

REPORT OF SCIENCE BOARD

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The Science Board met on October 18 (18:30-21:30) to review the order of the agenda, set up tasks for Scientific and Technical Committees agendas and hold the election of the Science Board Chairman; and on October 24 (09:30-16:30) for further discussion. Drs. W. Doug McKone and Alexander S. Bychkov served as rapporteurs. (See Endnote 1 for participants.)

October 18, 1998

The Chairman, Dr. Makoto Kashiwai, called the meeting of the 18th to order and welcomed the members of Science Board and observers. Dr. Kashiwai outlined the objectives of the meeting, the timetable for reports on Committees and Group activities, and significant issues for discussion. The agenda was circulated prior to the meeting. The Chairman reviewed the agenda, proposed the order in which to take up the various items, and asked for changes and additions. The agenda was adopted without changes (Endnote 2).

The Chairmen of the Scientific and Technical Committees, and the CCCC Implementation Panel presented agendas for their meetings. Additional items important for future general discussion were determined and recommended to be included into agendas (Endnote 3).

Dr. Kashiwai noted that the Chairmen of the Science Board, POC, BIO and MEQ Committees will have completed their terms of office after this Annual Meeting. To ensure that PICES activities are heading in the right direction for the new Chairmen, they have to pay special attention on the Strategic Workplans for at least the next three years. The discussion and revision of the Strategic Workplans should be

completed during the Committee meetings and be reported to the Science Board. Dr. Kashiwai reviewed the Science Board activities for the period from PICES I to PICES VII and presented a draft Science Board Strategic Plan. Oral and written comments were solicited by the second Science Board meeting on Oct. 24.

Election of Science Board Chairman

Dr. Kashiwai introduced the PICES rule 14 for selection of the Science Board Chairman and informed that he had received only one written proposal from the U.S. Delegate, Dr. Vera Alexander, who nominated Ms. Patricia Livingston for the position of the Science Board Chairman. No other candidates were proposed at the meeting and Ms. Patricia Livingston was elected the new Science Board Chairman by acclamation. The Science Board members congratulated Ms. Livingston on her election. Ms. Livingston expressed her thanks for the support given by the Science Board.

Handbook for Chairmen and Convenors

The final draft of the Handbook for Chairmen and Convenors was prepared by the Secretariat and Science Board. Dr. Kashiwai reported that the draft changes in the Rules of Procedure were required for consistency with these Guidelines. After discussion and minor revision, the proposed Rule of Procedure changes, developed by the Executive Secretary, have been recommended to the Governing Council for approval. The Science Board also recommended that the Handbook for Chairmen and Convenors be published.

October 24, 1998

The Chairman opened the meeting of the 24th and proposed the order in which to take up the various items. The Science Board reviewed the findings and recommendations of the Scientific Committees, Implementation Panel for the CCCC Program, TCODE, and Study Group on Publications; the Strategic Plans developed by the Science Board and Scientific Committees; discussed the implementation of PICES VI decisions, and Science Board recommendations from 1997; made arrangements for future activities and planned a program for the Eighth Annual Meeting; discussed relations with other Organizations and Programs; and made recommendations to the Governing Council.

Reports and recommendations of the Scientific and Technical Committees, CCCC-IP/EC and Working and Study Groups

Reports of the Scientific and Technical Committees, the CCCC Implementation Panel and Publication Study Group were presented by their Chairmen and are summarized below (see reports for the full text). Although both TCODE and the CCCC/IP report to Science Board, for the purposes of the Annual Report, their accounts have been given more visibility under their own heading.

Biological Oceanography Committee – Prof. Patricia A. Wheeler

The Biological Oceanography Committee met on October 22 (13:30-16:20). The Chairman Dr. Patricia A. Wheeler called the meeting to order and welcomed the members of the Committee and observers. Dr. Vladimir I. Radchenko served as rapporteur. Suggestions were made about the agenda and the revised agenda was approved.

Dr. Wheeler distributed copies of a draft strategic plan for the BIO Committee that reviewed past activities and outlined plans for the future. The BIO Committee agreed with the recommendations for further integration of symposia and sessions with other PICES Scientific Committees and international organizations, to encourage an increased level of attendance at meetings of Scientific Committees, Working Groups, and Task Teams, and increased support for students to attend PICES meetings.

Dr. Wheeler reviewed the PICES rules for choice of the BIO Chairman. The formal election was conducted by Dr. W. Doug McKone, Executive Secretary of PICES. Dr. Tsutomu Ikeda was nominated and elected by acclamation in accordance with the Rules of Procedure.

The PICES Secretariat would like to improve its web page and BIO Committee selected Dr. Linda Jones to serve as the initial contact advisor for the Secretariat.

Dr. Wheeler reported on the plans for an ICES/PICES workshop on “Zooplankton Ecology” in April/May of 2000. The BIO Committee discussed the proposal and recommends Dr. Tsutomu Ikeda, BIO Chairman-elect, nominate a Committee member to serve as the main PICES representative in planning this workshop with further approval of this nominee by BIO.

Dr. Wheeler reported on the PICES plan for a four-day conference on “*El Niño and Beyond: A conference on Pacific climate variability and marine ecosystem impacts from the Tropics to the Arctic*” in late March 2000 in La Jolla, U.S.A. The BIO Committee discussed the proposed conference and voted in favour of supporting the proposal.

Dr. Richard D. Brodeur reported on the first meeting of Working Group 14 on Micronekton. WG 14's terms of references were expanded to include the ecological

role of micronekton in addition to sampling methods. The first report of Working Group 14 follows the report of the BIO Committee in the Annual Report.

Dr. Allen Macklin gave an update on the Bering Sea Metadata project and invited input of additional data.

Mr. Robin Brown described the proposal for a TCODE Workshop on Data Visualization. The BIO Committee discussed the proposal and voted by acclamation in favour of supporting the proposal.

Dr. Paul J. Harrison described the proposal for a CCCC Advisory Panel to evaluate the proposal for an Iron Fertilization Experiment in the North Pacific. The BIO Committee discussed the proposal and recommended it for Science Board approval with special note to future CCCC Advisory Panel members on the necessity undertaking a carefully controlled experiment and additional measurements to understand underlying processes.

Nominations were tabulated for BIO's Best Presentation Award. Based on these nominations, the BIO Committee selected a short list of seven candidates and voted for Dr. Kazuaki Tadokoro (co-author Dr. Takashige Sugimoto) "Importance of low saline advected water from the Sea of Okhotsk for spring blooming of phytoplankton in west side of the North Pacific Ocean" as the 1998 Best BIO Presentation.

Drs. George L. Hunt and Hidehiro Kato presented a summary of WG 11 progress. The final report will be submitted to BIO in spring 1999. BIO will review the final report and recommendations, and forward it with comments to SB prior to PICES VIII. WG 11 proposed several suggestions for establishing a 3-year Study Group on Marine Mammal and Seabird Ecology. The BIO Committee discussed these proposals and recommended approval by Science

Board. On behalf of the BIO Committee, Dr. Wheeler thanked Drs. Hunt and Kato for their efforts.

The BIO Committee discussed possible Topic Sessions for PICES VIII. Past unselected topics and new topics (listed below) were discussed. A short list of possible topics was generated and the Committee selected "Recent findings of GLOBEC and GLOBEC-like programs in the North Pacific" as the next BIO/CCCC special topic. Possible BIO Co-Convenors are Drs. Vladimir I. Radchenko and Mark D. Ohman. The topic "Coastal eutrophication, phytoplankton dynamics, and harmful algal blooms" as a special MEQ/BIO session was also approved if scheduling permits. Dr. Kwang-Woo Lee was recommended as a possible Co-Convenor. The BIO Committee noted that this BIO/MEQ session might have greater attendance in PICES IX in Japan. Other topics suggested for PICES IX include "Marine birds and mammals", "The importance of microbial loop processes and cycling of DOC", "Zooplankton dynamics and top-down control" and as a result of the Science Board Symposium "A regional comparison of annual production".

Fishery Science Committee (FIS) – Dr. Chang-ik Zhang

The Chairman, Dr. Chang-ik Zhang, opened the meeting. The agenda was reviewed and approved by all members. Dr. Gordon H. Kruse was appointed as rapporteur. The FIS Committee welcomed one new member, Dr. Tokimasa Kobayashi (Japan).

Dr. Robert S. Otto summarized the activities and discussed a number of recommendations of WG 12. The FIS Committee supported the continuation of WG 12 activity for one more year and proposal to convene an inter-sessional WG 12 meeting in August or early September, 1999, in the People's Republic of China.

The FIS Committee requests a final report from WG 12 at PICES VIII in Vladivostok.

A SCOR WG 105 and ICES joint symposium on “The Ecosystem Effects of Fishing” will be held in March 16-19, 1999, in Montpellier, France. The FIS Committee recommends Dr. Zhang’s participation in the symposium and requests partial support (per diem) for this trip.

The FIS Committee supports a proposal by Dr. Tokio Wada for a FIS Topic Session at the next Annual Meeting on “GLOBEC and GLOBEC-like studies and application to fishery management”. The session would be co-convened by Dr. Tokio Wada (Japan) and representatives from other PICES countries. Dr. Gordon H. Kruse (U.S.A.) will be the interim contact.

The FIS Committee voted for the Best Presentation Award from talks presented during the FIS Paper Session and FIS/CCCC Joint Session. The award went to Mr. Jae-Bong Lee for his excellent presentation titled “The impacts of climate changes on the marine fisheries resources in Korea”.

Dr. Zhang drafted a “Review of Activities and Strategic Workplan of FIS Committee” that reviewed the Committee’s activities and recommended a three-year workplan. The FIS Committee reviewed the report, and provided editorial remarks for inclusion in the final draft.

Marine Environmental Quality Committee – Prof. Makoto Shimizu

Prof. Makoto Shimizu opened the MEQ Committee meeting on behalf of Dr. Richard F. Addison, who was absent from this Annual Meeting. The election of a new Chairman was conducted by Dr. W. Doug McKone, Executive Secretary of PICES, and Dr. Alexander V. Tkalin was nominated and elected by acclamation.

The MEQ Committee discussed and endorsed the report of WG 8, and the recommendation of the WG to change the venue for the Practical Workshop to Vancouver Harbour, B.C., Canada. Dr. Colin D. Levings (Canada) was appointed as Co-Chairman of the Implementation Team for the Practical Workshop. The change in venue was necessary because permission was denied by the Chinese authorities to conduct the workshop in Jiaozhou Bay, China. The Committee noted that the denial of permission demonstrates that PICES, at all levels, must work together to ensure that inter-governmental projects sponsored by PICES are given the necessary support and authorization to be implemented successfully. The tasks of WG 8 would be complete at PICES VIII and a task team will be identified to complete the final report of the Practical Workshop.

The Committee reviewed the scientific sessions of the MEQ and was encouraged by higher attendance, quality and number of presentations as compared to sessions at previous meetings. The session on “Science and technology for environmentally sustainable mariculture” was well attended and addressed issues from environmental impacts and global feed requirements for sustainable production to research on salmon hatchery practices to meet recovery objectives for depressed or endangered salmon populations. The joint session with the BIO Committee on “contaminants in high trophic level biota – linkages between individual and population responses” was deemed very successful and the Committee hopes to have future joint sessions with BIO. The Best Presentation Award was given to Dr. Peter S. Ross for his presentation “Marine mammals at the top of the food chain: ecological sentinels”, which was presented in the MEQ/BIO Joint Session.

Several Committee members noted that in the announcement for PICES VII and in the

“online” registration form, that there was no mention of the MEQ Paper Session. In addition, the Committee recommends the inclusion of a description of topic areas for the MEQ Paper Session on the PICES Web page. (See attached).

It was agreed that the MEQ Committee would develop, inter-sessionally, a strategic plan for the Committee. The draft plan will be discussed and made final at PICES VIII. Drs. Richard F. Addison, current Chairman of MEQ, and Alexander V. Tkalin, Chairman-elect of MEQ, will develop the review draft.

The MEQ Committee proposed a joint MEQ/BIO session on “Coastal pollution – eutrophication, phytoplankton dynamics, and harmful algal events” for PICES VIII in Vladivostok.

The MEQ Committee recommended that the Topic Session for PICES VIII be “Ecological impacts and mitigation of oil spills and oil exploration”. The convenor will be Dr. Alexander V. Tkalin.

The Committee also recommended that a follow-up session to the mariculture session at PICES VII be held as a Topic Session at PICES IX in Japan. The proposed title is “Science and technology for environmentally sustainable mariculture: impacts and mitigation in coastal areas”.

Physical Oceanography Committee – Dr. Paul H. LeBlond

The POC Committee met on October 19 and October 22.

Dr. Christopher N.K. Mooers described progress of report of WG 10 on Circulation and Ventilation in the Japan/East Sea. A draft has already been circulated and comments received. More work is needed to complete the report. POC agreed on the following timetable and procedure.

The completed report will be submitted to the Secretariat by Dec. 1, 1998. It will then be posted on the PICES web site or otherwise made available to POC members for review. Comments on the report are to be made to the Chairman of POC, with copy to the Secretariat, by January 13, 1999. Final approval for publication will be made by the Chairman of POC by January 31, 1999.

In addition, Dr. Mooers reported on the creation of a modern bibliography on the Japan/East Sea. This document will be available on the PICES web site and will be kept up to date under POC supervision with the assistance of the Secretariat. POC members thanked Drs. Mooers and Sang-Kyung Byun, Co-Chairmen of WG 10, as well as other members of the Working Group, for their work. It was agreed that WG 10 should be disbanded after completion of its report.

Dr. Yukihiro. Nojiri, Co-Chairman of WG 13, reported on progress. The WG, under the co-chairmanship of Drs. Nojiri and Richard Feely, held a meeting and technical discussions in Fairbanks on Oct. 14-15, 1998. Plans formulated by the WG are presented (attached in the POC Report) and were discussed by POC, which arrived at the following recommendations:

The POC Committee recommends that PICES support a technical workshop “to discuss results of inter-comparisons of measurement techniques and to initiate detailed technical exchange on measurement technique and data quality between scientists studying CO₂ in the North Pacific”. This workshop would be held in Japan, in April 1999. WG 13 Co-Chairmen would be responsible for its organization. The Committee supports the recommendation of travel assistance to Dr. Feely, as Co-Chairman of WG 13, to attend the JGOFS North Pacific Workshop in March 1999. The Committee also

expressed support for other initiatives of the WG. The idea of a data workshop in the year 2000 received support in principle, but will have to receive further justification and discussion at PICES VIII. Committee members agreed with the desirability of sampling the WOCE P1 line within a single year. Canadian participation in some of this work may be available.

Dr. Allen Macklin made a short presentation and answered questions on the Bering Sea Metadatabase.

Dr. Vyacheslav B. Lobanov (Russia) was elected by acclamation as the new Chairman of POC.

The structure of the draft Strategic Plan circulated by the Chairman was deemed generally acceptable with many useful suggestions about future POC directions. Particularly emphasized were:

- a. the need to keep POC interdisciplinary – in close contact with other PICES Scientific Committees as well as integrating the physics and chemistry of the ocean and the atmosphere over short and long time scales;
- b. development of scientific and technical basis for the forecasting of ocean conditions as the next stage in the progress of ocean sciences;
- c. the importance of broadening the focus of POC both within PICES countries and through the scientific disciplines (more chemists, paleo-oceanographers...) – bring new people to PICES meetings, invite prominent scientists from all over the world;
- d. PICES must continue to promote high quality science and communication among member countries;

These recommendations will be included in a revised version of the Strategic Plan for POC.

Prof. Steve C. Riser reported as POC observer at the recent CREAMS Workshop. CREAMS appreciates the support of PICES, especially in the matter of obtaining clearances to work in national waters. The resolution approved by PICES last year (1997 Annual Report, p 96) is re-affirmed. In addition, PICES ecological programs with the CCCC should be made aware of the extensive body of physical data about the Japan/East Sea to be gathered by CREAMS and their availability for ecosystem modeling.

Prof. Riser presented an overview of the Global Ocean Data Assimilation Experiment (GODAE) and its informational support, the Array for Real-time Geostrophic Oceanography (ARGO). U.S., European and Japanese groups are currently developing these programs. Assimilated data are to be freely available on the web. By 2003, the ARGO system is to consist of 3,000 PALACE floats deployed globally from ships of opportunity at a 300 km x 300 km resolution. GODAE and ARGO are to be components of GOOS. POC recommends that:

- a. PICES encourage member countries to create national committees to plan for participation in GODAE and ARGO;
- b. PICES encourage PICES members to make ARGO data and assimilation results from GODAE freely available to all users;
- c. An informational article on GODAE and ARGO be prepared for PICES Press.

Drs. Vyacheslav B. Lobanov and Yutaka Nagata reported that the Okhotsk Sea Multilingual Nomenclature was published as PICES Scientific Report #8. POC members applauded their successful efforts.

POC discussed a proposal to publish an annotated bibliography of the Japan/East Sea oceanography, prepared by Dr. Mikhail A. Danchenkov (Russia). The bibliography is very extensive, containing more than 1,100 references. Publication has the support of WG 10. POC recommends publication of the bibliography as a PICES Scientific Report, with distribution appropriate to demand.

New technology for airborne sensing of salinity, of low accuracy, but appropriate for coastal areas, is becoming available. Dr. David L. Musgrave plans to apply to a U.S. agency for funding for such a device (approx. \$500,000) and he requests PICES endorsement. After some discussion, POC agreed that the current Chairman would write a letter expressing general support for the use of such a device in coastal areas and possibility of application in many POC countries.

Following a request from the Secretariat for more scientific information on the PICES web page, Dr. Howard J. Freeland volunteered to help in this respect. He will liaise with the Secretariat to provide information and links to science programs for the web page.

Mr. Robin M. Brown briefly presented the TCODE proposal for a one-day data visualization workshop to be held before PICES VIII. POC enthusiastically supports this proposal.

The Second Okhotsk Sea Workshop will be held November 9-12, 1998, in Nemuro, Japan. To date, there are 23 participants from Japan, 13 from Russia and 2 from the U.S.A. Organizers expect a report including about 25 papers. POC supports the publication of the proceedings as a PICES Scientific Report. Manuscript submission deadline will be February 1, 1999, review and completion by May 1, 1999. The Committee members expressed their thanks to the organizers Drs. Vyacheslav B.

Lobanov, Yutaka Nagata, and Steve C. Riser.

The POC Committee supports the plans for the formation of an advisory group under the BASS Task Team on an iron fertilization experiment in the subarctic Pacific.

The POC Committee proposes to hold a symposium at PICES VIII entitled: "Modeling and prediction: the state of the art". Convenors will be Drs. Takeshi Uji (or designate) and David L. Musgrave. They are to invite prominent modelers and address a broad scale of problems.

17 nominations for best presentation were received. The nominee receiving most votes was Dr. Hisashi Nakamura for the presentation of his paper: H. Nakamura and T. Yamagata "Observed association between SST and atmospheric anomalies in the North Pacific decadal climate variability".

Technical Committee on Data Exchange – Mr. Robin M. Brown

The Committee met on October 18 and October 22 during the PICES Annual Meeting. Participation was fairly good, with representatives from each PICES nation. The Committee discussed a wide range of issues and developed a work plan for the 1998/1999 year. A detailed report was prepared and is summarized below:

Achievements since 1997 – PICES VI

The TCODE Inventory of Long Time Series and the list of Internet resources (on the PICES web site) were reviewed, updated and expanded.

TCODE and the CCCC-IP are working together to develop a data management plan for the CCCC Program. Little progress was made and this remains an important item for TCODE.

TCODE members have done a lot of 'networking' to develop linkages with data management components of other projects, including GOOS, NEAR-GOOS, GLOBEC-International, JGOFS, and the World Data Center-A for Oceanography.

Workplan for 1998/1999

TCODE intends to make additions and improvements to the web pages on Long Time Series and Other Internet Resources, based, in part, on contributions from other Committees and WGs. In addition, the Inventory of Long Time Series will be restructured to be consistent with new metadata standards (such as DIF, FDGC). The Committee also intends to undertake some 'promotion' of these offerings on the PICES web site, to ensure that maximal use is made of this information.

TCODE will work with the CCCC-IP, national GLOBEC committees to develop a data management plan that will ensure proper archiving and allow for exchange of GLOBEC data amongst the participants.

TCODE will assist:

- CCCC-IP MONITOR Task Team to assemble a detailed list of ongoing monitoring activities (by time and location).
- CCCC-IP BASS Task Team to identify planned cruises in the open North Pacific in order to allow for sharing of ship time and improved program integration.
- CCCC-IP MODEL Task Team in identifying sources of nutrient data that are not yet in international databases.

TCODE recommends that Science Board approve its plan to organize a one-day workshop on the use of scientific data visualization to integrate diverse, multi-dimensional datasets in conjunction with

PICES VIII in Vladivostok, Russia. The organizers of the workshop will be Dr. Bernard A. Megrey (U.S.A.), Dr. Igor I. Shevchenko (Russia) and Dr. Thomas C. Royer (U.S.A.). TCODE requests funds to support travel for two experts to provide 'keynote' demonstrations and/or presentations.

TCODE recommends that the following statement of concern be forwarded to Governing Council:

The Technical Committee on Data Exchange notes that improvements in national data management systems in PICES nations are imperative in order to properly support programs and activities of PICES (such as the CCCC Program) and other modern, interdisciplinary marine programs such as JGOFS, GLOBEC and GOOS. These improvements are required to:

- Ensure proper archival of the diverse datasets that support these programs.
- Provide mechanisms for the efficient inventorying and exchange of these data.

The Committee also notes that valuable datasets may be endangered by the retirement of investigators and the restructuring of government programs and advise that consideration of data integrity and preservation be included when research programs are re-structured.

Following rule changes, Mr. Brown agreed to serve a 3-year term as TCODE Chairman starting at the end of the Seventh Annual Meeting.

Implementation Panel on CCCC – Ms. Patricia Livingston

The CCCC-IP Panel met on Thursday, October 22, 1998. Agenda for the meeting is attached (Endnote 3). The meeting was

opened by the two CCCC-IP Co-Chairmen and the agenda was reviewed. An agenda item to discuss a CCCC web representative was added and the agenda item on national GLOBEC reports was omitted because GLOBEC representatives had previously provided their reports at the FIS-CCCC Topic Session. The Co-Chairmen discussed their activities of the previous year, including attendance at the GLOBEC International Open Science Meeting, design of the CCCC web pages, and regular provision of newsletter articles to the PICES Press, and the GLOBEC International newsletter. The Panel then heard reports of each of the Task Team accomplishments for 1998, and planned activities for 1999. The group accepted the proposal by Dr. C.S. Wong to add an advisory group under BASS to assist in the development and implementation of an iron fertilization experiment in the subarctic. The proposals developed by REX, MODEL, MONITOR, and BASS for workshops were discussed, revised, and accepted. It was noted that the first two weeks of April are not good for Japanese scientists to attend meetings or workshops due to the nature of the funding system and the school year. A recommendation was made to forward the Working Group 11 (Birds and Mammals) report to the MODEL Task Team for consideration and further action in deciding how to incorporate these data into upper trophic level models. The Panel received information about the current status of co-operation with other programs such as JGOFS, GLOBEC International, and the GOOS-LMR module. A recommendation was made and adopted that CCCC will nominate a representative from REX who will be the contact point to receive cruise information of CREAMS and other programs doing research in the Japan/East Sea region. Once received, this information will be posted on the PICES web site. Mr. Robin M. Brown presented a report on data management issues based on his attendance earlier in the year of a JGOFS

data management meeting. The Panel discussed the responses received from the letter sent earlier in the year from TCODE and CCCC to national GLOBEC committees about data management issues. Mr. Brown made the suggestion that the CCCC-IP wait for the results from JGOFS in their trial of a structured inventory system before making suggestions to national GLOBEC committees about a standard format for the inventory system. Mr. Brown agreed to notify the CCCC upon completion of the JGOFS trial whereupon TCODE and CCCC would consult and jointly recommend a strategy to the national GLOBEC programs in PICES nations. The CCCC/IP agreed to nominate one CCCC representative as a web representative of the program, who would oversee and coordinate the provision of scientific information for the PICES web site.

The PICES CCCC/IP recommended:

Publications

Publication of the 1998 MODEL, REX, and MONITOR workshops' proceedings in a single volume of the PICES Scientific Report Series.

Travel support

- PICES travel support for 1 outside expert to attend the MONITOR Workshop in Hakodate, Japan, just prior to PICES VIII;
- PICES travel support for 1 outside expert to attend the BASS Workshop;
- PICES travel support for one scientist each from China and Korea to attend the REX Workshop;

Approval of members

- Drs. David W. Welch (Canada) and Suam Kim (Korea) as the new CCCC/IP Co-Chairmen;
- Dr. William T. Peterson as REX Co-Chairman to replace Dr. Anne B. Hollowed;

- Drs. Gordon A. McFarlane (Canada) and Andrei S. Krovnin (Russia) as the new BASS Co-Chairmen;
- Drs. Michio J. Kishi (Japan) and Dan M. Ware (Canada) as the new MODEL Co-Chairmen;
- Drs. C.S. Wong, Paul J. Harrison, N. Price (Canada), M. Wells, K. Coale, R. Bidigare (U.S.A.), S. Takeda, M. Kiyono, H. Obata (Japan) as members of the BASS Advisory Committee on an Iron Fertilization Experiment.

Proposed Workshops and symposia for 1999

- BASS should hold a 2-day workshop to identify key research questions and opportunities for co-ordinated research on climate change in the subarctic North Pacific;
- MONITOR should hold a 2-day workshop in Hakodate, Japan, just prior to the PICES Annual Meeting to design an improved monitoring system based on the findings of the BASS Workshop;
- REX should hold a 2-day workshop just prior to the Annual Meeting in Vladivostok, Russia, to compare vital rates of herring and examine food web interactions with euphausiids;
- A 2-day workshop on "Regime Shifts and their identification" to be held on the west coast of North America in early September;
- A half-day Topic Session on "Recent Findings of GLOBEC and GLOBEC-like programs in the North Pacific" to be convened at PICES VIII.

Proposed workshops and symposia for 2000

- A 3-day workshop on "Prototype lower trophic level ecosystem model for comparison of different ecosystems in the North Pacific" to be held in Nemuro, Japan, in February;
- A 2-day ICES/PICES workshop on "Zooplankton Production Ecology" to be convened in Hawaii, U.S.A., in March.

Publication Study Group – Dr. Warren S. Wooster

A Publication Study Group (PSG) was established at PICES VI. Its terms of reference were to review questions on publication and translation policy, to consider the desirability of establishing a peer-reviewed publication and a PICES editorial board, to consider policy for distribution of PICES publications, and to review budgetary and other matters concerning PICES publications. PSG members are William G. Doubleday, Makoto Kashiwai, Paul H. LeBlond, and Warren S. Wooster.

The PSG recommends the following to the Science Board:

1. That a standing Publications Committee reporting to Science Board be established, with the terms of reference given to the PSG. Membership shall consist of one participant from each member country, selected by Science Board from members of PICES Scientific Committees, Working Groups, and Task Teams, together with an elected Chairman and a representative of the Secretariat. The Publication Committee will work inter-sessionally by correspondence and will convene during the Annual Meeting.
2. The present PICES publications, with the following responsibilities, should be continued by the Secretariat:
 - 2.1. *Annual Reports* - reports of Annual Meetings, including decisions of the Governing Council, reports of the Secretariat, Science Board, Finance and Administration Committee, and other documentation of the meeting, together with reports of Working Groups and other bodies, as appropriate.
 - 2.2. *Scientific Reports* - occasional publication of technical

reports of the findings or activities of Working Groups, Task Teams, and other PICES scientific bodies, as recommended by Science Board.

- 2.3. *PICES Press* - twice-yearly bulletin of news on PICES activities and personalities, including scientific reviews as appropriate, such as state of the ocean articles, but not refereed scientific papers.
3. The Publications Committee should explore the desirability and feasibility of publishing a peer-reviewed scientific journal to deal with all aspects of marine science within the purview and geographical sphere of PICES interest. The relative advantages and budgetary implications of publishing in-house or commercially should be examined, with a view to presenting a proposal to PICES VIII.
 4. The Publications Committee should examine the relative merits and costs of electronic publication and its applicability to PICES publication needs.
 5. The Publication Committee should recommend a policy for translation and dissemination of papers endorsed by Scientific Committees, Working Groups, or other appropriate PICES scientific bodies. The translation policy should take into account the need for such translations, the likely beneficiaries, the reasons why PICES should undertake them, how they might best be done, and at what cost. Translation priorities should be recommended by the Publication Committee.
- i. The Second Okhotsk Sea Workshop will be held Nov. 9-12, 1998, in Nemuro, Japan and co-convened by Drs. Vyacheslav B. Lobanov (Russia), Yutaka Nagata (Japan) and Steve C. Riser (U.S.A.). The opportunity for 10 Russian scientists to attend the meeting was developed combining Nemuro-city and PICES funds with financial support provided by Russian institutions.
 - ii. MODEL Workshop on Lower Trophic Level Modelling planned to be organized in California in March 1998, was cancelled. Instead, a small, invitation-only workshop was held Oct. 14-15, immediately prior to PICES VII (Fairbanks, Alaska, U.S.A.) and co-convened by Drs. Sinjae Yoo (Korea) and Richard Dugdale (U.S.A.). The purpose of this workshop was to bring together experts in lower trophic level models to discuss and evaluate the various ways of expressing nutrient uptake, grazing, and predation in these models. The workshop presentations and in-depth discussion of actual model runs using various combinations of key sub-models were combined. Discussions were focussed on issues relating to model comparison. The latter part of the workshop was devoted to activities and discussion of a nutrient database.
 - iii. MEQ (WG 8) Practical Workshop did not happen either in Jiazhou Bay (China) or Masan/Chinhae Bay (Korea). In both cases approval from the host country was not granted. Currently MEQ is requesting to hold an approximately two-week MEQ Practical Workshop in Vancouver, Canada, in May 1999.

Implementation of PICES VI Decisions

Science Board reviewed implementation of PICES VI decisions.

- a. Inter-sessional Workshops and Working Group Meetings (**97/S/1**)

- iv. Inter-sessional WG 12 meeting on the western side of Pacific was cancelled as consensus on a place was not achieved. A 4-day meeting was held Oct. 14-17, immediately prior to PICES VII in Fairbanks, Alaska.
- b. Relations with other Organizations and Programs (**97/S/2**)
- i. A draft Memorandum of Understanding (MOU) with the International Council for the Exploration of the Sea (ICES) prepared jointly by the PICES and ICES Secretariats was circulated to the Contracting Parties for review. MOU has been adopted and signed by PICES' Chairman on behalf of the Governing Council at PICES VII.
 - ii. The Secretariat contacted Dr. Bruce Leaman, Director of the International Pacific Halibut Commission (IPHC), to explore the possibility of developing an MOU with IPHC. A positive response was received indicating an aspiration to work on this issue in 1999.
 - iii. A draft MOU with the North Pacific Anadromous Fish Commission (NPAFC) was prepared by Canada and U.S.A., and circulated to other Contracting Parties with a request to consider if it will be possible to agree on the MOU at the Governing Council meeting during PICES VII. The MOU was adopted and signed by PICES' Chairman on behalf of the Governing Council at PICES VII, and will also be reviewed at the NPAFC Annual Meeting held Nov. 1-5, 1998, in Moscow, Russia.
 - iv. Dr. William G. Doubleday, the Chairman of PICES, wrote an endorsement letter to Circulation Research of the East Asian Marginal Seas (CREAMS) requesting an observer to the CREAMS planning meeting in February, 1998. Drs. Makoto Kashiwai (Science Board Chairman) and Steve C. Riser (POC member) represented PICES at the CREAMS planning meeting. The output from this meeting was reflected in the article written by Dr. Riser for the PICES Press (Vol. 6, No. 2). Council also accepted the CREAMS proposal to hold a Workshop in conjunction with PICES VII. The joint CREAMS-PICES Workshop convened by Dr. Kuh Kim (Korea) was held Oct.18, prior to PICES VII.
- c. Publications (**97/S/3**)
- i. Bering Sea: Physical, Chemical and Biological Dynamics review volume will be published by the end of 1998. All payments were transferred to Alaska Sea Grant and preparations for publication are at a final stage.
 - ii. Progress reports of WGs 8-12 and CCCC Task Teams (BASS, MODEL and REX) and the Report of the Study Group on PICES Communications were published in the 1997 Annual Report.
 - iii. Multilingual Nomenclature of Place and Oceanographic Names in the Region of the Okhotsk Sea was published as PICES Scientific Report No. 8. Publication costs were covered by the Marine Information Research Center (MIRC) and the Japanese Hydrographic Association. The document was also reprinted as MIRC Scientific Report No. 1.
 - iv. PICES CCCC REX 97 Workshop on the Development of cooperative

Research in Coastal Regions of the North Pacific was published as PICES Scientific Report No. 9.

- v. The revised PICES Handbook was published.
 - vi. Proceedings of the BASS Symposium on Ecosystem dynamics in the eastern and western gyres of the subarctic Pacific will be published in 1999 as a special issue of *Progress in Oceanography*,
 - vii. PICES WG 10 Report was not published due to the delay in finalizing the document.
 - viii. MODEL 98 Workshop was cancelled and the report was not published.
- d. Working Groups issues (**97/S/4** and **97/S/5**)

A new Working Group 13 on "CO₂ in the North Pacific" reporting to the POC Committee was established at PICES VI. Drs. Richard Feely (U.S.A.) and Yukihiro Nojiri (Japan) were appointed as Co-Chairmen. The first WG 13 meeting was held Oct. 14-15, just prior to PICES VII.

A new Working Group 14 on "Effective Sampling of Micronecton to Estimate Ecosystem Carrying Capacity" was established at PICES VI. Drs. Nikolay Parin (Russia) and Bruce Robison (U.S.A.) were appointed as Co-Chairmen. An organizational WG 14 meeting was held Oct. 19, at PICES VII.

- e. CCCC Program and CCCC Task Teams (**97/S/6**)

A new MONITOR Task Team reporting to the CCCC/IP was established at PICES VI. Drs. Yasunori Sakurai (Japan) and Bruce A. Taft (U.S.A.) were appointed as Co-Chairmen. The Task

Team organized a workshop on monitoring in the North Pacific to review existing monitoring activities of PICES member nations and to suggest improvements in the monitoring of the Subarctic Pacific to further understand the effects of climate variations on the marine ecosystems of the Subarctic North Pacific. The workshop was held on Oct. 16-17, immediately prior to PICES VII.

- f. Travel Support (**97/S/7**)

- i. Dr. Chang-Ik Zhang (FIS Chairman) attended SCOR WG 105 meeting in Hobart, Australia, in January 1998;
- ii. Ms. Patricia Livingston (CCCC-IP Co-Chairman) attended the First GLOBEC Open Science Meeting in Paris, France, in March 1998;

In addition, the following scientists were supported to participate in international meetings on behalf of PICES:

- iii. Drs. Paul H. LeBlond (POC Chairman) and W. Doug McKone (Executive Secretary) attended the planning meeting for the "El Niño and Beyond Symposium" in Seattle, U.S.A., in August 1998;
 - iv. Drs. Kenneth L. Denman (BIO member) and Alexander S. Bychkov (Assistant Executive Secretary) attended the JGOFS Equatorial Pacific Synthesis and Modelling Workshop in Seattle, U.S.A., in September 1998;
 - v. Mr. Robin M. Brown (TCODE Chairman) attended the JGOFS Data Management and Synthesis Workshop in Bergen, Norway, in September 1998.
- g. Co-sponsorship for the Pandalid Shrimp Symposium (**97/S/8**)

PICES joined the Northwest Atlantic Fisheries Organization (NAFO) and the International Council for the Exploration of Sea (ICES) as sponsor of a symposium on "Pandalid Shrimp Fisheries – Science and Management at the Millenium". The Symposium will be held September 8 – 10, 1999, in conjunction with the NAFO 21st Annual Meeting and during the 50th Anniversary of ICNAF/NAFO. Dr. J. Boutillier represents PICES as Co-Convenor together with Drs. P. Koeller (NAFO) and S. Tveite (ICES).

Implementation of 1997 Science Board Recommendations

Science Board reviewed the implementation of 1997 Science Board recommendations.

a. Review of Activities and Strategic Plans for Science Board and Scientific Committees

At the PICES Sixth Annual Meeting in Pusan, the Science Board proposed that all Chairmen prepare a draft review of activities during his/her term of office and a proposal of Strategic Workplan for the next three years for discussion at PICES VII. Dr. Kashiwai presented the Strategic Workplan for Science Board, and Science Board decided to include it in the Science Board Report as a working document. The Strategic Workplans for Scientific Committees were completed during the Committee business meetings and presented at the Science Board meeting. Science Board decided to attach these to each committee report as working documents.

b. Scientific Program and Schedule for PICES VII

Science Board recommendations on the program and schedule for the PICES Seventh Annual Meeting were

implemented successfully. For the first time:

- i. CCCC Program organized its own Topic Session (jointly with FIS);
- ii. PICES organized a joint Topic Session with another international program: POC/BIO Topic Session on "*Carbon Cycle in the North Pacific Ocean*", co-sponsored by JGOFS and LOICZ projects of IGBP;
- iii. All the Scientific Committee business meetings were scheduled simul-taneously for half a day.

c. Data Management for CCCC Program

Mr. Robin Brown (TCODE Chairman) and Ms. Patricia Livingston (CCCC/IP Co-Chairman) drafted a letter to each of the national GLOBEC programs in the PICES area to determine the status of their data management and exchange policies. The letter was distributed by the Secretariat to the National GLOBEC Committees and National GLOBEC representative on CCCC/IP-EC. Responses were received from Canada GLOBEC and US GLOBEC and reviewed at TCODE and CCCC-IP meetings during PICES VII. Summary of this discussion was reported to Science Board.

d. Guidelines for co-sponsorship

The Secretariat in consultation with Science Board has developed the guidelines for co-sponsorship and incorporated them in the Handbook for Chairmen and Convenors.

e. Recommendations of the Study Group on Communications

The implemented recommendations of the Study Group on Communications are listed below. A few recommendations concerning primarily

enhancements to the PICES communication system are in progress or under consideration.

To foster interdisciplinary communication and to ensure that information is distributed in a reliable, timely and equitable manner to participants in all Contracting Parties, the Secretariat keeps sending *all* PICES publications to *all* members of the Governing Council, Committees, Working Groups, and CCCC Program by *airmail* (Report of the Study Group, 4.1.5.1 & 4.1.5.2);

The list of libraries that receive the complete set of PICES publications will be reviewed by the end of 1998 and published in the upcoming volume of PICES Press to allow researchers to gain access to PICES publications through the most appropriate source within their country (4.5.1.4);

The Secretariat continues practice of receiving "orders" for PICES Reports and documents through the PICES web site (4.1.5.6);

Electronic versions of PICES Annual and Scientific Reports (except PICES Scientific Rep. No. 2) with graphics are assembled and accessible through PICES web site (4.1.5.7);

A special ftp area for group document editing was established on the PICES server (4.2.2.1);

To improve the content of the PICES web site, ideas and contributions were requested from the Science Board, Committees, Working Groups, and CCCC Program. Only TCODE Chairman (Robin Brown), Co-Chairmen of CCCC-IP (Pat Livingston) and CCCC MODEL Task Team (Ian Perry) worked

closely with the Secretariat to maintain material in their subject area (4.2.2.2);

A summary of the PICES Home Page contents and order form will be distributed with the upcoming issue of PICES Press (Vol. 7, No. 1) to allow users with limited WWW access to request printed versions of documents from the Secretariat (4.2.2.4).

Based on monitoring of PICES server usage a summary report was prepared by the Secretariat in consultation with TCODE (4.3.5.2).

PICES Eighth Annual Meeting

The Eighth Annual Meeting will be held in Vladivostok, the Russian Federation, in October 1998. The program of the meeting will include sessions of invited and contributed papers organized by the indicated committees on the following topics:

a. Science Board Symposium

"Regime shifts: The what, where, when, and why". Co-convenors: Steven R. Hare (U.S.A.), Shoshiro Minobe (Japan) and Warren S. Wooster. Session will be organized to review the physical and biological characteristics of regime shifts, the extent to which various elements of the ecosystem were (were not) affected, the special distribution of effects, and to determine whether there were precursors of these shifts that, in hindsight, could have been identified.

b. Topic Sessions

(POC) *Modeling and prediction: the state of the art.* (one-day session) Co-convenors David L. Musgrave (U.S.A.) and Nobuo Suginojara (Japan);

(MEQ/BIO) *Coastal pollution - eutrophication, phytoplankton dynamics, and*

harmful algal events; (one-day session)
Co-convenors TBA;

(MEQ) *Ecological impacts and mitigation of oil spills and oil exploration*. (half-day session) Co-Convenors will be Kwang-Woo Lee (Korea) and Alexander V. Tkalin (Russia);

(FIS) *GLOBEC and GLOBEC-like studies and fisheries management*. (1-day session) Co-Convenors will be Tokio Wada (Japan) and TBA, and Gordon H. Kruse will be the interim contact with a possibility to seek co-convenors from all six countries);

(BIO/CCCC) *Recent findings of GLOBEC and GLOBEC-type programs in the North Pacific* (1-day session). Co-convenors will be Vladimir I. Radchenko and Mark D. Ohman.

c. **Workshops and Working Group Meetings just prior to PICES VIII**

2-day REX Workshop on “*Herring and Euphausiids*”. Co-Convenors: William T. Peterson (U.S.A.), Vladimir I. Radchenko (Russia) and Tokio Wada (Japan) (see **Decision 98/S/2c**);

2-day BASS Workshop on Development of a Conceptual Model for the Subarctic North Pacific Gyres (Co-Convenors: Gordon A. McFarlane (Canada) and Andrei S. Krovnin (Russia) (see **Decision 98/S/2a**);

2-day MONITOR Workshop. Co-Convenors: Yasunori Sakurai (Japan) and Bruce A. Taft (U.S.A.) (see **Decision 98/S/2b**);

1-day Workshop on *Application of the Scientific Visualization to the Analysis of Marine Ecosystem*. Co-Convenors: Bernard A. Megrey (U.S.A.), Thomas C.

Royer (U.S.A.) and Igor I. Shevchenko (Russia);

1-day Working Group 8 (Practical Assessment Methodology) meeting;

2-day Working Group 13 (CO₂ in the North Pacific) meeting;

2-day Working Group 14 (Micronekton) meeting.

Proposed Inter-sessional Meetings 1999-2000

Science Board reviewed the proposed inter-sessional meetings and recommended that the following meetings are to be convened (see **Decision 98/S/1, 98/S/2d**):

1999

- a. 2-week MEQ Practical Workshop in Vancouver, Canada, in May 1999;
- b. 4-day WG 13 Technical Workshop in Tsukuba, Japan, in April 1999, to discuss results of intercomparisons of measurement techniques and to initiate detailed technical exchange on measurement technique and data quality between scientists studying CO₂ in the North Pacific;
- c. 2-3 day Working Group 12 meeting in the People's Republic of China in August or early September 1999;

2000

- d. 4-day conference “*Beyond El Niño: A conference on Pacific climate variability and marine ecosystem impacts, from the Tropics to the Arctic*” in La Jolla, U.S.A., in March 2000, with IPHC, IATTC, ISC, and possibly other marine organizations (see **Endnote 4**). Drs. Paul H. LeBlond and Warren S. Wooster will serve as Co-Chairman of the Steering Committee on behalf of PICES;
- e. 2-day joint workshop on “*Zooplankton production ecology*” in Hawaii, U.S.A., in

late April/early May 2000, with ICES. Dr. Tsutomu Ikeda (BIO Chairman-elect) will represent PICES serving as Co-Convenor;

- f. 3-day workshop on “*Prototype Lower Trophic Level Ecosystem Model for Comparison of Different Marine Ecosystem in the North Pacific*” in Nemuro, Japan, in early 2000.

PICES Publications

- a. Science Board reviewed a list of proposed publications and made recommendations (see **Decision 98/S/3**).
- b. Science Board reviewed POC Committee's proposal to publish Bibliography on the Japan/East Sea in the PICES Scientific Report Series, and decided to (with author Dr. Mikhail A. Danchenkov's approval) instead place on the PICES Home Page and provide printed copies upon request.
- c. Science Board accepted the proposal of the Study Group on Publication to establish a standing Publication Committee reporting to the Science Board (see **Decision 98/S/5**).

SB referred the Korean proposal to publish proceedings from Annual Meetings to the Publication Committee as the first order of business.

Proposed new Committees and Working/Study Groups

Science Board discussed the future of the existing Working and Study Groups and recommended (see **Decision 98/S/4**):

- a. WG 10 on “Circulation and ventilation in the Japan/East Sea” be disbanded in spring 1999 after the POC Committee's approval of the publication of the final

report.

- b. WG 11 on “Consumption of marine resources by marine mammals and seabirds” continue its work for one more year. Simultaneously, a new Study Group to propose ways to incorporate marine birds and mammals expertise into the PICES structure and activity was established. Members are Ms. Patricia Livingston (SB), Drs. Patricia A. Wheeler (BIO), Warren S. Wooster, David W. Welch and Suam Kim (CCCC), George L. Hunt and Hidehiro Kato (WG 11).

Terms of Reference

- 1. Intersessional communication to formulate a plan for incorporation of marine birds and mammals into the PICES structure and activities.
 - 2. Nominate 4 marine mammal and 4 marine bird experts to serve on CCCC Task Teams and be invited to attend PICES VIII.
 - 3. Convene at PICES VII to finalize recommendation and submit to BIO, CCCC and SB.
- c. Revised terms of reference for WG 14 were expanded to include the ecological role of micronekton in addition to sampling methods, and were approved.
 - d. CCCC-IP proposed to establish an Advisory Group (under BASS/CCCC-IP) on “An Iron Fertilization Experiment in the Subarctic Pacific Ocean” (see **Endnote 5** for rationale). Members are: Drs. C.S. Wong, Paul J. Harrison, N. Price (Canada), M. Wells, K. Coale, R. Bidigare (U.S.A.), S. Takeda, M. Kiyono and H. Obata (Japan).

Proposed travel support

Science Board recommends that Governing Council approve financial support for the

following scientists to participate in scientific meetings (see **Decision 98/S/6**).

- a. Dr. Chang-Ik Zhang (FIS Chairman) to attend a joint SCOR WG 105 and ICES symposium on *The Ecosystem Effect of Fishing* in Montpellier, France, in March 1999 (partial support);
- b. two outside experts to provide keynote demonstration and/or presentation at the TCODE Workshop on "*The Application of Scientific Visualization to Marine Ecosystem Analysis*" in conjunction with PICES VIII in Vladivostok;
- c. two scientists to attend the REX Workshop on "*Herring and Euphausiids*" immediately prior to PICES VIII;
- d. one invited speaker for the CCCC-related scientific sessions at PICES VIII.

Relations with other Organizations and Programs

- a. The Science Board, recognizing the importance of the proposed array for Real-time Geostrophic Oceanography (ARGO) and the Global Ocean Data Assimilation Experiment (GODAE) as tools for ocean current measurement and interpretation, and the desirability of sharing the resulting information, recommends that:
 - i. PICES member countries create appropriate structures (such as national committees, or GOOS sub-committees) to consider and prepare for participation in GODAE and ARGO.
 - ii. That data from ARGO and assimilation results from GODAE originating from PICES member countries be made generally

available to all ocean scientists (e.g., on the web).

- b. The Executive Secretary Dr. McKone notified Science Board on progress of developing MOUs, with ICES, NPAFC and IPHC. Memorandum of Understanding between PICES and NPAFC, and PICES and ICES were prepared, approved and signed by Council, and circulated to these respectable Organizations.
- c. Chairman of FIS Committee, reported on relation between PICES and SCOR WG 105 on "The Impact of World Fisheries Harvests on the Stability and Diversity of Marine Ecosystem".

1998 Science Board Best Presentation Award

The Science Board reviewed the current Best Presentation Award practice (one award for each Scientific Committee and one for Science Board) and recommended one more award for the CCCC Implementation Panel starting from the Seventh Annual Meeting. The Secretariat should find additional funds (\$50-70 CND) to support this practice.

The "Best Presentation Award" was made on the basis of nominations received from the audience at the Science Board Symposium. The winner was Dr. Cynthia Tynan (U.S.A.) for the paper entitled "*Redistributions of cetaceans in the southeast Bering Sea relative to anomalous oceanographic conditions during the 1997 El Niño*".

Other business

No other business was put forward for discussion.

Science Board recommendations

Discussion of Scientific and Technical Committee, Working Group and the CCCC Implementation Panel reports along with other issues led to a set of Recommendations for presentation to Governing Council for approval (see *Appendix (A)* to Council Report, **Decisions of Council**).

Closing remarks

Dr. Kashiwai thanked the out-going Science Board members for the work they have done and expressed how much he enjoyed serving as the Science Board Chairman and working with them. He welcomed the new Chairman and members of the Science Board and wished them success in achieving goals of the Organization. The Science Board members warmly thanked Dr. Kashiwai for his effective leadership.

Scientific Program

An interdisciplinary one-day Symposium was organized by the Science Board to review the effects of the 1997/98 El Niño on the physical, chemical and biological state of the northern North Pacific Ocean. The object will be to establish a list of impacts that the climate anomaly has had on the ocean extending all of the way through the ecological system from the physics, to the plankton biology and onwards to the fisheries. The following papers were presented and Dr. Cynthia Tynan (U.S.A.) won the Best Presentation Award for this session.

The impacts of the 1997/98 El Niño event on the North Pacific Ocean and its marginal seas. Co-convenors: Howard J. Freeland (Canada), William T. Peterson (U.S.A.) and Al Tyler (U.S.A.)

James J. O'Brien (invited speaker). The big picture in the North Pacific in 1997-98

- James E. Overland, J.M. Adams & N.A. Bond. Atmospheric anomalies in 1997: links to ENSO?
- Robert L. Smith, A. Huyer, P.M. Kosro & J.A. Barth. Observations of El Niño off Oregon: July 1997 to present
- William R. Crawford, J. Cherniawsky, M. Forman & P. Chandler. El Niño sea level signal along the west coast of Canada
- Howard J. Freeland & R. Thomson. The El Niño signal along the west coast of Canada - temperature, salinity and velocity
- Thomas C. Royer & T. Weingartner. Coastal hydrographic responses in the northern Gulf of Alaska to the 1997-98 ENSO event
- Henry J. Niebauer. ENSO events and "regime shifts" in the North Pacific and Bering Sea
- Vladimir I. Ponomarev, V.Yu. Arhipchuk & E.I. Ustinova. The ENSO signal in the north west Pacific
- Andrei S. Krovnin, G.P. Vanushin, M.Yu. Kruzhalov, M.A. Bogdanov, B.N. Kotenev & V.V. Maslennikov. The state of the far east seas during the 1998/98 El Niño event
- William T. Peterson. Hydrography and zooplankton off the central Oregon coast during the 1997-1998 El Niño event
- Patricia A. Wheeler & Jon Hill. Biological effects of the 1997-98 El Niño event off Oregon: nutrients and chlorophyll distributions
- Frank Whitney, D. Mackas, D. Welch; M. Robert. Impacts of the recent and past El Niño events on nutrient supply, primary production and plankton distribution off the B.C. coast
- Stacy L. Smith & S.M. Henrichs. Phytoplankton collected by a sediment trap deployed in the middle shelf domain of the southeast Bering Sea during 1997
- Kristen L.D. Milligan, C.D. Levings & R. DeWreede. Data compilation and preliminary time series analysis of

abundance of a dominant intertidal kelp species in relation to the 1997/1998 El Niño event

G.A. McFarlane & R.J. Beamish. Large numbers of sardines return to British Columbia waters

Cynthia T. Tynan. Redistributions of cetaceans in the southeast Bering Sea relative to anomalous oceanographic conditions during the 1997 El Niño

Akihiko Yatsu, J. Mori, H. Tanaka, T. Watanabe, T. Meguro, Y. Kamei & Y. Sakurai. Stock abundance and size compositions of the neon flying squid in the central north Pacific Ocean during 1979-1998

Oleg B. Feschenko. New point of view on

El Niño mechanism

Skip M. McKinnell. Did Canadian sockeye invade the United States?..Another story from the 1997 El Niño

Craig McNeil, D. Farmer & M. Trevorrow. Dissolved O2 and N2 measurements at Station P4 during the 97-98 El Niño

Kenneth H. Morgan. Impact of the 1997/1998 El Niño on seabirds of the N.E. Pacific

Vadim P. Pavlychev. Sharp changes of hydrometeorological conditions in the northwestern Pacific in period of 1997/1998 El Niño event

John Piatt & D. Roseneau. Biological effects of the 1997/1998 El Niño in Lower Cook Inlet, Alaska

Endnote 1

Participants

Makoto Kashiwai (Chairman, Science Board)
Patricia Wheeler (Chairman, BIO)
Chang-Ik Zhang (Chairman, FIS)
John E. Stein (Chairman WG 8) for Richard F. Addison (Chairman, MEQ)
Paul H. LeBlond (Chairman, POC)

Other

Robin M. Brown (Chairman, TCODE)
Yutaka Nagata (Co-Chairman, CCCC/IP)
Patricia Livingston (Co-Chairman, CCCC/IP; Chairman-elect, Science Board)

William G. Doubleday (Chairman, PICES)
Warren S. Wooster (*ex-officio* Council member, PICES)
W. Doug McKone (Executive Secretary, PICES)
Alexander S. Bychkov (Asst. Executive Secretary, PICES)
Tokio Wada (Japan)
Ming-Yu Zhou (People's Republic of China)
Igor I. Shevchenko (Russia)
Alexander V. Tkalin (Chairman-elect, MEQ)

Endnote 2

Science Board Agenda October 18 and 24, 1998

1. Welcome and Opening Remarks
2. Adoption of Agenda
3. Election of Science Board Chairman
4. Chairmen's Handbook
5. Reports of the Scientific and Technical Committees, CCCC IP, Working and Study Groups
 - Biological Oceanography Committee
 - Fishery Science Committee
 - Marine Environmental Quality Committee
6. Physical Oceanography and Climate Committee
7. Technical Committee on Data Exchange
8. CCCC Implementation Panel
9. Publication Study Group
10. Implementation of PICES VI Decisions
11. Implementation of 1997 Science Board Recommendations
12. Scientific Program for PICES Eighth Annual Meeting

9. Proposed Inter-sessional PICES Meetings/ 1998-2000
10. Proposed Publications/1998-1999
11. Proposed New Committees and Working/Study Groups
12. Proposed Travel Support
13. Relations with Other International
14. 1998 Science Board Best Presentation Award
15. Other Business
16. Summary of Science Board Recommendations
17. Closing Remarks

Notes for Consideration under SB Board Agenda Items

4. Chairmen's Handbook
The Executive Secretary will provide a report on the final draft of the Chairmen's Handbook and consistency of these guidelines with the proposed changes to Rules of Procedure
5. Reports of the Scientific and Technical Committees, CCCC IP and Publication Study Group
 - 1998 Accomplishments
 - 1999 Planned Activities
 - Recommendations to Science Board
6. Implementation of PICES VI Decisions
 - Inter-sessional Workshops and Working Group Meetings (96/S/1)
 - Relations with other Organizations and Programs (96/S/2)
 - Publications (97/S/3)
 - Working Groups issues (97/S/4 and 97/S/5)
 - CCCC Program and CCCC Task Teams (96/S/6)
 - Travel Support (97/S/7)
 - Co-sponsorship for the Pandalid Symposium (97/S/8)
7. Implementation of 1997 Science Board Recommendations
 - Review of Activities and Strategic Plans for Science Board and Scientific Committees
 - Scientific Program and Schedule for PICES VII

- Data Management for CCCC Program
 - Guidelines for co-sponsorship
 - Recommendations of the Study Group on Communication
8. Scientific Program for PICES Eighth Annual Meeting
 - Science Board Symposium
 - Topic Sessions
 - Workshops and Working Group Meetings prior to PICES VIII
 - Schedule for 1999 Annual Meeting
 9. Proposed Inter-sessional PICES Meetings/1998-2000
 - Second Okhotsk Sea Workshop (November 1998, Nemuro)
 - MEQ Practical Workshop (summer 1999)
 - El Niño and Beyond (February 2000)
 - 1998 Decisions
 10. Proposed Publications/1998-1999
 - Chairmen's Handbook
 - Proceedings of 1997 Science Board CCCC/BASS Symposium (Progress in Oceanography)
 - Proceedings of 1998 Science Board Symposium on 1997/98 El Niño Event
 - Proceedings of the Second Okhotsk Sea Workshop
 - Proceedings of the MODEL, REX and MONITOR Workshops
 - Bibliography on the Japan/East Sea
 11. Proposed New Committees and Working/Study Groups
 - Publication Committee
 - Working Group on Subarctic Iron Fertilization/SF6 Tracer Experiment
 - Study Group on Marine Mammal and Seabird Ecology
 13. Relations with Other International Organizations and Programs
 - ICES and ICES GLOBEC
 - NPAFC
 - IPHC
 - GOOS and LMR Panel of GOOS
 - IGBP GLOBEC and IGBP JGOFS

Endnote 3

Composite Agendas of Scientific and Technical Committee Meetings

Biological Oceanography Committee

October 22, 13:30-17:30

1. Welcome to new members and attendees (Wheeler)
2. Approval or modification of agenda
3. Comments on Draft Strategic Plan (Wheeler)
4. BIO contact for PICES web page
5. PICES/ICES co-sponsorship of workshop on zooplankton ecology
6. PICES sponsored conference on El Nino and Beyond
7. Working Group 14 Micronekton Report. (Brodeur)
8. Advisory panel on Iron Fertilization Experiment (Harrison)
9. Election of new chairman for BIO (PICES Secretariat)
10. Proposed Data Visualization Workshop (TCODE, Brown)
11. Update on Bering Sea Ecosystem Metadata Base (Macklin)
12. 1998 Best Presentation Award
13. Working Group 11 Marine Birds and Mammals Report (Hunt)
14. 1999 Session Topics
15. Draft of report to Science Board

Fishery Science Committee

October 22, 13:30-17:30

1. Discussion and approval of agenda.
2. Review of the implementation of PICES VI decisions
 - 2.1 Review and comment the WG12 Report (97/S/1d)
 - 2.2 Relations with other organizations and program (97/S/2c)
 - 2.3 Publications of reports (97/S/3a, b)
 - 2.4 Future of Working Groups (97/S/3a, b)
 - 2.5 CCCC Program and CCCC Task Teams (97/S/6a, b)
 - 2.6 Travel support (97/S/7a)

2.7 Co-sponsoring and Pandalid Shrimp Symposium (97/S/8)

3. Scientific items of the interests
 - 3.1 Review of scientific activity in the CCCC Program and the reports of REX, BASS and MODEL
 - 3.2 FIS role in the CCCC Program and the international GLOBEC
 - 3.3 SCOR WG 105 activity (97/S/7a)
 - 3.4 Review the work at PICES WG 12, and discussion of the WG recommendation for the next year
 - 3.5 Relationship with regional fisheries organizations or commissions
 - 3.6 Possibility to establish another working group
4. Proposals for the session topic for PICES VIII
5. Discussion of Best Presentation Award from FIS
6. Discussion of any other arising issues
7. Draft of report to Science Board

Marine Environmental Quality Committee

October 22, 13:30-17:30

1. Opening and Introduction of Members (All)
2. Minutes of MEQ business meeting, PICES 5 (M. Watson)
3. Business arising from Item 2
4. Report of WG 8, PICES VI (J. Stein)
 - (a) Proposal for Practical Workshop in Vancouver (R. Addison and C. Levings)
 - (b) Other WG 8 business
5. Report on MEQ scientific sessions (J. Stein and R. Addison)
6. Proposals for future MEQ scientific sessions (All)
7. Update on GIWA proposal (R. Addison)
8. Election of MEQ Chairman
9. Any other business

Physical Oceanography and Climate Committee

October 19, 11:00-12:00 and October 22, 13:30-17:30

Oct. 19 Part 1.

1. WG-10 report (Byun, Mooers)
2. WG 13 progress report (Nojiri)

Oct. 22 Part 2.

2. Other agenda items:
 - 2.1 Bering Sea Metadata Base
 - 2.2 Election of new Chairman
 - 2.3 POC Strategic plan: How should POC be most effective at monitoring and influencing scientific developments?
 - 2.4 PICES/POC-CREAMS relations (Riser, Kuh Kim)
 - 2.5 GODAE and ARGO (Riser)
 - 2.6 Okhotsk Sea Nomenclature (Lobanov)
 - 2.7 Japan/East Sea Bibliography
 - 2.8 Airborne salinity sensor (Masgrave)
 - 2.9 Contact for the PICES web page
 - 2.10 Data Visualization Workshop (Brown)
 - 2.11 Nemuro Okhotsk Sea Workshop (Lobanov)
 - 2.12 Iron Fertilization Experiment (Wong)
 - 2.13 Future symposia/Working Groups
 - 2.14 Best presentation award
 - 2.15 Other business

Bering Sea Metadatabase (Megrey, Brown)

- 2.4 Assistance with loading entries into the Bering Sea Metadatabase (Megrey)
- 2.5 Assemble descriptions of monitoring programs for the 1997/1998 El Niño (Brown)
3. Updates on data management activities in PICES nations:
 - 3.1 Canada
 - 3.2 China
 - 3.3 Japan
 - 3.4 Korea
 - 3.5 Russia
 - 3.6 U.S.A
4. TCODE and other PICES Committees
 - 4.1 MODEL Task Team - Sources of High Quality Nutrient data
 - 4.2 CCCC-IP - National GLOBEC data management plans
 - 4.3 MEQ - entries in the Inventory of Long Term Time Series
 - 4.4 WG11 - Marine Birds and Mammals
5. Other Activities Relevant to TCODE
 - 5.1 NEAR-GOOS (Nagai)
 - 5.2 JGOFS - North Pacific Task Team (Brown)
 - 5.3 GLOBEC Program Office - Data Management Activities
6. Organization Details
 - 6.1 Revised rules for PICES Committees
7. TCODE Workplan for 1998

Technical Committee on Data Exchange

October 18, 09:00-17:30; October 22, 13:30-17:30

1. Introduction of Members
2. Review progress on items in the 1997 Workplan
 - 2.1 Updates and additions to the Long Term Time Series Dataset Inventory
 - 2.2 Improvements and extensions to List of Other Internet Resources
 - 2.3 Progress on merging the Inventory of Long Term Time Series with the

CCCC Program / Implementation Panel

October 18, 13:30-17:30

1. IP Co-Chairmen Reports
 - 1998 activities
2. Task Team Progress Reports
 - 1998 accomplishments
 - 1999 planned activities
 - Recommendations for Science Board
3. Status of cooperation with other programs
 - IPHC

- ICES GLOBEC
 - IGBP GLOBEC
 - NPAFC
 - JGOFS
 - LMR-GOOS
4. Other issues
- Status of national GLOBEC Programs of PICES member nations
 - Data management issues and recommendations
 - ICES/PICES workshop on zooplankton production ecology
 - Backward facing workshop on regime shifts
 - North Pacific Iron Fertilization Experiment
 - CREAMS
 - Contact for PICES web page
 - CCCC-IP composition

Endnote 4

Beyond El Niño: A conference on Pacific climate variability and marine ecosystem impacts, from the Tropics to the Arctic

The very strong El Niño of 1997-1998 has stimulated interest in the effect of such events on longer term changes in the ocean and on the response of marine ecosystems and ultimately of marine fisheries. The Conference, tentatively scheduled for April 2000, will look at interannual, decadal, and interdecadal scales of variability in the Pacific from the tropics north to the Arctic. In each case, it will review the evidence for variability, the consequences of such variability, the mechanisms of interaction

with the ecosystems, and the implications for fishery production and management. It will also examine the impacts of human activities on our ability to detect and interpret these effects. Preference will be given to papers that deal with synthesis of observations and elucidation of mechanisms. Participation of scientists from countries around the Pacific Basin will be welcomed.



An informal planning group met in Fairbanks on October 20, to discuss further development of plans for the proposed conference described in the above summary description. Participants were:

- PICES: William G. Doubleday, Paul H. LeBlond, W. Doug McKone, Warren S. Wooster
- IPHC: Steven Hare

Representatives of other sponsoring organizations, IATTC and ISC, were not able to attend. An observer from NPAFC, Ms. Hiroko Omori, was present for the discussions.

Recommendations of the earlier discussions, on August 12, 1998, in Seattle,

were reaffirmed, some being repeated below, and agreement was reached on the followings matters:

Sponsorship: A report on planning progress and an invitation to sponsor the conference should be forwarded to NPAFC in time for consideration at its next meeting (starting November 1). An approach had been made to SCOR seeking its sponsorship, and decisions of PICES VII concerning the conference should be provided to SCOR promptly. Initial discussions have been held with IOC and FAO, and these should be followed up. An approach should also be made to CLIVAR.

Venue and time required: The preferred

time for the conference is during the first half of April 2000, the preferred place La Jolla, California, at the Scripps Institution of Oceanography (SIO). The breadth of subject coverage would seem to require a conference of four-days' duration.

Costs: The PICES Secretariat should prepare an estimated budget, with alternative scenarios on the level of supporting participant travel and expenses. The estimates can be used to seek financial support for the conference from its sponsors and other sources, the level of available support determining which scenario to apply.

Steering Committee: Drs. LeBlond and Wooster agreed to continue as Co-Chairmen. If NPAFC agrees to co-sponsor the conference, it should be invited to designate a member. A local arrangements committee will be required in La Jolla, and a representative of SIO should be asked to designate a member along with those from IATTC and the Southwest Fisheries Science Center (SWFSC).

Structure of conference: With a four-day conference, one half-day would be devoted to opening and keynote lecture(s) and to the summary by a panel made up of convenors. The conference would consist of four sections:

- evidence for the variability
- consequences of that variability
- mechanisms of interaction with the ecosystems
- implications for fisheries

Each of these sections would deal with the subject matter at the three scales (event/ interannual, decadal, interdecadal/ regime

shift). As proposed at the earlier planning meeting, there should be no concurrent sessions. Contributions would be reviewed by convenors and selected for oral and for poster presentation. Preference for oral presentation would be given to papers dealing with synthesis of observations and elucidation of mechanisms.

Selection of convenor: Careful identification and recruitment of appropriate convenors representing the principal disciplinary areas and geographical regions is essential to success of the conference. The Steering Committee will seek suggestions from the Science Board and the sponsoring organizations and will agree on those to be approached before the end of the year.

Publication (from previous discussions): Selected papers from the conference should be published, preferably in an established professional journal that accepts conference papers - examples included *Fisheries Oceanography*, *Progress in Oceanography*, *Fisheries Research*, and special publications of the *Canadian Journal of Fisheries and Aquatic Sciences*. The convenors would serve as guest editors of such a publication.

Announcement and publicity: The meeting would be announced by PICES, through its web page and through mailouts and journal announcements by PICES and the other sponsoring organizations.

The Steering Committee seeks the agreement and support of Science Board and the Governing Council for its continuing work which will be conducted for the most part by correspondence (e-mail).

Endnote 5

Working Group: An Iron Fertilization Experiment in the Subarctic Pacific Ocean

Rationale: Iron fertilization of HNLC (High nutrients low chlorophyll) water is one possible approach to remove CO₂ from the atmosphere to combat global warming caused by GHGs. Natural iron fertilization has been hypothesized to control glacial/interglacial shift in atmospheric CO₂. Iron fertilization experiments were repeatedly done in the equatorial Pacific under the programs IRONEX I and II, and recently in the Southern Ocean. The subarctic Pacific, with different biology and unique water structure (e.g. strong pycnocline, fresher mixed layer) from the other two regions, is the only HNLC region without such experiment to assess the CO₂ removal question related to iron.

This proposed working group under PICES will have the following terms of reference:

1. Examine the reasoning for a subarctic iron experiment

2. Examine the scale, disciplines, and resources (personnel and ships) required ensuring success
3. Design the experiment and its timing, particularly, the suite of chemical measurements and forms of iron, the biological parameters, the tracking of the spread of iron-induced bloom using SF₆ tracer.

The membership for the Working Group may be benefited from expertise of S. Takeda, M. Kiyono (Japan), P. Harrison, N. Price, C.S. Wong (Canada), K. Van Scoy, Mark Wells (U.S.A.), subjected to national nominations for PICES and not necessarily limited to the above.

PROPONENT: C.S. Wong (IOS, Canada)

CO-PROPONENT: S. Takeda (CRIEPI, Japan)