Desktop Study on Marine Litter including Micro-plastics in the Arctic

**1st Draft Outline 22 January 2018**

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# Background

Marine litter is one of the most pervasive pollution problems affecting the marine environment globally (citations? maybe- [UNEP, 2009](https://www.frontiersin.org/articles/10.3389/fmars.2015.00003/full#B57); [UNGA, 2012](https://www.frontiersin.org/articles/10.3389/fmars.2015.00003/full#B58); GOC, 2014).. The United Nations Environment Programme (UNEP) defines marine litter as ‘any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment’. Marine litter consists of items that have been made or used by people and deliberately discarded into the sea or rivers or on beaches; brought indirectly to the sea with rivers, sewage, storm water or winds; or accidentally lost, including material lost at sea in bad weather.[[1]](#footnote-1) The universal challenge of addressing and managing marine litter is a useful illustration of the global and transboundary nature of many marine environmental problems.

Plastics account for 60 to 80 percent of all marine litter (Gregory and Ryan, 1997). It is estimated that more than 150 million tonnes of plastics have accumulated in the world's oceans, and 4.6-12.7 million tonnes are added every year (Jambeck et al. 2015). Land-based sources are estimated to be responsible for approximately 80 percent of marine litter, though there are regional fluctuations, e.g., in the Northeast Atlantic, shipping and fishing activities may be significant sources of litter (reference [here](https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/The-ocean-plastic-pollution-challenge-Grantham-BP-19_web.pdf); Galgani et al. 2010).

Arctic Council Ministers adopted the [*Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities (Arctic RPA)*](http://pame.is/index.php/projects/rpa-reports) in 1998 and updated it in 2009. The Arctic-RPA is a dynamic programme of action that uses a step-wise approach for its implementation and recognizes the continually evolving situation in the Arctic environment and the need for an integrated approach. It is the regional extension of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA), and as such provides a framework for addressing the main pollution source categories and responding to the global concerns. Marine litter is one of eight contaminants sources of concern to the Arctic marine environment in the GPA and the Arctic RPA.

# Section I: Scope and Objectives

## Scope:

* Conduct a Desktop Study on marine litter and microplastics in the Arctic, and based on the outcomes of the study,
* Explore the possibility of developing an outline for a framework on an Arctic regional action plan on marine litter.

## Objectives:

* To evaluate the scope of marine litter in the Arctic, and its effects on the Arctic marine environment;
* Increase knowledge and awareness of marine litter in the Arctic;
* Enhance cooperation by the eight Arctic Council member governments to reduce negative impacts of marine litter to the Arctic marine environment; and,
* Contribute to the prevention and/or reduction of marine litter pollution in the Arctic and its impact on marine organisms, habitats, public health and safety, and reduce the socioeconomic costs it causes.

# Section II: Mandates

*[Include a text that leads into the sections below (The problem: global plastic pollution.)]*

## Arctic Council Internal Documents

* Arctic Council’s Fairbanks Ministerial Declaration, paragraph 11:

*Note with concern the increasing accumulation of marine debris in the Arctic, its effects on the environment and its impacts on Arctic communities, and decide to assess the scope of the problem and contribute to its prevention and reduction, and also to continue efforts to address growing concerns relating to the increasing levels of microplastics in the Arctic and potential effects on ecosystems and human health.*

* The Arctic Council Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA) (2009):

Objectives include: *“take action individually and jointly, which will lead to the prevention, reduction, control and elimination of pollution in the Arctic marine environment and the protection of its marine habitat.”*

## International political commitments to reduce marine litter pollution

* UN General Assembly Resolution 66/288 (2012): The Future We Want (paras. 163 and 218).
* UN Environment Assembly Resolution 1/6 (2014): Marine plastic debris and microplastics.
* UN Environment Assembly Resolution 2/11 (2016): Marine plastic litter and microplastics.
* UN Environment Assembly Resolution UNEP/EA.3/L.20 United Nations Environment Programme Third session Nairobi, 4–6 December 2017 Draft resolution on marine litter and microplastics.
* UN General Assembly Resolution 70/1 (2015): Transforming our world: the 2030 Agenda for Sustainable Development.
	+ Sustainable Development Goal 12: Ensure sustainable consumption and production patterns.
	+ 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment
	+ 12.5: By 2030, Substantially reduce waste generation through prevention, reduction, recycling and reuse
	+ Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
	+ 14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
* Other?

## International Agreements

* The United Nations Convention on the Law of the Sea (UNCLOS)
* Under Part XII, Protection and Preservation of the Marine Environment, UNCLOS requires only that States shall take measures necessary to prevent, reduce and control pollution of the marine environment using “the best practicable means at their disposal and in accordance with their capabilities”. Art. 194.
* Article 207 addresses land-based sources of pollution and directs States to adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources.
* Article 211 aims to “reduce and control pollution of the marine environment from vessels”.
* Enacted in 1982 and entered into force in 1994, UNCLOS has not significantly reduced ocean pollution, probably because of its broad scope and programmatic nature. Article 207 lacks an enforcement mechanism and its efficacy is dependent upon domestic waste management policies and procedures of nations.
* International Convention for the Prevention of Pollution from Ships (MARPOL 73/78); Annex V, Prevention of Pollution by Garbage from Ships – Particularly Sensitive Sea Areas (PSSAs) and Special Areas (SAs) (the North Sea is a SA established under Annex V; there are no PSSAs within the Arctic).
* Annex V contains a complete ban on the dumping into the sea of all forms of plastic from ships.
* Because of its limited scope, Annex V of MARPOL has not resulted in significant reductions of plastic pollution in the ocean since its widespread ratification in 1988.
* London Convention for the Prevention of Marine Pollution from the Dumping of wastes - Protocol 1996.
	+ The London Convention prevents nations from depositing wastes at sea that have been generated on land by prohibiting “any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea.”
	+ The London Convention and Protocol encourage action to combat marine litter and adopted Recommendation to Encourage Action to Combat Marine Litter (19-23 Sep 2016) (reference [here](http://www.imo.org/en/OurWork/Environment/LCLP/newandemergingissues/Pages/default.aspx))
	+ Review of the Current State of Knowledge Regarding Marine Litter in Wastes Dumped at Sea, Under the London Convention and Protocol, Final Report, 2016 (reference [here](http://www.imo.org/en/OurWork/Environment/LCLP/newandemergingissues/Documents/Marine%20litter%20review%20for%20publication%20April%202016_final_ebook_version.pdf))
* Other?

## Initiatives within other conventions and regions

* United Nations Environment Programme’s 1974 (UNEP) Regional Seas Programme
	+ Barcelona Convention: Land- and ocean-based waste from dumping, runoff, and discharges (including plastics) in the Mediterranean Sea region.
	+ Cartagena Convention: Pollution from ships; dumping at sea; land-based sources of pollution in the Wider Caribbean Region.
	+ As of 2014, more than 143 countries have been participating in one of eighteen regional seas and partner programs covering: the Antarctic, Arctic, Baltic Sea, Black Sea, Caspian Sea, Eastern Africa, East Asian Seas, Mediterranean, Northeast Atlantic, Northeast Pacific, Northwest Pacific, Pacific, Red Sea & Gulf of Aden, Regional Organization for the Protection of the Marine Environment (ROPME) Sea Area, South Asian Seas, Southeast Pacific, Western Africa, and Wider Caribbean.

General information at: <http://wedocs.unep.org/bitstream/handle/20.500.11822/9711/-Setting_a_course_for_Regional_Seas-2014Setting_a_Course_for_Regional_Seas.pdf.pdf?sequence=3&isAllowed=y>

* The European Marine Strategy Framework Directive 2008/56/EC: All litter in European Union seas based on where it is found (e. g., washed ashore, in water column, ingested by marine animals) and type (e.g., microplastics).
* The European Union published the first-ever Europe-wide strategy in January 2018 on plastics, adopted today, is a part of the transition towards a more circular economy. It will protect the environment from plastic pollution whilst fostering growth and innovation, turning a challenge into a positive agenda for the Future of Europe. There is a strong business case for transforming the way products are designed, produced, used, and recycled in the EU and by taking the lead in this transition, we will create new investment opportunities and jobs. Under the new plans, all plastic packaging on the EU market will be recyclable by 2030, the consumption of single-use plastics will be reduced and the intentional use of microplastics will be restricted (reference [here](http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy.pdf))
* EU legislation on land based and sea based sources (further information [here](http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/index_en.htm))
* Directive on port reception facilities for the delivery of waste from ships 2000/59/EC, which is currently being reviewed with a proposal for a 100% no special fee for garbage (further information further information [here](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0168&from=en))
* Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA)
* Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention): [OSPAR Regional Action Plan on Marine Litter covers Region I Arctic Sea](https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan).
* Helsinki convention (HELCOM)
* Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
* Convention on Biological Diversity (CBD Technical Series No. 83 – Marine Debris – Understanding, Preventing and Mitigating the Significant Impacts on Marine and Coastal Biodiversity)
* Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP). The Northwest Pacific Region Environmental Cooperation Center (NPEC) hosts the Special Monitoring & Coastal Environmental Assessment Regional Activity Centre (CEARAC), the center that carries out the individual activities of the NOWPAP.
* FAO Code of Conduct for Responsible Fisheries. Contains voluntary provisions port-reception waste facilities, storage of garbage on board, and reduction in abandoned, lost or otherwise discarded fishing gear.
* Other?

## National legislative initiatives that reduces the contribution of marine litter to the Arctic

*[Suggestion to include in Annex II]*

# Section III: Literature Review Timeline

*[Annotated outline submitted by Grid-Arendal as per a ToR to develop 1st draft of Section III based on the following timeline]:*

* 15th of Jan 2018-Annotated Outline.
* 15th of Mar 2018-“zero” draft of Section III (including its five sub-sections)
* 30th of Apr 2018-1st draft of Section III (including its five sub-sections)

The annotated outline below assumes that as part of the text dealing with the scope of the Desktop Study, within Section I, there will be clarification of the terms marine litter, marine debris, marine plastic pollution, macroplastics and microplastics. That would ensure coherence of the content across the Desktop Study and how these terms are used and should be understood by the reader. GRID-Arendal could provide some suggestions on these but the experts in charge for Section I or the whole study may have already defined these terms as part of the work in defining the scope. How the terms are used and defined could have a bearing on the title and content of the report and, it may therefore be desirable to discuss/clarify this with the whole group of experts. Below the term *marine plastic pollution* is used pending further clarification as it is generic enough to include the whole size spectra but specific enough to make it clear that the focus is directed towards particles of any size made mainly of plastic. Therefore, in every subsection information will be collected regarding macro, meso and microplastics. When the information is specific to a certain size group it will be clearly highlighted, specially if separation consideration would be required or advisable in terms of policy recommendations.

Each subsection should follow a similar structure with a generic introduction considering knowledge available relative to that section which conceptually applies to the Arctic followed by specific information based and referenced against existing Artic literature in the form of scientific publications or expert reports.

## Sources and Drivers

Introduction to potential sources of marine plastic pollution. Sources will be associated to different kinds of human activities (drivers) carried out in the Arctic region and immediate vicinity. When specific information on sources is limited, information on the drivers could be used as proxy but we will request guidance on the need/will to include this after “zero” draft has been delivered. Sources will be split between sea-based and land-based sources. Sources associated with coastal activities (i.e., coastal tourism, harbour activities) will be considered under sea-based sources.

### Sea-based sources

A priori this will include mainly fisheries (including commercial, subsistence, and recreational), aquaculture, shipping and coastal/cruise tourism. Details will be provided on the specific types of activities within each sector that may lead to plastic pollution, whenever possible.

### Land-based sources

Similar to sea-based sources, this will address activities on land that constitute the largest sources of land-based plastic pollution in Arctic marine environments. As for other regions, mismanaged domestic and industrial waste will likely dominate the land-based sources though documentation may be limited. Other potential sources that will be considered are transportation/logistics, mining and agriculture. Any other land-based sources that are identified in the Arctic region will be documented.

## Pathways and Distribution

Description and understanding of the pathways of entry of marine plastic pollution into Arctic waters is a crucial element in tracing the pollution back to its sources and developing preventive policies and action. In addition, the knowledge and understanding of the distribution of marine plastic pollution within the Arctic is limited and therefore the consideration of potential pathways and documented (if any) inflow of plastic pollution to the Arctic Ocean is a meaningful proxy to the distribution by pointing at likely areas for passage or (temporary) accumulation of plastic particles.

### Pathways

Riverine influx and marine currents influx will be considered under this subsection. The consideration of riverine input implies that the whole Arctic watershed is considered as a source area and this needs to be addressed in the scoping section of the report. Direct coastal input involving a human mediated pathway (i.e., accidental or intentional dumping) will be considered under the previous subsection as associated to human coastal activities (sea-based sources). Under pathways only influx involving a fluid flow (water courses –including sewage outfalls and marine currents) will be considered.

### Distribution

The distribution of marine plastic pollution in the different accumulation regions or sinks of the Arctic Ocean will be considered in this subsection. This will be split under coastal areas, surface water, water column, seafloor and sea ice. Information on composition and concentration of particles and objects among accumulation regions and, where possible, on stocks in the different compartments will be documented.

## Impacts

The impacts of marine plastic pollution in the Arctic are, as in other areas, two-fold. First, the impacts on ecosystems need to be considered in order to assess the potential socio-economic impacts. Ecological impacts are often documented in a quantitative manner, while socio-economic impacts are primarily documented qualitatively. The way these types of data are collected introduces a layer of complexity in the evaluation of ecosystems from a social-ecological perspective.

### Ecological impacts

The ecological impacts will be considered and documented when possible at the individual, species, functional group, habitat and ecosystem level. The impact from different kinds of interactions between organisms and plastic particles and objects i.e., ingestion, entanglement, transport of invasive species, and others will be considered and documented.

### Socioeconomic impacts

The socioeconomic impacts of marine plastic pollution in the Arctic region will be considered in a qualitative conceptual way and by documenting any instances of impacts on maritime activities and the communities relying on those activities. This will include traditional subsistence foods provisioning for Arctic indigenous communities (i.e., whaling, marine mammal harvesting and hunting, waterfowl, shorebird and seabird hunting), commercial and subsistence fishing, aquaculture, shipping and coastal/ cruise tourism. Impacts on the well-being (health and economic) of the Arctic communities connected to these activities will also be documented where possible.

## Response and Monitoring

This subsection will collect information on solutions and actions aimed at curbing plastic pollution in the Arctic marine environment and the monitoring of the evolution of effective evaluation.

### Arctic Actions and Solutions

As Section II will already include detailed information on existing or developing governance and regulations, and in order to avoid duplication, this section will be mostly focused on documenting implemented or planned action and solutions. It will address actions and solutions driven by public and private actors rooted (or not) in existing regulations. Actions and solutions will be split into pollution prevention, pollution reduction and impact mitigation. If enough documentation is identified in each of these categories a subsection will be devoted to each of them.

### Monitoring

Ongoing local, national, or international monitoring efforts covering the Arctic region will be compiled in order to have an understanding of the thematic and geographic scope of the tools available to monitor the evolution of marine plastic pollution in the Arctic.

## Crosscutting Issues

The information from crosscutting issues should be disaggregated to feed into the above sections and therefore we recommend removing this subsection unless we identify a clear need for it in order to be able to document cross-cutting information that cannot be included in the sections above. This section is inherited from the reference list but as of now we do not see a need for it in the desktop study.

## Gap Analysis

Each of the sections above could include a concluding paragraph on the knowledge gaps identified in order to have a good understanding of each of the themes addressed, but we would like to recommend including a subsection to jointly analyze the major knowledge gaps that would need to be addressed by future monitoring and research efforts in order to further guide and inform policy development.

# Section IV: Recommendations/Strategic Actions/Next Steps

* the reduction of litter from sea-based sources,
* the reduction of litter from land-based sources,
* the removal of existing marine litter from the marine environment (Fishing for Litter, removal of ghost nets (Norway best example), beach clean ups, etc.),
* *[Monitoring seems to be missing from this section or is it planned to address that under the proposal for an Arctic Action Plan?]*
* *Development of an Arctic action plan on marine litter* (e.g., OSPAR and HELCOM Regional Action Plans (both are based on the general structure agreed at the 5th International Marine Debris Conference), and
* education and outreach on the topic of marine litter.

# Section V: Conclusion

# Annexes

## Annex I: Summary of Relevant Literature

## Annex II: National Legislations

[e.g., relevant laws passed by the U.S. include the Clean Water Act; Resource Recovery and Conservation Act; Coastal Zone Management Act; Beaches Environmental Assessment and Coastal Health; Shore Protection Act of 1988; and Marine Debris Research, Prevention and Reduction Act. Consider asking for something similar from other Arctic Council member states (and observers?)]

# List of References

1. <https://euroshore.com/sites/euroshore.com/files/documents/unep_marine_litter.pdf> [↑](#footnote-ref-1)