

REPORT OF MARINE ENVIRONMENTAL QUALITY COMMITTEE



The meeting of the Marine Environmental Quality Committee (MEQ) was held from 08:30 to 18:00 hours on October 7, 2005. The Chairman, Dr. John E. Stein, called the meeting to order and welcomed the participants (*MEQ Endnote 1*). The Committee reviewed the draft agenda (*MEQ Endnote 2*), and it was adopted.

Business from PICES XIII (Agenda Item 3)

There were no pressing issues pending from last year's meeting in Honolulu, U.S.A. The Chairman summarized in some detail the report of the inter-sessional Science Board meeting, with the participation of Governing Council members, held in April 2005, in Seattle, U.S.A.

Membership and chairmanship of MEQ (Agenda Item 4)

A new member, Dr. Darlene Smith (Fisheries and Oceans Canada), was introduced to the Committee. Dr. Stein acknowledged Canada's appointment of Dr. Smith to MEQ.

The Committee expressed again its concern that there was no official participation in MEQ from China this year, nor has there been for the previous few years. The Committee also noted that there was minimal participation this year by the United States.

There continues to be the overall issue of having full participation in MEQ by all PICES member countries. At PICES XIV, only 5 of 17 MEQ members were in attendance.

This was the fifth year of Dr. Stein's chairmanship of MEQ, and it was the intent of the Committee to elect a new Chairman at PICES XIV. However, efforts to identify a candidate from the western Pacific were again not successful. The Committee requested Dr. Stein to serve for one more year, and he agreed. The Committee will identify a candidate before PICES XV. The preferred choice is a

candidate from the western Pacific. If unsuccessful, then the Committee will identify a candidate from the eastern Pacific.

The Committee supported the proposal to establish a Vice-Chairman position, and Dr. Hideaki Nakata (Japan) was elected as MEQ Vice-Chairman for a period of one year.

Progress reports of subsidiary bodies under the direction of MEQ (Agenda Items 5-7)

HAB Section

Dr. Hak Gyoon Kim, Co-Chairman of the MEQ Section on *Ecology of harmful algal blooms in the North Pacific* (HAB-S), reviewed activities of the Section since PICES XIII. His presentation included reports on the Section's meetings held October 1 and 2, 2005, and a report of the MEQ Workshop on "*Review of selected harmful algae in the PICES region: I. Pseudo-nitzschia and Alexandrium spp.*" held September 29-30. These two reports are included elsewhere in this Annual Report.

The Section made the following recommendations to the Committee:

- to convene a 1-day MEQ (HAB-S) Workshop at PICES XV to focus on 2 additional species: *Dinophysis* and *Cochlodinium* spp., and to fund travel of 1 invited speaker from Europe to attend the workshop (*HAB-S Endnote 3*);
- to hold, immediately prior to the workshop, a ½-day laboratory demonstration on Diarrhetic Shellfish Poisoning (DSP) detection at the National Fisheries Research Institute in Yokohama;
- to convene a 1-day MEQ (HAB-S) Topic Session on "*Harmful algal blooms in the PICES region: New trends and potential links with anthropogenic influences*", and to fund travel of 1 invited speaker to attend the session (*HAB-S Endnote 4*);

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- to encourage all PICES member countries to support monitoring programs for shellfish toxins;
- To strongly encourage participation of all member countries in HAB-S activities.

Working Group 18 on Mariculture

Dr. Ik-Kyo Chung, Co-Chairman of the MEQ/FIS Working Group 18 on *Mariculture in the 21st century – The intersection between ecology, socio-economics and production*, reported on their activities in 2005, including the results of the MEQ/FIS Topic Session on “*Current and emerging issues of marine and estuarine aquaculture in the Pacific region: Carrying capacity, ecosystem function and socioeconomics*” held on October 5, 2005. The report of the WG 18 meeting and the summary of the session are included elsewhere in this Annual Report. With the report from Russia, WG 18 has now reports on the status and projected trends in marine aquaculture from all PICES member countries, and intends to prepare a publication in the PICES Scientific Report series based on these national reports. The Working Group also recommends to convene a 1-day MEQ/FIS Topic Session at PICES XV on “*Aquaculture for sustainable management of marine environment and ecosystem*”, and to fund travel of 1 invited speaker to attend this session (WG 18 Endnote 4).

Working Group 19 on Ecosystem-based management science

Dr. Glen Jamieson, Co-Chairman of the MEQ/FIS Working Group on *Ecosystem-based management and its applications to the North Pacific*, reported on their activities in 2005, including the results of their meeting held from September 28-30, 2005, and the MEQ/FIS Topic Session on “*Ecosystem indicators and models*”. The full report of WG 19 and the summary of the session can be found elsewhere in the Annual Report. The Working Group requests a 3-day business meeting and a 1-day MEQ/FIS Topic Session on “*Criteria relevant to the determination of unit eco-regions for ecosystem-based management in the PICES area*” at PICES XV (WG 19 Endnote 5).

PIBOC research on “*Physiologically active compounds from North Pacific marine organisms*” (Agenda Item 8)

Dr. Dimitry Aminin, Pacific Institute of Biochemical Organic Chemistry (PIBOC), reviewed research done at his institute on isolation and characterization of pharmacologically active compounds from marine organisms. The Committee suggested that Dr. Aminin prepare a proposal for a workshop to be considered at next year’s Annual Meeting.

Introduced species (Agenda Items 9 and 10)

Following PICES XII, there was further communication with ICES to foster interactions with the ICES Working Group on *Introductions and Transfers of Marine Organisms* (WGITMO) and the ICES/IOC/IMO Working Group on *Ballast and Other Ship Vectors* (WGBOSV). The study of introductions and spread of non-indigenous species continues to be an area of considerable interest to the Committee both scientifically and for building collaboration with ICES. On behalf of PICES/MEQ, Dr. Mark L. Wells of the HAB Section attended the WGBOSV meeting held in March 2005, in Arendal, Norway. A PICES/ICES Workshop on “*Introduced species in the North Pacific*” was held October 4-5, 2005, at PICES XIV. Dr. Stephan Gollasch (Germany/ICES) served as a co-convenor of the workshop, and Drs. Sergej Olenin (Lithuania/ICES) and Helge Botnen (Norway/ICES) were invited speakers. A summary of this workshop can be found under Session Summaries in the Annual Report.

Proposals for new subsidiary bodies (Agenda Item 11)

Based on discussions at this year’s PICES/ICES Workshop on “*Introduced species in the North Pacific*” (Agenda Item 9), the Committee proposes a Working Group on *Non-indigenous aquatic species* to be coordinated with related Working Groups in ICES. Terms of reference, suggested members, and possible Co-Chairmen were provided (MEQ Endnote 3).

Planning for PICES XV (Agenda Item 12)

The Committee proposes the following sessions and workshops for PICES XV:

- a 1-day MEQ (HAB-S) Workshop on “*Review of selected harmful algae in the PICES region: II. Dinophysis and Cochlodinium spp.*”, preceded by a ½-day laboratory demonstration on DSP detection (HAB-S Endnote 3);
- a 1-day MEQ Topic Session on “*Harmful Algal Blooms in the PICES region: New trends and potential links with anthropogenic influences*” (HAB-S Endnote 4);
- a 1-day MEQ/FIS Topic Session on “*Aquaculture for sustainable management of marine environment and ecosystem*” (WG 18 Endnote 4);
- a 1-day MEQ/FIS Topic Session on “*Criteria relevant to the determination of unit eco-regions for ecosystem-based management in the PICES area*” (WG 19 Endnote 5);
- a ½-day BIO/FIS/MEQ Topic Session or Workshop on “*Ocean environmental change and jellyfish*” (BIO Endnote 6a).

Theme for PICES XVI (Agenda Item 13)

Canada suggested a theme “*The changing North Pacific: Previous patterns, future projections, and ecosystem impacts*” for PICES XVI, to be held in 2007, in Victoria, Canada. MEQ endorsed the theme but recommends the following changes (in italics and underlined) to the proposed description (SB Endnote 8):

- “This session will build on studies of climate variability and other anthropogenic impacts in the North Pacific...”;
- “e.g., less ice-cover in the Bering Sea and Sea of Okhotsk, aquatic bioinvasions...”;
- “(6) How projected global change and anthropogenic impacts may alter sustainability of the North Pacific...”.

MEQ Action Plan (Agenda Item 14)

Dr. Stein reviewed the draft Action Plan for MEQ activities for the next 3–5 years. The

Committee then revised the draft, and the revised version is appended as *MEQ Endnote 4*.

Next major PICES scientific program (Agenda Item 15)

Dr. Stein reported on the progress of the Study Group on *Future integrative scientific program(s)*. No further action was taken by the Committee.

PICES web site: MEQ contribution (Agenda Item 16)

The Committee encouraged the HAB Section and WG 18 to examine reports and presentations from this year’s Annual Meeting for possible inclusion on the MEQ web page.

Future MEQ activities (Agenda Item 17)

This agenda item was covered in discussion and revision of the MEQ Action Plan.

Relations with other international programs and organizations (Agenda Item 18)

The main focus for MEQ interactions with other international organizations is with ICES and its WGs on *Ballast and Other Ship Vectors* (jointly with IOC and IMO) and *Introductions and Transfers of Marine Organisms*.

Items with financial implications (Agenda Item 19)

Inter-sessional meetings for 2006 and beyond

- a symposium on “*Marine bioinvasions*” co-sponsored with ICES and MBC), spring 2007, US east coast (approved in 2003);

Publications for 2006 and beyond

- a WG 18 report in the PICES Scientific Reports series based on the national reports on the current status and trends in aquaculture in PICES member countries (2006-2007);
- a WG 19 report in the PICES Scientific Reports series and a brochure on ecosystem-based management; the brochure would be an executive summary of the final report of

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the working Group and would follow the template of the well-received approach used by the PICES Study Group on *Fisheries and ecosystem responses to recent regime shifts*.

Travel support requests

- 1 invited expert from Europe on *Dinophysis* to attend the MEQ Workshop “*Review of selected harmful algae in the PICES region: II. Dinophysis and Cochlodinium spp.*” at PICES XV;
- 1 invited speaker for the MEQ Topic Session on “*Harmful Algal Blooms in the PICES region: New trends and potential links with anthropogenic influences*”;
- 1 invited speaker for the MEQ/FIS Topic Session on “*Aquaculture for sustainable management of marine environment and ecosystem*”;
- 1 invited speaker for the MEQ/FIS Topic Session on “*Criteria relevant to the determination of unit eco-regions for ecosystem-based management in the PICES area*”;
- Dr. Sergej Olenin (Lithuania) to attend the first meeting of the Working Group on *Non-indigenous aquatic species*;
- A PICES representative to attend meetings of the ICES WGITMO and ICES/IOC/IMO WGBOSV to be held in March 2006, in Oostende, Belgium;

MEQ Endnote 1

Members

Glen Jamieson (Canada)
Hak-Gyoon Kim (Korea)
Olga Lukyanova (Russia)
Hideaki Nakata (Japan)
Darlene Smith (Canada)
John E. Stein (U.S.A., Chairman)

- Registration fee for Dr. Carolyn Friedman to attend the 3rd International Symposium on “*Stock enhancement and sea ranching*” to be held in September 2006, in Seattle, U.S.A.

Other items

Dr. George L. Hunt described a proposal for a joint ESSAS/PICES Workshop to compare four sub-Arctic marine ecosystems (Bering Sea, Sea of Okhotsk/Oyashio region, Barents Sea and Newfoundland/Labrador Shelf) to be held in June 2006, in Moscow or St. Petersburg, Russia (CCCC Endnote 3). He also described a request to Science Board for travel support for 4 scientists to attend the workshop. MEQ members supported the workshop proposal, with no comment on the request for travel support.

2005 MEQ Best Presentation Award (Agenda Item 20)

The MEQ Best Presentation Award was given to Xuelei Zhang (China) for his paper (co-authored with R.J. Wu, Z.H. Zhang, and Z.F. Dong) on “*Benzene toxicity to the scallop, Chlamys farreri, and the shrimp, Penaeus japonicus*” presented at the MEQ Topic Session on “*Ecological effects of offshore oil and gas development and oil spills*”.

Participation list

Observers

Dmitry Aminin (Russia)
Ik Kyo Chung (Korea)
Stephan Gollasch (Germany/ICES)
Chuanlin Huo (China)
Chang-Gu Kang (Korea)
Chang Kyu Lee (Korea)
Sam Guen Lee (Korea)
Yasunori Watanabe (Japan)

MEQ Endnote 2**MEQ meeting agenda**

1. Welcome and introductions
2. Approval of agenda
3. Business from last year's meeting
4. Membership and chairmanship of MEQ
5. Progress report from Section on *Ecology of harmful algal blooms in the North Pacific*
6. Progress report from WG 18 on *Mariculture in the 21st century*
7. Progress report from WG 19 on *Ecosystem-based management science and its application to the North Pacific*
8. PIBOC research on "*Physiologically active compounds from North Pacific marine organisms*" by Dimitry Aminin
9. Report on the PICES/ICES Workshop on "*Introduced species in the North Pacific*"
10. Report on inter-sessional meetings
11. Proposals for new subsidiary bodies
12. Planning for PICES XV
13. Theme for PICES XVI
14. MEQ Action Plan
15. Next major PICES scientific program(s)
16. PICES website: MEQ contribution
17. Discussion of future MEQ activities
18. Relations with other international programs and organizations
19. Items with financial implications
20. 2005 MEQ Best Presentation Award
21. Preparation of report and recommendations to Science Board

MEQ Endnote 3**Proposal for a Working Group on *Non-indigenous aquatic species* (acronym: WGNIAS)**Proposed terms of reference

1. Complete an inventory of all aquatic non-indigenous species (NIS) in all PICES member countries, together with compilation and definitions of terms and recommendations on use of terms. Summarize the situation on bioinvasions in the Pacific and compare and contrast to other regions (*e.g.*, Atlantic, Australia, *etc.*);
2. Complete inventory of scientific experts in all PICES member countries on aquatic NIS subject areas and of the relevant national research programs/projects underway;
3. Review and evaluate initiatives on mitigation measures (*e.g.*, ICES Code of Practice for the Introduction and Transfer of Marine Organisms, IMO Ballast Water Management Convention and others such as the Canadian Introductions and Transfers Code);
4. Summarize research related to best practices for ballast water management;
5. Coordinate activities of the PICES WG on aquatic non-indigenous species with related WGs in ICES through a joint back-to-back

meeting of the PICES and ICES Working Groups on invasive species in 2007/8;

6. Develop and recommend an approach for formal linkages between PICES and ICES on aquatic non-indigenous species;
7. Publish final report summarizing results and recommendations.

Possible Co-Chairmen

MEQ recommends Dr. Yasuwo Fukuyo or alternate from Japan as the Asian Co-Chairman, and Drs. Glen Jamieson or Darlene Smith (Canada) as the North American Co-Chairman.

MEQ also proposes a PICES representative to join as a Co-Chairman for the ICES/IOC/IMO Working Group on *Ballast and Other Ship Vectors* and/or the ICES Working Group on *Introductions and Transfers of Marine Organisms*, and the reverse, have an ICES representative (*e.g.*, Dr. Stephan Gollasch) as Co-Chairman of the proposed PICES Working Group on *Non-indigenous aquatic species*. Joining an ICES Working Group allows connections on global issues, such as IMO

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guidelines that are relevant to ballast water management.

Recommended membership

Canada: Tom Therriault, Dorothee Kieser, Michel Gilbert, Glen Jamieson (if not Co-Chairman)

China: Lijun Wang, Hao Guo

Korea: Kyung Soon Shin, Chang-Kyu Lee, Sam Geon Lee

Japan: Shinichi Hanayama, Hiroshi Kawai, Toshio Furota

Russia: Alexander Zvyagintsev, Vadim Panov

U.S.A: Mark Wells, Ted Grosholz, Henry Lee, Blake Feist, Greg Ruiz, Judith Pederson.

MEQ Endnote 4

MEQ Action Plan (October 2005)

Mission

The MEQ Committee will expand its science from physical/chemical quality as related to toxic contaminants to include: structure, process, and function of the marine system that sustains both ecosystem and human health. Ecosystem health will ultimately affect human health. Rather than focusing on physical drivers of ecosystem change, MEQ is concentrating on anthropogenic drivers of marine ecosystem health.

The Committee notes that each nation has a different approach and management structure for insuring marine environmental quality, which in turn influences the direction and relative priority for research and science advice. In other words, each culture and society has a different view of what quality represents. It is important to make sure that the efforts of MEQ include and are useful to each PICES member country.

Ecological health issues can include:

- Disease, biological pollution, bacteria, HABS;
- Biodiversity; species introductions and unintentional introductions of exotic species;
- Sustainability of the ecosystem; future use of resources;
- Integrated coastal zone management; ecosystem-based management;
- Predictive models, ecological forecasting.

Given the above view of the Committee's mission, the Committee made the following revisions to the list of issues in the current MEQ Strategic Plan:

Issues deleted because the focus is too narrow or they are the purview of another PICES Scientific Committee:

- Impacts of climate change on coastal ecosystems;
- Biogeochemical processes regulating contaminant dynamics in sediments;
- Harmonization of existing methods used in PICES countries;
- Scientific criteria for protection of marine ecosystems from contaminants.

Issues remaining unchanged, altered to broaden focus, or included *de novo* are as follows:

- Mariculture;
- Biological and physical transport of anthropogenic substances in the marine environment;
- Anthropogenic impacts on benthic habitat (formerly in the Plan as "trawling effects on benthic habitat");
- Identification and assessment of emerging chemical and biological pollutants (including exotic species), and their impacts on marine ecosystems;
- Defining indicators or biological markers of marine ecosystem health, with relevance to human health and welfare;
- Needing further clarification is a topic addressing: anthropogenic impacts on trophic dynamics and biodiversity that impact system sustainability.

Strategy of the MEQ Committee

The PICES mission has five central themes:

- A. Advancing scientific knowledge;
- B. Applying scientific knowledge;

- C. Fostering partnerships;
- D. Ensuring a modern organization in support of PICES activities; and
- E. Distributing PICES scientific information.

Specific goals are identified within each of these themes. The Actions of the MEQ Committee will seek to meet goals under each of the themes.

Theme A. Advancing scientific knowledge

Goal 1. Understand the physical, chemical, and biological functioning of marine ecosystems

Action 1.1 Address the substantial need for improved data and information on the occurrence and mechanisms of harmful species in the North Pacific.

Task 1.1.1 Conduct a workshop on HAB species (*Dinophysis* and *Cochlodinium*) in 2006;

Task 1.1.2 Convene a scientific session on HAB research in the western Pacific in 2006;

Task 1.1.3 Initiate discussion of the role of cnidarians and ctenophores in the marine environment.

Action 1.2 Develop a process for conducting holistic assessments of the impact of human activities, and identify a suite of indicators or variables that will facilitate the monitoring of ecosystem status. This will be achieved by the following activities:

Task 1.2.1 Produce an assessment of the spatial and temporal patterns of contaminants for inclusion in the North Pacific Ecosystem Status Report;

Task 1.2.2 In conjunction with 1.2.1, initiate assessment of relationship between contaminant levels and their effects on marine ecosystems.

Goal 2. Understand and quantify the impacts of human activities and climate on marine ecosystems

Action 2.1 Evaluate and increase knowledge in PICES of the potential impacts of aquaculture on ecosystems of the North Pacific.

Task 2.1.1 Convene a scientific session on “*Aquaculture and the sustainable management of the marine environment*”;

Task 2.1.2 Hold a workshop to train PICES scientists in methods to conduct risk assessments on aquaculture activities (note the ICES Code of Practice for Introductions and Transfer of Marine Organisms).

Action 2.2 Evaluate and increase knowledge on the potential impacts of intentional and accidental introductions of non-native species and their vectors of introductions, and collaborate with ICES on introductions and transfers of non-indigenous organisms, including genetically modified organisms.

Task 2.2.1 Propose a PICES Working Group on introduced species (2006);

Task 2.2.2 Participate in the International Marine Bioinvasions Symposium (2007);

Task 2.2.3 Conduct a joint PICES/ICES workshop on introduced species (2007/8).

Action 2.3 Evaluate and increase understanding of how human health issues are inextricably linked to ocean conditions, primarily in coastal areas.

Task 2.3.1 Conduct a workshop/session on “*Oceans and human health*” issues in the North Pacific.

Action 2.4 Develop the scientific basis for an ecosystem approach to management, including assessments and the provision of scientific advice. Specifically, the following activities are needed:

Task 2.4.1 Identify and evaluate the use of indicators for assessing the achievement of ecosystem-based management;

Task 2.4.2 Continue and expand the development of ecosystem models that facilitate the assessment of monitoring and scientific knowledge of ecosystem functions in a holistic manner;

Task 2.4.3 Hold a scientific session on approaches to designating eco-regions and areas that are ecologically and biologically significant (2006);

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Task 2.4.4 Develop country reports on approaches to ecosystem-based management (2006);

Task 2.4.5 Convene a symposium on the science of ecosystem-based management.

Goal 3. Provide advice on methods and tools to guide scientific activities

Action 3.1 Examine and assess methods for measuring HAB species and toxins for use by scientists and agencies of PICES member countries

Task 3.1.1 Conduct a workshop at PICES XIV to review selected harmful algae, such as *Pseudo nitzschia* and *Alexandrium*;

Task 3.1.2 Work to develop capacity for Russian scientists to assess and monitor HAB species and toxin levels;

Task 3.1.3 Conduct a laboratory demonstration of DSP detection.

Theme B. Applying scientific knowledge

Goal 4. Provide scientific advice towards wise use of the North Pacific Ocean

Action 4.1 None

Theme C. Fostering partnerships

Goal 5. Promote collaboration with organizations, scientific programs, and stakeholders that are relevant to the PICES goals

Action 5.1 Develop an approach for formal linkages with ICES/IOC/IMO WGBOSV (WG on *Ballast and Other Ship Vectors*) and/or the ICES WGITMO (WG on *Introductions and Transfers of Marine Organisms*) over the long term.

Goal 6. Promote collaboration among scientists within PICES

Action 6.1 Develop and maintain joint activities of PICES scientists with IOC in development of an international HAB database (HAE-DAT).

Task 6.1.1 Prepare event reports for 2001.

Action 6.2 Provide input to the implementation of GEOHAB activities in the PICES area, such as the HAB event database (see 6.1) and IOC Intergovernmental Panel on Harmful Algal Blooms.

Theme D. Ensuring a modern organization in support of PICES activities

Goal 7. Provide an effective infrastructure to support PICES programs

Action 7.1 None

Theme E. Distributing PICES scientific information

Goal 8. Make the scientific products of PICES accessible

Action 8.1 Publish Working Group reports

Task 8.1.1 Publish country reports on status of mariculture in PICES member countries in the PICES Scientific Report series;

Task 8.1.2 Publish WGNIAI inventories for PICES member countries in the PICES Scientific Report series;

Task 8.1.3 Publish a brochure on ecosystem-based management.