

Report of Working Group 32 on *Biodiversity of Biogenic Habitats*

The third business meeting of the Working Group on *Biodiversity of Biogenic Habitats* (WG 32) was held on September 23, 2017 in Vladivostok, Russia, under the chairmanship of Dr. Masashi Kiyota (Japan). Five people participated in the meeting and represented two PICES member countries (**WG 32 Endnote 1**). Several members who could not attend the meeting reported progress on their inter-sessional activities (see **WG 32 Endnote 2**) and/or provided comments through the E-mail communication.

AGENDA ITEM 1

Progress in species distribution modeling of corals and sponges

A progress report by Drs. Chris Rooper (USA), Anders Knudby (Canada) and Samuel Georgian (USA) was provided for the meeting that demonstrated on-going activity in constructing species distribution models for corals and sponges in the North Pacific Ocean. Three lines of research are:

- 1) Compilation of basin-wide environmental variables used in the modeling;
- 2) Procurement of additional records of presence and absence for benthic invertebrate taxa from sources in the North Pacific Ocean;
- 3) Construction of preliminary models for benthic invertebrates.

Work is also proceeding on developing and testing new techniques for species distribution modeling. For example, the modeling team has generated new environmental variables that reflect processes important to biogenic habitats (*e.g.*, angle between sea floor surface and current direction) and has developed a spatial bias grid which can account for and accommodate the spatial biases in species records caused by the prevalence of biological sampling in the eastern North Pacific.

In 2018 WG 32 expects to construct draft models for 6 groups of benthic invertebrates: 1) glass sponges, 2) gorgonian corals, 3) stony corals, 4) sea pens, and 5) shallow-water corals. The environmental variables, models and methodologies will be presented in talks at the proposed Topic Session on “*Indicators for assessing and monitoring biodiversity of biogenic habitats*” at PICES-2018 (see **WG 32 Endnote 3**). These analyses will also form the basis of peer-reviewed manuscripts and reports anticipated at completion of WG 32’s term, proposed for 2018.

AGENDA ITEM 2

Preparation for a topic session and paper submission

Preparation for a topic session

A report on the preparation for the Topic Session on “*Indicators for assessing and monitoring biodiversity of biogenic habitats*” was provided by Dr. Anya Dunham, one of the Co-Convenors. At PICES-2016, WG 32 proposed the Topic Session for the PICES 2017 Annual Meeting which was recommended by Science Board and accepted by Governing Council. Due to operational issues, WG 32 withdrew this Topic Session prior to PICES-2017. Therefore, WG 32 requested:

- 1) A one-year extension to complete WG 32’s terms of reference;
- 2) A Topic Session at PICES-2018 (see resubmitted proposal in **WG 32 Endnote 3**).

Participants discussed possible topics for the Topic Session. There was a question about the definition of the indicators, and participants confirmed that the indicators can include broad categories from physiological to species, community and habitat levels.

Dr. Mai Miyamoto presented her study to evaluate the effectiveness of cold-water corals as community diversity indicator taxa in the Emperor Seamounts region of the western North Pacific. She presented a new method to assess characteristics of benthic communities and to screen for potential indicator taxa based on the analysis of co-occurrence tendencies among benthic animals. Using this technique, she demonstrated the effectiveness of gorgonians and stony corals as indicator taxa that can represent the existence of various benthic taxa.

Dr. Tatiana Dautova presented results of surveys and researches in the northwestern Pacific that indicate high diversity of octocorals in the deep-sea zones of the Russian waters. She pointed out the importance of the Kurile Islands as pathway of cold-water coral diversity and suggested further research on taxonomy, biology and ecology of the cold-water corals in Russian waters.

Dr. Go Suzuki presented the on-going studies of his colleague on the use of environmental DNA (eDNA) as a species diversity indicator for shallow water corals. Laboratory studies and field experiments are in progress to examine the practicability of eDNA for biogenic habitat such as coral reefs.

Participants agreed that these topics will provide good materials for the anticipated Topic Session in 2018.

Paper submission

Dr. Dunham reported the progress of her team on the preparation of two papers addressing indicators for assessing and monitoring biogenic habitats:

- 1) Methods of benthic cover assessment in biogenic habitats;
- 2) Visual survey design for deep water biogenic habitats.

These papers will be presented in the anticipated Topic Session at PICES-2018, and may be refined using input received during the topic session. They will also form the basis of peer-reviewed manuscripts and reports anticipated for completion in 2018.

AGENDA ITEM 3

Collaboration with NPFC on a VME Workshop 2018

The North Pacific Fisheries Commission (NPFC) requested PICES to participate in and co-sponsor an NPFC/FAO Workshop on “*Protection of Vulnerable Marine Ecosystems in the North Pacific Fisheries Commission Area: Applying global experiences to regional assessments*” to be held in Tokyo, Japan in March 2018. WG 32’s parent committee, BIO, will bring this request to the Science Board for further consideration.

Dr. Alexander Zavolokin, Science Manager of the NPFC Secretariat, presented the scope and outline of the VME Workshop. Two PICES experts, Drs. Janelle Curtis and Chris Rooper, will tentatively attend the VME Workshop. Participants discuss about the possible collaboration between PICES and NPFC. PICES experts have ample scientific knowledge on the taxonomy, biology, biodiversity of corals, sponges and other associated organisms as well as the analyses and management of environmental and anthropogenic factors affecting their biodiversity mainly in the area within the national jurisdiction. NPFC scientists are engaged in the management of fisheries and conservation of marine ecosystems in the areas beyond national jurisdictions in the North Pacific. Participants recognized that the collaboration between PICES and NPFC on this issue will

be beneficial to both organizations, and endorsed the collaboration of PICES on the NPFC/FAO VME Workshop.

AGENDA ITEM 4

Other issues

Participation from member countries

A new participant from Russia, Dr. Tatiana A. Dautova was welcomed by the WG members.

Related activities

A report was provided by Dr. H.W. Moon that introduces the Korea–U.S. joint agreement on Vulnerable Marine Ecosystems for examining fisheries bycatch in the Emperor Seamounts region and constructing an identification guide. The program was to fulfil the requirements of UNGA Resolution 61/105, NPRFMO (inter-governmental agreement prior to the establishment of NPFC) and NPFC.

WG 32 Endnote 1

WG 32 participation list

Members

Masashi Kiyota (Co-Chair, Japan)
Go Suzuki (Japan)
Tatiana N. Dautova (Russia)

Observers

Mai Miyamoto (Japan)
Alexander Zavolokin (NPFC)

Members unable to attend

Canada: Janelle Curtis, Anya Dunham, Anders Knudby
China: Jianming Chen, Hui Huang, Keji Jiang, Shufang Liu, Zhuojun Ma, Shu Wang, Feng Zhao
Korea: Kwang-Sik Albert Choi, Hye-Won Moon, Seonock Woo
USA: John M. Guinotte, Chris Rooper, Les Watling

WG 32 Endnote 2

WG 32 meeting agenda

1. Progress in species distribution modeling of corals and sponges
2. Preparation for a topic session and paper submission on indicators for assessing and monitoring biogenic habitats
3. Collaboration with NPFC on VME Workshop 2018
4. Other issues

WG 32 Endnote 3

**Proposal for a Topic Session on
“Indicators for assessing and monitoring biodiversity of biogenic habitats” at PICES-2018**

Duration: 1 day

Convenors: Anya Dunham (Canada), Hye-Won Moon (Korea)

Suggested Invited Speakers: Mary Yoklavich (NOAA, USA); Peter Mumby (University of Queensland, Australia); Peter Houk (University of Guam)

Biogenic habitats formed by corals, sponges, and other structure-forming taxa support high species abundance and biodiversity, including socio-economically important fishes and invertebrates. These habitats are also known to be vulnerable to disturbances from human impacts and climate change. Predicting, assessing, and monitoring shifts in habitat-forming species and associated communities in response to natural and anthropogenic forcing require suites of measurable indicators. The goal of this session is to improve our understanding of ecologically relevant, sensitive, observation-based indicators for assessing and monitoring biogenic habitats. We invite presentations on indicators encompassing single or compound metrics of the marine biota in a broad sense (from physiological to species, community and habitat levels) which could be measured to indicate the condition of biogenic habitats and monitor changes to the habitats and communities they support. Empirical studies and literature reviews on indicator development, assessment, and/or application are invited. WG 32 members and collaborators will present a literature review of documented functional associations between commercially important fish and invertebrate species and biogenic habitats and address methods to incorporate these associations into indicator development. This session will help improve our understanding and ability to identify and characterize changes in biogenic habitats, as well as their recovery potential. The results of this session will help inform management and policy decisions and marine spatial planning processes that can maintain ecosystem biodiversity, structure, and function.