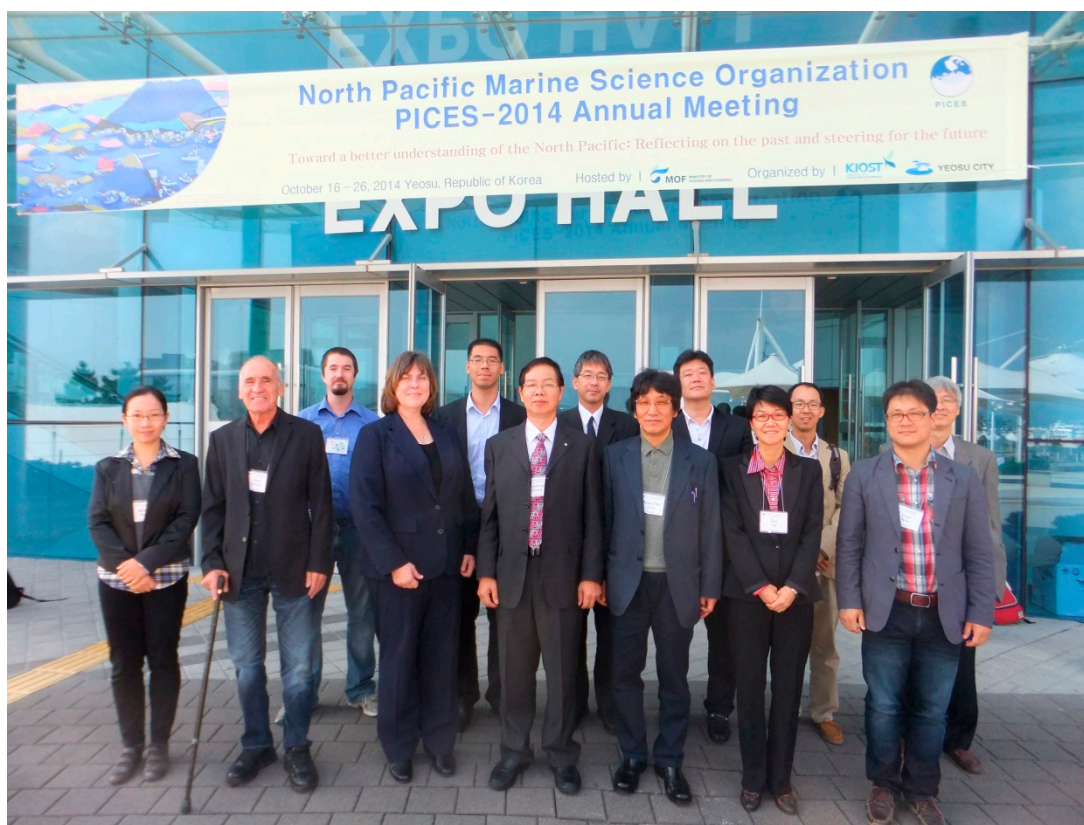


## Report of Working Group 30 on *Assessment of Marine Environmental Quality of Radiation around the North Pacific*

The Working Group on *Assessment of Marine Environmental Quality of Radiation around the North Pacific* (WG 30/WG-AMR) met on two days, from 9:00 to 18:00 h on October 16, 2014, and from 18:00 to 20:00 on October 17, in Yeosu, Korea. Co-Chairs Drs. Yusheng Zhang (China) and Kathryn Higley (USA) welcomed the members and observers and provided the opening address. Eighteen participants, including seven WG members from five member countries (except Russia) attended the meeting (*WG 30 Endnote 1*). The agenda for WG 30's second annual meeting was discussed and adopted without revision by the members (*WG 30 Endnote 2*).



Participants of the second meeting of WG 30. First row from the left: Wen Yu, John Smith, Kathryn Higley, Yusheng Zhang, Kyung Tae Jung, Tao Yu, Daeji Kim; second row from the left: Delvan Neville, He Wu, Tomowo Watanabe, In-Seong Han, Jung Hyup Lee, Seokwon Choi.

### AGENDA ITEM 2

#### **Overview and update of WG 30**

Professor Zhang provided an overview and update of the WG since its first meeting held during PICES-2013 (Nanaimo, Canada) and noted the changes in Korean membership, with Dr. In-Seong Han added as a new member, and Dr. Kyung Tae added as a new member, replacing Dr. Gi-Hoon Hong.

AGENDA ITEM 3

**Country reports**

Each member country of the WG 30 provided an overview of the research that they had conducted in the past year following the WG work plan.

*Canada*

Dr. John Smith gave an overview of the ongoing activities in Canada, particularly the ocean sampling efforts at Stations P26 and P4. He noted that they are seeing the arrival of the Fukushima plume along the west coast, and that this arrival is earlier than predicted by the Behrens model. He observed that the Rossi model, which overpredicted the surface concentration, has now been revised downward by a factor of 10, which now corresponds more closely with the measured data.

*China*

Dr. Wen Yu presented a small suggested change to the WG work plan, followed by monitored data from her institute (Third Institute of Oceanography, SOA) related to environmental concentrations of specific nuclides such as  $^{134}\text{Cs}$ ,  $^{137}\text{Cs}$ ,  $^{90}\text{Sr}$  and  $^{110\text{m}}\text{Ag}$  in seawater as well as in squids from the Northwest Pacific. Dr. Yu demonstrated a surprising difference in the internal organ concentrations in squid *versus* those in the muscle or the overall whole body concentration. Dr. Yu and colleagues have also successfully imaged a squid and have built a voxel model. She provided suggestions on the work plan of 2015 for the Working Group, including holding a workshop during the PICES-2015.

*Japan*

Dr. Tomowo Watanabe provided an overview of the ongoing research at the National Research Institute of Fisheries Science, FRA. He discussed monitoring activities of marine environmental radioactivity; influences of FDNPP-derived radioactive nuclides on marine environment and marine products; and recent research in marine environmental radioactivity in Japan. Dr. Watanabe noted that data collected on  $^{137}\text{Cs}$  in sediment has not shown substantial change in activity concentration since the time of the accident. He also stated that ongoing research has shown no correlation between activity in benthos and that of the marine sediment. However, he has observed that the 'excess ratio' (the ratio of detected activity  $>100$  Bq/kg /  $<100$  Bq/kg in fisheries samples) has been steadily decreasing post 3-11, and now represents  $<1\%$  of fisheries samples.

*Korea*

Drs. Suk Hyun Kim and Kyung Tae Jung presented comments on the work plan – specifically items 1, 2, 5 and 7. They discussed new publications that revise the estimate of the FDNPP source term. They presented data from sampling of the edible portions of several marine fish, both those found domestically and those imported, and data from a physical model that showed a higher resolution regional dispersion of the Fukushima release, for modeled dates in April, May and June of 2011. They also showed a POSEIDON-R dynamic biota model as applied to the Pacific near China, Japan and Korea, which accurately predicted the observed biota concentrations far better than the BCF approach. They are also developing a benthic food web model.

*United States*

Professor Kathryn Higley provided an overview of the ongoing research in her laboratory at Oregon State University (OSU). OSU is continuing to develop voxel models for use in the assessment of radiation dose to biota. OSU has offered to share the models with the WG 30 members to foster collaborative research. OSU is also undertaking analysis to determine tissue densities and elemental concentrations for the models. Separate work is being done to determine the natural and anthropogenic radiation background for several marine species.

## AGENDA ITEM 4

**Work Plan**

The components of the work plan were discussed by the members. The group reached consensus that broad goals should be maintained for the Working Group, and the plan would not be modified at this point.

The main goals of the WG in 2015 are to:

1. Write a technical paper on radionuclides in the marine environment in the North Pacific for submission to a journal (to be decided);
2. Hold a workshop on marine radioactivity at PICES-2015; and
3. Continue research by each member country in relevant areas following the work plan.

## AGENDA ITEM 5

**Data sharing**

The members discussed the type of information and data that might be shared. The group requested that PICES establish a secure ‘members only’ section on the PICES website where WG 30 can post and share data such as papers, technical information and spreadsheets. The Secretariat has agreed to establish this site.

## AGENDA ITEMS 6 AND 8

**Workshop proposal for PICES-2015 and financial support**

The WG 30 members discussed the content and format of a proposed ½-day workshop on “*Monitoring and assessment of environmental quality of radioactivity in the North Pacific*” [later revised to a 1-day workshop and renamed “*Monitoring and assessment of environmental radioactivity in the North Pacific*”] (*WG 30 Endnote 3*) to be held in conjunction with PICES-2015 (October 14–25, 2015, Qingdao, China). As part of this discussion, Dr. Smith provided an overview of the newly created working group associated with the Scientific Committee on Ocean Research. Working Group 05, led by Professors Ken Buessler and Minghan Dai, is very similar to the WG 30 mission. There was consensus that WG 30 should seek collaboration with the SCOR working group. It was suggested that one or two key members from SCOR be invited to the workshop.

- a. Workshop objectives:
  - i. To review the situation and to discuss the information gaps and deficiencies in monitoring and assessment of the Environmental Quality of Radioactivity and its impact on marine ecosystems in the North Pacific, especially since the “3/11” Fukushima Nuclear Accident;
  - ii. To exchange information on new techniques and methodologies for monitoring and assessment of the environmental quality of radioactivity, and to discuss development trends and research priorities.
- b. The proposed workshop products:
  - i. A white paper on information gaps and associated research needs;
  - ii. A white paper that identifies promising new techniques and methodologies.
- c. Budget for the workshop:
 

The WG 30 will request \$7.5 k be allocated for fund travel costs associated with three or four external participants.

## AGENDA ITEM 7

**Outline of WG 30 annual report**

Participants compared WG 30 terms of reference and work plan with work accomplished to date and agreed this will form the basis of the Group’s annual report.

*WG 30 Endnote 1*

**WG 30 participation list**

Members

In-Seong Han (Korea)  
Kathryn Higley (USA, Co-Chair)  
Kyung Tae Jung (Korea)  
John Smith (Canada)  
Tomowo Watanabe (Japan)  
Wen Yu (China)  
Yusheng Zhang (China, Co-Chair)

Observers

Robin Brown (Canada)  
Seokwon Choi (Korea)  
Daeji Kim (Korea)  
Jung Hyup Lee (Korea)  
Delvan Neville (USA)  
He Wu (China)  
Tao Yu (China)

*WG 30 Endnote 2*

**WG 30 meeting agenda**

1. Adoption of the Meeting Agenda
2. Overview and update of the WG-AMR/WG 30
3. Country reports
4. Work Plan
5. Data sharing
6. Workshop proposal for PICES-2015
7. Outline of WG 30 annual report
8. Financial support for the workshop

*WG 30 Endnote 3*

**Proposal for a 1-day Workshop on “Monitoring and assessment of environmental radioactivity in the North Pacific” [revised and renamed from a ½-day Workshop on “Monitoring and assessment of environmental quality of radioactivity in the North Pacific”] at PICES-2015**

Co-Convenors: Yusheng Zhang (China), Kathryn A. Higley (USA)

The Marine Environmental Quality Committee’s area of responsibility is to promote and coordinate marine environmental quality and interdisciplinary research in the North Pacific. This workshop has three objectives: 1. To coordinate with external expert groups, 2. To review the situation and to discuss the information gaps and deficiencies in monitoring and assessment of the Environmental Quality of Radioactivity and its impact on marine ecosystems in the North Pacific, especially since the “3·11” Fukushima Nuclear Accident, and 3. To exchange information on new techniques and methodologies for monitoring and assessment of the environmental quality of radioactivity in the marine environment, and to discuss development trends and research priorities. The main topics of the workshop include: 1. the current situation of environmental quality of radioactivity and its effect on marine ecosystems in the North Pacific, 2. new techniques for the analysis of radionuclides in the marine environment and 3. assessment of the radiological risk to non-human species. The workshop will invite experts in relevant fields, and welcome reports on research and progress in the above topics with regard to the monitoring and assessment on the marine environmental quality of radioactivity in the North Pacific.