



MEQ Committee Action Plan (2012-2015)

Mission

The PICES Marine Environmental Quality Committee (MEQ) serves as the Scientific Committee that encourages, facilitates, and conducts multi-national investigations of the status, conditions, trends, and effects in the environmental characteristics of coastal and marine ecosystems of the North Pacific. The MEQ mission is to:

- promote and coordinate interdisciplinary scientific research on marine environmental quality;
- improve understanding of the ecological effects of marine pollution on valued resources with emphasis on the sources and fates of environmental contaminants (including radionuclides), harmful algal blooms, marine aquaculture, and non-indigenous species; and
- increase societal awareness about human uses and influences on North Pacific marine and coastal ecosystems.

The MEQ will provide organizational support, guidance, and a forum for discussion, cooperation, and collaboration on a variety of issues related to the quality of marine and coastal ecosystems. More specifically, the MEQ will serve as the standing PICES Scientific Committee that supports working groups and study groups related to marine non-indigenous species, marine aquaculture, and multiple stressors in the marine environment, human dimensions and marine contaminants (including radionuclides). In addition, the MEQ also serves as the organizational liaison for cooperation and collaboration with other PICES Scientific and Technical Committees, PICES Advisory Panels, the PICES Science Board, and the PICES Governing Council.

Strategy

To implement its mission, the MEQ Committee will address each of the five central themes of the PICES Strategy: (A) Advancing scientific knowledge; (B) Applying scientific knowledge; (C) Fostering partnerships; (D) Developing capacity; and (E) Ensuring a progressive organization. Specific goals, actions and tasks within each of these themes are as follows.

Theme A *Advance scientific knowledge*

Goal 1. Understand the functioning, resilience, and vulnerability of marine ecosystems.

Action 1.1 Improve our understanding of emerging environmental health threats and vulnerable marine environmental settings, ecosystems and species.

Task 1.1.1 Convene a science session on social-ecological considerations for sustainable aquaculture in the Northeast Pacific Ocean.

Task 1.1.2 Assess the relative importance of marine pollutants, fisheries, and other natural and anthropogenic stressors on marine ecosystem structure and function.

Task 1.1.3 Convene a series of science sessions to characterize the source, status, trend and effects of emerging marine pollutants in coastal ecosystems.

Task 1.1.4 Develop frameworks and low-order process-based models on the cycling of radionuclides,

and study changing patterns of radioactivity constituting an additional stressor to the ecosystem in the North Pacific.

Action 1.2 Improve understanding of the complex interactions between anthropogenic and natural stressors and their impacts on key attributes of the North Pacific ecosystems.

Task 1.2.1 Convene a workshop to describe ecosystem-based aquaculture assessment and management as an integrated approach to multi-tropic aquaculture.

Task 1.2.2 Convene or co-convene a science session on marine environmental quality and ecosystems assessment in the North Pacific Ocean at a PICES meeting.

Goal 2. Understand and quantify how marine ecosystems respond to human activities and natural forcing.

Action 2.1 Update data and available information on the distribution of marine contaminants [heavy metals, persistent organic pollutants (POPs), and emerging pollutants] in the North Pacific.

Task 2.1.1 Convene a science session to examine the influence of marine contaminants on organisms, ecosystems, the food web, and the potential long-term influences on human and environmental health.

Task 2.1.2 Convene a science session to explore “the potential ecological effects of contaminants leaching from marine plastics, Styrofoam packaging, and other marine debris” and the transport of non-indigenous species attached to marine debris.

Task 2.1.3 Convene a science session to evaluate the effect of climate variability and change on the fate and bioavailability of contaminants in the North Pacific Ocean.

Action 2.2 Understand the effects of multiple stressors on the sustainability of threatened coastal and marine ecosystems in the North Pacific Ocean

Task 2.2.1 Convene information workshops and training to coastal communities affected by Harmful Algal Blooms.

Task 2.2.2 Convene a workshop to describe sources and effects of non-indigenous species in PICES member countries and to evaluate studies of their ecosystem effects.

Task 2.2.3 Convene a science session to describe how material inputs (nutrients, sediments, contaminants, pathogens, others) from large rivers and terrestrial sources affect coastal habitats and ecosystem productivity and how these process will be affected by climate change.

Action 2.3 Improve knowledge and understanding about the ecological effects of climate change and other stressors on coastal and marine ecosystems in the North Pacific Ocean with other organizations.

Task 2.3.1 Convene a science session to evaluate the effects of climate change on introduction, establishment, spread and impacts of non-indigenous species.

Action 2.4 Evaluate chronic effects of multiple stressors and cumulative effects of human activities on coastal and marine ecosystems of the North Pacific.

Task 2.4.1 Convene a science session on environmental consequences of offshore oil and gas activities in coastal and marine ecosystems of the North Pacific Ocean.

Task 2.4.2 Convene workshops on cumulative effect analysis of human activities on selected marine communities and ecosystems (emphasis on methodologies and standard approaches).

Action 2.5 Understand the quantities and distributions of radioactive contaminants, and assess the relevant effects of radionuclides in coastal and marine ecosystems.

Task 2.5.1 Review and summarize past and ongoing studies on the distribution of radionuclides (natural and artificial) in the environment phases (sediments, seawater, biota and atmosphere).

- Task 2.5.2** Determine the state of the science related to assessment and mitigation of radiological impacts to marine organisms from natural and anthropogenic releases of radionuclides into the marine environment.
- Task 2.5.3** Evaluate radiological doses in collaborating with other entities using simulation models.

Theme B *Applying scientific knowledge*

Goal 3. Provide scientific advice pertinent to North Pacific ecosystems.

- Action 3.1** Provide a list of controlled contaminants and contaminants of wide concern as a primary reference for the conservation of coastal and marine ecosystems of the North Pacific Ocean.
 - Task 3.1.1** Develop lists and describe the precedence-controlled radionuclides and other marine contaminants of the North Pacific Ocean.
 - Task 3.1.2** Compile a list of existing databases of MEQ Radionuclide (MEQR) experts of the North Pacific Ocean for academic exchange.
 - Task 3.1.3** Identify and compile a database of the representative organism species in the different North Pacific ecosystems for biota radioactive quality assessment.
 - Task 3.1.4** Identify priority research requirements for knowledge gaps, the planned expansion of nuclear facilities and other emerging issues in PICES region.
- Action 3.2** Describe and assess the impacts of the non-indigenous species and aquaculture resources.
 - Task 3.2.1** Convene workshops or science sessions on the transport, fate and effects of past and contemporary marine contaminants to assist regional vulnerability and climatic assessments, identify emerging threats and biological hotspots, and inform ecosystem-based management.

Goal 4. Ensure that PICES products are relevant, timely, and broadly accessible.

- Action 4.1** Publish products related to the FUTURE Science Plan and ongoing MEQ activities in PICES.
 - Task 4.1.1** Routinely publish products of MEQ activities, such as papers from MEQ topic sessions, in special issues of peer-reviewed journals and working group reports.
- Action 4.2** Link published products to the PICES website.
 - Task 4.2.1** Provide web links with information on recent publication

Theme C. *Foster partnerships*

Goal 5. Collaborate with organizations and scientific programs relevant to PICES.

- Action 5.1** Develop formal linkages with ICES, NOWPAP and other organizations on Marine Environment Quality areas of common interest.
 - Task 5.1.1** Periodically sponsor PICES scientists to join organizing committees and to give presentations in international symposia of mutual interest to PICES.
 - Task 5.1.2** Develop inter-calibration activities on monitoring techniques and methods of POPs, radionuclides and other marine contaminants cooperating with international relevant organizations.

Goal 6. Strengthen communication and engagement with users of PICES scientific products.

Action 6.1 Understand, quantify and broadly communicate the impacts of anthropogenic activities on marine environment quality, and how these impacts result in consequences for humans.

Task 6.1.1 Work with PICES Secretariat and other PICES committees to assure broad MEQ outreach to the public.

Task 6.1.2 Convene a topic session or workshop on methods for incorporating local knowledge (including traditional ecological knowledge) into ecosystem status reports and outlooks.

Theme D. *Develop capacity*

Goal 7. Advance methods and tools to improve and enhance scientific activities.

Action 7.1 Develop new tools to expand historical records of variability in North Pacific marine environment quality.

Task 7.1.1 Hold a scientific session or workshop to explore alternative methods to derive historical records on marine environment quality of North Pacific.

Action 7.2 Spread the information about the quality status and risk assessment of marine ecosystems of the North Pacific.

Task 7.2.1 Convene annual MEQ Contributed Paper sessions and a series of science sessions to foster information exchange on a diversity of marine environmental quality topics.

Task 7.2.2 Examine the utility of applying techniques on circulation, ecological transfers, biogeochemical cycling and consequences of climate change in the North Pacific, including the downstream interconnectivity in the Arctic Ocean.

Goal 8. Foster collaboration among scientists within PICES.

Action 8.1 Improve opportunities for early career scientists.

Task 8.1.1 Maintain MEQ Contributed Paper sessions at all PICES Annual Meetings to foster early career participation in PICES.

Task 8.1.2 Continue to sponsor and promote PICES/ICES early career scientists symposia.

Action 8.2 Improve participation of all PICES member countries in MEQ activities.

Task 8.2.1 Select topics for scientific sessions and working groups of broad interest among all PICES member countries and maintain broad representation among co-conveners.

Goal 9. Create education and training opportunities.

Action 9.1 Promote training courses and summer schools in relation to marine environment quality topics.

Theme E. *Ensure a progressive organization*

Goal 10. Provide an effective infrastructure to support PICES activities.

Action 10.1 Create and oversee expert groups to support FUTURE and other scientific activities.

Task 10.1.1 Make recommendations to the Science Board on the establishment of new expert groups to support FUTURE and other scientific activities.

- Task 10.1.2** Delegate representatives as members of the FUTURE Advisory Panels to effectively communicate with the FUTURE Advisory Panels.
- Task 10.1.3** Oversee and coordinate the activities of the daughter expert groups through communication with the FUTURE Advisory Panels.