

## REPORT OF PHYSICAL OCEANOGRAPHY AND CLIMATE COMMITTEE

The meeting of the Physical Oceanography and Climate Committee (POC) was held from 14:00–18:00 h on October 27, 2010. The Chairman, Dr. Michael Foreman, called the meeting to order and welcomed members and observers (*POC Endnote 1*). Dr. Kyung-Il Chang agreed to act as rapporteur. Dr. Chan Joo Jang was introduced as a new POC member from Korea, replacing Dr. Young-Gyu Park. Several changes were made to the draft agenda to accommodate an ICES report in Agenda Item 5, new Topic Session and workshop proposals for PICES-2011 in Agenda Item 9, and several requests for inter-sessional support in Agenda Item 11. The new draft agenda was adopted (*POC Endnote 2*).

### AGENDA ITEM 3

#### **Completion of PICES-2009 decisions**

1. Travel support request for CREAMS-AP to send 2 invited speakers in the Special Session on “*Plan for the international cooperation for CREAMS/PICES EAST-IP*” at the PEACE Workshop in September 2010 in Gangneung, Korea, was approved.
2. Travel support request for CC-S to send 2 scientists (non-CC-S members) to attend their 2<sup>nd</sup> Carbon Synthesis Workshop in Japan, June 2010, was approved. (Note: these funds were not actually used as support was found from other sources.)
3. Travel support request to send 1 PICES scientist to Co-Chair and speak at a WG-FCCIFS co-sponsored session at the September 2010 ICES ASC in Nantes, France.
4. Travel support request to send 1 WG 20 member to the PICES/ICES/FAO Symposium on “*Climate change effects on fish and fisheries*” in Sendai, April 2010.
5. Travel support request to send 1 WG 20 member to the ESSAS Annual Meeting in Iceland, August 30–September 1, 2010.
6. ESSAS request for PICES to provide logistical support to help organize their 2011 Open Science Meeting was approved but the \$20K requested to support the travel of young scientists from Asian countries to this meeting was deferred to 2011.
7. Proposed POC/BIO 2-day workshop on “*Carbon data synthesis*” was approved for PICES-2010.
8. Proposed POC/BIO/MONITOR/FUTURE 1-day Topic Session on “*Comparing the two major gyres of the subarctic North Pacific – seasonal and interannual variability and its predictability*” was approved for PICES-2010.
9. Proposed POC/MEQ/FUTURE ½-day Topic Session on “*Marine renewable energy development in coastal and estuarine environments around the North Pacific*” was approved for PICES-2010.
10. Proposed POC/FIS/BIO/FUTURE 1-day Topic Session on “*Impact of climate variability on marine ecosystems: understanding functional responses to facilitate forecasting*” was approved for PICES-2010.
11. Proposed POC Contributed Paper Session was approved for PICES-2010.

### AGENDA ITEM 4

#### **Reports of existing subsidiary bodies and plans for ones**

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

Dr. James Christian, Co-Chairman of the Section on *Carbon and Climate* (CC-S), reported on the Section’s October 22–23 Data Synthesis workshop and its meeting on October 24. He also summarized the 5-year report (see *CC-S Endnote 3*) that was emailed to all POC members on October 17. The Committee commended CC-S on its excellent progress and unanimously approved a recommendation to Science Board that the Section be renewed for another 5 years. Requests were made for a 1-day business meeting at PICES-2011 and for PICES to become a co-sponsor and provide funds for international participants at a SOLAS/IMBER workshop on

“*Designing a global ocean acidification–carbon observing system*” in late 2011 or early 2012. There was insufficient information on this workshop so POC decided that Dr. Christian should submit a more comprehensive proposal to Science Board at its inter-sessional meeting in April 2011. The full CC-S annual report appears elsewhere in the PICES 2010 Annual Report.

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

Dr. Joji Ishizaka, Co-Chairman of CREAMS-AP, gave a brief report on the activities of the Panel over the past year. These included two cruises in July 2010 and meetings in Qingdao, China on May 11, in Gangneung, Korea at the PEACE Workshop on September 11–12, and in Portland, U.S.A. on October 23. Requests were made to provide travel support for 3 invited speakers to a proposed workshop on “*Recent advances in monitoring and understanding of Asian marginal seas: 5 years of CREAMS/PICES EAST-I Program*” (CREAMS-AP Endnote 4) at PICES-2011, and for 4 students or early career scientists to attend the NOWPAP/IOC-WESTPAC/PICES training course on “*Remote sensing data analysis*” in Vladivostok in October 2011. The full CREAMS-AP report can be found elsewhere in the PICES 2010 Annual Report.

Working Group on *Evaluation of Climate Change Projections* (WG 20)

Dr. Foreman, Co-Chairman of WG 20, gave a brief summary of the Working Group business meeting on October 24. (Details can be found in the Working Group report elsewhere in the PICES 2010 Annual Report.) Highlights included: (1) a review of activities over the past 4 years cross-referenced to the Working Group’s TORs, (2) an outline of WG 20’s final report, (3) draft recommendations to FUTURE and PICES, and (4) a draft of TORs for a new working group on “North Pacific Climate Variability and Change” that was proposed by Dr. Emanuele Di Lorenzo (POC Endnote 3). There was considerable discussion about these TORs with a few of the more important issues being: (i) the need to clarify phrases like “conceptual mechanistic models”, (ii) the need to include “uncertainty” somewhere in the TORs, (iii) possible involvement with ICES, and (iv) possible membership (Drs. Howard Freeland and Ichiro Yasuda expressed interest). Dr. Shin-ichi Ito remarked that though it ended 1½ years ago, CFAME (Climate Forcing and Marine Ecosystems Task Team) has still not submitted a final report and this may hamper the establishment of this new working group. WG 20 will be disbanded after PICES-2010 so apart from an update on the status of its final report, there will be no need to provide further progress updates to POC.

PICES/ICES Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish* (WG-FCCIFS)

Dr. Anne Hollowed, Co-Chair of WG-FCCIFS, gave a brief report summarizing activities of the Group over the past year, the highlight of which was the very successful symposium on “*Climate change effects on fish and fisheries*” that they organized in Sendai, Japan, April 26–29, 2010. There was some discussion on the future of this Working Group after its term ends in 2011 and how it might be linked to the new working group proposed by WG 20. ICES plans to create a Strategic Initiative on Climate Change (SSICC) as the next step to succeed WG-FCCIFS and was seeking to align its activities with PICES. POC Committee members agreed that the present ICES “Initiative” has a mandate that is too broad for a Working Group. Joint activities with PICES should be considered by POC after more concrete TORs are available. Travel support requests were made for a workshop on “*Biological consequences of a decrease in sea ice in Arctic and sub-Arctic Seas*” at the ESSAS Open Science Meeting in Seattle, U.S.A. on May 22, 2011; a session on “*Atmospheric forcing of Northern hemisphere ocean gyres and their subsequent impact on the adjacent marine climate and ecosystems*” at the ICES Annual Science Meeting in Gdansk, Poland and a workshop on “*Reaction of Northern Hemisphere ecosystems to climate events: A comparison*” in Hamburg, Germany in May 2011. More details can be found in the WG-FCCIFS report contained in the 2010 PICES Annual Report.

## AGENDA ITEM 5

**Relation with other international organizations**

The following five brief presentations were given.

1. Dr. Howard Freeland, representing Argo, reviewed the current status of the Argo program, noting the relatively low density of Argo floats in some parts of the North Pacific and asking PICES members for help in the deployment of floats during their future surveys. Interested parties should contact Mathieu Belbeoch (belbeoch@jcommops.org).
2. Dr. Hee-Dong Jeong, also acting as an observer representing NEAR-GOOS, gave an overview of NEAR-GOOS activities over the last year, focusing on a meeting in Vladivostok in April and updates on their Regional Delayed Mode Data Base (RDMDDB) and regional observing system. There will be a workshop on NEAR/GOOS products at the 8<sup>th</sup> IOC/WESTPAC international scientific symposium in March 2011 in Busan, Korea.
3. Dr. Toshio Suga, a member of the CLIVAR Pacific Implementation Panel, summarized projects relevant to the North Pacific (NOPCE and Hot Spot) and discussed possible future collaborations with PICES. He was particularly interested in the proposed new working group on “North Pacific Climate Variability and Change” and suggested that CLIVAR might want to co-sponsor a workshop or Topic Session with that group at either the PICES-2012 in Japan, or at Ocean Expo-2012 in Yeosu, Korea. He also suggested inviting a PICES representative to the next Pacific Panel meeting in April 2012 in Noumea, New Caledonia.
4. Dr. Ken Drinkwater, Co-Chairman of the ESSAS Steering Committee, gave a brief summary of their annual meeting in Reykjavik, Iceland, and the status of their upcoming 2<sup>nd</sup> Open Science Meeting “*Comparative Studies of Climate Effects on Polar and Sub-Polar Ecosystems: Progress in Observations and Predictions*” in Seattle, May 2011. He requested travel support for 2 scientists from PICES Asian countries and 2 students or early career scientists from Asia to attend this meeting (expected total cost is \$14K).
5. Dr. Jürgen Alheit gave a brief summary of ICES activities relevant to PICES, re-iterating the travel support requests of the PICES/ICES WG-FCCIFS.

## AGENDA ITEM 6

**Election of new POC Chairman**

Dr. Michael Foreman nominated Kyung-Il Chang to stand for election as the new POC Chairman. No other candidates were nominated. The decision to elect Dr. Chang was unanimous (Executive Secretary presiding). Dr. Foreman agreed to remain as Vice-Chairman to provide assistance and continuity.

## AGENDA ITEM 7

**Discussion of POC Action Plan**

Considering numerous changes that are anticipated when the Terms of Reference for the three FUTURE Advisory Panels are ratified, the Chairman recommended that changes to the POC Action Plan be postponed for a year. The Committee agreed to review this issue at PICES-2011.

## AGENDA ITEM 8

**Update on FUTURE and the new Advisory Panels**

Dr. Hiroaki Saito, Chairman of the COVE Advisory Panel on *Climate, Oceanographic Variability and Ecosystems* (COVE-AP), gave a brief summary of the COVE-AP meeting held on October 22. COVE-AP fully supports the proposed new “climate” working group and is proposing another new working group on “Ecosystem Responses to Multiple Stressors” and a FUTURE workshop on “*Indicators of Status and Change within North Pacific Marine Ecosystems*” to occur just before or after the inter-sessional Science Board meeting in April 2011.

## POC-2010

### AGENDA ITEM 9

#### **Planning for PICES-2011**

1. The Committee endorsed a request for a 1-day CREAMS-AP workshop on “*Recent Advances in Monitoring and Understanding of Asian Marginal Seas: 5 years of CREAMS/PICES EAST-I Program*” (CREAMS-AP Endnote 4), with 3 invited speakers, to be followed by a business meeting.
2. In addition to a POC Paper Session, business meetings for CC-S, WG-FCCIFS, and the proposed new working group on “North Pacific Climate Variability and Change”, three Topic Sessions were proposed for PICES 2011 (POC Endnote 4).
3. No suggested invited speakers for the Science Board Symposium were put forward.

### AGENDA ITEM 10

#### **PICES-2012 theme**

The Annual Meeting will be held in Hiroshima, Japan and at the time of the 2010 POC meeting, the theme had yet to be finalized.

### AGENDA ITEM 11

#### **Items with financial implications**

##### *Inter-sessional travel requests in 2011*

The Committee agreed to put forward to Science Board the following ranked list of travel support requests:

1. Two non-PICES invited scientists to attend the International Workshop on “*Development and application of Regional Climate Models*”, Incheon, Korea, October 11–12, 2011 (POC Endnote 5).
2. An Asian PICES scientist to give a plenary talk at the annual meeting of the Canadian Meteorological and Oceanographic Society, “*Ocean, atmosphere and the changing Pacific*”, Victoria, Canada, June 5–9, 2011.
3. CREAMS-AP requests 4 students or early career scientists to attend the NOWPAP/IOC-WESTPAC/PICES training course on “*Remote sensing data analysis*” in Vladivostok, Russia, October 8–12, 2011.
4. WG-FCCIFS requests that Drs. Ichiro Yasuda and Emanuele Di Lorenzo co-convene the ICES/PICES session “*Atmospheric forcing of Northern hemisphere ocean gyres and their subsequent impact on the adjacent marine climate and ecosystems*” at the ICES ASC in Gdansk, Poland, September 2011.
5. WG-FCCIFS requests 2 Asian scientists to attend their workshop on “*Biological consequences of a decrease in sea ice in Arctic and sub-Arctic Seas*”, just prior to the ESSAS Open Science meeting in Seattle, U.S.A., May 2011.
6. WG-FCCIFS requests 2 Asian co-conveners to attend a workshop on the “*Reaction of Northern Hemisphere ecosystems to climate events: A comparison*” in Hamburg, Germany, May 2011.
7. ESSAS requests 4 PICES Asian scientists (2 students/early career scientists) to attend the ESSAS Open Science meeting in Seattle, U.S.A., May 2011.
8. SOLAS requests students to be selected from PICES member countries to attend the 5<sup>th</sup> SOLAS Summer School in Corsica, France, August 29–September 10, 2011.
9. WMO requests 1 PICES scientist to attend their International Workshop on “*Climate and oceanic fisheries*” in the Cook Islands (South Pacific), October 3–5, 2011.

##### *Proposed publications for 2010 and beyond*

1. WG-FCCIFS suggested publishing their report on the Symposium on “*Climate change effects on fish and fisheries*” held in Sendai, Japan (April 2010) provided to ICES, as PICES Scientific Report;
2. The WG-FCCIFS Sendai Symposium Co-Chairs and interested Working Group members plan to develop a synthesis paper for publication in a journal like *Nature*.
3. Drs. Shoshiro Minobe and Emanuele Di Lorenzo, the Co-Conveners of the PICES-2009 workshop (W8) on “*Exploring the predictability and mechanisms of Pacific low frequency variability beyond inter-annual time scales*”, are planning to write a review paper based on the workshop presentations.

*Funding requests associated with PICES-2011*

- Travel support requested for 3 invited speakers to attend a 1-day CREAMS AP workshop on “*Recent Advances in Monitoring and Understanding of Asian Marginal Seas: 5 years of CREAMS/PICES EAST-I Program*” (see CREAMS-AP report, Agenda Item 6, elsewhere in the PICES 2010 Annual Report).
- See requests in *POC Endnote 4*.

## AGENDA ITEM 12

**POC Best Presentation and Poster awards**

Drs. Ichiro Yasuda, Stephen Bograd, and Elena Ustinova were judges for the best young presenter and best poster at the POC Paper Session and Topic Session S8. The POC Best Presentation award was given to Hiroshi Kuroda (Japan) for “*A numerical study on the winter mixed layer on the shelf-slope region south of Japan*”. The best poster award (a tie) was given to Sarah Ann Thompson (U.S.A.) for her poster “*Comparing pathways of functional response of top predators to seasonality of upwelling in the California Current*”, and Chan Joo Jang (Korea) for his poster on “*Variability of mixed layer depth and its relation with chlorophyll concentration in the North Pacific Ocean*”.

## AGENDA ITEM 13

**Other business**

Of the 4 topic sessions that will be convened at the ICES Annual Science Conference in Gdansk, Poland, September 19–23, 2011 and that were considered relevant to POC’s interests, none inspired sufficient enthusiasm among the POC members present to co-convene or suggest PICES support.

## AGENDA ITEM 14

**Adoption of report and recommendations to Science Board (Agenda Item 14)**

This POC report was circulated among, and approved by all Committee members. All recommendations were brought by Dr. Foreman to Science Board meeting on October 30, 2010.

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

Steven Bograd (U.S.A.)  
 Kyung-Il Chang (Korea, rapporteur)  
 James Christian (Canada)  
 Michael Foreman (Canada, Chairman)  
 Shin-ichi Ito (Japan)  
 Chan Joo Jang (Korea)  
 Hee-Dong Jeong (Korea)  
 Nate Mantua (U.S.A.)  
 Elena Ustinova (Russia)  
 Ichiro Yasuda (Japan, Vice-Chairman)  
 Yury Zuenko (Russia)

Observers

Jürgen Alheit (ICES)  
 Emilie Brevière (SOLAS)  
 Alexander Bychkov (PICES)  
 Ken Drinkwater (ESSAS)  
 Howard Freeland (Argo)  
 Anne Hollowed (U.S.A.)  
 Joji Ishizaka (Japan)  
 Sophia Johannessen (Canada)  
 Kuh Kim (Korea)  
 Toshio Suga (CLIVAR)

POC Endnote 2

POC meeting agenda (revised)

1. Welcome, introductions, opening remarks
  - Membership changes
2. Changes to, adoption of, agenda and appointment of rapporteur
3. Completion of PICES-2009 decisions:
4. Reports of existing subsidiary bodies and plans for new ones
  - i) Five-year summary report of the Section on *Carbon and Climate* (Christian/Saino) and request for section renewal.
  - ii) Progress report of the Advisory Panel for a *CREAMS/PICES Program in East Asian Marginal Seas* (Ishizaka/Lobanov/Kim)
  - iii) Progress/final report of WG 20 on *Evaluation of Climate Change Projections* (Foreman/Yamanaka) and recommendations for FUTURE.
  - iv) Progress report and future plans of PICES/ICES WG on *Forecasting Climate Change Impacts on Fish and Shellfish* (Ito/Hollowed).
5. Relations with other international organizations/programs:
  - i) Argo (Howard Freeland)
  - ii) NEAR-GOOS (Hee-dong Jeong) and other OOS's (?)
  - iii) WCRP/CLIVAR (Toshio Suga?)
  - iv) ESSAS (George Hunt)
  - v) Other organizations/programs ?
6. Election of new POC Chairman
7. POC Action Plan discussion
8. Discussion of FUTURE Implementation Plan and the new Advisory Panels. (Hiroaki Saito)
9. Planning for PICES-2011 "*Mechanisms of marine ecosystem reorganization in the North Pacific*" in Khabarovsk, Russia, October 14–22, 2011.
  - i. Topic/Paper Sessions\*:
    - a. POC paper session
    - b. Others (?)
  - ii. Invited speakers for the Science Board Symposium
10. Theme for PICES-2012 in Hiroshima, Japan
11. Items with financial implications
  - i) Proposed inter-sessional meetings for 2011 and beyond
    - ICES/PICES Early Career Scientist Symposium, site (Palma, Majorca?) & dates (2012) TBA
    - *Effects of climate change on the World's oceans – II*, Yeosu, Korea, May 14–18, 2012 (official event of Ocean Expo 2012).
    - others
  - ii) Publications for 2010 and beyond
    - CC-S (?)
    - CSR Special volume on Tides in Marginal Seas – A Volume in Memory of Prof A. Nekrasov. Published April 1, 2010: 16 papers
    - Review paper from PICES-2009 workshop "*Exploring the predictability and mechanisms of Pacific low frequency variability beyond inter-annual time scales*" (Minobe and Di Lorenzo)
  - iii) Travel support requests
  - iv) Other items
12. 2009 POC Best Presentation and Poster awards (Judges will be appointed early in week and give their recommendation at the Closing Session)
13. Other business
14. Adoption of POC report and recommendations to Science Board

**POC Endnote 3****Proposal for a working group on “North Pacific Climate Variability and Change”****Motivation**

Need to develop essential mechanistic understandings of North Pacific climate variability and change that can better guide the formulation of process-based hypotheses underlying the links between ecosystem dynamics and physical climate.

**Draft Terms of Reference**

1. Develop conceptual models or frameworks of North Pacific climate variability and change that can be readily used by ecosystem scientists to explore hypotheses of the links between ecosystem dynamics and physical climate.
2. Summarize the current understanding of mechanisms of Pacific climate variability, and evaluate the strengths of the underlying hypotheses with supporting evidence.
3. Coordinate, in conjunction with ecosystem scientists, the development and implementation of process-based models to hindcast the variability of available long-term biological time series and explore forecasting.
4. Understand and fill the gaps between what the physical models can currently produce and what ecosystem scientists suggest are important physical forcing factors required for predicting species and ecosystem responses to climate change.
5. Maintain linkages with, and summarize the results from National and International programs/projects such as CLIVAR, IMBER, US CAMEO, Japanese Hot Spot in the Climate System, POMAL, CREAMS EAST-I, POBEX, and others.
6. Convene workshops and sessions to evaluate and compare results
7. Publish a final report summarizing results.

**Proposed Co-Chairs:** Emauele Di Lorenzo (U.S.A.), Shoshiro Minobe (Japan), Michael Foreman (Canada)

**Membership Suggestions** (a subset of the following):

Canada: Michael Foreman, Patrick Cummins, William Merryfield, John Fyfe, Howard Freeland

China: Lixin Wu, Guimei Liu

Japan: Shoshiro Minobe, Shin-ichi Ito, Ichiro Yasuda

Korea: Chan Joo Jang, Kwang-Yul Kim, Sang-Wook Yeh

Russia: Yury Zuenko, Elena Ustinova, Vladimir Kattsov

U.S.A.: Emanuele Di Lorenzo, Arthur Miller, Enrique Curchitser, Muyin Wang, Charles Stock, Nathan Mantua, Bo Qiu

**POC Endnote 4****Proposals for Paper and Topic Sessions for PICES-2011***1. Contributed Paper Session*

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

**Sponsor:** POC

**Duration:** 1 day

**Invited speakers:** none

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

2. *Topic Session*

**Title:** Linking migratory fish behavior to End-to-End models

**Sponsors:** POC, FIS, ICES(?)

**Duration:** ½day

**Co-Convenors:** Enrique Curchitser (U.S.A.), Michio Kishi (Japan), Shin-ichi Ito (Japan), Geir Huse (ICES) and Skip McKinnell (PICES)

**Invited speakers:** travel support requested for 1 invited speaker: either Wei Hao (China) or Jerome Fiechter (U.S.A.)

**Description:** In order to understand ecosystem response to climate impacts, End-to-End modeling (E2E) approaches are essential. One of the most difficult parts for E2E is the modeling of fish behavior migration. Fish behavior can be very complex; it is a consequence of genetics, physical, chemical and biological environments and their interaction. Learned behavior may also be a factor. Recently, new technology has been introduced to tagging equipment and as a consequence data availability is vastly improved. Additionally, new technologies are used to investigate fish movements in laboratory settings. This new information is expected to improve our understanding of fish migration mechanism and contribute to the development of fish-migration models. Furthermore, the development of high-resolution ecosystem models coupled to circulation models makes it possible to simulate fish-migration in the context of realistic environmental fields. The purpose of this session is to understand the current state of development in modeling fish behavior and discuss future potential collaborations to improve fish migration models. This session anticipates presentations that discuss successes (and failures) in modeling migratory fish behavior. Presentations related to data availability for model evaluation of fish behavior are also welcome. Based on the results and opinions expressed at the session, the conveners would like to discuss the desirability of establishing a group that will focus its attention on developing and advancing the state of fish behavioral modeling.

3. *Topic Session*

**Title:** Recent changes of North Pacific climate and marine ecosystems: implications for dynamics of the dominant species

**Sponsors:** FIS, POC

**Duration:** 1 day

**Co-Convenors:** Sukyung Kang (Korea), James Overland (U.S.A.), Akihiko Yatsu (Japan) and Skip McKinnell (PICES)

**Invited speakers:** two keynote speakers (climate-1 and fish-1)

**Description:** The coincidence of multidecadal-scale alternations of dominant marine fish species coupled with multidecadal-scale “Climatic Jumps” created a concept of the Regime Shift. The recently published PICES ecosystem status report noted that the frequency of these events appears to have increased and various indicators suggest that their amplitude has increased as well. The Arctic Oscillation Index, for example, reached an extreme negative anomaly during January–March of 2010, which brought a severe winter to much of the Northern Hemisphere, while other areas were warmed equivalently by the effects of the 2009/10 El Niño. The summer of 2010 saw record-setting high temperatures in some PICES member countries, accompanied by an abrupt shift in the tropics from El Niño to La Niña in July 2010. In the northwestern Pacific, after decades at low levels, sardine abundance has begun to increase while the anchovy abundance is declining; perhaps signalling a new Regime. This topic session will review recent ocean/climate variability, with particular emphasis on what has occurred from 2009 to 2010. It will focus on the major ecological components of North Pacific marine ecosystems, particularly commercially important fish species. Papers on mechanistic linkages between population dynamics of marine species and environmental conditions are especially encouraged.



#### 4. *Topic Session*

**Title:** Mechanisms of physical-biological coupling forcing biological “hotspots” in the Western North Pacific and Western North Atlantic [later renamed to “Mechanisms of physical-biological coupling forcing biological “hotspots””]

**Sponsors:** BIO/POC with potential for FIS

**Duration:** 1 day

**Co-convenors:** Elliott Hazen (U.S.A.), Robert Suryan (U.S.A.)  
(Japan) Suggested: Yutaka Watanuki (MBM Co-Chair), Ichiro Yasuda  
(Russia) Suggested: Oleg N. Katugin, Vladimir Radchenko  
(ICES) Jürgen Alheit

**Requests:** 2 invited speakers (PICES), 2 invited speakers (ICES)

**Potential invited speakers:** Sei-Ichi Saitoh (Japan), Jun Nishioka (Japan), Yuri Artukin (Russia), Gail Davoren (Canada/ICES), Per Fauchald (Norway/ICES), Andrew Pershing (USA/ICES)

**Description:** This topic session will examine the physical and oceanographic factors that result in biodiversity, ecological, or economic hotspots in the North Pacific. Spatially, this session will focus on the Kuroshio/Oyashio extensions and ecotone, the intersection of the Sea of Okhotsk and the western North Pacific (Kuril Islands region), and the Western Bering Sea. For the Atlantic, this session will focus on the intersection of the Gulf Stream and Labrador Current in addition to tidally driven systems such as the Gulf of Maine and Gulf of St. Lawrence.

“Hotspots” can broadly be defined as areas encompassing a high number of species, a high abundance of an indicator species, or an area of high economic value. More specifically, we seek interdisciplinary contributions on physical-biological coupling and resulting seasonal or year-round “hotspots” in primary to tertiary productivity. This includes data on physics, phyto- and zooplankton, forage fish, and upper trophic level predators (*e.g.* fish, seabirds, mammals, humans). We are particularly interested in multi-species and multi-use hotspots (*e.g.* the overlap between human and ecological importance) and potential changes in hotspots under future climate change scenarios. Modeling and empirical studies are encouraged. We would solicit a special publication in the primary literature pending subscription to the session.

POC Endnote 5

**Proposal for an inter-sessional workshop**

**Title:** International Workshop on “*Development and application of Regional Climate Models*”

**Dates:** October 11–12, 2011 (just before the 2011 PICES Annual Meeting in Russia)

**Venue:** Incheon, Korea

**Co-conveners:** Kyung-Il Chang (POC), Michael Foreman (POC), Chan Joo Jang (POC), Angelica Peña (BIO)

**Description:** Both global and regional numerical climate models are important tools in understanding physical mechanisms involved in and controlling climate change and variability at multiple spatio-temporal scales. They may also provide the unique possibility to construct physically based future climate projections, the starting point for many socio-economic impact and adaptation considerations to future climate change. Global and regional modeling complement each other. While the global coupled general circulation models (GCMs) may be capable of capturing the large-scale mean climate behavior, especially those related to anthropogenic forcing, they often cannot be directly used for assessing regional climate impacts mainly due to their coarse spatial scale. Furthermore, they are usually not successful in capturing regionally important physical processes and reproducing higher order statistics and extreme events. Regional climate modeling has been introduced to fill the gap between the GCMs and the growing demand of climate predictions and scenarios on highly-resolved spatio-temporal scales. Various approaches and parameterizations have been adopted in existing regional climate models (RCMs). This two-day workshop will provide a platform to discuss various aspects of regional climate modeling such as different approaches, downscaling, parameterizations, and coupling to the GCMs. It will also encompass the coupling of RCMs to ecosystem models.

**Financial support:** Two invited speakers from PICES member nations and two invitees from non-PICES member countries that are familiar with state of the art Regional Climate Models – supported by PICES (approach ICES as possible co-sponsor?); Korean government will support up to 10 invited speakers from PICES countries.

**Link to PICES/FUTURE goals:** Higher resolution projections of climate change that can be used by PICES ecosystem scientists.