Thematic Session I: Strategies in Monitoring

- Dr. Jennifer Provencher, Wildlife Health Unit Head, Canadian Wildlife Service, Environment & Climate Change Canada, Representing AMAP
- Tiina Kurvits, Project Manager, Grid-Arendal
- Dr. Melanie Bergmann, Marine Ecologist, Alfred Wegener Institute
- Nancy Wallace, Director, NOAA Marine Debris Program
Workshop on Arctic Plastic Pollution
30-31 October 2019

Thematic Session 1: Strategies in Monitoring
AMAP monitoring initiatives

Dr. Jennifer Provencher, Wildlife Health Unit Head, Canadian Wildlife Service, Environment & Climate Change Canada
Variation in plastics ingestion in seabirds across large spatial scales

OSPAR Ecological Quality Objective (EcoQO) target
Cooperation and coordination among the Arctic Council WGs

Arctic Migratory Birds Initiative (AMBI)
- Fulmars
- Eiders
- Murres
- Gulls
- Kittiwakes
- Skuas

Litter and Microplastic Expert Group (LMEG)
- Seabirds
- Polymer ID
- Accountability metrics
- Data management
- Monitoring Assessment

Microplastic Expert Group
- Regional Action Plans

Actions
- Measurable targets

Seabird and Plastics work supported by PSI

Cooperation and coordination among the Arctic Council WGs
Key findings from PAME desktop study

Tiina Kurvits, Project Manager, Grid-Arendal
The pathways for marine litter into and round the Arctic

- Oceanic Transport (Currents and sea-ice drift)
- Riverine Transport (Potentially important)
- Atmospheric Transport
- Biological Transport

Population in the Ob’, Yenisey and Lena watersheds, which extend beyond Arctic boundaries, is 38 million people, an order of magnitude larger than the population of the entire Arctic region.
Some key messages

• **Land based sources are currently not as important as sea-based sources**, which is different to most regions of world (where marine litter is strongly correlated with human population densities on land).

• **Fisheries** is a major source of marine litter
  • Aquaculture, passenger and goods, shipping, and oil and gas exploration activities constitute additional sea-based sources.

• For land-based sources, **deficient waste and wastewater management systems in some coastal Arctic communities** are an important localized source of marine litter.

• **Arctic acts as a sink, receiving marine plastic from elsewhere**, but the proportion of marine litter, including microplastics, arriving from distant sources is difficult to gauge against the local sources

• **Marine litter can be found in all reservoirs** (sea ice, sediments, water column, food chain)

• **Contribution of rivers still a question mark** and deserves further research
Pathways of marine plastic

Dr. Melanie Bergmann, Marine Ecologist, Alfred Wegener Institute
Time Series of Debris on Deep Ocean Floor

2500 m water depth

(Bergmann & Klages 2012; Tekman et al. 2017, Deep-Sea Res; Dirksen unpubl.)

Marine debris increases on the deep Arctic seafloor
Sample plastic debris in different ecosystem compartments to identify sinks and pathways. Repeat measurements to deduce temporal trends.

Plastic accumulates in deep-sea sediments and sea ice.

(Based on: Bergmann & Klages 2012, Bergmann et al. 2016; 2017; 2019; Peeken et al. 2018; Tekman et al. 2016; in rev.)
Arctic Marine Debris

Nancy Wallace, Director, NOAA Marine Debris Program
Arctic Marine Debris – Actions, Challenges, Opportunities

- USFWS MDMAP Data Analysis
- Pribilof Islands MD UAS Survey Imagery
- NPS Arctic MD Removal Sites
Discussions/Questions
Discussion points

• What are the most important things we should be monitoring if we can’t track everything?
• How do we coordinate the differences between harmonization and standardization?
• What information do we want from monitoring?
• What are the target regions for actions and monitoring?
• What strategies are being used globally that may be useful in an Arctic context?
• How can scientific collaboration among Arctic states simplify the monitoring process?
• What strategies can Arctic nations use to meet monitoring needs?