

**2011 Governing Council decisions**

**2011/A/1: Auditor**

- i. Council accepted the audited accounts for *FY* 2010.
- ii. Council authorized the Executive Secretary to sign a new 3-year contract (for *FYs* 2012-2014) with the current auditor *Flader, Hale & Hughesman*.

**2011/A/2: Annual contributions**

- i. Council instructed the Executive Secretary to send a letter commending Contracting Parties for their performance in submitting annual contributions for *FY* 2011, and describing the difficulties that late and/or partial payment causes the Organization.
- ii. Council re-iterated that for planning of their funding requests for annual contributions, Contracting Parties should continue to use the guideline generally accepted at PICES-1999 (Decision 1999/A/2(ii)), which states that the annual contributions will increase at the rate of inflation in Canada.

**2011/A/3: Budget and fund-raising**

- i. Council accepted the estimated accounts for *FY* 2011.
- ii. Council approved the *FY* 2012 budget of \$838,000. The amount of \$118,600 will be transferred from the Working Capital Fund to balance the budget, setting the total annual contribution at \$719,400, and the 2012 annual fee at \$119,900 per Contracting Party.
- iii. Council approved a transfer from the Working Capital Fund to the Trust Fund to recover the 2011 expenses, and to restore the Trust Fund to the level of \$110,000 by the end of the fiscal year.
- iv. Council agreed that funds available from all completed projects in the Working Capital Fund as of December 31, 2011, be allocated for the development of the PICES integrative science program on “*Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Ecosystems*” (FUTURE), with the provision that the funds should be used over the next three years.
- v. Council instructed the Executive Secretary to send a letter to the Contracting Parties providing information on planned activities for FUTURE and requesting contributions to these activities.
- vi. Council approved an additional lump sum employer contribution of \$20,000 to the International Fisheries Commission Pension Plan to pay down unfunded liabilities.

**2011/A/4: PICES Strategic Plan**

Council approved the PICES Strategic Plan developed by the Study Group on *Updating the PICES Strategic Plan* (SG-USP).

**2011/A/5: Yeosu Declaration**

Council accepted an invitation for PICES to be represented on the International Review Committee of the Yeosu Declaration pursued as part of the legacy of the Ocean Expo-2012 Yeosu Korea to be held from May 12 to August 12, 2012, under the theme of “*The Living Ocean and Coast: Diversity of Resources and Sustainable Activities*”.

**2011/A/6: UN Regular Process (UNRP) for Global Reporting and Assessment of the State of the Marine Environment**

Council instructed the Executive Secretary to inform the UN Division for Ocean Affairs and the Law of the Sea of PICES’ interest in conducting scientific peer review of UNRP regional assessments of North Pacific marine ecosystems, and in being involved in the regional workshops for the North Pacific and East Asian marginal seas.

**2011/A/7: Future PICES Annual Meetings and 2012 inter-sessional Science Board meeting**

- i. Council approved Japan’s request for \$40,000 to partially cover costs for PICES-2012 to be held from October 12–21, 2012, in Hiroshima. The theme of the meeting, “*Scientific challenge to the North Pacific ecosystem: Understanding and mitigation of the effects of natural and anthropogenic stress*”,

was approved in principle at PICES-2010, and the theme description was finalized at the 2011 inter-sessional Science Board meeting.

- ii. Council accepted the offer of Canada to host PICES-2013 from October 11-20, 2013, in Nanaimo, British Columbia. Council approved in principle the proposed theme of the meeting, “*Communicating forecasts, uncertainty and consequences of ecosystem change to society*”, and instructed Science Board to finalize the theme description by the 2012 inter-sessional Science Board meeting.
- iii. Following the established 6-year rotation cycle, Council requested China to explore the possibility of hosting PICES-2014, and inform the Secretariat on this matter by March 31, 2012.
- iv. Council agreed to keep the same registration fee structure for PICES-2012 as for PICES-2010 and PICES-2011:

Type of registration fee	CDN \$
Regular	275
Early	200
Student	50
Spousal/guest	50

- v. Considering that most of the changes in the format of the Annual Meeting proposed in the final report of the Study Group on *Restructuring of the PICES Annual Meeting* (SG-RAM) are to be implemented at PICES-2011 and PICES-2012, Council agreed to discuss the effectiveness of the approved changes at the next Annual Meeting.
- vi. Council approved an inter-sessional Science Board meeting to be held in conjunction with a 3-day FUTURE implementation workshop to be hosted by Korea in Busan, immediately after the 2<sup>nd</sup> PICES/ICES/IOC Symposium on “*Effects of climate change on the world’s oceans*” in Yeosu, Korea.

#### **2011/A/8: Intern Program**

- i. Council instructed the Executive Secretary to invite Contracting Parties to provide voluntary contributions to support the Intern Program in 2012 and beyond.
- ii. Considering the current level of the stipend (\$2,000), funding available for the Intern Program, and stated intentions for contributions by Contracting Parties, Council agreed to initiate the process to recruit the 2012/2013 intern, with the understanding that the intern’s term will start no earlier than June 2012.

#### **2011/A/9: Visiting Scientist Program**

Council instructed the F&A Committee to review and revise, if necessary, the description of the PICES Visiting Scientist Program (inactive since its inception in 2002), in preparation for a discussion of the program at the 2012 inter-sessional Science Board meeting.

#### **2011/A/10: Improvement of participation in PICES activities**

- i. Council re-iterated the necessity for Contracting Parties to: (1) regularly review their national membership, and to provide the updated national membership list to the Secretariat by the first day of the calendar year (January 1), and (2) follow up on *Rule 1(ii)* of the PICES Rules of Procedure in providing the national delegation list for Annual Meetings. The national membership lists are required to maintain a historical record of PICES membership, and to assist in improving participation in the activities of the Organization. The national delegation lists are required to assist in better coordinating activities of the Standing Committees and their subsidiary bodies, and in better preparing the Annual Meeting.
- ii. In order to better assess problems existing in Contracting Parties with the participation of their scientists in the activities of the Standing Committees and their subsidiary bodies, and in the Annual Meetings of the Organization, Council instructed the Executive Secretary to continue to regularly preparing and circulate to Contracting Parties information, including graphic materials, on participation of their scientists in the Annual Meetings for the previous six years.

#### **2011/S/1: 2012 PICES Annual Meeting**

- i. The following scientific sessions are to be convened at PICES-2012:
  - ¾-day Science Board Symposium on “*Effects of natural and anthropogenic stressors in the North Pacific ecosystems: Scientific challenges and possible solutions*”;

- 1-day BIO Contributed Paper Session;
  - 1-day BIO/FIS Topic Session on “*Jellyfish in marine ecosystems and their interactions with fish and fisheries*” (co-sponsored by ICES);
  - ½-day BIO/FIS/POC Topic Session on “*Advances in understanding the North Pacific Subtropical Frontal Zone ecosystem*”;
  - ½-day BIO/MEQ Topic Session on “*Environmental contaminants in marine ecosystems: Seabirds and marine mammals as sentinels of ecosystem health*” (co-sponsored by JSPS);
  - ½-day BIO/MEQ/FUTURE Topic Session on “*Ecosystem responses to multiple stressors in the North Pacific*”;
  - 1-day FIS Contributed Paper Session;
  - ½-day FIS/MONITOR/POC Topic Session on “*Monitoring on a small budget: Cooperative research and the use of commercial and recreational vessels as sampling platforms for biological and oceanographic monitoring*”;
  - ½-day FIS/MEQ Topic Session on “*Abundance, ecological functions and ecosystem service of macrophyte vegetations as indicators of natural and anthropogenic stressors in coastal ecosystem and productivity*”;
  - ½-day MEQ Topic Session on “*Range extension, toxicity and phylogeny of epiphytic dinoflagellates*”;
  - 1-day MEQ/FUTURE Topic Session on “*Social-ecological systems on walleye pollock and other commercial gadids under changing environment: An inter-disciplinary approach*”;
  - ½-day MEQ/FUTURE Topic Session on “*Risk management in coastal zone ecosystems around the North Pacific*”;
  - 1-day MONITOR/POC Topic Session on “*Effects of natural and artificial calamities on marine ecosystems and the scheme for their mitigation*” (co-sponsored by JSFO and FRA);
  - 1-day POC Contributed Paper Session;
  - 1-day POC Topic Session on “*Challenges in understanding North Hemisphere climate variability and change*” (co-sponsored by CLIVAR and ICES);
  - ½-day POC/FIS Topic Session on “*Linking migratory fish behavior to end-to-end models II*”;
  - 1-day POC/TCODE Topic Session on “*Changing ocean biogeochemistry and its ecosystem impacts*” (co-sponsored by ICES and IMBER).
- ii. The following workshops are to be convened at PICES-2012:
- 1-day BIO Workshop on “*Identifying critical multiple stressors of North Pacific marine ecosystems and indicators to assess their impacts*”;
  - 1-day BIO Workshop on “*Secondary production: Measurement methodology and its application on natural zooplankton community*”;
  - 1-day BIO Workshop on “*The feasibility of updating prey consumption by marine birds, marine mammals, and large predatory fish in the PICES regions*”;
  - 2-day BIO Workshop on “*Comparison of multiple ecosystem models in several North Pacific shelf ecosystems (MEMIP-IV)*”;
  - 1½-day MEQ Workshop on “*The contrasting cases of harmful algal blooms in the eastern and western Pacific in 2007 and 2011*”;
  - 1-day POC Workshop on “*Arctic–sub-Arctic interactions*” (co-sponsored by ESSAS).
- iii. The following business meetings are to be held at PICES-2012:
- ¼-day Science Board (SB) meeting (October 14) and 1½-day SB meeting (October 19 afternoon and October 20);
  - 1½-hour overture meetings (October 14 evening) and ½-day meetings of Scientific and Technical Committees (October 17 afternoon);
  - 1-day meeting of the SB Section on *Human Dimensions of Marine Systems*;
  - 1-day meeting of the BIO/FIS/POC Section on *Climate Change Effects on Marine Ecosystems*;
  - 1-day meeting of the MEQ Section on *Ecology of Harmful Algal Blooms in the North Pacific*;
  - ½-day meeting of the POC/BIO Section on *Carbon and Climate*;
  - 1-day meeting of the MEQ Working Group on *Non-indigenous Aquatic Species*;
  - ½-day meeting of the FIS/MEQ Working Group on *Environmental Interactions of Marine Aquaculture*;
  - ½-day meeting of the BIO Working Group on *Jellyfish Blooms around the North Pacific Rim*;

- ½-day meeting of the POC Working Group on *North Pacific Climate Variability and Change*;
- 1-day meeting of the MEQ/BIO Working Group on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors*;
- ½-day meeting of the POC Working Group on *Regional Climate Modeling*;
- 1-day meeting of the BIO Advisory Panel on *Marine Birds and Mammals*;
- ½-day meeting of the POC/MONITOR Advisory Panel for a *CREAMS/PICES Program in East Asian Marginal Seas*;
- ¼-day meeting of the MONITOR Advisory Panel on the *Continuous Plankton Recorder Survey in the North Pacific*;
- 1-day meeting of the MEQ Study Group on *Marine Pollutants*;
- ½-day concurrent meetings of the FUTURE Advisory Panels on *Anthropogenic Influences on Coastal Ecosystems, Climate, Oceanographic Variability and Ecosystems* and *Status, Outlooks, Forecasts, and Engagement*, preceded by ½-day joint meeting of these Panels.

### **2011/S/2: Inter-sessional symposia/sessions/workshops/meetings**

The following inter-sessional events are to be convened/co-sponsored in 2012 and beyond:

- i. Symposia:
  - 2<sup>nd</sup> International Symposium on “*Effects of climate change on the world’s oceans*” (primary international sponsors: PICES, ICES and IOC), May 15–19, 2012, Yeosu, Korea;
  - ICES/PICES International Symposium on “*Forage fish interactions: Creating the tools for ecosystem based management of marine resources*”, November 8–12, 2012, Nantes, France.
- ii. Joint Theme Sessions:
  - CLIOTOP special session “*Global science for global governance of oceanic ecosystems and fisheries*” (co-sponsored by PICES) at the Planet Under Pressure Conference, March 26–29, 2012, London, UK;
  - Theme Sessions on “*Understanding, measuring and projecting the limits of resilience in marine ecosystems*” (A), “*Multidisciplinary perspectives in the use (and misuse) of science and scientific advice in Marine Spatial Planning*” (I), “*Subarctic-Arctic Interactions: Ecological consequences*” (M), and “*Sustainability of aquaculture*” (Q) at the 2012 ICES Annual Science Conference, September 17–21, 2012, Bergen, Norway.
- iii. Workshops and meetings:
  - PICES/MAFF Project Synthesis Workshop, March 20–23, 2012, Newport, Oregon, U.S.A.;
  - MEMIP (*Marine Ecosystem Model Inter-comparison Project*) workshop, spring 2012, Corvallis, U.S.A.;
  - FUTURE Implementation Workshop, May 22–24, 2012, Busan, Korea;
  - Inter-sessional Science Board meeting, May 24–25, 2012, Busan, Korea;
  - ICES/PICES/GEOHAB workshop on “*Climate change and harmful algal blooms*”, in conjunction with the meeting of the ICES Working Group on *Harmful Algal Bloom Dynamics*, spring 2012, TBD;
  - GLOBEC/PICES workshop on “*Forecasting ecosystem indicators with climate-driven process models*”, summer 2012, Friday harbor, WA, U.S.A.;
  - SCOR WG 137 workshop on “*Global patterns of phytoplankton dynamics in coastal ecosystems: Comparative analysis of time series observations*” (co-sponsored by PICES), October 2012, prior to PICES-2012, Hiroshima, Japan.
- iv. Capacity development events:
  - PICES/MAFF Workshop on “*Introduction to Rapid Assessment Survey methodologies for detecting non-indigenous marine species*” (co-sponsored by FRA, NOWPAP and WESTPAC), February 8–9, 2012, Nagasaki, Japan;
  - PICES/MAFF training course on screening methods for testing shellfish for paralytic shellfish poisoning toxins and phytoplankton identification, February 17–22 (Jakarta) and February 23–24 (Lombok Island), 2012, Indonesia;
  - PICES/MAFF Harmful Algal Bloom workshop to review data collected by High Performance Liquid Chromatography and Mass Spectrometry methods, and to provide outreach for the project, March 5–9, 2012, Guatemala;
  - Second ICES/PICES Conference for Early Career Scientists on “*Oceans of Change*”, April 24–27, 2012, Majorca, Spain;

- IMBER Workshop on “Needs assessment for capacity development for integrated marine biogeochemistry and ecosystem research in the Asia-Pacific region” (co-sponsored by PICES), summer 2012, Shanghai, China;
- IMBER-led international ClimECO3 Summer School on “A view towards Earth System models: Human-natural system interactions in the marine world” (co-sponsored by PICES), July 23–28, Ankara, Turkey;
- PICES Summer School on “Ocean observing systems”, August 2013, Hatfield Marine Science Center, Newport, U.S.A.

### **2011/S/3: Travel and representation at the meetings of other organizations/programs**

- i. 2012 PICES Annual Meeting:
  - Invited speakers for Science Board Symposium and Topic Sessions, with the normal allocation of approximately \$5,000 per Committee/Program; additional requests are subject to fund availability;
  - One invited speaker for each of the approved workshops (see 2011/S/1(ii)).
- ii. Inter-sessional events:
  - PICES (MEQ) representative to participate in the 3<sup>rd</sup> Intergovernmental Review Meeting of the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (January 25–27, 2012, Manila, Philippines);
  - PICES (TCODE) representative to attend the IODE SG-ODP (IOC/IODE Study Group for the Ocean Data Portal) meeting (February 20–22, 2012, Oostende, Belgium);
  - PICES representative to participate in the workshop on “Salmon ocean ecology” (March 20–22, 2012, Newport, U.S.A.);
  - PICES (MONITOR) representative to attend the ICES WGNARS (Working Group on the Northwest Atlantic Regional Sea) meeting (March 6–8, 2012, Falmouth, MA, U.S.A.);
  - PICES invited speaker for the CLIOTOP special session “Global science for global governance of oceanic ecosystems and fisheries” at the Planet Under Pressure Conference (March 26–29, 2012, London, UK);
  - PICES (TCODE) representative to attend the IODE GE-BICH (IOC/IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices) meeting (March 26–30, 2012, Oostende, Belgium);
  - PICES (S-HAB) representative to participate in the planning meeting for the ICES/PICES/GEOHAB workshop on “Climate change and harmful algal blooms” (early 2012, venue TBD);
  - PICES coordinators for the 2<sup>nd</sup> ICES/PICES Conference for Early Career Scientists on “Oceans of Change” (April 24–27, 2012, Majorca, Spain);
  - PICES (POC/WG 27) representative to attend the CLIVAR Pacific Implementation Panel meeting (April 29–May 1, 2012, Noumea, New Caledonia);
  - PICES convenor for the workshop on “Climate change projections for marine ecosystems: Best practice, limitations and interpretation” (May 13–14, 2012, Yeosu, Korea);
  - PICES representative to attend the 2012 IOC Executive Council Meeting (June 25–29, 2012, Paris, France);
  - PICES representatives and convenors for the joint sessions to participate in the ICES Annual Science Conference (September 17–21, 2012, Bergen, Norway);
  - PICES representative (S-CC) to participate in the 3<sup>rd</sup> International Symposium on “Oceans in high-CO<sub>2</sub> world” (September 24–27, 2012, Monterey, U.S.A.);
  - PICES representative to attend the NPAFC Annual Meeting (October 7–12, 2012, St. Petersburg, Russia);
  - PICES representative to attend the SCOR General Meeting (October 22–26, 2012, Halifax, Canada);
  - PICES convenor for the International Symposium on “Forage fish interactions: Creating the tools for ecosystem based management of marine resources” (November 8–12, 2012, Nantes, France).

### **2011/S/4: Publications**

- i. The following publications are to be produced in primary journals in 2012–2013:
  - Special issue of *Aquaculture Economics and Management* based on selected papers from the PICES-2010 Topic Session on “Economic relation between marine aquaculture and wild capture fisheries” (Guest Editor: M. Pang) to be published in spring 2012;

- Special issue of *ICES Journal of Marine Science* based on selected papers from the 2011 PICES/ICES Zooplankton Production Symposium on “*Population connections, community dynamics and climate variability*” (Guest Editors: J. Keister, C. Johnson and D. Bonnet) to be published in summer 2012;
  - Review paper on Fraser River sockeye salmon and their marine environment in *Reviews in Fish Biology and Fisheries* (Lead Author: S. McKinnell) to be published in 2012;
  - Synthesis paper from the 2010 PICES/ICES/FAO Symposium on “*Forecasting climate change impacts on fish and fisheries: Forecasting impacts, assessing ecosystem responses, and evaluating management strategies*” in *Nature* (Lead author: A. Hollowed) to be published in 2012;
  - Special issue of *Journal of Marine Systems* on modeling dedicated to Dr. Bernard Megrey (Guest Editors: E. Curchitser and S. I. Ito) to be published in May 2013;
  - Special issue of *ICES Journal of Marine Science* based on selected papers from the 2<sup>nd</sup> International Symposium on “*Effects of climate change on the world’s oceans*” to be published in 2013.
- ii. The following publications are to be produced in PICES Scientific Report series in 2012:
- Final report of the Study Group on *Human Dimensions for Environmental Change* (Editor: M. Makino);
  - Final report of the Working Group on *Iron Supply and its Impact on Biogeochemistry and Ecosystems in the North Pacific Ocean* (Editors: F. Chai and S. Takeda);
  - Final report of the Working Group on *Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim* (Editor: W. Peterson);
  - Final report of the Working Group on *Environmental Interactions of Marine Aquaculture* (Editors: K. Abo, I. Burgetz, B. Dumbauld and S. Johnson);
  - Final report of the Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish* (Editors: A. Hollowed and S. Kim);
  - PICES Advisory Report to the Cohen Commission on “*The decline of Fraser River sockeye salmon in relation to marine ecology*” (Editor: S. McKinnell) – reproduction of the web-based Cohen Commission Technical Report No. 4;
  - Final report of the Climate Change and Carrying Capacity Program (Editors: H. Batchelder).
- iii. Other publications to be produced in 2012 include:
- Atlas of non-indigenous marine and estuarine species in the North Pacific (Editors: H. Lee II and D. Reusser) to be published on the website;
  - Develop a chapter on the biology of anadromous coastal cutthroat trout for the NPAFC 20<sup>th</sup> anniversary publication project on updating the life histories of Pacific salmon (invitation by NPAFC);
  - Two regular issues of PICES Press to be published on the website and distributed electronically in January (Vol. 20, No. 1) and July (Vol. 20, No. 2) of 2012;
  - PICES E-news to be published on the website and distributed electronically bimonthly;
  - Brochures and slide shows for policy makers, managers, stakeholders and other interested members of society developed, under directions of the FUTURE Advisory Panel on *Status, Outlooks, Forecasts, and Engagement*, based (tentatively) on the final report of the MEQ Working Group on *Ecosystem-based Management Science and its Application to the North Pacific* (PICES Scientific Report, 2010, No. 37, 166 pp.), the Second North Pacific Ecosystem Status Report (PICES Special Publication, 2010, No. 4, 393 pp.) and the final report of the PICES/MAFF project on “*Development of the prevention systems for harmful organisms’ expansion in the Pacific Rim*” (March 2012);
  - Book of Abstracts for the Second International Symposium on “*Effects of climate change on the world’s oceans*” (May 14–20, 2012, Yeosu, Korea);
  - Announcement, poster and Book of Abstracts for PICES-2012 (October 12–21, 2012, Hiroshima, Japan).
- iv. All member countries consider that the supplementary chapter for the Second North Pacific Ecosystem Status Report (PICES Special Publication No. 4, 2010) developed by the Advisory Panel for a CREAMS/PICES Program in East Asian Marginal Seas and endorsed for publication by Science Board, is an important scientific product of PICES, and agree to keep this agenda item open to allow member country governments to reflect further on this issue.

#### **2011/S/5: Future of current PICES expert groups**

- i. The following expert groups completed their terms of reference and should be disbanded:
  - BIO Working Group on *Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim* (WG 23; October 2007–October 2011);
  - FIS/POC Working Group on *Forecasting Climate Change Impacts on Fish and Shellfish* (joint PICES/ICES WG-FCCIFS; October 2008–October 2011);
  - Science Board Study Group on *Human Dimensions for Environmental Change* (SG-HD; October 2009–October 2011);
  - PICES/ICES Study Group on *Developing a Framework for Scientific Cooperation in Northern Hemisphere Marine Science* (SG-SP; October 2009–October 2011);
  - Study Group on *Updating the PICES Strategic Plan* (SG-USP; October 2009–October 2011);Final reports of the first three expert groups will be published in 2012 in the PICES Scientific Report series. The SG-SP final report and the approved new PICES Strategic Plan will be included in the 2011 PICES Annual Report.
- ii. To complete its terms of reference, the life span of the FIS/MEQ Working Group on *Environmental Interactions of Marine Aquaculture* (WG 24) was extended for 1 year (until October 2012). The draft of the WG 24 final report has to be completed by PICES-2012.
- iii. Following a review by the parent committee, the lifespan of the BIO Advisory Panel on *Marine Birds and Mammals* (MBM-AP) was extended for a 3-year term (until October 2014), with revised terms of reference as described in *GC Appendix B*;
- iv. Following a review by the parent committee, the lifespan of the MEQ Section on *Ecology of Harmful Algal Blooms in the North Pacific* (S-HAB) was extended for a 3-year term (until October 2014), pending approval of revisions to terms of reference described in *GC Appendix B* at the 2012 inter-sessional Science Board meeting.

#### **2011/S/6: New PICES expert groups**

- i. The following new Working Groups, with terms of reference as described in *GC Appendix B*, were established in the interim period:
  - POC Working Group on *North Pacific Climate Variability and Change* (WG 27);
  - BIO/MEQ Working Group on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors* (WG 28).
- ii. The following new expert groups, with terms of reference as described in *GC Appendix B*, were established at PICES-2011:
  - POC Working Group on *Regional Climate Modeling* (WG 29);
  - BIO/FIS/POC Section on *Climate Change Effects on Marine Ecosystems* (S-CCME);
  - Science Board Section on *Human Dimensions of Marine Systems* (S-HD);
  - MEQ Study Group on *Marine Pollutants* (SG-MP).

#### **2011/S/7: Chairmen/Vice-Chairmen for Standing Committees and Co-Chairmen for *ad hoc* expert groups**

- i. The following reflects new appointments for *ad hoc* expert groups in the interim period:
  - Drs. Richard Brodeur (U.S.A.), Young-Shil Kang (Korea) and Shin-ichi Uye (Japan) were appointed as Co-Chairmen of the BIO Working Group on *Jellyfish Blooms around the North Pacific Rim: Causes and Consequences*;
  - Drs. Michael Foreman (Canada), Emanuelle Di Lorenzo (U.S.A.) and Shoshiro Minobe (Japan) were appointed as Co-Chairmen of the POC Working Group on *North Pacific Climate Variability*.
  - Dr. Motomitsu Takahashi (Japan) was appointed as Co-Chairman of the BIO/MEQ Working Group on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors*.
- ii. The following reflects changes in Chairmanship and Vice-Chairmanship for Standing Committees and new appointments for expert groups at PICES-2011:
  - Dr. Elizabeth Logerwell (U.S.A.) was elected FIS Chairman to replace Dr. Mikhail Stepanenko (Russia);
  - Dr. Xianshi Jin (China) was elected FIS Vice-Chairman to replace Dr. Gordon Kruse (U.S.A.);

- Dr. Won-Duk Yoon (Korea) was appointed as Co-Chairman of the BIO Working Group on *Jellyfish Blooms around the North Pacific Rim: Causes and Consequences* to replace Dr. Young-Shil Kang (Korea);
- Drs. Changkyu Lee (Korea) and Vera Trainer (U.S.A.) were re-appointed as Co-Chairmen of the MEQ Section on *Ecology of Harmful Algal Blooms in the North Pacific* for a 3-year term;
- Drs. Rolf Ream (U.S.A.) and Yutaka Watanuki (Japan) were re-appointed as Co-Chairmen of the BIO Advisory Panel on *Marine Birds and Mammals* for a 3-year term.

#### **2011/S/8: Relations with other organizations and programs**

- i. Council approved the revised *Standing List of International and Regional Organizations and Programs* developed by Science Board and agreed with the identified priorities for interaction in 2011–2012.
- ii. Council approved in principle the report of the joint PICES/ICES Study Group on *Developing a Framework for Scientific Cooperation in Northern Hemisphere Marine Science*, and agreed with identified focal research and operational areas that can be enhanced by greater cooperation between the two organizations. The adopted framework will serve as the basis for linkages of PICES and ICES science plans and longer term strategic planning.
- iii. Council agreed to appoint an associate PICES member, Dr. Lisa Miller (Section on *Carbon and Climate*, Canada) to serve on the SCOR Working Group on *Biogeochemical Exchange Processes at the Sea-Ice Interfaces*.

#### **GC Appendix B**

##### **Advisory Panel on *Marine Birds and Mammals* (MBM-AP)**

Parent Committee: BIO  
Duration: 3 years

#### **Terms of Reference** (updated and approved at PICES-2011)

1. Provide information and scientific expertise to the Biological Oceanography Committee and the FUTURE Program, and, when necessary, to other scientific and technical committees, with regard to the biology and ecological roles of marine mammals and seabirds in the PICES region;
2. Identify important problems, scientific questions, and knowledge gaps for understanding the impacts of climate change and anthropogenic factors on marine mammals and seabirds and ecosystems in the PICES region through Workshops, Theme Sessions and Scientific Reports;
3. Assemble information on the status and key demographic parameters of marine mammals and seabirds and contribute to the Status Reports and Outlooks;
4. Improve collaborative, interdisciplinary research with marine mammal and seabird experts and the PICES scientific community.

##### **Section on *Ecology of Harmful Algal Blooms in the North Pacific* (S-HAB)**

Parent Committee: MEQ  
Duration: 3 years

#### **Terms of Reference** (updated at PICES-2011 and under revision)

1. Continue PICES member country data entry into the joint ICES-PICES harmful algal event database to allow global comparison of changes in harmful algal bloom occurrences.
2. Convene workshops and sessions including joint sessions with other international organizations to evaluate and compare results and maintain an awareness of state-of-the-art advances outside the PICES community.

3. Convene a joint PICES/ ICES workshop to assess the purported links between climate change and HAB character, frequency and severity, and publish a comprehensive review paper that identifies the near- and long-term research priorities and the monitoring structures needed to effectively hindcast and forecast future HAB events.
4. Produce and post on the PICES website papers that document the unanimous HAB Section opinion on timely subjects related to HABs, including topics related to FUTURE such as how human activities (increased cultural eutrophication and climate changes including temperature, changes in stratification and ocean acidification) might affect harmful algal bloom incidence and magnitude.

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

Parent Committee: POC

Duration: 3 years

#### **Motivation**

To develop essential understandings of the mechanisms 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.

**Terms of Reference** (approved at the 2011 inter-sessional Science Board meeting)

1. Develop conceptual frameworks and low-order models of North Pacific climate variability and change, which can be used by climate researchers to investigate the mechanisms of those variations and by ecosystem scientists to explore hypotheses linking ecosystem dynamics and physical climate.
2. Summarize the current understanding of mechanisms of Pacific climate variability and change, and evaluate the strengths of the underlying hypotheses with supporting evidence.
3. In conjunction with ecosystem scientists, coordinate the development and implementation of process-based models, which include important processes in simple forms, to hindcast the variability of available long-term biological time series.
4. Develop a method to identify and provide uncertainty estimates of decadal variability in recent historical climate and ecosystem time series.
5. Provide improved metrics to test the mechanisms of climate variability and change in IPCC models, and in coordination with other PICES working groups and FUTURE Advisory Panels, assist in evaluating those models and providing regional climate forecasts over the North Pacific.
6. Understand and fill the gaps between what physical models can currently produce and what ecosystem scientists suggest are the important physical forcing factors required for predicting species and ecosystem responses to climate variability and change.
7. Maintain linkages with, and summarize the results from National and International programs/projects such as CLIVAR, IMBER, US CAMEO, ESSAS, Japanese Hot Spot in the Climate System, POMAL, CREAMS EAST-I, POBEX, and others.
8. Convene workshops and sessions to evaluate and compare results and maintain an awareness of state-of-the-art advances outside the PICES community.
9. Publish a final report summarizing results.

**Working Group on Development of Ecosystem Indicators  
to Characterize Ecosystem Responses to Multiple Stressors (WG 28)**

Parent Committees: BIO and MEQ

Duration: 3 years

**Motivation**

Marine ecosystems of the North Pacific, both coastal and offshore, are impacted by multiple emerging stressors, such as increased temperature, change in iron supply, harmful algal bloom events, invasive species, hypoxia/eutrophication and ocean acidification. These multiple stressors can act synergistically to change ecosystem structure, function and dynamics in unexpected ways that differ from single stressor responses. Further, it is expected that stressors will vary by region, and critical stressors in PICES' regional ecosystems should be identified and characterized to allow comparative studies on North Pacific ecosystem responses to multiple stressors that will help determine how ecosystems might change in the future and identify ecosystems that are vulnerable to natural and anthropogenic forcing. This Working Group can address emerging issues from PICES WG 22 on *Iron Supply and its Impact on Biogeochemistry and Ecosystems in the North Pacific Ocean* (iron chemistry in low pH ocean, anthropogenic dust flux), PICES WG 23 on *Comparative Ecology of Krill in Coastal and Oceanic Waters Around the Pacific Rim* (hypoxia impact on euphausiids), and PICES WG 21 on *Non-indigenous Aquatic Species* (non-indigenous marine species) thereby highlighting the need for integrative studies.

**Terms of Reference** (approved at the 2011 inter-sessional Science Board meeting)

1. Identify and characterize the spatial (and temporal) extent of critical stressors in North Pacific ecosystems both coastal and offshore and identify locations where multiple stressors interact; identify trends in these stressors, if possible.
2. Review and identify categories of indicators needed to document status and trends of ecosystem change at the most appropriate spatial scale (*e.g.*, coastal, regional, basin).
3. Using criteria agreed to at the 2011 PICES FUTURE Inter-sessional Workshop in Honolulu, determine the most appropriate weighting for indicators used for:
  - a. documenting status and trends,
  - b. documenting extent of critical stressors,
  - c. assessing ecosystem impacts/change.
4. Review existing frameworks to link stressors to impacts/change, assessing their applicability to North Pacific ecosystems and identify the most appropriate for application to North Pacific ecosystems.
5. Determine if ecosystem indicators provide a mechanistic understanding of how ecosystems respond to multiple stressors and evaluate the potential to identify vulnerable ecosystem components.
6. For 1-2 case studies, identify and characterize how ecosystems respond to multiple stressors using indicators identified above. Are responses to stressors simply linear or are changes non-linear such that small additional stressors result in much larger ecosystem responses? Do different parts of the ecosystem respond differently (*e.g.*, trophic level responses)? How do stressors interact?
7. Publish a final report summarizing results with special attention to FUTURE needs. This WG will focus primarily on delivery of FUTURE Questions 3 and 1.

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

Parent Committee: POC

Duration: 3 years

### **Motivation**

With the realization that physically-based future climate projections are the starting point for many socio-economic impact and adaptation considerations to future climate change and that global climate models, although they capture large scale climate behaviour, have limitations for regional assessments due to their coarse spatial resolutions, a working group is proposed to assess state-of-the-art regional climate modeling efforts, their implications for regional ecosystem studies and to further their development in the North Pacific Ocean and its marginal seas.

### **Terms of Reference** (approved at PICES-2011)

1. Assemble a comprehensive review of existing regional climate modeling efforts.
2. Assess the requirements for regional ecosystem modeling studies (*e.g.*, how to downscale the biogeochemistry).
3. Continue the development of RCM implementations in the North Pacific and its marginal seas.
4. Convene special sessions and inter-sessional workshops dedicated to the RCM topic.
5. Publish report and/or review paper on best practices for regional coupled modeling.
6. Establish connections between PICES and climate organizations (*e.g.*, CLIVAR) and global climate modeling centers (*e.g.*, NCAR, JAMSTEC, CCCMA).
7. Collaborate with other PICES expert groups such as WG-27, S-CCME and the FUTURE Advisory Panels possibly by producing “Outlooks”.
8. Publish a final report summarizing results.

### **Section on *Climate Change Effects on Marine Ecosystems* (S-CCME)**

(joint expert group with ICES Strategic Initiative on *Climate Change Effects on Marine Ecosystems*)

Parent Committees: BIO, FIS and POC

Duration: lifetime of FUTURE

### **S-CCME Goals** (approved at PICES-2011)

- Define, coordinate and integrate the research activities needed to understand, assess and project climate change impacts on marine ecosystems;
- Plan strategies for sustaining the delivery of ecosystem goods and services, and when possible predictions should include quantifying estimations of uncertainty;
- Define and quantify the vulnerability and sustainability of marine ecosystems to climate change, including the cumulative impacts and synergetic effects of climate and marine resource use;
- Build global ocean prediction frameworks, through international collaborations and research, building on ICES and PICES monitoring programs.

### **Core Elements of S-CCME Implementation Plan Phases (3 years in duration)**

- Synthesis of existing knowledge;
- Advancement of new science and methodology;
- Communication of research findings.

### **Phase 1: 2012-2014**

- **Synthesis of existing knowledge:**
  - Complete synthesis papers from the 2010 Sendai Symposium and 2012 Yeosu Symposium;
  - Interpret the vulnerabilities of marine ecosystems to changing climate.
- **Advancement of new science and methodology:**

- Identify techniques for predicting climate change impacts in systems impacted by decadal variability;
- Define the vulnerability of commercial species to climate change and identify which species would be most likely to experience shifts in spatial distributions;
- Engage the global earth system modelling community in modelling climate change effects on marine ecosystems and identify opportunities for collaborations;
- Build response scenarios for how the human community will respond to climate change.
- **Communication and integration of science through international symposiums:**
  - Publish results in peer reviewed literature;
  - Serve as symposium/session co-convenors;
  - Assist in preparing and convening the PICES/ICES/IOC Symposium on “*Effects of climate change on the world’s oceans*” (May 2012, Yeosu, Korea).

**Phase 2: 2015-2017**

- Continue to advance new science focused on climate change effects on marine ecosystems through theme/topic sessions and workshops;
- Update and improve forecasts with IPCC AR5 scenarios;
- Convene an international symposium in 2016;
- Develop regional synthesis reports;
- Initiate inter-sessional training for projecting climate change impacts on marine ecosystems;
- Continue collaboration with global climate change research community.

**Phase 3: 2018-2020**

- Continue to advance new science focused on climate change effects on marine ecosystems through theme/topic Sessions and workshops;
- Update and improve predictions with IPCC AR6 scenarios;
- Develop regional synthesis reports;
- Convene an international symposium in 2018.

**Section on *Human Dimensions of Marine Systems* (S-HD)**

Parent Committee: Science Board

Duration: lifetime of FUTURE

**Objective**

To better understand and communicate the societal implications of the conditions and future trends of North Pacific marine ecosystems (FUTURE vision), to provide a forum for the integration of FUTURE-related studies using social science approaches and tools, and to facilitate the close discussions and communications among researchers from both the natural and social sciences.

**Terms of Reference** (approved at PICES-2011)

Section on *Human Dimensions of Marine Systems* (S-HD) is the scientific body responsible for the promotion, coordination, integration and synthesis of research activities related to the contribution of the social sciences to the second PICES integrative science program on “*Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Ecosystems*” (FUTURE), to PICES Scientific Committees, and to PICES as an organization.

1. S-HD will work towards SCIENTIFIC clarification of differences in societal objectives and needs among stakeholders in different sectors and countries. Based on that result, S-HD will develop an inventory of potential recipients, and their communication requirements for FUTURE and other PICES products, such as the state of the ocean reports (FUTURE Objective 2).

2. Based in part on the results of TOR 1, and with close coordination and communication with the Advisory Panel on *Status, Outlooks, Forecasts, and Engagement* (SOFE-AP) and other expert groups within PICES, S-HD will SCIENTIFICALLY explore the consequences to and responses of human social systems to factors such as climate-induced changes in marine ecosystems (FUTURE key question 3.4). Social science tools summarized in Table 3.1 of the final report of the Study Group on *Human Dimensions* will be applied to such an analysis.
3. S-HD will contribute a Human Dimension Chapter to the next North Pacific Ecosystem Status Report (FUTURE Objective 2).
4. S-HD will facilitate academic cooperation with other international research activities such as ICES, IMBER, LOICZ, *etc.*, and organize a symposium on the study of the human dimensions of marine ecosystems.

### **Study Group on *Marine Pollutants***

Parent Committee: MEQ

Duration: 1 year

#### **Description and Statement of Purpose**

The purpose of the proposed Study Group on *Marine Pollutants* (SG-MP) is to identify novel or promising approaches to monitoring pollutant trends over space and time, and to evaluate impacts on biota at the population level. The Study Group will establish a list of priority substances and pollutant indicators in PICES member countries using a series of case studies (*e.g.*, microplastics in seawater, seabird egg monitoring for persistent organic pollutants (POPs) over time; risk-based ranking of complex pollutant mixtures in sediments). This will help identify those methods or approaches that would benefit from harmonization (*e.g.*, characterization of heterogenous microplastic content in seawater or biota), and improve data delivery and scientific advice to managers and stakeholders.

While the Study Group will focus on impacts to biota, linkages will be established with those efforts that describe socio-economic impacts of pollution (*e.g.*, fisheries closures, consumption guidelines, impacts on endangered species, special vulnerability of coastal and indigenous peoples). Input from regional and international bodies such as ICES (International Council for the Exploration of the Sea), GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) and NOWPAP (Northwest Pacific Action Plan), will increase efficiencies and the scientific value of the SG-MP outcome.

The establishment of SG-MP is consistent with the FUTURE Science Plan component 3 (*How do human activities affect coastal ecosystems and how are societies affected by changes in these ecosystems?*), and contribute insight into the structure, function and resilience of ecosystems as in components 1 and 2. This will provide a critical evaluation of highly complex pollutant mixtures, clarify priority concerns in the North Pacific, and provide a platform to evaluate the relative importance of pollutants compared to other stressors.

#### **Terms of Reference**

1. Identify novel or promising approaches to operational marine pollution assessment in PICES member countries by:
  - a. establishing a list of priority pollutant concerns for each of the PICES member countries;
  - b. identifying useful indicators of status, trends and effects; and
  - c. identifying those issues or methods that would benefit from harmonization.
2. Identify interactions within PICES scientific committees and expert groups that will complement the Study Group and will be consistent with the ecosystem approach espoused by FUTURE.
3. Explore potential partnerships with other professional or multilateral organizations (*e.g.*, ICES, GESAMP, NOWPAP) which could lead to joint activities (working group, sessions, publications), improve efficiencies and strengthen scientific outcomes.
4. Develop recommendations for a possible PICES Working Group on marine pollutants.