

## REPORT OF PHYSICAL OCEANOGRAPHY AND CLIMATE COMMITTEE



The meeting of the Physical Oceanography and Climate Committee (hereafter POC) was held from 16:00–19:00 hours on October 31, 2007. The Chairman, Dr. Michael G. Foreman, called the meeting to order and welcomed members and observers (*POC Endnote 1*). Dr. James E. Overland served as the rapporteur. The Chairman welcomed Dr. Nathan Mantua as a new member of the Committee. Several changes were made to the draft agenda in order to accommodate cancellations and additions to the presentations from international organizations and programs (Agenda Item 6). The revised agenda was adopted (*POC Endnote 2*).

### Completion of PICES XV decisions (Agenda Item 3)

- a. Two members of WG 20 on *Evaluations of Climate Change Projections*, Drs. Muyin Wang and Enrique Curchitser, attended ESSAS workshops on “*Evaluation of climate scenarios for subarctic regions*” and “*The role of seasonal sea ice cover in marine ecosystems*” held on June 4–6, 2007, in Hakodate, Japan, with partial travel support from PICES.
- b. The BIO/POC Topic Session on “*Decadal changes in carbon biogeochemistry in the North Pacific*” proposed for PICES XVI was approved by Science Board.
- c. The POC Contributed Paper Session proposed for PICES XVI was approved by Science Board.
- d. The POC/CCCC/MONITOR Topic Session on “*Operational forecasts of oceans and ecosystems*” proposed for PICES XVI was approved by Science Board.
- e. The BIO/FIS/POC Topic Session on “*Phenology and climate change in the North Pacific: Implications of variability in the timing of zooplankton production to fish, seabirds, marine mammals and fisheries (humans)*” proposed for PICES XVI was approved by Science Board.
- f. The POC/CCCC workshop on “*Climate scenarios for ecosystem modeling*” proposed for PICES XVI was approved by Science Board.
- g. The ICES/PICES Early Career Scientists Conference entitled “*New frontiers in marine science*” was successfully held on June 26–29, 2007, in Baltimore, U.S.A. The summary of this conference can be found elsewhere in this Annual Report.
- h. Dr. Foreman gave a brief report on the planning for the ICES/PICES/IOC Symposium on “*Effects of climate change on the world’s oceans*” to be held May 19–23, 2008, in Gijón, Spain, and all POC and WG 20 members were encouraged to attend. Dr. Foreman is co-convening a session on “*Past and future variability and change in ocean climate: Climate model projections*”, and a WG 20 meeting will be held if a sufficient number of members attend.
- i. Dr. James R. Christian reported that the “*Guide to best practices for ocean CO<sub>2</sub> measurements*” has been completed and will be published by the end of this year as PICES Special Publication No. 3/IOCCP Report No. 8.

### Progress report of the Section on Carbon and climate (Agenda Item 4a)

Dr. Christian, Co-Chairman of the Section on *Carbon and Climate* (CC-S), briefly reported on their successful Topic Session (Agenda Item 3b above) and annual meeting at PICES XVI. Draft changes to the terms of reference for CC-S were presented (*CC-S Endnote 4*) and will be finalized by the inter-sessional Science Board meeting in April 2008. Details can be found in the CC-S chapter of this Annual Report.

**Progress report of the CREAMS/PICES Advisory Panel (Agenda Item 4b)**

Dr. Yasunori Sakurai, Co-Chairman of the Advisory Panel for a *CREAMS/PICES Program in East Asian Marginal Seas* (CREAMS-AP) gave a brief report of activities in the past year, including their annual meeting at PICES XVI and plans for 2008 and beyond. Details can be found in the CREAMS-AP chapter of this Annual Report.

**Progress report of WG 20 on “Evaluation of Climate Change Projections” (Agenda Item 4c)**

Dr. Foreman gave a brief report of the activities of WG 20 over the last year. The details can be found in the WG 20 chapter of this Annual Report. Highlights included: i) member attendance at the ESSAS workshops in Hakodate, Japan (Agenda Item 3a above); ii) a successful workshop with CFAME (Agenda Item 3f above) that had approximately 50 attendees on the first day, 23 on the second and that resulted in the request for a shopping list of climate variables to be provided for the CFAME inter-sessional workshop in April 2008; iii) a business meeting at PICES XVI in which WG 20’s role in the next PICES integrative scientific program (FUTURE) was discussed; and iv) a possible inter-sessional WG 20 meeting at the 2008 Gijón symposium, pending sufficient attendance (Agenda Item 3h above).

**Relations with other international programs and organizations (Agenda Item 5)**

Six presentations were given:

- a. Dr. Hee-Dong Jeong gave a brief summary of NEAR-GOOS (North-East Asian Regional Global Ocean Observing System) activities for the past year, including the provision of historical and real-time databases, and those planned for 2008.
- b. Dr. Howard J. Freeland, Co-Chairman of the Argo Science Team, outlined successes and problems with the Argo program. Four recommendations for PICES member countries were given (*POC Endnote 3*) and the Committee unanimously agreed that they be carried forward to Science Board.

- c. Dr. William R. Crawford, member of the Pacific CLIVAR (Climate Variability and Predictability Program) Panel, summarized their activities for the past year.
- d. Dr. Kenneth Drinkwater, Co-Chairman of the ESSAS (Ecosystem Studies of Sub-Arctic Seas) Steering Committee, provided a summary of their activities for the past year and those planned for 2008. He asked PICES to support travel for one WG 20/POC member to attend the next ESSAS Annual Meeting to be held in September 2008, in Halifax, Canada.
- e. Dr. George L. Hunt, Chairman of BEST (Bering Sea Ecosystem Study), reported that 8 related sub-projects have been funded (total \$35M) by the National Science Foundation and North Pacific Research Board for BEST and BSIERP (Bering Sea Integrated Ecosystem Research) programs.
- f. Dr. Foreman reported that the International Council for the Exploration of the Sea (ICES) was looking for PICES support for Theme Sessions at their Annual Science Conference to be held in September 2008, in Halifax, Canada. The only session that seemed applicable to POC was “*Coupled physical and biological models: Parameterization, validation, and application*”. It was recommended that travel support be given for an interested POC or BIO member to co-convene this session. (If practical, this could be the same person attending the ESSAS workshop since it is just before the ICES Annual Science Conference.)

**Election of Chairman and Vice-Chairman (Agenda item 6)**

Dr. Foreman was elected unanimously as POC Chairman for the second 3-year term. Dr. Ichiro Yasuda will also continue to serve as POC Vice-Chairman.

**POC Action Plan (Agenda Item 7)**

POC agreed that since the POC Action Plan was updated prior to the inter-sessional Science Board meeting in April 2007, it need not be reviewed further at the Annual Meeting.

### **Discussion of PICES' next scientific program, FUTURE (Agenda Item 8)**

This item was moved to the end of the meeting as it was expected to consume as much time as was available. The Chairman gave a brief summary of the history leading up to the present draft Science Plan (version 4.2) for a new PICES scientific program, FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Ecosystems). The Plan had been sent by e-mail to all committee members one month prior to this Annual Meeting and had also been posted on the PICES website. Dr. Foreman stated that although he hoped that POC would play a stronger role in FUTURE than it did in CCCC, he did not feel the present document reflected this desire. His feeling was that in the CCCC Program the physical and geochemical components of climate were assumed to be known, and the emphasis was on biological response. As there is still much to learn about physical/geochemical variability in the North Pacific, he did not feel this was appropriate then, nor is it now. Thus, FUTURE should not follow the CCCC Program in pushing physical and chemical oceanography into the background. With this in mind, possible changes to the key and secondary questions were suggested. A lengthy discussion followed and concluded by endorsing changes that would give more focus to understanding the physical and geochemical processes and uncertainties associated with climate patterns and projections. On behalf of POC, Dr. Foreman will present these suggestions at the upcoming Open Forum on November 1 and at the FISP workshop on November 3.

### **Planning PICES XVII (Agenda Item 9)**

Dr. Thomas C. Wainwright proposed a 1-day Topic Session on "*Marine system forecast models: Moving forward to the FUTURE*", to be jointly sponsored by MODEL (CCCC) and POC (*MODEL Endnote 3*). The Committee suggested that "models" be deleted from the title but otherwise supported the proposal and indicated they would be prepared to request travel support for one invited speaker.

Two further Topic Sessions were proposed by Dr. Fangli Qiao, but after some discussion it was decided that only one Topic Session entitled "*Coastal upwelling processes and their ecological effects*" should be supported (*POC Endnote 4*). Co-sponsorship from FIS and BIO would be requested but if not forthcoming, the Committee decided it could handle it alone. Travel support will be requested for one invited speaker.

Though not presented in time for the POC meeting, MONITOR asked POC to co-sponsor their joint Topic Session with TCODE and BIO entitled "*Linking biology, chemistry, and physics in our observational systems – present status and FUTURE needs*" (*MONITOR Endnote 6*). At the Science Board meeting, Dr. Foreman agreed to support this proposal along with the associated request for an invited speaker.

The Committee supported holding a 1-day POC Contributed Paper Session to be convened by Drs. Foreman and Yasuda; it was indicated that this session does not require invited speakers.

The Committee also approved the request for a joint CCCC/POC workshop, tentatively entitled "*Climate scenarios for ecosystem modeling (II)*" (*CFAME Endnote 4*). There will be no invited speakers.

No names of potential invited speakers for the Science Board Symposium at PICES XVII were suggested.

### **PICES XVIII theme (Agenda Item 10)**

The theme proposed by Korea for PICES XVIII was not available to be discussed at the meeting.

### **Ranked requests with financial implications (Agenda Item 11)**

#### Inter-sessional travel support requests

After considerable discussion, the Committee agreed to forward the following list of ranked requests for financial support to Science Board:

- a. WG 20 Co-Chairmen to attend the inter-sessional CFAME workshop on "*Linking and*

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*visualizing climate forcing and marine ecosystem changes: A comparative approach*” to be convened in April 2008, in Honolulu, U.S.A. (CFAME Endnote 3);

- b. a guest lecturer for the PICES Summer School on “*Biomass-based management*” to be held in August 2008, in Hakodate, Japan;
- c. a WG 20/POC member to attend the ESSAS workshop to be held in September 2008, in Halifax, Canada;
- d. an invited speaker for the PICES/CREAMS workshop on “*Flux studies in marginal seas*”, to be held in August 2008, in Seoul, Korea (tentative);
- e. a PICES convenor for a joint ICES/PICES Theme Session on “*Coupled physical and biological models: Parameterization, validation, and applications*” at the ICES Annual Science Conference in September 2008, in Halifax, Canada (could possibly be combined with request c);
- f. a session convenor to attend the symposium on “*Effects of climate change on the world’s oceans*” and possible WG 20 inter-sessional meeting to be held in May 2008, in Gijón, Spain;
- g. a member of CC-S to attend the conference on “*The ocean in a high CO<sub>2</sub> world –IP*” to be convened in October 2008, in Monaco.

### PICES XVII travel support requests

For PICES XVII, travel support is requested for 1 invited speaker for each of the three Topic Sessions that POC has agreed to co-sponsor.

### Proposed publications for 2008 and beyond

Nothing was foreseen.

### **POC Best Presentation and Best Poster Awards (Agenda Item 12)**

Drs. Steven Bograd, Christian Foreman and Yasuda acted as judges for the POC Best Presentation Award and the POC Best Poster Award to be given to an early career scientist presenting in the POC Contributed Paper Session and the BIO/POC Topic Session S2. The recipients were: Hitoshi Kaneko (University of Tokyo, Japan) for his paper (co-authored with Ichiro Yasuda) on “*Current and turbulence observations of North Pacific intermediate water in the Kuroshio-Oyashio confluence region*” (POC Contributed Paper Session), and Chun-Ok Jo (Seoul National University, Korea) for her poster (co-authored with Kyung-Ryul Kim) on “*Decadal changes of phytoplankton activity during spring in the southern East/Japan Sea*” (BIO/POC Topic Session S2).

### **Other business (Agenda Item 13)**

No other business was raised.

### **Adoption of Report and Science Board Recommendations (Agenda Item 14)**

The preceding report was circulated and approved by POC members. All recommendations were brought forward by Dr. Foreman to Science Board at its meeting on November 4, 2007.

**POC Endnote 1****Participation list**Members

Steven J. Bograd (U.S.A.)  
 Kyung-II Chang (Korea)  
 James R. Christian (Canada)  
 Michael G. Foreman (Canada, Chairman)  
 Shin-ichi Ito (Japan)  
 Hee-Dong Jeong (Korea)  
 Nathan Mantua (U.S.A.)  
 James E. Overland (U.S.A.)  
 Young-Gyu Park (Korea)  
 Elena Ustinova (Russia)  
 Fan Wang (China)  
 Ichiro Yasuda (Japan, Co-Chairman)  
 Yury I. Zuenko (Russia)

Observers

William R. Crawford (Canada)  
 Kenneth F. Drinkwater (Norway)  
 Howard J. Freeland (Canada)  
 Akira Nakadate (Japan)  
 Ig-Chan Pang (Korea)  
 Fangli Qiao (China)  
 David Rivas (U.S.A.)  
 Konstatin Rogachev (Russia)  
 Christopher L. Sabine (U.S.A.)  
 Yasunori Sakurai (CREAMS-AP Co-Chairman,  
 Japan)  
 Yasuhiro Yamanaka (WG 20 Co-Chairman,  
 Japan)

**POC Endnote 2****POC meeting agenda**

1. Welcome, introductions, opening remarks
2. Changes to, adoption of, agenda and appointment of rapporteur
3. Completion of PICES XV decisions:
  - a. ESSAS workshops on “*Evaluation of climate scenarios for subarctic regions*” and “*The role of seasonal sea ice cover in marine ecosystems*”, June 4–6, 2007, Hakodate, Japan
  - b. PICES XVI BIO/POC Topic Session “*Decadal changes in carbon biogeochemistry in the North Pacific*”
  - c. PICES XVI POC Contributed Paper Session
  - d. PICES XVI POC/MONITOR/CCCC Topic Session “*Operational forecasts of oceans and ecosystems*”
  - e. PICES XVI BIO/FIS/POC Topic Session “*Phenology and climate change in the North Pacific:...*”
  - f. PICES XVI POC/CCCC Workshop on “*Climate scenarios for ecosystem modeling XV*”
  - g. Early Career Scientists Conference on “*New frontiers in marine science*”, June 26–29, 2007, Baltimore, U.S.A.
  - h. ICES/PICES/IOC Symposium on “*Effects of climate change on the world’s oceans*”, May 19–23 2008, Gijón (Spain)
  - i. PICES Special Publication No. 3: *Guide to best practices for ocean CO<sub>2</sub> measurements*
4. Reports of existing subsidiary bodies
  - a. Progress report of the Section on *Carbon and Climate* (Christian/Saino)
  - b. Progress report of the Advisory Panel on *CREAMS/PICES Program in East Asian marginal seas* (Sakurai/Kim)
  - c. Progress report of WG20 on “*Evaluation of climate change projections*” (Foreman/Yamanaka)
5. Relations with other international programs and organizations:
  - a. NEAR-GOOS (Hee-Dong Jeong)
  - b. Argo (Howard Freeland)
  - c. CLIVAR (William Crawford)
  - d. ESSAS (Kenneth Drinkwater)
  - e. BEST/BSIERP (George Hunt, Jr.)
  - f. ICES
6. Election of Chairman and Vice-Chairman
7. Discussion of the POC Action Plan
8. Discussion on the next major PICES scientific program, FUTURE
9. Planning PICES XVII in Dalian, China
10. Theme for PICES XVIII in Busan, Korea
11. Items with financial implications
12. POC Best Presentation and Poster Award
13. Other business
14. Adoption of POC report and recommendations to Science Board

**POC Endnote 3**

**Recommendations to Science Board concerning the Project Argo**

1. We (POC) recommend that countries contributing to Argo give serious consideration to the possibility that floats might be deployed most usefully in locations remote from their own nation's territorial waters.
2. We (POC) believe that Argo is valuable for all nations and strongly recommend that countries contributing to Argo develop funding systems sufficient to maintain their national arrays.
3. We (POC) wish to encourage all countries to ensure that a plan for completing their own delayed-mode quality control on Argo profiles is in place and being executed.
4. We (POC) wish to encourage all countries to assure the continued ability of Argo to remain within the terms established by the Law of the Sea. To this end we encourage countries that do not presently contribute to the Argo infrastructure to find a means of making an annual contribution.

**POC Endnote 4**

**Proposal for a 1-day Topic Session at PICES XVII on  
“Coastal upwelling processes and their ecological effects”**

Upwelling is a key process in marine ecosystems linking physical oceanography, chemistry, and marine ecology. It brings rich nutrient water to the upper ocean so it has great impacts upon fisheries in these regions and on the ecological environment, and may also provide a suitable environment for harmful algal blooms. This session will focus on three aspects of upwelling: (1) observations, numerical modeling and mechanism analysis of upwelling and related processes; (2) the quantitative evaluation of

upwelling on marine ecology (biological production, diversity, *etc.*); and (3) changes in upwelling systems as a result of climate change. The session should be helpful for the ecosystem-based management of the marine environment.

Co-sponsors: POC and potentially FIS and BIO.

Recommended convenors: Tal Ezer, (U.S.A.), Vyacheslav Lobanov (Russia) and Xingang Lü, (China).