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A summary of 2021 activities by PICES Working Group 47 (WG-47) on Ecology of Seamounts

PICES' Working Group on Ecology of Seamounts (WG-47) was established in 2020 and has been active for almost one year. A description of WG-47 merits, terms of reference, work plan, and anticipated scientific outputs are available at https://meetings.pices.int/members/working-groups/wg47.

In 2021, 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.

Because of the pandemic, many of WG-47's scientific activities were postponed. Nevertheless, WG-47 co-chairs, Dr. Janelle Curtis and Dr. Mai Miyamoto, convened two business meetings that focused on introductions of members and observers, discussions of WG-47's terms of reference and exchanging information and ideas about participants' seamount research activities.

Participants share an interest in the work of regional fisheries management organizations (RFMOs) on the identification of vulnerable marine ecosystems (VMEs) on seamounts. Most participants were interested in the spatial ecology of benthic organisms, and had also supported the research activities of PICES WG-32 on Biodiversity of Biogenic Habitats.

Some WG-47 members anticipate contributing to the submission of life history and distribution data to biodiversity databases, including the Ocean Biodiversity Information System (OBIS). 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. Some participants also have expertise in analyzing climate-induced changes to benthic communities and predicting how their distributions change.

PICES WG-47 on Ecology of Seamounts is convening a two-day Workshop on "Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions" at PICES-2022 in Busan, Korea.

2nd Floor Hakuyo Hall
Tokyo University of Marine Science and Technology
4-5-7 Konan, Minato-ku, Tokyo
108-8477 JAPAN

TEL +81-3-5479-8717
FAX +81-3-5479-8718
Email secretariat@npfc.int
Web www.npfc.int

Because WG-47's workshop is of interest to both PICES and NPFC, the four co-convenors (Dr. Janelle Curtis, Dr. Mai Miyamoto, Dr. Chris Rooper, and Dr. Akash Sastri) are requesting that NPFC co-sponsor this workshop by contributing the equivalent of $5,000 USD.

PICES-2022 WG-47 Workshop Description:
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 PICES WG-32 on the Biodiversity of Biogenic Habitats 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.