REPORT OF BIOLOGICAL OCEANOGRAPHY COMMITTEE

The meeting of the Biological Oceanography Committee was held from 14:30-19:30 hours on October 12, 2003. The Chairman, Dr. Vladimir I. Radchenko, called the meeting to order and welcomed members, invitees, and guests (see *BIO Endnote 1* for attendance). Dr. Hidehiro Kato was welcomed as the new BIO Committee member from Japan. The Committee reviewed the agenda, and some items were supplemented by issues arising "at the last moment". Dr. Michio J. Kishi suggested that the next zooplankton symposium should be in Japan in 2007. Dr. David L. Mackas distributed an invitation to participate in a proposal for a workshop to identify global synchrony in fluctuations of zooplankton populations. Dr. R. Ian Perry has distributed a letter with the attached United States request to PICES for scientific advice. The Physical Oceanography and Climate Committee requested a discuss ion on proposals of the 2004 PICES/CLIVAR workshop. Decision was reached to discuss the first two proposals under item 3b, the third and fourth ones under item 16 of the agenda. The approved agenda is presented as *BIO Endnote 2*.

Business arising from last year's meeting (Agenda Item 3)

Status of proposed publications

Dr. Paul J. Harrison informed the Committee that a collection of contributed papers from JGOFS-related field programs in the North Pacific was published as a special issue of *Deep-Sea Research II* on "North Pacific Biogeochemical Processes" (Guest editors: T. Saino, A. Bychkov, C.-T. Chen and P. Harrison) in November 2002 (Vol. 49, Nos. 24-25). The issue includes an overview and 27 papers by authors from Canada, Japan, China-Taipei and Russia, with the majority of papers (21) from Japan.

Dr. Angelica Peña reported that a special issue of *Progress in Oceanography* on "Plankton size classes, functional groups and ecosystem dynamics" (Guest editors: A. Peña and A. Bychkov) was published in June 2003 (Vol. 57, Nos. 3-4). It includes selected papers from the PICES/JGOFS Topic Session at PICES X dedicated to the memory of the late Prof. Michael M. Mullin, the first BIO Chairman. The issue includes 11 papers by authors from Canada, Chile, Japan, Korea and U.S.A.

Dr. Harrison reported that a special issue of *Journal of Oceanography*, on "JGOFS North Pacific Synthesis" (Guest editors: T. Saino, A. Bychkov, C.-T. Chen, and P. Harrison) is in progress, and publication is expected in February 2004. The issue is based on invited papers only. A CD-ROM with data sets obtained during the North Pacific Process Studies will be prepared by the Japan Oceanographic Data Center and circulated later among the PICES scientific community. He also informed the Committee that another issue of *Journal of Oceanography* on "Progress in chemical, biological and geological oceanography" was published in April 2002 (Vol. 58, No. 2). It includes 11 review papers, in particular P. Harrison's paper on the one of the longest time series of any open ocean station, Station P, from the 1950s to 1981. This review summarizes the understanding of the plankton ecosystem for this station and examines interannual variability for the primary producers.

Dr. Richard D. Brodeur reported on the progress of a special issue of *Journal of Marine Systems*. This issue comprises of selected papers from the 2002 PICES XI BIO/POC/FIS Topic Session on "The importance of biophysical coupling in concentrating marine organisms around shallow topographic" (Guest editors: J. Dower and R. Brodeur). The issue will include an introduction and 6 papers by authors from Israel, Japan, Mexico and U.S.A. All papers are reviewed and revised, and will be sent to the journal in December 2003; publication is expected in the summer of 2004.

Dr. Brodeur also reported that the WG 14 final report is nearing completion. Two external reviewers have been arranged. Information gathered from PICES XII will be added to the report, and submission of the final version is anticipated by the year-end.

Status of proposed inter-sessional meetings

Dr. Tsutomu Ikeda reported on the 3rd Zooplankton Production Symposium on "The role of zooplankton in global ecosystem dynamics: Comparative studies from the World Oceans", jointly co-sponsored by PICES, GLOBEC and ICES. The Symposium was held May 20-23, 2003, in Gijón, Spain. This was a very successful meeting, the largest and most exciting zooplankton forum that has ever been convened, with 333 participants from 38 countries from 6 continents. Selected papers from the Symposium will be published as a special issue of the *ICES Journal of Marine Science* in May of 2004. Dr. Kishi suggested that the next Zooplankton Production Symposium be held in Japan in 2007. A BIO recommendation for a meeting theme was requested.

Dr. Mackas reported on a pending proposal for an international workshop to identify global synchrony in fluctuations of zooplankton populations (*SB Endnote 11*). If this proposal is approved, the workshop will be held in 2005 and involve 20-25 scientists. No funds are requested from PICES at this time. A letter of endorsement from BIO was requested. The Committee agreed to issue such a letter to support the proposal.

Dr. George L. Hunt reported on 2 programs (ESSAS – *Ecosystem Studies of Subarctic Seas*, and BEST – *Bering Ecosystem Study*) that are developing. Both are at the "science planning" stage. The first ESSAS meeting was held May 25-28, 2003, in Bergen, Norway, and the second meeting will be convened October 31 – November 1, 2003, in Seattle, U.S.A. ESSAS is planning an international symposium in mid-2005. Along with ICES and GLOBEC, PICES has been asked to be a co-sponsor (in name only, no funds were requested).

Dr. Alexander Bychkov informed the Committee on the international inter-comparison on "Underway and drifting/mooring $p(CO_2)$ measurement systems", held March 10-14, 2003, and SCOR-IOC/GCP/PICES Workshop on "Ocean surface pCO_2 data base and data integration", which was previously planned for October 6-8, 2003, in Tsukuba, Japan, and was postponed until January 14-18, 2004. Details can be found in the WG 17 progress report elsewhere in this Annual Report.

Dr. Radchenko reported on the 3rd PICES Workshop on "The Okhotsk Sea and adjacent areas", held June 4-6, 2003, in Vladivostok, Russia, and co-sponsored by TINRO-Center and Census of Marine Life. This workshop was well attended with 92 scientists from Canada, Japan, Russia and the United States. The abstract book of this workshop contains 91 abstracts. Presentation topics varied widely from the climate and geological aspects of the Sea of Okhotsk bottom structure formation, to the marine mammals' influence of the Greenland turbot fishery in the northern part of the sea. Extended abstracts will be published in the PICES Scientific Report Series and selected papers will constitute a special issue of a primary journal, such as *Progress in Oceanography*.

Dr. Radchenko also reported on the 26th SCOR Executive Committee meeting, which was held September 15-19, 2003, in Moscow, Russia. The PICES report on existing and potential areas of cooperation between SCOR and PICES was presented and met a friendly reception. Among the PICES activities, the iron fertilization experiment results attracted rapt attention. The Executive Committee reviewed progress of some sponsored and related research projects, such as GLOBEC, JGOFS, SOLAS, GEOHAB and IMBER. Working group reports were heard and proposals for four new SCOR Working Groups were discussed: ECOTRACES project (on the rare but biologically important chemical elements circulation in marine environment), on the mesoscale rings, and two proposals from the paleobiology field. The Executive Committee has considered several new proposals for research funding. Priority will be given to the

polar regions and biodiversity issues. It was a broad scientific program in conjunction with the meeting: Presentations on the progress in the Russian oceanographic research took 1.5 days. A half-day Census of Marine Life symposium was held on the last day of the meeting.

Progress report of the Advisory Panel on *Micronekton sampling inter-calibration experiment* (Agenda Item 4a)

The Panel Co-Chairman, Dr. Michael P. Seki presented a summary of the MIE-AP activities (*BIO Endnote 3*). The Panel has developed an ambitious field program that includes two marine cruises. The first will be conducted just before PICES XIII in October 2004, in the ocean near Hawaii (Station ALOHA at 22°45'N, 158°W - the location of the Hawaii Ocean Time Series). Ship time (10 days) aboard the NOAA ship *Oscar Elton Sette* is already covered. The second cruise is planned for 2005, at the higher latitudes in a colder climatic zone, possibly in the Bering Sea and the Gulf of Alaska area. The Japanese research vessel *Oshoro Maru* will be requested for that cruise. A funding proposal will be submitted to the North Pacific Research Board.

The Committee decided to distribute information on the field program among the PICES Committees and CCCC Task Teams to invite them to participate in the organization and conducting of the cruises. Support by other Committees could be necessary, if the cruise will require some monetary support from the PICES Trust Fund. A request could cover the travel costs of the cruise participants, who will be then attending PICES XIII. This request will be directed to the PICES Secretariat after the list of potential cruise participants is compiled.

Progress report of the Advisory Panel on *Marine birds and mammals* (Agenda Item 4b)

The Panel Co-Chairman, Dr. Hidehiro Kato, reported on the MBM-AP activities (*BIO Endnote 4*). The main topic of this progress report was the results from the PICES XII workshop on distribution and diet of selected bird and mammal species on the east and west coasts of the North Pacific. It was concluded that the dietary study on marine birds and mammals (pinnipeds and cetaceans) would contribute to ecosystem monitoring in the North Pacific.

It is suggested that the same type of study be done with different species at a ½-day follow-up workshop at PICES XIII (*MBM-AP Endnote 4*). The Panel also proposed that a 1-day Topic Session on oceanographic "hot spots" be convened at PICES XIII (*MBM-AP Endnote 5*).

At the recommendation of the MBM Advisory Panel, Dr. William J. Sydeman (U.S.A.) was approved as the new Co-Chairman for the Panel to replace Dr. Douglas F. Bertram (Canada).

Other issues discussed were: membership for the Panel and funding of some countries to participate in Annual Meetings, mechanisms for contributing information on marine birds and mammals to the North Pacific Ecosystem Status Report, sharing data on the PICES web site, and exchanging observers with the International Whaling Commission (IWC). Dr. Kato was recommended as the PICES observer at the next IWC Annual Meeting.

Progress report of Advisory Panel on *Iron fertilization experiment in the North Pacific* (Agenda Item 4c)

Dr. Harrison presented an overview of the IFEP-AP activities. The Eastern Subarctic Pacific iron enrichment study at Station P (SERIES-2002) was discussed at the interim meeting held in March 2003, in Sidney, Canada. Phase I of the mesoscale iron enrichment study in the Western Subarctic Pacific was completed in 2001 (SEEDS-2001), and the Phase II study in this region will be in July 2004 (SEEDS-2004). A 3-day PICES IFEP workshop on "*In situ* iron enrichment experiments in the Eastern and Western Subarctic Pacific" will be held February 10-12, 2004, in Sidney, Canada. Specific objectives of the workshop are *(i)* to synthesize results from two recent *in situ* iron enrichment experiments in the Subarctic Pacific (SEEDS-2001 and SERIES-2002); *(ii)* to determine similarity and differences in

biogeochemical and ecosystem responses to iron addition between the Eastern and Western Subarctic Pacific; and *(iii)* to identify specific scientific questions for the longer-term experiment in the Western Subarctic Pacific (SEEDS-2004). A 1.5-day joint Canadian-SOLAS/PICES IFEP session on "Response of the upper ocean to mesoscale iron enrichment" will be convened February 17-18, 2004, at the ASLO/TOS Ocean Research Conference in Honolulu, U.S.A.

Proposals for new subsidiary bodies (Agenda Item 4d)

BIO will not be sponsoring a Working Group after this year. WG 14 on *Effective sampling of micronekton* will complete its task with the scientific report preparation by the end of the year, and has been transformed into the Advisory Panel on *Micronekton inter-calibration experiment* to continue this work. An opportunity to organize a new Working Group was discussed. Dr. Radchenko mentioned that a new Working Group could be formed together with other Committees or the CCCC Task Teams. However, the Terms of Reference draft and a list of potential members are the minimum necessary for fruitful discussion. Such suggestions can also be regarded as the source of Topic Session proposals for BIO for the next Annual Meeting. However, nobody from Committee members expressed any idea on potential issues that a new Working Group might address.

From other Committees, a draft proposal for a Working Group on *Marine aquaculture* was prepared by MEQ and FIS, and distributed by e-mail before the meeting. Another proposal was a joint Working Group on *Ecosystem-based management*. The Terms of Reference of these Working Groups must be preceded by the corresponding Topic Sessions at PICES XII. To discuss these more fully, BIO decided that it was necessary to have written summaries on new Working Groups provided to Committee members before the meeting. It was agreed that BIO is unable to decide at this time but may join the proposed Working Groups later, if they are established and work successfully.

Programs of scientific sessions supported by BIO (Agenda item 5)

Dr. Michael J. Dagg reviewed the program of the POC/BIO Topic Session (S2) on "Physical and biological responses of coastal ocean ecosystems and estuaries to inputs of freshwater". The session would include 12 oral and 10 poster presentations by scientists from five PICES countries: Canada, China, Korea, Russia, and the United States.

Dr. Mackas reviewed the program of the BIO/POC/CCCC Topic Session (S6) on "Latitudinal differences in the responses of productivity and recruitment of marine organisms to physical variability". There would be 2 invited and 32 contributed papers to cover a wide range of spatial scales and processes.

Dr. Radchenko reviewed the program of the MEQ/BIO/FIS Topic Session (S10) on "Ecosystem-based management science and its application to the North Pacific". The session would consist of 17 talks and 4 posters presented by scientists from all PICES member countries.

No information was presented from conveners or BIO Committee members on the MEQ/BIO Topic Session (S4) on "Aquaculture in the ocean ecosystem".

Summaries of the sessions are included elsewhere in this Annual Report.

Science Board recommended that the BIO Best Presentation Award be chosen from the BIO/POC/CCCC Topic Session (S6) presenters.

Topic Session proposals for PICES XIII (Agenda Item 6)

Several potential themes were listed for Topic Sessions at PICES XIII. In order of priority it was agreed by the Committee:

- A ½-day BIO Paper Session; recommended convener: Dr. Vladimir I. Radchenko.
- A 1-day BIO Topic Session on "Mechanisms that regulate North Pacific ecosystems: bottom-up, top-down, or something else?" (*BIO Endnote 5*);

recommended convenors: Andrew Trites (Canada), Michio J. Kishi (Japan), Douglas DeMaster and Jeffrey Napp (U.S.A.), and a scientist from the Western Pacific (TBD).

- A ½-day BIO Topic Session on "Role of gelatinous zooplankton in coastal and oceanic ecosystems" (*BIO Endnote 6*); recommended convenors: Richard D. Brodeur (U.S.A.) and an Asian co-convener (TBD).
- A 1-day FIS/BIO Topic Session on "Hot spots and their use by migratory species and top predators in the North Pacific" (*MBM-AP Endnote 5*); recommended convenors: Hidehiro Kato (Japan), William J. Sydeman (U.S.A.) and a convenor from FIS (TBD).

Under mutual agreement, the topic "Natural and anthropogenic influences on pelagic-benthic coupling in coastal systems" was not regarded for the PICES XIII program and moved to 2005 or beyond. Proposals for a joint FIS/BIO Topic Session on "Use of the ocean environment by migratory species", and BIO Topic Sessions on "Biogeochemical processes" and "Regime shift in the low latitudes" were proposed during the meeting but not given a high rating.

It was also reiterated that BIO supports the request by the MBM Advisory Panel to convene a ½-day workshop on "Distribution and diets of marine birds and mammals: Phase II" (*MBM-AP Endnote 4*).

Theme for PICES XIV (Agenda Item 7)

Six overall themes suggested for PICES XIV (October 2005, in Vladivostok, Russia) were discussed and prioritized by voting. Top two priorities selected from the offered list are: (1) North Pacific links to global processes/studies, and (2) Progress in prediction.

North Pacific Ecosystem Status Report (Agenda Item 8)

The Committee was informed that the North Pacific Ecosystem Status report (approx 250 pp.) is close to completion. BIO supports the inclusion of a separate chapter on marine birds and mammals trends, which will be prepared by the MBM Advisory Panel.

Discussion of report from Study Group on *PICES Strategic Issues* (Agenda Item 9)

A draft of the PICES Strategic Plan (Vision Statement) was prepared by the Study Group on *PICES Strategic Issues* and distributed before the meeting. This document designates the PICES Mission with five central themes: (A) Building a foundation of science; (B) Producing the scientific basis for decision-making; (C) Fostering partnerships; (D) The added value of PICES; and (E) Informing the public; and specific goals, identified within each of these themes. It also includes an implementation strategy with several next steps. Under these implementation measures, the PICES Governing Council will prepare an Action Plan that looks ahead to at least three years. This plan will develop an approach on how to: *(i)* meet needs of member countries; *(ii)* increase value of PICES activities to support research; *(iii)* strengthen support of cooperative programs of PICES; *(iv)* provide opportunity for PICES initiatives; *(v)* attract the interest of excellent scientists; and *(vi)* contribute to better participation in PICES activities.

The linkage between the developing BIO Strategic Plan and the PICES Vision Statement was briefly presented by Dr. Radchenko. Because of time constraints, it was agreed that BIO members should discuss this further via e-mail.

Discussion of report from Study Group on *PICES Capacity Building* (Agenda Item 10)

Dr. Harrison reported on the PICES strategy for capacity building recommended by the Study Group (*SB Endnote 7*). Four proposed elements were discussed: *(i)* training and education; *(ii)* sharing of methodologies, management and data; *(iii)* enhancement of participation in PICES activities; and *(iv)* funding for expanded PICES activities. Comments to Science Board are requested by November 30, 2003.

Identifying future major PICES programs (Agenda item 11)

Dr. Makoto Kashiwai gave a presentation on the need for future major programs for PICES. This material was preliminary published in PICES Press Vol. 11, No. 2. The CCCC Program is entering its synthesis phase, and PICES needs to discuss and determine what will replace it. The BIO members were encouraged to present ideas, in particular on the leading role of the North Pacific Ecosystem Status Report in this process.

PICES web site revisions – information for BIO web page (Agenda item 12)

Ms. Julia Yazvenko (PICES Secretariat) reported on the development of the new PICES web site. Each Committee will have a separate page on this new site. Dr. Hidehiro Kato was nominated as the contact person on scientific content for the BIO web page.

Relations with other international organizations/programs (Agenda item 13)

A listing was made of international programs or organizations that PICES is collaborating with, including SCOR, GLOBEC, SOLAS, GEOHAB and IMBER. It was emphasized that the recent Zooplankton Production Symposium in Spain, jointly sponsored by PICES, GLOBEC and ICES, is an excellent example of how successful our collaborative efforts can be. PICES cooperation with NPAFC, including the field BASIS program, was also recognized as an important issue of scientific development in the North Pacific.

Items with financial implications (Agenda item 14)

Inter-sessional meetings

- A 3-day IFEP Workshop on "*In situ* iron enrichment experiments in the Eastern and Western Subarctic Pacific" to be held February 11-13, 2004, in Sidney, Canada.

Requests for travel funding

- 2 invited speakers for PICES XIII: 1 for the Topic Session on "Mechanisms that regulate North Pacific ecosystems: Bottom-up, top-down, or something else?" and 1 for the Topic Session on "Role of gelatinous zooplankton in coastal and oceanic ecosystems";
- 1 Russian scientist to attend the MBM-AP Workshop on "Distribution and diets of marine birds and mammals: Phase II" to be held in conjunction with PICES XIII.

Publications

- Final report of WG 14 to be published in the PICES Scientific Report Series in 2004;
- Collection of papers from the 2002 BIO Topic Session to be published as a special issue of *Journal of Marine Systems* on "The importance of biophysical coupling in concentrating marine organisms around shallow topographies" in 2004;
- Summary of the workshop to identify global synchrony in fluctuations of zooplankton population (if approved) to be published in the PICES Scientific Report Series in 2005.

Best Presentation Award (Agenda Item 15)

Sachihiko Itoh (Japan) won the BIO Best Presentation Award for his paper (co-authored by T. Sugimoto) entitled "Effect of eddy transport and blocking on migration of small pelagic fishes" at the BIO/POC/CCCC Topic Session (S6) on "Latitudinal differences in the responses of productivity and recruitment of marine organisms to physical variability".

Other business (Agenda Item 16)

PICES/CLIVAR Workshop

Dr. Kelvin Richards reported on the joint PICES/CLIVAR workshop on "Scale interaction of climate and biogeochemical systems" to be held next year at PICES XIII (*POC Endnote 5*). BIO members were requested to help with organizing the workshop. The Committee encouraged members with the necessary expertise to serve for achievement of planned workshop goals.

Request for advice from the United States

Committee members were asked to review and comment on the request for scientific advice

submitted to PICES Chairman Dr. Vera Alexander by the US delegate Dr. Richard Marasco. BIO recognized the high importance of the successful accomplishment of such a task (to study arisen questions and prepare detailed report), and recommended the establishment of a Study Group for the job. Dr. Mackas was nominated as a BIO representative on this group.

Preparation of report to Science Board (Agenda Item 17)

Dr. Radchenko expressed his great appreciation to Dr. Dagg who served as the rapporteur of the meeting.

Meeting was adjourned at 7:40 p.m.

BIO Endnote 1

Participation List

Members:

Richard D. Brodeur (U.S.A.)
Michael J. Dagg (U.S.A., Rapporteur)
Paul J. Harrison (Canada)
Tsutomu Ikeda (Japan)
Hidehiro Kato (Japan)
Woong-Seo Kim (Korea)
Michio J. Kishi (Japan)
David L. Mackas (Canada)
Angelica Peña (Canada)
Vladimir I. Radchenko (Russia, Chairman)
Sinjae Yoo (Korea)
Ming-Yuan Zhu (China)

Observers:

Vera Alexander (PICES Chairman)
George L. Hunt (U.S.A.)
Guennady A. Kantakov (Russia)
Makoto Kashiwai (Japan)
Elena M. Latkovskaya (Russia)
Jeffrey M. Napp (U.S.A.)
Svetlana V. Naydenko (Russia)
Sachi Ohki (Japan)
R. Ian Perry (Science Board Chairman)
Kelvin Richards (U.S.A., CLIVAR)
Michael P. Seki (U.S.A.)
Anatoly Yu. Semenchenko (Russia)
Thomas C. Wainwright (U.S.A.)

BIO Endnote 2

BIO Meeting Agenda

1. Welcome and introduction of members
2. Approval of agenda
3. Business from last year's meeting:
   a. Status of proposed publications
   b. Status of proposed interim meetings
4. Progress reports of existing subsidiary bodies and proposals for new subsidiary bodies:
   a. Progress report of Advisory Panel on *Micronekton sampling inter-calibration experiment*
   b. Progress report of Advisory Panel on *Marine bird and mammals*
   c. Progress report of Advisory Panel on *Iron fertilization experiment in the North Pacific*
   d. Proposals for new subsidiary bodies
5. Programs of scientific sessions supported by BIO:
   a. *Physical and biological responses of coastal ocean ecosystems and estuaries to inputs of freshwater* (POC/BIO)
   b. *Aquaculture in the ocean ecosystem* (MEQ/BIO)
   c. *Latitudinal differences in the responses of productivity and recruitment of marine organisms to physical variability* (BIO/POC/CCCC)
   d. *Ecosystem-based management science and its application to the North Pacific* (MEQ/BIO/FIS)
6. Topic session proposals for PICES XIII
7. Theme for PICES XIV
8. North Pacific Ecosystem Status Report
9. Discussion of report from Study Group on *PICES Strategic Issues*

10. Discussion of report from Study Group on *PICES Capacity Building*
11. Identifying future major PICES programs
12. PICES web site revisions
13. Relations with other international organizations/programs
14. Items with financial implications
15. 2003 BIO Best Presentation Award
16. Other business
17. Preparation of report to Science Board

BIO Endnote 3

Progress report of Advisory Panel on *Micronekton sampling gear intercalibration experiment*

Background

While a number of gears are presently being used to sample micronekton in the North Pacific and other parts of the world's oceans, there has been little effort expended in comparing the relative sampling efficiency and selectivity of these gears. At the recommendation of PICES WG 14 on *Effective sampling of micronekton*, a new PICES field effort to evaluate the efficacy of sampling gears and procedures employed by different agencies to sample micronekton in the North Pacific was launched, and the Advisory Panel on *Micronekton sampling gear intercalibration experiment* (MIE-AP) was established at PICES XI to oversee the field program. The first MIE-AP meeting/workshop was convened from 09:00 – 12:15 hours on October 11, 2003, in conjunction with PICES XII.

Workshop summary

This workshop was the first gathering of the MIE-AP members (see *MIE-AP Endnotes 1* for attendance). After short introductions of the participants, a review of the status of the related WG 14 activities (Dr. Richard D. Brodeur), and the project background (Dr. Michael P. Seki), the discussion turned to the goals, objectives, and status of the intercalibration experiment (*MIE-AP Endnote 2*).

The MIE-AP is currently planning to conduct the experiment in two phases: the first cruise in Central North Pacific waters off Hawaii just prior to PICES XIII in Honolulu, and the second cruise in waters of the Bering Sea (or possibly Gulf of Alaska) during the summer of 2005. The Hawaii cruise will serve two purposes: (1) to compare the performance of different types of sampling gears in an oligotrophic subtropical gyre to see how the choice of gear affects our perspective of the micronekton community; and (2) to use the relatively benign sea conditions of the subtropics to evaluate and refine protocols, logistics, and sampling designs. The northern (Bering Sea) leg will sample a much more productive regime and a faunal community of great interest to many in the PICES member countries. Upon completion, an unprecedented attempt to compare the performance of gears within and between the contrasting environments will highlight the MIE-AP effort.

A commitment for a 10-day shiptime aboard the NOAA ship *Oscar Elton Sette* has been acquired in the first two weeks of October 2004 to support the first leg of the experiment, and a short presentation was made on the facilities and capabilities of the research vessel for the initial phase of the experiment. For the northern cruise in 2005, several scenarios involving other platforms were discussed, including: ships involved with the multinational NPAFC's BASIS project in the Bering Sea, Hokkaido University's R/V *Oshoro Maru*, Japan Fisheries Agency's R/V *Kaiyo Maru*, and Hokkaido National Fisheries Research Institute's "new" *Hokko Maru* scheduled for operation in 2005.

Micronekton gears currently in use by PICES member countries were identified for the experiment. Smaller single warp gear-types included the Methot (5 m^2) net, RMT 8+1, fixed frame 4 m^2 beam trawl, and Isaacs-Kidd midwater trawls (IKMT) (1.8 and 3 m varieties). All of these gears can be accommodated on the *Sette* and will be rigged for monitoring depth and temperature in real-time during operations.

For "larger" dual warp stern trawls, considered were the "Stauffer" modified Cobb trawl and the OSU 100 m^2 rope trawl. Russian scientists generally use large commercial pelagic trawls equipped with a small mesh codend liner, but shipping such a large net out of Russia may be problematic. It was decided that inquiries will be made about the availability of a net with similar specifications in the United States for possible use. *Sette*'s Netmind mensuration system will be used for monitoring the stern trawl nets performances in the water.

A number of sampling protocols were addressed. Some of the highlights follow:

- to minimize some of the biases associated with diel sampling time, the order of operations conducted would be rotated from night to night;
- net mesh sizes would be standardized to 1 cm for all gears codends;
- tows will be conducted in a horizontal fashion at a depth to be determined in the field;
- many of the gear are designed to perform optimal at specific towing speeds and will be deployed accordingly;
- tow durations will be determined in the field; concern was expressed over the effect of tow duration on animal damage *vs*. reduction of within tow variability of catch.

Assessment of micronekton resources during the surveys will also use acoustic technologies. Specifically, MIE-AP members conducting acoustic assessments employ the Simrad EK60 equipped with two frequencies (38 and 120 kHz). Other gear-types suggested for consideration included visual methods (*e.g.*, video plankton recorders or cameras to monitor net extrusion), prototype lift nets (*e.g.*, Ocean Friendly design), and concurrent neuston nets. Traditional bongo and ring nets while generally macroplankton nets were also considered for inclusion in the experiment.

An unsuccessful attempt to obtain funding to support the experiment was made to the North Pacific Research Board (NPRB) at last year's request for proposals (RFP). A revised proposal will again be submitted to the current $3 million RFP by December 5, 2003.

Action items were identified for MIE-AP members in the weeks to come including the determination of the number of participants from each country for the cruises (particularly for inclusion in the NPRB proposal), consideration of specimen disposition and preservation requirements, and consideration to sample set replication for ensuring statistical analysis.

It was also recommended that a 1-day workshop be convened at PICES XIII, immediately after the *Sette* cruise, to review preliminary data and findings from the cruise, and discuss the goals, objectives, and status of the inter-calibration experiment and the future field program.

MIE-AP Endnote 1

Participation list

Members:

Richard D. Brodeur (U.S.A.)
Kazushi Miyashita (Japan)
Vadim F. Savinykh (Russia)
Michael P. Seki (Co-Chairman, U.S.A.)
Won Duk Yoon (Korea)

Observers:

Koh Kawaguchi (Japan)
Vladimir I. Radchenko (Russia)
Orio Yamamura (Japan)

MIE-AP Endnote 2

Workshop Agenda

1. Welcome and introductions
2. Status and review of the WG 14 final report
3. Background and Terms of Reference for the Advisory Panel on *Micronekton sampling gear intercalibration experiment*
4. Discussion of experiment logistics, including proposed platform(s), cruise dates, location (region) of survey, participants sampling gears to be included, experiment logistics, protocols, and analysis
5. Status of financial support status including discussion of scenarios in the absence of funding
6. Summary wrap-up and report write-up

BIO Endnote 4

Progress report of Advisory Panel on *Marine birds and mammals*

The third meeting of the Advisory Panel on *Marine birds and mammals* was held from 09:00 - 12:00 hours on October 12, 2003. The Co-Chairman, Dr. Hidehiro Kato, called the meeting to order and welcomed the participants (*MBM-AP Endnote 1*). The Panel reviewed the Terms of Reference (*MBM-AP Endnote 2*), the recommendations from the 2002 Panel meeting, and the draft agenda that was adopted (*MBM-AP Endnote 3*).

Nomination of new Co-Chairman (Agenda Item 3)

Dr. Douglas F. Bertram has stepped down as the MBM-AP Co-Chairman. Although he was not present, Panel members thanked Dr. Bertram for his service. It was noted that his leadership was exemplary and he will be missed. Dr. Kato introduced the circumstances of the previous Chairmanship nomination and suggested the necessity to maintain balance between west and east, and also between taxa. After some discussion, MBM-AP members agreed to nominate Dr. William J. Sydeman to replace Dr. Bertram as the Co-Chairman. Dr. Sydeman indicated that he would be happy to serve in this capacity if his nomination is approved.

Review of MBM-AP Workshop at PICES XII

The MBM-AP Workshop entitled "Combining datasets on distribution and diets of marine birds and mammals" was held October 10, 2003, and attended by 19 scientists. Six oral presentations were made, including 2 talks on marine birds, 3 talks on marine mammals, and a brief overview of how to investigate predator behavior in the marine environment. The summary of the workshop is included elsewhere in this Annual Report. Presentations and associated discussions reveled the following:

- Diet composition of birds and mammals varied between the Western and Eastern North Pacific;
- Diet composition of top predators has switched dramatically at decadal levels, probably related to regime shift;
- Marine birds and mammals can be used as ecosystem indicators;
- There is a "hot spot" at about 40ºN, 160ºE, supported by higher chlorophyll concentration and probably also by other oceanographic factors, where marine birds and mammals are abundant.

Workshop and Topic Session proposals for PICES XIII (Agenda Item 5)

Reviewing the results of this year's MBM-AP Workshop, the participants recommend that a ½-day follow-up workshop on "Distribution and diets of marine birds and mammals: Phase II" (*MBM-AP Endnote 4*) and a 1-day Topic Session on "Hot spots and their use by migratory species and top predators in the North Pacific" (*MBM-AP Endnote 5*) be convened at PICES XIII.

Membership for MBM-AP (Agenda Item 6)

Participation of scientists from PICES member countries in MBM-AP activities was discussed.

It was recommended that recruitment of Panel members from all PICES nations should be given high priority and that member countries should be requested to provide travel support for marine bird and mammal scientists to attend PICES Annual Meetings.

Cooperation with International Whaling Commission (Agenda Item 7)

Relations with the International Whaling Commission (IWC) were discussed and Dr. Hidehiro Kato was recommended as the PICES observer to the IWC.

Other business (Agenda Item 8)

The participants discussed the draft North Pacific Ecosystem Status Report (NPESR). It was recommended that Panel members and observers with expertise in particular regions of the North Pacific Ocean review the draft report and provide comments to the MBM-AP Co-Chairmen, which will then be synthesized and forwarded to the NPESR Working Group.

MBM-AP Endnote 1

Participation List

Members

Hidehiro Kato (Japan)
Zung G. Kim (Korea)
Thomas R. Loughlin (U.S.A.)
William J. Sydeman (U.S.A.)
Yutaka Watanuki (Japan)

Observers

George L. Hunt (U.S.A.)
Rolf Ream (U.S.A.)
Tsutomu Tamura (Japan)
Julie Thayer (U.S.A.)

MBM-AP Endnote 2

Terms of Reference

1. Provide information and scientific expertise to the BIO Committee, CCCC Program, and when necessary, to other scientific and technical committees with regard to the biology and ecological roles of marine mammals and seabirds.
2. Identify important problems, scientific questions, and knowledge gaps in assessing the roles of marine mammals and seabirds in marine ecosystems.
3. Assemble relevant information on the biology of marine mammals and sea birds and disseminate it to the PICES community through scientific reports and symposia.
4. Develop strategies to improve collaborative, interdisciplinary research with marine mammal and sea birds researchers and PICES.

MBM-AP Endnote 3

MBM-AP Meeting Agenda

1. Address of welcome
2. Adoption of agenda
3. Nomination of new Co-Chairman
4. Review of Workshop on “Combining data sets on distributions and diets of marine birds and mammals” at PICES XII
5. Workshop and Topic Session proposals for PICES XIII
6. Membership for MBM-AP
7. Cooperation with International Whaling Commission
8. Other business

MBM-AP Endnote 4

Proposal for a ½-day MBM-AP Workshop at PICES XIII on
"Distribution and diets of marine birds and mammals: Phase II"

The MBM-AP Workshop on "Combining data sets on distributions and diets of marine birds and mammals" at PICES XII led to enhanced knowledge of relations of marine birds and mammals and the environment. Continuation of this workshop would further our understanding of coupled climate-ecosystem fluctuations in the North Pacific Ocean. The PICES Advisory Panel on *Marine birds and mammals* identified four species (2 birds and 2 mammals) with extensive spatial and temporal datasets on food habits and prey characteristics, which are not reviewed at PICES XII and could be examined. Species of interest include: Dall's porpoise, northern fur seal, common murre and Cassin's auklet (a planktivorous seabird). Reports on other species that have appropriate time series are also welcome.

Recommended convenors: Hidehiro Kato (Japan) and William J. Sydeman (U.S.A.)

Travel support is requested for at least one scientist who will make the key presentation at the workshop.

MBM-AP Endnote 5

Proposal for a 1-day Topic Session at PICES XIII on
"Hot spots and their use by migratory species and top predators in the North Pacific"

Through discussion at the MBM-AP Workshop at PICES XII on "Combining data sets on distributions and diets of marine birds and mammals", some "hot spots" in which cetaceans, pinnipeds and sea birds are abundant were identified. Oceanographic, nutritional and topographical conditions might support such hot spots. It was envisioned that this Topic Session could take advantage of long-term fisheries oceanography programs where the dispersion of top predators has been surveyed, as well as the advances in satellite technology, which has resulted in extensive novel information on the use of oceanographic habitats by top predators. The session would open with a review of persistent oceanographic habitats that may be used by top predators.

Recommended conveners: Hidehiro Kato (Japan) and William J. Sydeman (USA). FIS and POC are to be approached to co-sponsor the session and nominate convenors.

If the proposal is not accepted for PICES XIII, we suggest convening this session at PICES XIV in 2005.

BIO Endnote 6

Proposal for a 1-day BIO Topic Session at PICES XIII on
"Mechanisms that regulate North Pacific ecosystems: Bottom up, top down, or something else?"

Within the PICES region, dramatic changes have been observed in the past 50 years in the structure and function of marine ecosystems. In an effort to understand what caused these changes, various hypotheses have been proposed as controlling mechanisms for entire ecosystems or for particular components of the ecosystems (*e.g.* fish stocks and apex predators). Each of the hypotheses (*e.g.* trophic cascade, oscillating control, nutritional stress, and regime shift) has at its core a fundamental assumption that control is the result of bottom-up, top-down, or a wasp waist trophic pyramid restriction. Is it really that simple? Are these hypotheses testable? Will they lead us to a predictive capability?

We propose a Topic Session to critically examine these hypotheses, as applied to

ecosystems and important marine populations from the western and eastern North Pacific Ocean. The goal is to review, based on observations and model results, the basic assumption (source of control), and to evaluate the strength and weaknesses of the individual hypothesis. The session will also discuss how the different control mechanisms might affect the ability of managers to maintain sustainable fisheries in the region. The possibility of publishing the results in a special issue of a leading international journal will be explored.

The sponsors of this proposal and possible convenors are: Andrew Trites (Canada), Michio J. Kishi (Japan), and George L. Hunt and Douglas DeMaster (U.S.A.). A fifth convener from Asia will be desirable.

Travel support is requested for two invited speakers, at least one of which will be outside the PICES region.

BIO Endnote 6

Proposal for a ½-day BIO Topic Session at PICES XIII on
"Role of gelatinous zooplankton in coastal and oceanic ecosystems"

Recent increases in gelatinous zooplankton in a number of ecosystems in the North Pacific and elsewhere have demonstrated the potential importance of these organisms in energy transfer in coastal and oceanic environments. Gelatinous zooplankton exhibit rapid individual and population growth rates and have been shown to be major consumers of phytoplankton, zooplankton and early life stages of fishes. They are competitors with adult fishes and serve as conduits of energy transfer to the deep ocean. Despite their importance to the ecosystem, there are substantial gaps in our knowledge of basic life history, ecology and environmental responses even for many of the dominant species. This session will bring together information on such diverse gelatinous taxa as cnidarians, ctenophores, siphonophores, salps, and appendicularians, and examine their role in marine ecosystems and their responses to variable environmental conditions.

Recommended conveners: Richard D. Brodeur (U.S.A.) and a Japanese scientist (TBD).

Travel support is requested for two invited speakers.