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 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
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.

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

“Inuit communities can be a part of the solutions in prevention and cleanup.”

Ice in Canadian arctic contaminated with microplastics, scientists find

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

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

Airborne Plastic Is Blowing All the Way to the Arctic

Tiny plastic particles have turned up in remote Arctic locations, posing real dangers to the environment and the Inuit communities that live there.

Arctic Council eyes plan to clean up Arctic marine litter

"Inuit communities can be a part of the problem or the solution," said Nadeen Vokes, a marine biologist with the Arctic Council.

Plastic pollution in the Arctic, here's how to prevent it

"The Arctic is under assault from plastic pollution," said Dr. Jane Goodall, a renowned conservationist.

Ice in Canadian arctic melting faster, scientists find

Scientists have found that ice in the Canadian Arctic is melting faster than ever before, with devastating consequences for the environment and the Inuit communities依赖

Scientists Find Microparticles Along ‘Entire’ Arctic Route

A new study has revealed that microplastics and other microparticles are present along the entire Arctic route, posing a threat to marine life.

Can Release Topical Plastic Particles Into Your Drink, Study Finds

A new study has shown that topical plastic particles can be released into your drink, potentially posing a risk to your health.

During its Chairmanship, Iceland will highlight plastic pollution in the Arctic marine environment.

"During its Chairmanship, Iceland will focus on the problem of plastic pollution in the Arctic marine environment," said Iceland’s Prime Minister, Katrin Jakobsdottir.

ARCTIC MARINE ENVIRONMENT

Andres Cordone, Working Groups have contributed significantly to the scientific knowledge and understanding of the Arctic marine environment. The Arctic Council will continue its work on monitoring and assessment, protection of marine and coastal ecosystems, and promotion of sustainable use of marine resources.

"During its Chairmanship, Iceland will highlight plastic pollution in the Arctic marine environment, drawing on the findings of the first dedicated study on this issue. The emphasis will be on the development of a Regional Action Plan to address marine litter, including microplastics, along with other efforts to monitor and limit its impacts."

"Plastic pollution is a significant threat to the Arctic marine ecosystem and our ability to monitor and address this issue will be crucial. We will work closely with our partners, including the United Kingdom, to strengthen the Arctic Council’s role in this area."

"The Arctic Council has a unique opportunity to lead the fight against plastic pollution in the Arctic, and we are committed to doing our part. We look forward to working closely with our colleagues on this important issue."
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 Group (SDWG)
Chair: Iceland

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.
- 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

- 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

- 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

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Experts (as of October 10, 2019)</th>
<th>Topical contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>8</td>
<td>Birds, mammals, fish, air, water, soil, sediments, community based monitoring, beaches, ecotoxicology</td>
</tr>
<tr>
<td>Denmark</td>
<td>4</td>
<td>Beaches</td>
</tr>
<tr>
<td>Faroe Islands</td>
<td>2</td>
<td>Birds, fish</td>
</tr>
<tr>
<td>Germany*</td>
<td>5</td>
<td>Polymer types, ice, water, air</td>
</tr>
<tr>
<td>Iceland</td>
<td>2</td>
<td>Marine bivalves, invertebrates, ecotoxicology</td>
</tr>
<tr>
<td>Italy*</td>
<td>2</td>
<td>Mammals, water, ice</td>
</tr>
<tr>
<td>Norway</td>
<td>10</td>
<td>Birds, fish, mammals, air, water, sediments, invertebrates, modelling, ecotoxicology</td>
</tr>
<tr>
<td>Sweden</td>
<td>3</td>
<td>Sediments, invertebrates</td>
</tr>
<tr>
<td>USA</td>
<td>2</td>
<td>Beaches, birds</td>
</tr>
</tbody>
</table>
AMAP LMEG - Relation to Other Initiatives

National Programs

- Environment and Climate Change Canada
- Indigenous and Northern Affairs Canada
- Norwegian Environment Agency
- Norsk Polarinstitutt
- Nansen Legacy
- Ministry of Environment and Food of Denmark
- Natural Resources Canada
- NOAA
- Universitat Àgilada de Igualada

Arctic Council

- AMAP
- ICES

International

- ICES CIEM
- PICES
- GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection)
- CAFF (Conservation of Arctic Flora and Fauna)
- PAME (Protection of the Arctic Marine Environment)
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

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