

# **NORTH PACIFIC MARINE SCIENCE ORGANIZATION (PICES)**

ANNUAL REPORT

FOURTH MEETING

QINGDAO, PEOPLE'S REPUBLIC OF CHINA

OCTOBER 16 - 22, 1995

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# AGENDA

## FOURTH ANNUAL MEETING October 16 - 22, 1995

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### Opening Session

1. Address of welcome were given by Mr. Zhang; Deputy Minister of the Ministry of Agriculture, Mr. Yang, Vice Director of the State Oceanographic Agency; Mr. Sun, Deputy Director of the National Natural Science Foundation; and Mr. Zhou, the Vice-Mayor of Qingdao.
2. Remarks by the Chairman.
3. Remarks by representatives of contracting parties.
4. Announcements.
5. Keynote lecture by Prof. Ji-Lan Su: *Kuroshio and the East China Sea Circulation*.

### Governing Council

1. Preliminary report on administration.
2. Relations with other international organizations and observers from such organizations.
3. Membership and observers from other countries.
4. Election of Vice-Chairman.
5. Appointment of new Assistant Executive Secretary in 1996.
6. Report of Finance and Administration Committee.
7. Audited accounts for financial year 1994.
8. Estimated accounts for financial year 1995.
9. Budget for financial year 1996.
10. Forecast budget for financial year 1997.
11. Trust Fund.
12. Other funds held.
13. Report and recommendations of Science Board.

14. Future meetings of the organization and subsidiary bodies, including time and place for the Fifth and Sixth Annual Meetings.
15. Any other business.
  - a. Representation at the F & A meetings and notification procedures
  - b. Funding sources for the Trust Fund
  - c. Quality of scientific communications during presentations at meetings

## REPORT OF OPENING SESSION

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The meeting of October 16 was called to order by the Chairman, Dr. Warren S. Wooster, who welcomed all delegates, observers and researchers to the Fourth Annual Meeting. Dr. Wooster called on Vice Minister Yan-Xi Zhang of the Ministry of Agriculture to make a statement on behalf of the Chinese Government.

*I would like to thank Dr. Wooster for the kind introduction. I am exceedingly honored to be able to deliver a speech on behalf of China, the host of the Fourth Annual Meeting of the North Pacific Marine Science Organization, held here in Qingdao. The present meeting includes two new member nations, the Russian Federation and the Republic of Korea. I wish to express my warm congratulations to them. And, on behalf of the Chinese government, I am very pleased to extend my warm welcome to all the delegates, especially those colleagues who have come from afar to participate in the meetings.*

*The Chinese government has always supported bilateral and multilateral exchange and cooperation in science and technology with all the countries in the world. Today, environment deterioration, energy shortage and other problems have caused concerns for the world as they threaten human life. As we all know, the environment was the major subject of the Non-Governmental Organization (NGO) Forum of the Fourth World Women Conference recently held in Beijing. To solve these problems, there needs to be a wide range of international cooperation as well as mutual exchange of scientific and technical personnel, information and data.*

*The ocean and sea occupy more than 70% of the total surface area of the earth and they have a close relationship with human*

*existence. Human beings have put a lot of time, energy and financial resources into marine scientific research. Inputs of these kinds will increase in the future and many global marine research projects, such as the Global Ocean Ecosystem Dynamics and Global Ocean Observation System, are bilateral and multilateral cooperative projects that require participation by scientists from different countries.*

*The North Pacific sea waters play an important role in the global environment and climatic changes. In March 1992, the North Pacific Marine Science Organization was set up in order to establish an international science organization that is open to all countries along the coastal area, commonly promoting and coordinating scientific research on sea waters and to increase knowledge about the biological resources of the North Pacific ocean and adjacent sea waters. This research is aimed at not only the ocean environment, but also the interaction of sea, land, meteorology and their effect on the global climate and climatic change, and the effect on the fauna and flora and ecology and the utilization of resources, as well as the effect of human activities on the oceans. Though this Organization has existed for only 3 years, it has accomplished a lot in a short time.*

*China, as a coastal nation of the North Pacific, is one of the major world marine fishing counties which has actively participated in all related activities of this region. Under the circumstances of limited available land resources, making full use of the oceans will be an area of future development potential. Therefore, research on protection of the oceans by China and other member countries and international scientific and technological cooperation to realize the aims of this Organization will*

*play a very important role in the future. I hope, through the active cooperation of all member nations, we will carry out more scientific research in the North Pacific region in order to collect and exchange scientific research data and effectively and rationally use and protect the resources of this region and make a contribution to the development of mankind.*

*I hope that, through this meeting, all participants can not only discuss and exchange information on research activities, but also promote cooperation and further make many friends. Finally, I wish this Annual Session a complete success.*

Dr. Wooster called on Mr. Wen-He Yang, Vice Director of the State Oceanic Administration to make a statement on behalf of his agency.

*Mr. Chairman, ladies and gentlemen, on behalf of the State Oceanic Administration of the People's Republic of China, I would like to extend our warm welcome to those hosting the Fourth PICES Annual Meeting held in this beautiful seaside city, Qingdao. We would also like to extend a warm welcome to all scientists from Canada, Japan, Korea, Russia, the United States and China and delegates from international organizations who have come here for discussions on North Pacific regional marine science programs in which we are all interested.*

*Since PICES' formation in 1992, the Chairman, Dr. W.S. Wooster actively contributed to the organization and coordination of its scientific activities and extended its international influence. We are also very glad to recognize the Secretariat headed by Executive Secretary Dr. W.D. McKone, and their contribution has been tremendous and highly effective to the work of PICES. The State Oceanic Administration of the People's Republic of China highly appreciates their work.*

*Though PICES has not existed long, its scientific activities and potential role in the North Pacific has gained the appreciation and general attention of governments and scientists in this region.*

*As we all know, the United Nations Convention on the Law of the Sea came into force on Nov. 16, 1994. Since then, marine awareness of peoples from all over the world has increased. Protection of the marine environment and promotion of marine resources utilization and sustainable development have become universal issues to which all nations pay great attention. PICES is the only multilateral comprehensive marine science organization in the area. It undoubtedly plays an important role in the above mentioned issues on marine science research and economic development.*

*The State Oceanic Administration of the People's Republic of China and its subordinate units and scientists will continue to support PICES' work, by helping it play a greater role in the marine science study in this area.*

*Finally, I wish the meeting a full success, wish all participants and delegates a happy time in China.*

Dr. Wooster called upon Mr. Shu Sun, Vice President, National Natural Science Foundation of China to provide a few words from his agency.

*Mr. Chairman, distinguished guests, ladies and gentlemen, it is a great honor for me to say a few words on the occasion of the opening ceremony of the Fourth PICES Annual Meeting. First of all, on behalf of the National Science Foundation of China (NSFC), I would like to express a warm welcome to the representatives from abroad and in China, and to extend my heartfelt congratulations on the opening of this*

*Meeting. I am pleased that the Fourth Annual Meeting is being held in Qingdao, China. One task of the meeting is to review the scientific work during the past year and to develop a plan of PICES activities for the coming year. In addition, the science committees and Working Groups of PICES will have working meetings and a scientific symposium. Prof. Lin Hai, the deputy director of the Department of Earth Science, NSFC, will attend the meeting to hear discussion on some scientific problems. We are greatly interested in marine resources and the environment, especially, to changes in the abundance of marine organisms, sources and circulation of the chemical pollutants, the impact of the environment on the Pacific, and its marginal seas, and the climate of both China and the world. Since 1986, NSFC has actively supported the aforementioned scientific projects in the scope of Earth Science and Life Science. I believe that mutual cooperation and information exchange between scientists will promote research activities in these fields and make greater contributions to the cause of PICES.*

*The main tasks and responsibility of the NSFC are to direct, coordinate and finance basic research and part of applied research in accordance with the guiding principles, policies and plans of the State for the Development of Science and Technology by making effective use of available science funds; to give advice on major issues in relation to basic research and part of applied researches and undertake the evaluation of key state laboratories according to the entrustment concerned; to discover and train talented personnel to establish relations with the science foundations and relevant scientific organizations of other countries and regions and carry out international scientific cooperation and exchange.*

*NSFC consists of 6 academic departments and a division, i.e., Department of*

*Mathematical and Physical Sciences, Department of Chemistry, Department of Life Sciences, Department of Earth Sciences, Department of Material and Engineering Sciences, Department of Information Science, and the Division of Management Science; four bureaus, i.e., Bureau of Planning, Bureau of International Cooperation, Bureau of Policy, and Bureau of Personnel; as well as an administrative office.*

*The funds of NSFC amount to 500 million Chinese yuan in 1995. On the average each year, NSFC makes grants to about 60,000 scientists and 20,000 postgraduates, and receives 20,000 proposals from universities and research institutes. It is also one of the main channels for international scientific cooperation and exchange in China. Up to now, NSFC has signed bilateral agreements and memoranda of understanding of scientific cooperation with 34 science foundations and other academic institutions in 27 countries and 2 regions. Therefore, I would take this opportunity to inform you that, in our field, NSFC will make every effort to encourage Chinese scientists to participate in scientific research in the PICES area and promote cooperation with scientists from other member countries of PICES.*

*Finally, I wish the Meeting a satisfactory success.*

*The Chairman of Council, Dr. Wooster, spoke on behalf of PICES.*

*This is a historic occasion for PICES and an honor for me to welcome two new members to their first meeting in an official status, the Russian Federation and the Republic of Korea. We have been seeking their active participation for the last several years, so that PICES would have access to their expertise, their scientific communities, and their information and know-how about the*

*northern North Pacific and so that we could join with them in a more concerted effort to unravel the scientific mysteries of our region.*

*Of course, it is not only mysteries with which we are concerned. In fulfilling its mission of promoting and coordinating marine scientific research and the collection and exchange of relevant information and data, PICES cannot ignore the ultimate relation of its activities to the meeting of societal needs.*

*It has been conventional wisdom at least since the end of World War II that "Basic research ... provides scientific capital. It creates the fund from which the practical applications of knowledge must be drawn" and "scientific progress on a broad front results from the free play of free intellects, working on subjects of their own choice, in the manner dictated by their curiosity" (Bush, 1945).*

*Now it is generally held that science must also meet the related conditions of accountability to societal goals and sustained political support. The new paradigm is that "good science is necessary but not sufficient; association with a societal goal is required." It now seems fair to ask "(i) in what ways does science contribute to the national welfare? and (ii) how can science best be marshaled to assist in addressing specific societal problems?" "Science should be driven by internal and external problems, not just curiosity." (all from Byerly and Pielke 1995).*

*These tests are undoubtedly being applied in the countries from which we come and will surely influence the continuation of our work. This is particularly true in this time of limited funding for science. We must convince our governments that scientific research is not an idle luxury, but to the contrary is crucial if we are to enter the Twenty-first century with a world significantly less troubled than that of the present.*

*Some have complained that research sponsored by PICES is of little practical use because it is not directed at providing the information needed by the industry. The issue arises, for example, in considering the interactions between PICES and regional fishery management organizations. PICES explicitly has no management responsibilities or authority, but the research it promotes will almost certainly be of importance to the rational exploitation of marine living resources in the region. While fishery management tends to work on short time scales, usually a year or less, the solution of many of the central problems of fisheries production must encompass much longer time scales, of several years and perhaps decades or longer.*

*These problems are related to our lack of understanding of the interactions among marine ecosystems and their forcing by human activities and by variations in their physical environment. They are contained within the central question stated during a PICES Scientific Workshop held in December 1991:*

*What is the nature of the subarctic Pacific ecosystem (or ecosystems) and how is it affected over periods of months to centuries by changes in the physical environment, by interactions among components of the ecosystem, and by human activities?*

*I would argue that PICES should vigorously pursue this fundamental question in close cooperation with institutions, programs, and projects with different perspectives. The synergism among these approaches will serve to benefit all concerned.*

*Our scientific efforts are both disciplinary - hence the four Scientific Committees, on Biological Oceanography, Fishery Science, Marine Environmental Quality, and Physical Oceanography and Climate, and their Working Groups - and interdisciplinary, as*

*evidenced in the program on Climate Change and Carrying Capacity and the Bering Sea Symposium of the present meeting. I urge you all to attend the scientific sessions, participate in the work of the Scientific Committees (which are open to all), attend the open meeting of the CCCC Implementation Group (now called Implementation Panel), and otherwise join fully in the work of the Organization. Only you can make it best serve the needs of the North Pacific scientific community.*

Dr. Wooster called upon the head of the Canadian delegation, Dr. William G. Doubleday, to make a statement on behalf of his government.

*Mr. Chairman, honoured guests, colleagues, on behalf of the Government of Canada I wish to express the pleasure of all members of the Canadian delegation to participate in the Fourth Annual Meeting of PICES in Qingdao. Qingdao is a great city of marine science located next to a rich and diverse marine ecosystem. I wish to thank our hosts from the Government of China, the City of Qingdao, and especially the Yellow Sea Fisheries Research Institute for their hard work which has provided us an excellent venue and well organized support for the meeting and the warm hospitality they have shown to visiting scientists.*

*The Fourth Annual Meeting is significant as the first time that colleagues from Russia and Korea will participate fully in PICES. Canada welcomes Russian and Korean colleagues who are joining the PICES scientific community.*

*The scientific program for this meeting is diverse and exciting, covering a wide range of scientific topics from marine contaminants to the circulation of the subarctic North Pacific and its impact on climate to the carrying capacity of the ocean.*

*With respect to carrying capacity, I would like to make two observations. First, I draw your attention to a paper by Bigler, Welch, and Helle which will soon appear in the Canadian Journal of Fisheries and Aquatic Science. These authors are finding widespread trends towards smaller size for Pacific salmon of all species over the past fifteen or so years. Second, in 1995 the sea survival of sockeye in the Fraser river in Canada unexpectedly was one half of the rate of recent years. The reasons for these changes in productivity of marine resources lie in the open Pacific Ocean, not in the rivers of the surrounding countries. We believe that the best way to understand such changes in productivity of marine resources is through the multidisciplinary cooperative approach of PICES.*

*Finally I wish to invite you to come to Nanaimo, British Columbia, next year for the Fifth Annual Meeting of PICES. This meeting will be an opportunity to strengthen ties between scientists from all our member states and to exchange knowledge of the marine environment and ecosystem of the North Pacific. Thank you.*

Dr. Wooster called upon Mr. Zuo-Fu Gan, speaking on behalf of delegate Cong-Meng Liu, to make a statement on behalf of the Ministry of Agriculture.

*First of all, please allow me, on behalf of the Chinese delegation and in the name of Mr. Cong-Meng Liu, to extend the warmest welcome to the delegates from various countries and all scientists participating in the Fourth Annual Meeting, and sincere congratulations to the opening of the meeting. The Chinese Government is greatly interested in the success of the present meeting. The Chinese delegates include representatives from many parts of the government such as Ministry of Agriculture, Ministry of Foreign Affairs, Ministry of Finance, the State Oceanic*



*Administration, and officials of the National Natural Science Foundation of China.*

*As a major coastal country of the North Pacific and being one of the largest fishing countries in the world, the Chinese Government always participates in various activities concerned with this region, therefore, together with other member countries conduct marine research and conservation of resources, and are involved in international scientific cooperation which contributes to the goals of this organization.*

*We believe that, at present, the main tasks of PICES are: first, to give prominence to marine research because the research scope of PICES is related to several fields and it is necessary to select a scientific focus that has a practical valued as a target priority. Secondly, PICES should increase cooperation with other multinational organizations around the Pacific, i.e., to provide scientific support to these organizations, and to exchange information to reach common goals. The influence of PICES will increase and its vitality will be strengthened from cooperation with such organizations. When these are done, it will avoid duplicating research, saving labor, material resources and money, and provide a scientific base to various countries.*

*It is well known that China is a developing country, we hope that PICES would use the limited money, material resources and labor force to the largest extent to do various activities to "shoot the arrow at the target" and avoid wasting valuable resources.*

*Finally, I sincerely wish this Annual Meeting a success.*

*Dr. Wooster asked Dr. Takashi Sasaki, the Japanese delegate to say a few words on behalf of his government.*

*Thank you, Dr. Wooster, for your very kind introduction. Distinguished delegates,*

*ladies and gentlemen, on behalf of Japanese participants, I am honored to have the opportunity to make these remarks.*

*First of all, I would like to express my sincere thanks to the delegates, of the People's Republic of China, the Yellow Sea Fisheries Research Institute and the Government of Qingdao for their arrangement of the Fourth Annual Meeting in this beautiful city of Qingdao.*

*The First PICES Annual Meeting was in Victoria in 1992. Since then, PICES has steadily expanded its activities. With the contributions of the Contracting Parties, the Chairman and the Secretariat, PICES has established its structure, held many workshops and run Working Groups.*

*Above all, it is my pleasure that the Russian Federation and the Republic of Korea have acceded to the PICES Convention. Participation of the Russian Federation and the Republic of Korea, which have a great amount of experience and information related to the North Pacific area, will provide a considerable contribution to PICES activities. Together with many scientists from both countries, PICES has widened its scope of activities. Casting a light on each activity of the organization, Scientific Committees have renewed Working Groups, to keep the organization vigorous. From the viewpoint of the relation with other international organizations, PICES has signed a Memorandum of Understanding with IOC, and is also promoting cooperation with NPAFC.*

*Concerning individual scientists who are expected to be involved in activities, PICES has established a Trust Fund last year to help deserving scientists attend PICES meetings. In this way, PICES has been formed and widened its activities in various aspects.*

*Three years have passed since the Convention entered into force. Today, I think we can celebrate that PICES has made good progress so far and consolidated its foundation. Now, I would like to say that PICES must face a new phase of development. From now on, it would be very important for us to maintain the momentum we have gathered and promote the efficiency of the activities of PICES. On behalf of the Japanese participants, I hope this Fourth Annual Meeting will become the kick off of this new phase.*

Dr. Wooster asked Dr. Sangbok D. Hahn to say a few words on behalf of the Republic of Korea.

*Thank you Mr. Chairman. Ladies and gentlemen, on behalf of the Government of Korea, I am glad to inform you the Republic of Korea is a full member of PICES since August 1995, just 77 days as a new member. We give many thanks to all of you, particularly, members of Governing Council, who supported our membership. We promise that we will do our best to work towards the goals of PICES as a full member.*

*We all know that sustainable use of the ocean and the coastal zone is of key importance in the coming Twenty-first century. We are living in the United Nations Convention of the Law of the Sea era since November 1994. UNCLOS, serves as a focal point for cooperation on marine scientific research. We are all here now, because of our interest in the North Pacific Ocean and understanding the marine ecosystem in the North Pacific requires the cooperation of all PICES members to be successful.*

*This week, I hope we all enjoy and benefit this meeting and I would like to give many thanks to members of the local organizing committee for their efforts in making this meeting possible, in Qingdao.*

Dr. Wooster asked the Russian Federation Dr. Boris N. Kotenev to speak on behalf of his government.

*Mr. Chairman, ladies and gentlemen, on behalf of the Russian delegation, let me congratulate all PICES meeting representatives. We express a big appreciation to China National Science Foundation, scientific and administrative organizations for warm welcome and their excellent work on organizing the meeting. We express a special appreciation to the chairman, Dr. Wooster, for significant help to our delegation. We hope that we can become rich with new ideas, new methods of research for the conservation and national exploitation of marine resources as a result of this meeting. We can consider more closely the relation with our colleagues from other countries on such important scientific and practical issues as:*

- 1. Evaluation of carrying capacity of ecosystems in diverse regions of the Pacific Ocean;*
- 2. More accurate estimation of stock state and definition of possible catch level;*
- 3. Definition of long term trends in stock changes.*

*Sustainable development of fisheries in our countries and stable economic progress are closely dependent on finding solutions to important scientific questions.*

*We wish the Fourth PICES meeting every success.*

Dr. Wooster called upon the U.S.A. delegate, Dr. William Aron, to make a statement on behalf of his government.

*Please forgive me for making remarks that might be deemed by some as personal. I have been involved for nearly two decades with the conception, birth and early growth of PICES and because of my retirement*

*early next year I expect my official role in PICES will be over.*

*My prior visit to Qingdao was almost exactly ten years ago. I came to a country steeped in tradition, but with a sense of optimism and enthusiasm that belied its great age and maturity. Biological experience dictates that mature animals grow very slowly, if at all, are not apt to change, except to die. Qingdao and China are clearly not biological entities, if they are, they defy the rules. The growth and change of the past decade are blatantly obvious. Only the optimism and enthusiasm remain unchanged and give hope and certainty to the belief that when PICES meets in China next time all road maps and guide books will be obsolete.*

*PICES is young. It is an organization that includes participation of the brightest minds of its member nations. The dependence of all Pacific Rim nations of the North Pacific make it certain that the normal short-term*

*partner nations in economic health will be overcome and that the ultimate development of a full synthesis of knowledge and growth of understanding will occur. PICES was created at the right time to provide the mechanism required for such development. I am convinced that if I am allowed to return to China for the next PICES meeting I will neither recognize China nor PICES. They will have both changed by growing, by being better and by strengthening their role in the development and improvement to benefit all human kind.*

Dr. Wooster thanked the representatives of China and the delegates for their remarks and introduced Prof. Ji-Lan Su, a member of the Chinese Academy Sinica, to give the keynote lecture. Prof. Su addressed the subject of *Kuroshio and the East China Sea Circulation* describing the interactions between this strong western boundary current and the body of water lying to its west.

# REPORT OF GOVERNING COUNCIL MEETINGS

The Governing Council met on October 16, 19 and 22, under the Chairmanship of Dr. Wooster. The Executive Secretary, Dr. W. Doug McKone, served as rapporteur.

All Contracting Parties were represented at the three sessions (Endnote 1). The Chairman of the Science Board, Dr. Dan Ware, was in attendance during part or all of each session.

At the first session, the Chairman welcomed the delegates and noted that there were two new Parties to the Convention, namely, the Russian Federation, whose permanent representatives are Dr. A. Rodin and Dr. S.E. Dyagilev, and the Republic of Korea, whose permanent representatives are Mr. K.S. Park and Dr. H.T. Huh. It should be noted that Japan has replaced Council member Mr. Naotoshi Sugiuchi by Mr. Teruyoshi Inagawa. For this meeting, Dr. B.N. Kotenev represented Dr. Rodin, Mr. Nakahara represented Mr. Inagawa, Dr. S. Hahn represented Mr. Park and Mr. Gan represented Mr. Liu respectively. The Chairman reviewed the agenda and proposed the order in which to take up the various items. This report summarizes the treatment of each agenda item during the course of the three sessions.

## **Agenda Item 1. Preliminary Report on Administration**

The Executive Secretary summarized the activities of the Secretariat during the previous year (Endnote 2). During the reporting it was decided that the Finance and Administration Committee should report to Council on representation of countries at the F & A meetings, including notification procedures and on funding sources for the Trust Fund.

## **Agenda Item 2. Relations with Other International Organizations and Observers from such Organizations**

The Executive Secretary indicated that the Memorandum of Understanding (MOU) being developed between PICES and the NPAFC is at a standstill because the NPAFC was not prepared to move forward until it is discussed at their upcoming meeting starting November 5, 1995. Depending on the outcome of these discussions, a second draft of the MOU could be circulated sometime after their meeting.

Letters of invitation to attend PICES IV were sent to the agreed list of Organizations and the following sent observers:

Asian Pacific Economic Cooperation(APEC)	Dr. J.C. Davis
Food and Agriculture Organization (FAO)	Dr. A. Bakun
North Pacific Anadromous Fish Commission (NPAFC)	Mr. H. Endo
Intergovernmental Oceanographic Commission (IOC)	Prof. J. Su
Scientific Committee on Problems of the Environment (SCOPE)	Prof. J.Y. Liu

## **Agenda Item 3. Membership and Observers from Other Countries**

The Russian Federation and the Republic of Korea joined PICES this year; no other countries sent observers to this year's meeting.

## **Agenda Item 4. Election of Vice-Chairman**

Dr. Wooster called for nominations for Vice-Chairman of Council. In accordance with the Rules of Procedure, delegates were

provided ballots for nomination of candidates. Dr. Huh and Dr. Sasaki were nominated and Dr. Huh was elected. The delegates congratulated Dr. Huh on his election. Dr. Huh expressed his thanks for the support given by Council members.

#### **Agenda Item 5. Appointment of new Assistant Executive Secretary in 1996**

The job description for the position, which was reviewed by the Finance and Administration Committee, was approved by Council. Further, Council's decisions centered on the advertisement of the position. China suggested that this position should be filled by someone from the western side of the Pacific to provide a balance in the staff representation from member countries as the current Executive Secretary is from Canada. Korea and Russia suggested that the quality of the candidate should be the governing criteria for selection of an acceptable person. After much discussion on the merits of the selection process, Council approved that, for this staffing action, preference would be given to candidates from the western side of the Pacific. However, an exceptional candidate from the eastern side of the Pacific should be given serious consideration for the position. Council also agreed that this decision should not be considered as setting a precedent on how future appointments would be filled.

Delegates from the western side of the Pacific agreed that they would advertise the position in their respective countries. Dr. Doubleday indicated that the job description would not be circulated or advertised in Canada. The Executive Secretary provided each council member with a copy of the job description and staff rules for circulation in their countries.

The Executive Secretary stressed that applications should be received by December 31, 1995, and he would interview

a short list of candidates in the new year. He indicated that this timetable is necessary to allow an overlap between the incumbent and the successful candidate. The United States suggested that this process seemed short in order to attract good candidates and the Executive Secretary should not be pushed into filling the position with a person who may not be best for the position. It was left to the Executive Secretary to decide on the suitability of the applications received.

#### **Agenda Item 6. Report of Finance and Administration Committee**

The Finance and Administration Committee met under the Chairmanship of Dr. John C. Davis who presented the report to the Governing Council (see F & A Report for text). The report was approved by Council.

#### **Agenda Item 7. Audited Accounts for Financial Year 1994**

With the recommendation of the Finance and Administration Committee, the Governing Council accepted the audited accounts and agreed to continue with Flader and Greene as auditors for another year (Decision 95/A/1).

#### **Agenda Item 8. Estimated Accounts for Financial Year 1995**

The estimated accounts from October 1 to December 31 were reviewed by the Finance and Administration Committee. The committee recognized that expenditures would likely exceed allotments resulting in there being a necessity to direct funds from the Working Capital Fund to meet some of the obligations for the remainder of this year. Although the WCF started the year in a negative position due to an over-estimate of the surplus in 1994, it will have a substantial surplus at the end of the year due to the fees received from the two new members. The Governing Council approved the 1996 budget as

recommended by the Finance and Administration Committee.

#### **Agenda Item 9. Budget for Financial Year 1996**

The Finance and Administration Committee reviewed the appropriations in all categories and adjusted some to give a 1996 budget total of \$509,000 CDN, an increase from last year to reflect the increased costs associated with the new members (Decision 95/A/2).

Merit Salary increases for staff were accepted by the Finance and Administration Committee. The Governing Council approved the merit increases. The Chairman agreed to investigate salary practices in other organizations, including the issue of whether such organizations employ a salary scale.

Council approved a change in the Financial Regulations to allow the WCF to increase to CDN \$100,000 to provide for cash flow problems that can occur when fees are not paid in a timely manner (95/A/2). Council agreed that the funds in the WCF fund at the end of the year should be used to increase the level to the agreed amount.

Council approved the Finance and Administration Committee recommendation to establish a Relocation and Home Leave Fund (RHLF) to a maximum of CDN \$110,000 in order to dampen sudden changes in the annual budget from time to time due to staff changes (95/A/2). Funding to establish the RHLF would come from surplus from the 1995 WCF and the 1996 budget. In subsequent years the fund will be financed from the levy in lieu of taxes from foreign staff and refunds from the GST as well as budget adjustments if needed (95/A/2).

#### **Agenda Item 10. Forecast Budget for Financial Year 1997**

The forecast budget for 1997 was revised by the Finance and Administration Committee to reflect the changes in the 1996 budget. The United States suggested that the salary levels of staff members at the top of their scale according to Canadian standards for the position should be adjusted up as was done in previous years. The Governing Council agreed with the adjustments as the budget was only for planning purposes (Decision 95/A/2). Council noted that further revisions would likely be required as the new member countries' involvement in the activities of PICES takes effect.

#### **Agenda Item 11. Trust Fund**

Considerable discussion took place in Finance and Administration Committee on the use of the Trust fund. China proposed that the fund should be used to support the participation of member country attendees at PICES meetings. The Executive Secretary noted that by Rule of Procedure (iii), each Contracting Party shall pay the expenses of its own Delegation to all meetings held pursuant to the Convention. The Chairman and Executive Secretary have interpreted the word "Delegation" to mean those participants listed in Rule 1 (i). Council recommended that the Chairman and the Executive Secretary develop a paper on the purposes of the Trust fund for review by Council at PICES V (95/A/1).

#### **Agenda Item 12. Other Funds Held**

The Executive Secretary reported on the state of the other funds held on behalf of members. Japan indicated to the Executive Secretary their funds should be used to reduce fees in 1996 and 1997. The United States informed members that with respect to the CDN \$50,000 held, it continues to be prepared to donate all or a portion of the

funds to the Trust Fund providing other member countries contribute an equal amount.

### **Agenda Item 13. Report and Recommendations of Science Board**

The Chairman of Science Board, Dr. Ware, summarized the report of the Board's meeting on October 18 and 21, and presented its recommendations. Working Groups 8 and 9 and the CCCC/IP/EC met during the year and the Vladivostok Workshop was held in June. Their work, summarized in the report, has been reviewed by the relevant Scientific Committees and Science Board. Council approved recommendations concerning the PICES-GLOBEC International Program on Climate Change and Carrying Capacity (Decision 95/S/1), publications (Decision 95/S/2), future work of Scientific Committees (Decision 95/S/3), data exchange (Decision 95/S/4), monitoring (Decision 95/S/5), future of existing Working Groups (Decision 95/S/6), establishment of three new Working Groups (Decision 95/S/7), electronic communications (Decision 95/S/8), and presentation of papers (Decision 95/S/9). Details are given in Appendix 1.

The Science Board also approved a scientific program for the Fifth Annual Meeting (See Science Board Report).

### **Agenda Item 14. Future Meetings of the Organization and Subsidiary Bodies, Including Time and Place for the Fifth and Sixth Annual Meeting**

Council accepted the Canadian offer to hold the Fifth Annual Meeting in Nanaimo, B.C., scheduled October 11- 20, 1996. Council also approved, with pleasure, the Republic of Korea's proposal to explore the possibility of hosting PICES VI the week of October 10, 1997 (Decision 95/A/3). The 1998

meeting will be at about the same time of the year; no host has been identified.

### **Agenda Item 15. Any Other Business**

#### a. Representation at Finance and Administration Committee Meetings and Notification Procedures

Council noted that according to Rule of Procedure 1(i), each Contracting Party shall notify the Executive Secretary in writing the names of its Delegates, experts, advisers and observers appointed to attend future Annual Meetings of PICES. Council approved the Finance and Administration Committee recommendation that the Executive Secretary remind Parties of this requirement when distributing budget information for the next Annual Meeting (95/A/1).

#### b. Funding Sources for the Trust Fund

Council discussed the need to establish sources that would regularly contribute to the fund and expressed a desire to know how other organizations obtain their funding. The Chairman pointed out that in all international organizations with which he was familiar, the sole source of support for Trust Funds was through members to those organizations and it was highly unlikely that funds could be found from other sources. Council approved the Finance and Administration Committee recommendation that the Executive Secretary obtain information for circulation and review at PICES V on the operation and funding of the WMO and IOC Trust Funds (95/A/1).

## **Appendix**

### **A. Decisions**

**95/A/1:** Council accepted the recommendations of the Finance and

Administration Committee and agreed to the following actions:

1. *Auditor.* Accepted the audited accounts for 1994 and agreed to continue with Flader and Greene as auditor for another year.
2. *Trust Fund.*
  - a. Council approved that the Chairman and Executive Secretary develop a paper on the purpose of the Trust Fund for review by Council during PICES V.
  - b. Council agreed that Executive Secretary obtain information for circulation and review on the operation and funding of the WMO and the IOC Trust funds for review during PICES V.
3. *Notification Procedures.* Council agreed that Contracting Parties notify the Executive Secretary of members of their delegations three weeks before the coming Annual Meeting.

**95/A/2:** Council accepted the financial statements for the audited accounts of 1994 and the estimated accounts of 1995 and agreed to the following actions:

1. *1996 Budget.* The budget of \$509,000 CDN was approved.
2. *Forecast 1997 Budget.* The forecast budget for 1997 was reviewed and will be further considered during PICES V.
3. *Working Capital Fund.* Council raised the authorized level of the Working Capital Fund to \$100,000.
4. *Relocation and Home Leave Fund.*
  - a. Council approved the establishment of the Relocation and Home Leave Fund, set at a maximum of \$110,000.
  - b. To the extent possible, income for this Fund should be derived from the refund of the GST and from the levy in lieu of taxes from foreign staff.

**95/A/3:** Council accepted the proposal of the Republic of Korea to investigate the feasibility of hosting the 1997 Annual Meeting in Korea. It was agreed that the Republic of Korea would inform the Secretariat of their intentions by December 15, 1995. In the absence of offers to host the 1998 Annual Meeting, it will be held at the seat of the Organization.

- 95/S/1:** PICES-GLOBEC CCCC Program
1. Member States are encouraged to provide necessary financial support of CCCC and its program components.
  2. The CCCC Workshop on Conceptual/Theoretical Studies and Model Development will be held in Nemuro, Hokkaido, Japan, in late June 1996. The full membership of the Implementation Panel will meet on that occasion.
  3. Establishment of Task Teams is authorized on advancing the development of conceptual/ theoretical and modeling studies (MODEL), on development of basin scale studies (BASS), and on development of the intercomparison of regional scale studies (REX).
  4. Other Executive Committee recommendations listed in Endnote 3 are endorsed.

- 95/S/2:** Publications
- The following reports should be published in the Scientific Report series:
- a. Proceedings of the Okhotsk Sea and Adjacent Areas Workshop
  - b. Modeling of the subarctic North Pacific circulation (WG 7 report)
  - c. CCCC Science Plan and Implementation Plan

- 95/S/3:** Scientific Committees
1. The Vladivostok Workshop Report and its recommendations (Endnote 4) should be reviewed by BIO, FIS, and POC who should advise the Science Board on their implementation. POC should prepare the proposed list of geographical features of the Okhotsk Sea region, including bays,



straits, and currents, in all Member State languages.

2. POC should review WG 7 recommendations and advise on their implementation.
3. FIS should review and comment on the stock identification document provided by ICES.
4. Ways should be sought to increase participation in Scientific Committee meetings during PICES V.

**95/S/4:** Technical Committee on Data Exchange:

1. TCODE's strategic plan for PICES data management (Endnote 5a) is endorsed.
2. Recommendation 8.1 on ship schedules should be reconciled with the Secretariat proposal (Endnote 5b) preferred by the Science Board. TCODE members will arrange for submission of schedules, and the PICES WWW Home Page will be used for their dissemination.
3. TCODE should provide an implementation plan for its recommendation 8.2 on cruise reports (Endnote 5a).
4. TCODE should begin to implement its recommendations 8.3 (inventory of relevant data holdings of agencies and institutions in the PICES region) and 8.4 (inventory of long time series) (Endnote 5a).
5. Representatives of TCODE should be invited to participate in relevant meetings of other groups, to report on TCODE activities and to learn of data requirements and issues. When possible, in order to minimize costs, such TCODE representatives should be from the country hosting the meeting.

**95/S/5:** Monitoring

1. Scientific Committees and CCCC Task Teams BASS and REX should review the WG 9 report and forward comments to the WG Chairman and the Secretariat for discussion during the WG's 1996 meeting.

2. PICES should express support for development of the Global Ocean Observing System (GOOS) and offer assistance in coordinating its implementation in the subarctic Pacific.

**95/S/6:** Future of Working Groups

1. WG 3 on Coastal Pelagic Fish has completed its work and will disband. Russian and Korean members of FIS should be asked to provide the names of their scientists working on pelagic species in order to complete the WG 3 inventory.
2. WG 5 on the Bering Sea will meet for a final time in 1996 to prepare recommendations on future directions in Bering Sea science.
3. WG 7 on Modeling Subarctic Pacific Circulation will edit its report for publication and will disband.
4. WG 8 on Practical Assessment Methodology will continue planning of Phase 1 of its practical workshop and will initiate planning for Phase 2.
5. WG 9 should complete its first report and should further consider development of a strategy for long term monitoring in the PICES region.

**95/S/7:** New Working Groups

The following groups are to be established (see Appendix B (i) - (iii) for terms of reference):

1. WG 10 on Circulation and Ventilation in the Japan Sea (East Sea) (POC).
  2. WG 11 on Consumption of Marine Resources by Marine Birds and Mammals (BIO).
  3. WG 12 on Crabs and Shrimps (FIS).
- Member States should consider limiting their appointments to these groups to no more than three per group.

**95/S/8:** Electronic Communications

The Secretariat is authorized to establish a WWW Home Page, as described in Endnote 6.

**95/S/9: Presentation of Papers**

With a view to improving communication at PICES meetings, the Secretariat, in consultation with the Chairman and the Science Board Chairman, should review practices of other organizations for improving presentation of visual material. As an experiment for the Fifth Annual Meeting, speakers will be asked to provide advance copies of their presentations, in accordance with specifications to be developed by the Secretariat.

**B. Working Group Terms of Reference**

**i) Working Group 10: Circulation and Ventilation in the Japan Sea (East Sea) and its adjacent areas**

- Review the present level of knowledge of the oceanic circulation and ventilation in this area, and identify knowledge gaps.
- Review the ongoing and planned scientific programs in this area, and identify gaps.
- Review studies relating chemical, biologic and geophysical regimes, and encourage interactive understanding and planning of multidisciplinary experiments.
- Identify the scientific and logistical difficulties of ocean studies in the area.
- Encourage the planning of experiments and discussion relating to physical processes in the area.

**ii) Working Group 11: Consumption of Marine Resources by Marine Birds and Mammals in the PICES Region**

In order to evaluate the effects of predation by marine birds and mammals on intermediate and lower trophic levels of subarctic Pacific marine ecosystems, the Working Group will:

- Obtain and tabulate available data on population sizes and prey consumption by marine birds and mammals.
- Calculate seasonal and annual consumption, expressed as numbers and biomass, of particular marine resource species by particular bird and mammal populations.
- Where possible, stratify the calculation as to age classes of prey and locality (local stock impacted).
- Prepare a report for PICES describing data sources and methods of calculation, and the results, and identifying major lacunae in knowledge.

**iii) Working Group 12: Crabs and Shrimps**

Because of recent changes in the abundance of crabs and shrimps and their economic consequences in the PICES region, the Working Group is established to:

- Identify the persons performing scientific work on the distribution, recruitment, larval transport, migration, population dynamics, and influences of environmental conditions for crabs and shrimp in the PICES region.
- Identify data that are available that would assist in the analyses of factors affecting abundance trends.
- Review current knowledge of factors affecting abundance and survival of crabs and shrimp and identify the key scientific questions relating to the understanding of the reasons for abundance fluctuations.
- Exchange data on the abundance of crabs and shrimp stocks in the PICES region.

## Endnote 1

### Participants

#### Canada

Dr. William G. Doubleday (delegate)  
Dr. J. C. Davis (delegate)

#### China

Prof. Yu-Kun Xu (delegate)  
Mr. Zhuo-Fu Gan (alternate delegate)

#### Japan

Dr. Takashi Sasaki (delegate)  
Mr. Masataka Nakahara (alternate delegate)

#### Republic of Korea

Dr. Hyung-Tack Huh (delegate)  
Dr. Sangbok D. Hahn (alternate delegate)

#### Russian Federation

Dr. Sergey E. Dyagilev (delegate)  
Dr. Boris N. Kotenev (alternate delegate)  
Dr. Vladimir I. Radchenko (advisor)

#### U.S.A.

Dr. Vera Alexander (delegate)  
Dr. William Aron (delegate)  
Mr. William L. Sullivan, Jr. (advisor)

#### Others

Dr. Warren S. Wooster (Chairman, PICES)  
Dr. W. Douglas McKone (Executive Secretary) (Rapporteur)  
Dr. Daniel M. Ware (Chairman, Science Board)

## Endnote 2

### Report on Administration for 1995

#### **Council, Committees and Working Groups.**

##### 1. Membership

The Russian Federation became a member on December 16, and the Republic of Korea on July 30 of this year.

##### 2. Payment of National Contributions

Financial contributions from Parties who were members as of January 1, 1994 were received by July 18. The Republic of Korea's fees which were due August 31, has not been received to date.

##### 3. National Delegations

a. Dr. Alexander Rodin, First Vice President for the Fishery Committee and Dr. Sergey Dyagilev, Head,

Department of Science, Committee of Fisheries, are the delegates representing the Russian Federation. The Republic of Korea's delegates are Dr. Hyung-Tack Huh, Senior Research Fellow, Director, Korea Ocean Research and Development Institute, and Mr. Kyu-Seok Park, Director General, Deep-Sea Fisheries Bureau, National Fisheries Administration.

b. Mr. Teruyoshi Inagawa, Deputy Director General for Arms Control and Scientific Affairs, replaced Mr. Naotoshi Sugiuchi as Japanese delegate to Council.

##### 4. Committees and Working Groups

a. Members of the new Technical Committee on Data Exchange

(TCODE) have been preparing for the PICES IV meeting in Qingdao.

b. WG 8 (Practical Assessment Methodology and Working) and WG 9 (Subarctic Pacific Monitoring) members have been named. In preparation for PICES IV, WG 8 held its first meeting just prior to PICES IV and WG 9 held its first meeting August 1-3.

c. The Russian Federation and the Republic of Korea have provided lists of members to Scientific Committees, Working Groups and the PICES-GLOBEC Program. However, I understand that there may be further changes to the Russian list.

d. The Implementation Panel and its Executive Committee for the PICES-GLOBEC Climate Change and Carrying Capacity Program members were named and a draft report will be considered at this Annual Meeting.

e. Other changes in Scientific Committees and Working Groups are:

- F & A Committee  
Japan Dr. Tsuyoshi Yamaguchi replaces Mr. Masashi Mizukami
- Fishery Science Committee  
U.S.A. Dr. Loh-Lee Low replaces Dr. Gary D. Stauffer
- Marine Envir. Quality Committee  
Canada Dr. Richard Addison replaces Mr. Michael Nassichuk  
U.S.A. Dr. Paul K. Park replaces Prof. William S. Reeburgh

China Prof. Shi-Zuo Fang replaces Prof. Hua Tong Wang

- Bering Sea Working Group (WG 5)  
U.S.A. Dr. Patricia Livingston replaces Dr. Richard D. Methot
- Subarctic Pacific Monitoring (WG 9)  
China Prof. Shao-Sai Ma replaces Prof. Qi-Sheng Tang

f. A very successful Vladivostok Workshop on the Okhotsk Sea and Adjacent Areas was held in June. A report of the discussion and recommendations is being presented at this Annual Meeting.

g. A data set of zooplankton from Ocean Weather Station PAPA from the 1950's to the 1980's was compiled by Chairman Skip McKinnell of WG 4 (Pacific Biological Station, Department of Fisheries and Oceans, Canada). The data will be distributed by the Secretariat (94/S/4).

h. A draft of a master inventory of data inventories was put together by the Secretariat and submitted to the chairman of TCODE for review. The document will be discussed by TCODE members at PICES IV (94/S/4).

i. The Secretariat sent a letter to 32 oceanography/fisheries agencies asking them to provide information for updating "Inventory of Time Series of Physical, Chemical, Biological and Fisheries Data from the Eastern North Pacific" by Healey et al. Twelve responses were received. The report was revised and sent to the Chairman of TCODE for review at the PICES IV (94/S/4).

## 5. Observers

Invitation letters were sent to inter-Governmental and non-Governmental organizations on the standing list. Organizations that accepted our invitation are:

Asian Pacific Economic Cooperation (APEC)

Dr. John C. Davis

Food and Agriculture Organization (FAO)

Dr. Andrew Bakun

North Pacific Anadromous Fish Commission (NPAFC)

Mr. Hisashi Endo

Intergovernmental Oceanographic Commission (IOC)

Prof. Ji-Lan Su

Scientific Committee on Problems of the Environment (SCOPE)

Prof. Jing-Yi Liu

## 6. Travel and Representation at Other Organization Meetings

a. Dr. Wooster, Dr. Ware, Dr. Kashiwai and Dr. McKone attended the NPAFC Research Planning and Coordinating Meeting as well as held a strategy meeting related to the PICES-GLOBEC Climate Change and Carrying Capacity Program (CCCC) in Seattle (March 5-10).

b. Dr. Wooster and Dr. Ware attended the Executive Committee meeting of the Implementation Panel for the CCCC program in Honolulu (May 24-26).

c. Dr. Wooster attended the Vladivostok Workshop (June 19-24).

d. Dr. Wooster attended a meeting with officials of SCOR, IOC and ICES to discuss the International GLOBEC program in relation to PICES

activities, in Dartmouth, Mass. (Aug. 7-9).

e. Dr. McKone and Ms. C. Chiu traveled to China to discuss the PICES IV meeting in Qingdao (April 15, 17-18).

f. Dr. McKone and Ms. C. Chiu attended the Pension Society meeting in Halifax (May 24-26).

g. Dr. McKone and Ms. C. Chiu attended a meeting at the Pacific Biological Station to discuss PICES V to be held in Nanaimo (June 28).

## Communication

### 1. Publications

a. The Executive Secretary was asked by Council to look into the cost recovery practices of other similar organizations 94/A/4(2). Letters were sent to the Inter-American Tropical Tuna Commission (IATTC), North Pacific Anadromous Fish Commission (NPAFC), Pacific Salmon Commission North Atlantic Fishery Organization (NAFO) and the International Council for the Exploration of the Sea (ICES). All these Organizations except ICES have a policy of not charging for their publications. ICES has a cost recovery policy for all key publications. For gray literature they provide copies to members of the working group etc., but all others requesting copies must pay on a cost recovery basis. Libraries of key institutions generally receive a complete set of all ICES publications, all others must pay on a cost recovery basis. These libraries act as a repository for the publication record of ICES for Member Countries.

- b. The Secretariat arranged to purchase 50 copies of detailed inventories of scientific surveys (1980-1992) from TINRO to help pay for some cost of translation and publication as recommended by Council 94/S/6.
- c. List of publications produced so far this year:
  - i. The Annual Report was published and circulated in early February to all PICES members, international organizations and libraries.
  - ii. A poster for the Fourth Annual Meeting was distributed in early February.
  - iii. Newsletters were circulated in early February and late July.
  - iv. The Vladivostok Workshop Final Announcement was printed and sent out in early February.
  - v. The First Announcement for the Fourth Annual Meeting was distributed in early February.
  - vi. *PICES Papers: Reports of Meetings Leading to the Establishment of the North Pacific Marine Science Organization (PICES)* was printed and distributed to Delegates, Chairman, Science Board Chairman, Scientific Committee members and international organizations and libraries in mid-March.
  - vii. PICES published and distributed an inventory of *Multilateral Organizations Concerned with the Implementation of the Oceans Chapter of UNCED* under contract for the Asia Pacific Economic Cooperation (APEC) in March.
  - viii. PICES Scientific Report No. 2 on the *Ohkotsk Sea and Oyashio Region* containing the 1993 report of WG 1 was circulated to Delegates, Chairman, Science Board Chairman, Scientific Committee members and members of WG 1 in late April.
  - ix. The PICES Directory was distributed to all PICES members in late April.
  - x. The Final Announcement for the Fourth Annual Meeting was distributed in early June.
  - xi. A volume of abstracts for the Vladivostok Workshop was prepared for circulation at the Workshop in June.
  - xii. A final draft of the Implementation Plan for PICES-GLOBEC Program on Carrying Capacity and Climate Change was distributed to all Scientific Committees, TCODE and WGs 3 and 9 in late August.
  - xiii. WGs 3, 5 and 7 reports and the Vladivostok Workshop report were circulated to Scientific Committee Chairman, Science Board Chairman, Scientific Committee members and the respective WG members in late September.
  - xiv. A volume of abstracts for the Fourth Annual Meeting was prepared for circulation at the Annual Meeting.

## 2. Communication

- a. Draft text for a Memorandum of Understanding (MOU) with the North Pacific Anadromous Fish Commission (NPAFC) was developed and circulated to Parties of both organizations. Comments were received by the Secretariat from Japan, the People's Republic of China and the United States. It is my understanding that the MOU will be discussed at the November Annual Meeting of the NPAFC. Depending on the outcome of those discussions, a second draft could be developed for circulation in the next fiscal year.
- b. The bulletin board PICES.OCEAN was closed down in December 1994, when Omnet ceased to provide service. The Secretariat has been regularly sending PICES news via Internet (once a week or so) to those who request it. The e-mail list has expanded more than three-fold this year, with approximately 800 individuals and organizations from nearly 30 countries.

## Secretariat Matters

### 1. Administration/Financial

- a. Council requested the Executive Secretary to seek funding sources for the Trust Fund 94/A/4(4). Discussions were held with a number of sources to seek funding. None of these proved successful. Most of the organizations contacted receive regular donations to their Trust Funds from the member governments. Based on these discussions it would seem that the best way to proceed would be for Parties to identify funding sources in their respective governments and

aid the Secretariat to obtain commitments to regularly support the Trust Fund.

- b. The Administrative Assistant is working this year to set up a recognized accounting program to handle finances starting in fiscal year 1996. This will be an improvement over the current system developed from a spreadsheet program.
- c. The general mailing list is still increasing as more and more people interested in North Pacific marine science issues ask to be put on the list. The list in 1993 was 300-400, in 1994 it increased to 700 and it is now at approximately 1,120. Additionally, there are 57 libraries and 39 organizations on the list. PICES members (Council, Scientific Committees, WGs) add another 176 with the recent addition of the Republic of Korea and the Russian Federation. It is expected that the list will continue to grow as scientists from the new members of PICES and other scientists become knowledgeable of our activities.
- d. The Secretariat was given a US\$5,000 contract by the Marine Resources and Conservation Working Group of the Asian Pacific Economic Cooperation, to compile an inventory of multinational organizations in the Pacific region involved with follow up to the Oceans Chapter of the United Nations Conference on Environmental Development. The report "Objectives and Activities of Multilateral Organizations Concerned with the Implementation of the Oceans Chapter of UNCED Agenda 21 in the Asia-Pacific Region" was completed in March

1995, and was distributed to thirty one participating organizations as well as to APEC members. PICES Council members were also included on the mailing list.

- e. In March, the Secretariat received refunds of the Provincial Government Sales Tax from January 8, 1993. All purchases are now exempt from this tax.
- f. In July and September the Secretariat finally received refunds of the Federal Government Goods and Services Tax for the period of January 1, 1994 to August 31, 1995. We are still patiently waiting for the remission order to collect tax payments from January 8, 1993 to the December 31, 1993. I am told that, at the earliest, it will take a further 5 to 6 months before we can expect the Order in Council.

## 2. Space, Facilities and Equipment

- a. A computer was purchased with the addition of the Secretariat position. Additionally, a scanner was purchased to aid in producing publications.
- b. A computer and desk were purchased to set up a World Wide Web Page (WWWP) to allow PICES to better provide services to the scientific community (94/S/1). The

Secretariat has developed a crude structure for the WWWP which is being circulated to the different committees for review and comment. Among other uses we will be able to put the PICES Directory, PICES Press, a Bulletin Board, ship schedules (if required) and special data sets on line.

- c. The Secretariat has had discussions with Dr. Davis concerning upgrading the room provided for storage last year. We are now using part of this room for the WWWP computer. The room is not adequately lighted, heated, nor are there sufficient electrical plug receptacles and there is a need to split the room into a storage area and an office for the computer. We have also asked to have the other office computers put on the Uninterrupted Power Supply as we experienced a number of interruptions last winter due to overloaded circuits that are partly used by the Secretariat. It is my understanding that funds are presently short but that the changes will be given priority when funds become available.

## 3. Staffing

As agreed by Council at last year's meeting, the part-time secretarial position became a full-time position as of January 1, 1995.

## Endnote 3

### CCCC Program Executive Committee Recommendations

- 1. The CCCC Scientific Steering Committee established after PICES III should be renamed the Implementation Panel.
- 2. A CCCC Workshop on conceptual/theoretical studies and model development should be held in Nemuro, Hokkaido, Japan, in late June 1996. A Scientific Steering Committee for the workshop should be established based



on the MODEL Task Team, with additional members from WG 7, WG 9 and the NPAFC Science Sub-Committee. Existing research programs in member countries that fit the goals of the CCCC Program should be encouraged to join the CCCC.

3. The full membership of the CCCC/IP should meet on the occasion of the workshop.
4. A symposium on the methods and findings of retrospective analyses should be organized by the Executive Committee and held during PICES V.
5. The following interim task teams, established by the Executive Committee, should now be established on a continuing basis:  
MODEL - a task team concerned with advancing the development of conceptual/theoretical and modeling studies needed for both regional and basin scale components of CCCC.  
BASS - a task team concerned with development of the basin scale component of CCCC.
6. The following task team should also be established on a continuing basis:  
REX - a task team concerned with developing the intercomparison of regional scale studies, as proposed in the Implementation Plan. Scientists working on marine birds and mammals should be encouraged to join the task team.
7. The Co-Chairmen, in consultation with the Science Board Chairman, should propose assignment of IP members to

TTs. Upon approval by members of these assignments, and with agreement of the Executive Committee, the Chairmen should designate TT co-chairmen and request PICES Scientific Committees for help in filling gaps in required expertise. Chairmen of the Scientific Committees should be added as ex officio members of the IP.

8. Task teams should develop work plans for review and approval by the Executive Committee.
9. In its planning for basin scale studies, BASS and the Executive Committee should consider research elements that might be developed under NPAFC sponsorship and in support of this task should meet with the NPAFC Science Sub-Committee.
10. Membership of the Implementation Panel should be kept under review and revised as appropriate to ensure availability of the necessary expertise. In principle, three year rotation of members is considered appropriate.
11. The draft Implementation Plan should be revised to incorporate information received by the end of 1995 and should be published, together with the Science Plan, in the first of a series of CCCC scientific reports. Information for inclusion in tables of national and international programs should be augmented to include on-going and planned institutional programs that contribute to CCCC goals whether or not identified as national GLOBEC projects.
12. PICES should recommend financial support of the CCCC and its program components to its member states.

## Endnote 4

### Recommendations of the Vladivostok Workshop

1. The Workshop recommends that PICES support the volunteer group of Russian scientists and publish the workshop proceedings.

Discussions and conclusions in the SSC meetings and in the plenary session are summarized in the form of recommendations as follow:

2. Further physical investigations on the Okhotsk Sea Region are essential not only for the local physics but also for solving the world climate problem. PICES should maintain its interest in this region. The workshop recommends that POC takes initiative on the researches in this region and assists to create relevant international cooperative studies to solve the urgent problems mentioned in the O-1 session summary report. As one of such activities, the workshop recommends that POC hold another workshop on the Okhotsk Sea Region in the near future, with much more focused items.
3. As discussed in the O-4 session summary report, the Japan Sea (East Sea) is also a very important region and deserves further discussion within PICES: in particular, the Japan Sea (East Sea) may be considered as a suitable domain to test our models of formation and circulation of the abyssal waters. We recommend that POC organize a working group on the circulation and ventilation of the Japan Sea (East Sea) as done for the Okhotsk Sea and Oyashio region. The workshop should further discuss the recommendation items given in the O-4 session summary.
4. The Okhotsk Sea region is highly productive and has important fisheries.

The Workshop created a good atmosphere for discussion of future biological and fisheries researches. It is recommended that BIO and/or FIS should focus on the biological and fisheries aspects of the Okhotsk Sea and adjacent areas, through the medium of a report or workshop.

5. As necessary future actions, important research items relating fisheries sciences in the Okhotsk region are summarized, and establishment of several workshops and/or working groups are proposed in the summary reports of the F-1, F-2, and F-3 sessions. It is recommended that FIS discuss these problems and take necessary actions to coordinate future researches.
6. Almost all of the Okhotsk Sea region belongs to the economic territories of Russia or Japan. Thus, cooperation is essential for the studies of the Okhotsk Sea (A similar situation exists for the studies of the Japan Sea (East Sea) and the Bering Sea). The Workshop recommends that PICES member countries bordering the Okhotsk Sea facilitate access to investigators to cooperate on scientific research in the region. In addition, PICES should endorse and support international research programs such as CREAMS in the Japan Sea (East Sea) and the Soya/La Perouse Project. As a first step the Sakhalin NIRO and the Hokkaido Fisheries Experimental Station will start a cooperative study.
7. Investigation of the Okhotsk Sea and its adjacent areas is essential for the CCCC Program. The Workshop recommends that CCCC Implementation Panel coordinate an international

cooperative project on the Okhotsk Sea area as one of its key projects.

8. The Workshop recognized that data and information exchange in the regions under consideration is insufficient for the detailed quantitative analysis of the seas under consideration. An accurate and dense data set such as CTD data at 1 to 2-decibar interval is required. TCODE should consider amassing the data necessary for the special process oriented studies. As studies on the Okhotsk Sea are done not only by the established institutions like POI, TINRO, and FERHRI of Russia and JFA and the

universities in Japan, but also by many local organizations of both countries. Complete data inventories of the relevant institutions and individuals are required. It is recommended that TCODE takes an initiative to solve these problems.

9. Several different names are often used for a single place due to historical reasons. A complete nomenclature list of the bays, straits, currents and so on in all languages is needed. It is recommended that POC takes an initiative to make such list and to publish it.

## Endnote 5

### TCODE Report

#### A. TCODE Report Sections 7.3, 7.4 and Recommendations 8.1-8.5

##### ***7.3 Develop strategic plans to meet these requirements***

The TCODE strategic plan for PICES data management has the following elements:

- use existing national/international data centers, programs and techniques wherever possible
- encourage migration of data to these existing data centers
- assist PICES scientists to locate and obtain data of interest
- use the WWW/Internet system to provide information and provide "pointers" to important agencies or institutions
- provide a "home" and active distribution system for data sets that are not available elsewhere

##### ***7.4 Identify the data management needs of PICES***

PICES scientists require access to data in the following subject areas:

- ship schedules and cruise reports
- meteorological data

- physical and chemical oceanographic data
- biological oceanographic and plankton data
- fish catch and distribution data
- fish "biology" data (length, condition etc.)
- commonly used environmental indices (PNA, El Nino etc.)
- birds and marine mammal distribution and abundance data
- marine environmental quality data
- remote sensing data

In addition, TCODE should distribute information on software "tools" for the analysis and processing of these data sets.

##### ***8.1 Ship schedules***

TCODE recommends that all PICES members submit cruise plans for cruises or surveys in the PICES area to the PICES Secretariat for distribution. The preferred format for such plans is the IOC National Oceanographic Program (NOP) format, but other formats will be acceptable. Where possible, the PICES WWW servers will provide links to other cruise schedule posting areas (e.g. UNOLS ships schedule

page). Members should include all cruises/surveys that are of broad interest to the PICES members and special purpose coastal or inshore cruises may be omitted. TCODE members from each PICES nation will ensure that the schedules are submitted.

### **8.2 Cruise Reports**

TCODE recommends that all PICES members submit cruise summary reports (CSR) to the PICES Secretariat for distribution. These cruise reports are an important source of information on recent sampling activities and data that is not yet available from national or international data centers. The preferred format for such reports is the ICES/IOC CSR format (formerly known as ROSCOP). Members should include all cruises/surveys that are of broad interest to the PICES members and special purpose coastal or inshore cruises may be omitted. TCODE members from each PICES nation will ensure that the reports are submitted.

### **8.3 Master Inventory / Directory of data holdings**

TCODE recommends that PICES begin to assemble a master inventory or directory that describes (in general terms) the relevant data holdings of agencies and institutions in the PICES area. TCODE members will provide this information for distribution on the PICES WWW server.

### **8.4 Inventory of long term time series**

TCODE recommends that PICES assemble and distribute an inventory of long term time series of meteorological, oceanographic and fisheries data that are of broad interest to the PICES members. TCODE members will assemble such an inventory for distribution using the PICES WWW server as well as by printed copy (on request). Where possible, links will be established to the agencies that hold and distribute these data.

### **8.5 Relationships with other committees and Working Groups**

TCODE recommends that TCODE be invited to provide a representative to relevant meetings of other groups, to report on TCODE activities and to report data requirements and issues to TCODE at the earliest opportunity. Such a mechanism will help to minimize delays in reacting to requirements of these committees. TCODE representatives have agreed to make every attempt to attend such meetings when they are held in their own country. This will minimize travel costs.

### **B. Proposal for Ship Schedule Information**

At the Third Annual Meeting, it was agreed that a ship schedule scheme should be prepared indicating what information is required on what time schedule, and how it might be most effectively disseminated. The following scheme is based on discussions among the Chairman, Executive Secretary, Science Board Chairman, and TCODE Chairman.

What is it that scientists want to know about ship operations that are scheduled or being planned in the subarctic Pacific? For any area in which they are interested, they want to know:

- 1) who will be operating there,
- 2) along what track,
- 3) on what dates, and
- 4) making what measurements.

Further, they would like to know if additional experiments and scientists could be accommodated, and whom to contact for further information. Thus for any given operation, the desired information might be of the form:

R/V Marplex. Marine Research Institute, Sidonia. Operating in Okhotsk Sea, 1-30 September 1995. [show track chart].

Observations on 50 km centers include surface to bottom CTD casts with full chemistry, zooplankton tows with Excalibur profiling nets, and continuous surface observations. Space for four visiting scientists, but no additional experiments that require winch time. For further information, contact Director, MRI Sidonia [give e-mail and fax addresses].

Research vessels for which such information is desired include those generally 30 m or greater working offshore (beyond 12 miles), and operated by government and academic laboratories. Track charts might be prepared in common

format by the PICES Secretariat. The most effective dissemination would be on a PICES Home Page. While information would be desirable several months in advance of the operations, it could be updated as cruise plans evolved.

The biggest problem in implementing such a scheme is in obtaining the information on a regular basis. This problem would have to be solved at the national level and a national commitment made to provide the information before implementation is attempted. The national contact for providing ship schedule information would need to work closely with the Secretariat for this project to succeed.

## Endnote 6

### PICES Electronic Communication System

Our bulletin board (PICES.OCEAN) on Omnet ceased operation in December, 1994, when Omnet went out of business. We have been regularly mailing PICES News via Internet to those who request it. Our e-mail list has expanded more than three fold since the Third Annual Meeting last October, to approximately 800 individuals and organizations from nearly 30 countries. Our aim is to facilitate the exchange of news and information on marine science in the North Pacific. In order to provide better service to the marine science community, we are in the act of setting up our own World Wide Web (see below) home page.

The World Wide Web (often called "WWW" or "The Web" or "W3") is a project that was started at CERN, the Center for European Particle Research. It has since spread all over the world. Essentially, this is a way of linking all kinds of computer data - words, sounds, pictures, digital movies - into a seamless web of interconnected information. This sort of non-sequential linking of information is known as

"hypertext." Many other forms of computer-based information store files as individual units with no links. But with hypertext files you can move very quickly between files until you find the information you want.

The World Wide Web uses what is called a "client and server" method. This means that the user runs a program called a client. It connects over a network to a program called the server. The server, which can be anywhere in the world, sends information back to user's client. There are different client programs available. "Lynx" (a pun on links) cannot display pictures or play sounds - all the information available to it is text only, whereas Mosaic is a graphics-based client program.

Our WWW server will be placed at the PICES Secretariat. We propose the following structure for comments:

1. Discussion Groups
  - A. Scientific Committees
    - (a) Science Board
    - (b) BIO

- (c) FIS
- (c) MEQ
- (d) POC
- B. Working Groups
  - (a) CCCC
  - (b) WG5
  - (c) WG8
  - (d) WG9
- 2. Data
  - (a) TCODE
  - (b) Inventories
  - (c) Data
  - (d) Research cruise report
  - (e) Ship schedule
- 3. Information and News
  - A. Secretariat
    - (a) PICES publications
    - (b) PICES PRESS
    - (c) PICES News
    - (d) Annual Mtg. announcement

- (e) Meetings of interest
- B. Other interesting WWW sites
- 4. Reference Material
  - (a) PICES convention
  - (b) Rules of procedure
  - (c) Financial regulations
  - (d) Structure and personnel
  - (e) PICES directory
  - (f) E-mail list

It is intended that the home page will be operational in a month or two. The Secretariat would like to have comments from Committee members, WG members and others through recommendations to the Science Board. After the Annual Meeting any comments or suggestions can be sent to: [pices@ios.bc.ca](mailto:pices@ios.bc.ca)

## REPORT OF SCIENCE BOARD

The Board met on October 21 (08:30 - 17:00).  
(See Endnote 1 for participants.)

The Chairman, Dr. D.M. Ware, called the meeting to order and set out the task before the Board. The Board was to review the findings and recommendations of the Science Committees, TCODE and the Working Groups; review the PICES/GLOBEC Implementation Panel Report and recommendations; make arrangements for future Science activities; and plan the Fifth Annual Meeting. Dr. Ware noted that the Chairmen of the Science Board, POC, BIO and MEQ will have completed their terms of office after this meeting, so this was their last chance to ensure that PICES activities are heading in the right direction for the new Chairmen. Dr. Ware thanked the out-going Chairmen for the work they have done, and expressed how much he enjoyed working with them. Dr. Makoto Kashiwai (Japan) was elected the new Chairman of the Science Board. (The meeting was adjourned at 17:00.)

The new Science Board, POC, BIO and MEQ Chairmen begin their terms on Dec. 1, 1995.

### **Reports from the Scientific and Technical Committees**

Reports from the Science Committees were presented by their Chairmen and are summarized below (see reports for full text):

#### **Physical Oceanography and Climate Committee (POC) - Prof. Yutaka Nagata**

The Physical Oceanography and Climate Committee met on October 18 and 19, 1995. An election was held and Prof. Paul H. LeBlond was unanimously acclaimed the

new Chairman of the Committee for the next three years. The Committee discussed the WG 7 report on Ocean Circulation Modelling and recommended that this report be published as a PICES Scientific Report. POC also recommended that responsible bodies within PICES establish a formal liaison between POC and TCODE.

As a follow up of the Vladivostok Workshop on the Okhotsk Sea and Adjacent Areas, it was recommended that PICES should maintain an active interest in the Sea of Okhotsk and be prepared to possibly hold another workshop after two to three years. The Committee also recommended that it be responsible for preparing a complete nomenclature list of the bays, straits, currents, etc., in the Sea of Okhotsk in the languages of PICES countries.

WG 7 has been disbanded and POC proposed a new Working Group 10 on the Circulation and Ventilation in the Japan Sea (East Sea) and its adjacent areas. The Committee has two concerns that they asked the Science Board to convey to Governing Council:

1. that it is important to maintain a balance between routine monitoring programs and observational programs in support of specific scientific research activities; and
2. that university oceanographers in several countries have not been as active in PICES as would be expected from the proportion of national oceanographic research carried on in universities.

#### **Biological Oceanography Committee (BIO) - Prof. Michael M. Mullin**

Prof. Patricia A. Wheeler (U.S.A.) was elected by acclamation to succeed Prof.

M.M. Mullin as Chairman of the BIO Committee. The Committee discussed the CCCC Draft Implementation Plan, and recommended that BIO be more closely connected to CCCC activities. In both the proposed data collection and modelling in the CCCC Program, BIO recommended greater consideration of marine birds and mammals. Establishment of standards for data collection procedures and analytical methods (like those employed by JGOFS) is desirable. BIO recommended that a Working Group 11 be established under its guidance to develop and tabulate estimates of the food consumption of marine resources by marine birds and mammals in the PICES region (by age class and sub-location). Working Group Co-Chairmen will be determined later.

BIO recommended that its topic session at PICES V be "Regional and Interannual Variants in Life Histories of Key Species".

#### **Fishery Science Committee (FIS) - Prof. Qi-Sheng Tang**

The Committee reviewed WG 3's final report, agreed that the work was finished, and recommended that WG 3 be disbanded. WG 3 has produced an inventory of scientists working on pelagic fish which will be provided to the Secretariat for distribution upon request. FIS reviewed the CCCC Draft Implementation Plan and supports the establishment of the CCCC/REX Task Team to coordinate comparative coastal pelagic species studies among areas. The Committee noted that it would like to participate in the selection of FIS representatives. The Committee recommended that it identify the key fish scientific research issues in relation to the CCCC Program. FIS is concerned that there is a need to separate fishing effects from environmental effects in the dynamics of fish populations.

The Committee recommends a new Working Group 12 on Crabs and Shrimps.

#### **Marine Environmental Quality Committee (MEQ) - Prof. Jia-Yi Zhou**

Dr. Richard F. Addison (Canada) was elected the new MEQ Chairman, replacing Prof. Jia-Yi Zhou. The Committee reviewed WG 8's report and agreed that MEQ and WG 8 will work together to implement the Practical Workshop. The Practical Workshop will be conducted in two phases. Phase 1 will be held in May 1997 and will focus on contamination of Jiaozhou Bay at Qingdao; the Institute of Oceanology (Academia Sinica) has offered laboratory space and facilities. It is expected that Phase 2 will be conducted in a subsequent year. The Committee further replaced Dr. Addison as one of the Co-Chairmen of WG 8 by Dr. John E. Stein.

MEQ Committee discussed the membership of WGs and recommended that in future the number of members appointed by member countries be kept as small as practicable.

MEQ will organize a topic session for PICES V on "Processes of contaminant cycling". This will address such physical, chemical and geochemical topics as long range transport of contaminants across the Pacific.

#### **Technical Committee on Data Exchange (TCODE) - Mr. Robin Brown**

TCODE was formed as a standing committee to replace WG 4 (PICES III Decision 94/S/4). It is an interdisciplinary committee consisting of two scientists from each member country. Members from Canada, Japan, Republic of Korea, the People's Republic of China, the Russian Federation, and the U.S.A. were appointed in 1995. TCODE members exchanged views on the issues raised last year by WG 4 and the Science Board prior to PICES IV.



The Committee held its first meeting at PICES IV in Qingdao.

The Committee discussed a strategy for PICES data management, and made recommendations regarding ship schedules, cruise reports, master inventory of long-term time series, and relationships with other Committees and Working Groups.

### **Working Group Reports**

PICES currently has five WGs, tasked to meet specific objectives. The Board reviewed the WG reports and recommendations. WG report summaries follow:

#### **WG 3. Coastal Pelagic Fish (FIS)**

WG 3 completed its terms of reference by e-mail exchange this year, under the co-chairmanship of Dr. J.R. Hunter (U.S.A.) and Dr. T. Wada (Japan). The WG has assembled a complete time series of catch, abundance and recruitment data for herring stocks from British Columbia, Alaska, Russia and Hokkaido. These data are available upon request from Dr. D.E. Hay (Canada) or Dr. V.G. Wespestad (U.S.A.). Various members of the WG have initiated future collaborative projects with Russian scientists, such as comparative retrospective studies of North Pacific herring population dynamics. WG 3 activities also led to two new bilateral initiatives:

1. between the National Research Institute of Fisheries Science (Yokohama, Japan) and the National Marine Fisheries Service (La Jolla, U.S.A.), on a comparative retrospective study of Pacific sardine; and
2. a three year joint Japan (Hokkaido University) and U.S.A. (University of Alaska) program on walleye pollock in the Bering Sea. The WG has finished preparing a computer based inventory of North Pacific scientists working on small

pelagic fishes. The inventory includes names, addresses and research specialties. Prof. B.L. Norcross (U.S.A.) will make the inventory available to the Secretariat.

Science Board thanks WG 3 for completing its work, and is pleased to see that the activities of the WG have spawned several new initiatives that the scientists can pursue in the future, to the mutual benefit of their member countries.

#### **WG 7. Modelling of the Subarctic North Pacific Circulation (POC)**

This WG was formed after PICES II, and is co-chaired by Prof. Paul H. LeBlond (Canada) and Dr. Masahiro Endoh (Japan). The WG was tasked to:

1. review the status of present physical modelling efforts on the subarctic North Pacific circulation;
2. identify the observations and information needed to improve circulation models;
3. identify the knowledge of physical processes and ocean dynamics needed to improve the circulation models; and
4. identify how incompleteness of the present models influences other modelling efforts on global climate, ecosystems, material transport, etc.

The group had its final meeting at PICES III in Nemuro to assign reporting tasks. The review focuses on modelling ocean circulation and its variability in the subarctic North Pacific. The performance of existing models is assessed in relation to observations in the upper ocean, intermediate waters, and abyssal waters. The quality of the model results was found to match that of the observations. Models of surface circulation, where data are most abundant, reproduce many observed features, while the reliability of the model results at greater depths remains more problematic. In general, model results are found to be too coarse and insufficiently reliable for many of the applications towards

which they have been developed (fisheries, pollution, climate change, etc.) and significant improvements are required. The report identifies a number of gaps in physical understanding and supporting data which need to be filled to improve model performance. Many of these apply to ocean modelling in general, but some, particularly with respect to the influence of marginal seas (Bering, Japan, Okhotsk), are specific to the North Pacific. The recommendations address ways of filling these gaps and using international collaboration within PICES to foster development of better ocean circulation models in the subarctic North Pacific.

Science Board accepts the final report from WG 7, and compliments the members for producing such a comprehensive and informative review document.

#### WG 8. Practical Assessment Methodology (MEQ)

This WG was formed at PICES III, and is co-chaired by Dr. R.F. Addison (Canada) and Prof. M.J. Zhou (China). The WG met just prior to PICES IV in Qingdao. The WG is designing a workplan and outline for a 2-3 week practical workshop to assess contaminant effects in the western Pacific / East China Seas region. MEQ decided to conduct this workshop in 2 phases: Phase 1 will be a study of Qingdao's Jiaozhou Bay. Phase 2 will be conducted in a subsequent year in the Changjiang Delta, with the primary focus being the ecosystem effects arising from the Three Gorges Project. The target date for the Phase 1 workshop is May 1997.

#### **Inter-Committee (Science Board) Working Group Reports**

##### WG 5. Bering Sea

The Bering Sea WG completed its terms of reference by fax, phone and e-mail this year

under the chairmanship of Dr. A.V. Tyler (U.S.A.). There was no formal meeting. The WG was tasked with:

1. planning and convening a one-day Symposium on the Oceanography and Fisheries of the Bering Sea at PICES IV, and
2. developing a review volume on Bering Sea Oceanography and Fisheries.

The Bering Sea Symposium was organized by Drs. J.E. Overland (U.S.A.), R.J. Beamish (Canada) and J. Rice (Canada). The purpose of the Symposium was to showcase ideas, concepts and insights into the biological, physical and chemical dynamics of the Bering Sea. Twenty-three papers and posters were presented and discussed at Qingdao by the Symposium participants. Planning for the review volume progressed this year. The co-editors are Drs. T.R. Loughlin (U.S.A.) and Prof. K. Ohtani (Japan). It is anticipated that the volume will be published as a 400 to 500 page book. The section editors have selected the authors and have provided guidance on content and format. Chapter drafts are due by the end of December 1995. Publication is anticipated by the end of 1997. The WG recommends to Science Board:

1. that the Editorial Committee proceed to produce a final draft of the book by 1996; and
2. that the WG meet in 1996 for a final time to draft recommendations to Science Board on future directions for Bering Sea Science.

##### WG 9. Subarctic Pacific Monitoring

This Working Group was formed at PICES III, and is co-chaired by Drs. K. Hanawa (Japan) and B.A. Taft (U.S.A.). This interdisciplinary WG has the following terms of reference:

1. it is responsible for planning the monitoring activities in the PICES area including proposing priorities and

- schedules, and including physical, biological and chemical measurements;
2. it should cooperate with GOOS and the PICES-GLOBEC CCCC Program Implementation Panel;
  3. it will work with TCODE to ensure timely and open exchange of monitoring data between participants and external data users, as a mechanism to control the quality and relevance of the data.

The WG had its first meeting in Seattle on 1-3 August, 1995. The first WG meeting focused on the design of an observational system to support the PICES-GLOBEC CCCC Program. The WG report contains a brief review of present monitoring activities in the PICES area. The WG identifies seven key observational programs that should be considered in the subarctic Pacific, and outlines some cost-effective ways of implementing these programs:

1. time series measurements of primary production and zooplankton stocks;
2. heat content and freshwater variability of subarctic Pacific;
3. time series analysis of salmon scales to provide a measure of productivity;
4. electromagnetic measurements of transport through Kamchatka Strait;
5. aeolian transport of iron into the subarctic Pacific gyre;
6. voluntary observing ship basin-scale measurements employing flow-through sensors;
7. surface-velocity measurements using satellite-tracked drifters.

### **PICES-GLOBEC Implementation Panel Report**

The PICES-GLOBEC "Climate Change and Carrying Capacity" (CCCC) Program is a regional component of the GLOBEC International Program which is currently sponsored by SCOR and the IOC. IGBP will be a third international sponsor if the International GLOBEC program gains Core Project status. The PICES-GLOBEC

Implementation Panel (formerly known as the CCCC Steering Committee) was struck at the last Annual Meeting to initiate development of a draft Implementation Plan for the CCCC Program. It was also tasked with:

1. determining how the work of the PICES Science Committees and WGs can most effectively support the CCCC Program, and
2. identifying existing or foreseen national and international programs that the CCCC program could be coordinated with, and determine how this can be effectively achieved.

The Implementation Panel is co-chaired by Drs. M. Kashiwai (Japan) and W.S. Wooster (U.S.A.). There is an Executive Committee which consists of the IP Co-Chairmen, the Science Board Chairman, the National GLOBEC representatives, one of the WG 9 Co-Chairmen, TCODE Chairman and the NPAFC liaison. The Executive Committee met in Honolulu on May 24-26 to prepare a draft Implementation Plan and a schedule for reviewing the draft leading up to PICES IV. The draft report was circulated to the IP, Science Committees and selected WG members in August 1995 for feedback. The IP/EC met at Qingdao on October 17 to plan an evening meeting with the full IP, Science Committee Chairmen and other interested parties on the evening of October 19 to finalize the report. The CCCC/IP report was submitted to the Science Committees and to Science Board with a number of recommendations.

The Science Board recommends that in view of the election of Dr. Kashiwai as new Science Board Chairman, that Dr. Ware and Prof. Nagata replace Drs. Kashiwai and Wooster as the CCCC/IP Co-Chairmen, effective December 1, 1995. To avoid confusion with other National bodies, the Board recommends that the CCCC Scientific Steering Committee should be renamed the Implementation Panel (CCCC/IP).

## **Okhotsk Sea and Adjacent Areas Workshop**

This Workshop was endorsed by Governing Council at PICES III and was held in Vladivostok between June 19-24, 1995. It was organized by POC and was co-chaired by Drs. V. Lobanov (Russia), Y. Nagata (Japan) and L.D. Talley (U.S.A.). The objective of the Workshop was to review present knowledge of the oceanography and fisheries of that region, the availability and exchange of relevant data, and the development of cooperative investigations. Eight parallel symposium sessions were held on June 20-23. The Workshop made a number of recommendations to Science Board, POC, BIO, FIS and TCODE. The report recommends that Science Board request funding to publish extended abstracts of the Workshop proceedings in the PICES Scientific Reports Series, and to translate a Russian monograph on hydrometeorological conditions in the Okhotsk Sea.

## **Science Board Recommendations**

Consideration of Scientific Committee, Working Group and the CCCC Draft Implementation Plan reports led to a set of Resolutions for presentation to Council for approval (see Appendix to Council minutes, Decisions of Council).

## **Publications**

PICES Scientific Report No. 2 was published this year. It contains WG 1's report "The Okhotsk sea and Oyashio region" edited by Drs. L.D. Talley (U.S.A.) and Y. Nagata (Japan). The Report summarizing the proceedings of the PICES-STA Workshop (held at PICES III) is in preparation and will be published by the end of 1995.

## **Ships Schedule**

The Board discussed TCODE's recommendation 8.1 regarding a plan for notifying people about ship operations in the PICES area, and decided that the IOC/NOP format was not detailed enough. The Board recommended adopting the proposal provided by the Secretariat.

## **Fifth Annual Meeting**

The Fifth Annual Meeting will be held in Nanaimo, British Columbia, Canada, in 1996. The program will include sessions of invited and contributed papers organized by the indicated committees on the following topics:

1. (Science Board) *Methods and findings of retrospective analyses.* The CCCC/IP/EC will organize a one-day symposium for Science Board on this topic. The content of the session should be selected to enhance the development of the CCCC basin-scale, and regional-scale physical and ecosystem studies. Co-convenors: Robert C. Francis (U.S.A.) and Kimio Hanawa (Japan).
2. (POC) *Exchanges of water, organisms, and sediment between continental shelf waters and the nearby ocean.* Co-convenors: Kenneth L. Denman (Canada) and Kuh Kim (Korea).
3. (BIO) *Regional and interannual variants in life histories of key species.* Co-convenors: David L. Mackas (Canada) and another co-convenor from the west side of the Pacific to be determined.
4. (FIS) *Ecological effects of truncated age and size distributions and fishing on fish populations.* Co-convenors: R.J. Beamish (Canada), A.B. Hollowed (U.S.A.) and Suam Kim (Korea).

5. (MEQ) *Processes of contaminant cycling*. Co-convenors to be determined.

TCODE and WG 8 will meet a few days in advance of PICES V.

### Future Symposia

The Board recommends that a one-day Symposium on "Regime shifts in the North Pacific" be held at PICES VI (in 1997), and that a small organizing committee be established to begin planning this Symposium.

### Young Scientists Travel Fund

The opportunities for young scientists to attend PICES meetings were discussed. The Board recommends that PICES make travel funds available to support outstanding young scientists in attending and participating in future PICES Annual Meetings and Symposia.

### Endnote 1

Dr. Daniel M. Ware  
(Chairman, Science Board)  
Prof. Michael M. Mullin  
(Chairman, BIO Committee)  
Prof. Qi-Sheng Tang  
(Chairman, FIS Committee)  
Prof. Jia-Yi Zhou  
(Chairman, MEQ Committee)  
Prof. Yutaka Nagata  
(Chairman, POC Committee)

### Scientific Program

An interdisciplinary session was organized by the Science Board. The following papers were presented.

*Marine carrying capacity: fact or fiction?*. Co-convenors: Dr. Makoto Kashiwai (Japan) and Dr. Alec D. MacCall (U.S.A.)

L.M. Dickie

Measuring carrying capacity using biomass spectrum

O.F. Gritsenko et al

The problem of criteria for carrying capacity of the North Pacific for salmon

M. Kashiwai

History of carrying capacity as an index of ecosystem productivity

A.D. MacCall

Carrying capacity in simple theoretical population models

D.W. Welch

Evolutionary evidence for a finite marine carrying capacity for salmonids

### Participants

Dr. Warren S. Wooster (Chairman, PICES)  
Dr. W. Doug McKone (Executive Secretary, PICES)  
Dr. Sangbok Hahn (Korean representative)  
Dr. Lev N. Bocharov (Russian representative)  
Dr. Makoto Kashiwai (Chairman-elect, Science Board)  
Prof. Patricia A. Wheeler (Chairman-elect, BIO Committee)

## REPORT OF BIOLOGICAL OCEANOGRAPHY COMMITTEE

The Committee thanked Profs. M. Omori and R. Wang for convening a stimulating topic session, "Factors affecting the balance between alternative food web structures in coastal and oceanic ecosystems".

Dr. Patricia A. Wheeler (U.S.A.) was elected by acclamation to succeed Prof. Michael M. Mullin as Chairman of this Committee, beginning Dec. 1, 1995.

The Committee had no comments on the WG 5 (Bering Sea) report, as summarized by A. Tyler.

Concerning the WG 9 (Subarctic Monitoring) report, summarized by B. Taft, the Committee made the following comments/suggestions:

1. Unfortunately, a ship-of-opportunity program monitoring surface conditions (particularly chlorophyll) between Japan and Korea has been terminated. However, a China-Korea Continuous Plankton Recorder (CPR) program will be started next year.
2. Dr. T. Sugimoto described a Japanese ship-of-opportunity program with 8 crossings of the Subarctic per year, and including preservation of small samples of zooplankton from the ship's seawater system. It is hoped to expand this to a CPR program.
3. It would be desirable to add a bird/mammal observer program to the ship-of-opportunity program described by A. Taft.
4. For the Atlas moorings, multi-frequency acoustic sampling of zooplankton (i.e. some resolution of organism's size) should be considered. Also, a micro-

wet chemistry method for  $\text{NO}_3$ , developed at MBARI, shows considerable promise as a way to monitor this important nutrient.

5. ALYCE floats should be considered as a useful addition to the sampling described by A. Taft.

Concerning the CCCC report and recommendations, distributed to members, the committee had the following comments:

1. In the proposed MODEL task team, attention should be given to models of community structure (species, etc.) as well as more common (in oceanography) physics/biomass models. Also, "top-down" or "keystone predator" models (i.e., in which a dominant "force" is selective predation) should be included in the discussion.
2. Concerning the proposed CCCC workshop in Nemuro (June, 1996), this Committee was concerned that its member on the Implementation Group (R. Wang) had not been informed. BIO believes that a "biological oceanographic" perspective is important to CCCC, and (without intending to question the stature of the IP members) believes that BIO should be more strongly represented in CCCC.
3. The symposium proposed by CCCC/IP for PICES V should emphasize suitable standard and/or innovative methods of statistical analysis of retrospective data. BIO believes that powerful methods of analysis need to be distributed just as much as data. In this connection, attention was called to SCOR WG 98 which is considering these issues.

4. Regarding membership of task teams, BIO recommends that a bird/mammal expert be included in (e.g.) REX.
5. BIO also discussed the need to establish standards for collection procedures and analytical methods, following the JGOFS model. A task team under CCCC would be appropriate.
6. Regarding the recommendation that PICES recommend financial support of the CCCC, it was stated that several national GLOBEC programs are already being considered for funding, and it is unclear how PICES can help at this stage (except possibly in China).

The proposed PICES WWW site is good for information. However, it may be less satisfactory for data exchange if a user cannot be identified and informed of corrections to data. Data users should "leave an ID card" when they extract data.

Exchange / posting of research ship schedules is useful. However, since individual scientists may need many months to obtain funds to participate in a cruise, even vague cruise plans known two years in advance could be helpful. Also, potential seekers for a ship should be able to advertise their desires. The problem is that the biological community is much more diffuse than is the physical oceanographic one, and less uniformly connected to large, information-sharing programs.

Four possible topic sessions for PICES V were proposed and discussed. By vote, BIO recommends that its topic session at PICES V be, "Regional and Interannual Variants in Life Histories of Key Species". Co-convenor will be Dr. D.L. Mackas, for BIO; it would be desirable for the other co-convenor to be from a western Pacific nation. This topic is intended to call attention to the importance of, and variability in, the life histories of species of regional

ecological importance. In addition, BIO agreed to co-operate with MEQ in organizing a symposium on "Harmful Algal Blooms - Causes and Consequences", if MEQ recommends such a topic session, but BIO places top priority on the "life histories" topic. Additional topics recorded for possible future use are: "Controls on lower trophic level productivity in the subarctic North Pacific", "Trophic ecology and impact of marine birds and mammals", and "Physical and biological causes of extreme (very large or small) recruitment events in the North Pacific".

BIO has not previously recommended the establishment of a Working Group to Science Board. Now, however, BIO recommends that a Working Group be established under its guidance to develop and tabulate estimates of the consumption by marine birds and mammals in the PICES region of marine resource species (by age class and sub-location). Dr. L. Jones will be the point of contact for BIO. BIO believes that this activity will contribute to the ecosystem studies contemplated in CCCC.

Specifically, BIO recommends that PICES establish a WG 11, called "WG on consumption of marine resources by marine birds and mammals in the PICES region". This WG should:

- Obtain and tabulate available data on population sizes and prey consumption by marine birds and mammals.
- Calculate seasonal and annual consumption, expressed as numbers and biomass, of particular marine resource species by particular bird and mammal populations.
- Where possible, stratify the calculation as to age classes of prey and locality (local stock impacted).
- Prepare a report for PICES describing data sources and methods of calculation, and the results, and

identifying major lacunae in knowledge.

It is the intent of BIO that this WG encourage communication with CCCC/IP, with overlapping membership where possible. BIO anticipates that two meetings of the WG should be sufficient.

Prof. Wang noted that China is likely to recommend that Dr. Wu (who is in ill health) be replaced as delegate to BIO by Dr. Ming-Yuan Zhu of the First Institute of Oceanology.

### Scientific Program

The following scientific papers were presented from the BIO Committee sponsored part of the program.

*Factors affecting the balance between alternative foodweb structures in coastal and oceanic ecosystems.* Co-convenors: Prof. Makoto Omori (Japan) & Prof. Rong Wang (China).

H. Guo & Z. Yu.

The characteristics of the photoplankton communities in the prawn ponds and the relationship with shrimp disease

S. Harada et al.

Variations in the transfer efficiency from photosynthetic and bacterial carbon production into zooplankton during a shift of zooplankton dominance from copepoda to doliolida

W.S. Kim.

Trophic interactions in the planktonic food webs

D.L. Mackas.

Year-to-year changes in zooplankton community composition off the west coast of Canada

R.I. Perry et al.

Stable carbon isotopes identify different food-webs between shelf and slope regions west of Vancouver Island

H. Seki.

Stability and importance of detritus food chains in the marine food web

H. Sugisaki.

Food webs of zooplankton and micronekton communities in the two cold water masses around Japan

K. Taki.

Distribution and life cycle of *Euphausia pacifica* hansen in the coastal water off Sanriku, Northeastern Japan

A. Taniguchi & Y.O. Kim.

Seasonal variation of excystment ability of the cyst population of the planktonic oligotrich ciliate *strombidium conicum*

T. Weisse.

The link between the classical food chain and the microbial food web: the role of keystone predators

S. Yoo.

Primary productivity of the East China Sea



## Endnote 1

### Canada

Dr. David L. Mackas

### China

Prof. Ya-Qu Chen

Prof. Rong Wang

### Japan

Dr. Takashige Sugimoto

## Participants

### Russia

Dr. Boris N. Kotenev

### U.S.A.

Dr. Linda Jones

Prof. Michael M. Mullin (Chairman)

Prof. Patricia A. Wheeler

## REPORT OF FISHERY SCIENCE COMMITTEE

The Fishery Science Committee meet on October 18 and 19. The Chairman, Prof. Qi-Sheng Tang announced that he had just been informed that he had to attend a meeting in Beijing and asked Dr. R. Beamish to be the acting Chairman. The proposed agenda was then discussed and approved.

There was a discussion about Working Groups and Working Group 3. Working Groups are created to focus attention of experts on specific issues for short time periods. It was agreed that WG 3 had completed its business and should be terminated. However, there were some issues resulting from the activities of the working group that the Committee considered could be continued in a new working group.

The Committee discussed the formation of MODEL, BASS and REX. REX was a proposed group that FIS considered could help coordinate the comparative coastal pelagic species studies. FIS recommends that it participate in the selection of its representatives on REX.

There was a report on the progress of the PICES-GLOBEC CCCC Program which lead the Committee to discuss the need to identify specific activities related to fish. After a lengthy discussion, there was consensus that FIS identify that key scientific issues relating to fish in each of the 12 PICES areas, once the CCCC Program is approved. The Committee also noted that it was important to identify fishing effects and environmental effects when studying the dynamics of the key commercial species as part of the CCCC Program.

A document on stock identification, prepared by ICES, was submitted to the Committee for comment. As this was a specialized area of research and the appropriate experts from each country were not present, it was decided to ask that the document be reviewed at a later date by each country and that comments be sent directly to the Secretariat.

There were two proposals for Working Groups, a Working Group on crabs and a group to continue the studies of small coastal pelagics. The WG on crabs would have the following objectives:

1. identify the persons performing scientific work on the distribution, recruitment, larval transport, migration, population dynamics, and influences of environmental conditions for crabs and shrimp in the PICES region,
2. identify data that are available that would assist in the analyses of factors affecting abundance trends, and
3. review current knowledge of factors affecting abundance and survival of crabs and shrimp and identify the key scientific questions relating to the understanding of the reasons for abundance fluctuations.

The working group to continue the studies of coastal pelagics would

1. seek consensus and describe the temporal and geographic properties of small pelagic fish stocks, favouring the concept of "unit stocks" to the extent possible. Maps of stock distributions would be one of the products;
2. describe the patterns of mixing or overlap if "unit stocks" cannot be defined;
3. describe the alternative views of the differing parties if consensus cannot be reached;

4. describe appropriate research that would solve problems identified; (v) describe known or suspected patterns of oceanographic variability that influence stock distribution.

Last year FIS agreed to its topic for the 1996 annual meeting. This decision was reviewed and supported. The topic, "Truncated age and size distributions and effects of fishing on the ecology of fish populations", relates to the need to understand how fishing has affected the ability of a fish population to survive future extremes in the environment. Fish populations are more than just numbers. The structure of the population has evolved to adapt to the particular habitat. In many species this has resulted in fish obtaining older ages and larger sizes. Fishing has become a force of selection and may be altering the structure in a manner that reduces the population's ability to adapt to extremes in the environment. In particular, many populations have greatly truncated age structure and reductions in average size at age. FIS also suggested that PICES have a symposium topic on retrospective analysis.

The inventory of scientists produced by working group 3 was given to the Secretariat.

### Scientific Program

The following scientific papers were presented from the FIS Committee sponsored part of the program.

*Density-dependent effects on fluctuations in the abundance of marine organisms.* Co-convenors: Dr. Yasunori Sakurai (Japan) and Dr. Vidar G. Weststad (U.S.A.).

R.J. Beamish.  
Density-dependent effects and regime shifts

- J.Y. Deng et al.  
Study on dynamics of the stock recruitment relationship (SRR) of penaeid shrimp in the Bohai Sea
- J.G. Fang et al.  
Study on cultivation carrying capacity of kelp *Laminaria japonica* in Sungo Bay
- J. Helle.  
Size decreases and older age at maturity in chum salmon in North America
- Y. Hiyama.  
Density dependent effects on growth and recruitment in some fish and squid populations in the Sea of Japan
- J.Y. Kim & J.I. Kim.  
A density-dependent effect on the reproduction caused by the decrease in sardine population off Korea
- Y.L. Lan et al.  
Population dynamics of some main commercial fishes in the East China Sea and Yellow Sea
- S. McKinnell.  
Density-dependent effects of ocean sockeye abundance on adult body size of British Columbia sockeye stocks
- B.A. Megrey.  
Interannual trends in maturity for Gulf of Alaska walleye pollock: is there evidence for density-dependence?
- T.J. Quinn II.  
Expression of density dependence in population models
- V.I. Radchenko.  
Density-dependent effects on growth and maturing of pink salmon during marine anadromous migration
- W.M. Smoker & A.J. Gharret.  
Genetic and environmental variation of fitness traits in pink salmon
- O.S. Temnykh.  
The peculiarities of asia pink salmon growth at the different abundance
- T. Wada.  
Role of density-dependent effects on the population fluctuation of Japanese sardine, *sardinops melanostictus*

K. Watanabe.

Changes in the relative abundance of demersal and benthopelagic fishes around the coast of Hokkaido, observed in the data from trawlers and Danish seiners

D.W. Welch.

Thermal limits and oceanic migrations of Pacific salmon

O. Yamamura.

Density-independent niche dynamics in demersal fish assemblages: are fish communities saturated?

## Endnote 1

### Participants and Observers

#### Canada

Dr. Richard J. Beamish (Rapporteur)

#### China

Prof. Qi-Sheng Tang (Chairman)

#### Japan

Prof. Kiyotaka Ohtani

Dr. Tokio Wada

#### Korea

Dr. Suam Kim

Dr. Chang-Ik Zhang

#### Russia

Dr. Vladimir I. Radchenko

#### U.S.A.

Dr. Gordon H. Kruse (for Douglas M. Eggers)

Dr. Loh-Lee Low

Dr. Alec D. MacCall (for John R. Hunter)

Dr. Vidar G. Wespestad

# REPORT OF MARINE ENVIRONMENTAL QUALITY COMMITTEE

03

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The MEQ Scientific Committee met in two sessions during PICES IV in Qingdao, People's Republic of China. The first session was held from 1500 to 1750 hours on Wednesday, October 18, 1995. Through the courtesy of Prof. Ming-Jiang Zhou and our Chinese hosts, members and observers of MEQ were taken on a shipboard field trip the next morning, to familiarize us with pollution sources and marine resource utilization in Qingdao's Jiaozhou Bay. Following the field trip, a concluding session was convened from 1330 to 1750 hours on Thursday, October 19, 1995.

## Introduction

The meeting began with Chairman Prof. J.Y. Zhou extending a welcome to all. All present in the meeting room were asked to briefly introduce themselves and their various backgrounds and interests, and encouraged to actively participate and contribute as much as possible in our various discussions and issues. The Chairman then briefly set forth a general outline of the various agenda at hand, and the meeting was called to order.

## Election of New MEQ Chairman

Because PICES by-laws limit the tenure of each scientific Committee Chairman to a maximum of four years, it was necessary for MEQ to elect a new Chairman at this time. The MEQ Committee unanimously expressed its gratitude to Chairman J.Y. Zhou, for his past leadership and his great pioneering efforts in marine pollution issues in Asia and throughout the world. Further, MEQ unanimously urged that he consent to remaining an active MEQ Scientific Member, to assure our retention of his insight and knowledge.

As per the by-laws, the formal election process was witnessed by PICES Executive Secretary Dr. W. Doug McKone, who had attended this portion of the MEQ Session to provide administrative and procedural assistance. Nominees for new Chairman included Drs. Watanabe, Varanasi, and Addison. After thorough discussion and deliberations, individual written ballots presented to Dr. McKone revealed the selection of Dr. Richard F. Addison as the new MEQ Chairman-Elect.

## Brief Review of the History and Prior Recommendations of the MEQ Committee

For the benefit of those unfamiliar with the history of our marine pollution efforts within PICES, rapporteur Dr. M. Watson presented a brief synopsis of the history and evolving scope of the MEQ Scientific Committee. Our first two meetings, held respectively at Victoria, Canada (1992) and Seattle, U.S.A. (1993) were largely focused on identifying common problems of marine pollution in the North Pacific. From this, it soon became obvious that MEQ must surmount the more "oceanographically correct" issue of pollution of the "open North Pacific Ocean", and instead focus PICES resources toward the vastly more impacted nearshore regions of coastal areas and marginal seas. These efforts led to our MEQ symposium in Nemuro, Japan (at PICES III, 1994) on "Interdisciplinary Methodology to Better Assess and Predict the Impacts of Pollutants on Structure and Function of Marine Ecosystems". At Nemuro, the MEQ decided to narrow and refine its focus, and to select a single perturbed marine ecosystem of interest to all PICES member nations. The area chosen by MEQ was the East China Sea, and especially the area

impacted by its largest river, the Changjiang (Yangtze).

With this in mind, MEQ also specifically identified pollution-mediated phenomena in the East China Sea and Changjiang outflow system as the theme for our MEQ symposium and Topic Session at the PICES IV in Qingdao.

Also at Nemuro, MEQ and Working Group 2 (WG 2; disbanded at PICES III and refocused as WG 8) agreed to sponsor and conduct a two-to-three week Practical Workshop, along a gradient outward from the Changjiang into the East China Sea. Slated for 1997 or 1998, the workshop would involve working scientists from all PICES member nations. This would be a cooperative sampling and analysis effort along a pollutant gradient extending out from the Changjiang estuary, and designed to assess and predict degradative changes in the marine ecosystem as a result of the construction of the massive Three Gorges Dam approximately 500 kilometers upriver.

MEQ Chairman J.Y. Zhou then formally turned the meeting over to Chairman-Elect Addison, who subsequently assumed responsibilities for the remainder of our business meeting.

### **Selection of a New Working Group 8 (WG 8) Co-Chairman, Overview of the 1995 (WG 8) Meetings, and Recommendations for Implementing MEQ's Proposed Practical Workshop(s)**

New WG 8 Co-Chairman; Dr. John E. Stein: Due to Dr. Addison's assumption of his new leadership duties with MEQ, it was thus necessary to select a replacement to continue his former responsibilities as WG 8 Co-Chairman. The MEQ agreed to appoint Dr. John E. Stein (Director, Environmental Conservation, NMFS /NOAA, Seattle, U.S.A.) to fill this vacancy. Dr. Stein will

serve as WG 8 Co-Chairman along with Professor Mingjiang Zhou.

WG 8 Meetings at PICES IV: Dr. Addison then led a discussion about the recent activities of the MEQ Scientific Working Group, WG 8. Just prior to PICES IV, the WG 8 convened in Qingdao on October 12-13, 1995, at the Institute of Oceanology, Chinese Academy of Sciences.

WG 8 Members in attendance were:

- Prof. Ming-Jiang Zhou (China), Co-Chairman
- Dr. Richard. F. Addison (Canada), Co-Chairman
- Prof. You-Xian Yuan (China)
- Dr. Colin D. Levings (Canada)
- Dr. Brenda Sanders (U.S.A.)
- Dr. Masataka Watanabe (Japan)
- Prof. Makoto Shimizu (Japan)
- Dr. Hisashi Yamada (Japan)

The Proposed Practical Workshop(s): Building on PICES III's revised Terms of Reference in chartering WG 8, Dr. Addison went on to highlight WG 8's extensive discussions of the proposed MEQ plans for holding a future Practical Workshop in a critical Chinese Marine ecosystem. As outlined in Annex 4 of the 1995 WG 8 Report, it was recommended that instead of first seeking to examine a single, relatively massive area like the Changjiang estuary and adjoining East China Sea, MEQ should consider a more stepwise approach. This would involve two successive phases for the Practical Workshop, rather than one.

1. The first stage, targeted for 1997, could most logically be an assessment of (for example) contaminant fluxes, productivity levels, and/or biological perturbations in Qingdao's Jiaozhou Bay (Yellow Sea). This effort would focus on preliminary logistics; e.g., defining analytical and comparative methods, assembling needed equipment and instrumentation, quality assurance, shipboard needs, etc. Most importantly,

this initial international study of Jiaozhou Bay would be able to focus on the extensive data on local marine ecosystems already available in the literature, as well as utilize the locally existing network of marine scientific research facilities and personnel.

2. A second, and much more comprehensive stage of the Practical Workshop would be a preliminary assessment of the Changjiang estuary itself, conducted along a preselected gradient in the East China Sea as a contribution to baseline data for the Three Gorges Project.

Recommendation to create an "Implementation Group" within WG 8, to plan and implement the Practical Workshop(s): As outlined in Annex 4 of the WG 8 Report, Dr. Addison also explained that WG 8 recommended that MEQ/WG 8 organize a small "Implementation Group"; in effect, a subset of WG 8, which would be exclusively responsible for planning and carrying out the Practical Workshop(s) in China.

This session of the MEQ business meeting was then concluded, to resume the following afternoon following our field assessment trip to Jiaozhou Bay.

### **Introduction of Background Information on Jiaozhou Bay, via MEQ Scientific Field Trip: Boat Tour to Assess Jiaozhou Bay**

From 0800 to 1200 hours on Thursday, October 19, 1995, the MEQ Scientific Committee, attending members of WG 8, and observers were taken on a special guided shipboard tour of Jiaozhou Bay. MEQ greatly appreciates the efforts of Prof. Ming-Jiang Zhou, his colleagues at the Academia Sinica, the scientists at the Yellow Sea Fishery Research Institute, the

Chinese Government, and City of Qingdao for making this tour possible.

After being bussed along Zhongshan Blvd. through the center of downtown Qingdao to the Qingdao Harbour and Passenger Terminal area, we boarded a special research vessel. We were then treated to a three hour scientific tour of the bay, specifically focusing upon the various mariculture and fishery uses, and how the Bay is being directly impacted by pollution sources. The Bay is also utilized as a major shipping facility.

Especially impressive were the extensive culturing operations for bay scallop and macroalgae; some extending literally as far as the eye could see across the Bay. We also were able to observe many types and sizes of fishing and shipping vessels; some working at close quarters to our route.

Numerous point sources of pollutant loading were observed first hand. Some of these--all in very close proximity to each other along the shoreline -- included a pulp mill, a large military base, a military aircraft base, a metal smelting facility, a textile mill, an organophosphate pesticide plant, extensive agricultural runoff from a major river, and various other industrial sites. Charts of the bay were provided for us on deck, and our many questions about the ecosystem and its basic oceanography and biology were answered by our thoughtful hosts as thoroughly as time and circumstances would allow.

We are greatly indebted to Prof. Ming-Jiang Zhou and our Chinese hosts for making such a tour possible; such on-site experience was indispensable for all attending scientists, allowing us to familiarize ourselves with the area first-hand, thus ensuring the best possible research and logistic design for our proposed Phase One of the MEQ Practical Workshop.

## Discussion of 1995 WG 8 Report

In general discussions of the WG 8 Report, it was strongly suggested that each PICES country be limited to a maximum of three scientists per Working Group. Also, it was agreed that the idea of having two WG 8 Co-Chairmen should be continued.

Annex 3 (Revised Terms of Reference for WG 8): Dr. Addison then led a discussion of key points in the WG 8 Report, with initial discussion focusing on Annex 3, in which minor changes were suggested which would allow greater flexibility, especially in light of our new proposal to focus our preliminary workshop on Jiaozhou Bay (Yellow Sea). Specifically, this involved (a) removing the language limiting the workshop solely to the "East China Sea", and (b) changing the proposed workshop research target of "..... along a selected pollutant gradient in the East China Sea" to read: ".....along a potential gradient of impact of anthropogenic activities".

Annex 4 (Proposed Terms of Reference for Implementation Group for MEQ Practical Workshop): The Committee then discussed Annex 4 of the WG 8 Report. It was agreed that rather than establishing another formal "subcommittee" to design and carry out the Practical Workshop, a more workable approach would be to simply create an informal "Implementation Group", made up of working scientists appointed by WG 8 /MEQ. This Implementation Group would be responsible for "scoping" the framework of the Workshop(s), including:

1. assembling existing data and literature on the chosen site(s),
2. describing techniques to be used,
3. the general design and schedule of the study plan(s),
4. identifying potential participants,
5. logistic considerations, and
6. ensuring the reporting of results.

Workshop Implementation Group Membership: It was agreed that membership in this informal Implementation Group shall consist of at least one working scientist from each country, and that the group have two Co-Chairmen. MEQ and WG 8 agreed to establishing such an Implementation Group, with the following scientists as participating members:

Canada: Dr. Colin D. Levings  
China: Prof. Ming-Jiang Zhou (Co-Chairman)  
Prof. You-Xian Yuan  
Japan: Dr. Shigeki Harada  
Korea: (although none has been formally named at this time, Dr. Addison will ask Dr. Yang to nominate a candidate Korean scientist)  
Russia: Dr. Alexander V. Tkalin  
U.S.A.: Dr. John E. Stein (Co-Chairman)  
Dr. Brenda Sanders

Funding for Workshop(s): It was agreed that sources of funding is a very critical issue, and that this should be formally be brought to the attention of the PICES Science Board. Dr. Addison will also contact all MEQ members later in the year, asking for specific suggestions as to how we might generate adequate funding for our proposed workshop(s).

## Review of MEQ Topic Sessions and Paper Sessions Presented at the Fourth Annual Meeting

The Qingdao PICES IV MEQ sessions were arranged and convened by Prof. Jia-Yi Zhou, Dr. John Stein, and Dr. Richard Addison. This year's symposium, which was recommended by MEQ at the PICES III meetings in Nemuro, was entitled "Sources, Transport, and Impact of Chemical Contaminants". Six papers were presented in the MEQ Topic Session (PICES Topic 5) held on Tuesday, October 17, and nine were presented at the MEQ Papers Session



held on Wednesday, October 18. Unfortunately, a few papers scheduled for the sessions were not presented due to travel difficulties for some of the invited authors.

MEQ is especially thankful to Prof. Rui-Yu Liu (President Emeritus, Chinese Society for Oceanology and Limnology; and Senior Scientist, Institute of Oceanology, Chinese Academy of Sciences) for keynoting our Topic Session with his presentation of a specially invited paper, "Impact of the Three Gorges Project on the estuarine environment and living resources of the Changjiang River", co-authored by Prof. J.Y. Liu.

All papers were relevant to the purposes of the symposium, and could be divided into two basic groupings. One subset of papers, mostly presented in the Topic Session, focused primarily on contaminant-related phenomena in and around the East China and Yellow Sea regions. The second subset, mostly presented in the Papers Session, focused on problems and processes related to contaminants in other areas of the North Pacific. A few papers also addressed scientific techniques in identifying and assessing biomarkers in marine organisms exposed to environmental stressors. All papers stimulated very useful and fruitful discussion, and served us especially well in establishing a more complete scientific understanding of basic contaminant-related problems in the Yellow and East China Sea regions.

#### **Discussion of Future Work of MEQ Scientific Committee, and the 1996 PICES /MEQ Sessions to be held at Nanaimo, B.C., Canada**

Considerable discussion was devoted to the proposed format and scope of the 1996 MEQ activities at PICES V. The following key points were agreed upon:

1. The MEQ Symposium topic for PICES V will be "Processes of Contaminant Cycling".
2. In addition to our traditional MEQ emphasis on harmful chemicals, MEQ will co-sponsor, and consider, a joint session with the Biological Oceanography Scientific Committee (BIO), to focus specifically on "Harmful Algal Blooms" (HAB).
3. MEQ is also considering the possibility of a joint session with Physical Oceanography (POC), which would focus on the question of how regulation of freshwater discharges (e.g., via impoundments, dams) affects the marine environment.
4. MEQ resolves that more attention should be given to the problem of very long range transport of contaminants; especially long range atmospheric transport across the Pacific (see MEQ Topic 5 paper by Gao, et al. 1995; p. 19 of Abstracts from PICES IV, Qingdao)
5. More emphasis should be devoted on benthic ecosystems, especially benthic-pelagic coupling.

#### **Scientific Program**

The following is a list of scientific papers from the MEQ Committee sponsored part of the program.

*Sources, transport and impact of chemical contaminants.* Co-convenors: Jia-Yi Zhou (China), Richard F. Addison (Canada) and John E. Stein (U.S.A.)

Y.Q. Chen.

An ecological study on harmful bloom in Zhoushan fishing area

Y.Q. Chen

The impact of pollution on ecosystem in Changjiang River Estuarine area, Hongzhou Bay and Zhoushan fishing area

W.J. Cretney et al.  
Sources, fate and trends of contaminants in the Strait of Georgia: chemostratigraphy and chemometrics

S.D. Hahn  
Estimation of surface circulation in winter in the East China Sea and the Yellow Sea regions as a role of contaminant transport for real time service

S. Harada et al.  
A strategy for assessing the effects of contaminants on marine ecosystem: Case of Tokyo Bay and possibility of model development in East China Sea

K.D. Jenkins  
Relationships between trace metal bioaccumulation, metabolism and higher level effects in coastal benthic ecosystems

C.D. Levings et al.  
Movements of the starry flounder *Platichthys stellatus* in relation to its role as a sentinel species for contaminants in northeastern Pacific estuaries

R.Y. Liu & J.Y. Liu  
Impact of the Three Gorges Project on the estuarine environment and living resources of the Changjiang River

S.S. Ma  
Analysis of nutrient condition of Rushan Bay in China in August

B.M. Sanders et al.  
Detection of proteotoxicity of environmentally exposed mussels using the cellular stress response

J.P. Wu et al.  
<sup>15</sup>N/<sup>14</sup>N isotope ratios in the subarctic northeast Pacific ecosystems: nitrate utilization and trophic structure

H. Yamada & K. Takayanagi  
Distribution and behaviour of butyltin compounds in Aburatsubo Bay and adjacent waters in Japan

J.Y. Zhou  
Concentration, speciation and transfer of trace metals in the Changjiang Estuary and its adjacent East China Sea

M.Y. Zhu et al.  
Effect of aquaculture on the Sango Bay ecosystem

## Endnote 1

## Participants and Observers

### Canada

Dr. Richard F. Addison  
Mr. Lee Harding

### China

Prof. Jia-Yi Zhou (Chairman)  
Prof. Ming-Jiang Zhou

### Japan

Dr. Toshiyuki Hirano  
Dr. Makoto Shimizu  
Dr. Masataka Watanabe

### Russia

Dr. Alexander V. Tkalin

### U.S.A.

Dr. Usha Varanasi  
Dr. C. Michael Watson

### Observers

Dr. Yuan Gao (China)  
Dr. Hyung-Tack Huh (Korea)  
Dr. Kenneth Jenkins (U.S.A.)  
Dr. Soon Song Kim (Korea)  
Dr. Colin D. Levings (Canada)  
Dr. Jun Li (China)  
Dr. Qiu-Fen Li (China)  
Dr. Hong-Bin Liu (China)  
Dr. Bei-Wei Lu (China)  
Dr. A. Sathy Naidu (U.S.A.)  
Dr. Brenda M. Sanders (U.S.A.)  
Mr. Ling Tong (China)  
Dr. Gui-Yu Wang (China)  
Dr. Patricia A. Wheeler (U.S.A.)  
Dr. Jin-Ping Wu (Canada)  
Dr. Hisashi Yamada (Japan)  
Dr. Tian Yan (China)  
Dr. You-Xian Yuan (China)  
Dr. Cheng Zhang (China)

# REPORT OF PHYSICAL OCEANOGRAPHY AND CLIMATE COMMITTEE

The meeting was opened by the Chairman, Prof. Y. Nagata (Japan), at 1500. The members present briefly introduced themselves.

Dr. J.F. Garrett (Canada) agreed to serve as Rapporteur for this meeting.

## **Report of WG 7: Modelling of the Subarctic North Pacific Circulation**

Prof. P.H. LeBlond presented the report of WG 7, Ocean Circulation Modelling. The terms of reference and history of the group were reviewed. The report is in a final draft stage, and will be circulated to POC committee members. Comments are welcome, provided they are received before November 15. In view of the large amount of effort invested nationally and internationally on improving ocean circulation models, the WG focussed its recommendations on how PICES could make work easier for modellers and facilitate progress in modelling. Many of the recommendations therefore have to do with data. The WG proposes to dissolve itself when the report is finished as it will have completed its tasks.

POC thanked the WG for its excellent work and comprehensive and insightful report.

POC agreed to recommend to the Science Board that this report be published as a PICES Scientific Report.

## **Report of Vladivostok Workshop and PICES Scientific Report No. 2**

Prof. Nagata presented the report of the PICES Vladivostok workshop on the Okhotsk Sea and Adjacent Areas. He reminded POC that the workshop was

planned to complete the work of PICES WG 2 on the Okhotsk Sea and Oyashio area, which was previously unable to achieve a thorough representation of Russian work in the area. The proceedings will be published by the PICES secretariat to complement the earlier working group report. The workshop produced a number of recommendations. One is that the WG should be disbanded, but that PICES should maintain an active interest in the Sea of Okhotsk, and perhaps prepare another workshop after two or three years. Another is that PICES should establish a new WG on the circulation and ventilation in the Japan Sea (East Sea) and adjacent areas. Finally, the workshop recommended that PICES prepare a complete nomenclature list of the bays, straits, currents, etc., in the Sea of Okhotsk in all PICES member languages.

POC thanked the organizers of the workshop for their effective work. It also expressed its appreciation to the editors of the proceedings and the authors of the meeting report.

## **Proposal for new Working Group**

Only one proposal for a new working group was received in response to the Chairman's request made earlier in the year. This was the recommendation from the Vladivostok Workshop for a Working Group on the Circulation and Ventilation in the Japan Sea (East Sea) and its adjacent areas. The proposed terms of reference are:

- Review the present level of knowledge of the oceanic circulation and ventilation in this area, and identify gaps in this knowledge.
- Review the ongoing and planned scientific programs in this area, and identify gaps.

- Review studies relating chemical, biologic and geophysical regimes, and encourage interactive understanding and planning of multidisciplinary experiments.
- Identify the scientific and logistical difficulties of ocean studies in the area.
- Encourage the planning of experiments and discussion relating to physical processes in the area.

Potential co-chairs for this group would be Dr. S.K. Byun from KORDI, Korea, and Dr. C.N.K. Mooers from the University of Miami, U.S.A.

A lively discussion followed, focussed on the relationship between the proposed group and the existing informal and formal mechanisms for coordination in the region:

PAMS/ JECSS (Pacific Marginal Seas Studies/Japan and East China Sea Studies) have been holding informal meetings every other year since 1981

IOC WESPAC provides an intergovernmental umbrella

The CREAMS (Circulation Research for Eastern Asian Marginal Seas) program has been developed through JECSS and under the IOS WESPAC umbrella.

The leaders of IOC WESTPAC (Prof. J.L. Su) and JESCC (Prof. Kim), who were both present, did not think the proposed group would detract from the activities within their communities, although they also thought that the WG should coordinate closely with the existing groups to avoid duplication of effort. Some members felt that the WG would provide an overview which would be useful to the planning of specific research projects in the area, and also that it might provide a framework for projects not yet included in the existing projects.

The meeting concluded that the WG would be worthwhile, but that its progress should be reviewed on a year by year basis because the previous work of JECSS and WESPAC might permit the WG to be complete its tasks quite quickly.

### **Actions in response to the recommendations of WG 7 and the Vladivostok Workshop**

The meeting generally endorsed the recommendations from both sources. It also noted that several of the recommendations from WG 7 related to data exchange and management.

In consequence and in recognition of the central importance of data exchange to both regional and large scale problems, POC agreed to request that responsible bodies within PICES establish a formal liaison between POC and TCODE. This might take the form of designating a member of one group to participate in the activities of the other.

### **Proposal for the POC Symposium in the Fifth and Sixth PICES Annual Meetings**

Several possible topics were suggested. After a lively discussion and an informal poll to assess potential interest in the scientific community, it was agreed that the preferred topic for the POC Symposium at the 1996 PICES Annual Meeting would be "*Exchanges of water, organisms, and sediment between continental shelf waters and the nearby ocean*". Dr. K.L. Denman (Canada) and Prof. K. Kim (Korea) were proposed as co-convenors, subject to their acceptance.

No decision was made regarding a topic for the 1997 Annual Meeting.

## **Election of the Chairman of POC**

Prof. Nagata reviewed the PICES rules for choice of Chairman of the Scientific Committees. The formal election was conducted by Dr. McKone, Executive Secretary of PICES. Only one candidate was proposed. Dr. Paul H. LeBlond (Canada) was elected by acclamation.

The POC Committee members present warmly thanked Prof. Nagata for his effective leadership over the critical formative period of the POC Committee. His sensitivity to the interests of the member countries has been particularly appreciated.

## **Preparation of Report for Science Board and PICES Closing**

The Rapporteur will prepare a brief summary report for the PICES Closing Ceremony. The Chairman will use the present document in reporting to Science Board.

## **Progress Report from WG 9: Monitoring**

Dr. B.A. Taft (U.S.A.) presented a brief overview of the progress of WG 9. He explained that the ideas in the preliminary report (circulated at this meeting) arose from the meeting of a small group and that the WG would benefit from input from the larger community. The objective is to find the best ways to measure climate change in the North Pacific in both physical and biological systems. He asked that POC members, and experts in their home countries, provide ideas and information to the Working Group within the next few months.

The relationship between the PICES WG and the Global Ocean Observing System (GOOS) was discussed. PICES recommendations which are not compatible with the national GOOS programs may find it difficult to obtain funding. With respect to

the large scale North Pacific PICES appears to be somewhat ahead of GOOS. It should therefore be able to influence the development of GOOS, provided that effective means can be found to communicate PICES requirements to national and international GOOS planning groups.

Some members expressed concern with the impact of monitoring programs on research agencies. Maintenance of monitoring programs can easily use up such a large proportion of available resources that little funding is left for research. As a consequence the agencies lose credibility as research organizations. Concern was also expressed over possible overlaps and funding competition with environmental monitoring agencies.

POC agreed to ask the Science Board to use appropriate means to remind the member states that it was important to maintain a balance between routine monitoring programs and observational programs in support of specific scientific research activities.

## **PICES Activities in Member Countries as related to POC interests**

Prof. Nagata presented a brief informal overview of the agencies involved in physical oceanography and climate work in the member countries and the factors affecting participation in PICES and POC. In several countries university oceanographers have not been as active in PICES as would be expected from the proportion of national oceanographic research carried on in universities. In some cases important government agencies are not well represented.

The POC Committee recommends that the Science Board bring this concern to the attention of the Governing Council, with the objective of encouraging broadly based and

representative participation from all member countries.

### **Future Working Groups**

The meeting decided that it would leave open the question of future POC Working Groups, other than that proposed under Agenda 5 above.

The meeting agreed to recommend to the Science Board that a general PICES Working Group be established to review information on the 'regime shift' in the late 1970s. Possible terms of reference for this group might include:

- compile available time series observations of physical and biological parameters for the North Pacific for the period from about 1960 until after 1990,
- assemble a bibliography of relevant scientific publications,
- review the available information and prepare an overview of the nature of the changes observed and their expression in various physical, chemical and biological systems.

### **Other Items**

The group agreed that it was important to maintain communications between the annual meetings, although the Chair noted that he had often had little response to his requests for material. As Internet e-mail becomes more widely available in all countries this could be used for to hold 'virtual meetings' on various topics.

### **Closing**

Prof. Nagata closed the meeting at 15:00 on October 19. The members reiterated their expressions of appreciation for his work as the first POC Chairman. The Russian delegation particularly thanked him for his continual efforts to ensure that they were involved in POC activities during the period

when Russia had not finally confirmed its participation in PICES.

### **Scientific Program**

The following scientific papers were presented from the POC Committee sponsored part of the program.

*Circulation in the subarctic North Pacific and its marginal seas, and its impact on climate.* Co-convenors: Prof. Ming-Yu Zhou (China) and Dr. John F. Garrett (Canada).

S. Bai.

Sea ice in the Bohai Sea of China

M. Endoh.

Tracer studies in North Pacific subsurface and intermediate layers with subarctic/subtropical circulations and isopycnal mixing in an MRI OGCM

K. Hanawa.

Strengthening of wintertime midlatitude westerlies over the North Pacific since mid 1970's and decadal variability of the North Pacific

Y. Kawasaki

Recent changes in water characteristics around the Kuril region during summer

K. Kim.

Changes in deep water characteristics in the East Sea (Sea of Japan): a regional evidence for global warming?

Y. Nagata.

Salinity balance in the dense water formation area of the Okhotsk Sea

Y.Q. Pan.

The formation and evolution of the East Sea dense water and Changjiang diluted water diffusion and their relations with Taiwan warm current

S.C. Riser.

Ventilation and deep water formation in the Japan Sea: a new assessment based on recent tracer measurements

T.C. Royer.

Interdecadal changes hydrography in the Gulf of Alaska

S.M Varlamov.

The role of oceans surface temperature anomalies in formation of short-range climate variability in simple coupled atmosphere - ocean model

J.Y. Wang. A study on the verification method of the marine environment forecasts in the Northwest Pacific

J.Y. Zang.

The methane distribution in coastal marine waters

H. Zhang.

The surface flux of carbon dioxide over the shelf edge region in the East China Sea

## Endnote 1

### Participants and Observers

#### Canada

Dr. John F. Garrett (rapporteur)  
Prof. Paul H. LeBlond

#### China

Prof. Ming-Yu Zhou  
Prof. Dun-Xin Hu

#### Japan

Prof. Yutaka Nagata (Chairman)

#### Korea

Dr. Kuh Kim

#### Russia

Dr. Alexander S. Bychkov  
Dr. Gennady I. Yurasov

#### U.S.A.

Dr. David L. Musgrave  
Dr. James E. Overland  
Prof. Stephen C. Riser

#### Observers

Dr. Makoto Kashiwai (Japan)  
Dr. Yasuhiro Kawasaki (Japan)  
Dr. Vyacheslav B. Lobanov (Russia)  
Prof. Yao-Chu Yuan (China) (WG 7)  
Dr. Jae-Yul Yun (Korea)

# REPORT OF THE TECHNICAL COMMITTEE ON DATA EXCHANGE

3

8

The meeting was opened by the Chairman, Prof. Y. Nagata (Japan), at 1500. The members present briefly introduced themselves.

## 1. Terms of Reference

The terms of reference for TCODE include:

- Recommend formation of ad hoc task groups to deal with specific functions of

TCODE

- Review progress of task groups and provide Annual Reports
- Develop strategic plans to meet these requirements
- Identify the data management needs of PICES
- Advise PICES Secretariat on its data exchange activities

## 2. Committee Members

Canada	Mr. Robin Brown IOS/DFO	Mr. William Shaw PBS/DFO
China	Mr. Song-Nian Jang NMD&IS / SOA	Mr. Ling Tong YSFRI/CAFS
Japan	Dr. Tadao Tatsuno JODC	Dr. Tokimasa Kobayashi NRIFS/FAJ
Korea	Dr. Kee Soo Nam KORDI	Dr. Sangbok Hahn KODC/NFRDA
Russia	Dr. Gennady Yurasov POI	Dr. Lev Bocharov TINRO
U.S.A.	Dr. Jim Swift Scripps	Dr. William Karp NMFS

## 3. Summary of Activities Prior To Annual Meeting

The Technical Committee on Data Exchange (TCODE) was formed as a standing committee to replace WG 4 (Decision 94/S/4). PICES requested that each nation provide two scientists, with specialties in physical/ chemical oceanographic data and biological oceanographic and fisheries data. The committee was formed and a chairman (Mr. Robin Brown, Canada) appointed in the spring of 1995. Members from Russia were

appointed in August 1995, and members for Korea were appointed in September 1995.

The first meeting of TCODE was held in conjunction with the 4th Annual Meeting in Qingdao. Prior to this meeting, the chairman circulated a review of issues raised from WG 4 and the Science Board. Comments were received from TCODE members and a summary of the responses was distributed in August, 1995. A draft committee report was prepared and circulated to all members in September, prior to the Annual Meeting.



#### 4. Summary of Meeting

TCODE meetings were held on the mornings of October 18 and 19, 1995. See Endnote 1 for attendance.

Observers included:

Mr. Skip McKinnell (Canada)

Prof. Y. Nagata (Japan)

Dr. V. Luchin (Russia)

Dr. V. Lobanov (Russia)

Dr. S. Varlamov (Russia)

The following members were unable to attend the meeting:

Dr. L. Bocharov (Russia) (attended PICES meeting, but was absent due to illness)

Dr. Kee Soo Nam (Korea)

Mr. William Shaw (Canada)

Dr. Jim Swift (U.S.A.) (represented by Dr. T. Royer)

Dr. Tadao Tatsuno (Japan)

#### 5. Operation of TCODE

The Committee reviewed progress to date and discussed the possibility of additional committee meetings between PICES annual meetings. The Committee recognized that travels costs were a substantial barrier for all members and agreed that members would meet only once each year, during the PICES annual meeting, with the bulk of the Committee's work to be carried out by correspondence. The committee noted that most representatives have access to electronic mail and this service would be available to all members in the near future.

The Committee agreed that while most of the business can be conducted by correspondence, attendance by representatives at the Annual Meeting was very important. If TCODE members are unable to meet and discuss issues arising from the Science Committees, TCODE will be unable to react to these important issues in a timely manner and undesirable lags in activities may result.

The working relationships with various Science Committees and Working Groups was discussed. TCODE recommends that a TCODE member should attend WG and Science Committee meetings when appropriate to report on TCODE activities and to report back to TCODE on the relevant issues raised. TCODE members agreed to share the responsibility for this activity to minimize costs.

#### 6. Issues Discussed

##### ***6.1 WG 4 Recommendation 4.2.1 - Visit international agencies to review data holdings***

##### ***WG 4 Recommendation 4.2.2 - Create master inventory for the PICES region***

##### ***WG 4 Recommendation 4.2.3 - Continue development of the Healey et al (1985) report***

TCODE members considered these recommendations together. TCODE supports these goals, but recognizes some serious difficulties in attacking these recommendations directly. In addition, the PICES Secretariat has experienced some difficulty in updating the information in the Healey et al report. The strategy suggested is as follows:

1. establish links with the key agencies who are responsible for the data holdings of interest in the area. This entails creating descriptions of the data holdings, distribution procedures and key contacts for each agency and distributing this information among PICES scientists as a short term solution for data exchange.
2. enlist the support of these agencies in the exchange and inventorying of relevant datasets and information. These agencies frequently have the staff and experts available to support data exchange functions.

3. PICES should create "links" among these organizations so that PICES scientists can retrieve the data that they require. We recommend setting up a PICES data directory or set of "pointers" to these agencies using the World Wide Web (WWW) on the Internet. The concept here is to provide access to the primary data holder, rather than duplicating the holdings within PICES, where possible and practical. This may prevent some of the serious problems of maintenance and synchronization that result when portions of data holdings are duplicated. The issue of maintenance and updating is important. PICES should carefully consider how it will maintain any datasets that it takes direct responsibility for the distribution and maintenance of. The resulting links will form a "virtual" inventory, rather than a physical, "standalone" inventory.

TCODE strongly supports the recommendation that PICES representatives visit or contact national and international science organizations to review data inventories and data exchange functions. TCODE members noted the importance of establishing lists of organizations, holdings, contacts and procedures as a necessary early step in data exchange. The members were concerned about the potential for large travel costs and have requested that these visits be carefully planned and coordinated with other travel, wherever possible. Each visit should result in a trip report which summarizes the findings and is broadly distributed. Dr. Miyata (PICES Secretariat) will undertake the first of these visits to Korea following the Qingdao meeting. TCODE members will assist in providing names of organizations and contacts and coordinating visits within their own country.

#### **6.2 WG 4 Recommendation 4.2.4 Detailed Survey of Research Cruises**

The creation of an inventory of recent and proposed cruises in the PICES region is strongly supported by TCODE. TCODE notes that there are already existing formats and conventions for such reports and recommends that these be adopted. Adopting existing standards and formats will reduce the burden on the information providers and will allow users to create Cruise Summary Reports (CSR) using software provided by ICES/IOC.

The creation of a ship schedule "notice board" is also supported. This would allow PICES scientists to explore the possibilities of joint projects or sampling using planned cruises from other nations. It will be a challenge to gather this information well in advance of the scheduled cruise date. The IOC has an existing system for exchanging this information (the National Oceanographic Program - NOP) which contains much of the required information. We also note that the University National Oceanographic Laboratory System (UNOLS) in the United States has an electronic ship schedule available on the Internet.

#### **6.3 WG 4 Recommendation 4.3.2 - PICES enter into joint ventures with other Data Centers to produce CD-ROMs of important dataset (e.g. OWS PAPA).**

TCODE supports this activity, so long as it does not duplicate any related activity at one of the existing data centers. We feel it is more important to ensure that data from PICES nations is migrated quickly and efficiently to the existing national centers and to ensure that the links amongst the national and world data centers are operating well. TCODE feels the strategy for publication of important datasets should be (in order of priority):

- a. migrate data to world or regional centers so that the data are included in the existing products (for example, we feel it is important to migrate CTD and water property data to WDC-A in Washington to be included in the World Ocean Atlas product which is being produced by WDC-A; we also note that JODC has recently published a similar volume to temperature profiles of the Pacific on CD-ROM).
- b. where there is no existing or planned data product offered by national, regional or world data centers, PICES should encourage an existing data center to undertake this task.
- c. PICES should undertake publishing, distribution and maintenance of datasets when options a) or b) are unavailable or will take too long to complete. PICES might well serve as a temporary distribution center for datasets which will eventually be included in other products/databases or for datasets which cannot find a suitable "home" elsewhere. PICES (through the efforts of the Secretariat and TCODE) should take an active role in "advertising" and distributing information on datasets that are useful to the PICES members. Mr. Skip McKinnell (Pacific Biological Station, Department of Fisheries and Oceans, Canada) has created such a dataset for distribution by PICES. This dataset (and accompanying Technical Report) contains zooplankton data from Ocean Weather Station PAPA from the 1950's to the 1980's.

**6.4 Science Board Recommendation 94/S/5 - Joint PICES/NPAFC task group on fisheries data**

The goal of the proposed task group was to assemble the historical INPFC catch summary statistics in a convenient, electronic form for distribution to the

scientific community. The arrangements for this are still in the hands of the Secretariat and it is not yet clear what the role of TCODE might be.

**6.5 Science Board Recommendation 94/S/6 - Translation of TINRO inventories of scientific surveys**

TCODE was to review these publications and comment on the utility and importance of translation of such inventories. Members found such inventories to be useful, but represent an interim step towards on-line inventories of oceanographic and fisheries data. Such on-line inventories can reduce the costs of distributing this kind of information and can allow users to form specific requests.

**6.6 Science Board Recommendation 94/S/7 - PICES-GLOBEC Climate Change and Carrying Capacity Program**

TCODE members recognize the importance of coordination of data management and exchange for this program. The TCODE Chairman is a member of the Implementation Panel. TCODE should take an active role in providing access to basin-scale datasets for model input and retrospective analysis. In response to a request for information on long term time series, TCODE proposes to assemble and electronic inventory of such data for the PICES area.

**6.7 Science Board Recommendation 94/S/1 - Electronic networks and bulletin boards**

The PICES Secretariat has recently purchased a computer to serve as a World Wide Web (WWW) server for PICES. TCODE strongly supports this strategy. The exploitation of the WWW strategy, which involves creating "links" to other locations/datasets/information resources is

consistent with the TCODE recommendations with respect to data exchange - we should be exploiting the facilities, holdings and expertise of existing data centers whenever possible. In this view, much of the PICES data distribution function could be provided by building clear, concise web documents that describe the various available data sources and how to get data from these locations. In many cases, there will be an actual hypertext link that will take the user from a PICES web page to other existing web pages (e.g. NODC/WDC-A, MEDS, JODC etc.). This will prevent duplication of information (the user is automatically "moved" to the real data source) and reduce the requirement for maintenance and updating of datasets and information on the PICES system. Automated distribution (via ftp) of data files can also be accomplished using this system. Access to WWW is not universal in the PICES region, so it will be necessary for the PICES secretariat to maintain a separate "digest" or summary of the contents and a method of "ordering" documents and/or data files by mail. The summary of the current contents of the PICES web pages should be included in any future mailings to the PICES information distribution list. In time, this requirement may become unnecessary.

## **7. Summary of Progress Made on Terms of Reference**

### ***7.1 Recommend formation of ad hoc task groups to deal with specific functions of TCODE***

TCODE does not recommend the formation of Task Groups at this time. The activities planned by TCODE will be carried out by the committee of the whole.

### ***7.2 Review progress of task groups and provide Annual Reports***

TCODE held its first meeting at the PICES 4th Annual Meeting in Qingdao. The report describes the activities of the committee since formation (Spring, 1995).

### ***7.3 Develop strategic plans to meet these requirements***

The TCODE strategic plan for PICES data management has the following elements:

- use existing national/international data centers, programs and techniques wherever possible
- encourage migration of data to these existing data centers
- assist PICES scientists to locate and obtain data of interest
- use the WWW/Internet system to provide information and provide "pointers" to important agencies or institutions
- provide a "home" and active distribution system for datasets that are not available elsewhere

### ***7.4 Identify the data management needs of PICES***

PICES scientists require access to data in the following subject areas:

- ship schedules and cruise reports
- meteorological data
- physical and chemical oceanographic data
- biological oceanographic and plankton data
- fish catch and distribution data
- fish "biology" data (length, condition etc.)
- commonly used environmental indices (PNA, El Nino etc.)

- birds and marine mammal distribution and abundance data
- marine environmental quality data
- remote sensing data

In addition, TCODE should distribute information on software "tools" for the analysis and processing of these datasets.

### **7.5 Advise PICES Secretariat on its data management activities**

TCODE has been active in advising the PICES Secretariat in data management activities including:

- advising on the installation and configuration of the PICES WWW server
- advising on information-gathering visits to other agencies. The first of these visits will be to Korea immediately following the PICES 4th Annual Meeting)
- in the coming year, TCODE members will be expected to contribute information material for the PICES WWW server.

## **8. Recommendations**

### **8.1 Ship schedules**

TCODE recommends that all PICES members submit cruise plans for cruises or surveys in the PICES area to the PICES Secretariat for distribution. The preferred format for such plans is the IOC National Oceanographic Program (NOP) format, but other formats will be acceptable. Where possible, the PICES WWW servers will provide links to other cruise schedule posting areas (e.g. UNOLS ships schedule page). Members should include all cruises/surveys that are of broad interest to the PICES members and special purpose coastal or inshore cruises may be omitted. TCODE members from each PICES nation will ensure that the schedules are submitted.

### **8.2 Cruise Reports**

TCODE recommends that all PICES members submit cruise summary reports (CSR) to the PICES Secretariat for distribution. These cruise reports are an important source of information on recent sampling activities and data that is not yet available from national or international data centers. The preferred format for such reports is the ICES/IOC CSR format (formerly known as ROSCOP). Members should include all cruises/surveys that are of broad interest to the PICES members and special purpose coastal or inshore cruises may be omitted. TCODE members from each PICES nation will ensure that the reports are submitted.

### **8.3 Master Inventory / Directory of data holdings**

TCODE recommends that PICES begin to assemble a master inventory or directory that describes (in general terms) the relevant data holdings of agencies and institutions in the PICES area. TCODE members will provide this information for distribution on the PICES WWW server.

### **8.4 Inventory of long term time series**

TCODE recommends that PICES assemble and distribute an inventory of long term time series of meteorological, oceanographic and fisheries data that are of broad interest to the PICES members. TCODE members will assemble such an inventory for distribution using the PICES WWW server as well as by printed copy (on request). Where possible, links will be established to the agencies that hold and distribute these data.

### **8.5 Relationships with other committees and Working Groups**

TCODE recommends that TCODE be invited to provide a representative to

relevant meetings of other groups, to report on TCODE activities and to report data requirements and issues to TCODE at the earliest opportunity. Such a mechanism will help to minimize delays in reacting to

requirements of these committees. TCODE representatives have agreed to make every attempt to attend such meetings when they are held in their own country. This will minimize travel costs.

## Endnote 1

### Participants and Observers

#### Canada

Mr. Robin Brown (Chairman)

#### China

Mr. Song-Nian Jiang

Mr. Ling Tong

#### Japan

Dr. Tokimasa Kobayashi

#### Korea

Dr. Sangbok D. Hahn

#### Russia

Dr. Gennady I. Yurasov

#### U.S.A.

Dr. William Karp (U.S.A.)

Dr. Tom Royer (for Dr. Jim Swift)

#### Observer

Dr. Motoyasu Miyata (PICES Secretariat)

# REPORT OF THE FINANCE AND ADMINISTRATION COMMITTEE

The Committee met on October 17th under the Chairmanship of Dr. John C. Davis. (See Endnote 1 for list of participants.)

The Chairman of PICES, Dr. W.S. Wooster, attended and the Executive Secretary, Dr. W.D. McKone, also participated and together with the meeting Chairman, acted as rapporteur.

## **Agenda Item 1. Opening by the Chairman**

The Chairman called the meeting to order and welcomed the participants, particularly those from the Russian Federation and the Republic of Korea who were participating for the first time as formal members of the Committee. The Chairman reviewed the objectives of the Committee, specifying that the goal of the session was to complete consideration of the agenda in one day in order to prepare a draft of the meeting report for review and approval by the Committee members on the following day.

## **Agenda Item 2. Adoption of Agenda**

The agenda was adopted with several items added under "Other Business". "Finance and Administration Committee Membership and Notification Process" was added in this section along with "Increasing the Size of the Trust Fund" and "Quality of Scientific Communications During Presentations at Meetings" appended as additional agenda items.

## **Agenda Item 3. Scheduling Annual Meetings**

The Committee discussed scheduling of the Annual Meeting with the objective of

determining, if possible where subsequent meetings would be held. Following on the discussion in the Committee at the Third Annual Meeting, it is highly desirable that PICES have as much notice about the location and financial arrangements as possible well in advance of meetings to facilitate planning and budgetary considerations. Thus, at the Third Annual Meeting a process was adopted as described in the minutes of that meeting that established dates by which prospective or actual hosts of Annual Meetings would provide information to the Secretariat regarding confirmation of arrangements to host the meeting or to cover some of the costs associated with holding the meeting.

At the Third Annual Meeting it was established that the Fourth Annual meeting would be held in the People's Republic of China and that the 1996 and 1997 Annual Meetings would be held on the East side of the Pacific and the West side of the Pacific respectively. Canada has confirmed that it will host the 1996 Annual Meeting in Nanaimo, British Columbia. In keeping with that arrangement, the Republic of Korea agreed to investigate the feasibility of hosting the 1997 Annual Meeting in Korea, with the proviso that this would take some time to investigate and would require formal approval. It was agreed that the Republic of Korea would inform the Secretariat by December 15, 1995, whether or not the ROK intends to host the 1997 Annual Meeting. Should the ROK agree to host the meeting it would be necessary for the ROK to inform the Secretariat of details of what costs it would cover and provide sufficient details of arrangements by June 15, 1996 so that the Secretariat could establish a firm budget for the meeting. No offers to host the 1998 Annual Meeting were forthcoming.

#### **Agenda Item 4. Appointment of New Assistant Executive Secretary in 1996**

The Executive Secretary reviewed the proposed job description for the new assistant executive secretary's position, explaining that the current Assistant Executive Secretary, Dr. M. Miyata, would be returning to Japan in April 1996. The new job description contains additional responsibilities compared to the former description of the position occupied by Dr. Miyata. There are additional duties related to review of papers and documents, editorial responsibilities, strong computer science and data management responsibilities, linkages to key Committees such as TCODE, press relations and other duties that increase the complexity of the position in keeping with the emerging role of PICES. A Ph.D. or equivalent in terms of significant experience is needed. While service in a major international organization would be a desirable quality in a candidate, it is not mandatory; however, knowledge of international organizations and experience in working with them is highly desirable.

There was considerable discussion of the proposed salary range for the position which is established at CDN \$ 68,371 - \$86,920 in the job description. Canada proposed that the salary on appointment be established at the bottom end of the salary range and that any subsequent salary increases be withheld in keeping with the existing salary freeze in the Canadian Public Service. Considerable debate ensued with several countries pointing out the organization is an international organization and is not bound to follow the salary practices of the host country, rather that those salary practices only serve as guidance for the organization which is free to adjust salary arrangements as appropriate. Several participants stressed that the desire was to attract the best possible candidate for the position and there were concerns that the low end of the salary range or prospects of a wage freeze

would discourage good candidates. Canada stressed that unless an exceptional candidate comes forward, the salary should be set at the lower end of the range and urged that the Executive Secretary consider this approach when staffing.

Following this discussion, the Committee approved the proposed draft of the job description and recommended it to Council for adoption with one amendment which referred to staff rules which apply to the position. The Staff Rules would be distributed with the job description to prospective candidates. Following approval of the F & A report by Council, finalized copies of the job description were to be provided to each member nation for circulation within their respective countries. Prospective candidates should apply to the Secretariat by the end of December 1995 to facilitate staffing early in the new calendar year with a desired objective of having a short overlap between the new employee and the departing current Assistant Executive Secretary for familiarization purposes.

#### **Agenda Item 5. Space, Facilities and Equipment**

The Executive Secretary briefed the Committee on the desirability of improving existing space at the Institute of Ocean Sciences to provide additional office accommodation to serve the Secretariat's new World Wide Web communications function and to improve wiring, power supply and other support arrangements. The space at the Institute is provided by the Government of Canada and Canada asked to be briefed on the rationale for the proposed changes to the room and to learn the positions of the Committee members with respect to PICES offering such internet services. All members support the initiative in keeping with the importance of PICES' role as an international organization concerned with the North Pacific Ocean and



in terms of the need to communicate with member nations, cooperators and interested parties on science-related issues. Dr. McKone will discuss the matter further with the Regional Director of Science, Dr. Davis, at the Institute, to facilitate having the modifications made to the room when funds become available.

#### **Agenda Item 6. Proposed Changes to Financial Regulations**

The Committee discussed two draft changes to financial regulations dealing with the establishment of a relocation and home leave fund and an increase to the authorized level of the Working Capital Fund as proposed by the Executive Secretary. It was proposed to establish a Relocation and Home Leave Fund and increase the Working Capital Fund to deal with serious problems related to budgeting and cash flow experienced in the initial years of operating PICES. Specifically, due to complexities of budgeting and approvals processes and also to the fact that fiscal years differ significantly between member countries, annual contributions often reach the organization late which places operations in jeopardy unless the working capital fund is sufficiently large to offset a delay in the arrival of the contributions. It was agreed that a fund sufficient to allow approximately two months of operation of the secretariat in the event of late payments (about CDN \$100,000.00) was desirable. The other problem related to periodic fluctuations in the need to make relatively large payments for home leave and relocation of employees due to them returning to their home country and a new incumbent arriving. For example, when Dr. Miyata leaves in the Spring of 1996 and if a new replacement comes from the western Pacific, a relocation cost of around \$100,000 CDN could be incurred. Establishment of a Relocation and Home Leave Fund would allow the organization to finance such periodic expenditures without

large year to year changes in contributions from members. Accordingly, the Executive Secretary proposed the following which was reviewed and adopted by the Committee:

“The estimated surplus in the Working Capital Fund on December 31st will be approximately \$150,000. The Secretariat proposes that these funds be used as follows:

1. Raise the authorized amount of the Working Capital Fund to CDN \$100,000 to allow for cash flow problems that can occur when fees are not paid in a timely manner.
2. The residue of the funds in the Working Capital Fund (approximately \$50,000 CDN) be used to establish the Relocation and Home Leave Fund proposed in the amendments to the Financial Regulations.
3. Funds collected from the levee in lieu of taxes from foreign staff and the refunds from the GST be deposited in the Relocation and Home Leave Fund to bring it up to an agreed level. This fund is proposed to be set at a maximum of \$110,000 initially and would need to be adjusted from time to time as the costs increase.

To effect these proposed changes, the Financial Regulations will need to be amended as follows:

Revise Financial Regulation 6(iii) to read:

The amount of the Working Capital Fund shall be reviewed by the Council at each annual meeting, and may be revised effective on the first day of the ensuing financial year. The Working Capital Fund may be increased by miscellaneous income, contributions pursuant to Regulation 6(vi), and any cash surplus in the General Fund at the

close of the financial year following that annual meeting, to the extent that any such surplus is not required to meet outstanding commitments as provided in Regulation 4(ii).

Revise Financial Regulation 6(v) to read:

The Council may decide to enter amounts from the Working Capital Fund at the close of the financial year as income in the budget of the ensuing financial year and use such amounts to offset contributions of Contracting Parties in the ensuing financial year; provided, however, if the annual budget for any financial year includes any appropriation or transfer from the Working Capital Fund based in whole or in part on estimates of the amount in the Working Capital Fund at the close of the financial year, and the deduction of that appropriation or transfer shall cause the Fund established pursuant to Regulation 6(iii) to fall below the amount set by Council for the following year, the Executive Secretary shall reduce the said appropriation or transfer to the extent necessary to prevent the Fund from falling below the amount established pursuant to Regulation 6(iii), and shall adjust said contributions to compensate for the reduced appropriation or transfer, or the amount of any such appropriation or transfer may be entered as a credit to contracting party or parties in a special credit fund. The Executive Secretary shall promptly inform the Council of such actions.

Insert new Financial Regulation 6(vii).

... funds available in the Relocation and Home Leave Fund shall be used, to the extent appropriated by the Council as part of the budget decision, to pay relocation and home leave expenses of appropriate new employees and their dependents to the seat of the Secretariat and for removal after the

period of employment has ended, and for home leave for internationally recruited staff and their dependents, in accordance with established rules and practices;

Renumber existing Financial Regulation 6(vii) as (viii) and revise it to read:

... and any advance made by a Contracting Party to the Organization, or any credit made to a Contracting Party as a result of an appropriation or transfer from the Working Capital Fund pursuant to Regulation 6(v), shall be carried to the credit of the respective Contracting Party or Parties in a Special Credit Fund until such Contracting Party or Parties informs the Executive Secretary of any disposition it desires of any such credit or credits.

#### **Agenda Item 7. Auditor's Report**

The Auditor's Report (Endnote 2) was reviewed and adopted by the Committee as tabled. The Executive Secretary expressed a desire to use the same audit firm for an additional year. The Executive Secretary reported that new accounting software under investigation may reduce audit costs in future years.

#### **Agenda Item 8. Working Capital Fund**

This item was dealt with under Agenda Item 6 as reported above.

#### **Agenda Item 9. Administrative and Financial Statements for 1995 (to October 1 and estimated to December 31)**

The Executive Secretary reviewed administrative and financial statements for 1995 as distributed to Committee members and the statements were discussed by the Committee.

### **Agenda Item 10. Budget for Fiscal Year 1996**

The budget proposed for 1996 fiscal year was presented item by item by the Executive Secretary. China suggested that the total budget should be held to \$440,000, the same level as the previous year, but other members thought that this would restrict activities at a time when PICES is still growing to meet the needs of members and this is particularly important with the increase in membership in 1995. The key point is that Secretariat operating costs must increase to provide services to new members. Canada proposed that salary raises should not occur in 1996 as the Canadian civil service salaries have been frozen for several years. The U.S.A. pointed out that PICES was not restricted to explicitly follow the Canadian Government in setting salary levels. The Committee agreed that the salary levels should be raised as proposed by the Executive Secretary (Endnote 3). The Committee recommended that the Chairman investigate salary increase practices in other international organizations including the issue of whether such organizations employ a salary scale. The Chairman, Dr. Wooster, undertook to have that study done.

Canada suggested that where possible, Secretariat participation in non-PICES meetings be kept down to one person and that where practical, PICES be represented at such meetings by someone from a PICES member country who is already attending.

Cost recovery on publications was discussed but the committee did not come to any conclusion on changing the current practice of no cost recovery. Much of the increased cost of printing and communications is due to growing activity of PICES committees and working groups and is internal to PICES.

On reviewing the draft budget presented by the Executive Secretary, China proposed that the amount shown against relocation and home leave be reduced. The Committee agreed to Canada's proposal to reduce that item in the budget from \$ 100,000 CDN to \$ 60,000 CDN and that change was incorporated in the budget document.

The Committee recommends to the Governing Council that the 1996 budget be adopted at CDN \$509,000 (Endnote 3).

### **Agenda Item 11. Forecast Budget for Fiscal Year 1997**

A forecast budget for fiscal year 1997 was presented by the Executive Secretary and reviewed by the Committee. The salary levels were adjusted to reflect discussion on the 1996 budget levels. For purposes of the forecast budget for 1997, Personnel Services were tentatively set at a level 3% above the 1996 budget level with the recognition that the entire matter will be reviewed next year, including consideration of the salary study to be conducted by the Chairman of PICES. The funding level of the Relocation and Home Leave Fund reflects the decision to establish such a fund and the need to replenish the fund after expected expenditures in 1996. It was agreed to propose a total forecast budget of CDN \$534,000 for consideration by the Governing Council.

### **Agenda Item 12. Trust Fund**

The Executive Secretary reported on the status of the Trust Fund. Considerable discussion took place on the use of the Trust Fund which China proposed be used to support the participation of member country attendees at PICES meetings. In response to this request, the Committee considered that guidelines for the use of the Trust Fund were developed during the Third Annual Meeting which provide general

direction as to its use. At present the Executive Secretary and the Chairman make decisions on the use of the Trust Fund but this does not exclude the possible use of the fund to support participation of scientists from member nations although this has been discouraged to date to avoid rapidly depleting the fund due to off loading of costs associated with delegation participation. Rules of Procedure (Rule 1(iii)) stipulate that each Contracting Party shall pay the expenses of its own Delegation to all meetings held pursuant to the Convention. As a general rule, it is desirable that the Parties pay for their delegates as specified, however, flexibility exists to support desirable attendees such as young scientists in future. It is anticipated that the fund could be used more broadly in future, particularly if a means can be found to increase the size of the fund.

(see also below under Other Business).

### **Agenda Item 13. Other Funds Held**

The Executive Secretary reported on the disposition of funds held on behalf of Japan and the United States. The United States informed the Committee that with respect to the \$50,000 of US funding held by the Secretariat, they continue to be prepared to donate all or a portion of that amount to the Trust Fund providing other countries would match the amount donated by equal contributions to the Trust Fund. No other use of the credit has been decided to date.

### **Agenda Item 14. Other Business**

Three additional items were discussed:  
Representation at the F & A Meetings and Notification Procedures

Difficulties were reported by the Executive Secretary related to knowing in advance who would participate in Finance and Administration Committee meetings and also with respect to communications

between financial officers, Delegates and the Secretariat. It was resolved that Rule 1(i) of the Rules of Procedure should be followed such that each Contracting Party would inform the Executive Secretary in writing of their delegation to the coming Annual Meeting, including the names of those who will attend the F & A meeting. This notification should be made at least three weeks in advance of the Annual Meeting and any subsequent changes in participation should be brought to the immediate attention of the Executive Secretary. In addition, it was requested that all correspondence between the Secretariat and financial analysts of member countries be copied to corresponding national Delegates.

### Increasing the Size of the Trust Fund

In response to a referral from Governing Council and a suggestion made in Council by the United States, the Committee considered ways by which the size of the Trust Fund could be increased. It was generally agreed that it may be difficult to gain support from funding sources for an intergovernmental organization and that the most likely source of funding was from the member governments themselves. It was pointed out that in order to attract additional funding, specific focussed uses related to scientific issues in the North Pacific need to be identified. It was also thought desirable to develop more promotional information, brochures and other documentation that explains the activities and purpose of the PICES organization so it becomes better known and supported within member countries. It was agreed that the Executive Secretary should obtain and circulate information on the operation and funding of the WMO and IOC Trust Fund. The Committee felt this matter deserved further consideration by Council.

### Quality of Scientific Communications During Presentations at Meetings

The Committee discussed this matter from the perspective of the need to maximize the effectiveness of communications and improve the quality of presentations made at PICES meetings. Specifically, as the organization is composed of many nationalities and operates in the English language, it is particularly important that priority be given to effective presentations of papers at meetings and in addressing the challenge of improving communications where linguistic differences occur. Since English is the second language of most participants, presentations should be particularly clear, to the point, and make

effective use of graphics. The Committee feels that guidelines for presentation of papers and examples of good, clear presentational material need to be developed and distributed to speakers prior to each PICES meeting in an attempt to improve and standardize the quality of presentations. The Committee requests that Council task the Science Board to develop these guidelines in consultation with the Secretariat and that a package of information be distributed to all speakers prior the next Annual Meeting. In addition, as the organization matures, Council may wish to consider moving to a more formal requirement to have papers written and distributed at or prior to meetings in order to improve communications.

### **Endnote 1**

#### **Participants and Observers**

##### Canada

Dr. William G. Doubleday

##### China

Mr. Qian-Fei Liu  
Mr. Yong Li

##### Japan

Dr. Takashi Sasaki  
Mr. Masataka Nakahara

##### Korea

Dr. Sangbok D. Hahn  
Dr. Hyung-Tack Huh

##### Russia

Dr. Boris N. Kotenev  
Dr. Vladimir I. Radchenko

##### U.S.A.

Mr. William L. Sullivan, Jr.

##### Other

Dr. Warren S. Wooster (Chairman, PICES)  
Dr. John C. Davis (Chairman, F & A Committee)  
Dr. W. Doug McKone (Rapporteur)

## Endnote 2

### Auditor's Report to the Organization

Flader and Greene  
Chartered Accountants  
9768 Third Street,  
Sidney B.C.  
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We have audited the statements of assets and liabilities of the North Pacific Marine Science Organization as at December 31, 1994, and the statement of sources of funds and expenditures for the year then ended. These financial statements are the responsibility of the organization's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the organization as at December 31, 1994, and the results of its operations and the changes in financial position for the year then ended in accordance with generally accepted accounting principles.

Sidney, B.C. Canada  
January 31, 1995

Flader and Greene  
Chartered Accountants

**Statement of Assets and Liabilities  
December 31, 1994**

	<u>1994</u>	<u>1993</u>
<b>ASSETS</b>		
<b>Current Assets</b>		
Cash and term deposits	\$ 287,466	\$ 263,836
Accounts receivable	<u>-</u>	<u>\$ 15,062</u>
	\$ 287,466	\$ 278,898
<b>LIABILITIES AND FUND BALANCES</b>		
<b>Current Liabilities</b>		
Accounts payable	\$ 23,846	\$ 6,664
Contributions received in advance from contracting parties		<u>30,240</u>
<u>30,240</u>		
	\$ 54,086	\$ 36,904
<b>Fund Balances</b>		
Working Capital Fund	\$ 221,823	\$ 241,994
Trust Fund	<u>11,557</u>	<u>-</u>
	<u>233,380</u>	<u>241,994</u>
	<u>\$ 287,466</u>	<u>\$ 278,898</u>

**Statement of Sources of Funds and Expenditures  
For the Year Ended December 31, 1994**

	General Fund	Working Capital Fund	Trust Fund	1994 Total	1993 Total
<b>Fund Balances</b> , beginning of year	\$ -	\$ 241,994	\$ -	\$ 241,994	\$ 216,409
<b>Sources of Funds</b>					
Transfers from Working Capital Fund	80,000	(80,000)	-	-	-
Contributions from Contracting Parties	360,000	-	34,060	394,060	351,980
Interest earned	-	14,907	252	15,159	13,374
<b>Fund Balances</b> , before expenditures	<u>440,000</u>	<u>176,901</u>	<u>34,312</u>	<u>651,213</u>	<u>581,763</u>
<b>Expenditures</b>					
Personnel services	214,672	-	-	214,672	175,537
Travel	32,283	-	22,755	55,038	32,647
Communication	14,733	-	-	14,733	13,161
Contractual services	6,308	-	-	6,308	7,520
Printing	21,906	-	-	21,906	11,771
Supplies	1,433	-	-	1,433	4,599
Equipment - Note 2	15,344	-	-	15,344	24,294
Meetings	70,731	-	-	70,731	14,504
Relocation	16,168	-	-	16,168	51,866
Miscellaneous	1,500	-	-	1,500	3,869
	<u>395,078</u>	<u>-</u>	<u>22,755</u>	<u>417,833</u>	<u>339,769</u>
<b>Net Funds Available</b>	44,922	176,901	11,557	233,380	241,994
<b>Transfers to Working Capital Fund</b>	<u>(44,922)</u>	<u>44,922</u>	<u>-</u>	<u>-</u>	<u>-</u>
<b>Fund Balances</b> , end of year	<u>\$ -</u>	<u>\$ 221,823</u>	<u>\$ 11,557</u>	<u>\$ 233,380</u>	<u>\$ 241,994</u>



**Notes to Financial Statements  
December 31, 1994**

**1. Accounting Policies**

The financial statements are prepared in accordance with the North Pacific Marine Science Organization's Financial Regulations and are prepared in accordance with generally accepted accounting principles. The following is a summary of the significant accounting policies used in the preparation of these financial statements:

a) Fund Accounting

The Working Capital Fund represents the accumulated excess of funds provided by the Contracting Parties over expenditures . The purposes of the General Fund and Working Capital Fund are established by Regulation 6 of the Organization Financial Regulation.

b) Capital Assets

Capital assets acquired by the Organization are expensed in the year of acquisition. (Note 2).

c) Income Tax

The Organization is a non-taxable organization under the Privileges and Immunities (International Organizations) Act (Canada).

d) Foreign Exchange

Transactions originating in foreign currencies are translated at the exchange rate prevailing at the transaction dates. Assets and liabilities denominated in foreign currency are translated to equivalent Canadian amounts at the current rate of exchange at the balance sheet date.

**2. Equipment**

At December 31, 1994, capital assets on hand and their original purchase price are as follows:

Furniture and fixtures	\$ 28,890
Computer equipment	<u>42,693</u>
	\$ 71,582

The assets were expensed in the year of acquisition.

**3. Commitments**

Office space and services are provided to the Secretariat to the Organization by the Government of Canada through the Department of Fisheries and Ocean. This agreement commenced April 1, 1992 and continues indefinitely with a review every three years. The fixed cost for office space is \$2,000 per year. Services provided are invoiced quarterly.

#### 4. Contingent Asset

As of December 15, 1993, the Organization received approval by the Order in Council of Canada exempting it from the Goods and Services Tax (GST). A second Order in Council is required to allow the Organization to apply for a refund for GST paid retroactive to January 8, 1993. No estimate of this contingent asset is reflected in the financial statements.

#### Endnote 3

#### Budget for Fiscal Year 1996

Source	Contributions
Contributions from six Contracting Parties	509,000
<b>Total</b>	<b>509,000</b>

Category	Allotment
Personnel Services	284,000
Travel	37,000
Communication	21,000
Contractual Services	9,000
Printing	34,000
Supplies	6,000
Equipment	10,000
Annual Meeting	19,000
CCCC Workshop	27,000
Relocation and Home Leave	60,000
Miscellaneous	2,000
<b>Total</b>	<b>509,000</b>

# COMPOSITION OF THE ORGANIZATION

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## Officers:

Chairman: Dr. W.S. Wooster  
Vice-Chairman: Dr. H.T. Huh

## Delegates and Points of Contact:

Canada  
Dr. W.G. Doubleday (Delegate)  
Dr. J.C. Davis (Delegate)

Korea  
Dr. H.T. Huh  
Mr. K.S. Park

China  
Mr. C.M. Liu (Delegate)  
Prof. Y.K. Xu (Delegate)

Russia  
Dr. S.E. Dyagilev  
Dr. A. Rodin

Japan  
Mr. T. Inagawa (Delegate)  
Dr. T. Sasaki (Delegate)

U.S.A.  
Dr. V. Alexander (Delegate)  
Dr. W. Aron (Delegate)

## Finance and Administration Committee:

Canada  
**Dr. J.C. Davis** (Chairman)  
Ms. J. Quintal-McGrath

Japan  
Mr. H. Karube  
Dr. T. Sasaki

China  
Mr. L.Z. Chen  
Mr. S.P. Chen  
Mr. G. Wu

Korea  
Mr. G.S. Shin

U.S.A.  
Mr. W. Erb

## Science Board:

Chairman, Science Board

Dr. M. Kashiwai

Chairman, Biological Oceanography Committee

Prof. P.A. Wheeler

Chairman, Fishery Science Committee

Prof. Q.S. Tang

Chairman, Marine Environmental Quality Committee

Dr. R.F. Addison

Chairman, Physical Oceanography and Climate Committee

Prof. P.H. LeBlond

**Secretariat:**

Executive Secretary: Dr. W.D. McKone  
Assistant Executive Secretary: Dr. M. Miyata  
Administrative Assistant: Ms. C. Chiu  
Secretary: Ms. C. McAlister

**Scientific Committees:**

**Biological Oceanography Committee:**

Canada

Dr. K.L. Denman  
Dr. D.L. Mackas  
Prof. T.R. Parsons

China

Prof. Y.Q. Chen  
Prof. R. Wang  
Dr. M.Y. Zhu

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Prof. T. Sugimoto

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Dr. J.U. Lee  
Dr. S.K. Yi

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Dr. V.I. Radchenko  
Dr. V.V. Sapozhnikov

U.S.A.

Dr. L. Jones  
Prof. M.M. Mullin  
**Prof. P.A. Wheeler** (Chairman)

**Fishery Science Committee:**

Canada

Dr. R.J. Beamish  
Dr. J. Rice

China

**Prof. Q.S. Tang** (Chairman)  
Prof. Z. Yan  
Prof. M.J. Zhou

Japan

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Dr. T. Wada  
Dr. K. Wakabayashi

Korea

Dr. Y. Gong  
Dr. S. Kim  
Dr. C.I. Zhang

Russia

Dr. L.V. Borets  
Dr. V.I. Radchenko  
Dr. M. Stepanenko

U.S.A.

Dr. D.M. Eggers  
Dr. J.R. Hunter  
Dr. L.L. Low

**Marine Environmental Quality Committee:**

Canada

**Dr. R.F. Addison** (Chairman)  
Mr. L. Harding  
Mr. R.C.H. Wilson

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Prof. S.Z. Feng  
Prof. X.P. Jia  
Prof. J.Y. Zhou

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Dr. T. Yoshida

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Dr. D.B. Yang

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Dr. E.N. Shumilin  
Dr. A.V. Tkalin

U.S.A.

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Dr. U. Varnasi  
Dr. C.M. Watson

**Physical Oceanography and Climate Committee:**

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**P.H. LeBlond** (Chairman)  
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Y. Nagata  
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S.C. Riser

**Technical Committee on Data Exchange (TCODE):**

Canada

R. Brown (Chairman)  
W. Shaw

China

S.N. Jiang  
L. Tong

Japan

T. Kobayashi  
T. Tatsuno

Korea

S.D. Hahn  
K.S. Nam

Russia

L.N. Bocharov  
G.I. Yurasov

U.S.A.

W.A. Karp  
J.H. Swift

**Working Group 3: Coastal Pelagic Fish**  
(Disbanded as of October 1995)

**Working Group 5: Bering Sea**

Canada

R.J. Beamish  
J. Rice  
C.S. Wong

China

Q.S. Tang  
R. Wang

Japan

K. Mito  
K. Ohtani  
T. Takizawa

Korea

S. Kim  
J.H. Lee  
D.Y. Moon

Russia

S.V. Gladyshev  
V.I. Radchenko  
V.V. Sapozhnikov

U.S.A.

R.C. Francis  
P. Livingston  
T.R. Loughlin  
L.L. Low  
**A. Tyler** (Chairman)  
T.E. Whiteledge

**Working Group 7: Modelling of the Subarctic North Pacific Circulation**  
(Disbanded as of October 1995)

**Working Group 8: Practical Assessment Methodology**

Canada

**R.F. Addison** (Co-chairman)  
C. Levings

China

Y.X. Yuan  
**M.J. Zhou** (Co-chairman)

Japan

T. Hirano  
M. Shimizu  
M. Watanabe  
H. Yamada

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G.H. Hong  
S.Y. Hong  
H.D. Jeong  
P.Y. Lee  
T.S. Lee  
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J.H. Shim

Russia

S.A. Patin  
E.N. Shumilin  
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A. Robertson  
B.M. Sanders  
J.E. Stein

**Working Group 9: Subarctic Pacific Monitoring**

Canada

D.W. Welch  
C.S. Wong

China

S.S. Ma

Japan

I. Asanuma  
**K. Hanawa** (Co-chairman)

Korea

Y.H. Ahn  
C. Kim  
S. Yoo

Russia

L.N. Bocharov  
E.I. Lastovetsky

U.S.A.

C.B. Miller  
**B.A. Taft** (Co-chairman)

**Working Group 10: Circulation and Ventilation in the Japan Sea (East Sea) and its adjacent areas**

(Members to be nominated by Contracting Parties)

**Working Group 11: Consumption of Marine Resources by Marine Birds and Mammals in the PICES Region**

(Members to be nominated by Contracting Parties)

**Working Group 12: Crabs and Shrimps**

(Members to be nominated by Contracting Parties)

**PICES-GLOBEC Implementation Panel on Climate Change and Carrying Capacity Program:**

Chairmen:

Prof. Yutaka Nagata (Japan)  
Dr. Dan Ware (Canada)

Executive Committee:

Dr. Anne B. Hollowed (U.S.A. GLOBEC)  
Dr. R. Ian Perry (Canada GLOBEC)  
Prof. Qi-Sheng Tang (China GLOBEC)  
Prof. Makoto Terazaki (Japan GLOBEC)  
Dr. Sinjae Yoo (Korea GLOBEC)  
Dr. Michael L. Dahlberg (NPAFC representative)

National Members:

Canada Dr. R.J. Beamish  
Dr. Michael A. Henderson

China Prof. Ji-Lan Su  
Prof. Rong Wang

Japan Dr. Kazuya Nagasawa  
Dr. Yasunori Sakurai  
Dr. Tokio Wada

Korea Dr. Suam Kim  
Dr. Chang Ik Zhang

Russia	Dr. A.I. Boltnev Dr. Vladimir I. Radchenko Dr. Vadim V. Navrotsky	U.S.A.	Dr. Robert Francis Dr. Bruce W. Frost Prof. Brenda L. Norcross
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Members:

Dr. Warren S. Wooster (PICES Chairman)  
Prof. Patricia A. Wheeler (BIO Chairman)  
Prof. Qi-Sheng Tang (FIS Chairman)  
Dr. Richard F. Addison (MEQ Chairman)  
Prof. Paul H. LeBlond (POC Chairman)  
Mr. Robin Brown (TCODE Chairman)  
Dr. Bruce A. Taft (WG9 Co-Chairman)



## LIST OF PARTICIPANTS

83

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## LIST OF ACRONYMS

ADCP	Acoustic Doppler Current Profiler
ALACE	Autonomous Lagrangian Circulation Explorer (float)
APEC	Asian Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BASS (TT)	Basin Scale Studies
BIO	Biological Oceanography Committee
CCCC	Climate Change and Carrying Capacity Program
CERN	Center for European Particle Research
CPR	Continuous Plankton Recorder Program
CREAMS	Circulation Research of the East Asian Marginal Seas
CSR	Cruise Summary Reports
CTD	Conductivity, Temperature, Depth profiler
EC/IP	Executive Committee / Implementation Panel for CCCC
ECOR	Engineering Committee on Oceanic Resources
FAO	Food and Agriculture Organization
FEB RAS	Far Eastern Branch of Russian Academy of Sciences
FERHRI	Far Eastern Regional Hydrometeorological Research Institute
FIS	Fishery Science Committee
GLOBEC	Global Ocean Ecosystem Dynamics Programme
GOOS	Global Ocean Observing System
GST	Goods and Services Tax
HAB	Harmful Algae Blooms
IACP	Institute of Automation and Control Process
IASC	International Arctic Science Committee
IATTC	Inter-American Tropical Tuna Commission
IBP	Institute of Biology and Pedology
ICCAT	International Commission for the Conservation of Atlantic Tuna
ICES	International Council for the Exploration of the Sea
ICSU	International Council of Scientific Unions
IGPB	International Geosphere Biosphere Programme
IMB	Institute of Marine Biology
IMG&G	Institute of Marine Geology and Geophysics
IO RAS	Institute of Oceanology Rasiian Academy of Sciences
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data Information Exchange (IOC)
IP	Implementation Panel for CCCC
IPHC	International Pacific Halibut Commission
ITSU	International Coordination Group for the Tsunami Warning System in the Pacific
IUGG	International Union of Geodesy and Geophysics
JEBAR	Joint Effect of the Baroclinicity and Bottom Relief
JECSS	Japan East China Sea Study
JFA	Japan Fisheries Agency
JGOFS	Joint Global Ocean Flux Study (IGPB)
JODC	Japanese Oceanographic Data Center

KamchatNIRO	Kamchatka Research Institute of Fisheries and Oceanography
KORDI	Korea Ocean Research and Development Institute
LOICZ	Land Ocean Interaction in the Coastal Zone
MBARI	Monterey Bay Aquarium Research Institute
MEDS	Marine Environmental Data Center
MEQ	Marine Environmental Committee
MODEL (TT)	Conceptual / Theoretical and Modeling Studies
MOU	Memorandum of Understanding
NAFO	Northwest Atlantic Fisheries Organization
NASCO	North Atlantic Salmon Conservation Organization
NOAA	National Oceanographic and Atmospheric Administration (U.S.A.)
NODC	National Oceanographic Data Center
NOP	National Oceanographic Program
NPAFC	North Pacific Anadromous Fish Commission
NSFC	National Science Foundation of China
ODC	Oceanographic Data Center
OECD	Organization for Economic Cooperation and Development
PAMS	Pacific Marginal Seas Studies
PIBOC	Pacific Institute of Bioorganic Chemistry
PICES	North Pacific Marine Science Organization
PIG	Pacific Institute of Geography
PNA	Pacific North America
POC	Physical Oceanography and Climate Committee
POI	Pacific Oceanological Institute
PSC	Pacific Salmon Commission
RAFOS	Listening float (SOFAR spelled backwards)
REX (TT)	Intercomparison of Regional Scale Studies
RHLF	Relocation and Home Leave Fund
ROK	Republic of Korea
SakhNIRO	Sakhalin Research Institute of Fisheries and Oceanography
SCOPE	Scientific Committee on Problems in the Environment
SCOR	Scientific Committee on Ocean Research
SOGI	Sakhalin Oil and Gas Institute
SOI	State Oceanographic Institute
SOPAC	South Pacific Applied Geoscience Commission
SPREP	South Pacific Regional Environment Programme
STA	Science and Technology Agency Japan
TCODE	Technical Committee on Data Exchange
TINRO	Pacific Research Institute of Fisheries and Oceanography
TT	Task Team
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention of the Law of the Sea
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNOLS	University National Oceanographic Laboratory System
VNIRO	Russian Federal Research Institute of Fisheries and Oceanography
WCF	Working Capital Fund
WCRP	World Climate Research Program
WDC-A	World Data Center - A

WESTPAC	Sub-Committee for the Western Pacific Intergovernmental Oceanographic Commission
WG	Working Group
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment
WWWP	World Wide Web Page