of Harmful Algal Blooms, and WG 16 on Climate Change and Fisheries Management should continue for two more years.

New PICES groups (Agenda Item 7c)

Science Board recommended that a Study Group on North Pacific Ecosystem Status Report and Regional Analysis Centers (RACs) be established for a period of 1 year. The terms of reference were significantly revised from those originally proposed. Some members reported that RACs were considered potentially controversial. Science Board decided that the positive and negative implications of RACs should be considered before proposing the details of how these might be implemented. (*SB Endnote 4*).

The CCCC/MONITOR Task Team proposed that PICES establish a PICES-GOOS Steering Group. The proposal was not endorsed as Science Board considered that there was sufficient overlap between what was being proposed with the existing terms of reference of the MONITOR Task Team, and with the recommended Study Group on North Pacific Ecosystem Status Report and RAC.

Relations with other programs and organizations (Agenda Item 7d)

The annual revision of the standing list of international organizations and programs (*GC Appendix C*) was endorsed to facilitate the interaction between PICES and other programs. This list indicates high priority organizations/programs with which PICES should regularly send representatives. New programs added this year include SOLAS, PORSEC, Gulf Ecosystem Monitoring Program and the Pacific Seabird Group.

Committees and programs identified the following programs as the highest priority:

BIO: ICES (WGZE), GLOBEC, GOOS
MEQ: ICES, AMAP, SCOR/GEOHAB
FIS: AFS Program on Climate and Aquatic Resources, IPCC, ICES
POC: CLIVAR, Argo, CREAMS, WESTPAC, NEAR-GOOS, JGOFS, GOOS, GCOS
CCCC: GLOBEC, GOOS, NEAR-GOOS, GEM, SAHFOS, CoML
TCODE: GLOBEC, GOOS, JGOFS

The discussion of interaction between PICES and NPAFC focused on a proposed series of Salmon and Climate workshops (*SB Endnote 5*). Science Board endorsed the proposal. The REX Workshop on "Temporal variations in size-at-age for fish species in coastal areas around the Pacific Rim" prior to PICES X was mentioned as a possible topic of interest to NPAFC researchers and that NPAFC should be invited to participate, particularly since the NPAFC will be meeting in the same location at approximately the same time of year. An NPAFC representative potentially could be named as a co-convenor to encourage participation by NPAFC scientists.

A proposal for a PICES, ICES and GLOBEC co-sponsored Symposium on Comparative Zooplankton Ecology to be held in Europe in 2003 was endorsed. Financial responsibilities for this workshop would be negotiated during the next 1-2 years.

PICES Tenth Annual Meetings (Agenda Item 8)

The following list of topics for sessions at PICES X was endorsed:

Science Board

The Science Board Symposium will be designated as a PICES X Anniversary Symposium entitled “Ten Years of PICES science: Decadal-scale scientific progress and prognosis for a regime shift in scientific approach” (¾ day). (*SB Endnote 6*). A proposal for a symposium on marginal seas was deferred to a later year.

CCCC Program

- a. A decade of variability in the physical and biological components of the Bering Sea ecosystem 1991-2001 (½ day);
- b. CCCC IP Meeting and results of GLOBEC and GLOBEC-like programs (with emphasis on possible 1999 regime shift) (½ day).

BIO Committee

Plankton size classes, functional groups, and ecosystem dynamics: causes and consequences (1 day).

FIS Committee

Migration of key ecological species in the North Pacific Ocean (1 day).

MEQ Committee

- a. Physical, chemical and biological interactions during harmful algal blooms (MEQ/BIO/POC) (½ day);
- b. Sediment contamination – the science behind remediation standards (½ day);
- c. Physical oceanography to societal valuation: Assessing the factors affecting coastal environments (½ day);
- d. Emerging issues for MEQ: A 10 year perspective (½ day).

POC Committee

- a. The physics and biology of eddies, meanders and rings in the PICES region (POC/BIO/FIS) (1 day);
- b. Coastal ocean physical processes responsible for biological productivity and biological resources distribution (½ day).

Poster Sessions

Recognizing the success of the format of the poster sessions at the Beyond El Niño Conference, Science Board recommends that one or more similar events be organized at PICES X. The poster session, with refreshments served, would occur following the oral presentations.

CCCC workshops and Working Group meetings

- a. Joint CCCC Workshop – all Task Teams (½ day);
- b. BASS/MODEL Workshop to review ecosystem models for the Subarctic Pacific gyres (1 day);
- c. REX Workshop on “Temporal variations in size-at-age for fish species in coastal areas around the Pacific Rim” (1 day);
- d. REX/MODEL Workshop to implement improvements and include higher trophic levels to the PICES NEMURO Model (½ day);
- e. WG 15 Workshop on “Taxonomy and identification of HAB species”, Vancouver, B.C. (2 days);
- f. WG 13, 14, 16 meetings (1 day);
- g. MBM, WG 15 meetings (½ day);
- h. PICES/CLIVAR Workshop.

Theme for PICES XI (Agenda Item 9)

The suggested theme for PICES XI is “Technological advances in marine scientific research” but the choice should be discussed with the host country. The Science Board Symposium will be developed using the theme. Committees are recommended to develop topics using this theme but Science Board did not consider this as mandatory. (*See SB Endnote 7* for theme description.)

High priority scientific projects (Agenda Item 7e)

Science Board discussed high priority scientific projects that may require external funding. Three were mentioned as having the highest priority: (i) develop a North Pacific Ecosystem Status Report, (ii) establish an International Zooplankton Monitoring Program for the North Pacific, and (iii) plan and convene a series of symposia/workshops on “Effect of human and climate interaction on fish production”. Proposals for the last 2 items will be developed during the coming year. The need for a coordinated ecosystem research effort in the Japan/East Sea was discussed and the POC Chairman agreed to work on preparing a proposal.

Resolution on assisting monitoring activities in the PICES region (Agenda Item 7g)

The following resolution was adopted by the Science Board:

Two PICES pilot projects using voluntary observing ships (VOS) in the North Pacific to monitor physical, chemical and biological parameters have had good results. PICES supports these projects and their continuation. Recognizing the urgent need for basin scale monitoring, beyond that encompassed within the existing programs, Science Board encourages the development of observing programs with dense regional coverage of parameters using VOS and similar cost-effective ecosystem observing systems. PICES will develop procedures for promoting such programs under its monitoring framework.

Strategic workplans and progress (Agenda Item 7a)

The list of potential themes for future Annual Meetings was added to the SB Strategic workplan (*SB Endnote 7*).

Other business (Agenda Item 10)

a. Proposed membership changes - CCCC Program

Makoto Kashiwai (Japan) to replace Suam Kim (Korea) as CCCC Co-Chairman;
David L. Mackas (Canada) and Sei-ichi Saitoh (Japan) to replace Bruce Taft (U.S.A.) and Yasunori Sakurai (Japan) as MONITOR Co-Chairmen;
Hidehiro Kato (Japan) and Thomas R. Loughlin (U.S.A.) to serve as BASS members;
Peter S. Ross (Canada) and George L. Hunt (U.S.A.) to serve as MODEL members;
Phil Mundy (U.S.A.), Douglas F. Bertram (Canada) and William J. Sydeman (U.S.A.) to serve as MONITOR members;
Yutaka Watanuki (Japan) to serve as a REX member.

b. Committee meetings attendance

Science Board noted widespread incomplete national representation at Committee meetings and recommended that member countries ensure that they are represented at all Committee meetings.

c. Science Board Symposium

Science Board recommended using the closing of the Science Board Symposium as an opportunity to introduce and describe how the meeting will be conducted during the remainder of the week, especially using visual aids to describe the meeting structure.

d. Best Presentation Award

The Science Board Award for Best Presentation went to Dr. Shingo Kimura (Japan) for his paper on “Biological production process associated with frontal disturbances of the Kuroshio and the Kuroshio Extension”. The first Science Board award for Best Poster went to Dr. Tetsuya Takatsu (Japan) for the poster on “Dominant year-classes in brown sole *Pleuronectes herzensteini*”.

e. Closing Session

Science Board recommended reducing the scope of the closing session to the announcement of

awards, themes, and proposed topics for the next Annual Meeting (the theme and topics would be announced by Science Board Chairman).

SB Endnote 1

Participation List

Patricia Livingston (Chairman, Science Board)
Tsutomu Ikeda (Chairman, BIO)
Douglas E. Hay (Chairman, FIS)
John E. Stein (Chairman, MEQ)
Vyacheslav B. Lobanov (Chairman, POC)

Suam Kim (Co-Chairman, CCCC)
David Welch (Co-Chairman, CCCC)
Robin M. Brown (Chairman, TCODE)
Stewart M. McKinnell (Asst. Executive Secretary)

SB Endnote 2

Agenda

October 22, 2000 (12:30 – 13:30)

1. Welcome and opening remarks.
2. Adoption of agenda.
3. Review of procedures for Best Presentation Awards.
4. Changes to Handbook for Chairmen and Convenors.
5. PICES VIII Governing Council decisions and Science Board recommendations.

October 25, 2000 (18:00 – 21:00)

6. Reports of Scientific and Technical Committees, CCCC Implementation Panel, Working and Study Groups with regard to items having financial implications for 2000 and beyond:
 - a. Inter-sessional meetings proposed for year 2001 and beyond;
 - b. Travel support requests for year 2001;
 - c. Proposed list of publications for 2001 and 2002;
 - d. Other items with financial implications.

October 27, 2000 (15:30-18:00) and October 28, 2000 (09:00 – 10:30)

7. Reports of the Science Board Chairman, Scientific and Technical Committees, CCCC Implementation Panel, Working and Study Groups with regard to other items:

- a. Brief summary report of the group's activities in the past year (including progress with regard to Strategic Workplan items);
- b. Future status of existing groups (changes in duration of active status, membership, terms of reference);
- c. Proposed list of future groups along with terms of reference and a list of potential members;
- d. High priority scientific projects to be forwarded to fundraising committee:
 - i. North Pacific Ecosystem Status Report;
 - ii. International zooplankton monitoring program for the North Pacific;
 - iii. Workshop/Symposium series on "Effect of human and climate interactions on fish production".
- e. Relations with other international programs/organizations;
- f. Proposed recommendations and draft text on other items that would be included in the Science Board Report to the Governing Council (e.g., recommendations for letters of support to various research efforts);
- g. Other items.
8. PICES Tenth Annual Meeting:
 - a. PICES X Anniversary Symposium;

- b. Science Board Symposium, Topic Sessions and Workshops.
- 9. Selection of PICES XI Annual Meeting theme.
- 10. Other business.
- 11. Adoption of SB Report and recommendations to the Governing Council.

SB Endnote 3

Progress on PICES VIII decisions and Science Board recommendations

99/S/1: Intersessional meetings, Working Group and CCCC Program workshops

The following inter-sessional meetings were convened:

- a. CCCC/MODEL Workshop on *Lower Trophic Level Modeling*, January 31–February 3, 2000, in Nemuro, Japan (co-sponsored by the Japan International Science and Technology Exchange Center and Nemuro-city);
- b. *Beyond El Niño Conference on Pacific Climate Variability and Marine Ecosystem Impacts*, March 23-26, 2000, La Jolla, U.S.A. (co-sponsored by IATTC, IPHC, ISC, NPAFC and SCOR);
- c. ICES/PICES Workshop on *Zooplankton Ecology of the North Atlantic and North Pacific*, April 17-19, 2000, Honolulu, U.S.A.;
- d. CREAMS (Circulation Research in the East Asian Marginal Seas)/PICES Workshop on *Oceanography of the East Asian Marginal Seas*, May 15-17, 2000, Vladivostok, Russia;
- e. Symposium/Workshop on *North Pacific CO₂ Data Synthesis* (including the second PICES/WG 13 method inter-comparison for carbonate parameters and joint meeting of PICES WG 13 on CO₂ in the North Pacific with TCODE and JGOFS/NPTT), October 18-21, 2000, Tsukuba, Japan (co-sponsored by the Core Research for Evolution Science and Technology of the Japan Science and Technology Corporation (CREST/JST) and the Marine Information Research Center (MIRC) of the Japan Hydrographic Association, and hosted by the National Institute for Environmental Studies);
- f. Series of CCCC Task Team Workshops: BASS Workshop on *Development of a Conceptual Model of the Subarctic Pacific Basin Ecosystem(s)*, MODEL Workshop on *Strategies for Coupling Higher and Lower Trophic Level Models*, MONITOR Workshop on *Progress in Monitoring the North Pacific*, and REX Workshop on *Trends in Herring Population Dynamics and Trophodynamics*, October 20-21, 2000, Hakodate, Japan (co-sponsored by the Ministry of Education of Japan);
- g. Technical Workshop on *Basis for Estimating the Abundance of Marine Birds and Mammals, and the Impact of their Predation on other Organisms*, October 20, 2000, Hakodate, Japan (co-sponsored by the Japanese Fisheries Agency);
- h. First joint NPAFC/PICES Workshop (hosted by NPAFC) on *Factors Affecting Production of Juvenile Salmon: Comparative Studies on Juvenile Salmon Ecology between East and West North Pacific Ocean*, will take place immediately after PICES IX, October 29, 2000, Tokyo, Japan.

99/S/2: Travel support

- a. One speaker per Committee or Program to attend PICES IX. Speakers have been identified and funding provided;
- b. Up to two Co-Chairmen of Working Groups to meet inter-sessionally. Funding was not requested;
- c. Science Board Chairman to attend the ICES Scientific Symposium. Ms. Patricia Livingston was unable to attend;
- d. One person to attend the SCOR Annual Meeting, October, 2000, Washington, DC.

Due to close scheduling of the annual meetings of the two organizations, a PICES representative was unable to attend.

99/S/3: Publications

- a. Bibliography on Oceanography of the Japan/East Sea, final report of WG 11 on Food Consumption by Marine Birds and Mammals and Proceedings of the 1999 MONITOR and REX Workshops and 2000 MODEL Workshop published as PICES Scientific Reports No. 13, 14 and 15 respectively.
- b. Progress reports of WG 8 on Practical Assessment Methodology, WG 12 on Crabs and Shrimps and WG 13 on CO₂ in the North Pacific published in the 1999 Annual Report.
- c. Selection of papers from the 1999 Science Board Symposium on “The nature and impacts of North Pacific climate regime shifts” published in a Special Issue of *Progress in Oceanography*, Vol. 47 (2-4).
- d. 40 manuscripts submitted for publication in the Beyond El Niño Conference Special Issue of *Progress in Oceanography*.
- e. Results from the 1999 and 2000 PICES method inter-comparisons for carbonate parameters will be published in a bilingual (Japanese/English) report published by the Center for Global Environmental Research (CGER) of the National Institute for Environmental Studies, Japan, and in the PICES Scientific Report Series in spring 2001.

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

- a. WG 8 on Practical Assessment Methodology convened the MEQ Topic Session at PICES X on “Environmental assessment of Vancouver Harbour” and completed collation of results from the 1999 MEQ Practical Workshop. The WG 8 final report will be published as PICES Scientific Report in 2001. A special issue of *Marine Environmental Research* based on results

from the 1999 MEQ Practical Workshop is planned for publication in 2002.

- b. WG 10 on Circulation and Ventilation in the Japan/East Sea was disbanded. The WG 10 final report was not completed.
- c. WG 11 on Consumption of Marine Resources by Marine Mammals and Birds was disbanded. The WG 11 final report was published as PICES Scientific Report No. 14.
- d. WG 12 on Crabs and Shrimps completed collation of results. The WG 12 final report will be published in 2001.
- e. Dr. Richard D. Brodeur accepted responsibility as Co-Chairman for WG 14 on Effective Sampling of Micronekton. The first formal WG 14 meeting will be organized at PICES IX in Hakodate.

99/S/5: New PICES groups

- a. WG 15 on the Ecology of Harmful Algal Blooms in the North Pacific is beginning its work.
- b. WG 16 on Climate Change, Shifts in Fish Production, and Fisheries Management is beginning its work.
- c. Advisory Panel on the Continuous Plankton Recorder will meet for the first time.
- d. Advisory Panel on Marine Mammals and Birds will meet for the first time.

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

- a. PICES and IPHC signed an MOU on scientific cooperation in January 2000.
- b. NPAFC, IPHC, ISC, IATTC and SCOR co-sponsored the Beyond El Niño Conference on “Pacific climate variability and marine ecosystem impacts”.
- c. GLOBEC co-sponsored a topic session on “Recent findings and comparisons of GLOBEC and GLOBEC-like programs in the North Pacific Ocean” at the PICES Ninth Annual Meeting in October 2000, and accepted a proposal of PICES to organize and co-sponsor a major ICES/PICES/GLOBEC Symposium on

- Zooplankton Ecology, in spring 2003.
- d. JGOFS participated in planning and co-sponsored a topic session on “North Pacific carbon cycling and ecosystem dynamics” at the PICES Ninth Annual Meeting, in October 2000.
 - e. After a successful ICES/PICES Workshop on “Zooplankton ecology of the North Atlantic and North Pacific”, in April 2000, ICES accepted a proposal of PICES to organize and co-sponsor a major ICES/PICES/GLOBEC Symposium on Zooplankton Ecology, in spring 2003.
 - f. NPAFC hosted a joint NPAFC/PICES Workshop on “Factors affecting production of juvenile salmon: Comparative studies on juvenile salmon ecology between east and west North Pacific Ocean”, in October 2000.
 - g. PICES co-sponsored a CREAMS Workshop on “Oceanography of the East Asian Marginal Sea”, in May 2000.
 - h. PICES Chairman attended the International Implementation Planning meeting for ARGO Floats in the Pacific Ocean and Adjacent Regions in Tokyo, Japan, and delivered a statement on behalf of PICES in support of the ARGO project.
 - i. Assistant Executive Secretary met with the Scientific Director of GIWA to discuss areas of mutual interest and potential cooperation between PICES and GIWA.
 - j. Assistant Executive Secretary met with ICES General Secretary to discuss progress in ICES/GOOS relations, ICES interests in Argo and proposed ICES/PICES/GLOBEC international symposium on zooplankton ecology.
 - k. PICES was invited by IOC to participate in the reviewing of the IOC OSLR (Ocean Science in Relation to Living Resources) Programme.

SB Endnote 4

North Pacific Ecosystem Status Report and Regional Analysis Center

North Pacific Ecosystem Status Report

Rationale:

Throughout the world, many regional marine management organizations are trying to move towards ecosystem-based management, particularly with regard to the management of marine fisheries. We have not yet reached the stage where we can quantitatively include our understanding of the dynamics of marine ecosystems directly into the traditional stock assessment advice that is usually given to such management organizations. However, there is now a strong trend towards at least providing such organizations with reports that might be thought of as ecosystem status reports. These reports compile our knowledge about the status and trends of various ecosystem components and may also summarize what we know about the relationship between these trends and changes in the productivity of various fisheries. Such reports have been compiled for the Great Lakes region in North America, Chesapeake Bay, the

Great Barrier Reef, Puget Sound, the North Sea, and the eastern North Pacific shelf areas of Alaska and British Columbia.

PICES provides a way for scientists involved in monitoring and researching the status and trends of many North Pacific ecosystem components to join their knowledge and data together to benefit all the PICES nations bordering the North Pacific. Our Working Groups and CCCC Program have been compiling information on many of these components. Similarly, the major fishery organizations of the North Pacific compile status and trends information specific to their species of interest. It is likely to be of mutual interest for us to update our information and provide ongoing scientific advice to PICES nations about the status of the North Pacific and the role of climate variability on fish production. Collaboration with our colleagues in NPAFC, ISC, IPHC, and IATTC (and other groups that focus on particular fish stocks) in the production of this document will be a move to provide

decision-makers and the interested public with integrated advice about our shared ocean.

Format:

This report would include sections on physical oceanography and climate indices, nutrients, phytoplankton and zooplankton production, micronekton, small pelagic fish, crabs and shrimps, salmon, halibut, tuna, marine mammals and birds, marine environmental quality, etc. The exact format, content, and level of detail would need to be decided by a steering group consisting of representatives of each of the organizations. However, we envision that east and west comparisons of key species groups and environmental variables will be a focus.

Resources Required:

Compiling the necessary data and analyses from the many individuals and groups that will be involved in this project will require a substantial commitment. Minimum staffing to obtain existing data and compile the report would be one full-time specialist at the PICES Secretariat. Report production, printing, and web access would also require extra funding. Ideally, the report would be strengthened by additional long term monitoring efforts and analytical assistance of the proposed GOOS Regional Analysis Centers. These Centers would receive climate, oceanographic, and fisheries data from national and international sources and on a regular basis would prepare descriptions of the current state of the ecosystem and recent and longer term changes therein, including climate forcing, ocean physical conditions and circulation, and abundance and distribution of various biological components of the system. To the extent that available data and understanding of the system permitted, forecasts would be made of probable future conditions of these same ecosystem components. The products of the now-casting and forecasting analyses would be regularly provided to participating countries and organizations and would be made widely available on the web. Results of the analyses would also be used for improving the observational system.

Proposal to develop a PICES Regional Analysis Center

The Living Marine Resources (LMR) Panel of GOOS concluded that one way to optimize the products that might be generated from its recommended monitoring activities could be achieved through the development of Regional Analysis Centers. The following description is taken from the draft LMR-GOOS Strategic Design:

The treatment of data resulting from the LMR components of GOOS will require bringing them together with relevant physical and other data in a holistic analysis of the ecosystem of interest. Such analyses are essential elements of monitoring systems. They could be made in regional analysis centers, where scientists of appropriate disciplines from participating countries would undertake the work. Work in these centers could also serve a central role in capacity building.

Such analysis centers would receive climate, oceanographic, and fisheries data from national and international sources and on a regular basis would prepare descriptions of the current state of the ecosystem and recent and longer term changes therein, including climate forcing, ocean physical conditions and circulation, and abundance and distribution of various biological components of the system. To the extent that available data and understanding of the system permitted, forecasts would be made of probable future conditions of these same ecosystem components. The products of the now-casting and forecasting analyses would be regularly provided to participating countries and organizations and would be made widely available on the web. Results of the analyses would also be used for improving the observational system.

The LMR Panel considered that each RAC would develop a suite of products and methods to deliver products to users, based on regional

biological and physical conditions and on capacities for data analysis, interpretation and dissemination. Where appropriate, products of the monitoring, analysis, and interpretation could be disseminated effectively through a well designed web site hosted by a RAC. These web-based products would contain a hierarchy of information detail. At the most general level, “red-flash alerts” of changing ecosystem conditions, status of stocks reports, and maps of relevant ocean features would be available for decision makers and those concerned with the general condition of the ocean. A second level would include information products useful for resource managers, such as stability and wind mixing indices, bycatch/incidental mortality estimates, length and age structures, and community structure. At a third, most detailed level, resource scientists and researchers would have access to raw formatted data, available through links to institutions responsible for the observations.

It was proposed that PICES, along with other international programs and organizations, should initiate discussions of the design and possible implementation of such centers in their regions of interest. These discussions should include assessment of present exchange arrangements for climate, oceanographic, and fisheries data relating to those regions.

From a PICES perspective RACs would provide a meaningful way for PICES to participate in GOOS and, incidentally, to obtain additional funding from member states as part of their GOOS participation. Furthermore, it would

enable PICES to develop an appropriate advisory role, analogous to that of ICES, by providing its members with periodic holistic assessments of the state of the marine ecosystem. Such advice would be objective and apolitical, with no one country having control of the data or the output.

Proposal for a Study Group

In order to move forward it is proposed that a PICES Study Group be established to consider the needs for implementation of the North Pacific Ecosystem Status Report and Regional Analysis Center. This group should report its findings to PICES X. Suggested items for consideration would be to:

- Devise a detailed outline for the first Status Report;
- Identify key contributors (individuals and organizations);
- Identify existing data sources for inclusion;
- Examine the process and implications of how those data would be synthesized into the report;
- Estimate the production, printing, and distribution costs of the document; and
- Examine the function, products and positive and negative implications of RACs

Membership in the group shall consist of Science Board chairman, one representative from each of the standing, technical and Scientific Committees and Scientific Programs, one representative of the GOOS community and one member from the Secretariat.

SB Endnote 5

Proposal for a series of Salmon and Climate workshops

Rationale:

Due to their commercial importance, complex life histories, and multiple ways in which environment might affect salmon production, it seems that a series of workshops that seeks to understand the complexity of salmon and climate interactions would be beneficial to understanding and ultimately predicting environmentally induced changes in salmon production. An initial workshop focusing on juvenile salmon ecology and climate interactions has been planned for fall 2000 between NPAFC and PICES. Further workshops might also include Atlantic/Pacific comparisons and thus NASCO and ICES would be co-convenors along with NPAFC and PICES.

As with the ICES Cod and Climate Study, this series of workshops would be undertaken to

address either the role of climate in influencing a particular life history stage or to explaining the role of climate in a particular salmon production change. GLOBEC research and associated models, monitoring, and comparative approaches would be included to bring an integrated approach to the problem.

Potential collaborating organizations: ICES, NASCO, NPAFC, PICES

Frequency of workshops: to be decided depending on interest, but perhaps every 2-3 years.

Product: joint report

SB Endnote 6

PICES X Anniversary Symposium

Ten Years of PICES Science: Decadal-Scale Scientific Progress and Prognosis for a Regime Shift in Scientific Approach. Convenors: Patricia Livingston (SB), Tsutomu Ikeda (BIO), Douglas E. Hay (FIS), John E. Stein (MEQ), Susan E. Allen (POC), David W. Welch (CCCC) and Thomas C. Royer (TCODE).

This Science Board Symposium is a celebration and reflection on the first ten years of scientific progress by PICES. In-depth overviews of the scientific activities and results of PICES committees and scientific programs will be given on topics related to climate variability, ocean impacts at lower and top trophic levels, factors influencing fish stock fluctuations, human activities and marine environmental quality, and North Pacific ecosystem structure and function. These overviews will consolidate

current information and frame new and better questions for future investigation.

A look to the future of marine science in the North Pacific will be provided through thought-provoking invited talks, given by distinguished scientists with connections outside PICES, on various topics, which could range from the future of ocean sensing technologies and our predictive capabilities to human perspectives on ocean uses; broadening our scientific disciplinary focus; and improving the links between marine science and policy. Contributed perspectives on marine ecosystem science and new directions for PICES are welcomed at the accompanying poster session.

Invited talks and selected contributions will be published in the PICES Scientific Report Series, in spring 2002.

SB Endnote 7

PICES Annual Meeting themes

PICES XI theme - *Technological advances in marine scientific research*

This annual meeting theme is dedicated to the potential for implementation of technology to advance the scientific activities conducted by PICES researchers. Technological advancements are occurring in a variety of research areas (biology, biomass assessments, physical and biological oceanography, etc.). For example, advances in stock identification techniques are occurring in the areas of the microscopic laser ablation technology, new nuclear DNA techniques, and smart tags, including acoustical tags for fish and mammals, etc. For stock assessments there are some new developments in the areas of laser technology and associated data analyses technology that can scan the upper 20-30m from aircraft, some other techniques that use other parts of the spectrum, and satellite technology. There are continuing developments in acoustical assessments, such as long-range sidescan SONAR and much more. Some of the greatest advancements may be occurring in the realm of physical oceanography, and the smart drifters being developed. There are also new chemical techniques being developed to assess the distribution and assessment of stable organochlorines, which

may have implications for marine mammals and human health. This emphasis on technological advancements also would include new developments in information technology.

In conjunction with the science meeting there could be a high tech trade show where some firms that are in the business of providing high tech equipment to the PICES scientific community would have an opportunity to demonstrate their wares.

Potential themes for future Annual Meetings

- Integration: Linking the scientific disciplines to understand ecosystems
- Human dimensions
- North Pacific links to global processes/issues
- Ecosystem protections/sustainable ocean use
- Coastal issues
- Progress in prediction
- Scientific foundations (hypothesis driven, data-rich research, improvements in methodology)
- Understanding ecosystem processes
- Implementation of the findings of the 3rd Assessment IPCC Report