

2021 Report of Working Group 47 on *Ecology of Seamounts*

The Working Group on *Ecology of Seamounts* (WG 47) Co-Chairs, Dr. Janelle Curtis (Canada) and Dr. Mai Miyamoto (Japan), convened two virtual business meetings (via Zoom) that focused on introductions of national representatives and observers, discussions of WG 47's terms of reference and exchange of information and ideas about participants' seamount research activities.

An inter-sessional business meeting was held on June 15, 2021 from 22:00 to 24:00 (PDT, +UTC-7) and a business meeting associated with the PICES-2021 virtual Annual Meeting was held on September 20, 2021 from 17:00 to 20:00 (PST, +UTC-8). Both meetings had the same agenda (*WG 47 Endnote 1*). There were seven participants at the inter-sessional meeting (*WG 47 Endnote 2*) and 16 participants at the Annual Meeting (*WG 47 Endnote 3*). Participants at both meetings included WG 47 members, observers, the PICES Secretariat and expert group members.

AGENDA ITEM 3

Introductions and review of members' expertise and research interests

Members, observers, and the PICES Secretariat staff introduced themselves, their expertise and their research interests at both meetings and through email correspondence from July to October 2021. Many participants shared an interest in the work of regional fisheries management organizations (RFMOs) on the identification of vulnerable marine ecosystems (VMEs) on seamounts. Participants were also interested in the spatial ecology of benthic organisms, and many had also supported the research activities of WG 32 on *Biodiversity of Biogenic Habitats*. Some observers were actively engaged in research related to pelagic species associated with seamounts, notably marine birds and mammals, and expressed interest in collaborating with WG 47 members.

AGENDA ITEM 4

Review of WG 47 terms of reference

In Year 1, WG 47 proposed to: (1) gather data on the distribution and life history of species associated with seamounts in the North Pacific Ocean and facilitate their submission to appropriate biodiversity databases (e.g., OBIS), (2) gather data on key environmental variables hypothesized to influence the distribution and diversity of species associated with seamounts, (3) convene a 2-day workshop on modelling the distributions of seamount taxa and (4) convene a business meeting.

- (1) Some participants anticipate contributing to the submission of life history and distribution data to biodiversity databases, including the Ocean Biodiversity Information System (OBIS). Members from Canada and Japan specifically expressed their interest and ability to do so.
- (2) Participants recognized the World Ocean Atlas data used by WG 32 have been updated and are available to WG 47, which will help members identify environmental and ecological predictors of the distribution and biodiversity of seamount taxa in the Northeast Pacific Ocean and develop one or more species distribution models for seamount taxa. Those data may also be used to predict climate-induced changes in the distribution of seamount taxa during the coming years.

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(3) The co-convenors of WG 47’s 2-day workshop on “*Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions*” agreed to postpone the workshop because PICES-2021 was a virtual meeting. They resubmitted their proposal for PICES-2022 in Busan, Korea (*WG 47 Endnote 4*).

(4) As noted above, WG 47 held a business meeting associated with PICES-2021 on September 20, 2021.

Participants also discussed WG 47’s terms of reference for Years 2 and 3.

AGENDA ITEM 5

Review of key scientific outputs

Participants discussed WG 47’s anticipated scientific outputs and recognized that these would begin to take shape when the terms of reference in Years 1 and 2 were completed, although a scientific peer-reviewed paper will be prepared and submitted on the topic of the distribution of seamount taxa if WG 47’s 2-day workshop proposal is accepted by PICES.

WG 47 Endnote 1

Agenda for WG 47’s inter-sessional and annual meetings in 2021

1. Welcome and opening remarks
2. Adoption of agenda and appointment of rapporteur
3. Introductions and review of members’ expertise and research interests
4. Review of WG 47 terms of reference (TOR)
5. Review of key scientific outputs (papers)
6. Other business

WG 47 Endnote 2

WG 47 inter-sessional meeting (June 15, 2021) participation list

Members

Janelle Curtis (Co-Chair, Canada)
Mai Miyamoto (Co-Chair, Japan)
Kenji Taki (Japan)

Members unable to attend

Canada: Cherisse Du Preez, Anders Knudby
China: Jinhui Wang, Zijun Xu
Japan: Nobuaki Suzuki
Korea: Hye-Won Moon, Seanock Woo
Russia: Tatiana Dautova, Alexei Orlov
USA: Amy Baco-Taylor, Les Watling

Observers

Chris Rooper (Fisheries and Oceans Canada)
Jackson Chu (Fisheries and Oceans Canada)
Samuel Georgian (Marine Conservation Institute)

PICES

Sonia Batten (Executive Secretary)

WG 47 Endnote 3**WG 47 Annual Meeting (20 September 2021) participation list**Members

Janelle Curtis (co-chair, Canada)
 Mai Miyamoto (co-chair, Japan)
 Cherisse Du Preez (Canada)
 Kenji Taki (Japan)
 Hidetada Kiyofuji (Japan)
 Sung Yong Kim (Korea)
 Hye-Won Moon (Korea)
 Samuel Georgian (USA)

Members unable to attend

Canada: Anders Knudby
 China: Jinhui Wang, Zijun Xu
 Korea: Seanock Woo
 Russia: Tatiana Dautova, Alexei Orlov
 USA: Amy Baco-Taylor, Les Watling

Observers

Ken Morgan (Canadian Wildlife Service)
 Chris Rooper (Fisheries and Oceans Canada)
 Jackson Chu (Fisheries and Oceans Canada)
 Patrick O'Hara (Co-Chair, S-MBM)
 Jennifer Boldt (FUTURE SSC liaison to WG 47)
 Alex Zavolokin (NPFC)

PICES

Sanae Chiba (Deputy Executive Secretary)
 Saeseul Kim (Intern)

WG 47 Endnote 4**Proposal for a Workshop on**

“Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions” resubmitted for PICES-2022

Co-convenors: Janelle Curtis (Canada), Akash Sastri (Canada), Chris Rooper (Canada), Mai Miyamoto (Japan)

Potential Sponsorship: North Pacific Fisheries Commission

Invited speakers:

Telmo Morato (IMAR Azores & Marine and Environmental Research Centre, Portugal)
 Russ Hopcroft (University of Alaska Fairbanks, USA)
 Peter Miller (Plymouth Marine Laboratory, UK)

Changes in the marine environment influence distribution patterns of marine organisms in pelagic, demersal, and benthic ecosystems associated with seamounts. Biogenic habitats formed by some of these organisms support a range of biodiversity and provide critical habitats for some socioeconomically important fishes and invertebrates that attract commercial fishing and other anthropogenic activities.

This workshop aims to improve our understanding of factors influencing the diversity and distributions of species associated with seamounts in the North Pacific Ocean, identify and begin applying models to understand the ecology and distribution of species associated with seamounts, and predict how they are likely to respond to natural and anthropogenic forcing, including climate change. In preparation for the workshop, participants will build on the work of WG-32 by compiling new and existing data on pelagic, demersal, and

benthic seamount species in the North Pacific Ocean as well as the marine environment to improve model predictions and interpretations based on a multi-model approach.

This workshop builds on quantitative approaches developed in a similar workshop convened by WG-32 in 2016. Applying habitat suitability models for the pelagic, demersal, and benthic biodiversity of seamounts in the North Pacific Ocean will be made for the collective biodiversity in these three ecosystems and for individual taxa, when plausible. Participants will be invited to discuss, compare, and evaluate the influence of predictor variable data, and different modelling approaches on results. This will help identify potential ecological and physiological mechanisms influencing seamount ecology and provide insight into the potential for changes in species distribution under different climate change scenarios. An anticipated novel outcome will be the first habitat predictions for seamount biodiversity at a basin-wide scale in the North Pacific Ocean. Workshop participants will synthesize lessons learned from the modelling exercise, future tasks to further improve predictive accuracy, and possible applications for supporting marine spatial planning processes.

Publication: a scientific peer-reviewed paper