

## Report of the Physical Oceanography and Climate Committee

An overture meeting of the Physical Oceanography and Climate Committee (POC) took place in Yeosu, Korea, from 18:00–20:00 h on October 15, 2014. POC Chairman, Dr. Kyung-II Chang, called the meeting to order, circulated the draft agenda, and introduced key issues that needed in-depth discussion and decisions at the formal POC meeting on October 22, 2014. Dr. Michael Foreman, Vice-Chairman of POC, agreed to be the rapporteur. Ten POC members and three observers attended the overture meeting (*POC Endnote 1*). Agenda items were re-ordered, and the following six agenda items (*POC Endnote 2*) were discussed on day 1.

*October 15, 2015*

AGENDA ITEM 3

### Membership

Dr. Hiromichi Ueno and Dr. Daisuke Hasegawa are new members of Committee, replacing Dr. Ichiro Yasuda and representing Japan. Committee member Dr. Steven Bograd (U.S.A.) was approved as the Chairman of the FUTURE AP-AICE to replace Dr. Thomas Therriault (Canada).

AGENDA ITEM 4

### Completion of PICES-2013 decisions

PICES-2014 POC Paper/Topic Sessions and Workshop

ID	Title	Convenors	Duration (day)	Committees (Sponsors)	Invited speakers
	POC Paper Session	Kyung-II Chang (Korea) Michael Foreman (Canada)	1 (Oct. 23–24, Thursday, Friday)	POC	–
S9	Variability in advection and its biological consequences for Subarctic and Arctic ecosystems	Franz Mueter (USA) Enrique Curchitser (USA) Kenneth Drinkwater (Norway / ICES) Sen Tok Kim (Russia) Hiroshi Kuroda (Japan) Sei-Ichi Saitoh (Japan)	1 (Oct. 21, Tuesday)	POC/MONITOR /ICES	Georgina Gibson (USA)
S10	Regional climate modeling in the North Pacific	Chan Joo Jang (Korea) Kyung-II Chang (Korea) Enrique Curchitser (USA) Michael Foreman (Canada) Shin-ichi Ito (Japan) Angelica Peña (Canada) Hyodae Seo (USA)	1	POC/TCODE/ FUTURE	Enrique Curchitser (USA) Eun Soon Im (Singapore/ USA) Hyun-Suk Kang (Korea) Hyouun-Woo Kang (UK) Kei Sakamoto (Japan) Hyodae Seo (USA)
W5	SOLAS into the Future: Designing the next phase of the Surface Ocean-Lower Atmosphere Study within the context of the Future Earth Program	Minhan Dai (China) Lisa Miller (Canada) Yukihiro Nojiri (Japan)	0.5	POC/SOLAS	–

Travel and representation at the meetings of other organizations/programs

- PICES associate member of SCOR WG 140 on Biogeochemical Exchange Processes at the Sea-Ice Interfaces (Lisa Miller) attended the WG 140 meeting in Hobart, Australia (March 16, 2014),

## POC-2014

- PICES representative (Shoshiro Minobe) attended the 1<sup>st</sup> Pan-CLIVAR meeting (July 17–18, 2014, The Hague, The Netherlands).

### Publications

- Special issue of *Progress in Oceanography* on modeling dedicated to Dr. Bernard Megrey (Guest Editors: Enrique Curchitser, Shin-ichi Ito, Kenneth Rose, Michio Kishi, Myron Peck) to be published in 2015.
- Dr. Minobe will contact Dr. Emanuele Di Lorenzo to see if the PICES Scientific Report on the 2012 GLOBEC/PICES/ICES Workshop “Forecasting ecosystem indicators with process-based models” (Editors: E. Di Lorenzo, A. Miller, S. Minobe) is still planned for publication.
- Dr. Yury Zuenko reported that the report on “Oceanography of the Yellow and East China Seas (EAST-II region)” (Editors: J. Ishizaka, T. Matsuno, J. Zhang, J.-H. Lee, S. Kim, D. Xu, Y. Fei, S.-M. Liu, V. Lobanov) will be ready in late 2015
- The bilateral meeting between Korea and Japan to resolve the naming issue of the Supplementary Chapter of the 2<sup>nd</sup> NPESR has happened but the outcome is unknown for the 2nd NPESR prepared by AP-CREAMS has taken place but the outcome is still unknown.

### AGENDA ITEM 5

#### Relations with other international organizations/programs

Copies of the following presentations were saved by POC for reference:

##### (1) ESSAS

Dr. Kenneth Drinkwater reported on IMBER’s regional program, ESSAS, and emphasized ESSAS’ regional comparison aspect. ESSAS has five WGs. It held its 2014 Annual Science Meeting in Copenhagen, Denmark (April 7–9, 2014), co-sponsored Theme Session Q on “*Physical and biological consequences of North Atlantic circulation patterns*”, at the 2014 ICES ASC in A Coruña Spain, and Dr. Franz Mueter (representing ESSAS) co-convoked POC/MONITOR Topic Session (S9) “*Variability in advection and its biological consequences for Subarctic and Arctic ecosystems*” at PICES-2014. A set of ESSAS papers was published in a special issue in the *Journal of Marine Systems* in May 2014. ESSAS submitted a proposal on “*Resilience and adaptive capacity of Arctic marine systems under a changing climate*” to the Belmont Forum. The next Annual Science Meeting, whose theme will be “*The role of sea ice in the sea*”, will be held in Seattle, USA, June 15–17, 2015. Dr. Drinkwater requested POC travel support for one PICES scientist to attend the meeting.

##### (2) CLIVAR

Dr. Shoshiro Minobe presented 2 reports; one on CLIVAR and the other on his proposal for intermediate goals within FUTURE.

- Dr. Minobe described the re-organization of the World Climate Research Program (WCRP) and the redefinition of CLIVAR, one of its core projects. CLIVAR now has international offices in Qingdao, China, and Pune, India, new core panels, and new research foci. The one most closely related to PICES is “*Biophysical interactions and dynamics of upwelling systems*” which is led by Dr. Kenneth Drinkwater (Norway). CLIVAR is planning a major symposium (in Qingdao, China, 2016) and will consider co-sponsoring a session at PICES-2016.
- Dr. Minobe’s second presentation (also given the joint FUTURE AP session). His premise is that physical oceanographers within PICES/FUTURE need intermediate goals to assist with their career progression and grant proposals. Presently they play a secondary role to biological and fishery oceanographers and this makes it difficult to get funding and attract new (early career) oceanographers to PICES. He suggested that intermediate goals on topics (WGs?) like mesoscale eddies, sub-mesoscale phenomena, and upwelling would still contribute to FUTURE and make it easier to write successful proposals. A recent [article](#) in PICES Press (Vol. 22, No. 2, Summer) also discussed this topic.

##### (4) SOLAS

Dr. Lisa Miller gave two presentations: SOLAS and SCOR WG 140 on Biogeochemical Exchange Processes at the Sea-Ice Interface (BEPSII).

- Dr. Miller summarized the 2014 and planned activities of SOLAS. Three SOLAS foci are biogeochemical interactions, exchange processes, and CO<sub>2</sub> air–sea fluxes. Their mid-term strategies were established in 2009 and there are 3 SOLAS/IMBER WGs. They are presently preparing proposals to the funding agencies to renew their program for another 10 years with 5 themes. SOALS co-sponsored a workshop (W5) with POC on “*SOLAS into the Future: Designing the next phase of the Surface Ocean-Lower Atmosphere Study within the context of the Future Earth Program*” at PICES-2014. SOLAS will hold an Open Science Conference September 7–11, 2015, in Kiel, Germany, and welcomes feedback on their website (<http://www.solas-int.org/>).
- Dr. Miller, PICES associate member of SCOR Working Group 140 on Biogeochemical Exchange Processes at the Sea-Ice Interface (BEPSII), briefly described 3 task groups (methods, data, modeling) of the WG and recent review papers. PICES provided travel support for her to attend a WG 140 meeting in Hobart, Australia (March 16, 2014). Dr. Miller requested travel support to attend the next WG140 meeting in Barga, Italy (March 20, 2015) in conjunction with the Gordon Research Conference on “*Polar shelves and shelf break exchange in times of rapid climate warming*”.

## AGENDA ITEM 6

**Planning for PICES-2015**

Dr. James Christian indicated that the proposed session P-10 title was changed from “*Ocean Acidification Observation Network for the Arctic and sub-Arctic Pacific oceans*” to “*Ocean Acidification Observation Network for the North Pacific and adjacent areas of the Arctic Ocean*”. He also indicated that he would like to see some session mergers and switches to workshops (see *POC Endnote 3*).

Topic sessions proposed by POC, its expert groups, or of relevance to POC.

Proposal ID	Title	Convenors	Duration	Committees (sponsors)	Invited Speakers
	POC Paper Session		1 day	POC	
11	Past, present, and future climate in the North Pacific Ocean: Updates of our understanding since IPCC AR5	Chan Joo Jang, (Korea) Ho-Jeong Shin (Korea) Fangli Qiao (China) Sukgeun Jung (Korea) Anne Hollowed, (USA) Kyung-Il Chang, (Korea) Angelica Peña (Canada) Shin-ichi Ito (Japan)	1 day	POC WG 27 WG 29	
10	Ocean Acidification Observation Network for the Arctic and sub-Arctic Pacific Oceans*	Li-Qi Chen, (China) Fei Chai (USA)	1 day	S-CC	Richard A. Feely (USA)
9	Advance in the Coupled General Circulation Models (CGCMs)*	Zhenya Song (China) Yang-Ki Cho (Korea) Michael Foreman (Canada)	1 day	WG 29	Stephen Griffies (USA) Adrian New (UK)
5	The ocean circulation of Western Pacific and its response to climate change	Wei Zexun (China)	1 day		Tangdong Qu (USA) Dwi Susanto (USA) Wang Fan (China) Wang Dongxiao (China)
1	The 2014/15 El Niño and anomalous warming of the North Pacific: What happened?	Howard Freeland (Canada) Bill Peterson (USA)	1 day	FIS, S-HD, ICES	Emanuele di Lorenzo (USA)

\* later renamed “*Ocean Acidification Observation Network for the North Pacific and adjacent areas of the Arctic Ocean*”

\*\* later merged with P-11 “*Past, present, and future climate in the North Pacific Ocean: Updates of our understanding since IPCC AR5*” by Science Board.

## POC-2014

### AGENDA ITEM 7

#### **PICES-2014 POC Best Presentation and Poster awards**

Drs. Chan Joo Jang and Shin-ichi Ito agreed to act as judges for the early career scientist presentations (10 from POC paper and 2 from S10), and posters (13 from POC Paper and 3 from S10). Best Presentation was awarded to Michael G. Jacox (University of California Santa Cruz, USA, for his talk on “*Climate variability and the 3-dimensional structure of coastal upwelling*” in the POC Paper Session. Best Poster from the POC-sponsored POC/TCODE/FUTURE Topic Session (S10) on “*Regional climate modeling in the North Pacific*” was awarded to Ho-Jeong Shin (KIOST, Korea) for his presentation on “*Regional efficacy of ocean heat uptake under a CO<sub>2</sub> quadrupling*”.

### AGENDA ITEM 8

#### **Documenting business meetings, topic sessions and workshops**

Dr. Chang reminded all POC conveners of workshops and sessions that summaries should be submitted to him before the end of PICES-2014. He requested a contact name for each session/workshop.

*October 22, 2014*

### AGENDA ITEM 5

#### **Relations with other international organizations/programs (continued)**

##### (3) NEAR-GOOS

Dr. Hee-Dong Jeong, member of the IOC/WESTPAC Coordinating Committee for the North-East Asian Regional-Global Ocean Observing System (NEAR-GOOS), presented the following NEAR-GOOS activities: The Coordinating Committee’s 15<sup>th</sup> annual meeting was held in Busan, Korea, in October 2013, and the next one is scheduled for Korea in December 2014. Dr. Jeong introduced data bases, regional observing systems, cruises, ferry instrumentations and showed an example of the complementary observing system in the NEAR-GOOS area between POI, Russia and JMA, Japan. Future monitoring plans include ferries between Korea and Japan, and an LNG carrier between Sakhalin and Korea.

##### (5) Argo

Prof Toshio Suga briefly covered the present status of Argo, the objectives of global Argo (to be more spatially complete), and emerging new missions. Some highlights were that, as of September 2014, 31 nations had contributed data from 3579 floats from all ocean basins, with approximately 800 new deployments/year; 1788 papers citing Argo have been published since 1998. A design for Global Argo is targeted to conduct double sampling in western boundary currents and equatorial regions, enhanced sampling in marginal seas, and normal sampling in seasonal ice zone; 500–600 more floats are necessary to meet the global design requirements. Emerging new missions of the Argo program include Deep Argo floats equipped with CTDs to permit deployments deeper than 2000m, and Bio Argo floats that can measure dissolved oxygen, nitrate, pH, and other bio-optical properties. The most important challenges to sustaining these essential and valuable observations across scientific generations are shrinking national resources, and achieving an international consensus on the deployment of Argo floats inside EEZs. The main ways for nations to contribute to Argo are to provide high quality CTD data to calibrate Argo data, to inform cruises by others to deploy floats, and to provide financial support for the Argo Information Centre.

### AGENDA ITEM 6

#### **Planning PICES-2015 (continued)**

Of the 5 Topic Sessions related to POC (*POC Endnote 3*):

1. POC endorsed P-1 (*The 2014/15 El Niño and anomalous warming of the North Pacific: What happened?*) but did not need to allot funds as Dr. Emanuele Di Lorenzo gets US support as a WG 27 Co-Chair.

2. POC suggested that P-5 (*The ocean circulation of Western Pacific and its response to climate change*) become a workshop and that P-9 (*Advances in the Coupled General Circulation Models (CGCMs)*) be merged with P-11.
3. One-day business meetings for S-CC, S-CCME, WG 27, and WG 29, and a ½-day business meeting for AP-CREAMS were requested.

#### AGENDA ITEM 9

##### **FUTURE issues**

Dr. Michael Foreman gave a brief presentation of the FUTURE Open Science Meeting (April 15–18, 2014) and Inter-session Science Board Meeting (April 19–21, 2014) highlights (Kohala Coast, Hawaii, USA). An evaluation and recommendations of the FUTURE program was made by an Evaluation Team at the FUTURE OSM. Based on recommendations, a new 12-person SSC will replace the FUTURE Advisory Panels to oversee the program. They will develop a work plan for FUTURE over the next 5 years and maybe convene their own expert groups. Suggested members from POC: Drs. Emanuele Di Lorenzo, and Steven Bograd (possible Co-Chair of SSC).

There was considerable discussion on proposed changes to the next phase of the North Pacific Ecosystem Status Report. Dr. Phillip Mundy's proposed Terms of Reference for a Study Group on "North Pacific Ecosystem Status Report" see *ISB-2014 Endnote 4* in [ISB-2014](#)) and proposed timelines were presented. POC supports establishment of the Study Group to develop an implementation plan for the new NPESR and recommended Drs. James Christian and Steven Bograd as potential members.

Possible POC products for FUTURE were discussed after reviewing a list of FUTURE products from the existing WGs and Sections. Model output data could be put on a "cloud" facility for a relatively small cost and that would be an alternative to PICES or a national facility, hosting such big data. Training of students or early career scientists could be considered as a product.

There was considerable discussion of what POC's role should be in implementing FUTURE. There was support for Dr. Shoshiro Minobe's suggestion of "intermediate goals" for physical oceanographers and Dr. Chang presented a list of six possible physical processes for POC to consider. Dr. Chang will propose to SB that POC host a workshop in Busan in May 2015 with the tentative title "*Physical processes as forcing of marine ecosystems*" and request PICES support for 2 invited speakers. Other funding sources for additional speakers will be investigated. The main purpose will be to decide which "physical process" should be the focus of a new working group. Dr. Shin-ichi Ito suggested that such a WG could become a CLIVAR regional program. This would further strengthen the ties between CLIVAR and PICES.

#### AGENDA ITEM 10

##### **Reports of POC active expert groups**

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

Dr. James Christian, Co-Chairman of S-CC, reported the Section's 2014 activities and 2015 plans. Highlights were that Dr. Tsuneo Ono (Japan) has been elected as Co-Chairman of S-CC. S-CC is expecting new members from US and China. S-CC proposes a Topic Session at PICES-2015 (see Agenda Item 6). S-CC is also proposing to develop assessments of acidification around the North Pacific and convene a workshop on this at PICES-2016.

POC supports the following S-CC requests:

- travel support for PICES associated member of SCOR WG 140 to attend BEPSII meeting in Barga, Italy, March 20, 2015,
- travel support for students/early career scientists to attend an IOC/SCOR IOCCP training course on "*Instrumenting our oceans for better observation: A training course on autonomous biogeochemical sensors*", June 22–July 1, 2015, Kristineberg, Sweden,

- support for a proposed Topic Session on “*Ocean Acidification Observation Network for the North Pacific and adjacent areas of the Arctic Ocean*” at PICES-2015,
- a full day for the S-CC meeting in 2015 (½ day each for the business meeting and to review assessment information).

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

Dr. Shin-ichi Ito, member of S-CCME, presented the Section’s activities and future plans. Dr. Suam Kim stepped down as PICES Co-Chairman, and Dr. Ito has agreed to replace him. Dr. Ito reviewed the goals of S-CCME, and introduced the Section’s 2012–2021 road map, with linkages to IPCC panels. S-CCME was very active in 2014, convening a theme session and two workshops. In 2015 S-CCME will convene a Theme Session (S10) on “*Forecasting climate change impacts on fish populations and fisheries*” at the 3<sup>rd</sup> PICES/ICES/IOC Symposium on “*Effects of climate change on the world’s oceans*” (March 21–27, 2015, Santos, Brazil; see *POC Endnote 4* for other POC-related sessions). The Chairs of S-CCME and FISH-MIP (ISI-MIP Marine Ecosystems and Fisheries Sector of the Inter-Sectoral Impact Model Intercomparison Project (ISI-MIP), Potsdam Institute for Climate Impact Research, Germany) agreed to explore the potential to work together during the Symposium as there are many overlaps in the two programs. The Chairs will look into collaboration and possibly the use of a standard set of GCMs and RCPs. S-CCME members will participate at the ESSAS Annual Science Meeting (June 15–17, 2015, Seattle, USA), and will hold a 3-day workshop on “*Ecosystem projection model inter-comparison and assessment of climate change impacts on global fish and fisheries*” (August 10–12, 2015, Princeton, USA; see *POC Endnote 3*). S-CCME is formally requesting to CMIP6 the additional variables (e.g., primary productivity), spatial resolution and temporal frequency they will need for future analyses. POC will bring this issue forward to Science Board. There should be a mechanism to poll the PICES community on what variables are needed. If the request does go through S-CCME, the ICES Co-Chairs will need to be notified.

POC supports the following S-CCME requests:

- the inter-sessional ICES/PICES workshop on “*Modelling effects of climate change on fish and fisheries*” at Princeton, USA, in August, 2015,
- PICES-2015 Topic Session on “*Past, present, and future climate change in the North Pacific Ocean: Updates of our understanding since IPCC AR5*”.

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

Dr. Yury Zuenko, member of AP-CREAMS, gave a brief report of the Panel on its activities in 2014 and plans for 2015 and beyond. Activities in 2014 included:

- AP-CREAMS meetings:
  - ✓ Inter-sessional, April 15, in Qingdao, China; 6 members from China, Japan, Korea,
  - ✓ PICES-2014, October 18, Yeosu, Korea; 6 members from Japan, Korea, Russia
  - ✓ Continuation of meeting from PICES-2014, where attendance by Chinese members is anticipated, October 29, in Qingdao, China; 10 members from China, Japan, Korea, Russia
- Joint cruises
  - ✓ EAST-I area: April 2014, R/V *Akademik M.A. Lavrentyev*
  - ✓ EAST-II area: July 2014, R/V *Nagasaki-maru*
- 2014 PICES Summer School on “*End-to-end Models for marine resources management and research*”, August 26–29, Gangneung, Korea
  - ✓ Participants: 29 students from 13 countries, including Canada, China, Japan, and Korea
  - ✓ Co-sponsors: PICES, Korea EAST-I, Gangneung-Wonju National University, NOAA, Gangwon Sea Grant, IMBER, SCOR, NPRB, Seoul National University
  - ✓ Instructors: Dr. Chris Harvey (NOAA), Dr. Chung Il Lee (Gangneung-Wonju University), Emanuele Di Lorenzo (Georgia Institute of Technology), Dr. Isaac Kaplan (NOAA), Dr. Kenneth Rose (Louisiana State University), Rubao Ji (Woods Hole Oceanographic Institution)
  - ✓ Course content: Introduction and NPZ Models, Ecopath and Ecosim, Atlantis End-to-End Model, Individual-Based Models

- Workshops
    - ✓ Korea–China Workshop on “*Marine research cooperation in the Yellow and East China seas*”, Jeju, Korea, June 24–27, 2014
    - ✓ Korea-Russia workshop to discuss joint cruise results at POI Cape Shults Marine Station, Russia, July 22–25, 2014
  - Publications
    - ✓ Revision and completion of the NPESR Supplement: Supplement to 2010 NPESR (314 pages, 83 authors) has been submitted to Science Board for publication and was endorsed by Science Board in 2011. Recommendations were made by AP-CREAMS to its parent committees to take to Science Board at PICES-2013, Nanaimo, Canada:
      - PICES should initiate the publication of the supplementary chapter without further delay as Science Board has already endorsed it;
      - In case of further delay, AP-CREAMS will initiate efforts to publish the prepared manuscript outside PICES, possibly as a book. However, this publication will not be a replacement of the missing chapter of the 2<sup>nd</sup> NPESR by any means. PICES should continue efforts for completing the 2<sup>nd</sup> NPESR and for the preparation of NPESR 3.
- In 2014:
- Revision of the manuscript comparable with other sections of the published North Pacific Ecosystem Status Report for publication by PICES is underway. Submission of this revised manuscript to the Chairman of Science Board will close AP-CREAMS activity on this issue.
  - Publication of other main parts of the prepared manuscript will be pursued outside PICES on voluntary basis. A survey on individual contributor’s consent for publication is under way.
  - ✓ The EAST-II publication (Oceanography of the Yellow and East China Seas) as a PICES Scientific Report was endorsed at PICES-2013 and is in preparation and expected to be published by the end of 2015.
- AP-CREAMS submitted its 3-year report as a requirement for another 3-year extension to 2019 (PICES Rules of Procedure (Rule 13); see *POC Endnote 5*).

Plans for 2015 and beyond include:

- Joint cruises:
  - ✓ EAST-I area: Russia–Korea joint cruise in April 2015,
  - ✓ EAST-II area: joint cruise in July–August 2015.
- Completion of a PICES Scientific Report on “Oceanography of the Yellow and East China Seas” by the end of 2015;
- Workshops and Summer Schools on remote sensing, circulation and ecosystem modeling are planned between 2015 and 2017;
- Next AP Meeting will be held in Okinawa in April 2015 during the PAMS Meeting.

POC supports the following AP-CREAMS requests:

- Extend the deadline for EAST-II report to the end of 2015,
- Proposal to continue the AP-CREAMS activities through 2019.

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

Dr. Michael Foreman, Co-Chairman of WG 27 (<http://wg27.pices.int>), gave a brief summary of activities over the last year and WG business meeting on October 16. Synthesis papers are planned and work has begun on the final report, as WG 27 will end in 1 year. WG 27 recommends:

- a panel to look into funding opportunities relevant to FUTURE in each PICES member country,
- ideas for possible new WGs (*e.g.*, Seasonal to multi-year projections, Mesoscale processes). These will be discussed further over the next year.

## POC-2014

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

Dr. Enrique Curchitser, Co-Chairman of WG 29, gave a report on activities and plans of WG 29. The WG's term will end in 2015. For its final report, the WG plans for each member to prepare 5–10 pages describing his/her activities followed by a synthesis and recommendations. WG 29 will also consider contributions from other expert groups (*e.g.*, S-CCME) if needed. Obstacles and gaps that need to be considered are regional coverage, biogeochemistry, upper trophic levels. A follow-up working group will be proposed. Details will be finalized over the next year.

### Study Group on *Socio-Ecological-Environmental Systems* (SG-SEES)

Dr. Michael Foreman gave a report on activities and plans of SG-SEES on behalf of Dr. Emanuele Di Lorenzo, Chairman of SG-SEES. The group completed their Terms of Reference successfully, as was reported by Dr. Emanuele Di Lorenzo at the joint FUTURE AP meeting (October 19). The Study Group requested to be extended by one year to plan the format of a Workshop. The final report (<http://goo.gl/QCJDvy>) is already available in draft form and will be finalized within the next month. At the end of the report there is an extended version of the SG recommendations and rationale.

#### *Summary of POC decisions regarding expert groups:*

1. Review and approve the proposal for an extension of the lifespan of AP-CREAMS to 2019.
2. As WG 27 and WG 29 lifespans have only one more year, POC members agreed to actively think about follow-up expert groups over 2015.

## AGENDA ITEM 11

### **Publication for 2014 and beyond**

AP-CREAMS plans to finish the PICES report “Oceanography of the Yellow and East China Seas” by the end of 2015.

## AGENDA ITEM 12

### **Items with financial implications**

1. \$2500 each to P-10 (*Ocean Acidification Observation Network for the Arctic and sub-Arctic Pacific Oceans*) and P-11 (*Past, present, and future climate in the North Pacific Ocean: Updates of our understanding since IPCC AR5*).
2. Proposed inter-sessional meetings for 2015 and beyond:
  - Travel support for 2 invited speakers to a 2-day POC inter-sessional workshop on “*Identifying key physical processes driving the ecosystems in the North Pacific focusing on phenomena unresolvable in current global climate models*”, May 16–17, 2015, Busan, Korea;
  - Travel support for students/early career scientists to attend an IOC/SCOR IOCCP training course on “*Instrumenting our oceans for better observation: A training course on autonomous biogeochemical sensors*”, June 22–July 1, 2015, Kristineberg, Sweden;
  - 3-day PICES/ICES (S-CCME) workshop on “*Modelling the effects of climate change on fish and fisheries*”, August 10–12, 2015, Princeton, USA;
  - Travel support for a POC representative to attend the 2015 ESSAS ASM in Seattle, USA, June 15–17, 2015;
  - Travel support for PICES Associate Member of SCOR WG 140, Dr. Lisa Miller, to attend BEPSII meeting in Barga, Italy, March 20, 2015.

## AGENDA ITEM 13

### **Proposals for new working groups, study groups, and special projects**

See Agenda Items 9 and 10 for proposals.



## AGENDA ITEM 14

**Requests for existing expert groups**

See Agenda Item 10.

## AGENDA ITEM 15

**Proposals for new meetings, workshops, symposia, conferences**

See Agenda Item 10.

## AGENDA ITEM 16

**Other business**

POC members discussed what the Committee could do for PICES' 25<sup>th</sup> anniversary (PICES-2016, USA). One suggestion was to have a topic session similar to Dr. Jacquelynne King's presentation in the PICES-2105 Science Board Symposium that looks both backward and forward from a POC perspective. Dr. Ito pointed out that since many US funding representatives are likely to attend this Annual Meeting, it would be a good opportunity to point out PICES' international collaborations – for example, where even western Pacific scientists have contributed to eastern Pacific issues via comparative studies. Dr. Steven Bograd showed his intention that he can play a role as a US representative on POC. Other possible activities could be a POC contribution to publication of a journal issue that 1) highlights the science advancements of PICES and future of marine science in the North Pacific or 2) Communicates at a Committee level (a former Chair to highlight accomplishments; a current Chair to describe the direction of focus).

## AGENDA ITEM 17

**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-Il Chang to the Science Board meeting on October 18–19, 2014.

***POC Endnote 1*****POC participation list**Members

Steven Bograd (USA)  
 Kyung-Il Chang (Korea, Chairman)  
 James Christian (Canada)  
 Enrique Curchitser (USA, Oct. 22)  
 Michael Foreman (Canada, Vice-Chairman,  
 rapporteur)  
 Daisuke Hasegawa (Japan)  
 Shin-ichi Ito (Japan)  
 Chan Joo Jang (Korea)  
 Hee-Dong Jeong (Korea, Oct. 22)  
 Hiromichi Ueno (Japan)  
 Elena Ustinova (Russia)  
 Yury Zuenko (Russia)

Observers

Nico Caltabiano (CLIVAR Oct. 22)  
 Kenneth Drinkwater (ESSAS, Oct. 15)  
 Lisa Miller (SOLAS, SCOR WG 140, Oct. 15)  
 Shoshiro Minobe (WG 27, Oct. 15)  
 Toshio Suga (Argo, Oct. 22)

*POC Endnote 2*

**POC meeting agenda**

1. Welcome, introductions, opening remarks
2. Changes to, adoption of, agenda and appointment of rapporteur
3. Membership
4. Completion of PICES-2013 decisions
  - (1) 2014 PICES POC Paper/Topic Sessions and Workshop
  - (2) 2014 Inter-sessional symposia/sessions/workshops/meetings/events
  - (3) Travel and representation at the meetings of other organizations/programs
  - (4) Publications
5. Relations with other international organizations/programs
  - (1) ESSAS (Ken Drinkwater)
  - (2) CLIVAR/WCRP (Enrique Curchitser, Shoshiro Minobe ?)
    - Pan-CLIVAR meeting
    - Incorporating ecosystem in U.S. CLIVAR WG on Ocean Model Development (Enrique Curchitser is a member of the WG)
  - (3) NEAR-GOOS ( Hee-Dong Jeong)
  - (4) SOLAS & SCOR WG 140 BEPSII (Lisa Miller)
    - New initiative of SOLAS within the context of the Future Earth program (W5)
  - (5) Argo (Toshio Suga)
6. Planning PICES-2015 “North Pacific ecosystem change and sustainability” in Qingdao, China
  - (1) POC-related topic sessions (Conveners from POC committee and/or subsidiary bodies, WG27, WG29, S-CC) : 5 among total 12 proposals
  - (2) POC-related workshops: 0 among total 5 proposals
  - (3) Business meetings (WG27, WG28, S-CC, S-CCME, CREAMS-AP)
7. PICES-2014 POC Best Presentation and Poster awards
  - (1) Eligibility: Oral – 1st author & presenter should be early career scientist; Poster – no age limit.
  - (2) Sessions: POC paper session (judge: ), S9 (judge: ), S10 (judge:)
  - (3) Evaluation sheet (available from secretariat, Rosalie)
8. Documenting business meetings, topic sessions and workshops
  - (1) Business meeting summary (WG27, WG29, CREAMS-AP, S-CC, S-CCME) – Chairs are asked to submit the summary reports to secretariat within 1 month after the annual meeting.
  - (2) Topic session summary - Conveners to Secretariat before the end of the annual meeting: POC-P, S2, S4, S6
9. FUTURE and Advisory Panels
  - (1) FUTURE OSM (Mike Foreman)
  - (2) FUTURE implementation (ISB, Mike Foreman)
  - (3) Evaluation of PICES FUTURE program by FUTURE Evaluation Team (Shin-ichi Ito)
  - (4) Next phase of the North Pacific Ecosystem Status Report (ISB, Mike Foreman)
10. Progress reports and future plans of POC active expert groups
  - (1) Section on *Carbon and Climate* (J. Christian)
  - (2) Joint PICES/ICES Section on *Climate Change Effects on Marine Ecosystems* (M. Foreman/S. Ito)
  - (3) Advisory Panel on *CREAMS/PICES Program in East Asian Marginal Seas* (Y. Zuenko )
  - (4) WG 27 on *North Pacific Climate Variability and Change* (E. Lorenzo/S. Minobe ?)
  - (5) WG 29 on *Regional Climate Modeling* (E. Curchitser/ C.J. Jang)
11. Proposals for publication for 2014 and beyond
12. Priority of items with funding implications
  - (1) Inter-sessional meetings/workshops/symposia for 2014 and beyond
    - WG 27, WG 29, S-CCME, S-CC, AP-CREAMS
13. Proposals for new working groups, study groups, and special projects
14. Requests for existing expert groups
15. Proposals for new meetings, workshops, symposia, conferences with PICES as organizer or co-sponsor

16. Other business  
 (1) PICES 25<sup>th</sup> Anniversary activities in USA in 2016  
 17. Adoption of POC report and recommendations to Science Board

**POC Endnote 3**

**Proposed Topic Sessions for PICES-2015**

**POC Paper Session**

Duration: 1 day  
 Conveners: Kyung-Il Chang (Korea) and Michael Foreman (Canada)  
 Invited speakers: one

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

**P-1: The 2014/15 El Niño and anomalous warming of the North Pacific: What happened?**

Sponsors: BIO/MONITOR/TCODE  
 Duration: 1 day  
 Conveners: Howard Freeland (Canada), Bill Peterson (USA)  
 Invited speakers: Emanuele Di Lorenzo (USA)

Major El Niño events in 1982/83 and 1997/98 had massive impacts on the ecosystems of the North Pacific Ocean. In spring 2014, computer models were predicting another major El Niño for 2014/15. However, it now appears that the event is weakening (but who knows what the future holds). Despite this, it is perhaps more noteworthy that the entire Pacific north of ~35°N is anomalously warm with SSTs in the Gulf of Alaska that are  $>3\sigma$  above the long-term mean. This warming event appears to be unprecedented, with strong signals in the Gulf of Alaska and Bering Sea, and across the Pacific to Japan, as well as in the Oyashio, the Sea of Okhotsk and coastal waters surrounding Russia, Japan and Korea. Anomalous warming is also seen in the Arctic Ocean, Baffin Bay, the Labrador Sea and much of the far north Atlantic. Key questions to address in this session include what are the atmospheric conditions leading to wide-spread warming, what are the consequences for local weather, and, what are the consequences to ecosystem structure and fisheries? The purpose of this session is to encourage researchers to present evidence of anomalous behaviour in the ecosystems of the North Pacific. We are interested in descriptions of anomalous behaviour in the physical environment, the chemistry of the oceans and the biological impacts of the physical anomalies. The session will be a success if investigators with related stories are brought together to write joint papers describing the evolution and impacts of both the 2014/15 El Niño event as well as anomalous warming of the North Pacific (and perhaps the North Atlantic and adjacent seas).

**P-5: The ocean circulation of Western Pacific and its response to climate change**

Committee Sponsor:  
 Duration: 1 day  
 Conveners: Wei Zexun (China), Wang Dongxiao (China)  
 Invited speakers: Xiaopei Lin (China)  
 Co-sponsor: CLIVAR

The ocean circulation system of the Western Pacific is complex. There are the Mindanao Current and Kuroshio that origin from North Equatorial Current, the Indonesia Throughflow which connects the Pacific and India Ocean, and the global largest Warm Pool. There are strongest ocean convection and typhoon frequently

occurrence all over the world. The ocean circulation of Western Pacific carries the heat from low latitude area to high latitude area, and then releases it into the atmosphere, adjusting the global air temperature. Meanwhile, it plays a key role in the process of formation and evolution of the Western Pacific Warm Pool, and has important effect on global climate system. The ocean circulation and Warm Pool in western Pacific play an important role in regulating the ENSO cycle, the East Asian Monsoon and Subtropical High, and has a significant effect on the marine environment and regional climate in East Asian marginal seas. This session will focus on the North Equatorial Current bifurcation, Mindanao Current, the Indonesian Throughflow, etc., and its interaction with the coastal circulation, will focus on their response to climate change, feedback process and its mechanism.

**P-9: Advances in the Coupled General Circulation Models (CGCMs)** [merged with “*Past, present, and future climate in the North Pacific Ocean: Updates of our understanding since IPCC AR5*”]

**P-10: Ocean Acidification Observation Network for the Arctic and sub-Arctic Pacific Oceans** [later renamed “*Ocean Acidification Observation Network for the North Pacific and adjacent areas of the Arctic Ocean*”]

Committee Sponsor: POC/BIO/MONITOR

Duration: 1 day

Convenors: Li-Qi Chen, (China), Fei Chai (USA), Kitack Lee (Korea), Toru Suzuki (Japan)

Invited speakers: Richard Bellerby (Norway)

The ocean acidification (OA) in 21 century has obviously speeded up in comparison of since 55m years. The averaged surface pH of the world ocean has dropped down 0.1 since the industrial revolution and would be projected to decrease 0.3-0.4 pH in the end this century, equal to increasing 1-1.5 times in ocean acidity. Due to its cold water temperature and the low alkalinity as well as sea ice rapid retreating, the Arctic Ocean and subarctic Pacific Ocean (AOPO) have absorbed massive atmospheric CO<sub>2</sub> and changed the CaCO<sub>3</sub> system to appear large scale aragonite unsaturated state. OA in SOPO will be greatly changed in marine chemical environment to affect marine ecosystem. Topics: Review on observations and researches in OA to develop AO observation network in AOPO under GOA-ON system. Main discussion issues: 1) Advances of investigations and researches of AO in AOPO 2) Role of AO in AOPO in GOA-OA (Global Ocean Acidification Observation Networks) and AMAP-AOA (Arctic Monitoring and Assessment Program- Arctic Ocean Acidification) 3) Exchanges of data and young scientists in OA in PICES’ parties.

**P-11: Past, present, and future climate in the North Pacific Ocean: Updates of our understanding since IPCC AR5**

Committee Sponsor:

Duration: 1 day

Convenors: Chan Joo Jang,(Korea), Ho-Jeong Shin (Korea), Fangli Qiao (China), Sukgeun Jung (Korea), Anne Hollowed,(USA), Kyung-Il Chang,(Korea), Angelica Peña (Canada), Shin-ichi Ito (Japan)

Invited speakers: Jacquelynne R. King (Canada), Yongqiang Yu (China), Masahiro Watanabe (Japan)

Climate has been changing and is highly likely to have been influenced by human activities. These changes, which have greatly affected the Earth’s environment, have been manifested in oceanic ecosystems. Social demands for information on future projections are increasing the need to adapt to and mitigate climate change. The objective of this session is to update our understanding since IPCC AR5 on the past, present and future climate for the North Pacific Ocean and its marine ecosystems, focusing particularly on climatic change in ecosystem-relevant upper ocean and atmospheric variables. Climate change and its impact have been widely investigated using global climate models, while adaptation and mitigation issues have been studied using

mostly regional climate models. While this session invites papers on various topics related to both climate simulations and observations, we also encourage presentations on the development and results of regional climate models (RCMs) and Earth System Models (ESMs), and assessment of hindcast simulations and their application to the projection of future climate or marine ecosystems using coupled general circulation models (CGCMs) in the North Pacific Ocean. Future projections of the North Pacific Ocean and its ecosystems, as obtained from global climate models (including CMIP5 standard experiment data for comparison with RCM results) will also be an important contribution to this session.

**Proposal for an Inter-session Workshop on “*Ecosystem projection model inter-comparison and assessment of climate change impacts on global fish and fisheries*”**

Committee Sponsor: S-CCME

Duration: 2½ days

Convenor: Anne Hollowed (USA), Francisco Werner (USA), Kirstin Holsman (USA), Michio Kawamiya (Japan), Trond Kristinsen (ICES), Brian MacKenzie (ICES)

Invited speakers: TBD

Co-sponsor: ICES, IMR?

Date/Location: August 2015, USA (Princeton?)

Members of the SICCME (S-CCME) seek to encourage the development of a global modeling framework to enable the marine science community to understand and project the implications of climate change on marine ecosystems and the fisheries that depend on them. A key step in the development of this framework is the establishment of an initiative to conduct a multi-model comparative analysis of projected climate change scenarios on fish distribution and abundance. The initiative will involve comparisons of multi-model scenarios within selected regions (Phase 1) and comparisons of multi-model scenarios between regions for a selected suite of species that share similar traits and trophic position (Phase 2). The group agreed to coordinate their research with the existing Fish-MIP program, a sub-group of the The Inter-Sectoral Impact Model Intercomparison Project (ISI-MIP; <http://www.isi-mip.org/>). The first step in this initiative will be to establish a framework for scenario modeling that is agreed upon by the international modeling teams. We propose a workshop wherein the group will reconvene to assess, discuss and finalize the framework for Phase 1 projections. Target species will include species of commercial, cultural or subsistence importance. To the extent possible participants will bring forward model performance metrics for discussion and review. Description and Objectives Specific objectives for the workshop include: Obj. 1 Build the community of research partners needed to complete this research and coordinate international efforts to assess biological and societal impacts of climate-driven changes to future marine resources. Obj. 2 Identify the similarities and differences in projections to gain insight into sources of uncertainty associated with model mis-specification errors, and to provide quantitative estimates of the impacts of climate change on major fish and fisheries around the world. Anticipated Outcomes/Products A suite of manuscripts will be produced from the workshop. An implementation plan for a global experiment will be delivered. If successful, the project will deliver a global assessment of the future distribution, abundance of commercial fish resources under a changing climate. Anticipated number of participants 30 Workshop format: We anticipate a small number of invited talks focusing on presentations by regional modeling groups and reviews of model outcomes, followed by focused discussion addressing the specified objectives (above). AV requirements: Projector, computer, internet connection.

*POC Endnote 4*

**POC-relevant sessions at the 3<sup>rd</sup> PICES/ICES/IOC Symposium on  
“Effects of climate change on the world’s oceans”  
March 21–27, 2015, Santos City, Brazil**

- S1: Role of advection and mixing in ocean biogeochemistry and marine ecosystems
- S2: Ocean acidification
- S3: Changing ocean chemistry: From trace elements and isotopes to radiochemistry and organic chemicals of environmental concern
- S4: Regional models for predictions of climate change impacts: methods, uncertainties and challenges
- S5: Coastal blue carbon and other ocean carbon sinks
- W2: First Brazilian ocean acidification research workshop
- W3: Effects of climate change on the biologically-driven ocean carbon pumps
- W4: Upwelling systems under future climate change

*POC Endnote 5*

**Proposal for CREAMS AP activity extension through 2019**

Co-Chairmen:

J. Ishizaka (Nagoya U., Japan)

K.-R. Kim (RIO SNU, Korea)

V. Lobanov (POI FEB RAS, Russia)

**1. CREAMS AP tasks and their implementation**

The CREAMS AP (Advisory Panel on Circulation Research in the East Asian Marginal Seas) was established in October 2005 with the tasks:

- to initiate and coordinate the studies on hydrography, circulation, and biology, as well as on variability of oceanographic and biological properties in PICES area of the East Asian Marginal Seas;
- to estimate climate-scale and long-term changes in abiotic and biotic environments of this region;
- to facilitate the establishment of permanent observation and data exchange networks in this region;
- to convene workshops/sessions to evaluate and compare the results of national and international research programs.

The AP-CREAMS activity was extended in 2010, and now the second term is finishing. Recently, in addition to the above mentioned tasks, AP-CREAMS started two new directions, as a contribution to FUTURE: i) scientific capacity building in the form of semi-regular summer schools on modern advances in oceanography and marine biology and ii) preparing scientific publications overviewing the state of regional ecosystems and their variations.

In 2014, AP-CREAMS continued coordination of national and international research in the frameworks of the research projects, EAST-I and EAST-II: two joint cruises were conducted, and two scientific workshops were held where the programs and results of these surveys were discussed. AP-CREAMS organized the summer school on “*End-to-end models for marine resources management and research*” in Gangneung, Korea, as one of a series of summer schools, and continued preparation of scientific publications on state of regional ecosystem, namely on the report “*Oceanography of the Yellow and East China Seas*”. All these activities are successfully developing and should be continued.

**2. Reasons for extending AP-CREAMS AP activities**

*2.1 Coordinate the current research projects*

- In the framework of the EAST-I project, a Russia–Korea joint cruise aboard a Russian research vessel is planned in April 2015 and beyond on an annual basis;
- In the framework of EAST-II project, the joint cruises aboard a Japanese research vessel are planned in July–August 2015;

- AP-CREAMS meeting to coordinate these surveys and discuss their results is planned for the spring of 2015.

2.2 Complete the volume “*Oceanography of the Yellow Sea and East China Sea*”, as a PICES Scientific Report. The deadline for the final draft is planned for September 2015, and it is expected to be submitted to PICES by October 2015.

### **3. Other motives for continuing AP-CREAMS activities**

#### *3.1 Coordination of national and international researches and observational and data-exchange networks*

Research activities among PICES member countries in the region of the East Asian marginal seas have a permanent character and need ongoing coordination, as the interests of different countries tightly overlap. Some ideas on further development of international surveys and observation networks have already been discussed by AP-CREAMS though the details, such as joint standard sections, extension to the Okhotsk Sea, *etc.*, are not yet developed.

#### *3.2 Scientific capacity building*

This FUTURE-related activity is deeply shared by the entire AP and will be continued in different forms, but most importantly as summer schools held at Seoul National University, taking advantage of SNU’s expertise in satellite oceanography, observational systems, hydrodynamic and ecosystem modeling, *etc.* A summer school on submarine groundwater discharge for 2016 will be discussed at the AP-CREAMS meeting on October 29, 2014.

### **4. Request for PICES**

As the activities of AP-CREAMS are continuing successfully, with some definite plans for 2015 and intentions for beyond, AP-CREAMS requests an extension for another term until 2019.