

REPORT OF BIOLOGICAL OCEANOGRAPHY COMMITTEE



The Biological Oceanography Committee (hereafter BIO) met from 16:00–19:30 hours on October 31, 2007. The Chairman, Dr. Michael J. Dagg, called the meeting to order and welcomed the participants (*BIO Endnote 1*). The proposed agenda was reviewed and approved without additions (*BIO Endnote 2*).

Progress reports of existing subsidiary bodies (Agenda Item 3)

Presently, the following three expert groups report only to BIO: the Advisory Panel on *Marine Birds and Mammals* (MBM-AP), the Advisory Panel on *Micronekton Sampling Inter-calibration Experiment* (MIE-AP), and the Advisory Panel on *Iron Fertilization Experiment in the Subarctic Pacific Ocean* (IFEP-AP). The Section on *Carbon and Climate* (CC-S) is a joint expert group under BIO and POC. The full progress reports of all these subsidiary bodies are included elsewhere in this Annual Report.

A brief report of MBM-AP activities was given by Dr. Hidehiro Kato, MBM-AP Co-Chairman. He focused on the results of the PICES XVI BIO/FIS/POC Topic Session on “*Phenology and climate change in the North Pacific*” (S11) and on a proposal for MBM-AP to update the PICES Scientific Report No. 14 (2000) on “*Predation by marine birds and mammals in the subarctic North Pacific Ocean*” produced by PICES Working Group 11 on *Consumption of Marine Resources by Marine Birds and Mammals* by 2010. The Panel also proposed a ½-day BIO/MEQ Topic Session at PICES XVII on “*Seabirds and marine mammals as environmental indicators*” (*MBM-AP Endnote 4*). Dr. Kato has attended the International Whaling Commission (IWC) Scientific Committee meetings for the past several years. He requested and received endorsement from BIO to continue serving as a liaison between PICES and IWC.

A summary report of IFEP-AP activities was given by Dr. Shigenobu Takeda, IFEP-AP Co-

Chairman. At the final meeting of the Panel held on October 30, it was agreed that IFEP-AP had completed its terms of reference and should be disbanded. A new Working Group on *Iron Supply and its Impact on Biogeochemistry and Ecosystems in the North Pacific Ocean* has been proposed under the direction of BIO (*IFEP-AP Endnote 4*).

Neither of the MIE-AP Co-Chairmen, Drs. Evgeny Pakhomov or Dr. Orio Yamamura, was present to make a report to BIO. A written report from the Panel was received after the Annual Meeting.

A report from CC-S was given by Dr. Toshiro Saino, CC-S Co-Chairman. He summarized briefly the successful PICES XVI POC/BIO Topic Session on “*Decadal changes in carbon biogeochemistry in the North Pacific*” (S2), and provided an update on the progress in integration of Pacific carbon data and preparation of the “*Guide to Best Practices for Ocean CO₂ Measurements*”. Changes to the terms of reference for CC-S were proposed to include “ocean acidification” (*CC-S Endnote 4*). The modified terms of reference will be circulated for review and discussion to BIO members and will be finalized and presented for approval at the 2008 inter-sessional Science Board meeting.

Proposals for new subsidiary bodies (Agenda Item 4)

A Working Group on *Iron Supply and its Impact on Biogeochemistry and Ecosystems in the North Pacific Ocean* was proposed on behalf of IFEP-AP by Dr. Takeda (*IFEP-AP Endnote 4*). Development of this Working Group has been ongoing for the past year. The draft terms of reference were presented at the inter-sessional Science Board meeting in April 2007 and revised based on the recommendations from the BIO Chairman. BIO endorsed this Working Group and recommended Drs. Fei Chai (U.S.A.) and Shigenobu Takeda (Japan) as Co-Chairmen.

A Working Group on *Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim* was proposed by Dr. William T. Peterson (*BIO Endnote 3*). This Working Group will build on PICES activities related to euphausiids that have been conducted over the past several years. This Working Group was also endorsed by the Committee. Proposed Co-Chairmen are Drs. Peterson (U.S.A.), Hiroaki Saito (Japan) and Song Sun (China).

Dr. Young-Shil Kang (Korea) will lead the preparation of a report on methodology and standards for sampling giant jellyfish. This jellyfish is an increasing problem in coastal waters of the western Pacific. The report will be given to BIO at PICES XVII.

Summaries of sessions and workshops at PICES XVI (Agenda Item 5)

Summaries written by convenors of each session and workshop can be found in the *Session Summaries* chapter of the Annual Report. The list of BIO-sponsored events at PICES XVI included:

- a 1-day BIO/POC Topic Session (S2; Oct. 30) on “*Decadal changes in carbon biogeochemistry in the North Pacific*”; Co-Convenors: James Christian (Canada) and Toshiro Saino (Japan);
- a 1-day BIO/FIS/POC Topic Session (S11; Nov. 2) on “*Phenology and climate change in the North Pacific: Implications of variability in the timing of zooplankton production to fish, seabirds, marine mammals and fisheries (humans)*”; Co-Convenors: Elizabeth A. Logerwell (U.S.A.), David L. Mackas (Canada), Shoshiro Minobe (Japan) and William J. Sydeman (U.S.A.);
- a 1-day BIO Contributed Paper Session (Nov. 1); Co-Convenors: Michael J. Dagg (U.S.A.), Michio J. Kishi (Japan) and Angelica Peña (Canada);
- a ½-day BIO Workshop (W1; Oct. 28) on “*Lessons learned during MIE-1 and MIE-2: Reconciling acoustics and trawl data*”; Co-Convenors: Evgeny A. Pakhomov (Canada) and Orio Yamamura (Japan);
- a ½-day MONITOR/BIO Workshop (W5; Oct. 27) on “*Measuring and monitoring*

primary productivity in the North Pacific”; Co-convenors: Paul J. Harrison (Canada) and Sei-Ichi Saitoh (Japan).

Drs. Michio Kishi, Angelica Peña, Patricia Wheeler and Atsushi Yamaguchi selected the winners for the BIO Best Presentation Award and the BIO Best Poster Award from among those given at the S11 Topic Session and the BIO Contributed Paper Session (POC handled the joint POC/BIO Topic Session S2). The BIO Best Presentation Award was given to Takumi Nonomura (University of Tokyo, Japan) for his paper (co-authored by Atsushi Tsuda, Ichiro Yasuda and Shuhei Nishida) on “*Distribution patterns of Calanus sinicus and C. jashnovi (Copepoda: Calanoida) in the western temperate North Pacific: Relations with the Kuroshio Extension*”. Dr. Goh Onitsuka (National Fisheries University, Japan) won the BIO Best Poster Award for his poster (co-authored by Itsushi Uno, Tetsuo Yanagi and Jong-Hwan Yoon) on “*Effect of atmospheric nitrogen on the lower trophic ecosystem in the Japan/East Sea*”.

Symposia and workshops (Agenda Item 6)

(a) Completed events

Dr. Dagg provided a brief report on the highly successful PICES/ICES/GLOBEC-sponsored, 4th International Zooplankton Production Symposium held in May 2007, in Hiroshima Japan. Dr. Kuh Kim, Chairman of Science Board, had previously presented a summary of this symposium in his remarks at the Opening Session. More details are available in the most recent issue of *PICES Press* (Vol. 15, No. 2).

(b) Upcoming events

BIO scientific sessions at PICES XVII

The next PICES Annual Meeting (PICES XVII) will be held October 24–November 2, 2008, in Dalian, China. The theme for this meeting is “*Beyond observations to achieving understanding and forecasting in a changing North Pacific: Forward to the FUTURE*”. The Committee recommends that the following

scientific sessions (in order of priority) be convened at PICES XVII:

- a ½-day or 1-day BIO Contributed Paper Session with papers focused on biological aspects of the meeting theme;
- a ½-day BIO/MEQ Topic Session on “*Seabirds and marine mammals as environmental indicators*” (MBM-AP Endnote 4);
- a 1-day BIO Topic Session “*End-to-end food webs: Impacts of a changing ocean*” (BIO Endnote 4); if approved, a possibility of co-sponsorship by IMBER for the session will be explored;
- a 1-day MONITOR/TCODE/BIO Topic Session on “*Linking biology, chemistry, and physics in our observational systems – present status and FUTURE needs*” (MONITOR Endnote 6);
- a 1-day BIO/FIS Topic Session on “*Ecosystem status in the North Pacific Ocean: Mechanisms and prediction*”.

BIO-sponsored workshops for 2008

A 1-day workshop on “*Oceanic ecodynamics comparison of subarctic Pacific*” (OECOS workshop) at PICES XVII was proposed by Dr. Atsushi Yamaguchi (BIO Endnote 5). After discussion about how to get some east–west comparisons as originally intended, the workshop was endorsed. It was decided to invite some participants from the Eastern Pacific region who have recently done related types of research, even though the eastern component of OECOS was not funded.

BIO also supported a 3-day 4th PICES workshop on “*The Okhotsk Sea and adjacent areas*” proposed by Dr. Kishi (BIO Endnote 6). This was initially proposed at PICES XV, but postponed for 1 year after discussion. The workshop will be held in late August 2008, in Abashiri, Japan, and its goals are: (a) to exchange and share most recent and basic knowledge on the sea; (b) to identify key scientific questions; (c) to identify gaps of knowledge and necessary approaches; (d) to develop the Okhotsk Sea component of PICES FUTURE Program.

2008 PICES Summer School

In August 2006, the 1st PICES Summer School on “*Ocean circulation and ecosystem modeling*” was organized in Busan, Korea. More than 30 students from 9 countries (including all PICES member countries) attended lectures, seminars and practical exercises. After this successful effort, PICES members at Hokkaido University (Drs. M. Kaeriyama, M.J. Kishi, Y. Sakurai and S.-I. Saitoh) proposed to hold the 2nd PICES Summer School in August 2008 (immediately prior to the workshop on “*The Okhotsk Sea and adjacent areas*”), in Hakodate, Japan. The theme is “*Biomass-based management*” (BIO Endnote 7). BIO strongly supported this activity.

Theme for PICES XVIII

The theme proposed by Korea for PICES XVIII (2009), “*Understanding ecosystem dynamics, pursuing ecosystem approaches to management*”, was discussed and endorsed by BIO.

Relationships with international programs and organizations (Agenda Item 7)

Dr. George L. Hunt provided brief information on the status of a U.S. program titled “*Bering Sea Integrated Ecosystem Research Plan*” (BSIERP), jointly supported by the National Science Foundation (NSF) and the North Pacific Research Board (NPRB). Detailed information is available at <http://bsierp.nprb.org/index.htm>.

Dr. Takeda gave a short presentation on the SOLAS (Surface Ocean Low Atmosphere Study) program, highlighting several potential areas for linkages between BIO and SOLAS, including potential collaboration with the proposed Working Group on *Iron Supply and its Impact on Biogeochemistry and Ecosystems in the North Pacific Ocean*.

Dr. Julie Hall briefly reviewed the overall goals and activities of the IMBER (Integrated Marine Biogeochemistry and Ecosystem Research) program, highlighting the many areas of potential collaborations between PICES and IMBER and identifying some possible activities

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with BIO. An IMBER sponsorship has been proposed for the BIO Topic Session on “*End-to-end food webs: Impacts of a changing ocean*” at PICES XVII.

Dr. Hunt gave a short presentation on the activities of a GLOBEC regional program on Ecosystem Studies of Sub-Arctic Seas (ESSAS) planned for the next year, emphasizing a workshop on “*Ecosystem models*” at the ESSAS Annual Meeting to be held September 15–19, 2008, in Halifax, Canada, immediately prior to the ICES Annual Science Conference (ASC).

There was brief discussion of the ICES ASC to be held September 22–26, 2008, in Halifax Canada, and possible participation by PICES in one or more of their Theme Sessions. The most relevant session was deemed to be “*Coupled physical and biological models*”, and it was decided to request that PICES provide travel support for one BIO member to attend.

Dr. Kato requested and received endorsement by BIO to continue serving as a liaison between PICES and IWC. A report of the 59th IWC Scientific Committee meeting was submitted (*MBM-AP Endnote 5*).

Financial requests (Agenda Item 8)

Financial requests associated with proposed BIO activities for the next year were discussed and listed in order of priority (this does not include invited speakers for BIO-sponsored scientific sessions at PICES XVII):

- 2 invited speakers for the PICES XVII OECOS workshop;
- 1 participant, probably a student, to attend the initial meeting of the Working Group on *Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim* at PICES XVII;
- 1 invited speaker for the 4th PICES workshop on “*The Okhotsk Sea and adjacent areas*”;
- 1 guest lecturer for the 2nd PICES Summer School on “*Biomass-based management*”;
- 1 participant for the ESSAS workshop on “*Ecosystem models*” at the 2008 ESSAS Annual Meeting;

- 1 co-convenor for the joint ICES/PICES Theme Session on “*Coupled physical and biological models*” at the 2008 ICES ASC;
- Travel for Dr. Andrey Suntsov (MIE-AP) from Newport (U.S.A.) to Vancouver (Canada) to complete identification of fish from the MIE-1 cruise;
- 1 MIE-AP Co-Chairman (Dr. Evgeny Pakhomov) to attend PICES XVII.

Publications (Agenda Item 9)

New publications

A special volume of a peer-reviewed scientific journal has been proposed as an outlet for papers presented at the BIO/FIS/POC Topic Session on “*Phenology and climate change in the North Pacific: Implications of variability in the timing of zooplankton production to fish, seabirds, marine mammals and fisheries (humans)*.” The session convenors will be the Guest Editors.

Previously approved

- Selected papers from the PICES XV BIO/FIS Topic Session on “*The human dimensions of jellyfish blooms*” will be published in a special volume of *Plankton and Benthos Research* (Guest Editors: H. Iizumi and H. Ishii) in early 2008.
- 25–30 papers from the 4th International Zooplankton Production Symposium will be published in a special volume of the *ICES Journal of Marine Science* (Guest Editors: M. Dagg, R. Harris, L. Valdés and S. Uye) in mid 2008.
- About 15 papers on krill from the same symposium will be published in a special volume of *Deep-Sea Research II* (Guest Editors: W. Peterson and S. Kawaguchi) in late 2008.
- A special issue of *Deep-Sea Research II* (Guest Editors: A. Tsuda, M. Wells, M. Uematsu and H. Saito) from the SEEDS-II experiment is anticipated to be published in 2008. The manuscript submission deadline was mid-October 2007. Sixteen papers have been submitted as of today, and 2 papers are expected shortly.

BIO Action Plan (Agenda Item 10)

The current version of the BIO Action Plan was distributed prior to PICES XVII. The BIO Chairman agreed to incorporate the actions proposed at this meeting into the Action Plan and circulate it to Committee members. It will then be posted on the PICES website.

FUTURE Science Plan (Agenda Item 11)

Opportunity was provided for BIO Committee members to comment on the most recent version (4.2) of the Science Plan for a new PICES scientific program, FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Ecosystems), that had been

circulated prior to the meeting. On behalf of BIO, Dr. Dagg will present these suggestions at the upcoming Open Forum on November 1 and at the FISP workshop on November 3.

Chairmanship of BIO (Agenda Item 12)

Dr. Skip McKinnell (PICES Secretariat) conducted a brief discussion about the status of the Chairmanship of BIO, noting that the term of Dr. Dagg expires after this Annual Meeting. An election was held, and Dr. Dagg was elected by acclamation for a second 3-year term.

Other items (Agenda Item 13)

There were no other issues brought forward.

BIO Endnote 1

Participation list

Members

Michael J. Dagg (U.S.A., Chairman)
 Richard D. Brodeur (U.S.A.)
 Young Shil Kang (Korea)
 Michio J. Kishi (Japan)
 Angelica Peña (Canada)
 Vladimir Radchenko (Russia)
 Patricia A. Wheeler (U.S.A.)
 Atsushi Yamaguchi (Japan)
 Sinjae Yoo (Korea)
 Ming Yuan Zhu (China)

Observers

Harold P. Batchelder (U.S.A.)
 Fei Chai (U.S.A.)
 Seok-Gwan Choi (Korea)
 Justin Grubich (U.S.A.)
 Julie Hall (IMBER)
 George L. Hunt, Jr. (U.S.A.)
 Hidehiro Kato (Japan)
 Hideki Nakano (Japan)
 William T. Peterson (U.S.A.)
 Christopher Sabine (U.S.A.)
 Toshiro Saino (Japan)
 Hiroaki Saito (Japan)
 Shigenobu Takeda (Japan)
 Tom Wainwright (U.S.A.)
 Shuichi Watanabe (Japan)
 C.S. Wong (Canada)

BIO Endnote 2

BIO meeting agenda

1. Welcome and introductions
2. Approval of agenda
3. Progress reports of subsidiary bodies:
 - MIE-AP
 - MBM-AP
 - IFEP-AP
4. Proposals for new subsidiary bodies:
 - CC-S
 - Working Group on iron supply
 - Working Group on euphausiids
 - Group to develop appropriate standards for sampling giant jellyfish

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5. Summaries of scientific sessions/workshops at PICES XVI
6. Symposia and workshops
 - (a) Completed events:
 - 4th International Zooplankton Production Symposium
 - (b) Upcoming events:
 - BIO scientific sessions at PICES XVII
 - BIO sponsored workshops in 2008
 - 2nd PICES Summer School
 - Science Board Symposium at PICES XVII – suggestions for invited speakers
 - Theme for PICES XVIII (2009, Korea)
 - ESSAS workshops
7. Relationships with other international programs and organizations
 - a. BSIERP
 - b. SOLAS
 - c. IMBER
 - d. ESSAS
 - e. ICES
 - f. IWC
8. Financial requests
9. Publications for upcoming year
10. BIO Action Plan update
11. FISP update
12. BIO Chairmanship
13. Other items

BIO Endnote 3

Proposal for a Working Group on *Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim*

Duration: October 2007–October 2011

Parent Committee: BIO

not only to populate but dominate such a wide variety of ecosystems?"

Background

Euphausiids are among the most important links in coastal and oceanic food webs, transferring energy from primary and secondary producers to higher trophic level animals such as salmon, herring, sardines, mackerel, Pacific whiting, sablefish, many rockfish species, auklets, shearwaters and whales. Given their importance in the food chain, euphausiids may be considered keystone sentinel species. One species of euphausiid, *Euphausia pacifica*, is of special interest because it ranges from the cool upwelling regions off Baja California, Mexico, California, Oregon, Washington and British Columbia, into the downwelling environment of the Gulf of Alaska, and across the Pacific through the Transition Zone, then south through the western Pacific from Russia to China. In the western Pacific this species inhabits waters where temperatures range from sub-arctic to sub-tropical (the Oyashio, the Kuroshio, the Japan/East Sea, and the East China and Yellow Seas). There are few species that occupy such a wide variety of ecosystems and such a wide range of latitudes. Thus, we ask, “*What are the unique characteristics of the life history of this cosmopolitan euphausiid species that allows it*

Surprisingly little information is available on the seasonal cycles of abundance, feeding, reproduction or growth rates of these animals. Comparative studies are needed to understand their trophic status, their adaptations which allow them to prosper in so many different regions, and to learn how climate change may affect their population dynamics. Given that many scientists within PICES have made great progress in applying NEMURO and ECOSIM models to the study of ecosystem dynamics, PICES scientists would benefit greatly from better estimates of euphausiid biomass and vital rates so as to properly parameterize the euphausiid component of these models. Improvements to the models will result in a tool that will allow us to investigate quantitatively the role of euphausiids in food chain dynamics.

PICES scientists are also uniquely capable of increasing our understanding of euphausiids because many oceanographic stations and monitoring lines are routinely sampled for hydrography and zooplankton. PICES scientists could easily incorporate sampling of euphausiids into these existing monitoring programs (by sampling at night) and, with some instructions and basic supplies, could learn how to collect

living animals at night to make measurements of reproduction, molting and growth rates.

Studies which focus on this single species, *Euphausia pacifica*, will provide a common starting point for international exchanges and partnerships. Another genera, *Thysanoessa* is also of particular interest because of dominance by several species in the Bering Sea, the Sea of Okhotsk, and coastal upwelling waters of the California Current. Scientists from the PICES member countries have much information and experience to share, and all would benefit from an increased understanding of this species. Moreover, scientific exchanges involving research cruises or visits to laboratories will further foster an exchange of ideas and will promote long-term collaborations among students as well as established research scientists.

Terms of reference

1. Assemble lists of existing data (including metadata) that contribute to an analysis of the comparative ecology of *Euphausia pacifica* and *Thysanoessa* species. Identify gaps in our understanding of krill ecology, life history and population dynamics.
2. Prepare a research plan to help fill gaps in our understanding and aid regional collaborative research efforts. Explore ways and means of facilitating exchange of scientists between laboratories and on research cruises.
3. Convene “hands-on” practical workshops with krill biologists (including students and established scientists) from PICES member countries to help them initiate and carry out krill research programs. These workshops could be convened before each PICES meeting, or at other times as appropriate. Protocols for experimental work have been already published on the PICES website at: <http://www.pices.int/projects/Euphausiid/PICES%20Protocols%20COMPLETE.pdf>.
4. Initiate euphausiid research programs in PICES member countries which will include sampling on a regular basis (biweekly-monthly) to determine seasonal cycles of spawning and growth, and incubations of live animals for measurement of brood size and molting rates.

5. Work with modelers to better parameterize euphausiids in the NEMURO and other models so as to explore their role in coastal and oceanic food chains.
6. Convene a krill workshop at the GLOBEC Open Science Meeting (June 2009).
7. Organize a Krill Symposium or a Topic Session at PICES XX in 2011, and submit a set of krill synthesis papers for a special issue of a scientific peer-reviewed journal.

Recommended membership

Canada

David L. Mackas (Institute of Ocean Sciences)

China

Sun Song (Institute of Oceanology, CAS; Co-Chairman)

Huilian Liu (Institute of Oceanology, CAS)

Japan

Michio Kishi (Hokkaido University)

Yuji Okazaki (Tohoku National Fisheries Research Institute)

Hiroaki Saito (National Research Institute of Far Seas Fisheries; Co-Chairman)

Kenji Taki (National Research Institute of Far Seas Fisheries)

Korea

Se-Jong Ju (Korea Ocean Research and Development Institute)

Young-Shil Kang (National Fisheries Research and Development Institute)

Hyoung-Chul Shin (Korea Polar Research Institute)

Russia

Anatoly Volkov (TINRO-Center)

U.S.A.

Michael J. Dagg (Louisiana Universities Marine Consortium)

William T. Peterson (Hatfield Marine Science Center; Co-Chairman)

Alexei Pinchuk (University of Alaska)

Tracy Shaw (Cooperative Institute for Marine Resources Studies)

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Timetable

October 2007–October 2008

- Appoint members;
- Have each member work on compiling data (with metadata) available;
- Chairman to prepare a “proposal” for how we will (a) fill gaps in our understanding, and (b) how to facilitate scientist exchange programs.

October 2008–October 2009

- Discuss data/metadata at PICES XVII (2008): What kinds of data do we all have? Are there unpublished theses and other unpublished data available?
- Ratify a research plan that is designed to fill gaps in our understanding;
- Discuss joint efforts with the MODEL Task Team;

- Discuss ways and means of implementing scientific exchanges;
- Co-convene a joint PICES/GLOBEC Krill Workshop at the GLOBEC Open Science Meeting (May 2009).

October 2009–October 2010

- Convene a workshop at PICES XVIII (2009) to review status of research and modeling of krill dynamics.

October 2010–October 2011

- Convene a workshop at PICES XIX (2010);
- Discuss results of research
- Convene a Krill Symposium or a Topic Session at PICES XX (2011) to include (if possible) the Antarctic Krill community of scientists;
- WG ends at PICES XX in October 2011.

BIO Endnote 4

Proposal for a 1-day BIO Topic Session at PICES XVII on “End-to-end food webs: Impacts of a changing ocean”

A holistic end-to-end approach is needed to study the impacts of global change in marine food webs, including the influences on biogeochemistry and feedbacks to climate. This approach is encapsulated by the term “end-to-end food webs”, which is defined as “feeding interactions, nutrient flows and feedbacks in an end-to-end food web of primary producers, consumers and decomposers”. This food web approach retains the energy transfer and nutrient cycles of traditional food webs, but emphasizes the importance of understanding food web

dynamics simultaneously at all levels and scales. To achieve an integrated understanding of end-to-end food web dynamics requires a merging of knowledge from many marine-related disciplines, including those concerned with global climate, marine food webs, marine ecosystems, marine biogeochemistry and biodiversity.

Recommended convenors: Hiroaki Saito (Japan), Sinjae Yoo (Korea) and TBD (HTL expert).

Potential Co-sponsor: IMBER.

BIO Endnote 5

Proposal for a 1-day workshop at PICES XVII on “Oceanic ecodynamics comparison of subarctic Pacific”

OECOS (Oceanic Ecodynamics COmparison in the Subarctic Pacific) is a PICES project, originally aiming to advance our understanding of the dynamics of lower trophic levels in the pelagic systems of the subarctic Pacific through a comparison of the east–west regions at a new level of detail. The first OECOS workshop was

held in May 2005, at Oregon University (U.S.A.), and participants from Japan (western Pacific region) and the U.S. and Canada (eastern Pacific region) discussed gaps in our knowledge about ecosystem dynamics of both eastern and western sectors of the subarctic Pacific, and new coordinated approaches for future research

activities (PICES Scientific Report No. 32, 2006). In March–April 2007, the western group (OECOS WEST) conducted two cruises to the Oyashio region before and during massive spring phytoplankton blooms. In both cruises, high-frequency samplings were made of various biological components (bacteria, phytoplankton, micro-, meso- and macrozooplankton, and micronekton) and nutrients (including iron). To aid analysis of the origin and history of water masses at the study sites, frequent CTD casts

and satellite monitoring of SST and water color were made. Drifting sediment traps were tracked to collect settling particles from the upper layers. At this workshop, recent achievements of OECOS WEST will be presented and discussed along with new OECOS WEST and EAST research prospects.

Recommended convenors: Charles B. Miller (U.S.A.) and Atsushi Yamaguchi (Japan).

BIO Endnote 6

Proposal for a 3-day 4th PICES workshop on “*The Okhotsk Sea and adjacent areas*”

Background

The Okhotsk Sea is one of the most biologically productive regions in the world with high fisheries production. Several previous reports indicate that primary productivity in the Okhotsk Sea is very high especially on the continental shelf (Saitoh *et al.*, 1996; Sorokin and Sorokin, 1999). The Okhotsk Sea is also well known as one of the southernmost zones of seasonal sea ice in the Northern Hemisphere. The most important factor required to characterize spatial and temporal variability of spring blooms was the timing of sea ice retreat (Matsumoto *et al.*, 2004), while a secondary factor was the adjustment of insolation. The beginning of the spring bloom in the Okhotsk Sea depends on the adjustment of the light environment, and the presence of sea ice controls light intensity in the surface water and thereby the timing of the spring bloom (Okunishi *et al.*, 2005). There is little information on iron concentration in the Okhotsk Sea, but Fe(III) solubility in the surface mixed layer is generally high and variable (0.3–0.7 nM) in the southern Okhotsk Sea (Tani *et al.*, 2003). The concentration of inorganic nitrogen varied in the upper mixed layer from 1–3 μM in the center of Okhotsk Sea in summer (Sorokin and Sorokin, 1999). Nitrate can be depleted after the spring phytoplankton bloom in the western region of the Okhotsk Sea (Nakatsuka *et al.*, 2004). These facts suggest that iron supply is higher in the Okhotsk Sea than in the western subarctic Pacific, and that phytoplankton growth is not limited by iron availability in the Okhotsk

Sea. The main source of iron in the Okhotsk Sea is not known. At least along the coast of Hokkaido, the Okhotsk Sea is well known for its scallops, Hanasaki crab, chum salmon and herring resources. An important consideration in the region is that the food for benthic animals is mainly supplied by the ice algae and the spring bloom after the ice floes are removed.

Consequently, goals of this workshop are:

- to exchange and share most recent and basic knowledge on the sea;
- to identify key scientific questions;
- to identify gaps of knowledge and necessary approaches;
- to develop the Okhotsk Sea component of PICES FUTURE Program.

Dates and duration

A full 3-day workshop in late August 2008 (temporally from August 27–29)

Venue and transportation

Okhotsk campus of the Tokyo University of Agriculture Yasaka 196, Abashiri, Hokkaido, 099-2422 Japan (Airplane from Tokyo Haneda to Memanbetsu, 90 min; Bus airport–campus, 30 min).

Program structure (draft)

Day 1

- Invited presentations on what is known (potential invited speakers (without their

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agreement): K.I. Ohshima, J.E. Overland, V.I. Radchenko)

- Submitted/selected papers on what is known
- Invited papers on gaps of knowledge and necessary approaches (potential invited speakers (without their agreement): G. Kantakov, T. Hirawake, F. Mueter)

Day 2 (morning)

- Invited presentations on key scientific questions and elements of the program (potential invited speakers (without their agreement): H. Mitsudera, T. Okunishi, Y. Sakurai, S. Taguchi, K. Tateyama, M. Fujii, S. McKinnell)
- Submitted/selected papers on element program proposals

Day 2 (afternoon)

- Group discussions on: (1) climate and oceanography (including sea-ice); (2) chemical and biological oceanography; (3) fisheries; (4) modeling studies; and (5) data and monitoring.

Day 3

- Plenary session for proposal synthesis

Estimated number of participants

Domestic participants: ~50

Overseas participants: ~30

Required arrangements

- One large lecture room for plenary sessions (~100 participants)
- At least 5 small lecture rooms for group discussions (~20 participants)
- Internet connections
- Coffee break facilities
- Lunch room and services
- Transportation between hotels

International Scientific Steering Committee

- Angelica Peña (BIO, Canada)
- Gordon H. Kruse (FIS, U.S.A.)
- Vyacheslav B. Lobanov (POC, Russia)
- Sei-Ichi Saitoh (MONITOR, Japan)

- Vladimir I. Radchenko (Russia)
- Yuri I. Zuenko (Russia)

Local Organizing Committee

- Akihiro Shiimoto (Tokyo University of Agriculture)
- Masahide Kaeriyama (Hokkaido University)
- Sei-Ichi Saitoh (Hokkaido University)
- Atsushi Yamaguchi (Hokkaido University)

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BIO Endnote 7**Proposal for a PICES/CREAMS Summer School on “Biomass-based management”****Background and objectives**

In August 2006, the 1st PICES Summer School on “*Ocean circulation and ecosystem modeling*” was organized in Busan, Korea. More than 30 students from 9 countries (including all PICES member countries) attended lectures, seminars and practical exercises. At the conclusion of the school, it was recommended to hold a following summer school within a couple of years. PICES members at Hokkaido University, Drs. M. Kaeriyama, M.J. Kishi, Y. Sakurai and S.-I. Saitoh, discussed this matter and proposed to hold the 2nd PICES Summer School in August 2008 (immediately prior to the workshop on “*The Okhotsk Sea and adjacent areas*”), in Hakodate, Japan. The theme is “*Biomass-based management*”.

Dates and duration

A full 3-day event in late August 2008 (temporarily from August 23–25)

Venue

Hakodate campus of Hokkaido University or Ohnuma Seminar house (both potential venues are located near Hakodate airport)

Program structure (tentative)Day 0 (Aug. 22, Fri.)

Registration and Welcome Reception

Day1 (Aug. 23, Sat.)

09:00–09:30 Information from convenors,
09:30–11:00 Lecture on “*Ecological Footprint*”
(lecturer to be supported by

PICES is not decided yet; potential invitees are Susannah Buchan, William Rees, Mathis Wackernagel)

11:00–15:00 Practical class on calculation of ecological footprint

15:30–17:00 Discussion on the results

Day 2 (Aug. 24, Sun.)

09:00–10:00 Invited lecture on “*Biomass based management*” (lecturer to be supported by FRA is not decided yet, but someone from FRA, Japan)

10:00–12:00 Discussion on ecological-based management: What should we do?

13:00–14:00 Discussion on what software we can use

14:00–17:00 Practical class on ecosystem-based management planning (*e.g.*, on whales, salmon, herring, *etc.*); making a flowchart of modeling

Day 3 (Aug. 25, Mon.)

09:00–14:00 Using NEMURO.FISH, Footprint software, or the other tools of numerical models, practicing of imaginary ocean ecological-based management or ecological footprint

14:00–16:00 Presentation by each group

17:00–19:00 Farewell party

Day 4 (Aug. 26, Tues.)

09:00–16:30 Excursion to fishermen’s village and discussions with fishermen

09:00 Departure to Abashiri for the Okhotsk Sea workshop (for those who are planning to attend)

