

Report of Working Group on Jellyfish Blooms around the North Pacific Rim: Causes and Consequences

The Working Group on *Jellyfish Blooms around the North Pacific Rim: Causes and Consequences* (WG 26) held its first meeting from 14:00 to 19:15 h on October 15, 2011 in Khabarovsk, Russia, under the local chairmanship of Prof. Shin-ichi Uye (Japan) and remote chairmanship of Dr. Richard Brodeur (USA). A total of 14 members and 5 observers participated in the meeting (*WG 26 Endnote 1*). The agenda for the meeting can be found in *WG 26 Endnote 2*.

AGENDA ITEM 2

Objectives and goals of WG 26

The Group confirmed the objectives and goals based on the Terms of Reference for WG-26.

Overview of jellyfish blooms and related research in members' countries

1. Canadian Pacific waters was reviewed by Lucas Brotz. He also provided an overview of the global picture of jellyfish blooms that he had studied for his recent Master's thesis.
2. Chinese waters was reviewed by Siqing Chen and Zijun Xu. Dr. Chen described the results of a national project on the Key Process, Mechanism and Ecological Consequences of Jellyfish Blooms in China Coastal Waters. Dr. Xu explained another national project, mainly focusing on the establishment of a monitoring system for early warning of possible jellyfish blooms.
3. Jellyfish in Japanese waters was reviewed by Hideki Akiyama and Shin-ichi Uye. Dr. Akiyama reported a China-Japan-Korea International Project on the Giant Jellyfish Bloom. Prof. Uye summarised the results of studies carried on under the Prediction and Control of Jellyfish Outbreak (STOPJELLY) Project.
4. Jellyfish in Korean waters was reviewed by Dr. Changhoon Han.
5. Jellyfish in Russian Pacific waters was reviewed by Dr. Alexander Zavolokin.
6. Jellyfish in U.S. Pacific waters was reviewed by Dr. Jennifer Purcell.

AGENDA ITEM 3

Draft outline for Working Group report

Following a brief explanation by Prof. Uye on the tentative outline of working group report, WG 26 discussed the viewpoint, target, structure, *etc.* of the report. The Co-Chairs will revise the tentative outline and email the members for further comments. Collaborative studies among PICES member countries were proposed to tackle some topics, such as sampling problems.

AGENDA ITEM 4

Proposal of a jellyfish blooms topic session at PICES-2012

Prof. Uye reported on a proposal for a topic session at PICES 2012 in Hiroshima that was submitted to the BIO Committee (*WG 26 Endnote 3*). The proposal is entitled "*Jellyfish in marine ecosystems and their interactions with fish and fisheries*". Because of high importance and popularity of the topic, the Co-Chairs believe that it is likely to be approved. This 1-day topic session will be a good opportunity to show WG 26 activity to the PICES community.

WG 26-2011

AGENDA ITEM 5

Change of co-chair

The current Co-Chair from Korea, Dr. Young-Shil Kang, will be replaced with Dr. Won-Duk Yoon.

AGENDA ITEM 6

Closing

Prof. Uye expressed his thanks to all participants for their enthusiastic discussion and cooperation for making the first Working Group meeting successful.

WG 26 Endnote 1

WG 26 participation list

Members

Hideki Akiyama (Japan)
Richard Brodeur* (USA, Co-Chairman)
Lucas Brotz (Canada)
Siqing Chen (China)
Kristin Cieciel (USA)
Elena Dulepova (Russia)
John Field (USA)
Changhoon Han (Korea)
Haruto Ishii (Japan)
Xinming Pu (China)
Jennifer Purcell (USA)
Shin-ichi Uye (Japan, Co-Chairman)
Zijun Xu (China)
Alexander Zavolokin (Russia)

Observers

Sonia Batten (Canada)
David Checkley (USA)
Cynthia Suchman (USA)
YongJiu Xu (China)
Mingyuan Zhu (China)

*via Skype

WG 26 Endnote 1

WG 26 meeting agenda

1. Opening remarks
2. Objectives and goals of WG 26
3. Draft outline for the Working Group report
4. Proposal of a jellyfish blooms topic session at PICES-2012
5. Change of co-chair
6. Closing

WG 26 Endnote 3**Proposal for a 1-day BIO/FIS Topic Session at PICES-2012 on
"Jellyfish in marine ecosystems and their interactions with fish and fisheries"**

Convenors: Shin-Ichi Uye (Japan), Richard Brodeur (USA), Song Sun (China), Won-Duk Yoon (Korea)

Evidence is accumulating that gelatinous zooplankton populations have increased substantially in many regions of the world, most likely through anthropogenic stresses, but we have insufficient understanding of how these blooms affect fish and, more broadly, marine ecosystems. Some benefits of jellyfish to marine fish include provisioning of food for some species and shelter for juvenile stages of several others. There is also a relatively minor human benefit in that some jellyfish are both commercially fished and cultured for human consumption in several countries. However, the negative effects of jellyfish population outbursts are thought to greatly exceed any positive ones and their effects on ecosystems and the economies that depend on them can be profound. These effects have been examined through field studies, controlled laboratory experiments, and estimated using quantitative ecosystem models. Jellyfish are generally detrimental to fish because they feed on zooplankton and ichthyoplankton, and so are both predators and potential competitors of fish. Relatively little of the energy consumed by gelatinous zooplankton ends up at higher trophic levels of interest to humans compared to krill and forage fishes. Jellyfish blooms also directly impact commercial fisheries through filling or clogging trawls and fouling fixed gear and aquaculture net pens, resulting in enormous economic losses worldwide. This session will focus on empirical field, laboratory, or modeling studies that examine the effects jellyfish have on marine ecosystems, fish species and fisheries, and relevant ecosystem-based management issues important to the needs of society over wide-ranging space and time-scales up to and including climate variations.