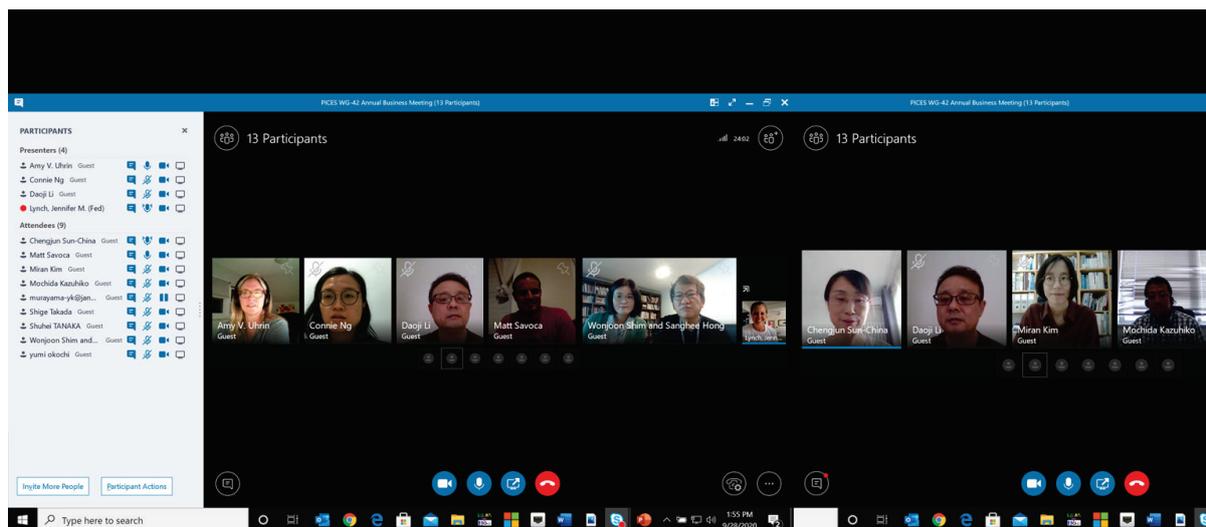


Report of Working Group on *Indicators of Marine Plastic Pollution*

The Working Group on *Indicators of Marine Plastic Pollution* (WG 42) held its meeting on September 28 to 30, 2020, virtually during PICES-2020. Thirteen members and four observers were in attendance over the 3 days (*WG 42 Endnote 1*). The meeting was co-chaired by Drs. Jennifer Lynch and Chengjun Sun who welcomed the participants. After calling the meeting to order, Drs. Lynch and Sun reviewed the meeting agenda. The agenda was adopted (*WG 42 Endnote 2*).



WG 42 meeting participants on one day of its virtual meeting during PICES-2020.

AGENDA ITEMS 3 AND 9

Achievements

Dr. Jennifer Lynch reviewed the presentation given to MEQ on September 22, 2020. The Working Group met via Skype on February 25 and June 2 in 2020. Sarah Dudas (Canada) was added as a new member in July 2020. Working Group members presented at at least three conferences in 2020. We are working towards five companion review articles regarding plastic pollution indicators in the North Pacific. We postponed our approved (at PICES-2019) Topic Session on “*Using environmental indicators to assess baselines, targets, and risk of plastic pollution in the North Pacific*” to the in-person PICES-2021 meeting. We requested open access publication fees from PICES; fees for only one of the five will be considered. We discussed extending our term, but it is still too early to tell if we need this or it will be approved.

AGENDA ITEMS 4 AND 5

Paper progress presentations

1. Sea surface and water column - Dr. Wonjoon Shim presented progress with data entered from 86 papers from a literature search and graphs made. Suggested indicator: $300 \mu\text{m}$ manta/neuston surface tow quantifying # of particles/ km^2 or particles/ m^3 .
2. Shoreline - Dr. Amy Uhrin presented progress with a literature search with approximately 89 papers to review. We discussed spatial scales. Suggested indicator: NOAA standing stock by area method quantifying # of pieces/ m^2 , mass of plastic/ m^2 , # of pieces/linear m, or mass of plastic/linear m.

3. Sediment and seafloor – Dr. Shuhei Tanaka presented progress with a literature search with approximately 171 papers collected for sediments globally including freshwater and other ocean basins. Suggested indicator: whichever is the dominant method from the review quantifying items/kg, items/m³, items/L, or mass/kg. We discussed how important it is to provide all raw metadata so that conversions among units are possible.
4. Biota ingestion – Dr. Matthew Savoca presented progress with a literature search resulting in <100 papers. We discussed other published reviews on this topic and existing programs that could be leveraged. Next steps are to create a rubric to score indicators. Suggested indicators: albatross, fulmar (missing W Pacific seabirds), loggerhead/green, mahi, lancet fish, anchovy, marine mammal feces, bivalve quantifying # items/individual, frequency of occurrence, mass/individual, mass/body mass, mass/GI tract mass.
5. Biota entanglement – Dr. Jennifer Lynch presented limited progress. A systematic literature search has not been done, but approximately 60 papers have been obtained. We discussed other published reviews on this topic and existing programs that could be leveraged. Suggested indicators: drone photography of marine mammal scars, leverage existing program in sea turtle strandings, bird monitoring quantifying frequency of occurrence.

AGENDA ITEMS 6 and 8

Review article timeline and journal selection

The following timeline was agreed upon. Each paper will have a breakout group meeting by end of November 2020. The next WG 42 meeting would be in January 2021 where we will discuss paper progress, indicator selections, and target reduction recommendations. Literature beyond January 2021 will not necessarily be included. Co-author review will begin May 2021, WG 42 review will start June 2021, agency internal reviews will start in August 2021, and journal submission is targeted for October 2021.

Environmental Pollution journal is interested in our companion review articles. There is no fee for regular submission, but the fee for open access is \$3550 per paper. Dr. Takada requested we look at submitting to *Environmental Monitoring and Contaminants Research* (EMCR), a new journal.

AGENDA ITEM 7

NOWPAP and other regions activities

Dr. Lynch shared communication as requested from NOWPAP activities. Dr. Ning Liu is Programme officer of NOWPAP, and he coordinates NOWPAP's marine litter activities. Dr. Takafumi Yoshida stated that one of the Regional Activity Centres of NOWPAP, POMRAC, is developing Ecological Quality Objectives (EcoQO) for the NOWPAP region. In the EcoQOs, marine pollution, including marine litter and microplastics, are future targeted Objectives. If WG 42 recommended a target/goal for plastic pollution from scientific knowledge, the information would be used for establishing NOWPAP's target. Dr. Yegor Volovik requested that Dr. Lynch share this email, "*Despite quite a difference between PICES with its strong scientific focus and NOWPAP with more engagement with ministries and governmental employees, we do find many dots we can connect for the benefits of both organisations. Let me reciprocate on some ideas you came up with in your message below:*

1. Marine Litter/Plastics EQOs and targets. *NOWPAP strongly supports your proposal to strengthen our collaboration in this field. You are right that PICES' recommendations for EQOs and targets are expected earlier than those in the NOWPAP region. However, our Regional Activity Centres and experts have expressed their interest in testing those in the NOWPAP region. One of our experts also proposed*

to extend those to the river runoff to ensure source-to-sea approach. Certainly, more technical discussions are required to shape up the cooperation to both organisations' benefit, but we are happy to move this way.

2. Experts and Sharing of Experiences. *We have a Regional Action Plan on Marine Litter (RAP MALI) for the NOWPAP region. Each member state has nominated a Focal Point (FP). However, these people are not scientists but mostly government employees, so if the need for stronger cooperation between PICES WG 42 and NOWPAP is supported, NOWPAP can ask the existing FPs to nominate experts to support the cooperation with PICES. This will allow us to strengthen the capacity of FPs and ensure a solid scientific approach. Similarly, PICES could assign a contact point(s) to keep the communication channel between PICES WG 42 and NOWPAP team operational. **WG 42 assigned Drs. Lynch and Sun as points of contact with NOWPAP.***
3. *NOWPAP is implementing a Special Project and has a Working Group on Microplastics. The 3rd Overview of Marine Litter is currently being finalised. NOWPAP will be happy to find some entry points for cooperation as well.*
4. *In terms of points of contract from NOWPAP's POMRAC (Russia), which could provide more information and insight on what POMRAC is doing, are Dr. Yana Blinovskaya (blinovskaya@hotmail.com) and Mr. Nikolay Kozlovsky (geo@tigdvo.ru). **This resulted in Russia approving Dr. Blinovskaya to join us as a member to WG 42.***
5. *And lastly, regarding a presentation of NOWPAP at the WG 42 Business Meeting starting tomorrow. As the notice is so short, I have requested our team to re-jiggle their schedules if possible, but the time difference is an issue. Maybe we can use another chance when we have more clarity on where we can move from here. Meanwhile, if you could present these points in general to the meeting, this will be sufficient for now, I think."*

Dr. Savoca reported that the Arctic Monitoring and Assessment Programme (AMAP) is working on indicators for plastic pollution, and point of contact is Dr. Jennifer Provencher. **This resulted in Drs. Savoca and Lynch meeting with Dr. Provencher, and AMAP draft documents will be shared with WG 42 to help guide our review articles.**

Dr. Sun described WestPAC's activities. WESTPAC has done three training workshops over the past three years on the Distribution, Source, Fate and Impacts of Marine Microplastics in Asia and the Pacific. Workshop in 2020 was not held due to COVID-19. We will keep our connection with WESTPAC for information exchange if needed.

AGENDA ITEM 10

Term extension

WG 42 will wait to request an extension after seeing our progress through mid-2021.

AGENDA ITEM 11

Other business

- PacifiChem has been rescheduled for December 16 – 21, 2021 in Honolulu, Hawaii;
- The *Microplastics and Nanoplastics* journal is now open at : <https://microplastics.springeropen.com/submission-guidelines/aims-and-scope>;
- Hawaii Pacific University is selling a polymer standards kit;
- Hawaii Pacific University is sourcing derelict fishing gear washing ashore in Hawaii, and could use help with translation, survey participants, fisheries contacts.

WG 42 Endnote 1

WG 42 participation list

Members

Jennifer M. Lynch (USA, Co-Chair)
Chengjun Sun (China, Co-Chair)
Sang Hee Hong (Korea)
Mochida Kazuhiko (Japan)
Miran Kim (Korea)
Daoji Li (Korea)
Kazuhiko Mochida (Japan)
Connie Ka-yan Ng (China)
Matthew Savoca (USA)
Wonjoon Shim (Korea)
Hideshige Takada (Japan)
Shuhei Tanaka (Japan)
Amy Uhrin (USA)

Members unable to attend

Canada: Sarah Dudas, Peter S. Ross
China: Juying Wang
Korea: Seung-Kyu Kim

Observers

Murayama Yuka (Japan)
Yumi Okochi (Japan NUS Co., Ltd.)
Lixin Zhu (China)
Jiaya Yu (China)

WG 42 Endnote 2

WG 42 meeting agenda

1. Welcome and adoption of agenda
2. Review of WG 42 mission and Terms of Reference
3. Achievements of WG 42
4. Revisit the template for review articles and Google Share Drive structure and function
5. Reports from each review article lead
6. Discuss timeline and journal selection for review article submission
7. Share NOWPAP announcement; plans to set an EcoQO
8. Schedule future online meetings and activities before PICES-2021
9. Discuss 2021 topic session
10. Discuss proposal to extend the term of WG 42
11. Other business