REPORT OF PHYSICAL OCEANOGRAPHY AND CLIMATE COMMITTEE

The meeting of the Physical Oceanography and Climate Committee (POC) was held from 8:30-15:30 hours on October 7, 2005. The Chairman, Dr. Michael G. Foreman, called the meeting to order and welcomed members and observers (*POC Endnote 1*). Dr. James Christian served as rapporteur. The Chairman introduced Drs. Kyung-Il Chang (Korea) and James Christian (Canada) as new members of the Committee. The draft agenda was reviewed and adopted (*POC Endnote 2*).

Completion of PICES XIII decisions (Agenda Item 4)

- Working Group 17 on *Biogeochenical data integration and synthesis* (whose term ends in 2005) was transformed into the new Section on *Carbon and climate* reporting to POC and BIO.
- The Advisory Panel for *the CREAMS/PICES Program in East Asian Marginal Seas* was established under POC. It was suggested that BIO and MONITOR should consider co-sponsoring this Advisory Panel with POC.
- POC Committee member Dr. James E. Overland was named a member of CFAME.
- The first version of the POC Action Plan has been drafted.
- At the 2004 Annual Meeting, Science Board clarified that Committees could elect a Vice-Chairman if they so choose. The POC Committee felt this would be a good way to provide alternative participation at meetings that the Chairman could not attend. Dr. Ichiro Yasuda (Japan) was elected to this position at PICES XIV.
- A 1½-day POC Paper Session was convened at PICES XIV. Two invited speakers gave interesting presentations related to global climate model results that have been submitted to the Inter-governmental Panel on Climate Change for their 4th Assessment Report. Twenty-seven oral and 21 poster presentations were given. The summary of the session is included elsewhere in this Annual Report.
- A 2-day CREAMS/PICES Workshop on "*East Asian Seas Time-series*" was held April 21-22, 2005, in Seoul, Korea.
- The POC suggestion of "*Boundary current ecosystems*" as a theme for PICES XV was accepted by Science Board.
- Science Board approved the Symposium on "*Time series of the Northeast Pacific Ocean: A symposium to mark the 50th anniversary of Line-P*" to be held from July 5-8, 2006, in Victoria (Canada), co-sponsored by Fisheries and Oceans Canada and PICES. Planning is underway and talks will be requested from other time-series programs in the North Pacific.
- The Young Scientists Conference (joint with ICES) has been approved by Science Board and tentatively scheduled for the summer of 2007. Funds have been allocated by PICES and ICES, and a Steering Committee, comprised of two senior and two early-career scientists from each organization, has been appointed.

Progress report of WG 17 on *Biogeochemical data integration and synthesis* (Agenda Item 5a)

Dr. Andrew G. Dickson, WG 17 Co-Chairman, was not able to attend the meeting and sent a brief review of Working Group activities. As this Working Group is scheduled to end in 2005, a final report has been requested.

Progress report of CREAMS/PICES Advisory Panel (Agenda Item 5b)

This report of the Advisory Panel for *the CREAMS/PICES Program in East Asian Marginal Seas* was presented by Dr. Kyung-

Ryul Kim, and the objectives, observation plan, and time table of the CREAMS/PICES Program in East Asian Marginal Seas are included as *POC Endnote 3*. Dr. Kim stated that the first phase of the program focused on the Japan/East Sea and East Asian Time-series I (EAST I). A workshop on "*East Asian Seas Time-series*", co-sponsored by the Korean Ministry of Maritime Affairs and Fisheries (MOMAF), the School of Earth and Environmental Sciences of the Seoul National University, and PICES, was held April 21-22, 2005, at the Seoul National University. More than 50 marine scientists from 7 countries attended the workshop, which included presentations from existing time-series programs, and provided a forum for exchange of scientific information and expertise, and to explore how earlier experiences of time-series studies might assist in the development of future East Asian Seas Time-series. Emphasis for the workshop was on reviewing prior research and monitoring programs in the Japan/East Sea (JES), and on developing a framework for a future JES program. This was envisioned as the beginning of a workshop series that will eventually generate implementation plans for other East Asian seas (*e.g.*, Okhotsk Sea, Bohai/Yellow Sea, East China Sea and South China Sea). The proceedings have been published and are available from Dr. Kyung-Ryul Kim. A summary of the workshop can be found in PICES Press (Vol. 13, No. 2).

A ten-year time-series program will be initiated in 2006, and a request has been made to the Korean government for financial support. This program will have three main components: HydroEAST, CarboEAST, and EcoEAST. An inaugural workshop will be held soon, hopefully in the spring of 2006.

Dr. Kyung-Ryul Kim (Korea) and Dr. Yasunori Sakurai (Japan) were nominated as Co-Chairmen of the Advisory Panel.

Progress report of North Pacific Data Buoy Advisory Panel (Agenda Item 5c)

A report (*POC Endnote 4*) was prepared by the Panel Technical Coordinator, Mr. Al Wallace, and a summary was presented to POC by Dr. Foreman.

Proposals for new subsidiary bodies (Agenda Item 5d)

Dr. Foreman presented draft terms of reference (*POC Endnote 5*) for a new Working Group on *Evaluation of climate change projections* that would report to POC and be affiliated with the new CFAME Task Team. As previous climate change analyses within PICES have primarily focused on retrospective studies, and the Inter-governmental Panel for Climate Change is currently preparing their 4th Assessment Report based on results submitted from over twenty global climate models, the timing is right for climate analyses that look into the future.

The underlying objective of the Working Group would be to make climate change projections accessible to other PICES committees, groups, and any new Science Programs, and to evaluate the implications of these projections for the oceanography of the North Pacific and its marginal seas. A short discussion ensued on the merits of the new Working Group, the draft terms of reference (ToR), and prospective membership. Dr. Francisco E. Werner suggested that the second ToR be amended to reflect ecosystem impacts. He also mentioned that he will soon be attending a workshop entitled "*Toward integrative science at NCAR: building links between climate and ecosystem impact research communities*", and agreed to be a PICES liaison. The Committee supported the new Working Group.

Science Board issues (Agenda Item 6)

The Chairman briefly reviewed a draft POC Action Plan that followed the template sent out by the Science Board. This Plan identified specific POC actions on the short (annual) to medium (~5 years) time scale relating to points in the PICES Strategic Plan. Modifications were made to some of the action items, and the Plan was accepted for presentation at the next inter-sessional Science Board meeting. This is where all Committee Action Plans will be discussed

and, possibly, merged into one PICES Action Plan.

Dr. George L. Hunt presented a proposal for an ESSAS/PICES Workshop to be held in June 2006, in Russia (*CCCC Endnote 3*). POC supported the concept, and it was recommended that Science Board should provide travel support for 1-2 PICES members to attend.

Dr. Kyung-Ryul Kim proposed a POC/PICES Workshop on "*Model-data inter-comparison for the Japan/East Sea*" and a summer school on "*Circulation and ecosystem modeling*" to be held in the summer of 2006, in Korea. A draft of this proposal has been included as *POC Endnote 6*. Travel support was requested for 1 lecturer and 1 invited speaker. The Committee also supported this proposal.

Potential topics towards next major PICES scientific program(s) (Agenda Item 7)

The Chairman briefly discussed the 6 themes that have been put forward for the next major PICES scientific program to start after the CCCC Program ends. (This was a continuation of the presentation made by Dr. John E. Stein, Science Board Vice-Chairman, at the Closing Session.) Noting that there was considerable overlap among the proposals, the Chairman stated that his objective, as a member of the Study Group on *Future integrative scientific program(s)* that was tasked with soliciting and recommending a final choice (or choices), was to ensure a role for POC activities. The deadline for discussion of the proposed themes is December 1, 2005. Comments should be sent to Science Board and copied to the POC Chairman. The tentative acronym for the program is FUTURE – *Forecasting and Understanding Trends and Uncertainties in Ecosystem Response*. Dr. Yury Zuenko noted that it was important that "prediction" be a key component of the new program. Dr. Shin-ichi Ito indicated that proposals 2, 3 and 4 are similar and consistent with POC priorities. He felt that they should be supported but modified to emphasize prediction. Dr. Foreman suggested that the first four letters in the proposed acronym tie in well with the new POC Working Group. It was concluded that key words in the new scientific program should include: *understanding mechanisms, forecasting, evaluating uncertainties*.

Planning PICES XV (Agenda Item 8)

Dr. Shin-ichi Ito proposed a 1-day Topic Session on "*Responses of North Pacific boundary current systems and its ecosystems to climate variability*", to be co-sponsored jointly with MODEL and MONITOR (*POC Endnote 7*). Travel funding for 1 invited speaker was requested. This proposal was supported by POC. [Later, the session title was changed to "*Synchronous and asynchronous responses of North Pacific boundary current systems to climate variability*".]

A ½-day joint BIO/POC Topic Session on "*Ecosystem responses to climate induced changes in along- and cross-shelf transport*" was suggested by BIO, but was not supported as no details of the proposal were provided.

The Chairman proposed a 1-day POC Paper Session and a 1-day Inaugural Workshop for the new Working Group on *Evaluation of climate change projections*. Travel funding for 1 invited speaker for the workshop was requested. This proposal was also supported by POC.

Possible invited speakers for the Science Board Symposium on "*Boundary current ecosystems*" were discussed, and the following suggestions (in order of preference) were put forward: Bo Qiu (U.S.A.), Guo Hong Fang (China), Alec MacCall (U.S.A.), and Mark Wimbush (U.S.A.).

PICES XVI theme (Agenda Item 9)

The theme "*The changing North Pacific: Previous patterns, future projections, and ecosystem impacts*" proposed by Canada for PICES XVI was discussed (*SB Endnote 8*). Dr. Zuenko and others suggested that alternative titles could be "*Climate change(s) in subarctic seas*" and "*Climate change(s) in the subarctic Pacific and its adjacent seas*". It was agreed that these alternatives should be carried forward to Science Board.

Relations with international programs and organizations (Agenda Item 10)

Dr. Vyacheslav Lobanov described the status of the GOOS and NEAR-GOOS projects. The expected shift from strategic planning to implementation of GOOS required a strengthening of both administration and funding mechanisms for the project. The recent consolidation of world-wide GOOS Regional Alliances (GRA) is currently supported through the GRA Network Development (GRAND) project of the European Commission (www.grandproject.org). Recognition of GOOS by GEO as an ocean component of the developing GEOSS (Global Earth Observation System of Systems) is crucial for further progress of the project. As a regional component of GOOS, NEAR-GOOS provides oceanographic data and products both in real-time and delayed mode, and is working on the development of a sustained monitoring system for the region.

A proposal for an ICES/PICES/IOC Symposium on "*Effects of climate change on the world's oceans*", tentatively scheduled of the spring of 2008, in Gijón (Spain), was briefly discussed. Noting that the title should perhaps be revised to reflect two-way interactions, *effects of the oceans on climate* as well as *effects of climate on the ocean*, the Committee recommended support for the proposal.

Items with financial implications (Agenda Item 11)

Inter-sessional meetings for 2006 and beyond:

POC requests travel support for:

- 1 invited speaker for the POC Workshop on "*Model-data inter-comparison for the Japan/East Sea*", and 1 lecturer for the summer school on *"Circulation and ecosystem modeling*";
- 1-2 scientists to attend the ESSAS/PICES Workshop on comparing sub-arctic ecosystems (to be shared with other committees).

POC also discussed an inter-sessional workshop of the new Working Group on *Evaluation of climate change projections* with CFAME in April 2007, and agreed to defer this request to PICES XV.

A PICES observer was also requested at the NEAR-GOOS meeting to be held in January 2006, in Busan, Korea, but this may or may not require travel support.

Publications for 2006 and beyond:

None is anticipated except "Guide to best practices for oceanic CO_2 measurements and data reporting" for which funds have already been allocated.

Travel support requests for PICES XV:

- 1 invited speaker for POC Topic Session on "*Synchronous and asynchronous responses of North Pacific boundary current systems to climate variability*";
- 1 invited speaker for the Inaugural Workshop for the new Working Group on *Evaluation of climate change projections.*

2005 POC Best Presentation Award (Agenda Item 12)

Drs. Foreman, Lobanov and Yasuda acted as judges for the POC Paper Session. Satoshi Osafune (Japan) and Yuri Nikonov (Russia) were named co-winners for their respective presentations "*Bidecadal variability in the intermediate waters of the northwestern subarctic Pacific and the Okhotsk Sea in relation to the 18.6 year nodal tidal cycle*" (co-authored by Ichiro Yasuda) and "*Water and chlorophyll circulation modeling of Aniva Gulf according to oceanographic data from the year 2002*" (co-authored by Valeriy Chastikov and Ludmila Gavrina).

POC members thanked Dr. Yury I. Zuenko for volunteering to serve on the Best Poster Award Committee. The winner was Hanna Na (Korea) for her poster (submitted to the POC Paper Session) "*Temporal variation of the estimated volume transport through the Korea and Tsugaru Straits*" (co-authored by Kuh Kim).

Adoption of POC report (Agenda Item 14)

The preceding report has been circulated and approved by Committee members. All recommendations were brought forward by Dr. Foreman at the Science Board meeting on October 8, 2005.

POC Endnote 1

Participation list

Members

Kyung-Il Chang (Korea)
James Christian (Canada)
Michael G. Foreman (Canada, Chairman)
Shin-ichi Ito (Japan)
Hee-Dong Jeong (Korea)
Vyacheslav B. Lobanov (Russia)
Young-Gyu Park (Korea)
Ichiro Yasuda (Japan)
Yury I. Zuenko (Russia)

Observers

Hiroyasu Hasumi (Japan)
Sok Kuh Kang (Korea)
Kyung-Ryul Kim (Korea)
Vadim Navrotsky (Russia)
Ig-Chan Pang (Korea)
Fangli Qiao (China)
Muyin Wang (U.S.A.)
Francisco Werner (U.S.A.)

POC Endnote 2

POC meeting agenda

1. Welcome, introductions, opening remarks
2. Adoption of agenda, appointment of rapporteur
3. Welcome new members (Jim Christian, Kyung-Il Chang)
4. Completion of PICES XIII decisions
5. Reports of existing subsidiary bodies and proposals for new subsidiary bodies
   a. Progress report of WG 17
   b. Progress report of CREAMS/PICES Advisory Panel
   c. Progress report of North Pacific Data Buoy Advisory Panel
   d. Proposal for new subsidiary bodies
6. Discussion of Science Board issues
7. Potential topics towards next major PICES scientific program(s)
8. Planning PICES XV
9. PICES XVI theme
10. Relation with other international programs and organizations
11. Items with financial implications
12. 2005 POC Best Presentation Award
13. Other business
14. Adoption of POC report and recommen dations to Science Board.

POC Endnote 3

CREAMS/PICES Program in East Asian Marginal Seas

Program objectives

1. To understand the hydrography and circulation and their variability in the East Asian marginal seas;
2. To understand the effect of climate and long-term changes in physical and chemical environments on the East Asian marginal seas ecosystems;
3. To establish permanent observation stations and a data exchange network in East Asian marginal seas.

The initial focus of the Program will be on the Japan/East Sea. The schedule and observational plan for the program is given in the following.

Time table

Dec. 2004: Establish CREAMS/PICES Advisory Panel
Mar. 2005: 132°E cruise
Spring 2005: Open CREAMS/PICES Office and hold 1st workshop on East Asian Seas Time-series, co-sponsored by MOMAF, RIO/SNU and PICES
Spring 2006: 132°E cruise; start of permanent stations
June 2006: Hold 2nd workshop on "East Asian Marginal Seas circulation: What we know and how well can we forecast?"
Spring 2007: 132°E cruise
Oct. 2007: Hold 3rd workshop on "Progress in studies of physical processes their impacts to the Japan/East Sea ecosystem" at PICES XVI

Observation plan

1. Hydrography baseline: 132°E;
2. Permanent stations: EAST-I (Ulleung Basin) and EAST-II (Western Japan Basin);
3. Mooring stations: Western Japan Basin and Ulleung Basin;
4. Profiling floats, surface drifters, SST and satellite data.

POC Endnote 4

Report of the *North Pacific Data Buoy Advisory Panel* (NPDB-AP) for 2004/2005

Summary of activities for September 2004 – August 2005

The NPDB-AP was officially accepted as an entity reporting to the Data Buoy Co-operation Panel (DBCP) and PICES at the 18th session of DBCP held in October 2002. This is the Panel's 3rd Annual Report as an official body of DBCP.

During the period September 1, 2004 to August 31, 2005, an average of 64 drifting buoys per month reported to MEDS from the North Pacific Ocean (30°N to 65°N and 110°E to 110°W). These buoys produced approximately 28,000 messages per month. These numbers are roughly the same as last year with 66 buoys and 24,000 messages per month. As of August 2005, 109 buoys were reporting, 28 with barometric pressure. Tables and figures showing breakdowns of the number of buoys in operation and the number of messages received were compiled by MEDS and are available on the NPDBAP website at http://npdbap.noaa.gov.

Meetings

October 17, 2004

A meeting was held during the 20th session of the Data Buoy Co-operation Panel (DBCP – XX) in Chennai, India. NPDB-AP and DBCP representatives from Canada, United States, Japan and the WMO were in attendance.

Summary of activities for 2004 - 2005

Canada

- 3 moored 6-meter NOMAD buoys deployed year round (deep sea);
- 13 moored 3-meter Discus buoys deployed year round (coastal);
- 1 developmental 3-meter Discus buoy (Pat Bay) – not reporting on GTS;
- 9 drifters

Reporting on GTS (31/07/05): 16 moored buoys, 9 drifting buoys

Four SVP/B (Surface Velocity Profiler with Barometer) drifters will be deployed in the Central North Pacific in summer/early fall 2006. Ten barometer upgrades are scheduled on U.S. drifter buoys in cooperation with GDP for deployment in the Pacific.

Japan

From September 2004 to August 2005, Japan deployed a total of 160 buoys (20 surface

drifting buoys, 117 profiling floats, 23 moored buoys) in the seas around Japan, North Pacific, Tropical Pacific, South Pacific, Indian Ocean, Southern Ocean, Arctic Ocean and Antarctic Ocean for oceanographic research and operational purposes by JMA (Japan Meteorological Agency), JCG (Japan Coast Guard), JAMSTEC (Japan Agency for Marine-Earth Science and Technology), Tohoku University, NIPR (National Institute of Polar Research) and FRA (Fisheries Research Agency).

JMA deployed 12 drifting buoys with air pressure, SST, significant wave height and period sensors in the seas around Japan. The data are distributed on the GTS, with header from "SSVB01 RJTD" to "SSVB19 RJTD".

United States

National Data Buoy Centre (NDBC)

- 3 moored buoys were deployed in the North Pacific in 2005;
- 1 Deep Ocean Assessment and Reporting of Tsunamis (DART) was deployed in the North Pacific in 2005. This program will increase six-fold over the next two years with DART buoys being deployed throughout the North Pacific;
- All 4 APEX (Automated Profiling EXplorer) floats that report water column temperature and salinity profiles every 10 days ceased reporting in 2005;
- No drifters were acquired or deployed in 2005.

Naval Oceanographic Office (NAVOCEANO)

10 SVP-B drifters were deployed in the eastern North Pacific. Environment Canada funded the upgrade of buoys.

Global Ocean Observing System Center

- 47 SVP-B drifters were deployed by the Atlantic Oceanographic and Meteorological Laboratory (AOML/ONR/NOAA) using Voluntary Observing Ships. Upgrades of buoys funded by NOAA/NDBC.
- 10 SVP drift buoys were deployed by research vessels in the North Pacific. The GDP worked with Environment Canada to upgrade 10 SVP buoys with barometers. These buoys were air deployed by the Naval Oceanographic Office.

Overview of plans for 2005 - 2006

The next NPDB-AP meeting is scheduled for Sunday, October 16th 2005, from 14:00 to 17:00, prior to the 21st session of the Data Buoy Co-operation Panel (DBCP – XXI). The meetings will take place at the Regente Palace Hotel, Buenos Aires, Argentina. It was felt that this would permit maximum attendance of active DBCP and NPDB-AP members while minimizing travel costs to attend a meeting in a different location.

Deployments and new initiatives for 2005 - 2006

Planned buoy deployments and other related activities for the next year are as follows.

Canada

Meteorological Survey of Canada

- Two SVP/BW drifter buoys awaiting deployment in fall 2005 in the Pacific in support of NPDB-AP;
- Eight SVP/B drifter buoys awaiting deployment in early fall 2005 in the Central and Western North Pacific in support of NPDB-AP;
- 2 SVP/BW drifters to be deployed in summer 2006 in the Central North Pacific;
- 4 SVP/B drifters are scheduled for deployment in summer/early fall of 2006 in the Western North Pacific.

Marine & Environmental Data Service (MEDS)

- MEDS would like to re-design the look and content of the Drifting Buoy/RNODC section of the website for easier maintenance and to include more graphs and statistics on their archive and its contents;
- Drifting buoy data is currently quality-controlled on a monthly basis, but the need for drifter data in a more timely manner is increasing. MEDS will be looking into changing their processing system to a weekly or even daily operation.

- Complete and implement new BUFR software.

Japan

From September 2005 to August 2006, a total of 163 buoys (18 surface drifting buoy, 122 profiling float, 23 moored buoy) are scheduled to be deployed in the seas around Japan, North Pacific, Tropical Pacific, South Pacific, Indian Ocean, Southern Ocean, Arctic Ocean and Antarctic Ocean for oceanographic research and operational purposes by JMA, JCG, JAMSTEC, Tohoku University, NIPR and FRA.

United States

NDBC/GDP
Forty SVP drifters are being upgraded to SVP-B by the National Data Buoy Center (NDBC), and are scheduled for deployment in the North Pacific in 2005/06. These 40 SVP-B buoys are in addition to the usual number of SVP buoys that are deployed in the North Pacific over time.

POC Endnote 5

Draft terms of reference for a Working Group on *Evaluation of climate change projections*

1. To analyse and evaluate climate change projections for the North Pacific and its marginal seas based on predictions from the latest global and regional models submitted to the Inter-governmental Panel on Climate Change (IPCC) for their 4th assessment report;
2. To facilitate analyses of climate effects on marine ecosystems and ecosystem feedbacks to climate by, for example computing an ensemble of the IPCC model projections for the North Pacific and making these projections available to other PICES groups such as CFAME;
3. To facilitate the development of higher-resolution regional ocean and coupled atmosphere-ocean models that are forced by, and take their boundary conditions from, IPCC global or regional models;
4. To facilitate the development of local and regional data sets (*e.g*., SST, river flow, sea ice cover) by incorporating information from climate model projections as well as observations and historical re-analyses;
5. To ensure effective two-way communication with CLIVAR;
6. To convene workshops/sessions to evaluate and compare results;
7. To publish a final report summarizing results.

POC Endnote 6

Proposal for a POC Workshop on "*Model-data inter-comparison for the Japan/East Sea*" and a summer school on "*Circulation and ecosystem modeling*"

Background

Water dynamics are important for physical processes, ecosystem dynamics and human activity. Given the growing importance of operational oceanographic information and forecasts (*e.g*. in relation to the development of regional coastal components of GOOS like NEAR-GOOS, and to PICES activities such as the North Pacific Ecosystem Status Report and the CREAMS/PICES Program), it is timely to ask what is known, and whether reliable forecasts can be made for the circulation in the Japan/East Sea (JES). Intensive field observations over recent years have increased our knowledge of the water dynamics in the JES, while at the same time, there have been further developments in numerical modeling. Are these observational and modeling advances interactive and comparable with each other? What have been the achievements and gaps? What would be an approach to create a reliable regional model?

Goals

- To review the most recent observations of physical and biogeochemical processes in the JES;
- To share results from simulations of physical and ecosystem processes, and to compare model results with observational data. Particular attention will be given to those data obtained during CREAMS II (ONR-JES program for 1999~2001, and other experiments) in order to identify common responses, to discover major disagreements among models, and to identify any extreme responses in individual models that might warrant further investigation;
- Share methodologies and approaches for analysis and diagnosis of simulations and propose more quantitative strategies for model-model and model-data inter-comparison;
- To introduce and share results from present state-of-art nowcast/forecast systems operating in the JES, and to evaluate their strengths and weaknesses with regard to circulation variability and ecosystem response;
- To introduce efforts that are developing regional coupled physical-biological models in North Pacific regions and to encourage such efforts in the JES;
- To gather together early-career scientists and motivate their involvement in research on "modeling the climate variability and ecosystem response" (dedicated PICES' capacity-building summer school).

Dates, venue and tentative schedule

Five days in summer 2006 (Monday to Friday) at location TBD in Korea. Two days will be dedicated to the workshop (inter-comparisons - 1.5-day; and nowcast/ forecast system and coupled modeling - 0.5-day) and three days to the summer school.

Expected participants

An attendance of 20-25 people is anticipated. Modelers as well as observationalists working on the physical and biological oceanography of the Japan/East Sea from Japan, Korea, Russia, and U.S.A. are expected to attend the workshop. Two lecturers (on circulation modeling and ecosystem modeling – NEMURO) will be invited for the summer school.

Funding

Potential funding sources would be the Korea CREAMS/PICES Program, the Seoul National University (Brain Korea 21 Program), the Korea Ocean Research and Development Institute (KORDI), IOC/WESTPAC, ONR-Asia, the Russian Academy of Sciences, and other organizations. Speakers and participants attending the workshop and summer school are required to cover their own expenses. Limited funding will be available for some workshop speakers and young scientists attending the summer school. PICES is requested to make an official announcement of the workshop and school, to recommend appropriate invited speakers and lecturers, and to provide funds for one speaker for workshop and one lecturer for the summer school.

Workshop outcome

- Extended abstracts of papers presented at the workshop and a summary of lecture notes for the summer school will be published in the PICES Scientific Report Series;
- Publication of selected papers from the workshop in a special issue of a relevant journal will be considered.

Conveners

Kyung-Il Chang (SNU, Korea)
Sok-Kuh Kang (KORDI, Korea)
Vyacheslav Lobanov (POI, Russia)
Christopher N. K. Mooers (U. Miami, U.S.A.)
TBD (Japan)

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POC Endnote 7

Proposal for a 1-day POC/MONITOR/CCCC Topic Session on

"Responses of North Pacific boundary current systems and its ecosystems to climate variability"

[later renamed "*Synchronous and asynchronous responses of North Pacific boundary current systems to climate variability*"]

A number of hypotheses have attempted to explain the synchronous low-frequency fluctuations in sardine populations off California and Japan. One hypothesis proposes that since the Kuroshio Current (subtropical western boundary current) and California Current (subtropical eastern boundary current) are driven mainly by wind stress, their variability should be closely related through basin-scale atmospheric teleconnections. However, basin-scale climate signals may be modulated by regional meso-scale processes, and both systems are impacted by a range of variability from decadal (*e.g*., regime shifts), to interannual (*e.g*., ENSO), to seasonal and shorter time scales. This variable forcing may lead to divergent and asynchronous ecosystem responses. This session will provide a comparative review of the physical and ecosystem variability of the boundary currents, discuss the degree of synchronicity of this variability, and facilitate understanding of the connectivity between North Pacific boundary current systems. A more comprehensive understanding of the boundary current systems requires modeling approaches, although the data for model validation is often limited. This session will also provide consideration of observing system requirements and techniques for monitoring boundary current circulation and ecosystems, in particular the necessary combination of data and models.

Recommended convenors: Jack Barth, Steven Bograd (U.S.A.), Shin-ichi Ito, Kosei Komatsu (Japan) and Vyacheslav B. Lobanov (Russia).