

The Physical Oceanography and Climate Committee

An overture meeting of the Physical Oceanography and Climate Committee (POC) took place in Hiroshima, Japan, from 18:00–19:30 h on October 14, 2012. POC Chairman, Dr. Kyung-Il Chang, called the meeting to order, circulated the draft agenda, and introduced key issues that needed in-depth discussion and decision at the POC meeting on October 17, 2012. Judges for 2012 POC Best Presentation and Poster Awards were nominated: Drs. Kyung-Il Chang, Michael Foreman, Yury Zuenko.

The second POC meeting was held at from 14:00-18:00 h on October 17, 2012. The Chairman called the meeting to order and welcomed members and observers (*POC Endnote 1*). Dr. Chang introduced two new POC members, Drs. Zhenya Song and Lei Zhou representing China, to replace Drs. Dake Chen and Zhanggui Wang (*POC Endnote 2*). The new members contacted the Chairman before the Annual Meeting, and asked the Chairman to deliver their regrets to POC members not to be able to attend the meeting due to various reasons. Dr. Michael Foreman, Vice-Chairman of POC, agreed to act as a rapporteur. The draft agenda presented at the overture POC meeting was adopted (*POC Endnote 3*).

AGENDA ITEM 4

Completion of PICES-2011 decisions

1. Travel support request for a PICES representative to attend the CLIVAR Pacific Implementation Panel meeting held in Noumea, New Caledonia, on April 29–May 1, 2012, was approved. (Shoshiro Minobe, Co-Chair of WG 27).
2. Travel support request for a PICES convenor for the Workshop on “*Climate change projections for marine ecosystems: Best practice, limitations and interpretation*” to be held at the 2nd International Symposium on “*Effects of climate change on the world’s oceans*”, May 13–14, 2012, Yeosu, Korea. (Enrique Curchitser, Co-Chair of WG 29).
3. Proposed 1-day POC Contributed Paper Session was approved for PICES-2012.
4. Proposed 1-day POC Topic Session S3 on “*Challenges in understanding North Hemisphere climate variability and change*” was approved for PICES-2012 (5 invited speakers, co-sponsored by CLIVAR and ICES).
5. Proposed ½-day FIS/MONITOR/POC Topic Session S4 on “*Monitoring on a small budget: Cooperative research and the use of commercial and recreational vessels as sampling platforms for biological and oceanographic monitoring*” was approved for PICES-2012 (1 invited speaker).
6. Proposed ½-day POC/FIS Topic Session S8 on “*Linking migratory fish behavior to end-to-end models II*” was approved for PICES-2012 (1 invited speaker).
7. Proposed 1-day MONITOR/POC Topic Session S11 on “*Effects of natural and artificial calamities on marine ecosystems and the scheme for their mitigation*” was approved for PICES-2012 (5 invited speakers, co-sponsored by JSFO and FRA).
8. Proposed ½-day BIO/FIS/POC Topic Session S12 on “*Advances in understanding North Pacific Subtropical Frontal Zone ecosystem*” was approved for PICES-2012 (1 invited speaker).
9. Proposed 1-day POC/TCODE Topic Session S14 on “*Changing ocean biogeochemistry and its ecosystem impacts*” was approved for PICES-2012 (3 invited speakers, co-sponsored by CLIVAR, IMBER, and SOLAS).
10. Proposed 1-day ESSAS/PICES Workshop W4 on “*Subarctic-Arctic interactions*” was approved for PICES- 2012 (3 invited speakers, co-sponsored by ESSAS).

AGENDA ITEM 5

Reports of active POC expert groups

Full reports of POC’s expert groups can be found elsewhere in the [2012 Annual Report](#). Brief highlights are given below.

POC-2012

Section on *Carbon and Climate* (S-CC)

Dr. James Christian, Co-Chairman of S-CC, reported the Section's 2012 activities and 2013 plans. The PACIFICA dataset was opened in May 2012, and a unified data product is now being produced, to be opened by the end of 2012. Documentation and analysis activities for the unified PACIFICA data product will follow. A SOLAS Summer School will be held in Xiamen, China, on August 23–September 2, 2013. S-CC supports a SOLAS request for PICES to provide travel funds for three early career scientists from PICES member countries to attend. S-CC has proposed a 1-day POC/BIO Topic Session for PICES-2013 on “*The changing carbon cycle of North Pacific continental shelves and marginal seas*”, and requested support for one invited speaker. S-CC plans to have ½-day business meeting at PICES-2013. POC approved all requests from S-CC.

Joint PICES/ICES Section on *Climate Change Effects on Marine Ecosystems* (S-CCME)

Dr. Anne Hollowed, Co-Chairman of S-CCME, summarized the Section's 2011/2012 activities and future plan, and sent the summary document to the POC Chairman prior to the POC meeting.

Advisory Panel for a *CREAMS/PICES Program in East Asian Marginal Seas* (AP-CREAMS)

Dr. Kyung-II Chang, a member of CREAMS-AP, gave a brief report of the Panel on its activities in 2011 and plans for 2012 and beyond. Since its meeting at Khabarovsk, Russia, during the 2011 PICES Annual Meeting, AP-CREAMS meetings were held twice in 2012, in Yeosu, Korea, on May 18, and in Hiroshima, Japan, on October 14 during the 2012 PICES Annual Meeting. National activities were presented including joint scientific cruises among AP members' countries, a Korea–Russia cruise in the Japan/East Sea and two China–Japan–Korea cruises in the East China Sea. The joint cruises will also be conducted in 2013 in both regions. The revised supplement to the 2010 North Pacific Ecosystem Status Report on the Japan/East Sea, after receiving comments from MONITOR and AP-SOFE, was prepared by AP-CREAMS and submitted to PICES.

Publication of an extensive status report or review of the EAST-II region was discussed and members in attendance agreed to establish an *ad hoc* committee to decide the format and scope of the report. Tentative *ad hoc* committee members were nominated and further discussion on preparing the report will be made during the PEACE meeting in Japan on November 28–29, 2012 and/or 17th PAMS meeting in China on April 23–25, 2013.

AP-CREAMS supports a NOWPAP request for travel support for one lecturer and some students to attend the 4th CEARAC/NOWPAP training course on “*Remote sensing data analysis*” in Qingdao, China, in 2013. AP-CREAMS was also requested to endorse a proposal for summer school on ecosystem modeling in 2014, prepared by Dr. K.-R. Kim. POC approved all requests from AP-CREAMS.

Working Group on *North Pacific Climate Variability and Change* (WG 27)

Dr. Emanuele Di Lorenzo, Co-Chairman of WG 27 (<http://wg27.pices.int>), gave a brief presentation on 2012 activities and future plans for WG 27. Objectives and terms of reference were reviewed, and the successful GLOBEC/PICES/ICES workshop on “*Forecasting ecosystem indicators with process-based models*” (ECOFOR Workshop) held in Friday Harbor Labs., Washington, USA on September 7–11, 2012, was reported (a report of ECOFOR is available at <http://wg27.pices.int/ecofor>). The importance of collaboration and exchange among marine ecosystem scientists and physical oceanographers, including climate scientists, in linking ecosystem response to climate forcing was highlighted during the workshop and recommendations were made to PICES and ICES. As the follow-up to the workshop, a 2013 ICES ASC Theme Session and PICES-2013 Workshop were proposed on “*Identifying mechanisms linking physical climate and ecosystem change: Observed indices, hypothesized processes, and “data dreams” for future*”. Another ECOFOR Workshop is being planned.

A Topic Session on “*Challenges in understanding Northern Hemisphere ocean climate variability and change*” (S3) led by WG 27 took place during the 2012 PICES Annual Meeting, and was well attended. Following the session, invited speakers from outside the PICES community and WG 27 members had a meeting to plan joint activities and team building targeted on “*Process modeling of large-scale ecosystem processes*”. Dr. Shoshiro

Minobe, Co-Chairman of WG 27, reported on his attendance at the 7th CLIVAR Pacific Panel meeting in Noumea, New Caledonia, on April 29–May 1, 2012. At the meeting, Dr. Minobe proposed that new CLIVAR after 2013 should widen its scope by including marine ecosystem and biogeochemical cycles in one of its scientific themes (*POC Endnote 3*). The proposal was reflected in grand challenges for new CLIVAR as “Marine biophysical interactions and dynamics of upwelling systems”. To build on the collaboration with CLIVAR, Dr. Minobe proposed a joint PICES/CLIVAR workshop in 2013 and requested PICES travel support for two PICES members, one from WG 27 and the other from other PICES members. A recent update of this proposal can be found in *POC Endnote 4*. POC approved requests from WG 27. See the WG 27 website (<http://wg27.pices.int>) containing all related materials, publications, and report.

Working Group on *Regional Climate Modeling* (WG 29)

Dr. Enrique Curchitser, Co-Chairman of WG 29, gave a brief summary of activities and plans of WG 29. During its first business meeting on October 12, 2012, Dr. Curchitser and Co-Chair, Dr. Chan Joo Jang, prepared a status of regional ocean or ocean–atmosphere coupled downscaling activities in the North Pacific from the PICES member countries. The status map contains the domain of each model and model resolutions both in the horizontal and vertical. The roadmap of WG 29, which contains annual major tasks of WG 29 between 2012 and 2014 focusing on the evaluation of regional models and analyses of CMIP5 results, was also shown. Contributions to the FUTURE outcome and outputs were also shown and discussed. Upcoming activities of WG 29 include a Topic Session on “*Recent trends and future projections of North Pacific climate and ecosystem*” for PICES-2013, and an inter-sessional workshop on “*Regional Climate Modeling – IP*” to be held in Korea in September 2013. An observer, Dr. Ken Drinkwater, suggested the workshop link to ICES or other Atlantic modelers. WG 29 requested PICES travel support for two PICES members as invited speakers to the workshop. POC approved the request, with strong support for the Topic Session and the workshop. BIO became the other parent committee of WG 29 after a request from BIO Chairman, Dr. Atsushi Tsuda, during the inter-sessional Science Board meeting in May 2012. Dr. Angelica Peña is the BIO member of WG 29.

AGENDA ITEM 6

Relations with other international organizations/programs

The following four brief presentations were given.

1. Dr. Toshio Suga gave summary of Argo activities on behalf of Dr. Howard Freeland. The number of Argo profiles will be 1 million by November 2012. Four issues for sustaining Argo were presented including a continuing focus on technology improvement and data management to reduce systematic errors in pressure and salinity and to avoid or identify major technical failures. Also given were new objectives of Argo: deployments in high latitudes and marginal seas, denser arrays in the boundary currents, improved surface layer sampling, enhanced vertical resolution, and expansions to deep ocean profiling and multi-disciplinary sensors such as dissolved oxygen, chlorophyll, nutrients, and pH. Contributions to Argo are to provide high-quality CTD data for re-calibration of Argo data, to provide information on cruises to unusual parts of the world oceans, and to support the Argo Information Center. Argo contact person is Mathieu Belbeoch, the Argo Technical Coordinator (belbeoch@jcommops.org).
2. Dr. Toshio Suga, representing the CLIVAR Pacific Panel, introduced post-2013 WCRP core projects that include new CLIVAR. Current CLIVAR will end in 2013, and the new CLIVAR will have a different organization of cross-cutting and regional panels. There will be the same Pacific Implementation Panel as that in the current regional panel. New CLIVAR research challenges were introduced including “Marine biophysical interactions and dynamics of upwelling system” as was mentioned by Dr. Shoshiro Minobe (Co-Chairman of WG29). POC members were curious why the specific topic, dynamics of upwelling systems, was recommended, and Dr. Suga said he will contact Dr. Martin Visbeck, Co-Chairman of CLIVAR SSG, to ask for further information. A proposal for future collaboration between CLIVAR and PICES, given by Dr. Minobe during the 7th CLIVAR Pacific Panel meeting, was also introduced. To strengthen links with PICES, CLIVAR co-sponsored the POC Topic Session “*Challenges in understanding Northern Hemisphere ocean climate variability and change*” at PICES-2012, and proposed a joint workshop between PICES and the CLIVAR Pacific Panel in 2013 (see *POC Endnote 4*).

3. Dr. Ken Drinkwater, Co-Chairman of ESSAS (Ecosystem Studies of Subarctic Seas), gave a brief presentation on ESSAS and its activities, the goal of ESSAS, and ESSAS Open Science Meeting in May 2012, with a special volume of publications being developed. ESSAS activities in 2012 involved an ESSAS/ICES Workshop at the PICES/ICES/IOC Climate Change Symposium held in Yeosu, Korea, ESSAS/PICES/ICES/ASOB theme session at the ICES ASC, and ESSAS/PICES/ICES Workshop on “*Arctic-Subarctic interactions*” at PICES-2012. The ESSAS 2013 Annual Science Meeting (ASM) will be held in Hakodate, Japan on January 7–9, 2013 with an overall theme of “Spatial Dynamics”. An ESSAS new working group on “Human Dimensions” and “Bioenergetics” could be formed during their ASM. A request was made to send at least one PICES scientist to attend the ESSAS ASM in Hakodate.
4. Dr. Lisa Miller provided a summary of SOLAS organizational issues. The 6th SOLAS Summer School will be held in Xiamen, China on August 23–September 2, 2013. The Summer School expects about 70 graduate students and will consist of 26 lectures and 5 practical workshops. A follow-up survey indicated that previous SOLAS summer schools provide a good scientific partnership among alumni of the schools. PICES support was requested to send three students to the 6th Summer School, which would cost about \$7,500.
5. At PICES-2011, PICES decided to support SCOR Working Group 140 – Biogeochemical Exchange Process at the Sea Ice Interfaces (BEPSE II) and recommended Dr. Lisa Miller as an associate member, representing PICES. Dr. Miller introduced the Working Group, co-chairs, terms of reference, and three task groups and their roles. The associate members have not yet been finalized, but Dr. Miller did not anticipate a problem, and requested PICES support to travel to the Working Group meeting in 2013.
6. Dr. Hee-Dong Jeong, NEAR-GOOS Coordinating Committee member, introduced the NEAR-GOOS regional observing system including ship-of-opportunity monitoring and a joint Japan–Russia survey in the Japan/East Sea, and a network of automated sea level stations in Russia.
7. Dr. Steven Bograd introduced the Central and Northern California Ocean Observing System (CeNCOOS), one of the components of U.S. Integrated Ocean Observing System (IOOS). CeNCOOS supports an “end-to-end” coastal ocean observing system based on shore stations, HF radar network, profiling gliders, and numerical models. CeNCOOS data products and data portal for accessing the products were also introduced.
8. There was a request from the Science Board Chair at the 2012 PICES inter-sessional Science Board meeting to review new SCOR Working Group proposals. POC supported one of proposals on “Surface Waves in Ocean Circulation and Climate System”.
9. Dr. Yutaka Michida, Vice-Chair of IOC, and Dr. Satoru Taguchi, SCOR Vice-President, gave presentations on both organizations and possible cooperation with PICES at the Science Board meeting on October 14. The POC Chairman then introduced their presentations to the POC Committee, focusing on possible linkages to POC such as the SCOR Visiting Scholars program, the POGO-SCOR Fellowships for Operational Oceanography, proposing and co-sponsoring SCOR working groups, and involvement of PICES scientists in the WESTPAC (sub-commission of IOC) program, like ocean acidification research.
10. The POC Chairman received and reviewed 18 theme session proposals for the ICES ASC to be held in Iceland in September 2013, and discussed the possible co-sponsorship of the sessions, focusing on the following 4 sessions; “Physico-chemical aspects of ocean acidification in the ICES area”, “Hydrographic processes, circulation, and water mass formation in the polar and subpolar basins”, “Identifying mechanisms linking physical climate and ecosystem change: Observed indices, hypothesized processes, and “data dreams” for the future” with Dr. E. Di Lorenzo, Co-Chair of WG 29, as a Co-Convenor, and “Responses of living marine resources to climate change and variability: Learning from the past and projecting the future” with Dr. Anne Hollowed, Co-Chair of S-CCME, as a Co-Convenor.

AGENDA ITEM 7
POC Action Plan

The POC Action Plan, based on the updated PICES Strategic Plan, was prepared by the POC Chairman, and reviewed and modified by the Vice-Chairman (*POC Endnote 5*). The Action Plan will be circulated among the members before submitting the final Action Plan to Science Board at the ISB-2013.

AGENDA ITEM 8
Update on FUTURE

POC expert groups, WG 27, WG 29, S-CCME, gave their summaries of activities related to FUTURE at the FUTURE meeting held on October 14 during PICES-2012. At the POC meeting, discussion about FUTURE was focused on three issues, and comments from the discussion for each issue are as follows.

1. Proposal for Production of the North Pacific Ecosystem Status Report (NPESR)
 - An annual web-based NPESR product would be beneficial but a possible problem of quality control of data was raised. In that regard, a bi-annual product may be better.
 - Annual NPESR could be published as a supplement to major journals like the supplement of the Bulletin of the American Meteorological Society (BAMS), State of the Climate in 2011, BAMS, Vol. 93, No. 7. (<http://www.ncdc.noaa.gov/bams-state-of-the-climate/2011.php>)
 - It should be easy to take information from member countries' on-going state of ocean reports such as Canadian State of the Ocean Report. (http://www.dfo-mpo.gc.ca/science/coecde/soto/documents/dfo_soto/english/index-eng.htm#a5).
 - Establishment of a Study Group to work on the production of NPESR was also suggested.
 - The annual or bi-annual production of NPESR would benefit from on-going regional observation programs such as CeNCOOS and NEAR-GOOS.
 - Nowcast/forecast model products could also be exploited for more frequent NPESR productions, but model results need validation.
 - The POC Chairman will contact POC members of each member country to provide what kind of physical parameters and data will be available in each country for an annual-based production of NPESR.

2. FUTURE roadmap prepared after the FUTURE Workshop in Busan, Korea, in May 2012
 - The Science Board Chairman asked each Committee member to consider necessary expert groups after the current expert groups expire. POC expert groups related to FUTURE, WG 27, WG 29, and S-CCME, were established in 2011 and 2012, and it may be premature to consider the next necessary expert groups until after the disbandment of these groups, between 2014 and 2016.
 - To accomplish the goal of FUTURE, analyses and evaluation of climate model results (AR4 and CMIP5) are very important. Currently WG 29 is working on it, and these efforts should be continued after the disbandment of WG 29.
 - A working group on end-to-end modeling is required to model the response of upper trophic levels to climate change.

3. FUTURE Open Science Meeting in 2014

A FUTURE Open Science Meeting (OSM) will be held in Hawaii in April 2014. The main objectives are the evaluation of FUTURE to date and the adjustment of its direction if necessary.

 - Dr. Shin-ichi Ito suggested the following themes and structure of the OSM:
 - Theme 1: What determines intrinsic resilience and vulnerability?
 - Theme 2: How do ecosystems respond to forcing and how might that change in the future?
 - Theme 3: How do human activities affect coastal ecosystems and how are societies impacted?
 - Theme 4: FUTURE current status and its perspectives.

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- Each theme from 1 to 3 to have a plenary session in the morning and parallel sessions in the afternoon;
- Theme 4 to have a plenary session including concluding remarks from 3 themes and discussion about the future of FUTURE;
- OSM duration to be 4 days;
- Consider workshop(s) before OSM, and a public seminar after OSM;
- Important to consider an active involvement of early career scientists;
- Consider whether OSM is open to policy makers, non-governmental groups, and fisheries industries as well as researchers;
- Comments on who and how to evaluate FUTURE progress;
- Review from invited external reviewers (also invited speakers);
- Also review from general participants outside PICES;
- Reports from expert groups;
- Each theme per whole day rather than parallel sessions every day for effective evaluation;
- Preparation of evaluation sheet and questionnaire.

AGENDA ITEM 9

Planning for PICES-2013

1. Six POC/expert group co-sponsored Topic Sessions were proposed for PICES-2012 as well as a POC Paper Session. Ranking of the proposed sessions was led by Dr. James Christian (*POC Endnote 6*). Allotment of POC money for selected sessions was discussed and entrusted to the POC Chairman to decide. Finally, the following allotment was determined: “*Recent trends and future projections of North Pacific climate and ecosystem*” (\$3,000), “*The changing carbon cycle of North Pacific continental shelves and marginal seas*” (\$1,500), and “*Are marine ecosystems of the North Pacific becoming more variable ?*” (\$500).
2. Two POC/expert group sponsored workshops were proposed (*POC Endnote 7*).
3. ½-day business meetings for S-CC, S-CCME, AP-CREAMS, WG 27, and WG 29 were proposed.
4. Two capacity building programs in 2013 and beyond were supported by POC (*POC Endnote 8*).

AGENDA ITEM 10

Publications for 2013 and beyond

A special issue in the Journal of Marine Systems on “*Modeling of marine ecosystem dynamics and the use of observations for improving models*” dedicated to Dr. Bernard Megrey was proposed with guest editors, Enrique Curchitser and Shin-ichi Ito, and approved at PICES-2011. There was a change of the journal to Progress in Oceanography.

AGENDA ITEM 11

Items with financial implications

1. Proposed inter-sessional meetings for 2013 and beyond supported by POC
 - ICES ASC Theme Session on “*Ocean acidification*” (S-CC);
 - Inter-sessional FUTURE Workshop (S-CCME);
 - ICES/PICES Topic Sessions at 2013 ICES ASC (S-CCME, WG 27);
 - Joint CLIVAR/PICES Theme Session on “*Biophysical interactions*” at the International Symposium on “*Boundary Current dynamics: Its connection with open-ocean, coastal processes, biophysical interactions and responses to global climate change*”, to be held on July 8–13, 2013, in Lijiang, China (WG 27);
 - 2nd RCM Workshop to be held in Korea in September 2013 (WG 29).

2. Proposed inter-sessional capacity building programs for 2013 and beyond supported by POC
 - 2013 SOLAS Summer School (S-CC);
 - 2013 NOWPAP training course on “*Remote sensing data analysis*” in Qingdao, China, in fall 2013 (AP-CREAMS);
 - 2014 PICES Summer School on “*Ecosystem modeling*” in Korea in August 2014 (AP-CREAMS)
3. POC ranked the following list of PICES travel support requests among the above inter-sessional meetings:
 - travel support for 2 scientists to attend the joint CLIVAR/PICES Theme Session including 1 WG 27 co-chair (Dr. Shoshiro Minobe);
 - travel support for 2 PICES members to attend the 2nd RCM Workshop (Seoul National University will support another approximately 12 invited speakers.);
 - travel support for 1 S-CC member to attend the 2013 ICES ASC Theme Session (This request was withdrawn because an available S-CC member could not be found.)
4. POC approved support for the following capacity building programs:
 - travel support for 1 lecturer and students for a NOWPAP training course on “*Remote sensing data analysis*”;
 - travel support for 3 early career scientists from PICES member countries to attend the 2013 SOLAS Summer School.

AGENDA ITEM 12

POC Best Presentation and Poster awards

Drs. Kyung-II Chang, Michael Foreman, and Yury Zuenko were judges for the best early career scientist oral presentation and best poster at the POC Paper Session and Topic Sessions S3, S4, S8, S11, S12, and S14. The POC Best Presentation Award was given to Yoshi N. Sasaki (Japan) for “*Interannual to decadal variability of the Gulf Stream and Kuroshio Extension jets*” presented at S3 Topic Session. The POC Best Poster Award was given to Sachihiko Itoh (Japan) for “*Strong vertical mixing in the Urup Strait, Kuril Islands*” presented at the POC Poster Session. Further details on best presentations can be found at the end of the Session Summaries section in the [2012 Annual Report](#).

AGENDA ITEM 13

Documenting Topic Sessions and Workshops

POC Chairman recalled the request from Science Board to complete and send documentation of topic sessions for PICES-2012 to the PICES Secretariat before the end of the Annual Meeting, and meeting reports of POC and expert groups within one month after the Annual Meeting.

AGENDA ITEM 14

Other business

POC reviewed and decided to support a proposal to establish a new Section on ‘Emerging Topics in Marine Pollution’ submitted by the Study Group on *Marine Pollution*.

AGENDA ITEM 15

Adoption of report and recommendations to Science Board

This POC report was circulated among, and approved by, all POC members. All recommendations were brought by Dr. Kyung-II Chang to Science Board meeting on October 19–20, 2012.

POC Endnote 1

POC participation list

Members

Steven Bograd (USA)
Kyung-Il Chang (Korea, Chairman)
James Christian (Canada)
Enrique Curchitser (USA)
Michael Foreman (Canada, Vice-Chairman)
Shin-ichi Ito (Japan)
Chan Joo Jang (Korea)
Hee-Dong Jeong (Korea)
Elena Ustinova (Russia)
Yury Zuenko (Russia)

Observers

Josef Cherniawsky (Canada)
Patrick Cummins (WG 27)
Seth Dainelson (USA)
Ken Drinkwater (ESSAS)
Victor Kuzin (Russia)
Emanuele Di Lorenzo (WG 27)
Lisa Miller (SOLAS, SCOR WG 140)
Shoshiro Minobe (WG 27)
Jae-Hun Park (Korea)
Young-Gyu Park (Korea)
Toshio Suga (Argo, CLIVAR)
Olga Trusenkova (Russia)

POC Endnote 2

POC meeting agenda (revised after the overture POC meeting)

1. Welcome, introductions, opening remarks
2. Membership changes
3. Changes to, adoption of agenda and appointment of rapporteur
4. Completion of PICES-2011 decisions
5. Reports of POC active groups
 - i) Section on Carbon and Climate (Christian)
 - ii) Joint PICES/ICES Section on Climate Change Effects on Marine Ecosystems
 - ii) Advisory Panel for a CREAMS/PICES Program in East Asian Marginal Seas (Chang)
 - iii) Working Group on North Pacific Climate Variability and Change (Di Lorenzo and Minobe)
 - iv) Working Group on Regional Climate Modeling (Curchitser)
6. Relations with other international organizations/programs
 - i) Argo (Suga)
 - ii) WCRP/CLIVAR (Suga)
 - iii) ESSAS (Drinkwater)
 - iv) SOLAS (Miller)
 - v) SCOR Working Group 140 (Miller)
 - vi) NEAR-GOOS (Jeong)
 - vii) CeNCOOS (Bograd)
 - viii) Review and support of SCOR Working Group proposal on Surface Waves in Ocean Circulation and Climate System
 - ix) IOC and SCOR (Dr. Kyung-Il Chang on behalf of Drs. Yutaka Michida and Satoru Taguchi)
 - x) Review of ICES ASC theme session proposals (Chang)
7. POC Action Plan discussion
8. Update on FUTURE
 - i) Draft proposal for production of the North Pacific Ecosystem Status Report
 - ii) FUTURE roadmap
 - iii) FUTURE Open Science Meeting in 2014
9. Planning for PICES-2013
 - i) Ranking and allotment for proposed six Topic Sessions
 - ii) Three Workshops proposed by POC or its active groups
 - iii) Business meetings of active groups

- iv) Capacity building programs in 2013 and beyond
- 10. Publication for 2012 and beyond
- 11. Items with financial implications
 - i) Proposed inter-sessional meetings for 2013 and beyond
 - ii) Proposed inter-sessional capacity building programs for 2013 and beyond
 - iii) Requests for PICES travel support for inter-sessional meetings
 - iv) Requests for PICES support for capacity building programs
- 12. POC Best Presentation and Poster awards
- 13. Documenting sessions and workshops
- 14. Other business
- 15. Adoption of POC report and recommendations to Science Board

POC Endnote 3

Recommendation to CLIVAR for a better collaboration across the blue and green oceans

Background

In recent years, it has become apparent that the oceans are undergoing substantial changes in a number of aspects, spanning the physical environment, biogeochemical cycles and marine ecosystems. Some changes may be associated with natural climate variability but others are related to anthropogenic forcing mainly due to post-industrial emissions of carbon dioxide. Examples of these changes are the reduction of water mass formation associated with air-temperature warming, the ocean's acidification due to atmospheric and thus ocean CO₂ concentration increases (Doney *et al.* 2009), and the reduction of dissolved oxygen caused by a SST increase and reduction of ventilation (Keeling *et al.* 2010). The ocean's acidification at depth is also closely related to water mass formations. The expansion of an oxygen minimum zone in the equatorial Pacific is related to thermocline variations (Deutsch *et al.* 2011). Also, the physical transport of nutrients across the base of euphotic zone, where photosynthesis occurs, is crucial for food-web dynamics. These changes in the physical properties of the ocean and resultant changes in marine biogeochemical cycles and ecosystems are inducing a degradation of ecosystem services on which our society depends. The sustainable use of marine ecosystem services under increasing anthropogenic forcing is an urgent issue to be resolved.

Recommendation to CLIVAR

How climate systems control biogeochemical cycles and ecosystem dynamics in present-day oceans and how the future climate will change them are essential questions for our society. Many physical processes controlling biogeochemical cycles and ecosystems are still not adequately known. These processes include ocean vertical and horizontal mixing associated with the mixed layer; horizontal and vertical advection due to sub-mesoscale and meso-scale phenomena; the transports of jets, striations and currents; water mass formation and ventilation; and air-sea interaction over SST fronts and eddies. The understanding of these processes for the present ocean and estimating future changes in them should be a basis of future projections of the earth system. The investigation of physical processes responsible for these biogeochemical and ecological impacts are not well covered by the current scope of programs under the WCPR. This is in contrast to the importance of the ocean and its interactions with the atmosphere were given in the successful studies by TOGA for the equatorial Pacific and that have been expanded globally by CLIVAR. Therefore, we strongly recommend that in their future endeavors CLIVAR, or Post-CLIVAR, assign appropriate weights to the understanding of physical processes that influence the biogeochemical cycles and marine ecosystems. For example, "variability and change of physical processes of the global oceans impacting on biogeochemical cycles and marine ecosystems" could be one of main themes for these programs, and could be studied by using field observations, data analysis and numerical modelings.

Studies with the foregoing themes should be lead by CLIVAR, or post-CLIVAR, with a close collaboration of climatologists/physical oceanographers and scientists with biogeochemical and biological disciplines under a proper international framework. Integrated Marine Biogeochemistry and Ecosystem Research (IMBER), the core program of IGBP and SCOR, focuses on marine biogeochemical and ecological studies. It's worth

pointing out that one of the themes of IMBER is “Responses of society”. Collaboration with IMBER is advantageous and could contribute to CLIVAR products that solve the emerging issues of society in the Global Change Era. In the North Pacific, PICES (The North Pacific Marine Science Organization) has carried out several interdisciplinary marine science programs. PICES recently launched an integrated program FUTURE to understand how marine ecosystems in the North Pacific respond to climate change and human activities. FUTURE has developed new Working Groups on *North Pacific Climate Variability and Change* (WG 27) and *Regional Climate Modeling* (WG 29). Physical oceanographers and biogeochemical oceanographers have been tightly collaborating in these activities. FUTURE and FUTURE-related national programs would be desirable partners for the CLIVAR Pacific Panel in their interdisciplinary collaborations.

References

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POC Endnote 4

Announcement of a joint CLIVAR/PICES Theme Session

At the 2012 PICES Annual Meeting, a proposal was approved for an inter-sessional joint CLIVAR/PICES workshop in 2013, with travel support for two PICES members. After a discussion with the Chairman of the CLIVAR Pacific Panel, it was decided instead to have a ½-day joint CLIVAR/PICES Theme Session on “*Biophysical interactions*” at the 2-day International Symposium on “*Boundary Current dynamics: Its connection with open-ocean, coastal processes, biophysical interactions and responses to global climate change*”, to be held between July 8–13, 2013, in Lijiang, China. The Co-Chairman of the PICES Working Group on *North Pacific Climate Variability and Change* (WG 27), Dr. Shoshiro Minobe (Hokkaido University, Japan) will serve as the PICES Convenor for this session. Dr. Xiaopei Lin (Ocean University of China), also a member of WG 27, is the Symposium local organizer.

The joint CLIVAR/PICES Theme Session on “*Biophysical interactions*” will be one of 4 scientific sessions of the Symposium, and key questions for this session will be:

- What roles do western boundary currents play in biogeochemical cycles and marine ecosystems?
- What processes are important?
- How variability and change of the western boundary current influence the biogeochemical cycles and marine ecosystems?

PICES will support an additional PICES member to give a presentation at the joint session. Dr. Minobe commented that an IMBER-type researcher would fit the theme of the session, because motivation for collaboration between PICES and the CLIVAR Pacific Panel is based on future collaboration between CLIVAR and IMBER. If you are interested in participating in the session, please contact Dr. Minobe (minobe@mail.sci.hokudai.ac.jp) in the next few weeks.

This will be the 2nd International Symposium on “*Boundary Current dynamics*”, following the first one held May 31–June 2, 2010, in Qingdao, China. The objectives of the Symposium can be found at <http://www3.ouc.edu.cn/gjhy/index.aspx>. The agenda of the 1st Symposium is included below.

Title: International Symposium on “Boundary Current Dynamics: Its connection with open-ocean and coastal processes and responses to global climate change”

Draft Agenda

Date: 05/31-06/02, 2010

Venue: Meeting Hall in Huanghai Hotel, Qingdao, China

 Day 1: May 31, 2010 (Monday)

Chaired by Lixin Wu

08:20~08:30 Prof. Dexing Wu (President of Ocean University of China): Welcome speech

08:30~08:40 Prof. Martin Visbeck: Speech on behalf of CLIVAR

Session 1: Boundary Current and Climate

Chaired by Shang-Ping Xie

08:40~09:00 Terrence Joyce (Woods Hole Oceanographic Institution) On the path of the Gulf Stream and the Atlantic Meridional Overturning Circulation.

09:00~09:20 Martin Visbeck (IFM-GEOMAR) Observing Western Boundary Current Transport and Property Variability in the Atlantic Sector from the Subpolar Gyre to the tropical South Atlantic.

09:20~09:40 R. Saravanann (Texas A&M University) Modeling the Influence of the Atlantic Meridional Overturning Circulation on Tropical Atlantic Climate.

09:40~10:00 Zhengyu Liu (University of Wisconsin-Madison) Testing thermohaline stability during deglaciation.

10:00~10:20 Ping Chang (Texas A&M University) A High-Resolution Coupled Regional Climate Model Study of Frontal-Mesoscale Air-Sea Interactions along the Gulf Stream.

10:20~10:40 Coffee break

Session 1: Boundary Current and Climate (continued)

Chaired by Zhengyu Liu

10:40~11:00 Walt Robinson (North Carolina State University) On the Influence of Anomalous Ocean Temperatures on the Large-scale Atmospheric Flow.

11:00~11:20 Niklas Schneider (University of Hawaii at Manoa) The impact of SST on the atmospheric Ekman pumping.

11:20~11:40 Hisashi Nakamura (University of Tokyo) Influence of mid-latitude oceanic frontal zones on the formation of storm-tracks and westerly jets and on their annular variability.

11:40~11:55 Xiaopei Lin (Ocean University of China) Millennial-scale climate changes in the western Pacific- Possible Role of the Kuroshio.

11:55~13:30 Lunch

Session 1: Boundary Current and Climate (continued)

Chaired by Chunzai Wang

13:30~13:50 Claude Frankignoul (Université Pierre et Marie Curie) Influence of the Meridional Shifts of the Kuroshio and the Oyashio Extensions on the Atmospheric Circulation.

13:50~14:10 Shoshiro Minobe (Hokkaido University) Influence of the Kuroshio in the East China Sea on the troposphere.

14:10~14:30 Masami Nonaka (Japan Agency for Marine-Earth Science and Technology)

Decadal variations in heat content and surface heat flux in the western North Pacific in a coupled GCM.

14:30~14:45 Jiaxu Zhang (University of Wisconsin-Madison) Kuroshio Extension variability during the last 50 years and its predictability.

14:45~15:00 Coffee break

Session 1: Boundary Current and Climate (continued)

Chaired by Jiayan Yang

15:00~15:20 Stephen Riser (University of Washington) Large-Scale Meridional Transport in the Pacific and the Inference of Western Boundary Current Transports.

15:20~15:40 Dunxin Hu (Institute of Oceanology, Chinese Academy of Sciences) Seasonal to Interdecadal Variability of the NEC-MC-Kuroshio System.

15:40~16:00 Bo Qiu (University of Hawaii at Manoa) Multi-scale Circulation Variability in the Low-Latitude Western North Pacific Ocean.

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- 16:00~16:20 Yuji Kashino (Japan Agency for Marine-Earth Science and Technology) Observations of the Pacific Low-latitude Western Boundary Currents.
- 16:20~16:40 David Harper (NASA) Potential opportunities for research analyses with satellite observations.
- 16:40~16:55 Yongqiang Yu (Institute of Atmospheric Physics, Chinese Academy of Sciences) A preliminary result of a high resolution Pacific-Indian basin-wide ocean general circulation model.
- 16:55~17:10 Faming Wang (Institute of Oceanology, Chinese Academy of Sciences) Interactions between Mesoscale SSH Features in the Western Tropical Pacific.
- 17:10~18:30 Poster session
- 18:30 Banquet

Day 2: June 1, 2010 (Tuesday)

Session 2: Tropical Climate Dynamics
Chaired by Ping Chang

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- 08:20~08:40 Michael Alexander (NOAA Earth System Research Laboratory) ENSO's Influence on the Gap Winds Through the Central America Mountains and the Eastern Tropical Pacific Ocean.
- 08:40~09:00 Wenju Cai (CSIRO) Asymmetry in ENSO teleconnection with regional rainfall, its multi-decadal variability, and impact.
- 09:00~09:20 Mu Mu (Institute of Oceanology, Chinese Academy of Sciences) The error growth dynamics and spring predictability barrier of El Nino prediction.
- 09:20~09:40 Axel Timmermann (IPRC/University of Hawaii) Wind effects on past and future regional sea-level rise in the Indo-Pacific.
- 09:40~09:55 Fan Wang (Institute of Oceanology, Chinese Academy of Sciences) Interannual variability of the North Equatorial Current bifurcation and its relationship with ENSO cycle.
- 09:55~10:10 Dongliang Yuan (Institute of Oceanology, Chinese Academy of Sciences) Interannual horizontal heat advection in the surface mixed layer over the equatorial Pacific Ocean: Assimilation versus TAO analysis.
- 10:10~10:30 Coffee break

Session 3: General Air-Sea Interaction Dynamics
Chaired by Wenju Cai

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- 10:30~10:50 Shang-Ping Xie (University of Hawaii at Manoa) Large-scale patterns that emerge from global warming.
- 10:50~11:10 Chunzai Wang (NOAA Atlantic Oceanographic and Meteorological Laboratory) Climate and Hurricane Variability.
- 11:10~11:25 Fangli Qiao (The first Institute Oceanography, State Oceanic Administration) The non-breaking surface wave induced vertical mixing and its effects in climate system.
- 11:25~11:40 Ge Chen (Ocean University of China) Climate Related Natural Modes in Sea Level and Sea Surface Temperature Variability.
- 11:40~11:55 Changlong Guan (Ocean University of China) The Proposed Parametrizations of Air-Sea Momentum and Heat Transfer Applicable to From Low to Extreme Winds.
- 11:55~13:30 Lunch

Session 4: Boundary Current and Marginal Sea Dynamics
Chaired by Bo Qiu

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- 13:30~13:50 Robert Weisberg (University of South Florida) West Florida Continental Shelf Circulation from Sustained Observations.
- 13:50~14:10 Michael Spall (Woods Hole Oceanographic Institution) On the heat transport and overturning circulation in marginal seas.
- 14:10~14:30 Jiayan Yang (Woods Hole Oceanographic Institution) WBC Interactions with Marginal and Shelf Seas.
- 14:30~14:45 Qinyu Liu (Ocean University of China) Coherence and Difference of Sea Surface Height and Temperature interannual variability in the South China Sea.
- 14:45~15:00 Shin Kida (Japan Agency for Marine-Earth Science and Technology) The impact of coastal currents on marginal sea outflows.

- 15:00~15:15 Magdalena Andres (Woods Hole Oceanographic Institution) Remote Forcing of the Kuroshio in the East China Sea: Transport Variability at Interannual-to-Decadal Time Scales.
- 15:15~15:30 Yuping Guan (South China Sea Institute of Oceanology, Chinese Academy of Sciences) Seasonal and Interannual Variability of the Kuroshio Anomalies in SST and Surface Heat Fluxes.
- 15:30~15:45 Coffee break

Session 4: Boundary Current and Marginal Sea Dynamics (continued)

Chaired by Qinyu Liu

- 15:45~16:05 Lian Xie (North Carolina State University) Dynamic Downscaling of Global Climate Change Impacts on the Variability of the Coastal Ocean Circulation in Galapagos Marine Reserve from 1951 to 2050.
- 16:05~16:25 Toru Miyama (Japan Agency for Marine-Earth Science and Technology) Beyond Coastal vs. Large-Scale Oceanography: Scale Interaction Modeling of Kuroshio with JCOPE (Japan Coastal Ocean Predictability Experiment).
- 16:25~16:40 Jiwei Tian (Ocean University of China) The pathway of the Pacific deep water into the South China Sea through the Luzon Strait
- 16:40~16:55 Wei Liu (University of Wisconsin-Madison) Breaking of progressive internal waves.
- 16:55~17:10 Yan Du (South China Sea Institute of Oceanology, Chinese Academy of Sciences) Three inflow pathways of the Indonesian throughflow as seen from the Simple Ocean Data Assimilation.
- 17:10~18:30 Poster session
- 18:30 Dinner

Day 3: June 2, 2010 (Wednesday)

Session 5: Biophysical Processes in Coastal Margins

Chaired by Ruoying He

- 08:20~08:40 Francisco Chavez (Monterey Bay Aquarium Research Institute) Biogeochemical and ecological response of eastern boundary currents to climate and global change.
- 08:40~09:00 Art Miller (Scripps Institution of Oceanography) Pacific Decadal Variability and Regional Impacts on Eastern Boundary Currents and the Ecosystem.
- 09:00~09:20 Fei Chai (University of Maine) Modeling impacts of mesoscale eddies on biogeochemical processes in the South China Sea.
- 09:20~09:40 R. Hetland (Texas A&M University) Transport and transformation of fresh water in river plumes, and shelf ecosystem impacts.
- 09:40~09:55 Jianyu Hu (Xiamen University) Statistical Analysis of Mesoscale Eddies in the South China Sea and the Western Pacific Ocean.
- 09:55~10:10 Wei Zhao (Ocean University of China) Observed abyssal flows in the Luzon Strait.
- 10:10~10:30 Coffee break

Session 5: Biophysical Processes in Coastal Margins

Chaired by Fei Chai

- 10:30~10:50 Richard Dugdale (Romberg Tiburon Center) Workhorses Eastern Boundary upwelling systems: home of diatoms of the sea.
- 10:50~11:10 Ruoying He (North Carolina State University) Inter-annual Variability of Circulation and Biophysical Processes in the Northeastern U.S. Coastal Ocean.
- 11:10~11:25 Jun Cheng (Nanjing University of Information Science and Technology) On the mechanism of thermohaline overshooting at Bolling-Allerod.
- 11:25~11:40 Lixin Wu (Ocean University of China) Linking the Western Pacific-Asian Marginal Seas to Global Climate System.
- 11:40~11:50 Lixin Wu: Closing remark
- 11:50~13:30 Lunch
- 13:30~ 18:30: City tour, gathered in the Hall of Huanghai Hotel

Poster:

- Qingjia Meng (Institute of Oceanology, Chinese Academy of Sciences) Did the Walker Circulation Weaken during the 20th Century?
- Xiangzhou Song (Ocean University of China) Dominance of the global oceanic sensible heat flux anomaly during the recent three decadal.
- Haixia Shan (Lanzhou University) Variability of Typhoons Impacting Taiwan Island.
- Xiaoling Yu (Institute of Oceanology, Chinese Academy of Sciences) Sensitivity of Kuroshio meander state in a ROMS simulation to different magnitude of horizontal mixing coefficients.
- Yanke Tan (PLA University of Science and Technology) Simultaneous Relationship between Abnormal Kuroshio Temperature Change and Rainfall Probability over China in Early Summer.
- Zhong Zhong (PLA University of Science and Technology) Propagation characteristics of atmospheric perturbations in response to the abnormal warmer SST in the Kuroshio Extension in winter.
- Yuanyuan Qu (The first Institute Oceanography, State Oceanic Administration) Dynamics response of shelf water in the East China Sea on the Strong shear of Kuroshio.
- Chun Hoe Chow (Ocean University of China) The Life Histories of the Dongsha Cyclonic Eddy and the Vietnam Cyclonic Eddy in the South China Sea.
- Jilin Sun (Ocean University of China) Affections of marginal heat anomaly on vicinity climate variation over continent.
- Hui Zhou (Institute of Oceanology, Chinese Academy of Sciences) Variations of the North Equatorial Current Bifurcation Induced by Mesoscale Eddies.
- Shan Gao (Institute of Oceanology, Chinese Academy of Sciences) Where does the water of Luzon undercurrent come from?
- Yousong Huang (Ocean University of China) Population genetic structure of the planktonic copepod *Calanus sinicus* in China Marginal Seas.
- Liangyong Zhou (Qingdao Institute of Marine Geology) Measuring Suspended Sediment Transport offshore North Jiangsu Province with Acoustic Doppler Current Profilers.
- Yonghong Wang (Ocean University of China) Variation on sedimentary environment changes during Holocene in the central South Yellow Sea: evidence from environmental magnetism.
- Ju Lin (Ocean University of China) Impact of Kuroshio intrusion on long-range underwater sound propagation in the Luzon Strait.
- Xiaomei Yan (Institute of Oceanology, Chinese Academy of Sciences) Streamwise Analysis of the Kuroshio Front in the East China Sea based on Remote Sensing Observations
- Yuanlong Li (Institute of Oceanology, Chinese Academy of Sciences) Intrusive Thermohaline Fine-structure near the Philippine coast.
- Xia Ju (The first Institute Oceanography, State Oceanic Administration) Heat Transport along Western Boundary of North Pacific in fall.
- Kaicheng Lu (PLA University of Science and Technology) Dynamic Statistic Analysis for Upper Abnormal Current of April in North Pacific
- Yongchui Zhang (PLA University of Science and Technology) Predictability of Sea Surface Height and Variability of Eddy Kinetic Energy.
- Peinan Zheng (Marine Environmental Ensuring Center) A Mechanism for the Bifurcation of the Tsushima Warm Current in the Japan/East Sea.
- Xiangfeng Meng (Ocean University of China) The response of Indonesian Throughflow (ITF) to ENSO events.
- Chao Ma (Ocean University of China) On the mechanism of Yellow Sea Warm Current and seasonal sea level variations in China coastal seas.
- Yun He (Ocean University of China) Comparison of Calculated Air-sea Fluxes by Vortex relation and Bulk Equations.
- Dedao Shi (Ocean University of China) Heat content variation in the eastern marginal seas and the local atmosphere-marginal sea interaction.
- Guojian Wang (Ocean University of China) The interannual adjustment of intraseasonal variability in the East Indian Ocean and its mechanism.
- Wenxia Zhang (Ocean University of China) The Interannual variability of the Mesoscale eddies in the southern ocean and its mechanism.
- Lei Zhang (Ocean University of China) Warm Pool and the Inter-annual, Decadal Variations of the Pacific Air-sea System.
- Yi Yu (Ocean University of China) The influence of MJO-related Kelvin waves on El Nino.
- Liping Zhang (Ocean University of China) Coupled Ocean-Atmosphere Response to Recent Freshwater Changes over the Kuroshio-Oyashio Extension Region.

Donghui Xu (Ocean University of China) Selective feeding of *Calanus sinicus* (Copepoda: Calanoida) on natural phytoplankton assemblage in the South Yellow Sea in summer.
 Hongju Chen (Ocean University of China) Patterns in diversity and community structure of pelagic copepods in the Yellow Sea and East China Sea in autumn, 2007.
 Zhaohui Chen (Ocean University of China) Dynamics of the seasonal cycle of the North Equatorial Current Bifurcation

POC Endnote 5

POC Committee Action Plan 2012

Mission

To promote and coordinate physical and geochemical oceanography, atmospheric science, and interdisciplinary research in the northern North Pacific. The impacts of climate variability and the physical dynamics in coastal, shelf and open ocean areas will be considered with emphasis on processes that relate to living marine resources and environmental quality.

Broad scientific issues that POC wants to address in the next five years are

- coordination of carbon-related issues in the North Pacific;
- improved understanding of climate variability and change and the provision and assessment of regional climate projections in the North Pacific

Key scientific questions, issues, or topics that POC plans to address in the next five years are

- What are the pivotal mechanisms of North Pacific climate variability and change that are linked to and required to predict changes in marine ecosystems of the North Pacific?
- What are the major circulation and physical/geochemical changes that the latest basin-wide and regional climate change models foresee for the North Pacific and its marginal seas?
- Providing a summary of these changes in a manner that will be useful to other PICES committees and groups.

Strategy of the POC Committee

In executing its mission, POC will address each of the five central themes of PICES: (A) Advancing scientific knowledge; (B) Applying scientific knowledge; (C) Fostering partnerships; (D) Developing capacity; and (E) Ensuring a progressive organization. Specific goals within each of these themes are as follows.

Theme A. *Advancing scientific knowledge*

Goal 1. Understand the functioning, resilience, and vulnerability of marine ecosystems

Action 1.1 At upcoming PICES meetings, convene sessions and workshops to address important physical and chemical processes that underlie the structure and function of marine ecosystems.

Task 1.1.1 Continue to support Working Group 27 on *North Pacific Climate Variability and Change*

Task 1.1.2 Convene topic session(s) and workshop(s) at PICES annual and inter-sessional meetings related to activities of Working Group 27.

Task 1.1.3 Facilitate future workshops of POC subsidiary groups such as the CREAMS Advisory Panel, Section on *Climate Change Effects on Marine Ecosystems*, and Section on Carbon and Climate.

Task 1.1.4 Convene a POC paper session at all PICES annual meetings.

Task 1.1.5 Continue to convene workshops and summer schools as proposed by AP-CREAMS and other POC subsidiary groups.

Goal 2. Understand and quantify how marine ecosystems respond to human activities and natural forcing

Action 2.1 Assess the regional climate projections focusing on but not limited to the North Pacific and their impact on marine ecosystems in collaboration with other committees and expert groups.

Task 2.1.1 Continue to support Working Group 29, “Regional Climate Modeling”.

Task 2.1.2 Convene topic session(s) and workshop(s) at PICES annual and inter-sessional meetings related to activities of Working Group 29

Task 2.1.3 Analyze CMIP5 climate projections.

Theme B. *Applying scientific knowledge*

Goal 3. Provide scientific advice pertinent to North Pacific ecosystems

Action 3.1 Provide necessary information for FUTURE Implementation Strategy

Task 3.1.1 Provide the PICES Science Board and its subsidiary groups with information about physical forcing and its climate modulation necessary for PICES actions regarding North Pacific ecosystems.

Goal 4. Ensure that PICES products are relevant, timely, and broadly accessible.

Action 4.1 Publish reports and workshop proceedings from POC subsidiary groups.

Task 4.1.1 Provide “Outlooks” of the North Pacific physical and chemical changes in conjunction with other PICES expert groups

Task 4.1.2 Publish final reports from the climate working groups.

Task 4.1.3 Publish a report and/or review paper on best practices for regional coupled modeling.

Task 4.1.3 Publish comprehensive research works in the Yellow Sea and the East China Sea from CREAMS advisory panel.

Task 4.1.4 Publish reports arising from S-CC data synthesis and other activities.

Theme C. *Fostering partnerships*

Goal 5. Collaborate with organizations and scientific programs relevant to PICES

Action 5.1 Collaborate with organizations with goals related to POC committee and its subsidiary groups.

Task 5.1.1 Coordinate North Pacific CO₂ issues through the CC-S section with international projects such as CLIVAR, IMBER, SOLAS, and GEOTRACES.

Task 5.1.2 Continue support for PICES-CREAMS advisory panel & S-CCME

Task 5.1.3 Continue support for NEAR-GOOS and the GOOS Regional Alliances Networking Development (GRAND) project.

Task 5.1.4 Continue support for capacity building programs convened by subsidiary groups.

Task 5.1.5 Collaborate with CLIVAR and other international programs on the new climate working groups.

Task 5.1.6 Continue working relationship with the Pacific Coastal Ocean Observing System (www.pacoos.org).

Goal 6. Strengthen communication and engagement with users of PICES scientific products

Action 6.1 Characterize North Pacific climate variability and change and their future outlooks, and communicate their possible impacts on marine ecosystems.

- Task 6.1.1 Participate actively in PICES's public outreach activities in disseminating products.
- Task 6.1.2 Establish web pages for participating in working group activities.

Theme D. Develop capacity

Goal 7. Advance methods and tools to improve and enhance scientific activities

- Action 7.1 Provide lessons learned from regional ocean climate projections.
 - Task 7.1.1 Publish reports and/or review papers on the best practices in regional climate modeling.
 - Task 7.1.2 Provide the requirements for regional ecosystem modeling studies.

Goal 8. Foster collaboration among scientists within PICES

- Action 8.1 Encourage active participation from all PICES countries in the POC committee and its subsidiary groups.
 - Task 8.1.1 Include participants from all PICES nations in new climate working groups and subsidiary groups.
- Action 8.2 Encourage communication with subsidiary groups and other committees.
 - Task 8.2.1 Convene joint sessions and workshops with other committees at PICES annual meetings.

Goal 9. Create education and training opportunities

- Action 9.1 Participate actively in developing PICES training courses
 - Task 9.1.1 Support 2013 (and subsequent) PICES summer school(s) by participating as organizing committee members.

Theme E. Ensure a progressive organization

Goal 10. Provide an effective infrastructure to support PICES activities

- Action 10.1 Ensure POC activities to be delivered to SB & other PICES community in a timely and effective fashion.
 - Task 10.1.1 Report scientific activities through annual and inter-sessional topic sessions and workshops in a timely fashion.
 - Task 8.1.3 Where possible, include electronic manuscripts (or links) arising from PICES/POC collaborations on PICES web page.

POC Endnote 6

Proposals for Paper and Topic Sessions at PICES-2013

1-day POC Paper Session

Papers are invited on all aspects of physical oceanography and climate in the North Pacific and its marginal seas

Co-conveners: Kyung-Il Chang (Korea) and Michael Foreman (Canada)

Ranked POC co-sponsoring Topic Sessions for PICES-2013

1. 1-day BIO/POC/TCODE/ MONITOR/FUTURE Topic Session on “*Recent trends and future projections of North Pacific climate and ecosystems*” (WG 29 Endnote 5);
2. 1-day POC Topic Session (co-sponsored by SOLAS) on “*The changing carbon cycle of North Pacific continental shelves and marginal seas*” (S-CC Endnote 3);
3. (½-day BIO/FIS/POC Topic Session) on “*Are marine ecosystems of the North Pacific becoming more variable?*” (AP-MBM Endnote 6);
4. 1-day MONITOR Topic Session on “*Cost-effective, cooperative ocean monitoring*” (MONITOR Endnote 3);
5. (1-day FIS/FUTURE Topic Session) on “*Science needs for offshore oil and gas development in the North Pacific*” (FIS Endnote 3);
6. 1-day FIS/TCODE Topic Session (co-sponsored by ISC) on “*Banking on recruitment curves; returns on intellectual investment*” (FIS Endnote 3).

POC Endnote 7

POC-supported workshops for PICES-2013

1. 1-day Workshop on “*Comparison of size-based and species based ecosystem models*”

Size-based and species-specific ecosystem models are two different approaches to ecosystem modeling, based on different assumptions and designed to address somewhat different questions. In recent years considerable development of size-based models has occurred within the ICES community while the PICES community has typically focused on species-specific models for its applications. The objective of this workshop is to bring together the two communities of modelers to: (1) advance our understanding of the advantages and limitations of these two modeling approaches, especially in the context of modeling climate impacts on ecosystems, (2) make direct comparisons of the predictions of ecosystem structure and dynamics, both top-down and bottom-up, from both these model types applied to the same regional ecosystem, where possible under climate change forcing, and (3) discuss the benefits and feasibility of developing hybrid size-based and species-specific models. The workshop will be structured with a series of talks to kick off discussion on these 3 topics.

Co-convenors: Jeffrey Polovina (USA), Anne Hollowed (USA), Shin-ichi Ito (Japan) and Myron Peck (Germany)

Co-sponsor: ICES

Invited speakers: Julia Blanchard (UK), Villy Christensen (Canada)

2. 1-day Workshop on “*Identifying mechanisms linking physical climate and ecosystem change: Observed indices, hypothesized processes, and “data dreams” for the future*”

Climate variability and change in the ocean is now recognized as a significant driver of marine ecosystem response, from primary production to zooplankton composition, and through the trophic chain to fish, marine mammals and other top predators. Past studies have often relied upon existing datasets to draw correlative conclusions (associated with indices and discovered time-lags in the system) regarding the possible mechanisms that may control these linkages. In this workshop, we seek to identify and model key processes that enable us to succinctly and quantifiably explain the mechanisms underlying the correlative relationships in physical-biological datasets, both in the North Pacific and North Atlantic. The description and modeling of these key processes may (a) involve few or several variables (but not full complexity), (b) use dynamical (e.g., eddy-resolving ocean models, NPZ, IBM, etc.) or statistically based methods (e.g., Bayesian, linear inverse models, etc.), (c) explain variability in low or high tropic levels (although we seek to emphasize secondary and higher producers), and (d) include uncertainty estimation. We also solicit ideas and hypotheses concerning new mechanisms of physical-biological linkages that can only be tested by establishing novel long-term observational strategies, where the harvest of understanding will eventually be reaped by future generations of

ocean scientists, as well as by developing creative modeling datasets, where ecosystem complexities can be effectively unraveled. The workshop format will be a mixture of talks and group discussions that aim at enriching the exchange of ideas and concepts between physical and biological ocean scientists. The ultimate goal is to deliver: (1) a set of new hypotheses of the mechanisms of marine ecosystem response to climate forcing, and (2) a description of the observational and modeling datasets required to test these hypotheses using process models.

Sponsoring Committees/Program: POC, BIO, MONITOR, FUTURE

Co-conveners: Emanuele Di Lorenzo (USA), Marc Hufnagl (Germany), Jacquelynn King (Canada), Arthur Miller (USA), Shoshiro Minobe (Japan), Ryan Rykaczewski (USA) and Kazuaki Tadakoro (Japan)

Co-sponsor: ICES

Invited speakers: Jürgen Alheit (Germany), Carolina Parada (Chile)

POC Endnote 8

POC-supported capacity building programs

2013 PICES Summer School (supported by Science Board; approved by Council in 2011)

Topic: Ocean Observing Systems and Ecosystem Monitoring

Date and venue: August 18–23, Newport, Oregon, USA

It will consist of lectures, lab. activities, and field works.

Students: ~25 graduate students and possibly early career scientists

Instructors: 8

Application deadline: February 1, 2013.

Principal organizer/Steering-Selection Committee: Dr. Jack Barth/8 from committees (3 from POC; Drs. Kyung-Il Chang, Shin-ichi Ito, and Steven Bograd)

Possible external funding: Nippon Science Foundation, APN, NOWPAP, other individual research funds

Proposal for 2014 PICES Summer School (submitted by AP-CREAMS)

Topic: Ecological Modeling

Purpose: Ecological models have applications in a wide variety of disciplines, such as natural resource management, wildlife conservation and agriculture. These models are formed by combining known complicated ecological relations with field observation data, and are being used to provide an understanding about the important processes in ecosystems and predictions about the changing ecosystem dynamics. The purpose of this Summer School is to review and present methods of modeling in ecological relations, and to show how these models (methods) can be applied to understand and predict ecosystem changes.

Date: August 18-21, 2014

Venue: Seoul National University, Korea

Students: maximum ~ 30

Lecturers: up to 10 (including 5 foreign lecturers)

Organizing committee: to be determined

Request for financial support from PICES: travel costs for 5 non-Korean students and two foreign lecturers