

AGENDA

FIFTH ANNUAL MEETING

October 11 - 20, 1996

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Opening Session

1. Address of welcome was given by Ted McWhinney Member of Parliament for Vancouver Quadra and Parliamentary Secretary to the Minister of Fisheries and Oceans.
2. Remarks by representatives of contracting parties.
3. Remarks by the Chairman.
4. Announcements.
5. Keynote lecture by Prof. Timothy R. Parsons. *Taking Stock of Biological Studies in the Ocean.*

Governing Council

1. Preliminary report on administration.
2. Relations with other international organizations and observers from such organizations.
3. Membership and observers from other countries.
4. Election of Chairman.
5. Appointment of Executive Secretary.
6. Rule change to allow past Chairman to serve as an ex officio participant of Council.
7. Report of Finance and Administration Committee.
 - a) Audited accounts for financial year 1995
 - b) Estimated accounts for financial year 1996
 - c) Budget for financial year 1997
 - d) Forecast budget for financial year 1998
 - e) Trust Fund
 - f) Working Capital Fund
 - g) Home Leave Relocation Fund
 - h) Other funds held
 - i) Appointment of Finance and Administration Committee Chairman
8. Report and recommendations of Science Board.
9. PICES Perspectives.

10. Future meetings of the Organization and subsidiary bodies, including time and place for the 7th and 8th Annual Meetings.

11. Any other business.

Access for cooperative research.

REPORT OF OPENING SESSION

83

80

The meeting of October 14 was called to order by the Chairman, Dr. Warren S. Wooster, who welcomed all delegates, observers and researchers to the Fifth Annual Meeting. Dr. Wooster called on Mr. Ted McWhinney, Member of Parliament for Vancouver Quadra, Parliamentary Secretary to the Minister of Fisheries and Oceans, to make a statement on behalf of the Canadian Government.

It is a pleasure to convey to the 200 marine scientists here assembled from the member countries of this Organization - China, Japan, Russia, South Korea, and the United States and Canada - greetings from the Prime Minister of Canada, Jean Chretien and also our Minister of Fisheries and Oceans, Admiral Fred Mifflin. The fact that the inaugural meeting of this Organization, in 1992, was held in Victoria, B.C., and that Canada, as host country, is now receiving this follow-up Annual Meeting in Nanaimo, B.C., testifies to the Canadian Government's awareness of Canada's new historical role as a Pacific Rim country, and also to the importance that Canada assigns to relations with our neighbour countries who share a Pacific littoral: relations that extend not merely to trade and commerce but that also include cultural and academic-scientific exchanges and the acceptance of a common responsibility for the safeguarding of the natural resources of our common Pacific region, with the oceans and the abundant fisheries ranking at the top of these conservation imperatives.

Canada, as a country that shares three oceans, - the Atlantic, the Pacific, and the Arctic - has always been a leader in the movement to "internationalize" the duty of protection of the oceans and ocean fisheries resources, the more so because our special relation with the Arctic has made us sensitive to its delicate ecosystem and the need for extra vigilance in its behalf. In 1970, we enacted, through our national Parliament, an Arctic Waters Pollution Control

Act that was avant-garde in international law terms. Though it drew upon the Conservation protocols attached to the proceedings of the Second United Nations Conference on the Law of the Sea (1958-1960), it broke new ground in its assertion of a municipal (national) law power to act affirmatively on behalf of these new international law imperatives.

It was in the same spirit that, in 1995, in the course of Canada's so called "Turbot War" with Spain and Portugal, designed legally to contain and limit extravagant overfishing by the vessels of those two countries of an endangered species that threatened to follow the North Atlantic cod into near extinction, Canada asserted a municipal (national) law power, in implementation of the new international law conservation imperatives, to reach the fishing vessels and crews of other countries, operating just outside our national territorial waters and contiguous waters and maritime zones and have consequences harmful for our international law rights and for those of the World Community at large. Acceptance by Canada of the right, if not the duty, to act affirmatively in protection of the new international law norms has meant an embracing of what an eloquent delegate to the Third United Nations Conference on the Law of the Sea (1970-1982), Ambassador Pardo of Malta, called the concept of the Oceans and their resources as the Common Heritage of Humankind.

Canadian diplomats, and I may cite here especially Ambassador Allan Beesley, who was born in this province of British Columbia and who now lives here in professionally active retirement, were part of a "Ginger" group at the marathon sessions of the Third United Nations Conference already referred to; and the Treaty signed at Kingston, Jamaica, in December 1982, reflects their energy and also their idealism which sometimes (happily, in retrospect) seemed to go beyond their more cautiously formulated

advance official briefs. But the Canadian foreign service, with a rich intellectual tradition built by Lester Pearson, and Paul Martin Sr., and Pierre-Elliot Trudeau, as political leaders, has never believed that the obligations of the international lawyer reduced to a mere mechanical restatement of the pre-existing law, as written. We have accepted, - in the spirit proclaimed by Myres McDougal of Yale University, the teacher of both President Gerald Ford and President Bill Clinton - that the role of the international lawyer - whether lawyer-diplomat, or judge, or parliamentarian - extends to active participation in changing and up-dating the law, so as to accord with the emerging juridical conscience of the World Community. It is a dynamic process of legal change: international law-in-the-making!

In this context, our turbot dispute with Spain and Portugal is now before the International Court of Justice at the instance of those two countries, and we will ask the international judges to strike out boldly in support of the new international law imperatives on safeguarding of endangered or disappearing species that are part of the Common Heritage. In the same spirit, face with what we regard as the State of Alaska's gross over-fishing of Pacific Coast salmon, in violation of the legal norms established by the Canada-U.S. Pacific Salmon Treaty of 1985, we have invited the U.S. Government - so far unsuccessfully - to submit this particular problem to legally binding international arbitration, or, failing that, to the jurisdiction of the International Court of Justice. We believe our portion is historically right and in full accord with the enlightened trends in contemporary international law and its progressive development in accordance with the United Nations Charter mandate.

Our government's commitment extends, also, to encouraging and supporting long-range, fundamental scientific research of the sort that you are already undertaking, in your various ways, in biological oceanography, fishery science, physical oceanography and climate, and marine environmental quality. Your work

provides the indispensable empirical base to the development of the new international law on environmental protection and Conservation of the Natural Resources of the World Community. In the new Canada Oceans Act, which we expect to pass in our House of Commons before the end of October, 1996, and in our planned new Canada Fisheries Act, we provide new and more comprehensive municipal (national) legal bases for doing that. In the spirit of co-operation, in a common international endeavour, that your Organization so well represents, we invite you to encourage your own national governments to continue their commitment to science and scientific research in aid of the oceans and ocean research.

Dr. Wooster called upon Dr. John C. Davis to make a statement on behalf of the Canadian Department of Fisheries and Oceans.

Mr. Chairman, honoured guests, colleagues, I am delighted to welcome you here today to Nanaimo and the Fifth Annual Meeting of PICES. I am speaking on behalf of Dr. W. Doubleday, Head of Delegation, who will join us shortly. You have heard words of welcome as well, from the Hon. T. McWhinney, Parliamentary Secretary, for the Department of Fisheries and Oceans on behalf of Canada. This message is from the Canadian Delegation responsible for hosting the meeting here in Nanaimo.

The Local Organizing Committee has worked extremely hard to make this meeting a success and hopes that everyone will find their stay in Nanaimo pleasant and scientifically rewarding. I know how hard this group has worked and feel sure that we will have an excellent meeting as a result of their labour.

We are particularly happy to be hosting the annual PICES meeting this year because Canada is initiating its GLOBEC program in 1996. Our GLOBEC program includes an Atlantic component focused on groundfish and a Pacific component focused on salmon. The program is multidisciplinary and involves government and

university scientists from across Canada. We hope that the Pacific component of Canada's GLOBEC program will complement the GLOBEC programs of our partners in PICES and realize the potential of the PICES CCCC program framework.

The North Pacific may be entering a period of rapid change in biological productivity. More information on the climate of the North Pacific and a better understanding of the forces causing climatic variation is urgently needed, both for fisheries conservation and for planning marine and coastal development. We in Canada hope that PICES can and will unite scientists in all relevant disciplines in all our member states to advance knowledge in this vitally important area.

In addition, all our countries around the Pacific Rim face major challenges and opportunities with respect to marine science. We are facing population growth, a global food supply crisis and major changes in our coastal environments in the coming years, all of which will pose significant challenges to marine science and coastal resource use planning. The scientists involved in PICES will play a major role in these issues and it is most important that we exchange information and engage in cooperative programs to address common problems and issues.

Finally, it is very fitting that PICES is meeting here in Nanaimo, as this city has been the site of marine science work for nearly 100 years. The Pacific Biological Station of the Department of Fisheries and Oceans located here in Nanaimo was opened in 1908 and has a long history of marine science and fisheries science of which we are very proud.

We look forward to a stimulating and productive meeting, building on the links established between us at previous meetings and paving the way to strengthening future cooperation.

Dr. Wooster asked Prof. Qi-Sheng Tang, speaking on behalf of Mr. Cong-Meng Liu, head

delegate, to make a statement on behalf of the Chinese Government.

On behalf of the Chinese Government, I wish to express the pleasure, of all members of the Chinese delegation, to participate in the Fifth Annual Meeting of PICES in Nanaimo, I wish to thank our hosts from the Government of Canada, the Department of Fisheries and Oceans, and especially the Pacific Biological Station and the Malaspina University-College for their hard work which has provided us with well organized support for this meeting.

China is a big and important fisheries country in the world, and in particular, in the North Pacific Ocean and we always attach great importance to and participated in various activities in this region. In association with other member countries, China has played a positive role in the development of the organization and contributed a great deal to marine science.

Presently, the issues of environmental deterioration and energy shortage have caused global concern since they are closely related and have become a threat to the existence of human beings. The founding of PICES is designed to promote and coordinate regional research on marine science. It is very important to enhance scientific understanding and strengthen scientific collaboration between member countries on the basis of mutual benefits. For this reason, PICES should further underline the priority of research programs like the CCCC program. Therefore, I hope all member countries will sincerely cooperate with each other, improve their efforts in marine science research and work together to protect and properly develop and utilize the resources so as to contribute to the development of mankind.

Finally, I wish the meeting every success.

Dr. Wooster asked delegate Dr. Satsuki Matsumura to speak on behalf of the Japanese Government.

Thank you Mr. Chairman for your nice introduction, on behalf of Japanese participants and Government of Japan, I am honored to have the opportunity to make these remarks.

Since the First Annual Meeting was held in Victoria, member countries have shared holding the Annual Meeting and PICES has steadily expanded year by year. The activities of the many Committees and Working Groups seem to have progressed over the years. The basic research in the North Pacific Ocean science has become stronger. After holding the Annual Meeting among the founding Member Countries, this Fifth Annual Meeting has returned again to Vancouver Island. This means PICES has grown.

During the four years, the technical oceanography has progressed extremely well. Satellite use for remote sensing for example, has been used to make many marine observations and collect data over the whole ocean. Japanese Earth Observation Satellite "ADEOS" was successfully launched on August 17th. It has two oceanographic sensors named OCTS and NSCAT, both of which are now working very well. It means that, in the very near future, we can expect to develop basin scale primary productivity maps each week. Many ocean biologists interested in satellite data are working to build up primary productivity algorithms using data from ocean color, temperature and sea surface wind which are collected by ADEOS. Many inter-national ocean science organizations and projects are expecting to use the data from the Japanese satellite. The earth observation program of Japan, which is led by the Science and Technology Agency (STA) and the National Space Development Agency (NASDA), will make the data available for all earth environmental scientists. STA is planning to install many marine observing buoys over the North Pacific. This buoy system will be deployed by the new large (8,000 ton) research vessel "Mirai".

A physical and biochemical circulation study on the North Pacific must be one of the goals of

PICES. I hope the buoy system, satellite system and other traditional methods using research vessel fleets will contribute to PICES activities and the new data sets will be used by all member countries and scientists who are working at saving the marine environment, especially in the North Pacific.

Finally as a newcomer to PICES meetings, I hope every one enjoys this meeting and would like to give many thanks to members of local organizing committee for their efforts.

Thank you for attention.

Dr. Wooster asked Dr. Jang Uk Lee to speak on behalf of the Republic of Korea Government.

First of all, on behalf of my Government, I would like to express my sincere thanks to the Government of Canada for hosting the Fifth meeting of PICES and the PICES Secretariat which prepared all the documents so nicely. Moreover, my special pleasure in attending in this meeting is doubled because I am not only directly involved in this meeting but also have the opportunity to be here in this very attractive coastal city of Nanaimo for the first time.

I would like to emphasize, Mr. Chairman, that there is not any doubt that PICES has made great progress in the exchange of scientific information and knowledge in terms of ocean and fisheries resources among scientists from contracting parties and others interested in these fields since the formation of PICES in 1992.

As we are all well aware, the North Pacific Ocean is one of the world's most productive waters for living marine resources. In fact, the leading species in the world's fisheries are from the Pacific and it is also known that most of the potential living resources biomass has recently started to follow a declining trend.

In this sense, Mr. Chairman, ocean scientific research and related information are vital to better understand the trends of abundance in living resources in relation to changes in

environmental conditions. Needless to say, this will only occur through participating in active research and sharing our mutual scientific information. My government has put great effort into conservation and management of living marine resources with emphasis on rational utilization and development by coastal countries in the fisheries sector.

Mr. Chairman, my government is interested that this Fifth Annual Meeting of PICES is successful and my delegation is ready to cooperate with scientists attending to make a successful meeting. I would like to inform you that, my government established the Ministry of Maritime Affairs and Fisheries in August this year so that marine and fisheries policies could be carried out more effectively, in the 21st century, than in the past years. I am very pleased to announce that my government is now ready to host the next PICES Annual Meeting and we invite you to come to Korea about this time next year.

Once again, my delegation would like to give our special thanks to the members of the organizing committee for their dedicated effort and also my deep appreciation goes to all present at this meeting for a most warm welcome you have given the Korean delegation.

Thank you very much for your attention.

Dr. Wooster asked Dr. Alexander Rodin of the Russian Federation to say a few words on behalf of his Government.

On behalf of the Government and the State Committee for Fisheries of the Russian Federation I welcome you to the Fifth PICES Annual Meeting!

I extend my gratitude to the Canadian Authorities and the Secretariat of the Organization for the invitation and preparation for this meeting.

Russia, with its coasts facing the Pacific Ocean and the peoples populating it, are very interested

in utilizing the ocean resources, particularly biologic resources. The food problem, in our view, may to a great degree be solved through proper exploitation of the biologic resources of the Ocean. With that in mind, one must not only consider the resources but also the condition under which they exist must be studied. We can speak about rational exploitation of riches (resources) of the Ocean only on a serious scientific basis.

Therefore, I would like to emphasize that we shall support the goals and objectives of PICES and we shall participate in its programs. We stand for working towards good cooperation between all member countries of PICES. Our delegation is ready to work at the Fifth Annual Meeting.

I wish every success for the fruitful work of all of you at this meeting.

Dr. Wooster called upon Dr. Vera Alexander to provide a few words on behalf of the U.S. Government.

Mr. Chairman, distinguished delegates, ladies and gentlemen, I am very pleased to be here today at the start of the Fifth Annual Meeting of PICES, the North Pacific Marine Science Organization. This is the second meeting which has been held in Canada, and this is significant and appropriate because Canada has played a major role in the formation and direction of PICES, since the earliest meetings during which the concept was introduced through the establishment of the Secretariat in Sidney, British Columbia and into the present. I thank our Canadian hosts for their welcome.

There has been a change in the delegation from the United States, and I wish to introduce to you Dr. James Balsiger, who is the new delegate from the United States Government, replacing Dr. William Aron, who has recently retired. I look forward to working with him.

PICES has been a success! The two main areas of success that I perceive have been the fostering

of enhanced communication among scientists and the identification of research priorities for the North Pacific Ocean which require a multi-national approach. It is significant that the numbers of such research problems are multiplying as PICES conducts its work through the various Committees and their Working Groups. This is good and appropriate. However, now we must turn our attention to the implementation of such research programs. There must be a commitment to the multi-national efforts which are developed. The extent to which this will happen will determine the effectiveness of PICES in advancing our knowledge of the North Pacific Ocean.

I look forward to an enjoyable and productive meeting. Once again, thank you to our Canadian hosts.

Dr. Wooster thanked the representative of Canada and the delegates for their remarks and spoke on behalf of PICES. At this Fifth Annual Meeting, when the organization is four and a half years old, PICES can look back with satisfaction at what has been accomplished until now, and forward with confidence at what should be done in the next few years. We are six nations strong and have engaged the active participation of hundreds of scientists from across the northern North Pacific. Our meetings offer a rich array of scientific papers and our publications are gaining acceptance as valuable contributions. We are tackling the continuing problems of data exchange and monitoring as well as considering possible new research efforts in the Bering Sea and in the Japan/East Sea, along with giving new attention to the roles of marine mammals, sea birds, and crabs and shrimps in the marine ecosystem. And we have initiated a research enterprise, the Four Seas (CCCC) program, that engages a prime scientific question of our time, the nature of climate variations and their effects on marine ecosystems.

Despite this record, not bad for such a young organization, there are problems we must resolve if this progress is to continue. I have set

out some of these in a perspectives paper you will all have seen. The biggest deficiency that I perceive is in the area of participation where significant segments of the marine science community are not involved, either because they haven't heard of PICES, or because their agencies or universities have not been brought in at the national level, or because travel funds are not available to them. In some ways, the awareness problem is the easiest to resolve, since it is largely up to our own ingenuity to design scientific programs and activities of broad interest, in which scientists will strongly desire to engage. The problem of interagency cooperation and coordination is one that must be faced at the national level, and we can only urge that it be recognized and solved at that level. The funding problem is not disconnected from the interagency problem if the costs of participation can be shared among interested agencies. To the extent that members expect PICES to support participation of individuals, for example junior scientists and invited experts, the Organization will need much larger resources than it has been granted so far. Participation in Annual Meetings is important because of the opportunities for exchange of information and ideas, the stimulation of collective thinking, and the potential to set the scientific agenda of the organization through meetings of the Scientific Committees. Working Groups and Technical Committees usually meet between sessions or just before the Annual Meeting, and these bodies are unable to carry out their assigned tasks if appointed members are unable to participate. One might assume that Member States who approve establishment of these bodies and appoint scientists to them would recognize their responsibility to ensure participation of their appointees, but this has not always been the case. Perhaps the advance and spread of technology will help to alleviate this problem - for example, a "virtual" Technical Committee on Communications has been proposed that would work primarily by electronic means - but I am old-fashioned enough to believe that the need for face-to-face interaction will not disappear. Remember the predictions of "paperless" offices!

You can't blame the Chairman and the Secretariat for getting bogged down in the operational details of the Organization, but we must not forget that the ultimate purpose of PICES is to promote scientific understanding of the northern North Pacific Ocean. I have seen grand top-down schemes invented by administrators and imposed on scientists - at first, the International Decade of Ocean Exploration was such a scheme - but I am a strong believer in the bottom-up approach which the PICES structure of Scientific Committees and the Science Board is meant to foster. This is how the CCCC Program and other activities, such as those in the Bering Sea, Japan/East Sea, and the Okhotsk Sea have arisen.

The goal of advancing scientific knowledge of the PICES area and of its living resources is established in the ICES Convention. Clearly our founders contemplated not only the increased understanding of our planet as a cultural advance, but also the gaining of knowledge that could eventually be applied to problems faced by Governments, such as the conservation and allocation of resources, protection of the marine environment, or prediction of the impact of climate change. The Convention (Art. V.1.d) lists among the scientific functions "to consider requests to develop scientific advice pertaining to the area concerned". However the process of transferring of scientific findings to user entities has not yet been well elaborated. It may work successfully within some member states, but an international organization such as PICES can make a major contribution to the transfer among its members and organizations that serve them. We have not yet been successful in establishing effective links with potential user organizations such as fishery commissions, but the effort must be continued if PICES is fully to serve its purpose.

We must keep in mind that PICES is not PISCES! It is not a fishery science organization, it is a marine science organization. And the set of scientific problems that face us, centered around the effects of climate variations and human activities on marine ecosystems certainly

engage all of the marine science disciplines. Approaches to this set of problems in PICES member laboratories go well beyond those represented at our meetings and in our Committees and Working Groups. If we are to see significant progress in your lifetime, we must find a way to link all of these efforts in a common approach. There is a challenge that should keep PICES busy well into the next century!

Dr. Wooster introduced Prof. Timothy Parsons to give the keynote lecture. Prof. Parsons addressed the subject of Taking Stock of Biological Studies in the Ocean describing a holistic perspective of the last 150 years of studies in ocean biology that reveals two distinct scientific activities. The first involved largely descriptive studies and was characterized by many international expeditions from the "Challenger" in 1870 to the Indian Ocean Expedition of the late 1960s. These studies ended in what Carlton Ray (1970) called the "Marine Revolution". This was caused by the need for biologists to pay much more attention to practical problems in fisheries, pollution, undersea mining and in particular the biology of the 200-mile economic zone which was established by many nations in the 1970s. The biology of the oceans moved from largely descriptive ecology into the field of dynamic processes, holistic models, new methods for collecting data, industrial aquaculture and networking of different national and international organizations. Further progress in the biological sciences is needed in these areas, particularly in determining the carrying capacity of the sea and the ecological consequences of removing marine species of fish from the oceans as part of the annual industrial harvest. These problems are only likely to be solved through new methodologies and from a consideration of entire ecosystems, which are often different to that expected from the sum of the determinate parts.

Reference: Ray, C. 1970. Ecology, law and the "Marine Revolution" Biol. Conserv. 3:9-17

REPORT OF GOVERNING COUNCIL MEETINGS

The Governing Council met on October 14, 16 and 20, under the Chairmanship of Dr. Warren S. Wooster. The Executive Secretary, Dr. W. Doug McKone, served as rapporteur.

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

At the first session, the Chairman welcomed the delegates and noted that for this meeting Prof. Qi-Sheng Tang and Mr. Lian-Zeng Chen were representing Mr. Cong-Meng Liu and Prof. Yu-Kun Xu of the People's Republic of China, Dr. Jang-Uk Lee was representing Mr. Kyu-Seok Park of the Republic of Korea and Mr. Kazumi Hagino was representing Mr. Teruyoshi Inagawa of Japan. The Chairman reviewed the agenda and proposed the order in which to take up the various items. This report summarizes the treatment of each agenda item during the course of the three sessions.

Agenda Item 1. Preliminary Report on Administration

The Executive Secretary summarized the activities of the Secretariat during the previous year (Endnote 2).

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

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

International Council for the Exploration of the Sea (ICES): Dr. Michael R. Reeve
North Pacific Anadromous Fish Commission (NPAFC): Dr. Irina Shestakova
Scientific Committee on Oceanic Research (SCOR): Dr. Kenneth L. Denman

Agenda Item 3. Membership and Observers from Other Countries

No non-member countries sent observers to this meeting. Dr. Wooster remarked that some interest in membership was expressed by Mexican scientists a few years ago but that there has been no follow up.

Agenda Item 4. Election of Chairman

The Executive Secretary, Dr. McKone, held the election for Chairman of Council in accordance with the Rules of Procedure. Dr. William G. Doubleday of Canada was elected. The delegates congratulated Dr. Doubleday on his election. Dr. Doubleday expressed his thanks for the support given by Council members.

Agenda Item 5. Appointment of Executive Secretary

Council approved the Finance and Administration Committee recommendation to extend the term of the Executive Secretary for one year until December 31, 1998. Editorial changes will be made to the description of the position and it will be reviewed at the next Annual Meeting for advertisement to be filled by January 1, 1999 (Decision 96/A/3).

Agenda Item 6. Rule Change to allow past Chairman to serve as an ex-officio participant of the Governing Council

Council agreed that the immediate past Chairman should be invited to serve as an ex-officio participant of Governing Council. Funding for his participation in Annual Meetings will be paid from interest accrued in the Working Capital Fund. Council agreed that a Rule change was not required for this purpose (Decision 96/A/5).

Agenda Item 7. Report of Finance and Administration Committee

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

Agenda Item 7a. Audited Accounts for Financial Year 1995

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

Agenda Item 7b. Estimated Accounts for Financial Year 1996

The estimated accounts from October 1 to December 31 were reviewed and accepted by the Finance and Administration Committee and Council.

Agenda Item 7c. Budget for Financial Year 1997

Upon the recommendation of the Finance and Administration Committee, Council approved the 1997 budget at the same level as for 1996, CDN \$509,000. (Decision 96/A/2)

Agenda Item 7d. Forecast Budget for Financial Year 1998

The forecast budget for 1998 was revised by the Finance and Administration Committee to reflect the changes in the 1997 budget (Decision 96/A/2). No decisions concerning the 1998 budget were made by Council.

Agenda Item 7e. Trust Fund

The Finance and Administration Committee reviewed the paper on this subject prepared by the Executive Secretary and recommended further consideration of necessary rule changes and guidelines. Council agreed that the Executive Secretary should develop a proposal

on these matters for consideration at PICES VI. (Decision 96/A/1)

Agenda Item 7f. Working Capital Fund

The status of the Working Capital Fund was reviewed. No action was taken by Council on this matter.

Agenda Item 7g. Home Leave Relocation Fund

The status of the Home Leave Relocation fund was reviewed. No action was taken by Council on this matter.

Agenda Item 7h. Other Funds Held

The Executive Secretary reported on the state of the other funds held on behalf of members. Council welcomed the offer of the United States to contribute the approximately CDN \$43,000 remaining in this account to support participation of Chinese and Russian scientists in future meetings.

Agenda Item 7i. Appointment of Finance and Administration Committee Chairman

Council appointed Dr. John L. McGruder as the Chairman of the F & A Committee for a period of two years.

Agenda Item 8. Report and Recommendations of Science Board

The Chairman of Science Board, Dr. Makoto Kashiwai summarized the report of the Board's meeting on October 15 and 19 and presented its recommendations. Working Group 5 met during the year, Working Groups 8, 9, 10, 11, 12, TCODE, and the REX, BASS and MODEL task teams met on October 11 and 13 and the IP/EC met in the afternoon of October 13. A very successful Nemuro Workshop on *Conceptual/Theoretical Studies and Model Development* was held in June 1996. The Workshop Report has been reviewed by the relevant Scientific Committees and Science

Board. Council approved recommendations concerning PICES-GLOBEC CCCC Program (Decision 96/S/1), publications (Decision 96/S/2), inter-sessional meetings (Decision 96/S/3), monitoring (Decision 96/S/4), cooperation with SCOR (Decision 96/S/5) and PICES perspectives (Decision 96/S/6). Details are given in Appendix 1.

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

Agenda Item 9. PICES Perspectives

The PICES Perspectives papers were reviewed by the Finance and Administration committee and the Science Board and Council. Council agreed that PICES Members should be encouraged to establish an interagency coordinating committee to facilitate the coordination of broad participation in PICES activities within each member country (details see Endnote 3 a, b and Decision 96/S/6).

Agenda Item 10. Future Meetings of the Organization and Subsidiary Bodies, Including Time and Place for the Sixth and Seventh Annual Meeting

Council accepted the Republic of Korea's proposal to host PICES VI October 17-26, 1997. The place is still to be determined (Decision 95/A/3). Council also agreed that the 1997 meeting will be of the same duration and structure as the 1996 meeting. The 1998 PICES VII meeting will be tentatively hosted by the USA in Alaska and the 1999 PICES VIII will be hosted by the Russian Federation in Vladivostok. Both of these meetings will be at about the same time of year as previous meetings (i.e. mid to late October).

Agenda Item 11. Any Other Business

Access for cooperative research

In light of Science board support for Recommendation 6 of the Vladivostok

Workshop (see p. 27 of the 1995 Annual Report), the United States submitted the following statement and recommendations:

As scientific investigations are developed under the auspices of PICES, the stage will be reached when research vessels will be working at sea on these investigations. The cruises will be elements of agreed scientific programs and are likely to involve scientists from several of the PICES member states. Dimensions of the oceanic phenomena being investigated are determined by natural processes, and these phenomena are likely to extend across boundaries of national jurisdiction, thus requiring permission from coastal states for access to carry out research. The United Nations Convention on the Law of the Sea makes special mention (Art. 247) of marine scientific research projects carried out under the auspices of an international organization, stating that a coastal State that belongs to such an organization shall be deemed to have authorized the project to be carried out in conformity with the agreed specifications if that State approved the detailed project when the decision was made by the organization for the undertaking of the project, or is willing to participate in it, and has not expressed any objection within four months of notification of the project by the organization to the coastal State. Application of this provision should be considered by PICES when cooperative projects have been designed. At the present time cooperative studies in the Japan Sea/East Sea are being planned by PICES Working Group 10. On-going research in that area has already been impacted by restrictions on access for marine scientific research, and successful conduct of the research being planned by WG 10 will depend on such access being granted. In view of these facts, it is recommended that:

These following recommendations were agreed to by Council (Decision 96/A/8):

1. Member States of PICES affirm application of Art. 247 to cooperative projects being developed under the auspices of PICES.

2. Working Groups present their research plans to the Science Board for approval and forwarding to the Governing Council for endorsement by the Organization.
3. Working Groups developing specific field phases of cooperative research programs identify elements of those programs where questions of research access arise. (96/A/8)

At the close of the Governing Council Dr. Doubleday, called on all members of the Governing Council to join with him in warmly thanking Dr. Wooster for his outstanding service to PICES over many years. He praised Dr. Wooster for leading PICES through its first years and establishing a strong and vital scientific program. The Governing Council unanimously applauded the contribution of Dr. Wooster.

Appendix 1

A. Decisions

96/A/1: Council agreed to the following actions:

1. *Auditor.* Accepted the audited accounts for 1995 and agreed to continue with Flader and Greene as auditor for another year.
2. *Trust Fund.* Council instructed the Executive Secretary to propose a draft a Rule change to include regular contributions to the Trust Fund, develop guidelines as to how the funds would be used, and propose a process for determining candidates for the use of funds.

96/A/2: Council accepted the financial statements for the audited accounts of 1995 and the estimated accounts of 1996 and agreed to the following actions:

1. *1997 Budget.* The budget of \$509,000 was approved.
2. *Forecast 1998 Budget.* The forecast budget for 1998 was reviewed and will be further considered during PICES VI.

96/A/3: Executive Secretary

Council approved a one-year extension to the contract of the Executive Secretary to December

31, 1998. Council will review the job description of the Executive Secretary at PICES VI for advertisement in late 1997 and 1998.

96/A/4: Finance and Administration Committee Membership and Chairman Council approved changes in Financial Rules 15 and 18 as follows:

Rule 15

The Finance and Administration Committee shall consist of one member and one alternate from each Contracting Party. The Executive Secretary shall be an ex officio member of this Committee without the right to vote. The Council's Vice-Chairman should attend the meetings of the Committee without the right to vote. The Chairman shall be appointed by the Council from among the Committee's members for a term of two years and shall be eligible for reappointment only once for a successive term. A Chairman of the Committee who is a Delegate shall not function as such during the time of Chairmanship, and the appointing Contracting Party shall have the right to appoint another person to serve as a Delegate. At each ordinary meeting of the Council the Finance Committee shall examine:

Rule 18

(ii) delete "and" at the end.

(iii) (a) meetings of the Science Board may be attended by persons other than the members only on the invitation of the Chairman of the Council,

(b) meetings of the Finance and Administration Committee may be attended by persons other than the members and alternates only on the invitation of the Chairman of the Council, and;

(iv) all Delegates, Alternate Delegates, experts, advisors, observers, and any person attending the meeting of the

Council may attend meetings of any of the Committees or Groups of the Council, except in cases where participation in meetings of a Committee or Group has been limited by the Council.

96/A/5: Past Chairman

Council approved that the past Chairman shall be invited to serve in an ex-officio advisory capacity and attend the Annual Meeting of Council for the period during which the incumbent is Chairman of Council. The associated travel costs are to be paid from interest accrued in the Working Capital Fund.

96/A/6: Attendance at important meetings

Council authorized the Chairman and the Executive Secretary, at their discretion, to approve travel costs of selected scientists, at PICES expense, to attend important meeting on behalf of PICES.

96/A/7: Detailed travel

Council instructed the Executive Secretary to prepare as detailed proposal for travel expenditures for the proposed budget year to circulate with the proposed budget 90 days before the Annual Meeting. At the same time detailed travel expenditures for the current year should be provided.

96/A/8: Access for cooperative research

1. Member States of PICES affirm application of Article 247 to cooperative projects being developed under the auspices of PICES,
2. Working Groups should present their research plans to the Science Board for approval and forwarding to the Governing Council for endorsement by the Organization, and
3. Working Groups should identify scientific field phases of cooperative research programs and identify elements of those programs where questions of research access arise.

96/A/9: Future Annual Meetings

Council accepted the proposal of the Republic of Korea to host the Annual Meeting in Korea October 17-26, 1997. The place is to be determined. The U.S.A. will host the 1998 Annual Meeting in Alaska and the Russian Federation will host the 1999 Annual Meeting in Vladivostok. The dates and places for these two meetings are to be determined at next years Annual Meeting.

96/S/1: PICES-GLOBEC CCCC Program

- a. The MODEL Task Team should convene a workshop in California in early 1998 to (a) develop vertical profiles for nitrate in the open North Pacific, and (b) compare lower trophic level physiological process models.
- b. The REX Task Team should convene a workshop immediately prior to PICES VI to (a) identify and prioritize desired retrospective and process oriented research programs needed for regional comparisons to be made, (b) discuss standardization of plankton sampling methods, (c) identify key species within the 10 REX regions, (d) identify methods for monitoring their distribution and abundance in selected regions.

96/S/2: Publications 1996-1997

The following reports are to be published:

- a. Working Group 5 Report in the 1996 Annual Report;
- b. Working Group 9 Reports 1 and 2 in the 1996 Annual Report;
- c. The report of the Workshop on Conceptual/Theoretical Studies and Model Development, reports of REX and BASS Task Teams in the PICES Scientific Report Series.

96/S/3: Inter-sessional meetings

The following inter-sessional meetings are to be convened:

- a. WG 10 (Circulation and ventilation in the Japan Sea / East Sea and its adjacent areas) should meet immediately after the CREAMS (Circulation Research of East Asia Marginal

- Seas) International Workshop (January 31-February 2, 1997, Fukuoka, Japan);
- b. WG 12 (Crabs and shrimps) should meet for 4-days (June 1997, Nemuro, Japan);
 - c. MEQ Practical Workshop on Methods to Assess Pollution Impact in Jiaozhou Bay should take place for approximately two weeks (May/June 1997, Qingdao, China).

Travel costs for Working Group and Workshop participants should be borne by Member States.

96/S/4: Monitoring

WG 9 should explore ways to implement their recommendations to establish ecological moorings and to use a cable to monitor the Kamchatka Current.

96/S/5: Cooperation with SCOR
 PICES should participate in SCOR - WG 105 on *The Impact of World Fisheries Harvests on the Stability and Diversity of Marine Ecosystems* and designates the Chairman-elect of FIS, Dr. Chang-Ik Zhang, to participate on behalf of PICES.

96/S/6: PICES perspectives

An interagency coordinating mechanism should be established in each Member Country to facilitate the coordination of broad participation in PICES activities (see item 1 Future perspectives for PICES),

Endnote 1

Participants

Canada

William G. Doubleday (delegate)
 John C. Davis (delegate)
 Dan Goodman (advisor)

China

Qi-Sheng Tang (alternate delegate)
 Lian-Zeng Chen (alternate delegate)

Japan

Satsuki Matsumura (delegate)
 Kazumi Hagino (alternate delegate)

Republic of Korea

Hyung-Tack Huh (delegate)
 Jang-Uk Lee (alternate delegate)
 Deok Bae Park (advisor)

Russian Federation

Alexander Rodin (delegate)
 Sergey E. Dyagilev (delegate)
 Boris N. Kotenev (advisor)
 Lev N. Bocharov (alternate delegate)
 Gennady V. Goussev (advisor)

U.S.A.

Vera Alexander (delegate)
 James W. Balsiger (delegate)
 John L. McGruder (advisor)
 Dorothy Bergamaschi (advisor)
 William L. Sullivan, Jr. (advisor)
 Mark Wildman (advisor)

Others

Warren S. Wooster (Chairman, PICES)
 W. Douglas McKone (Executive Secretary)
 (Rapporteur)
 Alexander Bychkov (Assistant Executive Secretary)
 Makoto Kashiwai (Chairman, Science Board)

Endnote 2

Report on Administration for 1995

Council, Committees and Working Groups

1. Payment of National Contributions

All financial contributions are due by January 1 each year. The People's Republic of China (May 23) and the Republic of Korea's fees (July 9) paid their fees very late.

2. National Delegations

- a. Dr. Takashi Sasaki has moved to a new position and has been replaced by Dr. Satsuki Matsumura, Director, Research Planning And Coordination Division, National Research Institute of Far Seas Fisheries, as Japanese delegate to Council.
- b. Dr. William Aron has retired and Dr. James Balsiger, Director, Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA, has replaced him as U.S. delegate to Council.

3. Committees and Working Groups

- a. Members of the new Working Groups 10, 11 and 12 have been appointed and meetings of these groups are being held at PICES V.
- b. Changes to existing Committees and Working Groups are:

Biological Oceanographic Committee

Japan: Dr. Atsushi Tsuda replaces Dr. Tsutomu Ikeda

Physical Oceanography and Climate Committee

Japan: Dr. Masahiro Endoh replaces Dr. Takeshi Uji

Russia: Dr. Vyacheslav Lobanov replaces Dr. Alexander Bychkov

Technical Committee on Data Exchange

U.S.A.: Dr. Thomas C. Royer replaces Dr. James H. Swift

Russia: Dr. Igar Rostov replaces Dr. Glennady Yurasov

Dr. Nickoly Rykov newly appointed

Implementation Panel

U.S.A.: Dr. Patricia Livingston replaces Dr. Robert Francis

Working Group 9

Russia: Dr. Sergey Sterkhov newly appointed

- c. A very successful Nemuro CCCC Workshop on Conceptual/Theoretical Studies and Model Development was held in June, 1996. The report of the discussion and recommendations will be presented at this Annual Meeting.

4. Observers

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

International Council for the Exploration of the Sea (ICES): Dr. Michael R. Reeve

North Pacific Anadromous Fish Commission (NPAFC): Dr. Irina Shestakova

Scientific Committee on Oceanic Research (SCOR): Dr. Kenneth L. Denman

5. Travel and Representation at Other Organization Meetings

- a. Dr. W. Doug McKone and Ms. Christina Chiu attended meetings for PICES V arrangements at PBS in Nanaimo (Jan. 10, Jan. 29 and Aug. 1).

- b. Dr. W. Doug McKone traveled to the People's Republic of China, Republic of Korea, Russia and the United States to interview candidates for the position of Assistant Executive Secretary (Jan. 30-Feb.10).

- c. Dr. Sangbok D. Hahn attended the IOC/WESTPAC III Meeting in Tokyo (Feb. 26-Mar. 1)
- d. Dr. Makoto Kashiwai attended the Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific in Tokyo (May 7-10).
- e. Dr. W. Doug McKone and Ms. Christina Chiu attended the Pension Society Meeting in Washington DC (May 21-23).
- f. Dr. Warren S. Wooster, Dr. Makoto Kashiwai, and Dr. W. Doug McKone and Ms. Christina Chiu from the Secretariat attended the CCCC Workshop in Nemuro (June 24-28).
- g. Mr. Robin Brown attended the Workshop for Environmental Data for Fisheries Science in Monterey (July 16-18).
- h. Dr. Bruce A. Taft and Dr. W. Doug McKone attended the PORSEC meeting in Victoria (August 13-16).
- i. Dr. Makoto Kashiwai attended the ICES Annual Meeting in Copenhagen and Reykjavik (Sept. 27-Oct. 4).

Communication

1. Publications

- a. The Secretariat spent a great deal of effort editing the Vladivostok Report for publication this year.
- b. List of publications produced so far this year:
 - i. The Annual Report was published and circulated in early February to all PICES members, international organizations and libraries.
 - ii. A poster for the Fifth Annual Meeting was distributed in early February.

- iii. PICES Press newsletters were circulated in early February and late July.
- iv. The First Announcement for the Fifth Annual Meeting was distributed in early February.
- v. A PICES Handbook was published and distributed to Council and F & A members.
- vi. The 1996 PICES Directory was distributed to all PICES members in early February and updated again and distributed in September.
- vii. Scientific Reports #4 (Science Plan/Implementation Plan - Report of the PICES-GLOBEC International Program on Climate Change and Carrying Capacity) and #5 (Modelling of the Subarctic North Pacific Circulation) were published and distributed in March.
- viii. The Final Announcement for the Fifth Annual Meeting was distributed in early June.
- ix. Scientific Report #6 (Proceedings of the PICES Workshop on the Okhotsk Sea and Adjacent Areas) was published and distributed in September.
- x. A program and a volume of abstracts for the Fifth Annual Meeting were prepared for circulation at the Annual Meeting.

2. Electronics Communication

A PICES Home Page (<http://pices.ios.bc.ca>) was created during the year and the Secretariat is continuing to develop it. The Secretariat also continues to monthly distribute a list of future meetings in marine sciences to more than 900 scientists.

Secretariat Matters

1. Administration/Financial

The Secretariat has converted the mailing list to a database system for more efficient handling and processing. It has improved the access time and allowed for better planning and organizing for the Fifth Annual Meeting as well as for other uses that will make our operations more efficient. The current mailing system is being reviewed and we will experiment with undertaking our own mail out instead of using the Department of Fisheries system. The objective is to have better financial control than we currently have.

2. Space, Facilities and Equipment

No changes in space requirements have developed over the last year. There is still the

outstanding commitment made by the Government of Canada to undertake an upgrade of part of the space they provide to office standards. Discussions have been held but there has not been an agreement on when the facilities would be upgraded.

3. Staffing

In April, Dr. Motoyasu Miyata completed his contract as Assistant Executive Secretary and returned home to Japan to the University of Tokyo. In May Dr. Alexander Bychkov, from POI, Vladivostok, was hired and he started a three-year contract as the new Assistant Executive Secretary.

Endnote 3

a. PICES Perspectives

As PICES approaches its Fifth Annual Meeting and the election of a new Chairman, it seems appropriate to consider what lies ahead. The Organization has the principal coastal states in the northern North Pacific as its members, has enlisted the support and involvement of several hundred marine scientists in those countries, has organized important scientific meetings, and has initiated projects of cooperative science in the region. What will the future bring? Are there new opportunities over the horizon, and are there problems whose solutions could advance the seizing of such opportunities?

The problems lie in the following three principal areas: participation, structure, and interactions.

Participation

1. Agency participation: Within the member countries, different agencies have the principal responsibility for interaction with PICES.

Often, fishery agencies have the lead, but in many countries weather/climate and environmental matters are handled by other departments, and important universities fall outside the purview of the national government. The lead agencies often seem not to represent the interests of other parties or to coordinate PICES interactions with them. In fact, few countries have effective interdepartmental coordination mechanisms.

Solution: An interagency coordination mechanism should be established in each member country whereby the participation in PICES activities of all interested parties can be arranged.

2. Appointed scientists: In each PICES country, some 25-30 scientists are formally involved in PICES affairs, as appointed members of scientific and technical committees and of working groups and analogous bodies. Although some of the work of these bodies is conducted by correspondence, their main

activities take place at meetings, especially during the annual meetings. While it is obviously important for these scientists to attend, unfortunately national funding for such participation is often not provided, and the work of the bodies is thereby seriously impaired. This is particularly a problem when the lead agency is reluctant to support other than its own people.

Solution: In budgeting for PICES, member countries should provide for the costs of participation of appointed scientists in PICES activities. These costs are likely to exceed the annual national contribution to the PICES budget.

3. Other scientists: The scientific program of PICES Annual Meetings should attract the interest of scientists beyond those appointed to committees and working groups. In most countries, only a small fraction of the marine science community is now involved with PICES. The Organization is unlikely to achieve its objectives without much broader links with that community. The mistaken perception that PICES is a fishery organization may discourage some, but the principal impediment is funding. In principle, each country should support participation of its own scientists, but funds are often not available, especially for participation of junior scientists.

Solution: Member countries should recognize their responsibility to ensure participation. If the Trust Fund is to be used to support otherwise unfunded scientists, it should be augmented and regularly replenished. Procedures for selection of recipients must be agreed.

Structure

1. Scientific Committees: At its first meeting, PICES established four standing Committees (BIO, FIS, MEQ, and POC) to provide a disciplinary home for scientists and to give them a voice in the governance of PICES through representation on the Science Board. The Committees have the responsibility not only to

oversee scientific sessions and develop programs for the next annual meeting, but also to review progress in their field and to propose actions that would accelerate advances. While each Committee has 18 appointed members (three from each country), it has always been hoped that all scientists at an Annual Meeting would participate in their work. An active Committee should work by correspondence between Annual Meetings, so that actions to be taken could, where possible, have been fully considered in advance. In practice, intersessional activities and participation in committee meetings have been limited.

Solution: Committee Chairmen should take the lead in developing committee programs through correspondence, and action should be taken to attract broad interest in committee meetings. [These actions are being taken for PICES V]

2. Technical Committees: In recognition of the continuing need for a body to deal with PICES data problems, a standing Committee, the Technical Committee on Data Exchange, was established. There are other areas where standing Committees may be needed, e.g., monitoring. The Implementation Panel of the CCCC Program will be required for five years or longer. The relationship of such bodies to the Science Committees and the Science Board remains to be defined.

Solution: The Science Board should review the need for such committees, their terms of reference, and their membership, as well as their relationship to the Science Committees and the Science Board. Recommendations on this should be forwarded to the Governing Council.

3. Working Groups: Working Groups have been established for specific purposes and with finite lives (2 - 3 years). Reports are expected at the end of their work, and the groups may evolve into other groups or into standing committees. The constraints have not been widely understood, with some groups expecting their work to go on indefinitely. In most cases,

participation of appointed members has been limited.

Solution: The Science Board should prepare specific guidelines for the function and duration of Working Groups. [Participation problems are considered above.]

Interactions

1. Fishery Commissions: While PICES has no responsibility or authority for fishery management, marine scientific research in general, and specific programs such as CCCC, can contribute to the rational use of marine resources and hence to the work of commissions with management responsibility. Existing and developing commissions have broad research mandates, and no clear jurisdictional lines have been drawn. National policies often differ from organization to organization. The resulting confusion threatens the development of PICES programs such as CCCC and impedes the transfer of information to the commissions.

Solution: Consistent national policies towards marine science organizations should be established. Jurisdictional conflicts should be resolved, and cooperative opportunities should be identified in memoranda of understanding with PICES.

2. Advisory activities: When plans for PICES were being developed, it was assumed that advisory activities in the fields of fisheries and environmental quality would be developed, in analogy with those performed by ICES. While the PICES Convention (Art.V.1.d) provides for that possibility, political and geographical realities have prevented it from developing. If the members were ultimately to decide on an active advisory role for PICES, there would be important budgetary and structural implications.

Solution: Members should include the possibility of a PICES advisory role in considering cooperative opportunities between PICES and fishery commissions. The Secretariat should analyze the budgetary and structural

implications for PICES of its assuming an active role in providing advice to member countries and to regional international organizations.

3. Cooperation with international research programs: Existing international research programs, bilateral and multilateral, regional and global, deal with questions that fall within the broad scientific mandate of PICES. However, within countries, participating agencies are often different from those that interact with PICES so that the activity appears to be unrelated. The difficulty is not a lack of control by PICES, but the loss of opportunities for effective collaboration.

Solution: International research programs related to ongoing activities and interests of PICES should be identified and listed. Opportunities for collaboration with these programs should be sought, first among agencies at the national level and then by PICES.

Opportunities for PICES, in addition to advisory activities mentioned above, fall in the areas of support services, for example in communication, exchange of information and data, and monitoring, and in research itself, as exemplified in the CCCC program. Ideas concerning these opportunities will be discussed in a subsequent note.

W. S. Wooster, Seattle, July 17 (rev. July 23), 1996

b. Communication Perspectives

Effective communication is important to PICES because the work places of participants are widely scattered. They work in several languages but communicate internationally in English. Except at meetings, where special effort is required to ensure effective oral presentations, communication is increasingly by electronic means. Thus it is important that PICES employ the developing technology in the most effective way to meet its goals and objectives.

Communication needs range from low frequency - archival reporting and data base management; - to mid frequency (MF) - distribution of news; - to high frequency (HF) - real-time exchanges. Methods differ among these:

LF: now, printed, distributed by post; future, distributed electronically. In the case of data bases, access is increasingly by electronic means.

MF: now, printed and mailed, increasingly electronic and fax; future, distributed electronically.

HF: now, e-mail and fax; future, e-mail (and fax?)

Problems that characterize these frequencies include publication delays, high costs, and uncertain print orders (LF); stale and incomplete news (MF); difficulties with equations and graphics (HF). Many communications problems arise because the response time of correspondents is often much slower than that of available technology. With the increasing use of electronic means of communication, problems also arise because the technology is not universally available and is not standardized, leading to mismatches in hardware and software. While the Secretariat has been diligent in trying to provide the necessary services, there has not

yet been a systematic effort to determine customer requirements and problems.

A goal is that every PICES participant be able to communicate freely and quickly with any other and have ready access to required information - archival, data base, and news. To facilitate achievement of this goal, there should be established a Technical Committee on Communications (TCCOM), to work primarily by electronic means, with the following terms of reference:

1. Consider ways whereby participation in PICES activities might be enhanced through an expanded communications network.
2. Determine the communication requirements of PICES participants and identify the present problems in meeting those requirements.
3. Review existing electronic communication practices and procedures within PICES.
4. Survey the electronic communication capabilities in member states.
5. Review technological developments of utility to PICES communications.
6. Develop a communication plan to meet the requirements of PICES participants and of the Organization, within the constraints of present and soon-to-be-available technology, together with estimates of anticipated costs.