REPORT OF OPENING SESSION

The Opening Session was called to order at 8:30 a.m. on October 18, 2004, by the Chairman, Dr. Vera Alexander, who welcomed delegates, observers and researchers to the PICES Thirteenth Annual Meeting.

Welcome addresses on behalf of the host state and the host country

Ms. Yvonne Izu (Deputy Director, Department of Land and Natural Resources, Hawaii) greeted participants on behalf of the host state (*OP Endnote 1*), and Dr. Michael P. Sissenwine (Director of Scientific Programs & Chief Science Advisor, National Marine Fisheries Service, U.S.A.), welcomed participants on behalf of the host country (*OP Endnote 2*).

Remarks by representatives of Contracting Parties and the Chairman of PICES

Dr. Alexander called upon Dr. Laura Richards (Regional Director of Science, Pacific Region, Fisheries & Oceans Canada) to make a statement on behalf of the Canadian Government. Dr. Richards addressed the session and her remarks are appended to the report in *OP Endnote 3*.

Dr. Alexander invited Dr. Tokimasa Kobayashi (Director, Seikai National Fisheries Research Institute, Fisheries Research Agency, Japan) to speak on behalf of the Japanese Government. Dr. Kobayashi addressed the session and his remarks are appended to the report in *OP Endnote 4*.

Dr. Alexander then asked Mr. Wen-Xi Zhu (Deputy Division Director, Department of International Cooperation, State Oceanic Administration, People's Republic of China) to make a statement on behalf of the Chinese Government. Mr. Zhu addressed the session and his remarks are appended to the report in *OP Endnote 5*.

Dr. Alexander called upon Dr. Chul Park (Director, Marine Environment Department, National Fisheries Research & Development Institute, Republic of Korea) to speak on behalf of the Korean Government. Mr. Park addressed the session and his remarks are appended to the report in *OP Endnote 6*.

Dr. Alexander asked Dr. Lev N. Bocharov (Director, Pacific Scientific Research Fisheries Center, Federal Agency on Fisheries, Russian Federation) to make a statement on behalf of the Russian Government. Dr. Bocharov addressed the session and his remarks are appended to the report in *OP Endnote 7*.

Dr. Alexander invited Dr. Richard J. Marasco (Director, Resource Ecology & Fisheries Management Division, Alaska Fisheries Science Center, National Marine Fisheries Service, U.S.A.) to speak on behalf of the Government of the United States of America. Dr. Marasco addressed the session and his remarks are appended to the report in *OP Endnote 8*.

Dr. Alexander thanked Ms. Izu, Dr. Sissenwine and all the delegates for their remarks and spoke on behalf of PICES. The text of her address is appended to the report in *OP Endnote 9*.

Wooster Award presentation ceremony

Dr. Alexander and the Science Board Chairman, Dr. Ian Perry, conducted the Wooster Award presentation ceremony.

Dr. Perry quoted the following Science Board citation for the 2004 Wooster Award:

In October 2000, PICES established a new award named in honour of Dr. Warren S. Wooster, the principal founder and first Chairman of PICES, and world-renowned researcher and statesman in the area of climate variability and fisheries production.

The criteria for the Wooster Award are summarized as follows:
The award is to be given annually to an individual who:

- *has made significant scientific contributions to North Pacific marine science;*
- *has achieved sustained excellence in research, teaching, administration or a combination of these in the area of the North Pacific;*
- *has worked to integrate the various disciplines of the marine sciences; and*
- *preferably someone who is or has been actively involved in PICES activities.*

The late Professor Michael M. Mullin (U.S.A.), Dr. Yutaka Nagata (Japan) and Dr. William Pearcy (U.S.A.) were honoured with the Wooster Award in 2001, 2002 and 2003, respectively.

PICES Science Board is pleased to confirm Dr. Paul H. LeBlond as the recipient of the 2004 Wooster Award.

Dr. Paul LeBlond has had a distinguished scientific, educational and public service career, which has contributed to the marine sciences generally and specifically to many of the goals of PICES. He has authored or co-authored more than 90 primary journal publications, 20 conference proceedings, and two books spanning a wide variety of physical and biological topics, many of which link fisheries research problems with changing physical oceanographic conditions in the North Pacific Ocean. His list of contributions also includes publications under the headings of Science Education, Book Reviews, Cryptozoology, Engineering Studies, Historical, Public Services, Marine Conservation, and Fun. The section under Cryptozoology alone has over 21 publications. Dr. LeBlond has remained one of the world's leading physical oceanographers throughout his distinguished career, and has supervised over 40 graduate students. He has lectured at several universities throughout the world, including onboard a cruise ship traveling the South Pacific. Dr. LeBlond has also served PICES well, as a member and then Chairman of the Physical Oceanography and Climate Committee, Chairman of WG 7 on Modeling of the Subarctic North Pacific Circulation, and Co-Chairman of the Scientific Steering Committee for the first major inter-sessional international conference organized by PICES entitled "Beyond El Niño". He has been the recipient of several Canadian and international marine science awards, and has been a member or chaired a number of important Canadian public marine science committees. The diversity and excellence of Dr. LeBlond's science, his significant contributions to university education and public awareness of marine problems, the recognition he has received through major awards from his peers, and his unselfish participation in national and international ecology and environmental committees, makes him a deserving candidate for this award.

Then Dr. Alexander invited Dr. Warren Wooster to provide some comments:

I applaud the Science Board selection of Paul LeBlond to receive this award. Their citation makes the case very clear. I would like to comment on two points.

The first point relates to the interdisciplinary nature of marine science. Paul is a physical oceanographer, a species well known for avoiding involvement in messy fishery questions. But he early recognized that changes in ocean circulation and mixing had impact on fish populations and therefore has contributed actively to the work of several Canadian fishery conservation organizations. This is exactly the kind of miscegenation PICES has tried to promote!

Paul's career had been carried out in academia, at the University of British Columbia, where much of his teaching and research had been highly relevant to the work of PICES. As in the case in other member countries, such work is not done exclusively, or even principally, in government laboratories. This is evident in the makeup of delegations to PICES meetings where for example participation from Japan, Korea, and the US has usually been equally divided between government and academic scientists. Academic participation from other members tends to be significantly less. Yet not all wisdom

is to be found in government laboratories – as Paul might say, au contraire! I hope this point can be kept in mind by governments when identifying those to be supported for PICES participation.

Dr. Alexander and Dr. Wooster presented a commemorative plaque to Dr. LeBlond (a permanent plaque identifying Wooster Award winners resides at the PICES Secretariat in Sidney, British Columbia, Canada), who then made his acceptance remarks:

Madame la Presidente, distingues delegues, chers collegues,

It is a great honour for me to receive the Wooster Award and to find myself in the company of previous award recipients, Michael Mullen, Yutaka Nagata and Bill Pearcy, all of whom I met and learned to appreciate at previous PICES meetings. I am also particularly delighted to be more closely associated, through this award, with our founding father, Warren Wooster, who is here with us today. Warren's child, PICES, is now holding its Thirteenth Annual Meeting: PICES is now a teen-ager! Teen-age years are a period of great turmoil in human development. I am happy to say that I can detect no such turmoil in PICES, the institution. More importantly, I detect no evidence of a more common and graver symptom of maturing institutions: the tendency to crystallize into formality, to replace youthful enthusiasm with routine and protocol. One way for an institution to retain its youthful dynamism is to attract young people to its fold, or at least to ensure that its supporters remain young-at-heart. So, in gratitude for this award, I offer two wishes. To all of you as individuals, I wish that you remain young-at-heart and full of joie-de-vivre: may you all follow in the footsteps of our founding father, who was already past usual retirement age when he gave birth to PICES. To PICES as an institution, I offer the wish of continuing youthful and dynamic success for years and years to come. Thank you again!

PICES "Year-in-Review" 2003

Dr. Perry reviewed PICES' scientific accomplishments since the Twelfth Annual Meeting (*OP Endnote 10*).

Keynote lecture

The Science Board Chairman introduced the keynote speaker, Dr. Jeffrey J. Polovina (Pacific Islands Fisheries Science Center, National Marine Fisheries Service, United States of America). Dr. Polovina gave a keynote lecture titled "Send out the turtle fleet!". The abstract of his presentation is appended to the report in *OP Endnote 11*.

The Opening Session closed at 11:00 a.m.

OP Endnote 1

Welcome addresses on behalf of the host state by Ms. Yvonne Izu

Good morning. I am very happy to welcome all of you to our beautiful State of Hawaii and our lovely city of Honolulu.

It is especially gratifying that your Organization, PICES, and the US Government chose Hawaii as the site of its Thirteenth Annual Meeting. Hawaii is literally isolated in the middle of the Pacific Ocean, far from any large land mass. The ocean and ocean resources, therefore, are central to our lives. From the earliest inhabitants of our islands, who crossed a vast expanse of ocean from the South Pacific, to the tourists who are drawn here by the romance of Waikiki Beach – the ocean has largely defined who we are and how we live here in Hawaii.

The State Department of Land and Natural Resources is charged with the responsibility for protecting and managing the ocean resources that falls within the State of Hawaii's jurisdiction. In carrying out that responsibility we need to balance many different, and often competing, interests, such as economic,

environmental, social, and cultural interests. But we understand that to adequately protect our ocean resources, we need to rely, first and foremost, on good science.

As resource managers, we have greatly benefited from the fact that many excellent ocean scientists have chosen either to be based here or to conduct their studies here. Hosting this meeting of marine scientists from around the world is further reinforcement that Hawaii is recognized as a leader in the field of marine science, technology and education. And we thank you for having selected Honolulu as the venue for this meeting.

I wish you great success in your meeting. And I hope that each of you will have the opportunity while you are here in Hawaii to see some of the natural beauty of our island state and to experience some of our very unique culture. Once again, welcome and I hope you have a very enjoyable time while you are here. Thank you.

OP Endnote 2

Welcome address on behalf of the Government of the United States of America
by Dr. Michael P. Sissenwine

Madam Chairperson, distinguished delegates, ladies and gentlemen, on behalf of the United States, on behalf of your US PICES Delegates and US members of the PICES community, it is an honor to welcome you to this Thirteenth Annual Meeting of the North Pacific Marine Science Organization, better known as PICES.

As some of you know, I wear more than one hat. Today, I am speaking as the leader of more than twenty marine research laboratories distributed throughout the United States. However, I am also the President of the International Council for the Exploration of the Sea, perhaps PICES' big brother or sister. In my ICES capacity, I recently signed an agreement for collaboration with the Intergovernmental Oceanographic Commission, IOC. Last week, I participated in a meeting of the United Nations Food and Agriculture Organization advising on marine science priorities. I also serve as a US delegate to the Pacific Sciences Association, which stresses marine ecology issues of the Pacific Islands. I feel fortunate to be able to work with all of the major international marine science organizations, now including PICES. Obviously, I believe in international collaboration, and indeed, I think it is essential if we are to advance our understanding of complex marine systems.

Never has the need for international collaboration been greater. I suspect that many speakers have said this before, but I am sure it is true now. Challenges, such as understanding climate change, cannot be met unless nations work together. Opportunities, such as implementing the Global Ocean Observing System to provide products and services on a routine basis, and opportunities such as Ocean Exploration, including Census of Marine Life, to open a new era of discovery and excitement about the oceans, all require collaboration at the international level. In addition, public interest in the oceans, and expectations for them to be wisely and sustainably used based on objective science, are obvious to anyone exposed to the news media. These challenges, opportunities and expectations, not only require organizations like PICES, but also collaboration among them. This is happening. For example, I note that your Science Board Chairman is a familiar participant at ICES meetings.

I am particularly pleased with PICES' recent study to address the implications of regime shifts in the North Pacific on living marine resources. PICES scientists have been pioneering in describing the phenomena both in terms of the physical drivers, and ecological responses. These scientific findings lead to obvious questions about what managers should do about them. How do they know when a regime shift has occurred? How will the shift affect productivity of the resources that are the subject of conservation and management? For example,

can rebuilding targets and overfishing thresholds be treated as static, as they usually are, or do they need to be dynamic in response to ecosystem dynamics? I think the answer is obvious, but how to create a dynamic management regime that reflects the true dynamics of ecosystems, and not just an excuse for overfishing, is a critical challenge. And of course, managers want to know if future regime shifts can be predicted, and if not, are there early warning signs, and how will they recognize the next shift whenever it occurs? These are difficult, and important scientific questions. They are the epitome of relevance. By answering such questions, PICES is demonstrating that it has an "end-to-end scientific program," from basic research, to applied research, to advice and products used for decision making. This is certainly the type of scientific enterprise we believe we have created with our six ecosystem-oriented Science Centers in the US, and it is the type of scientific organization we believe is most valuable internationally.

The issue of regime shifts, and what to do about them, broadly falls within the realm of an ecosystem approach. Today, everyone is talking about the ecosystem approach. It has been called for to replace traditional approaches, or "single species" approaches, which are perceived by some to have failed. The World Summit on Sustainable Development in Johannesburg in 2002 called on Nations to apply the ecosystem approach to fisheries by 2010. The US Commission on Ocean Policy recently called for an ecosystem approach for fisheries as well as all of the nation's coastal and ocean resources. But what is the ecosystem approach? Policy makers face the dilemma of having bought into an approach largely espoused by scientists, yet scientists have either failed to articulate what it is in practical terms (so that managers actually know what to do), or even worse, scientists argue among themselves about what it is. In my opinion, this is an example of the scientific community failing to fulfill the "end-to-end" model I described a few minutes ago. In this regard, I hope PICES can help to focus the debate on tangible outcomes as it is doing for regime shifts.

For what it is worth, I will offer my opinion about what an ecosystem approach is. I think this is the emerging view of people who both understand the scientific issues, and also have practical experience translating scientific information into scientific advice that decision makers can use. The ecosystem approach is a process that allows broad participation into setting objectives, and it considers all sources of scientific knowledge, and uncertainties. It is not a pre-determined outcome that is necessarily different from the outcome that would have occurred otherwise, but more views and information will have been considered. The approach must be implemented incrementally, and collaboratively. It is an approach that is evolutionary, not revolutionary. There is no point when we have suddenly switched from a traditional approach to an ecosystem approach. In fact, I think we are applying an ecosystem approach today, more so than we were five years ago, but not as much so as we will be five years from now. There are many examples, dealing with bycatch, species interactions, habitat protection, and implication of regime shifts, as I discussed a few minutes ago. It is time to claim some victories, at least small victories, and build on them.

Let me close by thanking you for holding your Thirteen Annual Meeting here in the United States, in beautiful Honolulu. It gives US scientists a great opportunity to experience PICES. I also realize that such meetings are a lot of work for the local organizers and the Secretariat. I also want to thank them for their dedication and commitment to making this meeting a success.

PICES participants, please enjoy, learn and generate the new ideas and collaborations we need for the future. Thank you.

OP Endnote 3

Remarks at the Opening Session by Dr. Laura Richards (Canada)

Madame Chairman, distinguished guests and colleagues, on behalf of Canada and the Canadian delegation, I would like to thank the United States for inviting us here to Honolulu.

Last year was a milestone for PICES. We completed a Strategic Plan which is now posted on the PICES web site. The Plan includes a clear mission to provide scientific leadership and to advance scientific knowledge. The challenge for Committees here in Honolulu will be to begin to set this Plan in motion and to decide on actions that would chart the course for PICES over the next 3 – 5 years.

As a step in implementing the Strategic Plan, PICES agreed, for the first time in its history, to provide formal advice at the request of a Contracting Party, in this case, the United States. I think it is very appropriate for us to be meeting here in Honolulu to hear about the work of the Study Group and to present PICES' formal advice to the Government of the United States.

I, for one, am very impressed with the quality and relevance of the advice that the Study Group was able to provide. As mentioned by Dr. Sissenwine, we know that international collaboration is essential for addressing global problems like climate change and the sustainability of marine ecosystems. The work of the Study Group and the North Pacific Ecosystems Status Report are testaments to the willingness to collaborate within PICES. Together, these reports illustrate the strengths and opportunities of the vibrant PICES organization that we have created.

I anticipate that as we move forward, we will have an even greater need to provide impartial international advice on topics of concern to Pacific Rim nations. PICES has demonstrated its strength as an organization that can fulfill this role.

Let us look to the future and continue to build on our successes!

OP Endnote 4

Remarks at the Opening Session by Dr. Tokimasa Kobayashi (Japan)

Chairperson, distinguished delegates, guests and colleagues: First of all, on behalf of Japan and the Japanese delegation I would like to express sincere thanks to the Government of the United States of America, the Government of Hawaii State, the National Oceanic and Atmospheric Administration, and the local organizing committee for hosting this meeting and organizing all the events. We are sure that all your excellent efforts will make this meeting a great success. Furthermore I would like to appreciate the opportunity to visit wonderful and fantastic Hawaiian Islands here.

Since PICES was established in 1992, the Organization has been challenged with plenty of important issues on marine science. The activities of PICES have multiplied and extended in depth through the spirit of international scientific cooperation on a mutually beneficial basis as outlined in the PICES Convention. Collaboration with relevant international scientific organizations has also growing every year. Of course, I would like to emphasize that the efforts of member countries have pushed forward PICES activities and made PICES a splendid and flexible Organization.

In recent years, in the southwestern area of Japan facing the East China Sea, specific changes have been observed in the fauna and flora of marine organism related to the rise of seawater temperature. Moreover, in the Sea of Japan, innumerable large jellyfish appeared and damaged coastal fisheries. It may indicate that the marine ecosystem around the East China Sea and the Sea of Japan has begun to shift to a new phase.

We are aware of the relationship between climate change and the sustainability of the marine ecosystem. Therefore elucidation of the marine ecosystem function is an important and substantial issue, and building up a new accurate trend-forecasting model on the relationship between ocean environmental change and the dynamic fisheries resources fluctuation is expected. I emphasize that it is necessary that PICES continues to lead the scientific investigation on this issue in the North Pacific.

By the way, reformation of national scientific organizations has been proceeding in Japan. National universities had been transformed into outstanding executive agencies, independent of any direct connection with the government since last April. In October 2003, Japan Fisheries Research Agency had also combined two corporations, Japan Marine Resources Developing Center and Japan Sea Farming Association. Although our situation has changed, Japanese scientists would like to continue to encourage the mutually beneficial collaboration with PICES member countries.

Finally, to make sure the highly successful achievement of this Thirteenth Annual Meeting, all of the participants today would try to work together with the PICES spirit. Thank you.

OP Endnote 5

Remarks at the Opening Session by Mr. Wen-Xi Zhu (People's Republic of China)

Dr. Vera Alexander, Chairperson of PICES, distinguished guests, ladies and gentlemen, on behalf of the Chinese Government and the Delegation of of China, I would like to thank the Government of the United States of America for inviting us here to Hawaii. The Delegation of China is very appreciative of our host's efforts to organize this meeting and expressions of their hospitality.

Ushering into 21st century, with rapid economic development, conflict among population, environment and resources is becoming more and more serious. In the context of sustainable development, it has become an important and pressing task for every country to better understand the oceans.

Adjacent to the Pacific Ocean, and with a dense population in coastal areas, China has inevitably come to depend more and more on the oceans. In response to the call of the UNCED and the WSSD, and to ensure the marine sustainable development, the Government of China adheres strictly to the principle of laying equal emphasis on protection and development. In recent years, several national plans and programs have been promulgated, such as the National Programming Compendium on Marine Economic Development and the National Marine Functional Zoning Scheme, and a dozen of marine-related laws and regulations have been put into force or amended. Besides, our government has intensified its efforts in sea area use management, marine environment protection, disaster prevention and mitigation. However, we have fully realized that the efficiency of ocean management and the sustainability of ocean development are dependent on scientific understanding and assessment of the regional seas, even the global oceans. That is, marine science is the most important basis for management.

As an intergovernmental marine science organization, PICES concentrates its research efforts on the North Pacific. Through more than 10 years' effort, by displaying its important role in the promotion and coordination of marine research; advancing scientific knowledge about the global weather, climate change, oceans ecosystems and the impacts of human activities; and promoting the collection and rapid exchange of scientific information, PICES has already become a major forum for international cooperation in marine science around the world. As a country with important marine science capabilities, China attaches great importance to

marine scientific research. Therefore, China would like to strengthen its cooperation with each party within PICES' framework, and to play an active role in this connection.

Finally, I wish this meeting a great success and everybody a good stay in this beautiful city. Thank you.

OP Endnote 6

Remarks at the Opening Session by Dr. Chul Park (Republic of Korea)

Madam Chairperson, distinguished delegates, ladies and gentlemen, on behalf of the Government of the Republic of Korea and Korean delegation, I would like to appreciate Dr. Vera Alexander, Chairperson of PICES, Dr. Richard Marasco, Chairman of the Finance and Administration Committee, and Dr. Alexander Bychkov, Executive Secretary of PICES, for their enthusiastic effort to prepare this Thirteenth Annual Meeting.

Probably the oldest intergovernmental marine science organization is the International Council for the Exploration of the Sea, ICES, which was founded in 1902. Although its North Pacific analog, PICES, was established much later, it is catching up with ICES pretty fast. And this must be due to the excellent leadership shown by former Chairmen Dr. Warren Wooster, Dr. William Doubleday, and Dr. Hyung Tack Huh. On behalf of the Korean delegation, I would like to thank them for their devotion.

We gather here in the need for improved scientific understanding of the North Pacific Ocean and its processes, living resources, and oceanographic features. And this year's main theme is "Beyond the continental slope - complexity and variability in the open North Pacific Ocean". Obviously, questions related to this theme can be best answered through a spirit of international scientific cooperation.

One of the major topics we have discussed during the past couple of years, and will also discuss this year, is global warming and its impact on fisheries. Previous discussions were primarily based on catch data, in that the amount of fisheries resources could be assessed. Though previous reports successfully showed the relationship between reduction in fish catches and climate changes, so-called regime shift, the time lag that might be accompanied in case of fishes with multi-year-classes was not fully examined yet. And the possibility was not tested yet, either, that fish species might change their habitats so that usual fishing sites were not appropriate for the amount of usual catches. This possible abnormal migration or the shift of habitats can better be studied by international cooperative research. In this sense this year's theme is timely and in very good harmony with the spirit of PICES.

Discussions on the recent increase in gelatinous zooplankton also seem to be very timely. Despite their importance to the ecosystem and their damage to fisheries, there are substantial gaps in our knowledge of these organisms. The ecology of gelatinous zooplankton will also be discussed this year.

Other topics of this Annual Meeting are all timely and essential for the better understanding of the ecosystem of the North Pacific. I believe this Thirteenth Annual Meeting will be very successful through the efforts of all the participants who will be working together. I hope you will all enjoy the meeting and the day and nights in this beautiful paradise of the North Pacific. Thank you for your attention.

OP Endnote 7

Remarks at the Opening Session by Dr. Lev N. Bocharov (Russian Federation)

Distinguished Madam Chairperson, esteemed participating national representatives, ladies and gentlemen: First of all, let me thank you on behalf of the Russian delegation for this great opportunity to take part in this Annual Meeting and to visit Honolulu, which is one of the most beautiful cities in the world, located on the Hawaiian Islands.

I would like to emphasize the excellent work of the Local Organizing Committee and appreciate their tremendous efforts made to successfully host the Thirteenth Annual Meeting of PICES.

Over the past twelve years, the scope of PICES activities has multiplied. Currently, PICES as an international scientific organization is widely known in the world's scientific community and in the international fisheries community of the North Pacific.

Also I would like to mark the productive contacts between PICES and other scientific organizations involved in a complex study of hydrobionts stocks in the northern part of the Pacific Ocean. The forthcoming joint symposium with the North Pacific Anadromous Fish Commission on "The State of Pacific salmon and their role as indicators of the health of North Pacific marine ecosystems" planned in 2005 confirms that.

It makes all of us proud, that by common efforts of the Contracting Parties, we have already completed the development of such important document for subsequent PICES work as the Strategic Plan.

Unfortunately, a potential country-participant of PICES – Mexico, has refused to join our Organization this year due to economical difficulties. We hope these difficulties are temporary and we will be very glad to see Mexico as an equal country-participant of PICES in the near future.

At the end of my speech I want to wish all participants of the Thirteenth Annual Meeting productive work this week. We have a lot of important tasks to accomplish and many important decisions to make. Good luck to the Meeting and thank you.

OP Endnote 8

Remarks at the Opening Session by Dr. Richard Marasco (U.S.A.)

Madam Chairperson, distinguished delegates, ladies and gentlemen: I would like to express a warmhearted welcome to all of you on behalf of the United States and the United States delegation. I would like to thank the Pacific States Marine Fishery Commission staff and the PICES Secretariat for their efforts in setting up this Annual Meeting.

The thematic focus of this Annual Meeting is on the area of the North Pacific far beyond the continental shelf. These areas are generally perceived as physically homogeneous and stable with low biological productivity. Despite the low productivity, they are viewed as supporting complex ecosystems with high biodiversity. This focus provides the opportunity to compare and contrast these areas with neighboring regions of higher productivity.

Oceans transcend national boundaries and their study requires international cooperation and collaboration. The progress that PICES has made on the North Pacific Ecosystem Status Report is a testament to the willingness to collaborate within PICES. The Report provides an important summary of the status and trends of marine ecosystems and will promote movement toward a common understanding of changes that have occurred in these systems. Such knowledge is necessary if efforts to implement ecosystem-based management are going to be

successful. The North Pacific Ecosystem Status Report should therefore be viewed as the first step in the process of applying this increasingly important and popular paradigm. Steps that will follow include the development of joint research plans and analyses. These steps will be more difficult but they will pay high dividends. Some countries, such as the United States, have expressed interest in cooperating in joint studies of oceans to support sustainable use of marine resources. PICES has, and should, continue to play an active role in promoting these activities. Further, PICES scientists should continue to provide advice that will assist member nations design management strategies that promote the sustainable use of their living marine resources.

Societies face many challenges in this 21st Century. One challenge is the implementation of an ecosystem approach to the management of living marine resources. PICES scientists should play an active role in addressing this challenge. The recent formation of the Ecosystem Based Study Group will promote a dialogue that should assist such efforts.

Again, I welcome you to Honolulu and hope that you find the scheduled sessions informative. Thank you.

OP Endnote 9

Welcome Address by Dr. Vera Alexander, Chairman of PICES

Welcome again to the opening session of the Thirteenth Annual Meeting of PICES, the North Pacific Marine Science Organization. Quite appropriately, we are meeting in the middle of the Pacific Ocean on the beautiful island of Oahu with two broad goals and activities for the week. First and foremost, we will discuss and synthesize scientific knowledge about our region, and the second goal is to accomplish the things needed, to effectively manage and advance the Organization itself, providing the support needed for the scientific work.

I am using this opportunity to present a brief discussion of the status of PICES today. There is no question about the scientific productivity of PICES – the output has been phenomenal, and the quality high. PICES' special issues of journals, part of the refereed literature, have been extremely highly used and cited. PICES is addressing scientific issues of great contemporary concern, and providing the best possible scientific analysis. Examples of areas in which PICES has contributed are climate change and ecosystems, including fisheries, scientific information needed for ecosystem-based management, carbon cycling, effective modeling of the complex ocean system, iron fertilization, marine birds and mammals, and so on.

The primary mission of PICES is to promote scientific knowledge of the North Pacific Ocean, and PICES is more than fulfilling this mission. There is absolutely no way that individual nations could produce such comprehensive analyses and publications or produce the venues for such extraordinary scientific interaction among young and older scientists from around the Pacific Rim. The concept of a PICES, roughly, but not entirely, parallel to ICES, was a good one; I believe that we can safely say this after more than a decade of experience. I am pleased to recognize the presence today of Dr. Warren Wooster, the visionary, but also the investor of hard labor and years of experience, who made this Organization a reality. Further, I might add that I am blessed, as PICES Chairman, with a functional and well-established Organization. Of course, we must continue to develop and refine, but the basics have been done. We have just completed a Strategic Plan, and will be moving towards a comprehensive action plan constructed from the plans of the Scientific Committees through the Science Board.

PICES, to an ever-increasing extent, is being recognized within the larger context of international marine organizations, and we are delighted with the great interest and

participation at this meeting by representatives from more than 22 organizations. Governing Council plans to spend a few minutes hearing from some of these, so that we can continue to develop relationships and cooperate effectively. In particular, we will be interested to learn of specific areas that we can pursue together.

This critical work of PICES that I have just described - the scientific mission - supported by the other Annual Meeting activity, the management of PICES business. We have a smoothly operating, but overworked, Secretariat; I want to acknowledge their hard and excellent work, their dedication, and their effectiveness. I also want to thank the national representatives who serve on the Governing Council and on the Finance and Administration Committee for their hard work. Decisions are often not easy, and the thoughtful contributions of the contracting party delegates are critical to the Organization. Whereas the PICES Science Board and Scientific Committees and other bodies enjoy the responsibility for oversight and conduct of the scientific part of the work, the governing structure plays an essential role. Finally, many Contracting Parties have provided financial support beyond the required contributions, and this makes all the difference in PICES' ability to serve. It has allowed the expansion of activities and has contributed to the high scientific productivity.

So, on the balance, PICES is thriving. Now, we can look forward to this meeting. Thank you for coming - Aloha.

OP Endnote 10

PICES "Year-in-Review" 2004 by Dr. Ian Perry, Chairman of Science Board

The success of PICES, now and into the future, is being built upon three pillars: scientific excellence, scientific advice, and scientific capacity.

Scientific excellence includes publications, working group activities, workshops and symposia. PICES has been very productive scientifically this year, with five issues of primary scientific journals on PICES topics and one scientific report being published to date in 2004. Three other scientific reports are expected before the end of 2004. A measure of the scientific impact of these publications is provided by the *Elsevier* publications website which, as of September 2004, indicated that of the top 25 downloaded publications from journals in which PICES has special issues, papers published by PICES occupied positions numbered 2, 3, 5, 6, 12, 16, 18, 20 in *Progress in Oceanography* and 2, 9, 11, 13, 24 in *Marine Environmental Research*.

PICES-sponsored and co-ordinated research continues to be active on the water. The Continuous Plankton Recorder project conducts meridional transects in the NE Pacific 5-6 times annually, and zonal transects across the North Pacific 3 times annually, using commercial ship-of-opportunity vessels. And just one week prior to the Annual Meeting, the PICES Advisory Panel on *Micronekton sampling inter-calibration experiment* hosted a field survey off Hawaii in which they conducted inter-comparisons of systems typically used to sample micronekton in the North Pacific.

Another indication of PICES' scientific excellence is the North Pacific Ecosystem Status Report, which is available in pre-publication form from the PICES web site, and is expected to be published shortly. This report provides an analysis of the thirteen PICES regions in the North Pacific and a synthesis which integrates the status of all these regions. In general, although there are local and regional stresses in the marine ecosystems of the North Pacific, there have also been successes where marine populations are doing well.

The extent of scientific meetings also indicates the vibrant scientific life of PICES. Over the past year, PICES has convened or co-sponsored 19 meetings and workshops, including

monitoring in the North Pacific, modelling lower trophic level production and linkages to fish, biogeochemical processes and data integration related to carbon cycling and iron enrichment experiments, and ecosystem indicators for fisheries management.

The Thirteenth Annual Meeting of PICES, which we open today, with the theme of "*Beyond the continental slope - complexity and variability in the open North Pacific Ocean*", promises to be another successful event with 11 scientific sessions, 6 workshops, and several Working Group, Task Team and Advisory Panel meetings.

Scientific advice: PICES is not designed to provide short-term, tactical, management advice, in contrast to our sister organization ICES. However, PICES is moving to provide advice on broad issues concerning North Pacific marine systems, whether or not specifically requested by member nations. The North Pacific Ecosystem Status Report is one example of unsolicited advice. In October 2003, PICES received a formal request for advice from the United States concerning the characteristics and impacts of recent regime-like changes in the North Pacific. PICES responded by forming a 1-year Study Group (called FERRRS: *Fisheries and Ecosystem Responses to Recent Regime Shifts in the North Pacific*). The report of this Study Group will be presented to the United States at PICES XIII.

Scientific capacity: Scientific capacity within PICES includes the willingness and commitment of the scientists and others about the North Pacific (and elsewhere) to devote time and effort to the work of PICES. It also includes a strong PICES Secretariat which, with only 4 permanent staff, is doing an outstanding job of keeping these activities going.

To help a broad-based, scientific, organisation like PICES formulate a clear direction and maintain a sense of forward momentum, the Governing Council, Science Board, and scientists of PICES developed the PICES Strategic Plan. The PICES mission is "*To promote and coordinate marine scientific research in the North Pacific Ocean in order to advance scientific knowledge of the area concerned and of its living resources.*" The Strategic Plan includes a strategy for PICES to achieve this mission, involving 5 themes each with specific goals:

Theme A. Advancing scientific knowledge
Theme B. Applying scientific knowledge
Theme C. Fostering partnerships
Theme D. Ensuring a modern organization supporting PICES activities
Theme E. Distributing PICES scientific information.

The Strategic Plan was developed to guide the selection of future activities of PICES. The next steps are to develop an Action Plan, in which each PICES Committee considers where they want to go over the next 3-5 years, what topics they want to explore, and how these fit together with topics of other Committees.

PICES has also reorganized the Climate Change and Carrying Capacity (CCCC) Program. The Basin Scale (BASS) and Regional Experiment (REX) Task Teams are concluded at this Annual Meeting, and PICES thanks their Chairmen and members for their effort and dedication. They have been replaced with a new Task Team on *Climate Forcing and Marine Ecosystem Response* (CFAME), whose objective is to synthesize regional and basin-wide studies and provide a forum for the integration and conclusion of CCCC-related hypotheses and data. The MONITOR Task Team of the CCCC Program has been removed from the CCCC Program and re-formed as a Technical Committee directly under Science Board. This will provide an on-going focus on monitoring in the North Pacific, and in particular will consider the monitoring needs of the PICES Region, oversee updates to the North Pacific Ecosystem Status Report, and serve as the interface between PICES and observing systems such as GOOS.

In addition, PICES is discussing what scientific issues should be the basis for the next major integrating program of PICES, after the completion of the CCCC Program. Suggestions so far include additional questions arising from the CCCC Program, possible interactions with

CLIVAR on climate and North Pacific ecosystems, issues of marine biogeochemistry and food webs that would link with the new IGBP program on *Integrated Marine Biogeochemistry and Ecosystems Research* (IMBER), and ocean and ecosystem responses to high concentrations of carbon dioxide.

Finally, as this meeting is the end of my 3-year term as Chairman of PICES' Science Board, I welcome Dr. Kuh Kim (Korea) as the new Chairman of Science Board, and express my thanks to the Governing Council, the scientists, and in particular to the PICES Secretariat for their help and support during my term. Your support has been essential – Thank You!

OP Endnote 11

"Send out the turtle fleet!"

Abstract of the keynote lecture by Jeffrey J. Polovina (Pacific Islands Fisheries Science Center)

In order to describe the oceanic habitats and migratory pathways of large pelagic animals, biological oceanographers are sending out fleets of animals with electronic tags. Since 1997, I have worked with a number of colleagues deploying fleets of pelagic animals including sea turtles, tunas, moonfish and whale sharks. I will describe some of the insights we have gained from sending out fleets of loggerhead, olive ridley and leatherback sea turtles in the North Pacific. The turtles we tracked come from a variety of sources including turtles caught in long-line fisheries, turtles captured by research scientists, and turtles released from aquaria. Electronic tags are attached to the turtles to transmit frequent estimates of the turtles' positions via an Argos satellite. These data together with environmental data from satellite remote sensing are used to describe the oceanic habitat used by these turtles. The results indicate that loggerheads travel across the North Pacific, moving seasonally north and south primarily through the region 28°-40°N, and occupy sea surface temperatures (SST) of 15°-25°C. Their dive depth distribution indicated that they spend 40% of their time at the surface and 90% of their time at depths less than 40 m. Loggerheads are found in association with fronts, eddies and geotropic currents. Specifically, the Transition Zone Chlorophyll Front (TZCF) and the meanders and eddies in and south of the Kuroshio Extension Current (KEC) appear to be important forage and migration habitats for loggerheads.

In contrast, olive ridleys were found primarily south of loggerhead habitat in the region 8°-31°N latitude, occupying warmer water of the subtropical gyre with SSTs of 23°-28°C. They have a deeper dive pattern than loggerheads, spending only 20% of their time at the surface and 60% shallower than 40 m. However, the three olive ridleys identified from genetics to be of western Pacific origin, spent some time associated with major ocean currents, specifically the southern edge of the KEC, the North Equatorial Current (NEC) and the Equatorial Counter Current (ECC). These habitats were not used by any olive ridleys of eastern Pacific origin, suggesting that olive ridleys from different populations may occupy different oceanic habitats. Finally leatherback turtles use a range of habitats including the California Current and the equatorial currents. Like the olive ridleys they forage subsurface with a high proportion of their time-at-depth in the 25-50 m depth range in both the eastern and equatorial Pacific.