An overview of AMAP's recently formed Litter and Microplastics Expert Group

Peter Murphy, NOAA Marine Debris Program (*Genwest*)

PICES Annual Meeting

October 24, 2019

Outline

1) NOAA Marine Debris Program
2) Marine Litter in the Arctic
3) Arctic Council + Marine Litter
4) AMAP Marine Litter Expert Group
   - Project
   - Plan
   - Timeline
5) Questions?

NOAA MDP + Arctic Marine Debris – Actions, Challenges, Opportunities

NOAA Marine Debris Program

- Established in 2006 by Congress as the federal lead for marine debris
- Regional Coordination
- Pillars:
  - Removal
  - Research
  - Prevention
  - Response
- Arctic + Alaska
  - Seasonality
  - Debris Composition
  - Disposal Challenges

Marine Litter in the Arctic

EARTH

Airborne Plastic Is Blowing All the Way to the Arctic

Tiny plastic particles have turned up in samples of Arctic snow, pointing to their ubiquity in the environment

Ice in Canadian arctic contaminated with microplastics, scientists find

Arctic Council eyes action plan to reduce Arctic marine litter, microplastics

"Inuit communities can be a part of the solutions in prevention and cleanup"

Russian Scientists Find Microplastics Along 'Entire' Arctic Sea Route

Oct. 9, 2019

Plastic pollution is seeping into the Arctic, here's how we can prevent it

MICROPLASTICS

Just One Tea Bag Can Release Billions of Microscopic Plastic Particles Into Your Drink, Study Finds

EARTH

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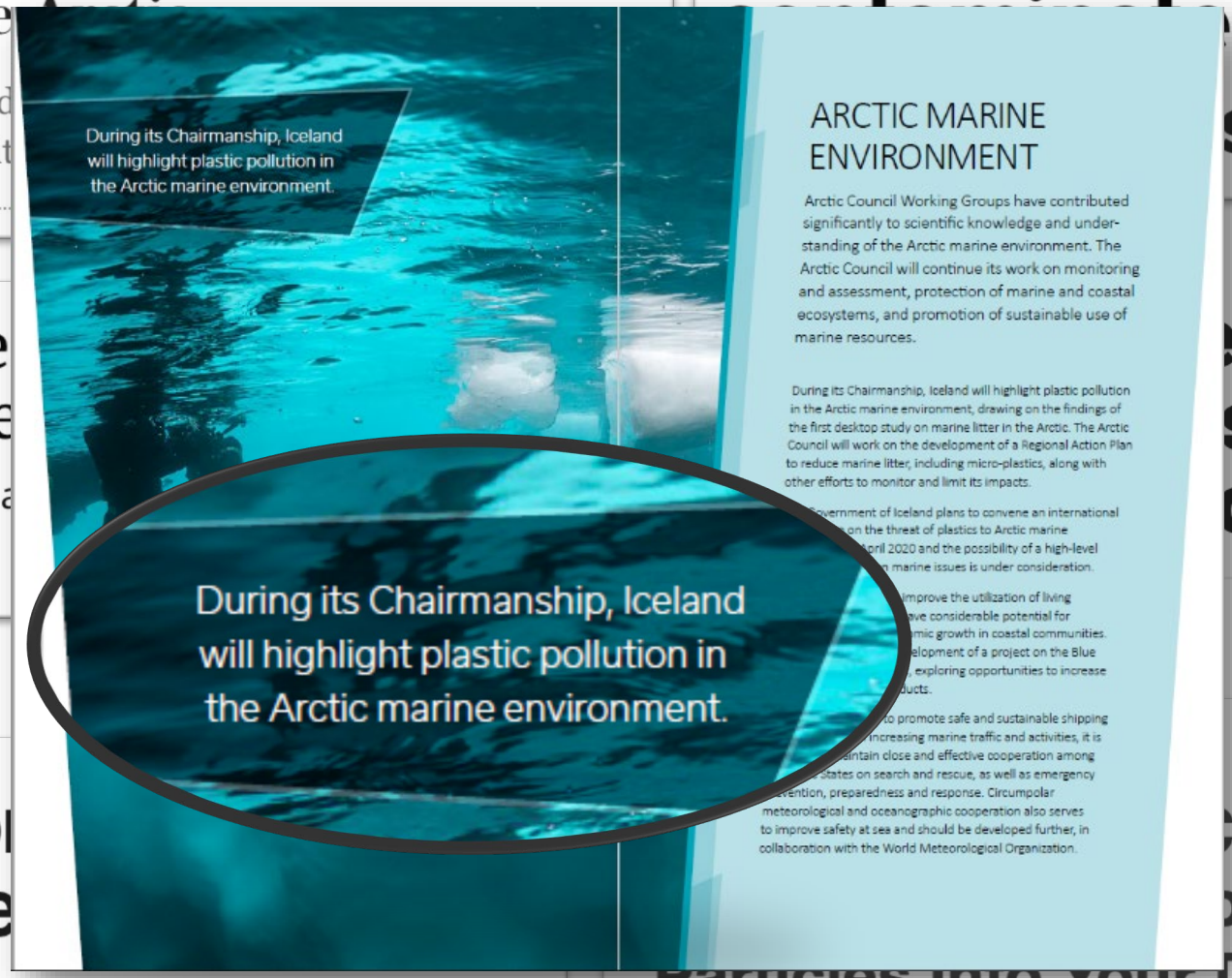

Arctic Council Structure

2017-2019 Finnish Chairmanship
2019-2021 Icelandic Chairmanship

Ministers

↕

Senior Arctic Officials (SAOs)

↕

Working groups

Arctic Monitoring and Assessment Program (AMAP)
Chair: Sweden

Arctic Contaminants Action Program (ACAP)
Chair: Norway

Conservation of Arctic Flora and Fauna (CAFF)
Chair: Sweden

Emergency Prevention and Preparedness and Response (EPPR)
Chair: Kingdom of Denmark

Protection of the Arctic Marine Environment (PAME)
Chair: Finland

Sustainable Development Working Goup (SDWG)
Chair: Iceland

ARCTIC COUNCIL

Canada
Finland
Iceland
Kingdom of Denmark
Norway
Sweden
Russia
USA

AMAP Projects

AMAPs geographical coverage extends from

- High Arctic to the sub Arctic areas
- including associated marine areas of
  - Canada,
  - the Kingdom of Denmark (Greenland and the Faroe Islands)
  - Finland
  - Iceland
  - Norway
  - the Russian Federation
  - Sweden
  - United States

AMAPs work addresses circum-Arctic issues within the context of global systems - these are intimately connected.

ARCTIC COUNCIL

PAME
Protection of the Arctic Marine Environment

- **Desktop study** of plastics in the Arctic
- **Regional Action plan** for reducing plastics in Arctic
- *Focus on regional actions that can be taken by nations throughout the Arctic*

AMAP
Arctic Monitoring and Assessment Programme

- **Litter and Microplastic Expert Group**
- **Monitoring Tool Assessment** - Focuses on what monitoring tools can be used across the Arctic
- *Next phase with include assessment of effects*

CAFF
Conservation of Arctic Flora and Fauna

- **Arctic Migratory Birds Initiative** (AMBI) seabird plastic project co-created by Canada
- *Current project underway with Arctic Council Project Support Instrument funding to develop seabird monitoring tools for plastics throughout the Arctic*

AMAP Litter and Microplastics Expert Group *(LMEG)*

- **GOAL** - Assessment of monitoring for marine litter in the Arctic
- **ORIGIN** - Formed in 2019 by AMAP Board
- **LEADERSHIP**
  - Norway (Eivind Farmen)
  - Canada (Jennifer Provencher)
- **MEMBERSHIP**
  - All 8 AC states, plus observers
- **TIMELINE** –
  - **”Zero Draft”** in process
  - **Workshop** - Copenhagen 13-14 November 2019
  - **Review/Feedback** – late 2020
  - **Goal of finalization** - early 2021

AMAP LMEG Membership

Country	Number of Experts (as of October 10, 2019)	Topical contributions
Canada	8	Birds, mammals, fish, air, water, soil, sediments, community based monitoring, beaches, ecotoxicology
Denmark	4	Beaches
Faroe Islands	2	Birds, fish
Germany*	5	Polymer types, ice, water, air
Iceland	2	Marine bivalves, invertebrates, ecotoxicology
Italy*	2	Mammals, water, ice
Norway	10	Birds, fish, mammals, air, water, sediments, invertebrates, modelling, ecotoxicology
Sweden	3	Sediments, invertebrates
USA	2	Beaches, birds

AMAP LMEG - Relation to Other Initiatives

National Programs

Environment and Climate Change Canada
Environnement et Changement climatique Canada

Indigenous and Northern Affairs Canada

NORWEGIAN ENVIRONMENT AGENCY

NORSK·POLARINSTITUTT

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

UNIVERSITATIS ISLANDIAE SIGILLUM

NATUR VÅRDS VERKET

HAVSTOVAN
FAROE MARINE RESEARCH INSTITUTE

Ministry of Environment and Food of Denmark
Environmental Protection Agency

Arctic Council

AMAP
Arctic Monitoring and Assessment Programme

PAME
Protection of the Arctic Marine Environment

CAFF
Conservation of Arctic Flora and Fauna

International

ICES
CIEM

PICES

GESAMP
Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection

AMAP LMEG First Assessment Project - Goals

- Support baseline monitoring in the Arctic
- Provide a toolbox of monitoring strategies that can be used to support:
  - Regional Action Plans
  - Assessment of most effective strategies for clean-up and prevention
- Catalyst to conversations among experts for cross-comparable and harmonized approaches in the Arctic, and beyond
- Sets the stage for effects studies based in the Arctic that may be done in the future
- Allow spatial and temporal comparisons to be made in the future, similar to other AMAP assessments (e.g. Mercury, POPS, etc.)

AMAP LMEG First Assessment Project

Cross-cutting chapters		Compartment specific chapters
Importance of Standardized Monitoring Approaches		Air
Existing Frameworks for Monitoring Plastics		Water (marine and freshwater)
The need for Harmonized Sampling procedures and Standardized Processing and Reporting procedures		Sediments (marine and freshwater)
Types of monitoring programs		Terrestrial soils
Synergies with monitoring programmes such as contaminant monitoring, population monitoring etc.		Ice and snow (from lakes and rivers, glacier cores, sea ice)
Accountability metrics		Beaches
Data treatment, management and reporting		Invertebrates; Benthic, Pelagic
Polymer Identification methods		Fish
Plastic processing once they are removed from different matrices		Birds
Modelling		Mammals

The Expert Group has proposed three phases:

Phase 1 - 2019-2021:

- General state of the knowledge in relation to monitoring of marine litter in the Arctic
  - Directly stems from the desktop study completed by PAME
- Synthesizing the work by CAFF in relation to seabirds as monitors of plastic pollution
- **Create a tool box of approaches to implement litter and microplastic monitoring that can be harmonized**
- Support future spatial and temporal comparison work

Phase 2 - 2021-2023:

- Assessment of the state of the knowledge on effects of plastic pollution
  - Similar to other assessments done by AMAP examining the biological effects of contaminants
    - Both physical and chemical effects will be considered

Phase 3 - 2023-2025:

- Examination and synthesis of spatial and temporal trends, building on phase 1 and the implemented monitoring
  - Similar to other trend assessments under AMAP
  - May include Power Analysis to help refine monitoring program implementation