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

The second business meeting of the Working Group on *Biodiversity of Biogenic Habitats* (WG 32) was held on 4 November 2016 in San Diego, USA, under the chairmanship of Dr. Masashi Kiyota (Japan). Fifteen people participated in the meeting and represented five PICES member countries (***WG 32 Endnote 1***). Dr. Kiyota welcomed all participants, including new member from China, Dr. Shufang Liu, to the meeting before conducting business (***WG 32 Endnote 2***).

AGENDA ITEM 2
Summary and follow-up of the workshop W3

WG 32 reviewed the progress made through the 2-day BIO Workshop (W3) on "*Distributions of habitat-forming coral and sponge assemblages in the North Pacific Ocean and factors influencing their distributions*" which was held on November 2 and 3, 2016 antecedent to the WG meeting:

- Potential factors influencing the distribution of deep/shallow water coral species were reviewed, and available data sets relevant to these factors were compiled;
- Species distribution models (SDMs) for deep-water glass sponges and shallow-water corals were developed;
- Impacts of global warming and ocean acidification and regional changes in precipitation and soil flux on shallow-water corals were summarized;
- Future projection modeling of the impacts of climate change and ocean acidification on shallow-water coral species were presented;
- Participants confirmed that the following future projection data would also be applicable to SDMs of deep-water species:
  - sea water temperature,
  - aragonite/calcite concentration related to ocean acidification,
  - water currents and their relation to bottom topography.

The progress on the above items fulfills the terms of reference (TORs) of the WG 32 for Year 2.

Dr. Chris Rooper (USA) presented additional outputs of species distribution models developed for shallow-water corals and deep-water glass sponges. Results of the glass sponge model prompted discussion regarding how future iterations of the model might be improved. A number of good suggestions were offered and will be incorporated into future collaborative modeling that WG 32 will conduct during the inter-sessional period.

Dr. Hye-Won Moon (Korea) made a presentation entitled "*Distribution and diversity of corals in Korea*" that demonstrated changes in coral species composition and distribution in Korean waters and summarized their conservation and monitoring status. Participants noted that such information would fit into the Year 3 TORs of the WG, especially for the purpose of establishing indicators for monitoring the biogenic habitats.

AGENDA ITEM 3
Possible inter-sessional works

Further development and improvement of SDMs and data sets:

- Program code and input data of the SDMs developed during the workshop were shared among the participants. WG 32 will continue the following works during the inter-sessional period:
  - Data treatment (addition of environmental data, data cleaning, variable selection, trial of data thinning and other techniques);
  - Application to other species (*e.g.*, stony corals, gorgonian corals and sea pens);
  - Expansion of the target area to include the entire PICES region of the North Pacific;

- Application and comparison of multiple models, including models that can handle presence/absence type distribution data;
- Application of future projection data.

Dissemination of the results:

- WG 32 discussed the publication of workshop results as original scientific papers. Participants agreed to continue the discussion while checking the progress accomplished through the inter-sessional works.

AGENDA ITEM 4
WG 32 work plan for 2017

Participants recalled that the TORs of WG 32 for Year 3 included following items:

- Review and propose potential indicators for assessing and monitoring diversity of biogenic habitat;
- Review and document commercially important species that are associated with biogenic habitats;
- Prepare scientific reports for dissemination of results.

To accomplish these tasks, Dr. Anya Dunham (Canada) proposed to convene a 1-day Topic Session at PICES-2017 (***WG 32 Endnote 3***). Participants discussed that the Workshop/Topic session should cover both indicators of biogenic habitats and association of commercially important species with these habitats.

AGENDA ITEM 5
Other issues

Nomination of an acting Co-Chair

WG 32 discussed how to supplement the immediate absence of Co-Chair, Dr. Janelle Curtis. Dr. Dunham was nominated by the WG to act as co-chair until Dr. Curtis returns to work.

Membership and participation

WG members asked Dr. Oleg Katugin (observer, Russia) about future participation of Russian scientists in WG 32. He will continue to encourage Russian specialists on cold-water corals to participate at the next meeting of the WG.

WG 32 Endnote 1

WG 32 participation list

Members	Observers
Kwang-Sik Choi (Korea)	Samuel Georgian (USA)
Anya Dunham (Canada)	Oleg Katugin (Russia)
Masashi Kiyota (Co-Chair, Japan)	Naoki H. Kumagai (Japan)
Anders Knudby (Canada)	Qiufen Li (China)
Shufang Liu (China)	Mai Miyamoto (Japan)
Hye-Won Moon (Korea)	Hiroaki Saito (Japan)
Chris Rooper (USA)	Go Suzuki (Japan)
Les Watling (USA)	

Members unable to attend

Canada: Janelle Curtis (Co-Chair)
China: Jianming Chen, Hui Huang, Keji Jiang, Zhuojun Ma, Shu Wang, Feng Zhao
Japan: Takeo Kurihara
Korea: Seonock Woo
Russia: Tatyana Dautova
USA: John Guinotte

WG 32 Endnote 2

WG 32 meeting agenda

1. Welcome
2. Summary and follow-up of the workshop W3
3. Possible intersessional works
4. WG32 work plan for 2017
4. Other issues

WG 32 Endnote 3

Proposal for a 1-day Topic Session on
***"Indicators for assessing and monitoring biodiversity of biogenic habitats"* at PICES-2017**

Duration: 1 day

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

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

Session Description

Biogenic habitats formed by corals, sponges, and other structure-forming taxa support a broad range of biodiversity, including socio-economically important fishes and invertebrates, and are known to be vulnerable to disturbances. 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 state of, or monitor impact to, biogenic 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 potential ways to incorporate these associations into indicator development. In line with PICES 2017 theme, this session will help improve our understanding and ability to identify and characterize changes in biogenic habitats, as well as their recovery potential. It will help inform management and policy decisions and marine spatial planning processes to maintain ecosystem biodiversity, structure, and function.

Co-sponsoring organization(s): TBD

Publications: primary paper(s)