

AGENDA

SECOND ANNUAL MEETING October 25 - 30, 1993



Opening Session

1. Address of welcome by Dr. D. James Baker, Under Secretary of Commerce for Oceans and Atmosphere
2. Remarks by chairman
3. Remarks by representatives of member states
4. Announcements
5. Keynote lecture by Professor J.M. Wallace; Climate Variability over the North Pacific

Governing Council

1. Preliminary report on administration
2. Relations with other international organizations
3. Membership of the organization
4. Role of Observers
5. Election of Vice-Chairman
6. Establishment of Scientific Committees
7. Report of Finance and Administration Committee
8. Audited accounts for financial year 1992
9. Estimated accounts for financial year 1993
10. Budget for financial year 1994
11. Forecast budget for financial year 1995
12. Report and recommendations of Science Board
13. Future meetings of the organization and subsidiary bodies
14. Any other business

REPORT OF OPENING SESSION

The meeting on Monday, October 25, was called to order by the Chairman Dr. Warren S. Wooster, who welcomed all delegates, observers and researchers to the Second Annual Meeting. Dr. Wooster introduced Dr. James Baker, Under Secretary of Commerce for Oceans and Atmosphere, who welcomed participants on behalf of the United States and the National Oceanic and Atmospheric Administration. Dr. Baker recalled the long development of PICES, going back to an FAO meeting in Vancouver in the early 1970s and leading to the present meeting and its excellent preparation by the Secretariat. He observed that in this post World War II, and post Cold War era, new driving forces of economic development, environmental protection, and social equity were operating. A key focus of the present U.S. Administration was sustainable development, as emphasized by the recent United Nations Conference on Environment and Development, where worldwide attention was focused on dual goals of preserving the earth's oceans, atmosphere, land, and biological species for future generations and promoting economic growth and development around the world.

Dr. Baker noted that sound policy decisions in these matters required interdisciplinary scientific research and advanced technologies, with strong links between scientific researchers, natural resources managers, and policy makers, and he regarded what was being done in PICES as a key link in this web of understanding and policy. He welcomed the PICES focus on long-term research, noting how the importance of research is often lost when dealing with immediate, short-term concerns.

The international cooperation and the collection of physical and biological data envisioned by PICES involves all elements of NOAA, and Dr. Baker indicated that NOAA will continue to play an active role in the development of this young organization. He noted the parallel evolution of the North Pacific Anadromous Fish Commission and stressed the importance of establishing a constructive relationship so that both organizations can fulfill their respective missions. He closed by noting the value of this Second Annual Meeting of PICES as a forum for discussion of marine issues and thanking participants for being a part of such an important initiative.

Mr. James Beckett, on behalf of the Canadian delegation, expressed the view that this Second Annual Meeting would prove to be an important step in the development of PICES towards becoming a focus for scientific activities relevant to sustainable development of the marine resources of the North Pacific, as envisioned at the United Nations Conference on the Environment and Sustainable Development. He noted the importance in coordinating marine research, particularly when this was responding to different objectives, in order to avoid duplication and to improve cost effectiveness. Mr. Beckett described the Canadian intent to submit papers on stock assessment and multidisciplinary studies as an initiative to help focus attention on how PICES will address the biology and status of harvestable resources as an integral part of its multidisciplinary work. He referred to the need to establish how PICES would respond to requests from other organizations for advice on scientific matters, and the need for PICES to facilitate access to harvest statistics for all species in the convention area.

Mr. Beckett conveyed to the meeting the regrets of Dr. L.S. Parsons in not being able to attend, and he noted the interest of ICES in the development of its Pacific counterpart.

Mr. Cong-Meng Liu, on behalf of the Chinese delegation, thanked the Government of the United States for hosting the PICES Second Annual Meeting which is providing an opportunity for old and new friends to meet in the beautiful city of Seattle. He also thanked the Chairman Dr. Wooster and the Secretariat staff for their excellent work in preparing for the meeting.

Mr. Liu mentioned that one year has elapsed since the First Annual meeting held in Victoria, B.C. Canada. PICES will continue to mature from the efforts of the Contracting Parties, scientists, and joint activities with other Organizations, especially from the efforts of Dr. McKone, the Executive Secretary of PICES, and his staff. Dr. McKone and his staff have done a lot of work over the past year to make the Secretariat fully operational.

He indicated that the Government of China has always attached importance to the scientific activities promoted by PICES. Chinese scientists will cooperate closely with other scientists from Contracting Parties and Organizations to secure the smooth implementation of scientific activities. In the scientific meetings, Chinese scientists will actively be involved in discussions on the topics of ocean circulation and climate variability, high resolution paeleoecological studies, priority chemicals in the subarctic Pacific, and biological contaminants and shifts in the abundance and species dominance in coastal seas as well as in the long-term monitoring from platforms of opportunity. Through discussion Chinese scientists will develop new measures to protect and regionally explore the North Pacific ocean.

He noted that more and more people in the world pay attention to the conservation and management of living marine resources on the high seas. Unfortunately, much remains unknown about fish stocks and their sustainable utilization, especially, conservation of straddling fish stocks and highly migratory fish stocks in the North Pacific. Therefore, China looks to the newly formed PICES to deal with the scientific issues related to fish species and other aspects in the North Pacific. It is hoped that, through PICES, a high level of conservation and rational exploration of the living marine resources can occur.

Finally, Mr. Liu mentioned that PICES is a newly formed Organization and it still has a long way to go. China will do what it can to strengthen PICES. From this point of view, the Government of China welcomes non Contracting Parties to consider joining PICES to work together in making a contribution to conserving the North Pacific region.

Dr. Hiroshi Hatanaka speaking on behalf of the Japanese Government noted his honor to be able to express the great pleasure in attending the Second Annual Meeting of our young organization, PICES. He was deeply grateful to the Chairman, the Secretariat, and the United States delegation for organizing this meeting in the beautiful city of Seattle.

He indicated that the Japanese Government is fully aware that multilateral cooperation in the field of marine science is necessary to deepen our understanding of the sea. PICES will contribute substantially to the enhancement of such international scientific cooperation in the North Pacific. Moreover the Japanese Government will continue to give its full support to the Organization.

Dr. Hatanaka mentioned that, since the First Annual Meeting held in Victoria last year, there have been important developments in

PICES including the establishment of the Secretariat and the holding of several Working Group Meetings. He pointed out that, the Second Annual Meeting will also be another significant step for PICES.

Dr. Vera Alexander, on behalf of the United States, was very pleased to have the opportunity to welcome friends from overseas and neighbors from Canada as well as colleagues from within the United States to Seattle for the Second Annual Meeting. This Second Annual Meeting of PICES is a critical one. After almost twenty years of incubation the North Pacific Marine Science Organization Convention has evolved towards reality, PICES is finally underway. Although less than two years old, the organization has progressed rapidly. The Secretariat is in place, scientific committees have been established and are working actively, and the several Working Groups, which were spawned, are developing programs and priorities. This PICES Second Annual Meeting will represent yet another step forward.

She further indicated that PICES offers a means for the development and promotion of North Pacific Ocean marine research on an international scale. The challenges requiring knowledge about the North Pacific Ocean are enormous, as day-by-day we are faced with new potential crises such as marine mammal declines, organochlorides in the sea water and oil spills. At the same time, we need to address more encompassing problems such as oceanic variability and long-term climate change. To address these topics, we must involve considerations ranging from the climatic to microbial scales.

Dr. Alexander noted how fitting it was to meet at the NOAA facility on Sand Point. This is truly a United States hub for oceanographic and fisheries research on the Pacific Ocean coast, and any PICES research program will pivot around the

expertise which exists here. She and her fellow delegate, Dr. Bill Aron, offered their assistance to other participants in making the meeting a success.

Dr. Warren S. Wooster, Chairman of PICES addressed the Opening Session, 25 October 1993:

Despite the long gestation period of PICES, it has only been in existence now for nineteen months and one day. Since our first annual meeting one year ago, we have a few accomplishments: A three-person secretariat has been recruited and has been on the job for most of the year, equipment has been acquired, office space has been enhanced, and many administrative and personnel details have been worked out. The six working groups we established last year have all met, and their recommendations for action are in our hands, providing the basis for a scientific plan that the scientific committees and Science Board will be elaborating at this meeting. A scientific program of distinction has been put together for this, the first meeting organized on our own responsibility.

Of course, the road to effective development and use of the organization is not without its rough patches and detours. First, although we have been in contact with colleagues and officials in Russia and Korea, I am unaware of any real progress toward either country joining PICES. I urge both the observers from those countries present at this meeting and the representatives of the PICES Contracting Parties to take effective steps to achieve the goal of Russian and Korean membership by the time of our 1994 annual meeting.

Second, we have made no visible progress toward establishing an effective working relationship with our sister organization, the North Pacific Anadromous Fish Commission. Such discussions as have

taken place, for example at last year's meeting, have centered on the function "to consider requests to develop scientific advice" set forth in the PICES Convention. The NPAFC has not yet decided whether to seek such advice, and PICES in awaiting such requests can only indicate its willingness to play an advisory role to the extent wished by its Contracting Parties.

Attention now is also being directed to the statutory purpose "to promote the collection and exchange of information and data related to marine scientific research in the area concerned." In this case, PICES is not constrained to react only to external stimuli. Several of the working groups have proposed a PICES data role, and fishery data will be one important measure of ecosystem health and change. Here too there would seem to be a fertile area for cooperation between the two organizations.

Perhaps more important, two PICES working groups have proposed scientific activities of considerable interest to those concerned with the living resources of the region. I refer here to proposals concerning the effects of climate change on the productivity and mix of species in the ecosystems of the subarctic Pacific. These could result in a PICES GLOBEC project which could lead to an understanding of changes in the potential yield of the system as well as of its carrying capacity for salmon and other nekton. To the extent these studies involve anadromous species, as they must, considering the importance of salmon in the ecosystems, I hope the Anadromous Fish Commission will accept an invitation to collaborate in them.

Another unsolved problem is that of effective working mechanisms for use between annual meetings. Working groups were an obvious approach, but their success this year was weakened by non-participation stemming from travel restrictions and shortages of travel funds at

the national level. That governments approved the establishment of working groups and named their members was in the event no guarantee that travel would be approved. We can undoubtedly use electronic communication to greater advantage, but the likelihood of response and interaction is obviously much greater when the parties meet together.

The underlying question here is how, in a time of recession, to implement recommendations that arise in the PICES Committees and Working Groups or otherwise at this meeting. It isn't that PICES has a pot of new money that can be contributed to new ventures. Perhaps PICES will always be more of a sink than a source for funds. But the hope is that the ideas for joint action will appeal to the governments represented here because they address recognized problems of real concern, for example, the inevitable climate-driven decline of the rich harvest of the late 1970s and 1980s. I hope that scientists will find ways to use PICES endorsement of their proposals successfully as they pursue funding. This has certainly been the experience in international organizations such as ICES and the IOC.

So here we are with a powerful new apparatus available to promote and develop marine science in the broad sense, both to help solve the scientific mysteries by which we are surrounded, and to help answer the practical problems faced by our countries as they use the ocean and its resources. We must learn how to use the apparatus while making it known and available to all marine scientists in our region. Let's bend our efforts to making it work.

Dr. Wooster then introduced Dr. J.M. Wallace, Professor of Atmospheric Sciences and Director of the Joint Institute for the Study of the Atmosphere and Ocean at the University of Washington. Dr. Wallace addressed the subject of "Climate

Variability over the North Pacific", describing the nature of the decadal and longer term changes in the atmospheric and ocean circulation, and their interactions.

These variations may serve as forcing functions for long-term changes in the biological systems of the region.

REPORT OF GOVERNING COUNCIL MEETINGS

The Governing Council met on October 25th, 27th, and 30th, under the Chairmanship of Dr. Warren S. Wooster. The Executive Secretary Dr. W. Doug McKone served as rapporteur.

All member countries were represented at the three sessions (see Endnote 1 for participation). The Chairman of the Science Board Dr. Dan Ware also was in attendance during part or all of each session.

At the first session, the Chairman welcomed the delegates and 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 of enlargement of facilities in the Secretariat, the Chairman asked each Contracting Party to give serious consideration to contribute a work of art to the Secretariat which would be representative of their culture while keeping in mind the role of PICES.

During the Executive Secretary report, Dr. Aron indicated that the circulation of research ship schedules might be very useful to scientists by providing opportunities for participation and a knowledge of the research activities of scientists in member states. Dr. Hatanaka indicated that it is not easy to collect ship schedules and provide them to the Secretariat sufficiently ahead of time for them to be useful. He indicated that Japan would need to coordinate the collection

between four agencies. Dr. Wooster indicated that the Secretariat had not systematically collected ship schedule information to date. After consulting with the Science Board, **Council agreed that the Secretariat compile and circulate ship schedules from Contracting Parties (Decision 93/A/1, see Endnote 3).** The Secretariat will send a letter to Contracting Parties requesting they designate a contact to work with the Secretariat in compiling ship schedule information.

Agenda Item 2. Relations with Other International Organizations

Dr. Stewart representing the Intergovernmental Oceanographic Commission(IOC) and Mr. Hase representing the North Pacific Anadromous Fish Commission(NPAFC) were invited to speak to Council relative to the Organizations that they represent.

Dr. Stewart asked how a mutually beneficial working relationship between PICES and IOC could be developed. He suggested that one possibility might be through WESTPAC, the principle IOC program in the PICES area of interest. He also asked what PICES was doing in relation to other programs, for example WCRP, JGOFS, LOICS, GLOBEC, and GOOS. He suggested that it might be beneficial for PICES and the IOC to develop a Memorandum of Understanding on Cooperation (MOU).

Dr. Wooster thought that some WESTPAC projects were not well known to PICES participants and suggested that PICES Contracting Parties should inform the Secretariat about their WESTPAC activities. Then the opportunities for joint action would become more apparent. He requested that

Dr. Stewart provide a copy of the ICES-IOC Memorandum of Understanding (MOU) which would be helpful in further consideration of the matter.

Mr. Hase indicated that the coordination of activities between PICES and the NPAFC would be an important topic at the upcoming meeting in the first week of November. He suggested all fisheries and scientific research in the NPAFC Convention Area was important to the activities of the Commission. He also pointed out that the NPAFC Convention states that "The Commission shall have the authority to: cooperate, as appropriate, with relevant international organizations, inter alia, to obtain the best available information, including scientific advice, to further the attainment of this Convention". He finally mentioned that the Commission has not yet considered any specific relationship between PICES and NPAFC.

Dr. Wooster asked who would be given the task of determining the issues that might be discussed with PICES should the need arise. Mr. Hase indicated that CSRS would likely play some role but it could not be determined until the Commission has decided on the PICES-NPAFC relationship. Dr. Wooster thanked Dr. Stewart and Mr. Hase for their comments.

Canada asked that the following two questions be referred to Science Board for response in relation to possible PICES-NPAFC interaction;

- a) How will PICES handle requests for scientific advice from member countries?
- b) Who will compile a comprehensive catch statistics bulletin for species in the convention area?

Agenda Item 3. Membership in the Organization

Dr. Wooster opened discussion on this item by noting that further efforts were required to encourage the Republic of Korea and Russia to join PICES. He suggested that two avenues of approach would be useful. First, a letter from PICES could indicate that accession of both States would be supported by the Council. Second, each Member State could send a letter to both States indicating their support for joining PICES.

Dr. Aron suggested that the PICES letter indicate the success of the Second Annual Meeting and state that all Member States would welcome membership of both States.

Council agreed that the Chairman should draft a letter for circulation to Parties before transmission to the Republic of Korea and Russian Federation. Delegates agreed to recommend that their governments send letters to both countries encouraging them to accede to the PICES convention (93/A/2).

Agenda Item 4. Role of Observers

Dr. Wooster opened discussion by noting that, currently, meetings of the General Council, the Finance and Administration Committee, and the Science Board are open only to their members. This restriction creates difficulties for observers who wish to report on decisions of PICES to their sponsors.

Dr. Davis pointed out that it was not necessary to remove constraints on closed meetings. The question is how to provide the information required by observers. He proposed that a summary report of the findings of the meeting be prepared and circulated before the end of the meeting.

Dr. Aron supported Dr. Davis and indicated that in most meetings that he attends it is common practice to produce such a document. He also suggested that consideration might be given to developing an agenda which would allow limited participation of observers.

Mr. Yamada also indicated that in most of the meetings of Organizations that he attends such a summary report is produced.

Mr. Beckett suggested that care should be taken in opening meetings to others since, while some organizations may be interested in PICES activities, others may use this access to advance their own particular agendas. Further, control over the number of participants attending Council would be difficult if constraints were removed.

Council accepted the proposal of the Finance and Administration Committee that Dr. Davis in consultation with other representatives of Parties and the Chairman of the Science Board coordinate preparation of such a draft report for consideration of Council. Upon adoption of the report, the document would be circulated to the observers, press and others who express interest in PICES activities. Council also agreed to invite the IOC and NPAFC observers to attend their meeting on 27 October (see agenda item 2). The observers from Russia and Korea were invited to the meeting on 30 October, but unfortunately they were unable to attend.

The summary of the meeting was completed and approved by Council for circulation as appropriate.

Agenda Item 5. Election of Vice Chairman

In accordance with the Rules of Procedure, delegates were provided ballots for nomination of candidates for Vice Chairman. A single candidate, Mr. Cong-Meng Liu of China, was nominated and was

elected unanimously. Dr. Wooster congratulated Mr. Liu and welcomed him as Vice Chairman.

Agenda Item 6. Establishment of Scientific Committees

At the Organizational Meeting of PICES in March 1992 it was decided to establish provisionally four scientific committees and to review their status at the Second Annual Meeting. With the concurrence of Science Board, **Council agreed that these Committees, as listed below, be confirmed as permanent committees of PICES (93/A/3):**

- a) Biological Oceanography Committee (BIO)
- b) Fishery Science Committee (FIS)
- c) Marine Environmental Quality Committee (MEQ)
- d) Physical Oceanography and Climate Committee (POC)

Agenda Item 7. Report of Finance and Administration Committee

The Finance and Administration Committee (F&A) met under the Chairmanship of Dr. Davis who presented its report to the Council (see Finance and Administration for text of the report). The report was accepted by Council, including adoption of recommendations on the amended Staff Rules, reporting proceedings of meetings, and continuing the amount called for in Financial Regulation 9(iv)(2) at \$6,000. Its recommendations were also considered in dealing with agenda items 8-11.

Agenda Item 8. Audited Accounts for Fiscal Year 1992

With the concurrence of the Finance and Administration Committee, Council accepted the audited accounts and agreed to continue with Flader & Greene as auditors for a second year.

Agenda Item 9. Estimated Accounts for Fiscal Year 1993

The estimated accounts to October 15th were reviewed by the Finance and Administration Committee which recognized that a surplus over expenditures would occur in 1993. This surplus along with earnings would be added to the Working Capital Fund (WCF) established in 1992. The Executive Secretary proposed that the authorized WCF be increased to \$100,000 to allow for difficulties that may occur in receiving annual contributions. The Committee recommended that in view of the uncertainty in scope and responsibilities of PICES during its first years, a maximum should not be set at this time. Council accepted this recommendation (see Finance and Administration Committee report).

Agenda Item 10. Budget for Fiscal Year 1994

The detailed components of the budget were discussed by the Finance and Administration Committees, and appropriations for travel, contractual services and annual meeting costs were reduced to give a 1994 budget total of \$440,000 CND.

During the Finance and Administration Committee meeting Dr. Hatanaka (Japan) inquired if there could be a budgetary provision to pay the cost of bringing scientists from various countries to PICES meetings. Mr. Wu (China) suggested that while PICES internal funds should not be used for this purpose, a special Trust Fund might be established to cover such travel costs. Mr. Sullivan made it clear that while the United States also could not support the use of appropriated funds for support of travel to PICES meetings, a trust fund could provide a solution to the problem. Mr. Sullivan and Mr. Wu were then asked to

developed a proposal for consideration of Council.

Council agreed in principle with the proposal to establish a Trust Fund. It was not clear whether the Fund would be available for both member state and non member state scientists or if it could also be used for the exchange of scientists. The Chairman, together with the Chairman of Science Board and the Executive Secretary, were asked to develop a simplified draft for further consideration by Contracting Parties.

Salaries of the Secretariat staff were discussed in the Finance and Administration Committee. It was noted that the salary provisions of the Canadian Public Service should serve as a guideline but were not binding on the Organization. Committee recommendations on merit increases and adjustments were approved by Council.

Council approved the 1994 budget as revised by the Finance and Administration Committee (see report). It was agreed that \$80,000 CND would be transferred from the Working Capital Fund to reduce the \$110,000 CND contribution from each Party to \$90,000 CND for 1994.

Agenda Item 11. Forecast Budget for Fiscal Year 1995

The Forecast Budget for 1995, after revision by the Finance and Administration Committee, was reviewed by Council which agreed with the Committee that the budget reflected the considerable uncertainty in the responsibilities of the Organization during the next years. The Budget would be further reviewed in the 1995 budgetary process.

Agenda Item. 12 Report and Recommendations of Science Board

The Chairman of the Science Board, Dr. Ware summarized the report of the Board's

meeting on 29 October and presented its recommendations. The six Working Groups established at the last Annual Meeting have met, and their work, summarized in the report, has been reviewed by the relevant Scientific Committees and the Board. Decisions on the following matters were proposed:

1. **93/S/1 and 1.1:** Working Groups should continue their activities, with a change in WG 2's terms of reference, and with WG 1 replaced by WG 7 on Modelling of the Subarctic Pacific Circulation.
2. **93/S/2 and 2.1:** A technical report series, *PICES Scientific Reports*, should be established and the reports of several Working Groups published therein.
3. **93/S/3:** Communication should be enhanced using the most modern methods.
4. **93/S/4:** The exchange of scientific information should be encouraged, and constraints thereon reviewed.
5. **93/S/5:** The Secretariat with the help of other bodies in PICES should initiate work with data inventories and identification of non-routine data.
6. **93/S/6:** A Workshop on *Monitoring Subarctic Pacific Ocean Variability* should be organized to review current status and advise on a strategy for developing a PICES monitoring program.
7. **93/S/7:** A proposal for a visiting scientist program should be developed.
8. **93/S/8:** A Workshop on the *Okhotsk Sea and Kuril Region* should be organized in Vladivostok.

9. **93/S/9:** A Workshop on *Climate Change and Carrying Capacity* should be organized to develop a PICES/GLOBEC International program.
10. **93/S/10:** Working Group 3, renamed Coastal Pelagic Fish, should undertake specific activities.
11. **93/S/11:** Working Group 4, renamed Data Exchange, should assist in implementing 93/S/5 and should give special attention to the exchange of fishery and other biological data.
12. **93/S/12:** Working Group 5, on the Bering Sea, should undertake specific activities.

In connection with 93/S/1.1, Council suggested that Working Group 7, should consult with Working Group 6 to ensure that the physical model can be used to force a biological model. It noted that implementation of 93/S/7 is linked to the proposal to establish a Trust Fund (see Agenda Item 10). With regard to 93/S/9, if it were not possible to hold the proposed separate Workshop, the scientific program of the Third Annual Meeting should as appropriate accommodate the suggested topics. With these comments, Council approved the Science Board Resolutions (93/A/4); see under Decisions of Council in Endnote 3.

The Science Board also approved a scientific program for the Third Annual Meeting (see Agenda Item 13) and addressed several questions directed to it by Council:

1. The Board proposed the following mechanism for dealing with requests for advice from member countries.

Upon receiving a written request for advice, the Chairman will refer the

question to Science Board who would form an ad hoc committee to respond to the question. The advice from this ad hoc committee will be referred to Science Board for review, and forwarded by the Chairman for consideration by Governing Council before forwarding to the requesting party. If there were a need for establishing a permanent mechanism for providing advice to a certain party, then the ad hoc committee could be made permanent and it could be empowered by Council to respond directly to requests.

While agreeing with this approach, Council observed that requests might also come from other organizations and established the following procedure.

Upon receiving a written request for scientific advice from another organization, the Chairman will refer the question to Science Board who will propose a process (e.g. refer to existing committee or to an ad hoc working group as appropriate) to address the request. The question and Science Board proposal for addressing it will be then referred to the Governing Council for approval before action is undertaken. The advice generated will be handled in the same manner as advice offered in response to a request from Contracting Parties (reviewed by Science Board, and considered by Governing Council before being sent to the requesting organization) (93/A/5).

2. The Board, in noting the value of catch statistics for studies of the ecosystem as well as for fishery management, proposed that compilation and dissemination of these and other data should be discussed with NPAFC and other relevant organizations.

3. The question about exchange of ship schedules is treated in 93/S/5.
4. The Board considered how to minimize cost of Working Group activities while maintaining their quality and asked the Secretariat to review the cost of alternative approaches (see Agenda Item 13).
5. The Board discussed the influence on project funding of the adequacy of planning.

Agenda Item 13. Future Meetings of the Organization and Subsidiary Bodies

Dr. Hatanaka, on behalf of Japan, proposed, that the Third Annual Meeting be held in Nemuro on agreed dates in October 1994. This proposal was welcomed and unanimously accepted by Council. The scientific program proposed by the Science Board (see their report) was also agreed.

With regard to dates for the meeting, the suggestion of Dr. Davis that the meeting be extended by one day to allow adequate review of the Science Board report before Council takes action on its recommendations was accepted. Council proposed, for Japanese consideration, that the meeting be scheduled for 15-24 October 1994. Dr. Wooster was asked to develop a draft schedule for review of delegates.

Mr. Liu reported that consideration is being given to invite the Fourth Annual Meeting (1995) to be held in China. Contracting Parties would be informed as soon as a decision has been reached.

The need for longer range planning for annual meetings was discussed. However, because of the possibility of additional members, it seemed premature to agree on a pattern of rotation for the meetings. Council agreed that the Fourth Annual Meeting should be scheduled for the week of the 16th October, 1995.

The practical problems of scheduling, location, and expenses of Working Group meetings were discussed by the Finance and Administration Committee and Science Board. Experience in 1993 had shown the value of holding these meetings well in advance of the Annual Meeting. The Board thought meetings three to six months in advance would be most likely to lead to substantial and useful reports that could be given adequate consideration before action by Council. On the other hand, costs might be reduced if the groups met in connection

with the Annual Meetings. Council asked the Secretariat look into the relative cost of several alternatives and report to the Third Annual Meeting. Taking this analysis into account, the Chairman, in consultation the Chairman of the Science Board and the Executive Secretary, should determine where and when Working Groups should meet in 1994.

Agenda Item 14. Other Business

Matters discussed are treated under appropriate items above.

Endnote 1:

Participants

Canada

Mr. J.S. Beckett (alternate delegate)
Dr. J.C. Davis (delegate)
Mr. C.C. Graham (advisor)
Mr. R. Steinbock (advisor)

Mr. G. Wu (advisor)
Mr. L.Z. Chen (advisor)
Mr. S.P. Chen (advisor)

China

Mr. C.M. Liu (delegate)
Prof. Y.K. Xu (delegate)

Japan

Dr. H. Hatanaka (delegate)
Mr. Y. Yamada (alternate delegate)
Mr. H. Kono (advisor)

United States

Dr. V. Alexander (delegate)
Dr. W. Aron (delegate)
Mr. W. Sullivan (advisor)
Mr. F.H. Beaudry (advisor)
Board
Ms. A. Somma (advisor)

Others

Dr. W.S. Wooster, Chairman, PICES
Dr. W.D. McKone, Executive Secretary
(rapporteur)
Dr. D.M. Ware, Chairman, Science

Endnote 2:

Report on Administration for 1993

Council and Committees

1. Membership

No changes in Contracting Party membership have taken place during the year. As agreed in the 1992 Report of Council (item 3) letters were sent to Russia, Korea and Poland concerning

procedures to be followed to accede to the PICES Convention. No response has been received.

2. Payment of National Contributions

All financial contributions were received by August 3 this year. I would like to remind Contracting Parties to forward

their contributions in a timely manner and ensure that the correct amount is sent.

3. National Delegates

The following changes in points of contact have occurred since the last annual meeting.

- Mr. Cong-Meng Liu replaces Mr. Jian-San Jia as the head delegate and point of contact with China.
- Council General Yasuhide Hayashi replaces Mr. Mitsunori Namba as the point of contact with Japan.

4. Committees and Working Groups

- a. No changes have taken place in the Chairmen of Committees over the last year.
- b. Dr. Al Tyler replaced Dr. Robert Francis as the chairman of Working Group 5.
- c. Japan has appointed Dr. Takashige Sugimoto to the Biological Oceanography Committee and Mr. Masashi Mizukami will replace Dr. Hiroshi Hatanaka and Mr. Mitsunori Namba on the Finance and Administration Committee.

5. Observers

As agreed at the First Annual Meeting, a list of organizations to be invited to send observers was developed and circulated to Contracting Parties for approval. Invitations were sent in accord with the list.

6. Travel and Representation at Other Organization Meetings

- a. Dr. W.S. Wooster represented PICES at the annual IOC meeting and at the JECSS meeting in Qingdao.

- b. Dr. L.S. Parsons represented PICES at the annual meeting of ICES.

- c. Dr. W.S. Wooster attended Working Group 5 meeting in Alaska and Dr. McKone and Dr. Miyata attended Working Groups 1,3,4 and 6 meetings in Nemuro Japan. Dr. Miyata attended the Working Group 2 meeting in Seattle.

7. Space Facilities and Equipment

- a. Space for the PICES office has been increased at IOS to give Dr. Miyata an office and sufficient room in Dr. McKone's office to meet with 3-4 people. The reception area has increased to allow sufficient space for Ms. Chiu and temporary help along with room for filing cabinets etc. Discussions are continuing to find suitable space for storage and library facilities.
- b. Notebook computers and a printer were purchased to use at annual meetings. Filing cabinets, book cases, and a desk suitable for temporary help were purchased.

Communication

1. Publications

- a. The annual report was published and circulated in February along with the second announcement and a poster to advertise the second annual meeting.
- b. The first Newsletter was circulated in June along with the final announcement of the second annual meeting.
- c. The Secretariat published the Convention, Rules of Procedure and Financial Rules for use by those interested.

2. Communication

- a. Improved communications were developed with the IOS VAX computer to allow better access to Omnet and Internet.
- b. The Secretariat developed and published a "Directory" of those involved in PICES and a special effort was given to get Omnet and Internet addresses for exchange of information. In addition an extensive mailing list has been developed including libraries, organizations and individuals not directly involved in PICES.
- c. An Omnet Bulletin Board PICES.OCEAN was set up for distributing information on PICES activities and to allow other interested scientists to provide information that would be of interest to those scientists working in the North Pacific.
- d. A list of scientists interested in PICES activities has been developed and Dr. Miyata forwards relevant information on PICES activities on Internet. Approximately 130 scientists from 6 countries are currently on the mailing list.
- e. The Secretariat is working with W.G. 4 to identify under-utilized physical and biological data sources in the marine environment in the North Pacific. Contacts have been made with ICES, WOCE, MEDS, and discussions have been held with MacLain (NOAA) and McConnaughey (NMFS Alaska). The latter contact has requested help on PICES.OCEAN to develop an information base on the fishery resources of the Bering Sea, Gulf of Alaska and West Coast.
- f. The first attempt has been made to collect ship schedules for member states and make them available through PICES.OCEAN.

Secretariat Matters

1. Administrative/Financial

- a. Action was taken to obtain an Order in Council with the Canadian Government upon reaching agreement on the Headquarters Agreement. The Order in Council will cover such items as the non payment of income tax by foreign nationals and the Goods and Services Tax by the Organization. To date we have not received the Order in Council.
- b. The B.C. Government was approached to seek an agreement which would allow the non payment of provincial income tax by foreign nationals and the provincial sales tax by the Organization. To date we have not received an official response to this request. They are waiting to see what the Federal Government's action is relative to the Headquarters Agreement.
- c. Flader and Greene was appointed auditor in January and the audited report was circulated to Contracting Parties in February.
- d. As recommended by F&A Report (item 2) the establishment of a separate bank account for the Working Capital Fund was considered but no action was taken. Creating separate bank accounts would restrict the Executive Secretary on being able to obtain a good return on funds not in use.
- e. As recommended by the F&A Report (item 2) the possibility of depositing PICES funds in several banks to meet the limits on deposit insurance was explored. No action was taken as it would limit the Executive Secretary in being able to manage the fund in the best interest of Contracting Parties.

- f. In accordance with item 7 of the F&A Report, staff rules were developed from comments provided on a draft sent to Contracting Parties. These were in turn circulated again for approval and they are now in force.
 - g. Agreements were reached with the Government concerning Unemployment Insurance and the Canada Pension Plan. Only Canadian citizens and landed immigrants are covered by these plans.
 - h. Agreement was reached with the Pension Society to cover Canadian citizens and landed immigrants by the pension plan. Life insurance and long-term disability insurance is also being provided to all employees by the Society.
 - i. Agreement was reached with the Pacific Salmon Commission to cover PICES employees through their Dental Plan, Extended Health Care Plan and B.C. Medical Plan. Without this agreement PICES would have a great of difficulty meeting these obligations at a reasonable rate because the number of permanent staff is small.
 - j. Agreement was reached with the Workman's Compensation Board to cover the costs related to accidents while working on the job for the organizations.
 - k. According to Regulation 9e each staff member is required to be bonded. I have had some difficulty in finding a company willing to bond the staff. Negotiations are still underway.
2. Staffing
- a. The exchange of administration of the Secretariat to the appointed Executive Secretary occurred in the first half of January.
 - b. Interviews were held and Christina Chiu was appointed Administrative Assistant in early February.
 - c. Information provided by candidates for the position of Assistant Secretary was reviewed and Dr. Motoyasu Miyata reported in April.

Endnote 3:

Decisions

93/A/1: Council agreed that the Secretariat will compile and circulate ship schedules from Contracting Parties .

93/A/2: Council agreed that the Chairman should draft a letter for circulation to Parties before transmission to the Republic of Korea and Russia. Governments should send letters to the Republic of Korea and Russia encouraging them to accede to the PICES convention.

93/A/3: The following Scientific Committees are confirmed as permanent committees of PICES.

- a) Biological Oceanography Committee (BIO)
- b) Fishery Science Committee (FIS)
- c) Marine Environmental Quality Committee (MEQ)
- d) Physical Oceanography and Climate Committee (POC)

93/A/4: Resolutions proposed by Science Board and listed below as Decisions are approved.

93/A/5: Procedures for responding to requests for scientific advice received from member countries and from other organizations are approved.

93/S/1: With the exception of Working Group 1, the Working Groups established during the First Annual Meeting will continue their work during the period prior to specific tasks as indicated. Working Group 2's second term of reference is modified to read "Identify the most important problems, scientific questions and knowledge gaps in sampling, analytical and assessment methodologies to evaluate marine environmental quality."

93/S/1.1: It is recommended that a new POC Working Group 7 on "Modelling of the Subarctic North Pacific Circulation" (Terms of Reference attached) be established to replace POC Working Group 1.

93/S/2: A technical report series, to be known as PICES *Scientific Reports*, will be established for publication of Working Group reports, data and information inventories, and workshop and symposium proceedings as appropriate. The Science Board will establish publication standards and serve as the editorial board.

93/S/2.1: The 1993 reports of Working Group 1 (Okhotsk Sea and Oyashio region), Working Group 3 (Coastal Pelagic Fish), and Working Group 6 (Subarctic Gyre) will be published in PICES Scientific Reports.

93/S/3: The Secretariat should strengthen communication among scientists, agencies, and organizations by means of electronic mail, facsimile, newsletter and other appropriate means.

93/S/4: PICES should encourage the exchange of scientific data, information, and research plans among its members and other Pacific Rim countries. In this connection, Contracting Parties should review constraints on data exchange in their laboratories with a view to facilitating data exchange. The Science Board should compile information on data access problems that are brought to their attention.

93/S/5: The Secretariat, with the help of the Working Group on Data Exchange and other Working Groups and Scientific Committees as appropriate, should initiate the following tasks:

1. Prepare, update when appropriate, and distribute inventories of physical,

chemical, and biological data sets held by member states and other countries pertaining to the area of interest.

2. Encourage and facilitate deposition in international archives of unclassified and non-routine data sets with special attention to regions where data are now scarce.

93/S/6: A Workshop on *Monitoring Subarctic Pacific Ocean Variability* should be organized by the Science Board to be held in association with PICES III. The workshop should review current programs devoted to monitoring ecosystems, their atmospheric, oceanic, and anthropogenic forcing, and their biological productivity; and, taking into account relevant existing and planned international programs such as GOOS, should advise on a strategy for developing a PICES monitoring program.

93/S/7: The Secretariat, in consultation with Science Board, should develop and circulate a proposal for a visiting scientist program, and, when agreement has been reached as to its character and dimensions, should consult with Contracting Parties and other potential sources of funding.

93/S/8: A Workshop on the *Okhotsk Sea and Kuril Region* should be organized in Vladivostok to review present knowledge of oceanography and fisheries and the availability and exchange of data for implementing collaborative oceanographic research projects in the region for initial consideration by PICES III. The physical Oceanography and Climate Committee should take the lead in establishing a Workshop Steering Committee which should also include representatives of the Biological Oceanography and Fishery Science Committees, and Russian laboratories in Vladivostok.

93/S/9: A workshop should be organized just prior to PICES III to develop a PICES-

GLOBEC International Program on Climate Change and Carrying Capacity. Working Group 6 and Working Group 3 will take a lead role in establishing a Workshop Steering Committee that should also include representatives of the host agency, and relevant PICES Science Committee members. The Steering Committee and Working Group members should (a) develop a strategy for determining the carrying capacity of the subarctic Pacific for salmon and other high-trophic level, pelagic carnivores and its changes in response to climate variations, (b) develop a plan for a cooperative study of how changes in oceanic conditions affect the productivity of key fish species such as salmonids in the subarctic Pacific and clupeoids and scombrids in the coastal zones of the Pacific Rim. For example, further study of existing or new salmon scale samples would be profitable. Cooperation with the NPAFC and other appropriate bodies should be invited.

93/S/10: Working Group 3, renamed Working Group on Coastal Pelagic Fish, will (a) compile an inventory of scientists working on key pelagic fishes in various geographic areas of the region, (b) assemble information on western and eastern Pacific pelagic fish stocks from all sources with a view to completing an inventory and summary of these data by PICES III, (c) plan a pan-Pacific comparison of life table differences and recruitment based on these data, and (d) begin planning a comparative trophodynamic model study of coastal ecosystems around the Pacific rim, to understand how these important systems support pelagic fish biomass, and how changes in oceanic conditions may lead to changes in species dominance and abundance (93/S/5 and 93/S/9).

93/S/11: Working Group 4, renamed Working Group on Data Exchange, will have the major responsibility for assisting the Secretariat in implementing 93/S/5, and will

give special attention to the problems of standards and methods for the exchange of fishery and other biological data.

93/S/12: Working Group 5 on the Bering Sea will (a) establish small tasks groups to work by E-mail in developing research strategies for the principal scientific questions developed during the first meeting

with the goal of preparing a report on these strategies for consideration at PICES III, (b) organize a Symposium on the Bering Sea for presentation at the Fourth Annual Meeting, and (c) initiate preparation of a book reviewing present knowledge of the climatology, oceanography, and biology of the Bering Sea.

Working Group 7 on Modelling of the Subarctic North Pacific Circulation Terms of Reference

Although the subarctic oceans play an important role in the earth's climate system as a region where strong air-sea interactions occur and active ventilation of the oceans takes place, the present state of modelling of the subarctic oceans is not satisfactory even with respect to the physics. This is one of the most important unresolved questions for constructing an accurate climate forecasting system. In view of the importance of modelling of the North Pacific Circulation for the global climate forecast, the Working Group will:

-Review the status of present physical modelling efforts on the subarctic North Pacific circulation and identify the gaps and problem areas,

-Identify the kinds of observations and other information needed to improve circulation models,
-Identify what kinds of knowledge of the related physical processes and of local ocean dynamics (such as in marginal seas) are needed to improve the circulation models, and
-Identify how the incompleteness of the present physical model of the subarctic North Pacific influences other modelling efforts such as the global climate, ecosystems, material transport, etc.

A focus on physical aspects of modelling will be maintained.

REPORT OF SCIENCE BOARD

The Board met on October 29, 1993 from 9:30 to 18:00.

Participants were:

Dr. D. Ware - Chairman, Science Board
Dr. W. Wooster - Chairman, PICES
Prof. Y. Nagata - Chairman, Physical Oceanography and Climate Committee
Prof. M. Mullin - Chairman, Biological Oceanography Committee
Prof. Q. Tang - Chairman, Fishery Science Committee
Prof. J. Zhou - Chairman, Marine Environmental Quality Committee
Dr. D. McKone - Executive Secretary (rapporteur)

The Chairman, Dr. Ware, called the meeting to order and the task before the Board was discussed. The Board was to review the findings and recommendations of the Science Committees and Working Groups; based on these, to develop a PICES Scientific agenda; discuss a publication plan for PICES; and plan the Third Annual Meeting.

The Board noted that the four Scientific Committees had been provisionally established and that their continuing status was to be reviewed at the present meeting. In response to the Governing Council's request for views on this, the Board strongly recommends that these bodies now be recognized as permanent Scientific Committees.

Reports from the Science Committees were presented by their chairmen and are summarized as follows, the full reports are appended:

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

The Biological Oceanography Committee proposes to sponsor a symposium at the Third

Annual Meeting, and to appoint a convener for this purpose. The symposium should be:

"Structure and ecosystem dynamics of the subarctic and transition zone North Pacific - is the east like the west?"

Structure and east-west comparisons explicitly include physical properties and processes, and seasonal cycle(s) as well as longer periods. Ecosystem dynamics explicitly include all trophic levels. The weakest link, in terms of data, may be mesopelagic fish and non-commercial squid.

In addition to its intrinsic interest, this symposium can initiate interactions with GLOBEC; we see PICES potentially filling an important role in linking GLOBEC programs (likely to be coastal) to the larger oceanic basin.

The Biological Oceanography Committee supported the concept of scientific exchanges among PICES countries, but was divided between increased availability of funds for Working Group and PICES meetings, and a program for visiting scientists, fewer people staying for longer periods to work with specific colleagues and/or institutions.

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

The Committee held a special meeting on October 26, to discuss how PICES should prepare itself to respond to requests for advice on issues or problems relative to the

marine science of the North Pacific, and how PICES could best facilitate the exchange of scientific information.

The Committee held its scheduled business meeting on October 28. Prof. Tang was elected chair of the Fishery Science Committee. The Coastal Pelagic Fish Working Group (WG3) report was discussed and a number of recommendations were passed to Science Board. The Committee endorsed Working Group 3's plan to carry out Pan-Pacific comparisons of life table differences and recruitment. The Committee supported the proposal to hold a PICES-GLOBEC Workshop at the Third Annual Meeting, and recommends that PICES develop an international PICES-GLOBEC program for the North Pacific Ocean. Last year's recommendation to reserve a block of time at the Annual Meeting to facilitate coordination of research surveys by member countries, was reiterated.

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

Working Group 2's report was reviewed and accepted by the Committee. It endorsed the report's conclusion that an important objective is to promote the harmonization of methods used in studying marine environmental quality within the PICES area in order to: 1) facilitate data exchange among the participating countries, and 2) the development of cooperative activities to assess marine environmental quality across national boundaries, and in the open ocean. To address this goal, the Committee recommended that a topic session at the Third Annual Meeting be arranged to explore the range of methodologies that could be used to assess and predict the impact of pollutants on marine ecosystem structure and function.

Prof. Zhou will represent PICES at a NOWPAP (North-West Pacific Action Plan)

meeting in November. The Committee expressed the hope that PICES MEQ activities will be complementary and helpful to NOWPAP in reaching common goals.

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

The Committee received and discussed the Working Group 1 report, and accepted it. Their recommendations were passed to the Science Board as parts of the POC recommendations. The Committee thanks the efforts of the Working Group 1 members, and decided to close it.

The Committee proposes to establish two new POC Working Groups, on Modelling of the Subarctic North Pacific Circulation, and on Monitoring of the North Pacific. The Committee also recommends two one-day sessions on Physical Processes and Modelling of the Subarctic North Pacific and its Marginal Sea, and on Monitoring of the Large Scale Variability of the North Pacific at the Third Annual Meeting.

The Committee recommends that PICES support and help research in the convention area. For example, the International North Pacific Ocean Climate (INPOC) Study has been very successful and should be supported.

The Board endorses the intersessional activities planned by the Scientific Committees, some of which are reflected in subsequent specific resolutions.

Working Group Reports

The Board also reviewed the Working Group reports and recommendations. Working Group summaries follow:

WG 1. Okhotsk Sea and Oyashio Region (POC)

Working Group 1 met in Nemuro, Japan between September 19-23, 1993, under the Chairmanship of Dr. Lynne Talley (USA). The objective of the group was to review the present level of knowledge of the oceanic circulation and water mass modification in the Okhotsk Sea and Oyashio region. The group prepared an extensive review on this topic, and drafted recommendations for international cooperation in the region, and to facilitate particular studies that would address the greatest weaknesses in our knowledge relating to ventilation of the North Pacific, and the exchange of Okhotsk Sea waters with the North Pacific. The greatest deficiencies are in quantitative estimates of all processes: rates, transports, variability and budgets.

The group also proposed that PICES should organize an international meeting on the Okhotsk Sea and Kuril region in Vladivostok to discuss physical oceanography, fisheries, and data exchange with Russian scientists. This meeting would facilitate communication and planning for projects that require international cooperation and support. It would also facilitate incorporation of unclassified Russian hydrographic, sea level, and sea ice data into appropriate international data bases.

WG 2. Development of common assessment methodology (MEQ)

Working Group 2 met on October 21-22 in Seattle. Background papers had been prepared by each member country before the meeting to review the kind of information about marine pollution in the PICES area. "Pollution" had been interpreted widely to cover not only chemical contamination but also the

impact of stressors such as pathogens, harmful algal blooms, etc. Most countries focused their pollution assessment and monitoring activities on the coastal zone, though there were occasional data sets from the open ocean. Furthermore, most countries focused their analyses on a suite of chemical contaminants, usually including organochlorines, metals, petroleum hydrocarbons and radionuclides, though there was a growing interest in the impact of eutrophication and in harmful algal blooms.

Three main questions emerged from the review of the background papers; (a) What are the known or potential stressors and their major sources? (b) What is the potential of these stressors to be transported to, and have an impact on the North Pacific? (c) What is the best approach to assessing the "health" of the subarctic North Pacific system, and, detecting changes in ecosystem structure for predictive purposes.

Several approaches to answering these questions were suggested. The underlying theme, which was supported unanimously, was that marine pollution should be thought of and addressed as a biological as well as a chemical question.

The Working Group recommended that PICES organize a symposium to review approaches to assessing the impact of anthropogenic stressors at the ecosystem level and suggested that PICES consider sponsoring a collaborative practical workshop to address some of the issues identified above.

WG 3. Dynamics of pelagics in coastal ecosystems (FIS)

Working Group 3 met in Nemuro, Japan between September 19-23, 1993, under the co-chairmanship of Dr. John Hunter (USA) and Dr. Tokio Wada (Japan). The objective of the Working Group is to develop a program for a comparative study of the population dynamics and productivity of key pelagic fish along the coastal margin of the North Pacific. The Working Group is initially focusing on the dynamics of Pacific herring, sardine, anchovy, saury and Pacific mackerel, and proposes to use comparative methods to determine how changes in oceanic conditions affect the dynamics of these stocks, and the coastal ecosystems in which they live.

The Working Group plans to begin by assembling an inventory of population time series for Eastern and Western Pacific pelagic fish stocks. The resulting time series will be analyzed for patterns and differences in recruitment and life table rates. A second comparative study will also be developed to apply trophodynamics models to understand how changes in ocean climate affect the production of selected coastal ecosystems around the Pacific rim, and the impacts on pelagic fish production.

Inter-Committee (Science Board) Working Group Reports

WG 4. Data collection and quality control

The objectives of this Working Group were to identify existing international standards relevant to data exchange within the PICES region; identify data sets which are available and suitable for exchange; advise on data exchange protocols and production of reference data sets. The Working Group met in Nemuro, Japan between October 18-23,

1993, under the co-chairmanship of Mr. Skip McKinnell (Canada) and Dr. De-Quan Yang (China). Data exchange standards include protocols for the consistent naming of measurements and standard formats designated to facilitate exchange and acquisition of data. The Working Group noted that international standards for data exchange in physical oceanography and meteorology are well established. In contrast, there are few equivalent standards for biological and fisheries data. The Working Group proposes to develop a PICES catalogue of data bases, and to work closely with PICES scientific programs to develop data standards, where they do not exist. The Working Group will examine the ICES model for collection and dissemination of scientific data and information and its relevance to PICES objectives.

WG 5. Bering Sea

The Working Group met in Girdwood, Alaska on August 24 and 25, 1993, under the chairmanship of Prof. Al Tyler (USA). The tasks set out for the Working Group were to review the present knowledge of the atmospheric and oceanic circulation of the Bering Sea; review present knowledge of the Bering Sea ecosystem and its responses to environmental variability; identify major gaps in present knowledge; develop a plan for a symposium on the Bering Sea ecosystem. The group proposed to reach its review objectives by preparing a book covering present knowledge of the Bering Sea. The group developed a series of principal research questions that it considered important for understanding environmental and ecosystem function in the Bering Sea. The questions focused on: Do lateral and vertical input processes cause the deep Bering Sea to be a significant

repository for global deep water? What are the effects of ice formation on Bering Sea productivity? What is the impact of changing predator/prey relationships on the dynamics of the Bering Sea ecosystem? Have the commercial fisheries affected the high trophic level predators?

WG 6. Subarctic Gyre

The Working Group met in Nemuro, Japan between September 18-23, 1993, under the co-chairmanship of Dr. Brent Hargreaves (Canada) and Prof. Takashige Sugimoto (Japan). The Working Group was asked to prepare a review of the ocean circulation and climate variability in the subarctic North Pacific, including information on primary and secondary production, and what is known about the carrying capacity for salmon and other nektonic species. The group was also asked to advise on which PICES and GLOBEC International objectives could be linked into a joint program for the subarctic North Pacific.

The Working Group prepared detailed reviews of the physical oceanography and biology of the Subarctic gyre, and drafted recommendations for collaborative research programs to fill in important gaps in knowledge. The Working Group reviews and discussions culminated in three main scientific questions: How do the various scales of physical variability affect biological processes and productivity of the subarctic North Pacific ecosystem? What is the structure of the food web in subarctic waters and what controls its spatial, seasonal, and interannual variability? What physical and biological oceanographic processes affect the production and carrying capacity of salmon and other nekton in the subarctic North Pacific?

PICES Publications

The role of PICES in publishing scientific reports was discussed. The Board noted that many of the Working Group reports and symposium proceedings contain significant scientific information that merit publication. The Board concluded that PICES should establish a series for publication of Working Group, and other reports and symposia proceedings that have significant scientific information that would be of general interest to the marine science community and public. Science Board would function as the Editorial Board and establish PICES publication standards. (Res. 2).

Third Annual Meeting

The Third Annual Meeting will be held in Nemuro, Japan in 1994. The program will include sessions of invited and contributed papers organized by the indicated committees on the following topics:

1. (Science Board) "Structure, Trophic linkages and Ecosystem Dynamics of the Subarctic Pacific". Conveners to be determined.
2. (POC) "Physical Processes and Modelling of the Subarctic North Pacific and its Marginal Seas". Conveners: Dr. Yutaka Nagata (Japan) and a co-convenor from North America.
3. (BIO) "Seasonal cycles and longer period variation of the subarctic and transition zone North Pacific - is the east like the west?" Conveners to be determined.
4. (FIS) "Recruitment Variability of Clupeoid Fishes and Mackerels". Conveners: Dr. Anne B. Hollowed (U.S.A.) and Dr. Tokio Wada (Japan).

5. (MEQ) "Interdisciplinary methodologies to better assess and predict the impact of pollutants on structure and function of marine ecosystems." Conveners to be determined.

Science Board recommends that the Third Annual Meeting be scheduled from October 15th to 24th. October 15th and 17th would be devoted to a special workshop. October 16th would be devoted to the local Nemuro Festival. The Third Annual Meeting would start on the 18th and finish on the 24th. Governing Council would meet for half a day on the 18th, 20th, and 24th. Science Board would meet on the 22nd.

Science Board Recommendations

Consideration of Scientific Committee and Working Group reports led to a set of Resolutions for presentation to Council for approval (see Endnote 3 to Council Minutes, Decisions of Council).

Other Matters Referred by Governing Council

- a) How will PICES handle requests for scientific advice from member countries? (Canada)

Upon receiving a written request for advice, the Chairman will refer the question to Science Board who would form an ad hoc committee to respond to the question. The advice from this ad hoc committee will be referred to Science Board for review, and forwarded by the Chairman for consideration by Governing Council before forwarding to the requesting party. If there were a need for establishing a permanent mechanism for providing advice to a certain party, then the ad hoc committee could be made permanent and it could be

empowered by Council to respond directly to requests.

- b) Who will compile a comprehensive catch statistical bulletin for species in the convention area? (Canada)

The scientific need is for full and free availability of reliable data to scientists. Catch statistics are useful for scientific studies of the ecosystem as well as for fishery management purposes. The practical problem of efficient and cost effective compilation and dissemination of such data as well as of environmental data needed for scientific studies, should be the subject of discussion between PICES and NPAFC as well as other relevant organizations.

- c) Do PICES scientists need to know the ship schedules of member countries to do their work? If they do, how should the schedule be compiled? (Japan)

The Secretariat will attempt to compile a ship schedule for all member states. Countries are requested to provide a contact point to the Secretariat who will compile the information, and disseminate it through the PICES newsletter, e-mail or fax to point of request.

- d) How can the Working Groups work effectively at minimal cost? (U.S.A.)

The Science Board notes that the decision on where and when a Working Group will meet must be agreed by the Chairman of the Science Board and the Chairman of the Working Group in consultation with the Executive Secretary with the aim of minimizing costs. The Science Board recommends that some of the Working Groups meet in the Spring or the Summer and send their reports to the Secretariat one month before the annual meeting. The Board believes that this process will lead to the highest quality scientific work.. In some

cases it will be preferable for some of the Working Groups to meet in conjunction with the Annual Meeting. For example next year Working Groups 6 and 7 could best complete their work objectives at the Annual Meeting.

The Secretariat is requested to look into the relative costs of several options and will report the results to Governing Council at the Third Annual Meeting.

e) How does PICES propose to implement the science programs after the planning stage? (U.S.A.)

The planning process is intended to progress to the stage where the need for, and utility of, a project is clear, and the steps to be taken for implementation are identified. At this point, the scientists will need governments to provide the necessary financial support. In cases of sufficient importance, this may require new funds. But it is implicit in the establishment of the scientific efforts in which PICES has been engaged that these are of sufficient importance to the Contracting Parties that when planning has been completed, means to carry out the programs will be found.

Scientific Program

The Scientific program took place on October 25-28. Each of the Scientific Committees held topic sessions and sessions of other contributed papers. An overview of these papers was presented at a closing Scientific Session (on October 28) by Drs. P.H. LeBlond, A. MacCall, J. Stein and M.M. Mullin. The papers are listed at the end of each Committee report.

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

Long-term monitoring from platforms of opportunity. Convener: Dr. Charles B. Miller (U.S.A.)

Dudley B. Chelton & P. Ted Strub
Radar remote sensing of large-scale surface circulation of the ocean

Chad A. Fox & Robert Leben
Observations of circulation variability in the Bering Sea using Geosat altimetry data

A. Harashima, R. Tsuda, Y. Tanaka, T. Kimoto, S. Tanaka, K. Furusawa, O. Kurokawa, Y. Takeuchi & Jae-Ryoung Oh
A semi-continuous environmental monitoring and associated chemical and biological measurement using seawater intake of Japan-Korea Ferry

Robert Leben & George H. Born
Monitoring of the Bering Sea and Gulf of Alaska using Topex and ERS-1 altimeter data

Howard I. McElderry
Fishing vessel observer programs in British Columbia

Douglas R. McLain
In-situ monitoring of the North Pacific

Roy Mendelssohn & Claude Roy
The importance of easy access to long-term oceanographic datasets when examining trends and changes in variability

Charles B. Miller
A history of ship of opportunity observations

Paul E. Smith
On a use for long-term observations on platforms of opportunity for simple population models of fish

William L. Stubblefield
Opportunities for cooperative use of NOAA platforms

Yuji Tanaka, Ryohei Tsuda & Akira Harashima
In situ monitoring of chlorophyll-*a* and six spectra of phyto-plankton via laser-induced fluorescence through an optical fiber on Japan-Korea ferry

Janet M. Wall

Long-term monitoring from platforms of opportunity

Peter Wiebe

Drilling platforms as opportunities for time-series of oceanographic observations in coastal locations

Fabian Wolk & Hidekatsu Yamazaki

Three dimensional CDT-data visualization on a graphics workstation

C.S. Wong & F.A. Whitney

Distribution of nitrate in the subarctic Pacific Ocean: results from trans-Pacific ships-of-opportunity and Station P time-series monitoring

REPORT OF BIOLOGICAL OCEANOGRAPHY COMMITTEE

The Biological Oceanography Committee met on October 28, 1993. Present were members M. Mullin (U.S.A.), L. Jones (U.S.A.), K. Denman (Canada), D. Mackas (Canada), T. Ikeda (Japan), T. Sugimoto (Japan) and Y.Q. Chen (China); and non-members A. Tyler and P. Gould, V. Alexander, W. Wooster and D. Ware were present for some of the discussions.

1. Chair Mullin opened the meeting and greeted new members Y.Q. Chen (not present last year) and T. Sugimoto.
2. A. Tyler representing the Bering Sea Working Group, distributed and discussed research recommendations and a statement of principle scientific questions from that WG. He requested that the Committee support a symposium, to be sponsored by the WG, on a subject of mutual interest yet to be defined. The Committee made no decision, and felt it would be better to postpone such a symposium until Russia joins PICES.
3. T. Ikeda discussed the merits of a symposium or session at next year's meeting covering comparisons of ecology of the east and west regions of the subarctic Pacific, in order that paradigms developed in one area not be inappropriately applied to other areas. The "small pelagics" WG might also be interested. Possible conveners include Parsons, Miller, Frost, Brodeur, Terazaki, Percy, or Tagouchi.
4. The Committee discussed a letter from C.S. Wong seeking support for

an expanded program of sediment traps in the North Pacific. His justification was primarily for a study of the carbon cycle. With respect to records of fish scales in such traps, it was pointed out the salmon are not deciduous. However, greater sharing of the ships' schedules (recommended by this committee last year)

might facilitate development or recovery of traps. The Committee decided that Wong's proposal was too specific for a WG, but might be incorporated into a more general WG on moorings or other intended systems. The Committee recommended last year that such a program be developed.

5. The following proposal was presented to the Committee and discussed. The Biological Oceanography Committee recommends that PICES form a new Working Group or Planning Committee to develop an international PICES-GLOBEC program for the North Pacific. The terms of reference should include:

1. Develop and solicit "strawman" proposals for the PICES-GLOBEC program, based on shared themes of climate variability and physical-biological interactions, prior to the PICES Third Annual Meeting. These should include as much opportunity as possible for direct input and participation from all other PICES Working Groups. Input from key people outside PICES (from Russian, Korea, GLOBEC, ICES etc.) should also

be encouraged and supported. The recommendations developed by PICES Working Groups in 1993 should form the foundation of the PICES-GLOBEC proposal.

2. Organize a PICES-GLOBEC Workshop at the PICES Third Annual Meeting to review these proposals and develop and finalize the scientific plan for the PICES-GLOBEC proposal.
3. Organize a symposium on a subject of mutual interest to PICES and GLOBEC for the Third or Fourth Annual Meeting.
4. One focus of the PICES-GLOBEC program should be decadal time scale and basin-wide spatial scale, variations in the subarctic Pacific ecosystem, mediated by climate and physical oceanographic variations. Subarctic Pacific trophodynamics, including recruitment of pelagic fish populations, should be modeled. Comparative studies of ecosystem and physical environment between eastern and western boundary currents and between subgyres should also be conducted.

The Committee noted that GLOBEC's actual work will be done by national entities, thus its investigations are likely to be coastal. PICES might provide information on the ocean-scale impacts on these systems. Recent studies strongly suggest that population changes in both high seas and continental margins ecosystems are caused by advective and nutrient-input processes operating at gyre-to-basin spatial and decadal time scales. Although evidence for association is strong, understanding of coupling mechanisms is inadequate for diagnosis

and prediction. PICES shares many objectives and approaches with the GLOBEC program and several existing PICES Working Groups and Committees share expertise and mandates. PICES might provide the infrastructure to further shared GLOBEC and PICES goals. These points were incorporated into the Committee's recommendations.

6. The Committee discussed selected recommendations of the PICES Working Groups.
7. The Physical Oceanography Committee may want to set up a WG in numerical modelling. The Committee agreed on supporting this WG providing that ecosystem modelling or linkages were included.
8. Visiting Scientist Programs which would provide support for scientists to work with specific colleagues in a different PICES country for a few days to several months were discussed. Some members felt that travel support to WG or PICES meetings is more important than visiting scientist programs. There was general agreement that non-member scientists should be included in a program, although member governments might not want to support non-member visits.

Recommendations

The following recommendations were presented to the Science Board by Chairman Mullin.

The Biological Oceanography Committee proposes to sponsor a symposium at the Third Annual Meeting and to appoint a convener for this purpose. The symposium should be: Structure and ecosystem dynamics of

the subarctic and transition zone North Pacific - is the east like the west?

Structure and east-west comparison explicitly include physical properties and processes, and season cycle(s) as well as longer periods. Ecosystem dynamics explicitly include all trophic levels. The weakest link, in terms of data, may be mesopelagic fish and non-commercial squid. In addition to its intrinsic interest, this symposium can initiate interactions with GLOBEC; we see PICES potentially filling an important role in linking GLOBEC programs (likely to be coastal) to the larger oceanic basin.

The Biological Oceanography Committee supported the concept of

scientific exchanges among PICES countries, but was divided between two models:

1. Increased availability of travel money to attend Working Group and PICES meetings. This option should probably include scientists from non-PICES countries (if permitted by PICES governments).
2. Visiting scientists - involving fewer people staying for longer periods (weeks to months) in a different PICES country to work with specific colleagues and/or institutions. This option probably is for exchanges among PICES countries.

Scientific Papers

The following is a list of scientific papers from the BIO Committee supported part of the program.

High resolution paleoecological studies in the subarctic Pacific. Convener: Prof. Michael M. Mullin (U.S.A.)

Rosanne D'Arrigo, Gordon Jacoby & Gregory Wiles

High-resolution Tree-Ring records from coastal Alaska and British Columbia: associations with northeast Pacific climate

Tim R. Baumgartner, Andy Soutar & Vicente Ferreira

Interdecadal variability of coastal pelagic fish populations in the California Current over the past two millennia

Sin-Jae Yoo

Monitoring plan for lower trophic level productivity of the Yellow Sea large marine ecosystem

V.P. Shuntov, E.P. Dulepova, V.I. Radchenko & O.S. Temnykh

On the beginning of large reformation in communities of plankton and nekton of the far eastern seas

Michael M. Mullin

Reproduction of the copepod, *Calanus pacificus*, off Southern California in the anomalous winter-spring of 1992, relative to 1989-91

Robert C. Francis & Steven R. Hare

A case for historical science in large marine ecosystem research: teasing order out of chaos

R.C. Hobbs, C.T. Tynan & J.A. Lerczak

Biological and environmental habitat factors for marine mammal species caught in the North Pacific driftnet fisheries for squid

David W. Welch, Yukimasa Ishida, Nancy D. Davis, Kazuaki Tadokoro & Peggy H. Ostrom

Inter-annual trophic phasing in the central North Pacific Ocean: evolutionary evidence for high seas competition in Pacific salmon

REPORT OF FISHERY SCIENCE COMMITTEE

The Fisheries Science Committee met on October 26 with the Canadian Delegate, Mr. James Beckett, to discuss how PICES should prepare itself to respond to requests for information on issues or problems relative to the marine science of the north Pacific Ocean, and how PICES might better serve the scientific community by disseminating scientific reports to PICES members. The Committee did not reach a position on what types of data bases and information should be maintained and disseminated by PICES. The Committee concluded that any such requests for advice or information coming to PICES from others outside PICES should be handled directly by the PICES Governing Council or such advisory body that it might set up. Responses by any of the committees and Working Groups would be inappropriate unless specifically empowered by the Governing Council. With respect to the second issue the Canadians proposed that each country submit copies of important scientific reports or papers which are not yet readily available in the scientific literature to PICES on a regular schedule to be disseminated to the PICES membership. The Committee agreed that this proposal should be considered as a possible service to be provided by PICES. This service could include a dissemination of a list of submitted documents with brief descriptions of their contents and the addresses of where copies of the documents could be obtained.

The Committee met again on October 28 under the Chairmanship of Q. Tang; D. Eggers served as rapporteur. The following members participated:

Canada: R.J. Beamish, J. Rice

China: Q. Tang

Japan: K. Ohtani, T. Sasaki,
T. Wada

U.S.A.: D. Eggers, J. Hunter,
G. Stauffer

An election supervised by PICES Executive Director, D. McKone, confirmed interim Chairman Q. Tang as the chair of the Fishery Science Committee.

Discussions in the Committee focused on review of the report of Working Group 3, and relevant portions of the reports from Working Groups 5 and 6. The FIS committee also discussed the Working Group reports with respect to major scientific direction and priority.

With respect to the report of Working Group 3, Coastal Pelagic Fishes, The FIS Committee recommends the following:

1. The name of PICES Working Group 3 be changed to Pelagic Fishes Working Group, and that Pacific Hake and Walleye Pollock be included as species of interest to the workgroup.
2. PICES establish a visiting scientist program and that the Science Board develop funding and details of the program. The Committee suggests that a minimum of two scientists be funded for a month or more. The process for selecting visiting scientists should be competitive with a group from PICES making the selections. Applicants should submit a letter of intent with Curriculum Vitae for consideration by the group.
3. PICES establish a workgroup report series produced in a useful format that

is identifiable and citable. The reports should be anonymous so as not to jeopardize publication of information in the reports in the open scientific literature.

4. The FIS Committee attaches highest priority to recommendation 1 of Working Group 3, that the workgroup assemble information on western and eastern Pacific pelagic fish stocks and produce a document with these data for key species for the 1994 workgroup meeting.

With respect to the relevant portions of the reports of Working Groups 5 and 6, the Committee makes no specific recommendations. The Committee supports any activity that improves the quality data and provides for communication of data among the PICES parties.

The FIS Committee reviewed proposed activities of the workgroup, and endorsed its scheduled meeting in August 1994 to review the assembled data and establish plans to carry out Pan-Pacific comparisons of life table differences and recruitment.

The FIS Committee recommends that the symposium "Recruitment Variability of Clupeoid Fishes and Mackerels" be the FIS sponsored symposium for the Third Annual Meeting of PICES. The FIS Committee further recommends that the Science Board consider the proposals for symposia and workshops recommended by Working Groups 5 and 6. The FIS Committee recommends that of these other proposals, the workshop on "PICES-GLOBEC Program for the North Pacific Ocean" be given highest priority. This is because of the limited time available to develop a joint PICES-GLOBEC program relative to the timing of the individual nation GLOBEC initiatives.

The Japanese delegation offered to sponsor a symposium related to the above symposium proposals, with the specific topic to be decided after the Science Board develops its recommendation for the program for the 1994 PICES Annual Meeting, which would be independent of PICES but held so that participants could attend the PICES meeting.

The FIS Committee recommends that PICES form a new Working Group or planning committee to develop an international PICES-GLOBEC program for the North Pacific Ocean. The FIS Committee reiterates its recommendation made at the first annual meeting, that PICES coordinate physical, biological and fisheries research surveys planned by different member countries in the PICES area of interest, and that a block of time be reserved at the Annual Meetings to facilitate this.

Scientific Papers

The following is a list of scientific papers from the FIS Committee supported part of the program.

Shifts in fish abundance and species dominance in coastal seas. Conveners: Prof. Qi-Sheng Tang (China) & Dr. Alec D. MacCall (U.S.A.)

V.I. Radchenko

Long-term variability in the Bering Sea surface geostrophic circulation and its possible influence on the pelagic fish community

Steven R. Hare

Quantifying the temporal and spatial aspects of climate change and its potential impact on marine fish populations

Hiroyuki Matsuda, Tokio Wada, Yasuhiro Takeuchi & Yoshiharu Matsumiya

- Effects of environmental fluctuation and interspecific competition on the species replacement pattern of pelagic fishes
Clifford L.K. Robinson & Daniel M. Ware
Trends in fish catch and ocean climate in southern British Columbia during the 20th century
- Scott G. Hinch, Michael C. Healey, Ron E. Diewert, Keith A. Thomson, Michael A. Henderson, Roy Hourston & Francis Juanes
Potential effects of climate change on adult Fraser River sockeye salmon
- David Welch, Yukimasa Ishida & Kazuya Nagasawa
Oceanographic controls on the distribution of Pacific salmon in the sub-arctic North Pacific, and the potential impact of 2xCO₂ climate change scenarios
- R.J. Beamish
Response of Pacific salmon and herring in the Strait of Georgia
- R. Ian Perry, N. Brent Hargreaves & Brenda J. Waddell
Juvenile salmon and plankton trophic interactions during early summer migrations on the B.C. continental shelf
- Jeremy S. Collie & Paul D. Spencer
Modelling shifts in fish stock abundance in the eastern North Pacific
- Keith A. Thomson, W. James Ingraham Jr., Michael C. Healey, Paul H. LeBlond, Ian D. Jardine, Cornelius Groot, Christopher G. Healey & Sonia M. Hanlon-Thomson
The influence of ocean currents on sockeye salmon returning to the Fraser River
- N. Brent Hargreaves
Interannual and decadal variation in abundance of Pacific hake and Pacific mackerel in Barkley Sound, B.C., and effects on mortality of juvenile salmon
- Shigeo Funakoshi & Hideaki Nakata & Motohiko Nakamura
Interactions between sardine and anchovy populations with special reference to the decadal changes in their life cycles: A case study in the Enshu-nada Sea, Japan
- Daniel Lluch-Belda
Fisheries and the regime problem
- Jeffrey J. Polovina
Physical and biological consequences of a climate event in the central North Pacific
- Takashige Sugimoto
Effect of climatic and oceanic events on long-term variations in pelagic fish populations focusing on Japanese sardine
- Kenneth Sherman
Variability and sustainability of biomass yields in large marine ecosystems
- Anne B. Hollowed
Decadal scale shifts in ocean conditions and their impact on the abundance of northeast Pacific fish stocks

REPORT OF MARINE ENVIRONMENTAL QUALITY COMMITTEE

The MEQ Scientific Committee met from 1300 to 1700 hrs. on Thursday, October 28, 1993, at the NOAA Sand Point facility in Seattle, Washington, USA. To maximize opportunities for the interdisciplinary exchanges of ideas and problem solving techniques, the meeting was held jointly with available members of PICES Working Group 2 (WG2: Development of Common Assessment Methodology for Marine Pollution).

Committee and Working Group members, observers and countries represented included: (* members of both MEQ and WG2 Scientific Committees)

Chair: Prof. J. Y. Zhou (China)

MEQ Scientific Committee Members:

Japan: * Dr. M. Watanabe
Mr. M. Kinoshita
* Dr. T. Hirano
China: * Prof. M. J. Zhou (replaced
Prof. H. T. Wang)
Canada: Mr. R. C. H. Wilson
U.S.A.: Prof. W. S. Reeburgh
* Dr. J. E. Stein (participated on
behalf of Dr. U. Varanasi)
Dr. C. M. Watson (Rapporteur)

Members of WG2:

Japan: * Dr. T. Hirano
Dr. T. Umezu
* Dr. M. Watanabe
China: * Prof. M. J. Zhou, Co-Chair
Canada: Dr. R. Addison, Co-Chair
U.S.A.: * Dr. J. E. Stein

Observers:

Ms. N. Lerner
Dr. F. B. Taub

Introductions:

The meeting began with Prof. J. Zhou extending a welcome, and asking all present in the

meeting room to briefly introduce themselves and their backgrounds and interests. The Chair then stressed that two very important tasks of this meeting would be: (1) to review the WG2 Report, and (2) to continue discussions of future MEQ agenda and focus. The Chair then briefly set forth a general outline of the various MEQ Business Meeting Agenda, and the meeting was called to order.

Review of 1992 MEQ Scientific Committee Meeting, Victoria, B.C., Canada:

Dr. Watson then provided a brief overview of the previous year's (and first annual) PICES MEQ meeting, held in Victoria on October 15, 1992. The meeting largely focused on the two tasks of:

- (a) Identifying common scientific problems, and
- (b) Recommending scientific sessions for the (current) Second Annual Meeting in Seattle.

The former task centered largely around discussions about the relationships between MEQ in the (more polluted and more researched) coastal regions of PICES countries, versus MEQ issues in the open ocean. It was suggested that PICES be encouraged to begin discussions to select suitable bio-indicator organisms for the North Pacific Ocean, and to develop a suite of chemicals and other phenomena of concern for the open ocean. For its second task, the Committee recommended that the Second Annual Meeting focus on the goal of

"The Development of Common Assessment Methodology for Marine Pollution in the North Pacific". Further, this topic would be divided into two subsets: (1) Algal blooms, and (2) Chemical and Biological Contaminants.

Dr. Watson emphasized that the issue of the coastal regions versus the open ocean remains the most challenging one before our Committee, and will necessarily play a major part in determining the focus of future discussions.

Review of the MEQ Scientific Papers Presented at the Second Annual Meeting: (see also Endnote 1)

Dr. Stein summarized the October 26, 1993 Seattle MEQ scientific sessions, which had been arranged and convened by Dr. Varanasi, and co-chaired by Drs. J. Davis (Canada), T. Hirano (Japan), M.J. Zhou (China) and C. M. Watson (U.S.A.). The technical session was extremely successful, and the invited papers were very appropriate to MEQ's scientific charge and goals. Presentations were made by scientists from all PICES countries, and covered a broad spectrum of highly pertinent issues; ranging from disposal of fish processing waste at sea and the introduction of exotic species, to storage and metabolism of chemical contaminants in marine fish and marine mammals and the atmospheric transport of chemical contaminants to Arctic environments. Transportation of contaminants was identified as an issue of major concern to the MEQ Scientific Committee. The presentations also identified a number of contaminants of concern to PICES countries, including: chemical contaminants, nutrients, radionuclides, marine debris, harmful algal blooms, and the introduction of exotic species via ballast waters.

The scientific sessions served to underscore the key theme that despite their

obvious differences, all of the PICES countries share many common similarities in terms of MEQ problems and the need for an integrated scientific approach. Mr. Wilson commented that we should not lose sight of the importance of atmospheric transport of contaminants as a common problem for all, as pointed out in the MEQ session's paper by Muir, et al regarding organochlorines in cetaceans from Canadian waters.

The MEQ Scientific Committee unanimously agreed that the scope and quality of the papers from the Second Annual Meeting fulfilled the goals set forth last year in Victoria as outlined above, and that they set the stage very appropriately for what should go forward in our future MEQ efforts.

Review of the Report of Working Group 2 (WG2):

(a) Background and Scope of WG2 Report:

Dr. Addison then provided a detailed overview of the WG2 Report. In preparing the report, the WG2 first invited background papers from each of the four PICES countries, which would then provide a series of broad introductory overviews of what are considered to be major MEQ issues and problems in each country, and summarizing their various approaches used in assessing MEQ. Following the two major terms of reference identified at the First Annual Meeting, these background papers were then used by the WG2 to develop general conclusions for future MEQ activities.

General conclusions from the four reports were that:

- (1) All four countries focus their marine pollution studies on coastal zones and continental shelves, rather than the "open ocean". This is because

not only do coastal zones serve as receiving waters, but also because they are the main areas of exploitation and productivity. Furthermore,

- (2) All four countries emphasize the distribution of "contaminants"; these are usually chemicals, but more recently the focus also include pathogens, harmful algal blooms, etc.

Questions arising from the four background papers included:

- (1) What are the contaminants?
- (2) What are their sources, pathways, and sinks? and
- (3) What are their impacts?

Mr. Wilson provided discussion as to how in actuality, the order of these three questions could easily be reversed, because society tends to care the most about "impacts" before it addresses the sources and causes of these impacts. PICES countries appear to be relatively comfortable with the first question, but the other two remain largely unanswered. Therefore, MEQ should focus more on the second and third questions. WG2 also recognized that chemical analysis is currently the area in which there has been the most research. Additional areas for suggested study include: (a) environmental quality objectives, and (b) the use of biomarkers to measure environmental effects of contaminants.

Dr. Addison went on with his summary to point out that China and Japan tend to be more concerned with chemicals which cause eutrophication, because of the relatively more shallow continental shelves along their Pacific borders. In

North America, on the other hand, higher priorities are given to chemicals we receive by "being downstream" from so many sources, atmospheric and otherwise.

- (b) Conclusions of WG2 Report:

Using this background information and guidance from the First Annual Meeting as a starting point, WG2 concluded that an important objective was to promote the harmonization of methods used in studying MEQ within the PICES area, including evaluation and comparison of methods. In turn, this would serve to facilitate the exchange of data among the participating countries and the development of comparative and cooperative activities to assess MEQ conditions across national boundaries and in the open ocean. Such harmonization can be conducted at three different levels: at the first level, (1) methods-based comparisons evaluate methods to determine whether the same techniques, procedures and equipment are being used. At the second level, (2) performance-based comparisons are made by analyzing identical environmental samples to assess how well results agree and within what levels of accuracy and precision it is valid to combine and compare results. At the third level, (3) assessment-based comparisons are made of the conclusions which result when the environmental conditions of an area are assessed using different methods. It was also concluded that in order to begin to achieve the goal of harmonization, data should begin to be exchanged among scientists from member countries.

- (c) WG2 Suggested Action Plan:

With these needs and objectives in mind, WG2 then sought to develop a

practical plan of action. This consisted of two key suggestions, which are the essential core of their recommendations: First, (1) MEQ should organize a symposium at the Third Annual Meeting (to be held at Nemuro, Hokkaido, Japan), dealing with how we can assess the question of the impact of contaminant stressors on marine ecosystem structure and function (MESAF). Such a symposium should explore the range of methodologies that could be used to assess and predict these ecosystem impacts. Secondly, (2) MEQ and WG2 should organize a collaborative, interdisciplinary workshop within the next two to three years, which would address problems of sources and transport of contaminants to the sub-Arctic North Pacific. Such a workshop should also encourage effects on biological systems, rather than just focusing on chemicals, biomarkers, and so forth. The workshop should be designed around a practical, "hands-on" approach in the use of methodologies for assessing sources, transport, and impacts of contaminants on MEQ.

The reasoning for the suggestion to conduct both a symposium and a workshop was based on the fact that it is both easier and necessary to set up a symposium for the more general question, which could be set up within the year and serve to generate ways to measure stressors. The workshop would require more time to organize. One of the underlying recurrent themes of the WG2 meeting was that we need to be able to look at pollutants not solely in terms of chemistry, but also in terms of their biological response and impact. The symposium is seen as a necessary step in clarifying and defining the work of the practical workshop.

(d) Discussion of Proposed WG2 Action Plan:

Elements and scientific focus of the proposed symposium and workshop were discussed heavily. Dr. Addison presented a visual paradigm, which compared studies at the population level to those of whole organisms and subcellular processes, in terms of their ecological relevance, sensitivity, specificity and timeliness. This served to highlight the parameters which are used to measure impacts at the ecosystem level, and to set the stage for discussion as to how to address basic MEQ questions by using biochemical indices, organismal and population levels, and community structure. In measuring impacts, one must first identify the question before choosing the level of study. For example, one could investigate subcellular biochemical impacts if the goal were to look for an "early warning system". On the other hand, studies of community structure would be more useful in understanding impacts of contaminant stressors "after the fact". Problems with this approach include accurately determining the structure of the community prior to the advent of the stressors involved. Also, examination of an ecosystem, species by species, will not necessarily allow one to understand a community structure and make predictions.

Mr. Wilson pointed out the need to sort out changes in ecosystems which are due to pollution, versus those changes which are not. A suggestion was made that Dalian Bay in China would be an ideal situation for convening the proposed workshop, because it provides a wide gradient of ecosystem pollution, ranging from severely impacted to near-"background" areas. Dr. Watanabe emphasized the importance of eutrophication. Although we all know

that reducing the input of nutrients into the ocean is very desirable, we remain unable to predict the effects of this at the ecosystem level. Dr. Hirano felt that such a workshop would be a good first step toward the development of cooperative studies among PICES nations. The Chair summarized the benefits from convening such a proposed MEQ Workshop, which include: (1) Getting appropriate scientists together to solve common problems, and (2) developing the best possible scientific solutions to these common problems.

Recommendations to the PICES Science Board:

The MEQ Committee reiterated its support for the WG2 report, and moved to submit it to the PICES Science Board for their consideration and implementation.

In addition the MEQ Committee strongly suggested that the Science Board select a Scientific Convener as soon as possible for the MEQ Sessions to be held in Nemuro, Japan in 1994.

Furthermore, due to the international nature and geographic vastness of the PICES area, there are obvious practical difficulties in assembling all members of MEQ and its various working group(s) in a convenient and reasonable meeting location. As a possible solution, and intersessional meeting in a mid-Pacific area such as Hawaii, was proposed as both geographically and financially practical.

Review of the North-West Pacific Action Plan (NOWPAP) and discussion on relationship and cooperation between PICES and NOWPAP:

The Chair briefly described NOWPAP, which is an Asian Pacific international effort sponsored by the United Nations Environment Programme (UNEP).

NOWPAP focuses on the North West Pacific Region; specifically, the Yellow Sea and Sea of Japan. Relevant countries in NOWPAP consist of: the Democratic People's Republic of Korea, Japan, the People's Republic of China, the Republic of Korea, and the Russian Federation. PICES has designated MEQ Scientific Committee Chair, Prof. J. Y. Zhou, to officially represent PICES at the upcoming NOWPAP meeting to be held in Bangkok on 10-12 November, 1993.

The Chair then entertained discussion and comment about the desired extent and nature of this proposed relationship with NOWPAP. Mr. Kinoshita pointed out the importance of PICES being aware of Japan's formal position with regard to NOWPAP, which is that the issue of Marine Resource Preservation be excluded from NOWPAP at this time. Dr. Reeburgh suggested that MEQ and PICES should seek to establish communication with and complement NOWPAP, providing whatever assistance we can. Following discussion around the table, the MEQ Committee unanimously welcomed the communication and participation of Prof. Zhou with NOWPAP, and is hopeful that our MEQ efforts will prove complementary and helpful to theirs in carrying out our many mutual interests.

Other Business:

Members of both committees briefly addressed the problem of not being able to prepare, receive and review the final WG2 Report until well into the Second Annual Meeting. In order to give both MEQ and WG2 more time to generate and to review such reports, it would be ideal to phase the two committees in a bimodal fashion. However, financing such an arrangement would clearly be more costly. For the time being, Dr. Addison suggested that we continue to hold the meetings in the same back-to-back arrangement.

Scientific Papers

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

Priority chemical and biological contaminants in the North Pacific ecosystem. Convener: Dr. Usha Varanasi (U.S.A.)

Bradley G. Stevens, Jan A. Haaga & Brian H. Himelbloom

Effects of seafood waste dumping on the microbial and megafaunal communities of an Alaskan bay

Takeshi Umezu

Oceanic distribution of 110m-Ag, 108m- and 60-Co estimated with squid hepatopancreas

John T. Landahl, Bruce McCain, Sin-Lam Chan, Donald W. Brown, Susan M. Pierce & Usha Varanasi

Trends in organic chemical contaminants in sediments and fish on the west coast of North America from

1984-1989: results from the National Benthic Surveillance Program

Edward D. Goldberg

Pollutants and contaminants in monitoring programs for the Asian Pacific waters

Jia-Yi Zhou & Ming-Jiang Zhou

Priority chemical and biological contaminants in the marine environment of China

D.C.G. Muir, C.A. Ford, M. Segstro, M. Simon, R.J. Norstrom & K. Langelier

Comparisons of PCBs and other organochlorines in cetaceans from Canadian waters: spatial and temporal trends and data gaps

Masaaki Kinoshita

Result of monitoring of adjacent sea of Japan in 1992

James Carlton

Transoceanic transport of biological contaminants: ballast water, exotic species and the role of ICES

Masataka Watanabe

Nutrient enrichment and dynamic response of element cycle in the marine ecosystem

Endnote 1:

Review of the MEQ Technical Sessions, October 26, 93

Dr. Bradley Stevens of the National Marine Fisheries Service, Kodiak, Alaska (USA), presented results of an initial study of the impact of disposal of fish processing waste in waters near Kodiak, Alaska. The conclusions of the study were that there were no major effects on megafaunal abundance or on water quality due to the dumping of nearshore fish processing wastes. Rapid decomposition of wastes prevented the buildup of waste, and the only significant difference between the dump site and the control site was a significantly higher microbial count in dump areas, which probably contributed to the residual decay of the waste.

Dr. Stevens concluded that there was no apparent effect on the benthos, but stipulated that his results could not be extrapolated to disposal in the open ocean. Waste at sea is not processed for disposal in the same manner as nearshore waste, and therefore it is not known whether disposal at sea poses any concern.

Dr. John Landahl, National Marine Fisheries Service, Seattle (USA), described efforts to determine trends over time in the levels of chemical contaminants in sediment and fish from sites along the U.S. West Coast. One conclusion of the Benthic Surveillance Program was that at least 4-5 years of data are needed for trends analysis. Several questions regarding time lags in the system

for persistent compounds, the role of offshore transport processes, and the land as a source of contaminants were raised, as well as difficulties in sorting out natural variations in the system. This presentation generated a good discussion, bringing out the need for long-term data sets to effectively determine trends. At the same time, the presentation generated discussion on the need to revise goals and incorporate new techniques as developed and validated that will improve our ability to address our ultimate goal: the effects of contaminants on biological systems.

Dr. Edward Goldberg, Marine Research Division of Scripps Institution of Oceanography in California (U.S.A.), provided a position paper on what he currently views as the most important issues related to marine environmental quality, and some insights on recent activities of an international mussel watch project. Dr. Goldberg described how we have historically only identified harmful contaminants through catastrophic events that resulted from the introduction of a contaminant into the environment, such as the effects of TBT and DDT on nontarget organisms, or the methyl mercury poisoning of Minamata Bay. Dr. Goldberg pointed out three contaminants of considerable future concern: namely nutrients, plastics, and radionuclides. These contaminants are also priority issues identified by other international organizations. All three contaminants were highlighted by speakers in other presentations in the session.

Prof. Ming-Jiang Zhou from the Chinese Academy of Sciences in Qingdao, and Prof. Jia-Yi Zhou of the Institute of Marine Environmental Protection in Dalian (China) emphasized that two key issues for China are nutrients, and their relationship to harmful algal blooms. Recently, human consumption of shellfish containing biotoxins and pathogens in China has led to serious human health consequences. Prof.

M.J. Zhou also effectively presented the knowledge gaps in methodologies for effectively monitoring harmful algal blooms and in generating information that would allow us to predict such events, including: criteria with which to judge eutrophication and the relationship between eutrophication and red tides; the taxonomy, mechanisms, and control of harmful algal blooms; monitoring of organic and pathogenic marine pollution; the bioavailability of heavy metals and organic compounds in the marine environment; sediment criteria (type, particle size, organic matter, biological assessment); and the relationship between coastal waters and the open sea in environmental quality issues.

Dr. Masataka Watanabe, National Institute for Environmental Studies (Japan), presented the results of mesocosm-studies designed to determine the processes and factors important in creating the proper environmental conditions for the formation of harmful algal blooms, which will lead to increased ability to predict their occurrences. Dr. Watanabe's studies employed a mesocosm (18 m. deep and 5 m. in diameter) that allowed for systematic vertical circulation in the surface layer. Nutrients were then added at different depths and a range of physical and biological parameters were measured. Dr. Watanabe's results clearly showed that controlled studies are very useful in identifying key parameters in order to effectively model abiotic and biotic changes resulting from nutrient enrichment.

Dr. Takeshi Umezu of the Environment Conservation Division of the National Research Institute of Fisheries Science (Japan), presented results of a study evaluating the squid as a biological monitor for the dispersion of radionuclides in the North Pacific. Dr. Umezu's studies highlighted two important topics concerning marine environmental quality in the PICES region: transboundary transport of

contaminants, and radionuclides as contaminants of concern.

Mr. Masaaki Kinoshita of the Office of Marine Pollution Control and Waste Management, Japan Environment Agency (Japan) presented a paper on the results of the monitoring in the Sea of Japan conducted by his Agency in 1992. These studies involved monitoring of chemical contaminants and marine debris, such as plastics, and assessed both spatial and temporal trends in the parameters measured. The results showed that some parameters (e.g. total organic carbon in seawater) were apparently declining in relation to decreased disposal of wastes at sea; however, Mr. Kinoshita's results also showed that on transects from disposal sites towards the open sea, plastics are being observed, at times at levels comparable to the levels near the disposal sites. These findings augmented those of other presenters suggesting that transboundary transport of both chemical and biological substances is an area of concern.

Dr. Derek Muir from the Dept. of Fisheries and Oceans at the Freshwater Institute in Winnipeg (Canada) presented work on chemical contaminants in the Arctic. Briefly, his data confirm other studies showing atmospheric transport of certain chemical contaminants to the Arctic, where they are then transferred through the food web to marine mammals. One unexpected finding was the presence of higher concentrations of an organochlorine contaminant in Arctic waters than in water from the lower latitudes. Dr. Muir's study also found that seals from the Arctic had higher concentrations of dioxin in their tissues than did seals nearer urban centers, where contamination of the environment is much higher. Dr. Muir's presentation clearly pointed to the importance of the issue of atmospheric transport in the PICES region, and demonstrates that identifying sources of

the contaminants is an important facet in gaining a better understanding of the scope of the issue of transboundary transport of chemical contaminants. He also identified several gaps in data, including the lack of temporal trend data in most species, the limited information on the biological effects of contaminants, the need to test additional biomarkers and test for immunocompetence, and the need for comparisons of biopsy and whole tissue samples for use in organochlorines and biomarker monitoring.

Dr. James Carlton from the Maritime Studies Program at Williams College (USA) addressed the issue of transboundary transport of biological contaminants. Dr. Carlton provided an excellent overview of the potential for introduction of exotic species to coastal areas through the exchange of ballast water and sediments. He noted that at any one moment there are 30,000 vessels and nearly 2,000 species in motion globally. The issue did not receive much attention recently until a catastrophe, the invasion of the zebra mussel into the Great lakes, which has brought about significant biological and economic damage. Dr. Carlton noted the need for further studies on the relationship between harmful algal blooms and ballast water and on the costs of prevention vs. removal and control of harmful species introductions, as well as the true cost of decades of invasions. He also emphasized that although transport of species has been going on for a long time, and although steps are being taken now to address the issue, we can still expect invasions to occur for the foreseeable future because it will take time to develop scientific data and accrue effective international policies, as well as to implement them.

The MEQ sessions presented a broad array of issues relating to marine environmental quality, demonstrating the challenge of finding a suite of endpoints and processes that can be studied by collaborators from

widely diverse fields, and that PICES can serve as a mechanism to address these problems. One of the first steps needs to be exploring possible routes of biological and physical transport of contaminants to and throughout the North Pacific. Investigations of the distribution and transport of contaminants between marine ecosystems, from nearshore to offshore, and from one country's coastline to another country's coastline, will help us to address our ultimate goal: increasing our understanding of the processes so that the

magnitude of the impact of contaminants on biological systems in the marine environment can be determined.

The convener of the MEQ session, Dr. Usha Varanasi, felt it was also important to note that a key issue in marine environmental quality is marine debris (such as plastics). Presentations for this important topic were not sought for this meeting, because there will be an International Meeting on Marine Debris in Miami, Florida, in May, 1994.

REPORT OF PHYSICAL OCEANOGRAPHY AND CLIMATE COMMITTEE

The PICES Physical Oceanography and Climate Committee held two meetings during the PICES Second Annual Meeting. Both were chaired by Dr. Yutaka Nagata, the POC Committee Chairman. Dr. John Garrett served as rapporteur.

1. Joint Meeting of PICES Physical Oceanography and Climate Committee and Working Group-1: The Okhotsk Sea and Oyashio Region, October 26

The Working Group presented its report, which contains three main sections:

- a series of recommendations for international cooperation in the Okhotsk Sea and Kuril region,
- a review of previous work in the sea ice and physical oceanography of the Okhotsk Sea and Oyashio region,
- a lengthy bibliography (more than 500 citations) on the physics of the Oyashio region and the Okhotsk Sea.

The Working Group identified lack of input from Russian scientists as a major deficiency in the report and bibliography.

The Joint Meeting reviewed and discussed the principal recommendations of the report.

The first Working Group recommendation is that PICES should encourage the organization of a meeting on the Sea of Okhotsk and Kuril region in Vladivostok sometime in the near future, with discussions of physical oceanography, fisheries and data exchange. One major purpose of this meeting would be to facilitate the incorporation of Russian information in the review of past work and in the bibliography.

The Joint Meeting was told that the Russian laboratories in Vladivostok were prepared to organize such a meeting in September 1994.

The ensuing discussion suggested that:

- care should be taken to ensure that the main Russian institutes were represented,
- 3 to 5 days should be allowed for the meeting,
- foreign participants would be prepared to pay a reasonable registration fee to defray some of the local costs,
- about 20 foreign physical oceanographers might be expected to attend,
- there was interest in broadening the meeting to include some aspects of the Sea of Japan, which might provide increased access to Russian funding.

In view of the importance of Russian contributions to the understanding of the region, the Physical Oceanography Committee recommends that PICES endorse the workshop. It also recommends that PICES consider taking a more active role in the workshop depending on the status of Russian membership in PICES and providing suitable administrative arrangements can be found.

The Joint Meeting next considered a group of Working Group recommendations related to data exchange:

- Full efforts should be made to facilitate incorporation of unclassified Russian hydrographic, sea level and sea ice measurements into the appropriate international databases, and to identify

datasets which are not archived in WDCB which should be part of the international archive,

-Efforts should be made to ensure that all special (non-routine) Japanese hydrographic and current (ADCP and current meter) data sets in the Okhotsk Sea are archived in the appropriate international databases,

-CTD data collected in the Okhotsk Sea, Kuril region and along major routine network lines in the Mixed Water Region should be archived in high density form (1-2 decibars or meters) as well as at standard depths.

A number of points were raised during the discussion:

-there are large amounts of Russian data, so that archiving it is not a small task,

-a monograph on Russian data from the Okhotsk Sea is in preparation,

-some efforts are already being made to acquire Russian data for incorporation in WDCA, which could benefit from an indication of PICES support,

-INPOC data should also be archived in the international archives: it is assumed that Canada will do this,

-CTD profiles using only standard depths do not provide adequate vertical resolution to describe the complex interactions between water masses in this area,

-national oceanographic data centres may not be prepared to accept high density CTD profiles,

-a core group of scientists is needed to identify the important CTD data.

The Physical Oceanography Committee agreed to draft a letter indicating the great importance it attaches to ensuring that Russian hydrographic data from the area are archived in World Data Center A.

The Physical Oceanography Committee also recommends establishment of a focussed task group of interested scientists to assemble a data set of high density CTD profiles in the area of interest.

The third group of Working Group recommendations related to high priority topics for international cooperation:

International cooperation should be sought for observations relating to ventilation of the North Pacific and the exchange of Okhotsk Sea waters with the North Pacific. The greatest deficiencies are in quantitative estimates of all processes: rates, transports, variability and budgets. Recommended projects and studies for the Okhotsk Sea are:

-linkage of Japanese and Russian geodetic networks (tide gauge levelling),

-sea ice formation, dense shelf water formation in the northwestern Okhotsk Sea, and the polynya over Kashevarov Bank,

-Kuril straits exchange and mixing,

-Soya Current volume, fresh water and heat transports; how the Soya current leaves the shelf,

-influence of mesoscale eddies in the southern Okhotsk Sea on water structure and dynamics, including mixing of saline Soya Current water.

Recommended projects and studies for the Oyashio region are:

-Oyashio transport monitoring,

-transformation of waters in the Oyashio/East Kamchatka Current region, including the role of large anticyclonic eddies,

-NPIW formation in the Mixed Water Region.

International cooperation should be sought for exchange of SST and sea ice observations and for technical improvements to Russian sea ice analysis and forecasting capabilities.

Discussion of these recommendations included the following important points:

- international scientific cooperation is inhibited by some current national policies restricting port calls by scientific vessels and foreign scientific observations within EEZs. In some cases the rules applied to scientific vessels appear to be inconsistent with those applied to commercial, fishing or military ships,
- the list in the recommendations only covers topics within the mandate of Working Group 1.

The Physical Oceanography Committee decided to recommend that PICES recognize as scientific priorities the topics listed and that PICES encourage member countries to develop projects responding to these priorities.

The Physical Oceanography Committee congratulated the Working Group on its success in producing such a comprehensive and thorough report and for developing well thought out recommendations. The POC enthusiastically accepted the report, recognizing that additional material reviewing Russian information would be forthcoming within the next year.

The Working Group will revise the report to reflect editorial comments received since the completion of the draft.

PICES is requested to arrange for the publication of the Working Group report and the eventual Russian addendum. The objective should be to ensure wide and permanent availability of the material,

especially the bibliography. Three options were identified:

- PICES provide secretarial assistance and page costs to publish a substantially complete version of the report and bibliography in a series such as Progress in Oceanography,
- PICES publish the report under PICES covers and assist preparation of a shortened version for publication in the primary literature,
- PICES assist in the preparation of a manuscript for publication as a book by a commercial publisher.

It was felt that the first option would best achieve the objectives of wide distribution and permanent availability.

2. Physical Oceanography and Climate Committee, October 28

A list of those participating in this meeting is attached as Endnote 1.

2.1 Working Groups

The nature and role of working groups was discussed. The points raised included the following:

- working groups are an extremely important tool to achieve the objectives of PICES,
- the cost of travel may limit participation in working groups, so that working groups should be well justified,
- working groups should be well focussed,
- if possible, working group reports should be circulated before the PICES annual meeting so that committee members would have time to consider national responses. This includes the reports of multi-committee Working Groups, which should be circulated to the members of all of the committees concerned,

-Working Groups may wish to meet during PICES annual general meetings but they should not be constrained to do this as there may be more effective ways to complete their tasks, such as correspondence and meetings in conjunction with other activities which bring the members together.

Three proposals for new working groups were considered:

- Modelling of the Subarctic North Pacific Circulation
- Subarctic Pacific Sediment Trap Study
- Monitoring of the North Pacific

The Committee agreed to recommend the formation of a Working Group on Modelling of the Subarctic North Pacific Circulation. The proposed terms of reference are included in Endnote 2. The following points were raised during consideration of the proposal:

- the availability of the WOCE data set makes this timely,
- there is a need to improve the representation in global models of the subarctic North Pacific,
- there is both a need for better models of the subarctic region and the potential for significant advances,
- special attention needs to be paid to the representation of air-sea interactions and marginal seas,
- the reliability of models of the biological system, chemical components and material transport depends on the availability of reliable physical models.

After considerable discussion it was agreed that the Sediment Trap Study would be covered by the broader Monitoring proposal. This does not preclude the formation of a group of interested scientists for joint planning and coordination of sediment trap work. The Physical Oceanography Committee would encourage such coordination, and would also like to bring

this activity to the attention of the biological community as the data collected are fundamentally multidisciplinary.

The Committee also agreed to recommend the formation of a Working Group on Monitoring of the North Pacific. The proposed terms of reference are attached as Endnote 3. Some of the points raised during the discussion included:

- the timeliness of this proposal, which should provide a means to ensure that PICES concerns are well expressed during the planning of the Global Ocean Observing System,
- several PICES member countries are planning contributions to GOOS,
- PICES may wish to expand the terms of reference to include biological and chemical monitoring. Careful thought should be given to maintaining the focus of the group.

The Committee was divided on the relative priority of the two proposed Working Groups. Both are important and timely. The Modelling Working Group has the potential to have significant impact on the progress of research, has a reasonable prospect of completing its task within a year, and is not duplicated elsewhere. The Monitoring working group has the potential to have an impact on the development of long term observing systems and data collection and can help ensure that the needs of PICES are adequately represented in national and international planning during the period of transition from WOCE and TOGA to longer term observing systems. It may not be able to complete its task within a year.

The Committee suggested that Dr. Paul LeBlond of Canada might be asked to chair the Working Group on Modelling, and that either Dr. Klaus Wyrтки of the USA or Dr. R.W. Stewart of Canada be asked to chair the Working Group on Monitoring.

2.2 Ongoing Programs

The International North Pacific Ocean Climate (INPOC) Study has been very successful in focusing the efforts of Canadian, Russian and US scientists on the study of the subarctic North Pacific. The Physical Oceanography Committee requested PICES to provide a letter to the Russian Ministry of Science asking that INPOC be granted official status in the Russian government program, Complex Investigations of Oceans, Seas, Arctic and Antarctic. If possible this letter should be provided to Dr. Yurasov before November 7.

2.3 Theme of POC Session in the PICES Third Annual Meeting Symposium

The Committee recommended that a one-day session be held on the topic of "Physical Processes and Modelling of the Subarctic North Pacific and its Marginal Seas". Dr. Y. Nagata agreed to act as convener provided someone from North America could be found to serve as co-convener.

The Committee also recommended a second one-day session on the topic of Monitoring of the Large Scale Variability of the North Pacific. Dr. Y. Sugimori agreed to act as convener for this session, but requested the assistance of at least one co-convener from North America.

Scientific Papers

The following is a list of scientific papers from the POC Committee supported part of the program.

Ocean circulation and climate variability in the subarctic Pacific. Conveners: Prof. Paul H. LeBlond (Canada), Dr. James D.

Overland and Prof. Stephen C. Riser (U.S.A.)

C.C. Ebbesmeyer & W. Tangborn
Columbia River reservoir operations related to northeast Pacific Sea surface salinity trends, 1930-1990

Greg Holloway & Michael Eby
Dynamics of circulation in the North Pacific

Toshihiro Kono & Yasuhiro Kawasaki
Formation process of Oyashio Water

Y. Nagata
Possible formation mechanisms of the North Pacific Intermediate Water in the western North Pacific

H. Onishi & K. Ohtani
Zonal transport estimation from geostrophic flow in the North Pacific subarctic gyre

R.K. Reed
Variability of circulation in the western subarctic gyre, 1990-1992

Thomas C. Royer
Time series measurements in the northern North Pacific

Lynne D. Talley & Yutaka Nagata
On North Pacific Intermediate Water formation

Mark J. Warner, John L. Bullister, Richard H. Gammon & David Wisegarver
Distributions of the anthropogenic chlorofluorocarbons F-11 and F-12 in the North Pacific Ocean: 1985-89

C.S. Wong
Processes in the subarctic Pacific Ocean affecting the uptake and transport of CO₂

Man-Li Wu, Ming-Yu Zhou & J. Sunsking
Fresh water balance in the Northern Pacific

Liu-Sen Xie & William W. Hsieh
Global upwelling -- interannual variability and climate change

Endnote 1:

Participants in October 28 POC Committee Meeting

Y. Nagata, Japan, Chairman

A. Bychkov, Russia
J. Garrett, Canada
A. Harashima, Japan
I. Il'ychev, Russia
M. Kashiwai, Japan
P. LeBlond, Canada
D.R. McLain, USA

M. Miyake, Canada
D. Musgrave, USA
S. Riser, USA
T. Royer, USA
Y. Sugimori, Japan
G. Yurasov, Russia
C.S. Wong, Canada
M. Zhou, China

Endnote 2:

**Working Group on Modelling of the Subarctic North Pacific Circulation
Terms of Reference**

Although the subarctic oceans play an important role in the Earth's climate system as a region where strong air-sea interactions occur and active ventilation of the oceans takes place, the present state of modelling of the subarctic oceans is not satisfactory even with respect to the physics. This is one of the most important unresolved questions for constructing an accurate climate forecasting system. In view of the importance of modelling of the North Pacific Circulation for the global climate forecast, the Working Group will:

-Review the status of present physical modelling efforts on the subarctic North Pacific circulation and identify the gaps and problem areas,

-Identify the kinds of observations and other information needed to improve circulation models,
-Identify what kinds of knowledge of the related physical processes and of local ocean dynamics (such as in marginal seas) are needed to improve the circulation models,
-Identify how the incompleteness of the present physical model of the subarctic North Pacific influences other modelling efforts such as the global climate, ecosystems, material transport, etc.

A focus on physical aspects of modelling will be maintained.

Endnote 3:

**Working Group on Monitoring North Pacific Ocean Variability
Terms of Reference**

There is ample evidence that large scale variability in ocean conditions affects fish stocks on interannual and decadal time scales, even in coastal waters. There is also concern regarding the detection of trends in response to human activities, e.g. emission of greenhouse gasses.

International recognition that systematic long term oceanic observations are essential has resulted in the initiation of planning for a Global Ocean Observing System. Sustained monitoring over the necessary long periods will be impossible unless there is an acceptable balance

between cost and benefit from the observations. Careful consideration must be given to the type, number and location of observations and to the development of simple, robust and automated techniques.

The Working Group is to:

- identify the key physical and chemical parameters for the North Pacific, on the basis of their value as indicators of large scale ocean conditions and circulation, on the basis of the best present understanding of their role in biological processes, and on the basis of their potential for improving the quality of model forecasts,

- review the measurement accuracy and time and space resolution required to obtain useful observations of changes in these key parameters,

- review current and planned national and international monitoring programs,

- review current technology for measuring the key parameters with respect to its ability to meet the needs for accuracy and time and space resolution,

- estimate the costs of meeting these needs using current technology,

- advise on priorities for development of techniques,

- advise on priorities and strategy for implementation of a monitoring program in the North Pacific.

REPORT OF THE FINANCE AND ADMINISTRATION COMMITTEE

The Committee met in the afternoon of the 26th and the morning of the 27th of October, 1993, under the Chairmanship of J.C. Davis. Participants at the meeting were:

Canada	C.C. Graham
China	G. Wu S.P. Chen L.Z. Chen
Japan	Y. Yamada H. Hatanaka
U.S.A.	W.L. Sullivan, Jr. W. Aron A. Somma F.H. Beaudry

The Chairman of PICES, Dr. W.S. Wooster, and the Executive Secretary, Dr. W.D. McKone also participated.

Agenda Item 1. Opening by the Chairman:

The Chairman called the meeting to order and welcomed participants. It was agreed that a second session of the Committee would be convened in the morning of October 27th if the opening session failed to complete all the business at hand. (Subsequently, it was agreed to hold a second session on the 27th to complete Committee business).

Agenda Item 2. Adoption of Agenda:

The agenda was adopted as proposed with the addition of four items under "Other Business". These were "Establishment of Foreign Currency Account", "Bonding and Insurance", a "Proposal Expected from

APEC" and the "Expiry of Temporary or Transition Rules and Regulations, March 1992".

Agenda Item 3. Implementation of Headquarters Agreement:

This item, which was previously discussed briefly at the Opening Session of Governing Council was reported upon by Canada. An additional Order in Council is required to bring the Agreement into force and allow PICES to become exempt from paying sales tax and income taxes for foreign nationals working for the Secretariat. Canada has taken steps to have processing of the Order in Council expedited. A second Order in Council is required from Revenue Canada to set the date to make retroactive deductions possible as of January 8th, 1993. It is hoped that the Order will be in place by December of 1993. Once in place, refunds accruing to the credit of the organization can be applied for. In response to questions, the Executive Secretary reported that with the necessary Order in Council in place, PICES can recover GST, import tax paid on goods and also the income tax paid by the Assistant Executive Secretary. In keeping with the practice of other international organizations, the income tax paid by foreign nationals working for the organization can be retained as a levy to the credit of the organization.

Agenda Item 4. Staff Rules:

The Executive Secretary reported that Staff Rules were circulated to Contracting Parties with a request for comments. No written comments were received. The Committee discussed the Staff Rules and agreed to make several amendments as follows:

Staff Rule 6 (Duties, Obligations and Privileges):

Amend staff rule 6(a) to read:

"(a) Staff members of the Secretariat, upon assuming their responsibilities as employees of the Organization, shall discharge their duties faithfully and conduct themselves in its best interest."

Amend last line of staff rule 6(b) to read:

"They shall avoid any actions, statements and public activities which might be detrimental or harmful to the Organization and its aims, or to the Contracting Parties."

Staff Rule 13 (Recruiting and Appointment):

Amend the first line of staff rule 13 to read:

"Staff shall be appointed by the Executive Secretary in accordance with Article VIII of the Convention, subject to a probationary period of one year."

The revised Staff Rules were approved as amended.

The Committee also discussed the policy for recruiting staff from nations representing the Parties to the Convention and agreed that, for the senior positions in the Secretariat, it was desirable to recruit staff from as wide a representation of the Parties as possible. Members of the Committee wished to bring this matter to the attention of the Governing Council for future consideration should additional staff be recruited.

With the above-mentioned changes, the Committee recommends the amended staff rules for adoption by Governing Council during the Second Annual Meeting.

Agenda Item 5. Reporting Proceedings of Meetings, Reporting and Approval Procedures:

The Chairman introduced this item, explaining the intent was to review reporting procedures for meetings, including the nature of reports and the approval procedures for proceedings. There was consensus that minutes of the Governing Council meetings should be circulated to the Parties for review and approval as promptly as possible following the Annual Meeting. The Secretariat would request comments and approval by the Parties within 30 days of transmittal of the draft minutes. Once approved, the minutes could be published in final form as a portion of the Annual Report. The Committee recommends this procedure to Governing Council for approval.

There was considerable discussion of the need for some sort of summary report or press release to be prepared for approval and distribution at the conclusion of each Annual Meeting. This was deemed important from the standpoint of summarizing highlights of the meeting and could be used for the information of the public, observers, press or any groups or individuals interested in PICES. The difficulties of producing a detailed report or summary of the final session of Governing Council were recognized but there was agreement that some sort of brief summary document was both feasible and desirable. The Committee agreed to try to produce such a document at the Second Annual Meeting. Dr. Davis, working with representatives of the Parties, and the Chairmen of the Science Board and various Committees, agreed to coordinate preparation of such a draft for Council consideration.

Agenda Item 6. Space, Facilities and Equipment:

The Executive Secretary reported that PICES office space has been increased at the Institute of Ocean Sciences to give Dr. Miyata an office and provide sufficient space to allow for small meetings in Dr. McKone's office. Discussions were underway to find suitable storage and library space. The Executive Secretary thanked Canada for providing the modifications and said that the Secretariat was pleased with the alterations. Canada pointed out that the space now exceeds the area originally agreed to be supplied for the Organization. Structural modifications were paid for by Canada with the Organization assuming some of the cost for wiring, telephone and computer connections.

With regard to equipment, the Executive Secretary reported that some new equipment (computers) and furnishings have been acquired and that some items are still needed. Additional connections to the Institute computer and to communications networks have been acquired to improve communication capabilities.

Agenda Item 7. Auditor's Report, 1992:

The Auditor's Report was reviewed by the Committee and recommended for adoption by Governing Council at the Second Annual Meeting. Given that this was PICES first year of experience with the company Flader and Greene of Sidney, B.C., and the fact that the Executive Secretary was satisfied with the services of this firm, the Committee agreed to recommend to Governing Council, retention of Flader and Greene as auditors for a second year. (Endnote 1)

Agenda Item 8. Working Capital Fund:

The status of funds in the Working Capital Fund was reviewed by the Executive

Secretary and discussed by the Committee. There was discussion of setting a limit of \$100,000.00 as the maximum for the Working Capital Fund. After considerable discussion it was agreed that it was best to defer consideration of a maximum level for the working capital fund, given the uncertainty of the responsibilities and scope of the PICES Organization and its potential involvement in costly items such as data archiving and processing.

Agenda Item 9. Administrative and Financial Statements for 1993 (to October 15 and estimated to December 31):

Administrative and financial statements for 1993 were reviewed by the Committee in preparation for consideration of the budget. Those statements are attached for information purposes.

Agenda Item 10. Budget for Fiscal Year 1994:

The Budget proposal for the 1994 fiscal year was presented by the Executive Secretary and discussed by the Committee.

Japan inquired as to whether there could be provision in the budget for paying the costs for bringing scientists from various countries, such as Russia, to PICES meetings. China proposed consideration of a special "trust fund" that could be used to fund travel for scientists to PICES meetings and suggested that PICES internal funds should not be used for such a purpose. Review of the Financial Regulations indicated that PICES has the ability to establish such a fund. Both China and the USA were opposed to using funds appropriated by the Parties for PICES to support such travel. A small working group composed of representatives from China and the United States was struck to investigate the matter of establishing a trust

fund and provide a proposal for consideration by the Organization.

Salaries of staff were discussed by the Committee. Details of these discussions and recommendations are provided in an Annex available to Contracting Parties.

In response to questions raised regarding components of the proposed 1994 budget circulated prior to the meeting, the Executive Secretary presented details of specific anticipated expenditures for travel, the 1994 Annual Meeting and for contractual services. Following discussion, it was agreed to reduce the proposed budget appropriations for travel, contractual services and the Annual Meeting to bring the overall budget down to \$440,000 CDN.

With regards to appropriations from the Parties, a budget totaling \$440,000 requires \$110,000 as a contribution from each of the Parties. In order to reduce the appropriation to a level more consistent with that in the previous budget cycle, the Committee recommends removing \$80,000 from the Working Capital Fund. This will reduce the contribution from each of the Parties to \$90,000.00 CDN. - i.e. an increase in contribution of \$2000 from each of the Parties over the 1993 level. (Endnote 2)

Committee members stressed that the precise functional responsibilities of the Organization are not yet firmly established. For example, the Organization may have to deal with the handling and processing of large amounts of data, large databases and other complexities which may necessitate growth of the staff and acquisition of special equipment, increased travel and meeting costs, and other uncertainties. Accordingly, some members were concerned that existing budget levels may not, in the future, allow for such increased responsibilities.

The practical problems of meeting scheduling, location and expenses

associated with the cost of Working Group and Annual Meetings were discussed. From the Secretariat's standpoint, more precise budget estimates would be possible if some certainty as to the location of the Annual Meeting and what costs would be covered by the host country were available 2-3 years in advance. In addition, the problems of cost and travel approval difficulties were of considerable concern to the Parties with regard to activities of the Working Groups. If Working Groups meet during the year at times and locations not corresponding to the Annual Meeting additional costs are incurred. All Parties support attempts to organize Working Groups and Annual Meetings in as cost effective a fashion as possible. Many international organizations have scientific sessions prior to formal Annual Meetings and use this procedure to keep costs down. The Committee recommends that Governing Council discuss this matter and seek input from the Science Board on the topic.

Agenda Item 11. Forecast Budget for Fiscal Year 1995:

A revised forecast budget for fiscal year 1995 was presented by the Executive Secretary and reviewed by the Committee. It was agreed to propose a budget totaling \$484,000 for consideration by Council. Such a budget would represent the growing role of the Organization, but considerable uncertainty still exists as to the actual functional responsibilities of the Organization. Members felt that costs could increase significantly in future years as responsibilities expand.

Agenda Item 12. Other Business:

The Committee reviewed the matter of establishing foreign currency accounts to reduce bank charges and exchange expenses for meetings held in countries other than the seat of the Organization. The

merits of establishing an account in the Country where the Annual Meeting is to take place in a given year and having the host country place part of its appropriation, as a credit to PICES, in an account in that country was discussed. Costs associated with the local expenses of the Annual meeting could be provided for in such an account and credited to the host country as part of its appropriation. Members agreed to explore this concept and report back to the Executive Secretary by Correspondence. The Executive Secretary was asked to explore the merits of setting up foreign exchange accounts in various currencies in Canada and provide a paper assessing the possibilities and potential savings to the Organization and report back to the Contracting Parties through correspondence.

The Executive Secretary reported difficulties he is having with bonding Secretariat employees and with signing arrangements for cheques. If employees are to be bonded all three Secretariat employees must be given signing authority and the Executive Secretary is concerned about liability without direct control. The Committee asked the Executive Secretary to discuss this matter with the Auditor and also explore the arrangement and costs associated with bonding incurred by other international organizations. The Contracting Parties will consider the matter further upon receipt of this information.

The Committee was informed by the US representative, Mr. Sullivan, of a proposal from the Asia Pacific Economic Cooperation (APEC) Working Group on Marine

Resource Conservation which may be submitted to PICES. The Working Group proposes to ask PICES to enter into a USD\$5,000 contract to collect information on organizations active in the Pacific, their principal officers, and their objectives and current and planned activities. The Marine Resource Conservation Working Group is proposing this contract in relation to its UNCED Agenda 21 follow-up (Ocean Chapter) Proposal which has the objective of establishing a network amongst APEC and other organizations, developing collaborative programs and planning objectives and avoiding costly duplication of effort between organizations. The committee recommends approval of this contract by Council.

With respect to expiry of the temporary transition rules and regulations, dated March 92, the Committee noted that the amount called for in Financial Regulation 9(iv)(2), above which the Executive Secretary shall solicit written proposals for things the Secretariat desires to purchase, is only provided for in rules which expire on October 30, 1993 at the end of the Second Annual Meeting. The Committee recommends that the Governing Council agree to continue that amount at \$6000 as stated in the March 3, 1992 document until such time in the future as the Council determines it should be changed.

Adjournment:

The Committee recommends this report and its contents for approval by Governing Council. The meeting was adjourned at 1200 hrs, Wednesday, October 27th, 1993.

Endnote 1:

Auditor's Report To The Organization

Flader and Greene
Chartered Accountants
9768 Third Street,
Sidney B.C.
V8L 3A4

We have audited the statement of assets and liabilities of the North Pacific Marine Science Organization as of December 31, 1992 and the statements of income and expenditures and changes in funds and changes in cash for the period then ended. These financial statements are the responsibility of the Executive Secretary. Our responsibility is to express an opinion on these financial statements based on our audit.

Our audit was conducted in accordance with general accepted auditing standards. Those standards require that we plan and perform an audit to obtain 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 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, 1992 and the results of its operations and the changes in its cash position for the period then ended in accordance with generally accepted accounting principles described in Note 1 to the financial statements.

Sidney, B.C. Canada
February 9, 1993

Flader and Greene
Chartered Accountants

**Statement of Assets and Liabilities
December 31, 1992**

ASSETS

Current Assets

Cash and term deposits	\$337,702
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LIABILITIES AND FUND BALANCE

Current Liabilities

Accounts payable	\$3,053
Contributions received in advance from Contracting Parties	<u>\$118,240</u>

\$121,293

Fund Balances

General Fund	\$64,000
Working Capital Fund	<u>\$152,409</u>

\$216,409

\$337,702

**Statement of Income and Expenditures and Change in Funds
for the Nine Months Ending December 31, 1992**

	General Fund	Working Capital Fund	Total
Income			
Contributions from Contracting Parties	\$352,000		\$352,000
Interest earned	6,311	962	7,237
	<u>358,311</u>	<u>962</u>	<u>359,237</u>
Expenditures			
Personnel Services	52,687		52,687
Travel	12,917		12,917
Communication	4,174		4,174
Contractual Services	2,300		2,300
Printing	3,418		3,418
Rental			
Supplies	2,440		2,440
Equipment - note 2	31,944		31,944
Annual Meeting	31,729		31,729
Relocation			
Miscellaneous	2,440		2,440
	<u>142,828</u>		<u>142,828</u>
Excess of Income Over Expenditures	215,483	962	216,409
Transfers			
Budgeted	(25,000)	25,000	
Excess	(126,483)	126,483	
Balance (end of period)	\$64,000	\$152,409	\$216,409

**Statement of Change in Cash for the Nine
Months Ended December 31,1992**

Source of Cash

Contributions from Contracting Parties	\$470,240
Interest	7,237
	<hr/>
	477,477

Use of Cash

Personnel Services	50,373
Travel	12,917
Communication	4,142
Contractual Services	2,300
Printing	3,418
Rental	
Supplies	1,734
Equipment	31,944
Annual Meeting	31,729
Relocation	
Miscellaneous	1,218
	<hr/>
	139,775
Cash Balance (end of period)	\$337,702

**Notes to Financial Statements
December 31, 1992**

1. Accounting Policies

The financial statements are prepared in accordance with the North Pacific Marine Science Organization 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 Contracting Parties over expenditures. The purposes of the General Fund and Working Capital Fund are established by Regulation 6 of the Organization's Financial Regulations.

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

2. Equipment

At December 31, 1992, capital assets on hand and their original purchase price are as follows:

Furniture and fixtures	\$14,459
Computer equipment	17,485
	<hr/>
	\$31,944

The assets were expensed in the year.

Endnote 2:**Budget for Fiscal Year 1994**

Source	Contribution
Contributions from four Contracting Parties	360,000
Transferred from Working Capital Fund	80,000
Total	440,000

Category	Allotment
Personnel Services	237,000
Travel	43,000
Communication	17,000
Contractual Services	12,000
Printing	30,000
Rental	3,000
Supplies	10,000
Equipment	15,000
Annual Meeting	53,000
Relocation	16,000
Miscellaneous	4,000
Total	440,000

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Vice-Chairman: Mr. C.M. Liu

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