

Report of the Marine Environmental Quality Committee

The business meetings of the Marine Environmental Quality Committee (MEQ) were held on October 18 (18:00-20:00) and October 20 (14:00-20:00), 2015 in Qingdao, China. All six countries sent members or alternatives to the meetings. A total of 26 participants including 2 observers attended (MEQ Endnote 1). MEQ Chair, Dr. Chuanlin Huo called the meetings to order and welcomed all participants. MEQ members and observers were asked to give self-introduction and to provide a brief statement about their interests and expertise. Through MEQ meeting day 1 and day 2, 8 items from the agenda were completed.

Experts Groups (S-HAB, WG28, WG30, WG31, SG-BC) reported their progress and requests, observers from GESAMP and NOWPAP introduced the development of relevant areas with PICES. Based on review of the main achievements of MEQ-2015, ideas/proposals of new topics and direction, items with financial implications for 2016 were discussed. The details were reported as follows.

October 18, 2015

AGENDA ITEM 2

Implementation of PICES-2014 decisions and review of the main achievement of MEQ-2015

At PICES-2015, MEQ sponsored or co-sponsored the following topic sessions and workshops (see [Session Summaries](#) elsewhere in the 2015 PICES Annual Report).

- MEQ Paper Session: (Oct. 23, ½ day) Co-Convenors: Chuanlin Huo (China) and Darlene Smith (Canada). Because WG 30 and WG 31 had their own workshop and topic session, respectively, there were fewer contributed papers to MEQ-P this year. The Co-Convenors held open discussions with the more than 30 scientists in attendance on suggestions for new topics and direction for future MEQ-P sessions and received much helpful feedback.
- S4: MEQ Topic Session, “*Indicators of emerging pollution issues in the North Pacific Ocean*” (Oct. 22, 1 day). Co-Convenors: Olga Lukyanova (Russia), Peter S. Ross (Canada). Invited Speakers: Tomohiko Isobe (National Institute for Environmental Studies, Japan), Hyo-Bang Moon (NOWPAP, Korea), Vladimir Shulkin (NOWPAP, Russia), Hideshige Takada (NOWPAP, Japan).
- S10: SB/MEQ Topic Session, “*The human dimensions of harmful algal blooms*” (Oct. 22, 1/2 day). Co-Convenors: Mark Wells (USA), Mitsutaku Makino (Japan). Invited Speakers: Lorraine C. Backer (Center for Disease Control, GA, USA), Takashi Kamiyama (Tohoku National Fisheries Research Institute, FRA, Japan)
- W1: “*Contrasting conditions for success of fish-killing flagellates in the western and eastern Pacific – A comparative ecosystem approach*” (Oct. 15 and 16, 1½days). Co-Convenors: Douding Lu (China), Vera Trainer (USA). Invited Speakers: Changkyu Lee (National Fisheries Research and Development Institute, Korea), Charles Trick (University of Western Ontario, Canada).
- W2: “*Identifying major threats to marine biodiversity and ecosystems in the North Pacific*” (Oct. 15, 1 day). Co-Convenors: Takafumi Yoshida (Japan/NOWPAP), Chris Rooper (USA). Invited Speakers: Malcolm Clark (National Institute of Water and Atmospheric Research, Wellington, New Zealand), Noriaki Sakaguchi (IPBES Asia-Pacific Regional Assessment, IGES Tokyo Office, Japan/NOWPAP).
- W4: “*Marine Environment Emergencies: Detection, monitoring, response and impacts*” (Oct. 15, 1 day). Co-Convenors: Ziwei Yao (China), Seong-Gil Kang (Korea/NOWPAP), Peter Ross (Canada), Olga Lukyanova (Russia). Invited Speakers: Seong Gil Kang (Korea/NOWPAP), Yongge Sun (Zhejiang University, China).

Dr. Huo also reviewed the Committee the main achievements of the draft of SG-SCOOP framework, such as collaboration mechanisms and activity priorities.

MEQ-2015

AGENDA ITEM 3

Relations with other groups/organizations

Dr. Huo discussed MEQ cooperation with other groups or organizations, such as NOWPAP. Dr. Takafumi Yoshida (NOWPAP) introduced the work his organization was involved in, especially on collaboration with PICES on marine environmental issues, such as harmful algal bloom and marine pollution that were high priorities for both organizations.

AGENDA ITEM 4

Other business

None

October 22, 2014

AGENDA ITEM 5

Relations with other groups/organizations (continued)

Mr. Xiaodong Zhong (NOWPAP) continued discussions introduced by Dr. Yoshida about the work of NOWPAP and on collaboration with PICES on marine environmental issues. For PICES-2015:

- a) NOWPAP led development, and is a co-sponsor, of MEQ Topic Session (S4) on “*Indicators of emerging pollution issues in the North Pacific Ocean*”;
- b) NOWPAP is a co-sponsor of a Workshop (W1) on “*Contrasting conditions for success of fish-killing flagellates in the western and eastern Pacific — A comparative ecosystem approach*”;
- c) NOWPAP is a co-sponsor of a Workshop (W2) on “*Identifying major threats to marine biodiversity and ecosystems in the North Pacific*” at PICES-2015;
- d) NOWPAP is a co-sponsor of a Workshop (W4) on “*Marine Environment Emergencies: Detection, monitoring, response, and impacts*”;

Four representatives from NOWPAP RCU and RACs attended PICES-2015, plus 9 experts were funded by NOWPAP to attend the Meeting.

NOWPAP invited MEQ representation at NOWPAP’s 2016 meetings including the Focal Points meetings of CEARAC (April 7–8, 2016, Toyama, Japan), POMRAC (May 18–20, 2016, Vladivostok, Russia), DINRAC (May 26–27, 2016, Beijing, China), and MERRAC (May 31–June 3, 2016, Jeju, Korea).

Dr. Peter Kershaw provided a brief overview of GESAMP and its MEQ-related activities, including an upcoming report by GESAMP’s WG 40 on Sources, Fate and Effects of Micro-plastics in the Marine Environment – A Global Assessment. Microplastics as a vector for nonindigenous species has been added to WG 40’s terms of reference. One of GESAMP’s objectives is to contribute to PICES meetings, discuss mechanisms for identifying emerging issues of mutual concern and potential action, and generally to encourage more cooperation between PICES and GESAMP.

MEQ members were requested by Dr. Huo to rank the SCOR working group proposals for potential PICES affiliate status. MEQ highest ranking (“Must Fund”) proposals for No. 1, Towards a Global Comparison of Zooplankton; No. 4, Changing Ocean Biological Systems (COBS); and No. 9, International Quality Controlled Ocean Database. The objectives of these three proposed working groups align well with PICES priorities. (MEQ ranked proposals Nos. 3, 5, 7 and 8 as “May Fund” and Proposals No. 2, 6 and 10 as “Do Not Fund”).

AGENDA ITEM 6

Reports from MEQ expert groups

Representatives from all expert groups under MEQ attended the MEQ Committee meeting during PICES 2015. Co-Chair from each group reported their work and progress in 2015. Proposals for new topics and direction were discussed for the development of MEQ.

1. *Topic Sessions and Workshops for PICES-2016 and inter-sessional workshops for 2016*

Of 17 proposed Topic Sessions for PICES-2016, MEQ recommended combining several into one priority on climate change. MEQ gave highest priority ranking to:

- Proposal #5, “*Source, transport and fate of hydrocarbons in the marine environment*”;
- Proposal #10, “*Understanding our changing oceans through species distributions and habitat models based on remotely sensed data*”;
- Proposal #14, “*New stage of ocean acidification studies: responses of oceanic ecosystem including fisheries resources*”;
- Proposal #15, “*The effect of marine debris caused by the Great Tsunami of 2011*”.

Of the 11 proposed Workshops, MEQ gave highest ranking to:

- Proposal #2, “*Conditions promoting extreme *Pseudo-nitzschia* events in the eastern Pacific but not the western Pacific*”;
- Proposal #4, “*Methods relating oceanographic conditions to the distribution of highly migratory species*”;
- Proposal #8, “*Mesoscale and submesoscale processes in the North Pacific: History and new challenges*”
- Proposal #10, “*Distribution and risk analysis of radionuclides in the North Pacific*”.

MEQ supported the proposal for a SG-NPESR inter-sessional workshops in summer 2016 (location TBD).

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

- Dr. Douding Lu (China) was nominated as S-HAB Co-Chair, replacing Dr. Shigeru Itakura (Japan);
- S-HAB held a 1-day meeting on October 17 at PICES-2015, with 37 participants. Members from all PICES member countries, except Korea, attended;
- W1: *Contrasting cases of raphidophytes in the eastern and western Pacific* was held during PICES-2015, with 20 participants. Papers from W1 will be submitted to a peer-reviewed journal or published in PICES Press (Spring 2016);
- PICES co-sponsored a harmful algal blooms and climate change symposium, May 19–22, 2015 in Gothenburg, Sweden (Dr. Mark Wells was a symposium co-convenor); 64 scientists participated;
- A paper entitled “*Harmful algal blooms and climate change: Learning from the past and present to forecast the future*” was published in the journal *Harmful Algae* (2015; 49: 68 DOI: 10.1016/j.hal.2015.07.009);
- Two articles, “*S-HAB contributions to FUTURE*” and “*Mitigation of HABs – the way forward*” were published in the Summer 2015 edition of PICES Press, [Vol. 23, No. 2](#);
- S-HAB is continuing to provide input to the ICES/PICES/IOC harmful algal event database;
- S-HAB is contributing to the North Pacific Ecosystem Status Report by providing information on mechanisms underlying HAB occurrence and environmental changes.
- S-HAB requested:
 - 1½-day Workshop on “*Conditions promoting *Pseudo-nitzschia* events in the eastern but not the western Pacific*” at PICES-2016. Proposed to be jointly sponsored by NOWPAP. **HIGH**;
 - Funds for 2 invited speakers (1 eastern and 1 western Pacific) to attend the Workshop
 - 1-day business meeting at PICES-2016. **HIGH**;
 - Travel support for a PICES member to attend the Global HAB Scientific Steering Committee meeting. Anticipated to be in Europe in Spring 2016. Estimated travel funds ~\$4k **HIGH**;
 - Travel support for S-HAB member to promote PICES contribution to a “*Best Practices Manual*” focused on the design studies needed for HABs and Climate Change. This is a recommendation resulting from the international symposium held in May in Gothenburg, Sweden. Estimated travel funds ~\$5k. **HIGH**;

- Funds for publication of *Heterosigma* paper (W1 on “Contrasting conditions for success of fish-killing flagellates in the western and eastern Pacific – A comparative ecosystem approach” from PICES-2015) in peer-reviewed journal – estimated at \$3k. **MEDIUM.**

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

WG 28 held its last meeting on October 16–17, 2015 at PICES-2015, with 9 of the 19 members in attendance. WG 28 is making good progress on its terms of reference. WG Co-Chair, Dr. Ian Perry, reported that:

- WG 28 will submit its final report before ISB-2016. Outline of the report:
 - Chapter 1: “Introduction”,
 - Chapter 2: “Frameworks linking pressures to impacts and changes in North Pacific marine ecosystems”,
 - Chapter 3: “Multiple pressures on North Pacific marine ecosystems”,
 - Chapter 4: “Case Studies”,
 - Chapter 5: “Developing ecosystem indicators for responses to multiple pressures”,
 - Chapter 6: “Ecosystem indicators for ecosystem responses to multiple pressures in the North Pacific”
 - Chapter 7: “Summary and Conclusions”.
- One primary publication has been completed and two more will be published;
- WG 28 supports the proposal by Dr. Jameal Samhoury *et al.* for a Study Group on “Ecosystem Reference Points as a Common Currency across PICES Member Countries”.

4. Working Group on *Assessment of Marine Environmental Quality of Radiation around the North Pacific* (WG 30)

WG 30 Co-Chair, Dr. Yusheng Zhang, reported that:

- WG 30 held a workshop (W5) on “*Monitoring and assessment of environmental quality of radioactivity in the North Pacific*”, at PICES-2015 with 18 presentations, including 3 invited speakers, and 6 posters;
- Dr. Tsuneo Ono (Japan) stepped down as a WG 30 member;
- WG 30 members provided feedback for the 1st FUTURE SSC meeting;
- WG 30 is drafting a paper on the activity level and impact of artificial radionuclide in North Pacific to improve the understanding of the human activities influence on marine environment (journal TBD);
- WG 30 proposed a workshop on “*Distribution and risk analysis of radionuclides in the North Pacific*” for PICES-2016. Potential co-sponsors will be SCOR and ICRP/IAEA. WG 30 requested \$5000 travel funds for 2 invited speakers from IAEA, ICRP or SCOR;
- WG 30 plans to draft a paper from the outcomes of the Workshop (W5) on “*Monitoring and assessment of environmental Radioactivity in the North Pacific*” at PICES-2015;
- WG 30 requested a 1-day business meeting at PICES-2016;
- Work plan next steps are to:
 - Predict and observe transport and fate of the FNA radionuclides,
 - Collect and monitor marine environmental radionuclide levels from the FNA,
 - Assess the impacts of radionuclides from the FNA on the marine ecosystem in the North Pacific.

5. Working Group on *Emerging Topics in Marine Pollution* (WG 31)

WG 31 Co-Chair, Dr. Peter S. Ross, reported that:

- WG 31 held a workshop (W4) on “*Marine environmental emergencies: Detection, monitoring, response, and impacts*” (co-sponsored by NOWPAP) at PICES-2015 with more than 30 participants in attendance;
- WG 31 held a Topic Session (S4) on “*Indicators of emerging pollution issues in the North Pacific Ocean*” (co-sponsored by NOWPAP) at PICES-2015, with 11 presentations including 4 invited talks;
- A Special Issue on “*Marine environmental emergencies*” drawn from presentations in W4 will be published in a peer-reviewed journal in 2016. It will feature environmental monitoring of oil spills and hazardous and noxious substances (HNS) spills and will provide a useful compendium for both scientists and managers.
- A Special Issue on “*Indicators of ocean pollution in the North Pacific Ocean*” drawn from presentations in Topic Session S4, and additional submissions, will be published in peer-reviewed journal in 2017. It will showcase the efforts of WG 31 and contribute to an increased awareness of pollution issues (priorities) in

the North Pacific.

- WG 31 will complete NPESR contributions with candidate time series and/or “snapshots” identified for PICES member countries (strong likelihood of international datasets across PICES members);
- WG 31 proposed a Topic Session on “*Source, transport and fate of hydrocarbons in the marine environment*” at PICES-2016 and requested \$3500 travel support for 2 invited speakers;
- WG 31 requested a 1-day business meeting at PICES-2016;
- WG 31 requested travel support for 2 scientists to attend a SG-NPESR inter-sessional workshop in summer 2016 (location TBD).

AGENDA ITEM 7

MEQ Best Oral Presentation award at PICES-2015

Dr. Shizuho Miki (Research Center for Fisheries Oceanography and Marine Ecosystem, National Research Institute of Fisheries Science FRA, Japan) was awarded the Best Oral Presentation in an MEQ-sponsored session (MEQ Paper Session) for her report on “*Strontium-90 in marine fishes*”.

The Best Poster award in an MEQ-sponsored session (MEQ Paper Session) was given to Prof. Ren-Cheng Yu (Key Laboratory of Marine Ecology and Environment Sciences, Institute of Oceanology, Chinese Academy of Sciences, Qingdao, China) for his research on “*Application of qPCR methods in detection of PST-producing Alexandrium species in the Yellow Sea and East China Sea*”.

AGENDA ITEM 8

Other business

None.

MEQ Endnote 1

MEQ meeting participants

Members

Tayana A. Belan (Russia)
 Minkyu Choi (Korea)
 Chuanlin Huo (China, Chair)
 Toyomitsu Horii (Japan)
 Ichiro Imai (Japan)
 Hideaki Maki (Japan)
 Elena Maximovna Latkovskaya (Russia)
 Olga N. Lukyanova (Russia, WG 31 Co-Chair)
 Peter S. Ross (Canada)
 Xinqiang Shen (China)
 Won Joon Shim (Korea, WG 31 Co-Chair)
 Staci Simonich (USA)
 Darlene L. Smith (Canada, Vice-Chair)
 Durelle Patricia Smith (USA)
 Thomas W. Therriault (Canada)
 Dexing Wu (China)
 Gina M. Ylitalo (USA)

Observers

Karin Baba (Japan Nus Co. Ltd)
 Peter Kershaw (GESAMP)
 Ian Perry (Canada, WG 28 Co-Chair)
 Vera L. Trainer (USA, S-HAB Co-Chair)
 Mark Wells (USA, S-HAB)
 Dong-Woon Hwang (Korea, WG 31)
 Taichi Yonezawa (Japan Nus Co. Ltd)
 Takafumi Yoshida (NOWPAP CEARAC, S-HAB, SG-SCOOP)
 Yusheng Zhang (China, WG 30 Co-Chair)

MEQ Endnote 2

MEQ meeting agenda

Sunday, October 18, 2015

1. Welcome and adoption of agenda (Huo)
Welcome members and introduce the agenda about the MEQ meeting.
2. Implementation of PICES-2014 decisions and review of the main achievement of MEQ 2015 (Huo)
Review the relevant content of the Reports of the SB Meeting 2014 and the ISB Meeting 2015, and summarize the progress and the main achievements of MEQ in the past year.
3. Relations with other groups/organizations (All)
 - Introduce the progress on their work with other groups or other organizations
 - Review and rank SCOR Working Group proposals (from the perspective of the value to PICES)
4. Other business (All)

Tuesday, October 20, 2015

5. Relations with other groups/organizations (continue, All)
Discuss MEQ-related work with other groups or other organizations. [Potential presentations and the duration from observers will be updated after contact with representatives.]
 - NOWPAP presentation: Mr. Xiaodong Zhong (NOWPAP Deputy Coordinator)
 - Discussion and arrangement of representation at 2016 NOWPAP and other organizations' schedule of meetings, ensure the participation in and the increasing exchange at each other's meetings or workshops (need to be reported to SB and ensure the framework works essentially)
6. Reports from MEQ expert groups (S-HAB, WG 28, WG 30, WG 31)
High priority items (things that need to be reported to SB) from each ExG
 - Proposals of new topics and direction (All), new topics and direction should be discussed for the development of MEQ.
 - Statement about sessions and workshops for PICES-2016 (sponsors or other delegates)
 - Items with financial implications for 2016 (Topic sessions, Workshops, *etc.*) (All)All WGs to propose their financial implications for topic sessions, workshops, *etc.* The meeting will form the document about financial implications to the SB.
7. MEQ Best Oral Presentation award for PICES-2015 (All)
Discuss and propose candidates for MEQ Best Oral Presentation award.
8. Other business (All)
 - Discussion of PICES-2016 (25th Anniversary), and arrangement of MEQ-P session and MEQ meeting