REPORT OF OPENING SESSION

The Opening Session was called to order at 9:00 am on October 23. The Chairman, Dr. Hyung-Tack Huh, welcomed delegates, observers and researchers to the Ninth Annual Meeting. Dr. Huh introduced the Mayor of Hakodate, Mr. Hiroshi Inoue, who greeted participants on behalf of the host city.

Mr. Chairman, distinguished Delegates, ladies and gentlemen:

It is my great pleasure to have this opportunity of personally offering a few words of greeting. First, on behalf of the citizens of Hakodate, I would like to express my warmest welcome to all of you. It also gives us great pleasure to greet all the participants here in Hakodate from all over the world to the PICES Ninth Annual Meeting.

With the 21st century just ahead, we, human beings, are faced with serious problems such as an increasing human population, decreasing food resources, anticipated food shortage, and global environmental problems. So, worldwide interest in the ocean has been increasing day by day.

Under these circumstances, it is appropriate that the PICES Ninth Annual Meeting be held here so all the participants can report on the results of their research and exchange views regarding marine environment change, useful utilization of living resources, and the impacts on ecosystems by human activities such as fishing. I also believe that this meeting will have a great significance in promoting the development of marine science.

This Future University of Hakodate, venue for this meeting, opened in April this year with the objective of developing human resources so that they can play active role in the forefront of today's information intensive society. I sincerely hope that you will actively exchange views and information in the novel, futuristic and open atmosphere of the university.

In conclusion, I offer to the PICES Ninth Annual Meeting my best wishes for success. Also, I would like to express my gratitude to the members of PICES and related organizations such as the Ministry of Foreign Affairs, who have made special efforts to make this meeting possible in Hakodate. Thank you for your attention.

Dr. Huh asked Mr. Yukiya Amano, Deputy Director-General for Arms Control and Scientific Affairs, Ministry of Foreign Affairs, to welcome participants on behalf of the Japanese Government.

Thank you Dr. Huh for your very kind introduction. Distinguished Delegates, participants, ladies and gentlemen:

I am honored to have the opportunity to welcome you all today. I would like to express my sincere welcome to all participants, especially those who have traveled long distances and spared valuable time from their very busy schedules to attend this meeting. I would like to say a few words on behalf of the Japanese Government at the start of the PICES Ninth Annual Meeting.

One of my duties in the Ministry of Foreign Affairs of Japan is to promote both bilateral and multilateral cooperation in science and technology. Recent years' progress in the field of science and technology has opened up new intellectual frontiers. At the same time, as the development in information and communication technologies have underpinned the development of globalization, progress in the field of science and technology has had a substantial influence on economic and industrial activities as well.

Such broad influences brought about by the progress in science and technology may cross

beyond national borders reaching the entire international society. The international community is now confronted with various global issues that can no longer be solved by a single nation. Some examples of these issues include environmental problems, the population explosion, energy supply, food security, and so on. Against this background, the world is following with great expectation and interest, the progress of science and technology.

As things are being globalized, it is a prerequisite for realizing the peace and prosperity of the international community to tackle these global and common issues of the international community. To solve these global issues, it is also necessary to make all the scientific and technological expertise available through international cooperation. Recently research projects in the field of science and technology are getting larger, such as the international Space Station, human genome and others. No country alone can easily afford to cope with current issues. International cooperation in science and technology is also indispensable to make use of effective funds and scientific knowledge.

Under these circumstances, Japan intends to play a positive role commensurate with its status in the international community through bilateral and multilateral cooperative activities in the field of science and technology. These are the basic thoughts based on which Japan has been making efforts to promote international cooperation in the field of science and technology, and that through international agreements with about 40 countries.

Now to focus on marine science. This is a very old theme of science. The sea, which covers 70% of the surface of the Earth, has existed far longer than human beings. The sea has always been deeply connected with human life. The North Pacific region has a lot to do with the global environment and climate change. As our life in Japan depends on the sea for fisheries, transportation and many other things, it is important for our country to promote various scientific marine research in this region.

In marine scientific research, international cooperation is a prerequisite. Specifically, regarding marine scientific research in Japanese waters, it is essential to cooperate with the countries in this region. PICES has been highly valued by Japanese marine science researchers as an important forum to exchange information among scientists in the North Pacific region. It is an indispensable organization for marine scientists who conduct research on the North Pacific region including the area around Japan, while actively participating in PICES activities.

PICES is currently holding its ninth meeting. Since we had the first PICES Meeting in Victoria in 1992, PICES has steadily expanded its activities by sharing scientific knowledge, and providing a forum to exchange information among marine scientists from the member countries in the various fields of marine science. Next year we will mark the tenth anniversary of PICES. I hope that we can exchange information on various plans to commemorate the anniversary at this meeting.

I hope that PICES activities will develop in the future and contribute to the solution of global issues, particularly those relating to humanity. The purpose of the PICES Meeting is not only to discuss and to exchange information and knowledge, but also to form a well-fabricated network of scientists. I believe this network will make our research activities efficient.

Lastly I wish to extend my gratitude to Dr. Huh and the citizens of Hakodate. Thank you very much.

Dr. Huh then called upon Dr. William G. Doubleday to make a statement on behalf of the Canadian Government.

Mr. Chairman, your Worship the Mayor of Hakodate, honoured guests, distinguished Delegates and scientific colleagues:

On behalf of Canada and the Canadian delegation, I wish to thank the Government of Japan and the City of Hakodate for inviting us here to a city with a long and strong connection with the sea.

Canada is a strong supporter of PICES. We are encouraged by the way PICES shares data and ideas across the disciplines of marine science. We must build on the success of PICES to expand this cooperation and increase the data we share.

World scale cooperative ocean monitoring systems are gaining momentum. Argo is underway and Canada is joining other countries deploying Argo drifting buoys in the North Pacific. PICES should play a key role in Argo implementation in the North Pacific. PICES should also play an active role in implementing GOOS, the Global Ocean Observing System in our area. We believe that PICES should have a single monitoring committee covering all aspects of North Pacific ocean monitoring.

PICES has expanded its cooperation with other organizations and is beginning to involve climatologists in our community. The North Pacific CO_2 Data Synthesis Symposium and associated Workshop held in conjunction with the Ninth Annual Meeting last week is a good example of progress in this area. We should continue to expand the PICES community to address issues of coastal and ocean management and to develop close links with climate programs such as CLIVAR.

The cooperation of fisheries commissions with PICES in sponsoring the Beyond El Niño Conference on Pacific Climate Variability and Marine Ecosystem Impacts is a sign of the growing recognition and influence of PICES. The joint symposium with NPAFC next week is another sign of the increasing importance of PICES. The excellent program and high level of participation at this meeting demonstrate that PICES continues to grow as a focus for all kinds of marine science in the North Pacific. Let us work together to continue this growth! Thank you.

Dr. Huh called upon Mr. Qian-Fei Liu, to make a statement on behalf of the Chinese Government.

Mr. Chairman, distinguished guests, ladies and gentlemen:

First of all, I want to sincerely thank the Japanese Government for the excellent organization of the PICES Ninth Annual Meeting and generous support to the Meeting. I am very honored to be able to deliver a speech on behalf of the Chinese delegation.
The Chinese government has always supported bilateral and multilateral exchange and cooperation in science and technology with all the countries in the world. Today, environmental deterioration, energy shortage and other problems have caused concerns from the whole world as they are threatening human life. To solve these problems, there needs to be a wide range of international cooperation as well as mutual exchange of scientific information.

The ocean occupies more than 70% of the total surface area of the Earth and it has a close relationship with human existence. Human beings have put a lot of time and resources into marine scientific research. These inputs will be increased in the future and many global marine research projects require the participation of different countries.

The oceanic research is aimed at not only the ocean environment, but also the interaction of the ocean and meteorology and their effect on the global climate, fauna, flora, ecology, and human activities related to the oceans. China, as a coastal nation of the North Pacific, is one of the major world oceanic scientific research countries with major marine fisheries. Under the circumstance of limited available resources, making full use of the ocean resources will be of future potential development. Therefore, all member states will play a very important role in

the future oceanic studies. I hope, through active cooperation, we will conduct more scientific research in the North Pacific region to promote scientific progress. I hope that all the participants will join in becoming the force to push the future cooperation in this region.

Finally, I wish the Meeting a great success. Thank you for attention.

Dr. Huh called upon Mr. Lae-Hyung Hong to make a statement on behalf of the Republic of Korea.

Mr. Chairman and distinguished Delegates, ladies and gentleman:

It is a great honor for me to have the opportunity to give an address on behalf of the Korean Delegation. I would like to thank the Japanese Government, the Hakodate local government and PICES staff for inviting us to this lovely place.

Over the last decade, we saw many important events which were crucial for the ocean community. For example, the UN Conference on Environmental and Development and the UN Convention on the Law of the Sea give much greater implications and responsibilities to us to strengthen and develop marine related activities in an effective manner. That's why we are interested in PICES.

I firmly believe that PICES has made progress since 1992 in quantity as well as quality. With regards to the program of PICES, we are pleased to see that PICES is concentrating on timely and appropriate issues such as El Niño and the relation between climate change and the marine ecosystem. We hope that PICES will greatly contribute to the societies of oceanography, fisheries, and other marine related fields.

The Korean Government and scientists will be highly supportive of cooperative studies promoting and coordinating marine science in the North Pacific Ocean. Moreover, we hope that PICES will progress to contribute to regional economic growth by applying its marine scientific knowledge.

It is also my pleasure to take note that our government will host the 5th IOC/WESTPAC Scientific Symposium in August 2001, in Seoul, as a follow up to the 4th IOC/WESTPAC session held in Seoul, in March 1999. I hope that this symposium will provide an opportunity for us to share the result of PICES programs with other international organization in the North Pacific area.

Lastly, the Korean Delegation wishes all participants at the PICES Ninth Annual Meeting success in their scientific undertakings. Thank you very much.

Dr. Huh called upon Dr. Lev N. Bocharov to speak on behalf of the Russian Federation.
Dear Mr. Chairman, Honourable Mr. Inoue, Mayor of Hakodate, Mr. Amano, distinguished Delegates, ladies and gentlemen:

First of all, I would like to take the opportunity to say many thanks to the host country of the PICES Ninth Annual Meeting, to the Government of Japan, and to the Local Supporting Committee for the hard work in arranging this event. This meeting is very important for the scientists from North Pacific countries. Especially, I want to express my gratitude to the PICES Secretariat, whose work is equally successful on the both sides of the Pacific Ocean - in Japan and Russia, in the U.S.A. and Korea, in Canada and China.

PICES IX has already started its work and we must just wish for its successful continuation. But next year PICES will be holding an unusual Annual Meeting. Firstly, the meeting will be held in the PICES Secretariat' home country – Canada. Secondly, it will be the jubilee Tenth Anniversary Meeting. And we shall have to summarize the results of the first decade of PICES' existence. But some things we can already say now.

PICES' work has become very active. This year PICES already held two impotent events. One was the CCCC/MODEL Workshop on Lower Trophic Level Modelling in Nemuro, Japan. The other one was the Beyond El Niño Conference on Pacific Climate Variability and Marine Ecosystem Impacts in La Jolla, U.S.A., this spring. I think they gave new insights into the influence of climate extremes on living marine resources.

The cooperation with other International marine organizations became more active too – with the International Pacific Halibut Commission, the North Pacific Anadromous Fish Commission, etc.

Moreover, this year, my institute, the TINRO-Centre which hosted PICES VIII in Vladivostok, celebrated its 75th anniversary. So taking this opportunity, I say many thanks to Dr. Huh, the PICES Chairman, and to the PICES Secretariat for their warm congratulatory letters.

I believe that this year, PICES has given birth to one more good tradition here in Hakodate. The scientists from different countries will meet the students and fishermen of Hokkaido and share with them their scientific experience about marine living resources. We all wish to maintain the Ocean for the future generations and do our best for it. The scientific activity is a creative process, and the future of mankind must be built not by consumption, but by creativity.

I wish the PICES Ninth Annual Meeting a big creative success, which is impossible without wide international cooperation. Thank you.

Dr. Huh called upon Dr. Vera Alexander to make a statement on behalf of the U.S. Government.

Mayor Inoue, Mr. Amano, Chairman Huh, distinguished participants:

I speak on behalf of the United States Delegation to express our deep indebtedness to our hosts for providing us with an outstanding venue and support for the Ninth Annual Meeting of PICES. This promises to be an outstanding meeting.

As the end of the first decade of its life approaches, PICES has, we believe, fulfilled a potential which less than ten years ago was only a dream - to bring together the active leading scientists, both young and old, to address scientific problems of the North Pacific which can only be approached on a multi-national basis. PICES is doing this, and doing it well. Also, it is good to bring together scientists with differing scientific cultures, to develop mutual understanding and friendship. The exchange of information is flourishing.

Our hosts in Japan have selected an appropriate site for this meeting. Hakodate is an outstanding choice – a prime fishing hub and a world-class fisheries education and research center. Scientists from here have been among the first to recognize the importance of knowledge about the marine ecosystem and climate to understanding fish stocks. Many of the outstanding marine and fisheries scientists have received their training here, and their web of international contacts is broad and long-standing. Also, we are meeting at a new university, dedicated to the future. So is PICES, as we look forward to the approaching second decade.

Once again, we are excited about the productive, stimulating and even exciting week to come. We will move PICES forward one more step. Special recognition must go to the Japanese government, to Hokkaido, Hakodate, the Local Support Committee, and to our Japanese colleagues who have worked hard and long to assure the success of this meeting. Last but not least, the PICES Secretariat has done the usual excellent job in making sure that all details are taken care of. Thank you.

Dr. Huh asked Dr. Tadashi Inada to provide a few words on behalf of the Japanese Government.

Honourable guests and participants:

On behalf of Japanese marine scientists, I welcome all of you to Japan and Hakodate. I hope your trip to Hakodate was smooth and enjoyable.

This is the second PICES Annual Meeting held in Japan. The first time, we had it in Nemuro, the city of fishery at the easternmost of Japan and situated in the subarctic water. This time, we are here in Hakodate, the city of fishery, marine industry, marine sciences and sightseeing, at the southern boundary of subarctic water. Thus, you can expect nice seafood at night sessions.

In the preparation and arrangement of this meeting, we have had great support from Hakodate City and the members of the Local Supporting Committee. Also, we must thank the Hakodate Future University, as they offered their campus for our venue.

I believe PICES was established, as a Pacific ICES, to promote and co-ordinate marine sciences toward the wisdom for the best use of marine living resources in the North Pacific. This is also one of the goals for the Fisheries Agency and Fisheries Research Institutes under it. Increasing human population and increasing needs for food supply, and anticipated global climate changes, demand the best available solution as soon as possible. The PICES-GLOBEC "Carrying Capacity and Climate Change", so called 4C's Program, is the first and direct action plan of PICES toward this goal. The scientific question addressed by the 4C's Program is "How do the North Pacific marine ecosystems respond to climate changes, and how will the carrying capacity of important marine living resources be affected by it?"

This question is very difficult to answer by the science of a single discipline. The huge extent of the North Pacific makes it difficult to solve these questions by the effort of a single country. The need for co-operation is strengthened by the facts coming out through the implementation of the 4C's Program.

This past February, the PICES Lower Trophic Level Modeling Workshop was held in Nemuro. At this workshop, modelers and other scientists from all PICES countries met to discuss the technical problems of modeling, parameter setting, and observational data to verify the models. It was a fruitful workshop as a PICES activity.

Another important issue is the connection between regional ecosystems. Subarctic zooplankton move over-winter in the deeper layer and are transported at least one thousand kilometres by currents. In the case of fishes living in the subarctic region, for example, salmon also migrates between the coast of Japan and the Bering Sea and live on zooplankton in those areas. These migrants connect ecosystem dynamics spanning thousands of kilometers. Thus in order to reach the goal of the 4C's Program, we need not only to make inter-comparisons among regional ecosystem models, but also need to connect them by advection and migration.

The 4C's Program must begin the third phase of its implementation, where intense integration and synthesis will occur. One of the most important characteristics of PICES as a scientific organization is its function in inter-disciplinary and international co-ordination and co-operation. Thus we are here to develop tight inter-discipline, international and also intra-national co-operation. I believe important steps shall be made through this Annual Meeting.

Before ending my speech, I would like to relay Dr. Kashiwai's promise to recover and to pass his best regards to all of PICES friends. Thank you for your kind attention.

Dr. Huh thanked the Mayor Inoue, Mr. Amano and all the delegates for their remarks and spoke on behalf of PICES:

Honorable Mayor of Hakodate, Mr. Hiroshi Inoue, Mr. Yukiya Amano of the Japanese Ministry of Foreign Affairs, distinguished participants, ladies and gentlemen:

On behalf of PICES, I would like to extend a warm welcome to all of you to the Ninth Annual Meeting of PICES. It has been generally said that the New Millennium is the Era of the Pacific, and I am very excited by the fact that the first annual meeting of PICES in the new millennium is held in this beautiful City of Hakodate. I feel very comfortable to be here this morning as this is my second visit to Hokkaido. I believe that everybody from overseas particularly those who were in Nemuro in 1994 at the Third Annual Meeting will be reminded of the warm hospitality of the Hokkaido people. I, therefore, would like to express my special thanks to the citizens of Hakodate and commend the hard work of the Local Supporting Committee in preparing this Meeting.

PICES is now eight and a half years old, still young, but has grown as a strong international scientific organization with active participation of hundreds of scientists and government representatives from the nations in the North Pacific. Dr. Vera Alexander, Vice-Chairman of PICES, said last year that PICES "is a mature organization", and Dr. William Aron, then a delegate of the U.S.A., said in 1994, that PICES is "a formidable intellectual enterprise" when we were only two and a half years old. Well, I am not 100% sure about these comments, but I certainly believe that PICES has now become the main forum for advancing and coordinating international marine sciences in the North Pacific, and will continue to play a major role in providing the scientific underpinning for decisions regarding the sustainable use of marine resources of the North Pacific Ocean.

During the last inter-sessional period, PICES has made many recognizable accomplishments through meetings, publications, strengthening relationships with other international organizations, soliciting action plans, and so on. Among more than ten PICES-arranged meetings, the Beyond El-Niño Conference, held in La Jolla, U.S.A. last March, appeared to be one of the most successful events. The Conference was the first large inter-sessional meeting organized by PICES. It was well attended by scientists from member states and also from other Pacific Rim nations such as Mexico, Peru, Chile, Columbia and New Caledonia. We are very much indebted to Dr. Warren Wooster and his Steering Committee members for the excellent conference.

As for publications, I believe it is worth mentioning that the papers from 1999 Science Board Symposium were published last month as a Special Issue of Progress in Oceanography *under the theme of "The Nature and Impacts of North Pacific Climate Regime Shifts". The papers from the Beyond El-Niño Conference are also in progress of being published next year as the 3rd PICES Special Issue of* Progress in Oceanography. *We would like to continue to have this series of publication, as it is one of the best ways to communicate research results and accomplishments of PICES to the scientific community.*

Strengthening relationships with other international organizations and programs has been among the top priorities for PICES. This year has been quite successful in this regard as we have found many allies such as IATTC (Inter-American Tropical Tuna Commission), IPHC (International Pacific Halibut Commission), ISC (Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean), NPAFC (North Pacific Anadromous Fish Commission) and SCOR (Scientific Committee on Oceanic Research) to join PICES in co-sponsoring the Beyond El-Niño Conference. The joint workshops by NPAFC/ PICES on "Salmon and Climate Variability" and by ICES/PICES on "Zooplankton Ecology" exemplify the close cooperation between international bodies in advancing the marine sciences in the North Pacific.

As many people have already pointed out, PICES is now a strong, vibrant and very important ocean science organization, and its scientific prowess is widely recognized. PICES has made its own tradition, spirit and style of collaboration. With its effectiveness and scientific constituency, I hope that PICES will continue to gain momentum in the scientific community and to meet the challenge ahead of us in the coming years.

I am very pleased to see that we have a very exciting and diverse scientific program for the Annual Meeting. The program includes subjects of vital importance to the oceans community, covering a wide range of topics such as CO_2 cycle, subarctic gyre processes, plankton ecology and trophic pathways, sea birds and mammals, iron fertilization, ecosystem models, effects of climate variability on fish, large scale circulation, etc. I would like to recognize the significant contribution of Ms. Patricia Livingston and her troop, members of the Science Board, in making this excellent program.

It is a truly encouraging thing to see an ever-increasing number of participants at our Annual Meetings. Thanks to everybody for coming to Hakodate. I am particularly thankful to the Pacific Oceanological Institute of Russia and the Pukyung National University of Korea for sending their research vessels with big groups of scientists and students to Hakodate on the occasion of this Ninth Annual Meeting of PICES.

Before closing my remarks, I would like to recollect the memory of the late Prof. Kiyotaka Ohtani of the Hokkaido University. Prof. Ohtani, who passed away last year, made a great contribution to PICES. He had been deeply involved in PICES activities, particularly in the publication of "Dynamics of the Bering Sea" which is one of the best books PICES has published so far. We miss him very much as we gathered here in his hometown, Hakodate.

I would also like to share our concern for the illness of Dr. Makoto Kashiwai of the Hokkaido National Fisheries Research Institute. Dr. Kashiwai, the former Chairman of Science Board, has been one of the most enthusiastic supporters of PICES. He was suddenly hospitalized and had an operation last week. I hope you would join me in wishing him a fast and complete recovery.

Finally, I would like to recognize the support of organizations and people for which we are very much thankful: the City of Hakodate, the Japanese Ministry of Education, the Ministry of Foreign Affairs, the Japanese Fisheries Agency, the Environmental Agency of Japan, the Japan Science and Technology Corporation, the Future University of Hakodate, and Prof. Yutaka Nagata of the Marine Information Research Center.

I wish the meeting a full success and all participants a memorable time in Hakodate. Thank you.

Dr. Huh then introduced Ms. Patricia Livingston, the Science Board Chairman, to review PICES' scientific accomplishments in 2000.

The year 2000 saw continued progress in the area of international collaborative field and laboratory work by the PICES scientific community. A PICES-sponsored interdisciplinary cruise aboard a research vessel "Professor Gagarinsky" was organized by the Pacific Oceanological Institute (Vladivostok, Russia) to study ecosystem structure and dynamics of the northern Japan/East Sea. Integration of the results from the 1999 international Vancouver Harbour Practical Workshop by scientists of our Marine Environmental Quality Committee's Working Group 8 on Practical Assessment Methodology will take place in one of the topic sessions at this year's Annual Meeting. All collected data will be compiled and published as a PICES Scientific Report in 2001. Similarly, the Physical Oceanography and Climate Committee's

Working Group 13 on Carbon Dioxide in the North Pacific continued to make significant progress in improving measurement quality for the carbonate parameters by carrying out a series of between laboratory comparisons of measurement technique. This year's inter-comparison, followed up by a technical workshop in Tsukuba, was focused on the measurement of total alkalinity in seawater. Finally, the PICES-GLOBEC Climate Change and Carrying Capacity Program (CCCC) continued its two-year study to initiate continuous plankton recorder (CPR) monitoring in the North Pacific and showed interesting results with regard to a latitudinal gradient in maturation timing for winter-spring dominant copepods. PICES continues to discuss how to maintain this monitoring as a long-term PICES effort.

International collaborations of PICES are expanding. PICES scientists participated in a joint ICES/PICES mini-symposium at a meeting of the ICES Zooplankton Ecology Working Group in spring 2000. Plans for a jointly sponsored large symposium on zooplankton ecology by ICES, PICES and GLOBEC are now underway. The North Pacific Anadromous Fish Commission (NPAFC) and PICES jointly sponsored an international workshop on "Factors affecting production of juvenile salmon" in Tokyo just after the PICES Annual Meeting in Hakodate. The Census of Marine Life and the International Pacific Research Center will co-sponsor with PICES an international workshop on "Impact of Climate Variability on Observation and Prediction of Ecosystem and Biodiversity Changes in the North Pacific". This workshop will help us make significant advances in producing a PICES Ecosystem Status Report and to begin collaborations to advance a North Pacific monitoring and prediction system that will match the goals of the Census of Marine Life program and the International Oceanographic Commission's Global Ocean Observing System (GOOS).

In the spring of 2000, PICES and several international organizations sponsored the "Beyond El Niño" Conference. This highly successful scientific conference provided substantial evidence for North Pacific ecosystem variability at interannual and decadal time scales and insights on the implications of these variations for fishery management. Selected papers from the conference will be published in a Special Issue of Progress in Oceanography scheduled to come out later in 2001. The proceedings from the 1999 Science Board Symposium was published this year as a Special Issue on "North Pacific Climate Regime Shifts" in that same journal, Vol. 47 (2-4).

Many other PICES scientific efforts were documented in 2000 by the publication of results in the PICES Scientific Report series: Volume 13 represents Bibliography on Oceanography of the Japan/East Sea, Volume 14 summarizes results of Working Group 11 on Predation by Marine Birds and Mammals in the Subarctic North Pacific Ocean, and Volume 15 has the proceedings of the 1999 PICES-GLOBEC CCCC Program REX and MONITOR Workshops and the 2000 MODEL Workshop.

The PICES-GLOBEC CCCC Program continues its work on integrating and stimulating national GLOBEC research efforts in the North Pacific. MODEL has been very successful in beginning the development of a standardized lower trophic level model that can be applied to a variety of regions for intercomparison and coupling with upper trophic level models. The work on validating their NEMURO lower trophic level model will continue in the coming years. The Regional Experiments (REX) Task Team is presently focusing on comparative work on herring in the North Pacific. They just completed a workshop on "Trends in Herring Populations and Trophodynamics" and are planning an expansion of their work to consider trends in size-at-age for a number of fish species in 2001. REX and Basin Scale Studies (BASS) Task Teams are collaborating with MODEL

Task Team to begin integrating their work into coupled biophysical models.

PICES has several directions for its future scientific efforts. We need to find ways to promote more interaction with regional and international programs of the most interest to PICES scientists. In particular, there are many regional programs in the North Pacific that involve several PICES nations. PICES has an opportunity to bring its ecosystem perspective to these regional programs and provide assistance in coordinating research in these areas. There are many large international programs in the marine science area and PICES will be focusing its efforts on cooperation with those that are in the best interest of the PICES scientific community and of greatest benefit to PICES member nations. One of our biggest challenges still lies in promoting and coordinating international research efforts in the open North Pacific. The initiation and continuation of collaborative research efforts in this area will benefit all PICES nations that border this important area. Finally, providing scientific results that are useful to marine policy makers of the North Pacific is our ultimate goal.

Ms. Livingston introduced Dr. Takashige Sugimoto to give the keynote lecture. Dr. Sugimoto addressed the subject of *Recent advances of studies and key questions on the Kuroshio-Oyashio ecosystem* providing a comprehensive overview of the research efforts, results, and questions of this important region. He discussed influence of wind intensity versus density stratification, southward intrusion of the Oyashio, long-term variations in ocean circulation in the subarctic North Pacific, and interannual-interdecadal variations of the plankton biomass and fish populations in the northwestern Pacific. Recent activity and future plan of Japan GLOBEC and GLOBEC-like studies of the Kuroshio-Oyashio ecosystem were also introduced.