

REPORT OF SCIENCE BOARD/GOVERNING COUNCIL INTERIM MEETING

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The first PICES Interim Science Board meeting, with the participation of Governing Council, was held at the Victoria Conference Center, Victoria, Canada, from April 7-9, 2003. The Science Board Chairman, Dr. Ian Perry, welcomed participants and thanked them for their dedication and commitment to PICES for participating in the meeting. He noted that despite the 10-year history of PICES, this was the first joint meeting between Science Board and Governing Council. It is an important meeting, as it provides an opportunity to discuss larger issues for PICES, in particular relating to future directions of the Organization. It also provides the PICES Chairman and Governing Council with an opportunity to improve their understanding of the basis for discussions and recommendations of Science Board. The participants are identified in *SB-IM Endnote 1*, and the agenda is provided in *SB-IM Endnote 2*.

Agenda Item 1. Updates from the Committees and Programs

BIO Committee

The BIO Chairman, Dr. Vladimir Radchenko, presented his Committee's interim report (full BIO report is included elsewhere in this Annual Report). The main items were related to the development of the BIO Strategic Plan, preparations for BIO sessions at PICES XII, progress of Working Group 14 on *Effective sampling of micronekton*, and the Advisory Panel on *Micronekton sampling inter-calibration experiment*, membership concerns with the Advisory Panel on *Marine birds and mammals* (MBM-AP), and a proposal for a workshop on the ecosystems of subarctic seas.

In discussion, it was noted that the membership of the MBM-AP significantly lacks participation from Russia, Korea and China. It was recommended that the MBM-AP Co-Chairmen contact Dr. Jinping Zhao (China) and Dr.

Hyung-Tack Huh (Korea) to seek suggestions for members from China and Korea; Dr. Radchenko will provide suggestions from Russia. Council members were requested to help support the participation of scientists nominated from their countries.

FIS Committee

The FIS Chairman, Dr. Yukimasa Ishida, presented his Committee's interim report (full FIS report is included elsewhere in this Annual Report). The main points were related to preparations for PICES XII scientific sessions, activities of Working Group 16 on *Climate change, shifts in fish production, and fisheries management*, and possible future working group topics. There is a strong interest among FIS members and other committees to establish a working group on ecosystem-based management. An action item on this topic is described under the MEQ Committee report below.

MEQ Committee

The MEQ Chairman, Dr. John E. Stein, presented his Committee's interim report (full MEQ report is included elsewhere in this Annual Report). The main points were related to topic sessions for PICES XII and ICES' interest in participating in these sessions, development of the MEQ Strategic Plan, and activities of Working Group 15 on *Ecology of harmful algal blooms (HABs) in the North Pacific*.

It was agreed that the description of the roles and responsibilities of a proposed Section on Harmful Algal Blooms (to replace WG 15) need to be discussed by MEQ and presented to Science Board for consideration at PICES XII.

As this is the final year for Dr. Stein as MEQ Chairman, the Committee needs to discuss and nominate a new Chairman, for election at PICES XII.

Interest was expressed, particularly by Korea and China, in expanding PICES involvement in the science associated with North Pacific aquaculture issues. Participants at the meeting recognized that many of the issues associated with the role of aquaculture in marine ecosystems are currently shared or will be shared by all PICES member countries. This is an important issue with several aspects which are not addressed by PICES at present. This topic was discussed later in this meeting under Agenda Item 4.5.

As with FIS, MEQ expressed a strong interest in ecosystem-based management approaches. At least two options were considered: (1) a Working Group co-sponsored by more than one Scientific Committee (or possibly under Science Board), or (2) multiple Working Groups sponsored by individual committees which would each consider specific aspects of ecosystem-based management. Dr. Perry noted that this topic could potentially serve as the basis for a new Scientific Program in PICES. The PICES Chairman suggested that POC might also be interested in this issue. PICES Committees/Programs interested in ecosystem-based management were requested to discuss their interest and the potential format for such a Working Group among their committee members, and develop draft Terms of Reference prior to PICES XII. These suggestions would then be circulated for decision at PICES XII.

POC Committee

Dr. Michael G. Foreman presented the POC interim report on behalf of the POC Chairman, Dr. Kuh Kim (full POC report is included elsewhere in this Annual Report). The main points were related to preparations for PICES XII and suggested sessions for PICES XIII, and activities of Working Group 13 on *CO₂ in the North Pacific Ocean*, Working Group 17 on *Biogeochemical data integration and synthesis*, and the North Pacific Data Buoy Advisory Panel (NPDB-AP).

It was noted that the NPDB-AP needs a Co-Chairman from the western Pacific. As with the MBM-AP, the Technical Coordinator of the Panel was requested to contact Drs. Zhao

(China), Huh (Korea), Shevchenko (Russia) and Ishida (Japan) to seek their help in identifying potential members for this Panel. Council members are requested to help support the participation of scientists nominated from their countries.

For the proposed PICES-CLIVAR workshop on “Scale interaction of climate and marine ecosystems” at PICES XIII, the POC Chairman (or Dr. Foreman) was requested to circulate the draft workshop description to the Chairmen of the other Committees and Programs to invite their co-sponsorship (this includes the CCCC Program and in particular the MONITOR Task Team). In addition, a PICES biologist, preferably from the western Pacific, is being sought to act as co-convenor of this workshop. Suggestions are invited from Committee Chairmen.

For the proposed session on “ Application of global ocean observing systems to physics, fisheries and ecosystems” at PICES XIII, again the POC Chairman (or Dr. Foreman) was requested to circulate the draft session description to the Chairmen of the other Committees and Programs to invite their co-sponsorship.

TCODE

The TCODE Chairman, Dr. Igor Shevchenko, presented his Committee’s interim report (full TCODE report is included elsewhere in this Annual Report). The main points were related to expanding the Bering Sea metadatabase to cover the North Pacific, updating the keywords for this metadatabase, preparations for PICES XII, and updates to the data inventory on the TCODE web page (<http://tcode.tinro.ru/>).

In the discussion that followed, it was noted that TCODE has done an excellent job with assembling a list of web links to databases for meteorological, oceanographic, and biological information in the North Pacific. It was recommended that member countries periodically check and update changes in these web links. Scientific Committees and the CCCC Program were requested to help TCODE in identifying keywords prior to PICES XII. The

TCODE Chairman will e-mail the other Committee and Program Chairmen with examples and a request for help.

TCODE was requested to verify the web links to the data sources, and to include links to the Argo Project as necessary. Scientific Committees and the CCCC Program were asked to check these links on the TCODE web page and to provide TCODE with suggestions for new links prior to PICES XII.

CCCC Program

The CCCC Co-Chairman and Chairman of NEXT (NEMURO Experimental Planning Team), Dr. Harold P. Batchelder, presented the report on NEXT (full CCCC and NEXT reports are included elsewhere in this Annual Report). A draft NEXT plan was developed by the Chairman and circulated to NEXT members in late January 2003. The draft was intended to be provocative (or controversial) so that NEXT members would react strongly in favour or in opposition, but in either case would react and respond to the plan. For whatever reasons, the initial responses were few, although those who did respond generally favoured most elements of the plan. Subsequently, the Chairman learned that some members of NEXT and other scientists that had read the plan had difficulties with some suggestions of the plan. Those scientists have agreed to provide specific written responses to the plan, and the Chairman is currently awaiting these more specific responses and suggestions for modifying the plan. NEXT will complete the task as outlined in the terms of reference prior to PICES XII. The NEXT recommendations will be forwarded to the CCCC Program for distribution to the Task Teams prior to PICES XII, and will be one of several considerations used in developing the CCCC Integration Plan.

Dr. Perry felt that NEXT is an initiative of the CCCC Program, which should report to the CCCC Executive Committee (CCCC-IP/EC). The Committee should then use these recommendations to build towards the integration of the CCCC Program. In the discussion, it was agreed that NEXT should report to the CCCC-IP/EC at PICES XII. A

report on implementing the NEXT recommendations and program integration would then be presented at either the Science Board meeting during PICES XII, or at the next interim Science Board meeting.

The discussion following the presentation considered whether to have a major symposium on integrated/synthesized results of CCCC studies in spring 2005, or in spring 2006. The Executive Secretary noted that time was very short if the symposium would be held in spring 2005. Dr. Batchelder expressed a preference for having the meeting in spring 2006, but noted that he would solicit input on the timing of this meeting from CCCC-IP/EC members by correspondence, and respond to the PICES Secretariat with a recommendation.

The term of the CCCC Co-Chairman from the western Pacific is expiring and a new Co-Chairman must be identified at PICES XII.

Agenda Item 3. Updates on interactions with other organizations

Details on the interaction between PICES and relevant international organization and programs can be found in the Science Board Annual report and Report on Administration (*GC Endnote 3*) included elsewhere in this Annual Report.

Specific recommendations from the interim meeting are listed below:

- PICES should invite the Chairman of the NPAFC Committee on Scientific Research and Statistics to make a presentation on the status of salmon at the PICES North Pacific Ecosystem Status Report workshop in August 2003.
- PICES has a general interest in a symposium on the marine mortality of salmon in 2005/06, but would favour a minor role, letting NPAFC and NASCO develop the specifics and invite PICES to comment.
- The MEQ Chairman was requested to contact the appropriate ICES Working Group regarding a proposal to co-convene a workshop or topic session at PICES XIII on harmful bio-invasions. The MEQ Chairman was also asked to discuss with WG 15 the

potential for ICES participation in the workshop on “Harmful algal blooms - harmonization of data” at PICES XII.

- The PICES Secretariat was requested to send a letter to the ICES Secretariat inviting ICES to send representatives to participate in the sessions on “Ecosystem-based management science and its applications in the North Pacific” and on “Aquaculture in the ocean ecosystem” at PICES XII (in particular suggesting Dr. Stefan Gollasch for the latter).
- The BIO Chairman was requested to advise the Co-Chairmen of the Advisory Panel on *Micronekton sampling inter-calibration experiment* to re-assess the costs of their proposed experimental plan and re-submit the proposal to the North Pacific Research Board in fall 2003, and suggest potential alternative sources of funding.
- The PICES Secretariat was requested to explore the possibility of common interests that the Pacific Sciences Association and PICES may share with regard to PICES XIII activities.

Agenda Item 4. Implementation of PICES Review Committee Report

At PICES XI, Council endorsed the PICES (10 year) Review Committee Report and its recommendations. Discussion at the interim Science Board meeting focused on the implementation of this report.

Dr. George Boehlert noted the need to define principal areas of responsibility of Committees, and to show how these are linked to their Strategic Plans. Many problems are identified and it may be useful for PICES to investigate for ideas in other organizations.

Dr. Boehlert asked to what degree in the PICES Secretariat had attempted to make use of secondment in staffing. The Executive Secretary reported that this had been pursued with little success.

Mr. Qian-Fei Liu suggested that it would be valuable for PICES to review the progress in implementing the Review Committee report and

to make adjustments on an annual basis. This is similar to the concept of having a Strategic Plan for PICES and knowing which proposed activities fit that plan.

Specific items from the Review Committee report were discussed:

Study Group on PICES Capacity Building

Dr. Batchelder presented a draft report of this group on behalf of the Chairman, Dr. Warren Wooster. The main recommendations included:

1. Develop fiscal resources for capacity building, including travel costs;
2. Develop a web-based compendium of training/education opportunities;
3. Enhance opportunities for both young and experienced scientists to participate in PICES activities;
4. Strengthen the commitment of PICES member nations to support PICES and to improve coordination of national involvement in PICES;
5. Develop methodology workshops to improve inter-comparability of methods and train analysts in accepted methods;
6. Establish a permanent Data Management Team to ensure compatibility of national and international data management efforts;
7. Establish a permanent interdisciplinary modeling group to synthesize and integrate available large data sets, determine gaps, and propose new studies;
8. Create a common working environment, including data, techniques, methods, software tools, mathematical models, computing power for sharing among all scientists involved.

Dr. Perry thanked the Study Group for their initial report. In the discussions that followed, SB asked the Study Group to consider the following:

- Identify what could be done with (1) “unlimited” funding; (2) with “limited” funding; and (3) with “no additional funding”, e.g. having students participate in local PICES workshops. Which workshop/training topics would be recommended to occur first, which later? –

i.e. which potential workshop topics should be considered most important?

- Suggestions which establish “permanent” bodies, such as numbers 6 and 7, are less attractive;
- Suggestion number 3 implicitly includes numbers 1 and 2, and might be considered the highest priority. What does the Study Group recommend to implement these suggestions?
- What does the Study Group recommend to implement suggestion number 4?
- Suggestion number 8 is a subset of suggestion number 5. What does the Study Group recommend to implement these suggestions?

Other comments from the general discussion included:

- It would be useful to have training courses organized in Russia (*e.g.* data management for biologists);
- PICES needs to communicate, in particular with government officials, about what has been done and what will be done in the future to improve the authority and credibility of PICES. A 2-page glossy brochure may be helpful.
- PICES might consider developing books for graduate students from its various reports.
- Enhanced financial opportunities may be facilitated by improving the PICES web site.
- An expanded Intern Program which includes scientific interns, not simply administrative interns, might be valuable.
- It may be useful to request that member nations involve scientific program officers from their funding agencies at PICES Annual meetings.

The Study Group was requested to have their final report available to the Committees and Program by August 31, 2003. It will then be circulated to members of Standing Committees and the CCCC Program for discussion and recommendations to Science Board at PICES XII. In addition, Council members are asked to provide information on funding opportunities for capacity building within member nations to the Study Group, to be included in their report.

Vice-Chairman of Science Board

Dr. Perry recommended the establishment of the position of Science Board Vice-Chairman and proposed a set of rules for this position. This proposal was approved, and the Executive Secretary was requested to modify PICES regulations to identify this new position (for details see Agenda Item 15 in the Governing Council Report and Decision 03/A/6). In the discussion that followed, it was noted that a major role of the Vice-Chairman of Science Board is to assist with the co-ordination of the scientific activities of PICES.

Dr. Vladimir Radchenko was elected Vice-Chairman of Science Board by acclamation. His term will expire at the conclusion of PICES XIII.

Communication and PICES web site

The PICES web site is seriously out dated and in need of a major overhaul, but PICES Secretariat staff do not have the skills to do this task. There are three issues: immediate updating of material; on-going updating of material; and longer-term re-design of the web site. Science Board discussed how these might be accomplished, considering the limited resources available.

There was general agreement that this form of communication is extremely important, and should be a priority within PICES. Suggestions included appointing a member of the Secretariat to manage the web site; developing a template of the type of information to request from PICES Committees to put on the web site, but this detailed development and maintenance of a high-quality web site can be very expensive. One approach may be to contract a web designer to develop the basic site, which could then be maintained by Secretariat staff. It was recognized that the Secretariat cannot be responsible for determining what information goes onto the web site. As a communication issue, the CCCC Program would like the Secretariat to develop a *ListServ* system to improve distribution of their information.

The following actions were suggested:

- The Secretariat is requested to develop a plan (for discussion at PICES XII) to maintain the web site. This would include re-allocating duties of current employees and identifying what would happen to their present duties.
- Dr. Richard Marasco will identify what is required to develop 2 levels of web site design for PICES: a “top level” site, and a “basic level” site, and provide this to the Secretariat and Science Board.
- The Committees and Programs of PICES are requested to discuss and identify what information is necessary to include in the PICES web site, in particular from their Committee, and how this information should be provided to the web site (i.e. the “flow” of information from Committee to web page). Committee/Program responses should be provided to the Secretariat and Science Board by August 1, 2003, for circulation prior to PICES XII.
- Members of Science Board and Governing Council are requested to provide the Secretariat (within 2 months) with suggestions of the information that is necessary to present on the uppermost levels of the PICES web site.

“Vision” and coordination issues

The “PICES Strategic Plan” (prepared by Science Board in 1998) was discussed and compared with the recent ICES Strategic Plan. In particular, the PICES Plan was felt to be an operational or implementation plan, *i.e.* it describes the roles and responsibilities of the Committees, Programs, and “Officers” of PICES. It is mostly “backward-looking”, in that it describes what has happened in the past and how the present activities derive from past activities. Furthermore, the existing PICES Plan must be updated annually, while the ICES Strategic Plan is more encompassing. The ICES Plan has an overall mission statement (“to advance the scientific capacity to give advice on human activities affecting, and affected by, marine ecosystems”) and 10 goals which are divided into 5 sections, followed by 3 steps to implement these goals.

Participants at the meeting believed that PICES should have a forward-looking strategic plan/vision statement. Dr. Huh suggested that such a statement should not be restricted only to issues concerning the waters north of 30°N, since Korea and China, in particular, plus potentially other countries, are interested in processes occurring further south. Mr. Liu noted that for PICES to consider expanding its activities it should examine new funding opportunities with other organizations such as FAO. The geographical location of China and the budget limitations have restricted participation by Chinese scientists. Dr. Marasco expressed the desire to engage all of the contracting parties in the development of the PICES Strategic Plan.

Dr. Kobayashi noted that Dr. Huh raised an important issue. Contracting parties may have different expectations of the Organization, and that a committee similar to the previous Review Committee might help. Dr. Radchenko noted that there are big differences between ICES and PICES: the ICES plan emphasizes stability but the PICES Plan must consider future development. He suggested that strategic plans from each Standing Committee are required first, and then the Organization can work on implementing the plans. Dr. Zhao noted that different regions may have different scientific issues, and that Governing Council might concern itself with regional issues, whereas the Scientific Committees should deal with scientific disciplinary issues. Others suggested that the Science Board Strategic Plan provides a good starting point for a final PICES Strategic Plan, and also that some of the information for a PICES Strategic Plan was discussed in the PICES Review Committee report.

In the end, it was agreed that a Study Group on *PICES Strategic Issues* be formed under the direction of the Governing Council, to develop a Strategic Plan for the Organization (see Agenda Item 7 in the Governing Council Annual report for Terms of Reference and membership). It was suggested that the first draft report should be circulated in time to get feedback from Standing Committees at PICES XII. The final product is expected by the interim meeting in

2004, or PICES XIII if no interim meeting takes place.

Aquaculture in PICES

Consideration of aquaculture science within PICES was mentioned a number of times during the meeting. It was noted, in particular that at present, scientific issues associated with the development of aquaculture are discussed in different PICES Committees. There is considerable interest in this topic generally, especially in China and Korea, and the lack of a clear place for aquaculture within PICES is sometimes seen as a disadvantage in attracting participation from these member countries.

Dr. Laura Richards suggested that establishing a Working Group on *Scientific issues of aquaculture* might be a suitable means to focus and define scientific issues associated with aquaculture within PICES. Dr. Boehlert noted that PICES should consider both the science of production and the science of marine environment associated with aquaculture. Therefore, he suggested that such a Working Group might be considered jointly by MEQ and FIS. Dr. Ishida reported that FIS has not yet discussed this issue in detail, and noted that the existing recommendation of FIS to consider a Working Group on *Ecosystem-based management* may preclude an opportunity to create another Working Group under FIS. This problem may be resolved if the proposed working groups were co-sponsored by more than one Committee. Dr. Radchenko noted that BIO has some interest in the issue as well, and perhaps the topic is so broad that it should be considered as a Working Group under Science Board.

MEQ and FIS were requested to lead joint discussions about forming a Working Group on *Scientific issues of aquaculture* within PICES, with additional input from BIO. POC was asked to consider if they are also interested in co-sponsoring this Working Group. A report that includes the potential issues/questions that such a Working Group might address, and draft Terms of Reference, is to be provided to Science Board for consideration at PICES XII.

Agenda Item 5. North Pacific Ecosystem Status Report

Dr. Perry reviewed the progress to date (*SB-IM Endnote 3*). Dr. Ishida reported that Japan was invited to prepare draft chapters on the Kuroshio/Oyashio and western Subarctic Pacific, and will identify Chapter Lead Authors. Dr. Shevchenko reported that TINRO has material concerning this report for these regions. Contacts include Drs. Elena Dulepova, Yury Zuenko, and Igor Melnikov. Dr. Marasco noted that it may ultimately be desirable to separate the Bering Sea into eastern and western chapters. Dr. Kobayashi suggested that a clear process for publishing this document will be necessary and that Governing Council should approve the report. He also requested an Executive Summary of the whole report and a correction to a footnote concerning the name of the body of water between the Japanese archipelago and the Korean peninsula. Dr. Batchelder noted that it is desirable for time series data used to have the figures available in digital format, perhaps from the PICES web server. Dr. Kashiwai suggested that the NPESR could be considered part of a PICES/GOOS initiative. The output must meet expectations of users and be exciting products. All aspects of PICES activities could potentially be included in NPESR.

Agenda Item 6. Identifying future major PICES programs

Dr. Kashiwai reviewed the procedures agreed upon within PICES for the development of new major programs (*SB-IM Endnote 4*). General issues for discussion of such programs include whether they are single or multiple programs, and whether they can expect special funding.

Dr. Richards noted that some of the suggested procedures followed from earlier discussions, and that perhaps this discussion on the next major program(s) should wait until the report of the Study Group on *PICES Strategic Issues* has been completed. Dr. Boehlert suggested that the next major program should target all PICES member countries, and that more than one major program could occur concurrently.

It was agreed that:

- The report of the Study Group on *PICES Strategic Issues* should be developed prior to any extensive work on developing new PICES programs;
- PICES Scientific/Technical Committees and the CCCC Program should discuss what they see as possible new issues/topics for a major PICES program at PICES XII;
- The North Pacific Ecosystem Status Report can be expected to identify gaps in information and understanding in the North Pacific that might be good candidates for future major PICES programs.

Agenda Item 7. Global Ocean Observing System (GOOS) and PICES

The IOC Global Ocean Observing System (GOOS) is a permanent global system for observations, modelling and analysis of marine and ocean variables, to support operational ocean services worldwide. GOOS' objective is to provide descriptions of the present state of the oceans, including living resources; continuous forecasts of the future conditions of the sea for as far ahead as possible; and the basis for forecasts of climate change. GOOS sees ICES and PICES as important regional programs which will assist with the GOOS objectives. ICES already has an IOC-ICES Steering Group for GOOS (see <http://www.ices.dk/iceswork/wgdetail.asp?wg=SGGOOS>). They have expressed considerable interest in having PICES participate in developing activities related to the IOC-ICES GOOS program. ICES is developing pilot projects for GOOS in the North Sea and (probably) in the Gulf of Maine. This Steering Group has invited PICES to participate in their meeting in early April 2003, with the hope that pilot projects on GOOS might also be established in the Pacific. Present GOOS-related activities within PICES are conducted mostly by the MONITOR Task Team of the CCCC Program. In addition, there are at least 4 other programs that would make obvious candidates to put forward as Pacific contributions to GOOS, potentially with PICES involvement: NEAR-GOOS in the western Pacific; ACCEO in the California Current region; and CAOS (Coastal Alaska Observation

System) and EVOS-GEM in the Gulf of Alaska. Of these, the EVOS-GEM program appears to be the most advanced and with a reasonable amount of money available for its implementation. Dr. Phillip Mundy of the EVOS-GEM program has been supported by PICES to participate in the 2003 ICES GOOS Steering Group meeting. The participants discussed whether the activities of MONITOR are sufficient at present, and if not, how PICES might develop more active participation, or a program, to support GOOS in the Pacific.

Participants were unclear of the specific plans of GOOS activities in the North Pacific, and in particular what it is that GOOS is expecting of PICES. Long-term observing systems in the Pacific are a strong interest of PICES - perhaps PICES could offer advice to GOOS regarding its implementation in the Pacific. In addition, PICES could provide the scientific rationale for the ecosystem observations (what, where, and how often).

It was recommended that the Science Board Chairman contact GOOS to ask for details of GOOS' plans for the North Pacific, and in particular what they are expecting of PICES. This might be followed up with an invitation to GOOS to make a detailed presentation at the MONITOR Workshop at PICES XII, and to the Science Board and Governing Council on the potential for GOOS-PICES interactions.

Agenda Item 8. Update on plans for PICES XII and XIII

Plans for PICES XII were reviewed, and allocation of funding for invited speakers was resolved.

It was also agreed that Topic Sessions and Workshops at PICES XIII (2004) need to be *finalized* rather than *developed* at PICES XII (2003) in Seoul, so Committees and Task Teams need to do their preparation before the meeting. Proposals must include a title, convenors, description, duration in days, and potential invited speakers. POC has proposed a session already and MEQ is planning a session on aquaculture but no details are available.

Agenda Item 9. Discussion of work plans leading up to PICES XII

The Executive Secretary presented summaries of the publication plans and meeting plans of the various PICES Committees and groups. All items listed as new (since PICES XI) were approved by Science Board and subsequently by Governing Council. In the case of the invitation from SOLAS to co-sponsor their session at the 2004 TOS/ASLO 2004 Ocean Research Conference, Science Board agreed to co-sponsor but could not guarantee supplemental funding at this time.

Dr. Ishida was requested to contact the Chairman of WG 16 to clarify if they plan to publish their report as a book, and if so to encourage them to develop the publication details soon.

Agenda Item 10. Any other business

A brief discussion was held on the appropriateness of an interim Science Board / Governing Council meeting in 2004. Consensus was that this meeting had been useful and that another meeting would be considered if the agenda items warranted it.

SB-IM Endnote 1

Participation List

Vera Alexander (Chairman, PICES)
Douglas Bancroft (Canada, advisor)
Harold P. Batchelder (Co-Chairman, CCCC-IP)
George Boehlert (U.S.A., national delegate)
Alexander Bychkov (Executive Secretary)
Michael G. Foreman (representative, POC)
Hyung-Tack Huh (Korea, alternate delegate)
Yukimasa Ishida (Chairman, FIS)
Makoto Kashiwai (Co-Chairman, CCCC-IP)
Tokimasa Kobayashi (Japan, national delegate)

Qian-Fei Liu (China, alternate delegate)
Richard J. Marasco (U.S.A., national delegate)
Stewart (Skip) M. McKinnell (Deputy Executive Secretary)
R. Ian Perry (Chairman, Science Board)
Sixi Qu (China, advisor)
Vladimir I. Radchenko (Chairman, BIO)
Laura Richards (Canada, national delegate)
Igor Shevchenko (Chairman, TCODE)
Jin Ping Zhao (China, Science Board member)

SB-IM Endnote 2

Science Board / Governing Council Interim Meeting Agenda

Monday, April 7

1. Welcome, introductions, logistical details, purpose of meeting
2. Updates from Scientific Committees and Programs
 - 2.1. BIO (Radchenko)
 - 2.2. FIS (Ishida)
 - 2.3. MEQ (Stein)
 - 2.4. POC (Foreman)
 - 2.5. TCODE (Shevchenko)
 - 2.6. CCCC (Batchelder, Kashiwai)
3. Updates on interactions with other organizations
 - 3.1. NPAFC
 - 3.2. ICES
 - 3.3. SCOR and IOC

- 3.4. North Pacific Research Board
- 3.5. UBC – Fisheries Centre
4. Implementation of PICES Review Committee Report
 - 4.1. General discussion
 - 4.2. Draft report of Study Group on *PICES Capacity Building* (Batchelder)
 - 4.3. Position of Science Board Vice-Chairman (Perry)
 - 4.4. Communication and PICES web site (Perry)
 - 4.5. Vision and co-ordination issues:
 - strategic plan / vision for PICES (to include issues of greater direction by Science Board) (led by Perry)

- strategic plan / vision for Scientific and Technical Committees (Committee Chairmen)
- co-ordination among Committees and Programs (led by Perry)

Tuesday, April 8

5. North Pacific Ecosystem Status Report (led by Perry)
6. Discussion of a process for identifying the major program(s) to follow the CCCC program (Kashiwai)

SB-IM Endnote 3

PICES North Pacific Ecosystem Status Report

At PICES IX (Hakodate, 2000), Governing Council created a Study Group on North Pacific Ecosystem Status Report and Regional Analysis Centers (RAC). The Study Group was to:

1. Devise a detailed outline for the first North Pacific Ecosystem Status Report;
2. Identify key contributors (individuals and organizations);
3. Identify existing data source for inclusion in the Report;
4. Examine the process and implications of how those data would be synthesized in the Report;
5. Estimate the production, printing, and distribution costs of the document;
6. Examine the function, products, and positive and negative implications of RACs.

In Hakodate, the PICES Finance and Administration Committee identified the North Pacific Ecosystem Status Report (NPESR) as one of its high priority items for fund-raising. At PICES X (Victoria, 2001), the proposal from the Study Group to develop such an ecosystem status report was discussed, modified, and accepted by Science Board (chaired by Ms. Patricia Livingston). Science Board and Governing Council established a timetable for this activity: to have a pilot version of the report available for discussion by the end of 2002, and the first report available by the end of 2003.

7. PICES efforts in support of GOOS in the Pacific (led by Perry)
8. Update on plans for PICES XII and PICES XIII (Perry, Bychkov)

Wednesday, April 9

9. Discussion of Workplans from now until PICES XII, including update on plans for publications and special meetings (All)
10. Any other business
11. Review of draft meeting report (Perry)

Activities to date

A revised template was developed for the structure and content of the NPESR, which was circulated for discussion in 2002. Three approaches were developed to gather the information necessary for the report:

1. use existing published summaries where available, if possible written (or at least carefully edited) by regional experts;
2. for international regions where published summaries are not available, convene regional workshops with local experts to present summaries of the ecosystem components and to discuss general issues of ecosystem status;
3. for national regions where published summaries may not be widely available, encourage local experts to assemble and summarise those summaries that do exist, and/or convene a local workshop in which local experts could present and discuss views and ecosystem status.

The "Draft for Discussion" resulting from these approaches was circulated at PICES XI. Comments were mixed: some Committees were highly supportive, whereas others had concerns over who was to do the work and the lack of a synthesis chapter to provide comments. Governing Council had a thorough discussion, and raised concerns regarding the process for review of the report.

The National Marine Fisheries Service (NMFS, U.S.A.) and the Gulf of Alaska Ecosystem Monitoring and Research Program (GEM) of EVOS (Exxon Valdez Oil Spill Trustee Council, U.S.A.) contributed US \$15,000 and US \$10,000 respectively, to finance the development of the NPESR. In addition, PICES prepared and submitted a proposal for the Census of Marine Life (CoML) to support additional activities regarding what is known, unknown, and unknowable about marine life in the North Pacific, for which the information in the NPESR is a foundation. This CoML proposal was funded US \$45,000, which is providing significant resources to the NPESR/CoML workshops and publication. At PICES XI, a Working Group was proposed and approved to produce the first report (due end of 2003). Details of this Working Group are:

Title: North Pacific Ecosystem Status Report, and Working Group under Science Board

Duration: November 2002 - January 2004

Terms of Reference:

1. Prepare the full North Pacific Ecosystem Status Report, for review at PICES XII in October 2003, and for completion in December 2003;
2. Prepare the report for the PICES - CoML project on "Marine life in the North Pacific Ocean: The known, unknown and unknowable";
3. Recommend mechanisms to facilitate the data management requirements of the North Pacific Ecosystem Status Report;
4. Recommend how to implement production of the North Pacific Ecosystem Status Report as a regular activity of PICES.

Membership includes: Dr. Ian Perry (Science Board Chairman), Chairmen of the Standing Scientific Committees and Program, invited experts, and Dr. Skip McKinnell (Deputy Executive Secretary).

Plans proposed for 2003 include:

- Activate the Working Group: Membership in this WG includes Science Board as an Editorial or Steering Board. In addition, it is

proposed to invite "Chapter Lead Authors". These Chapter Lead Authors would be regional experts who would lead the writing of the Regional chapters.

- Regional workshops are planned for the Yellow Sea – East China Sea Region, and the Okhotsk Sea and adjacent seas. The first is titled "Workshop on "Variability and status of the Yellow Sea and East China Sea ecosystems" and is supported by PICES, KORDI and CoML. It will be held at KORDI in Ansan, Korea, on April 28-29, 2003. The 3rd PICES Workshop on Okhotsk Sea and adjacent areas, June 4-6, 2003, in Vladivostok, Russia will be the second NPESR regional workshop in 2003.
- June 2003 is the deadline proposed for the Chapter drafts to be submitted. An outline of a synthesis will then be prepared based on these chapters, and circulated among the WG in July. A Workshop is scheduled for August 25-27, 2003, at the PICES Secretariat, to which Science Board and all Chapter Lead Authors will be invited, to discuss and prepare the NPESR synthesis chapter, which will also be a major contribution to the CoML report. The draft NPESR (including the synthesis chapter) will be circulated for discussion in September 2003.
- A 2-day MONITOR workshop (co-sponsored by EVOS) to "Examine and critique a North Pacific Ecosystem Status Report" will be held just prior to PICES XII. This workshop will provide a formal review of the draft NPESR, and in particular, will discuss how to operationalise the preparation of the NPESR as an on-going activity of PICES.
- Discussions of this draft report will also take place during PICES XII, especially amongst the Committees, Science Board, and Governing Council.
- A second CoML workshop will be convened in November 2003, to prepare the final report to CoML.
- Publication of this first report is planned for the end of 2003.

SB Endnote 4

Process of identifying the major program(s) to follow the CCCC program

Process

Before considering the process of identifying the Scientific Program(s) to follow the CCCC Program, the Organization needs to agree on a design policy that includes the following issues:

- Will it be a 2nd phase of the existing CCCC Program or an entirely new program?
- Will it consist of a single program (with multiple umbrellas), or multiple programs (each with a single umbrella)?
- Will it be planned with or without special research funds, or as a response to a formal Request for Advice with cost sharing among the PICES member countries?
- Will it consider the output from CCCC Synthesis?

Governing Council must consider these elements of a design policy for the next PICES major scientific program.

A starting point of discussion on the procedure for development of a new PICES scientific program can be found in the *PICES Handbook for Chairmen and Convenors*, (Chapter A. Guidelines for Chairmen, Section VI. Scientific Programs), which states:

PICES has the responsibility to identify research priorities and problems pertaining to the area of interest, as well as appropriate methods for their solution. Coordinated research programs and related activities of common interest shall be undertaken through national efforts of the Contracting Parties. The following processes should be undertaken when developing a joint research project:

1. A Workshop should be undertaken to develop a Science Plan based on identified key scientific questions.
2. A Workshop should be undertaken to develop an Implementation Plan based on a scientific strategy that includes program management and a schedule for the program.

The agenda and participants of each workshop must be determined based on the requirements of each plan.

Science Plan

The scientific questions that form the Science Plan are critical for the success of the research program.

In the world, there are many things not elucidated, or yet to be elucidated. However, for many people, it is not clear what are unknown matters. If one can clearly point out what is not known, we can say that research has already started. Furthermore, when the unknown matter is captured clearly in the form of a problem, we can see that the way to the solution is already open. Questions that already take the form of problems can, in most cases, be solved. But, when we solve a problem on one subject, it does not always deepen our understanding on that subject. It is up to methodology to formulate the problem such that solution results in real deepening of our understandings. (Translation from Kenichi Shiragami, 1972)

Therefore, the Science Plan cannot be an assortment of unrelated scientific questions raised by individuals seeking a funding opportunity. The answer to these questions must give the best available scientific foundation for the decisions of member countries on urgent matters of marine policy for preventing global warming or for mediating resultant disaster caused by it. The Science Plan of a major research program of a science organization must give an updated reason of existence for the organization.

Science Board should have a set of criteria for prioritizing scientific plans, *e.g.*:

- Meet needs of member countries;
- Increase value of PICES activities in support of research;
- Strengthen support of cooperative programs of PICES;
- Provide opportunity for PICES initiatives;

- Attract the interest of excellent scientists;
- Contribute to better participation in PICES activities.

These criteria should be considered during the identification of scientific questions and the development of a scientific strategy.

The national interests of PICES member countries in marine sciences of the North Pacific are not identical because of their geographical position in the North Pacific, the relation to downstream/upstream influences of the major oceanographic features of the North Pacific, and the differences in marine policy of their governments. It is therefore natural and necessary for PICES, as an intergovernmental scientific organization, that major scientific programs planned and implemented by PICES, should meet the needs of its members. To ensure that this is achieved, at least three options can be considered:

- Approval by Governing Council of the Science Plan developed through a workshop under the initiative of Science Board;
- Composition of planning workshops based on national reports of requirements of the new scientific program from member countries;
- Development of the Science Plan based on the questions posed by member countries in the form of formal written requests for scientific advice.

The first option is a standard procedure for decision-making by PICES. However, when considering that the existing scientific questions of the CCCC Program can also be found among the discussion papers that led to the establishment of PICES, the identification of scientific questions to be addressed in the next major program should proceed on broadly based intra-national discussion among marine scientists in each member country. This first option does not necessarily lead to the successful implementation of the program.

The second option outlines the minimum requirement for better participation from all member countries in a new major PICES scientific program. If it can be assumed that the

major research efforts in a new program are to be covered by the activities of the national programs funded by member countries, the existence of contributing national programs is a crucial pre-condition for establishing a new major PICES scientific program. Therefore, national reports from member countries describing their requirements for a new major scientific program of PICES are required to establish and fund the component national programs.

The third option is a very strong challenge for PICES because answering such scientific questions cannot be undertaken by scratching through existing information, but requires the creative scientific production with authorship of scientists or sponsorship of the organization. Thus, even if PICES does not evolve into a science funding organization, the Organization still needs its own research money to conduct its own research program. Raising funds from outside sources for its research program may result in the implementation of scientific programs that are also of interest to outside sponsors, as in the case of the North Pacific Ecosystem Status Report.

The most appropriate way for PICES to have funds for its own research programs is via this third option. This must be considered and challenged with perspective to develop the advisory function of the Organization.

The scientific questions must be prioritized so as to increase the value of PICES activities in support of marine research. Valuable characteristics of PICES activities in support of marine research can include:

- A multi-disciplinary approach in marine science;
- Basin-scale research coordination in northern North Pacific;
- Fisheries-oriented marine science integration;
- Membership of almost all the northern North Pacific rim countries;
- 10-years experience in the study of ecosystem dynamics,
- On-going long-term ecosystem monitoring stations (more than 5),

- Well-established cooperative relations with other international fisheries organizations in the area concerned; etc.

The Science Plan of a major research program must draw on the best use of these characteristics of the Organization and make best use of, and strengthen the support of, on-going and planned cooperative programs of the Organization, which include:

- Data exchange;
- CPR survey;
- PICES GOOS Programs;
- Iron Fertilizing Experiments;
- North Pacific Ecosystem Status Report; and
- Capacity Building Program.

The scientific scope of a new scientific program must reflect the scientific strategy of PICES, appearing in the Strategic Plan of Science Board, that can provide opportunity for PICES initiatives, which may include:

- Human dimensions;
- Ecosystem approach in resources management; and
- Marine birds and mammals.

In principle, a scientific organization consists of scientists who are led by excellent scientists. Therefore, it is crucially important for the success of a Program to keep attracting excellent scientists and to have their commitment as leaders. This situation cannot be realized without a formulated set of excellent scientific questions addressed by the Program. For the Program to be able to contribute to better participation, the scientific questions addressed by the Program need to include leading questions within the scientific scope of Scientific Committees.

We can receive potential key scientific questions with description of background, needs and seeds, from the following sources:

- PICES National Delegates with national scientific interests, concerning what scientists are requested to answer by taxpayers and decision-makers;
- Scientific Committees and their substructures;

- Remaining or new questions arising from CCCC Program synthesis
- Presentations by individual scientists at scientific sessions and workshops during the Annual Meeting, or recommendations arising from Symposia or Topic Sessions.

The structuring and prioritizing of scientific questions is the most important component of a Science Plan that can be identified as a part of the Scientific Strategy. It is tightly connected with the sub-structuring of the Program Implementation Panel. Thus, when selecting categorical items for the structuring of scientific questions, we need to select categories that are also appropriate for establishing the sub-structure of the Program Implementation Panel. In CCCC these were grouped as:

- Development of methods (*e.g.* MODEL Task Team);
- Comparative studies among national/local programs (*e.g.* REX Task Team);
- Multi-national collaboration on specific fields (*e.g.* BASS Task Team);

Others include:

- Scientific initiatives on frontier area (*e.g.* human dimension-oriented);
- Specific umbrella program-oriented (*e.g.* atmospheric transport of iron dust);
- Specific disciplinary-oriented (*e.g.* sub-arctic/sub-tropic gyre interaction); etc.

The role of model development in the CCCC Program is not only for hypotheses testing but also for sensitivity studies to identify important ecosystem processes. The most important ecosystem process is the eco-physiological response of key species to the full range of environmental variability that they will experience in the future. It means that intense laboratory rearing studies and/or special field incubation experiments are needed, as are currently being performed by China GLOBEC. These process studies are key to constructing a Mechanistic Model, by which the CCCC Program is intending to overcome the limitations of superficial empirical correlation, and to obtain predictive power beyond regime shifts.

There have been many activities of PICES Scientific Committees in support of the CCCC Program implementation. The activity and results of the Working Group on *Marine Birds and Mammals* is one of the examples. CCCC/IP needs to make an effort to incorporate marine birds and mammals into North Pacific ecosystem models, and to identify hypotheses relating to the role of marine birds and mammals in the response of North Pacific ecosystem to climate change. CCCC/IP should encourage scientists on marine birds and mammals to identify key questions and to join in the practical program implementation.

Comparative study is an efficient approach to identify the specific characteristics of the object concerned. Thus, comparative studies are listed as an important task in many international or inter-program coordinating plans. In the CCCC Program, the REX Task Team is responsible for the comparative studies among North Pacific ecosystems. However, a comparative study cannot be performed by mere exchange and comparison of outputs from separate research projects on the subjects to be compared. It needs specific scientific questions, data from common tools and protocols, common base models, and common methods of analyses.

One of the key words for the next generation of the CCCC Program may be human dimensions. The Earth system is characterized as **the Planet of Water** among the other planets of the solar system, and the existence of the human race, that has been causing the change in greenhouse gases and global warming. Thus, it is reasonable that, for the study of global climate change, we need to include human dimensions into the Earth system. What does it mean to incorporate human dimensions into the CCCC Program? In the case of science in general, to incorporate human dimensions may mean the amalgamation of natural sciences and social sciences.

Bearing in mind the distance between, for example, biological oceanography and chemical oceanography, the distance between marine sciences and social sciences seems far beyond feasible amalgamation. Thus, at present, for PICES as a marine science organization, to

incorporate social sciences will be far beyond its scientific scope. Furthermore, we cannot see the effort of constructing a human society model, while we are struggling to construct a North Pacific marine ecosystem model. A possible challenge can be the incorporation of fisheries as a component into ecosystem models.

The first challenge, associated with incorporating fisheries into an ecosystem model, is to have a system composed of components each having its own goal function to be optimized, *i.e.* shift from a mechanistic model, like an automated factory system, to an animistic model, composed of relatively independent elements with capricious interactions among them. The second challenge is to compose an ecosystem model from components having inner system dynamics that exhibit plasticity in the life cycle. Intensive biology-oriented process studies will be needed for this approach.

For the successful implementation of the next generation CCCC Program, the enhancement of scientific creativity of PICES has crucial importance. Difficulties experienced in the CCCC Program implementation, that limited scientific creativity and efficient program progress, are:

- National scientific programs do not necessarily include scientific questions on basin-scales or questions requiring comparative studies, and therefore have no funding for them;
- The CCCC Program lacks dedicated research funds except for workshops or symposia, and national programs or member countries have no funds that can be transferred to the CCCC Program;
- The contribution by scientists to the CCCC Program is, in many cases, neither authorized nor encouraged by their employer.
- PICES is an inter-governmental organization that focuses on equality among member countries rather than on performance or scientific excellence, and thus the chairmanship of the implementation structure is limited to three-year terms and leaders are not eligible for re-election. This

makes it difficult to keep excellent leading scientists in key posts of the Program.

In order to overcome these difficulties, it is necessary to have strong support for the next generation CCCC Program from member countries, including high priority for the funding of CCCC contributing programs, promotion of the program by allocating transferable funds, or catering to member countries' request of advice on a specific scientific question to be addressed to the Program. At the same time, PICES needs to change its calling card from "*Inexpensive Organization*" to "*Creative Organization*" instead, and to change operational practices to fit it.

Implementation Plan

The major components of the Implementation Plan, and thus the agenda of the workshop to develop the Implementation Plan, will be:

- Establishment of an Implementation Panel;
- Action plan as an organized set of workplans for sub-structure of the Implementation Panel;
- Cooperation with other international Programs;
- Relation to international umbrella Programs; and
- Time schedule that recognizes program phases.

In the first stages of the CCCC Program, the sub-structure of the Implementation Panel was established as Task Teams, after developing an Implementation Plan, and along with separately determined terms of reference for each Task Team. Thus, the first stages of the CCCC Program lacked an organized workplan among the Task Teams, and the Implementation Plan lacked an organized research plan. Therefore, any workshop to develop an Implementation Plan must deal first with the establishment of sub-structures of its Implementation Panel. The core of the Implementation Plan must be a set of research plans to answer scientific questions given to the sub-structure of the Implementation Panel, and thus becomes the major agenda of the workshop to develop the Implementation Plan.

The CCCC Program is using models as a tool of program integration. The MODEL Task Team found it necessary to create a basic model for comparative studies and hypotheses testing, and has developed a basic lower trophic level ecosystem model, NEMURO, through a series of intensive practical workshops. The program code, parameter values and forcing factor dataset for typical stations, are open for use by the scientific community on the NEMURO Website.

This model is one of the major achievements of the CCCC Program and is evolving to include higher trophic level models, and to be embedded into a 3-dimensional ocean circulation model. The family of NEMURO models is expected to be the major tool in the CCCC Integration Plan. For this family of NEMURO models to be a community tool for ecosystem studies, there must be consistency among models of different ranks, *i.e.* among box models, 1-D models, 2-D models and 3-D models. This could not be achieved during the first stage of the CCCC Program.

Among marine biologists and even among ecosystem modelers, there is recognition that ecosystem models are special tools for ecosystem modelers only. This is the largest obstacle for models to be the core of program integration. There must be a protocol for biologists to use a sophisticated ecosystem model as scientific equipment, like a sophisticated chemical analyzer that a biologist cannot construct or repair. This will make it possible for a model-familiar biologist to be a good program synthesizer, while an ecosystem modeler cannot always be a good program coordinator.

Dr. George Hunt (University of California, Irvine) is proposing a Research Plan: *Ecosystem Studies of Sub-Arctic Seas Program*, including the Bering Sea, the Barents Sea, the Newfoundland/Labrador Shelf, the Sea of Okhotsk and the Oyashio shelf region, *i.e.* seasonally ice-covered, sub-arctic seas thought to be sensitive to decadal-scale and secular changes in climate. This proposal includes an important part of the PICES region and also encompasses PICES plans for comparative

studies between ICES-CCC and PICES-CCCC Programs. We need to discuss and decide how to consider this proposal.

Judging from the sequence of discussion that led to the foundation of PICES, it is quite natural and reasonable that PICES initiated its first research program as one of the regional programs of GLOBEC. The scientific question on dynamic response of the North Pacific ecosystems to large scale climate variability, is nothing but the scientific concern that pushed member countries to establish PICES, and is also the central question of GLOBEC.

However, GLOBEC is one of the international research programs dealing with the response of the ocean to climate changes. Each of these programs has its own focal questions based upon a specific discipline. Thus the choice of GLOBEC as an umbrella automatically confined the scientific scope of the CCCC Program within that of GLOBEC, which does not necessarily have a direct focus on the response of ocean circulation to climate variability of the atmosphere, or on the response of chemical cycling to the climate variability. Therefore, although the Key Scientific Questions of the CCCC Science Plan can be interpreted as

including questions on physical oceanography or chemical oceanography, the CCCC Program has been failing to attract scientists from the Physical Oceanography and Climate Committee and the Marine Environmental Quality Committee.

As a consequence, the CCCC Program lacked scientific questions and hypotheses from the point of view of physical oceanography; *e.g.* “How do the interannual or decadal changes in winter monsoon over the Subarctic Pacific affect the strength and distribution of upwelling velocity?”, “How does it change the productivity, geographical extent, and seasonal cycle of subdivisions of Subarctic Pacific ecosystems?”, and “How do the interannual or decadal changes in winter monsoon over the North Pacific affect the circulation and inter-gyre water-mass exchange?” We must note that the next stage of the CCCC Program may not need to limit its umbrella only to GLOBEC.

Finally, the Implementation Plan of the first stage of the CCCC Program failed to indicate the total duration of the program and the need for revision of the time schedule. I hope this article can ignite your inspiration for a new PICES scientific program.

