



TO
PAME

FROM
Drs. Wouter Jan Strietman MA

Dear all,

In this memo, the background, aim, activities, preliminary results and envisioned future steps within the Arctic Marine Litter Action Plan project (AMLAP) will be presented. The final results will be published later this year in a forthcoming Wageningen Economic Research report.

Project aim

The objective of the Arctic Marine Litter Action Plan project is to prevent marine plastic pollution in the Arctic by knowing the sources, taking action and creating solutions. A key element in the project is to identify litter items and linking these to specific sources. Based on this, stakeholders will be identified and engaged with to identify possible reasons why litter ends up in the sea and develop action plans to stop this. To evaluate actions taken, monitoring will take place throughout the region.

All nations in the Arctic are connected to the other areas in the Arctic through ocean currents and economic activities taking place in their waters. Since the objective of this project takes a collaborative effort and cross-border cooperation, local, regional and international stakeholders in the North-Atlantic and Barents Sea region are part of- and/or welcome to be part of the project.

Memo

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SUBJECT
Arctic Marine Litter Action Plan Project

POSTAL ADDRESS
The Netherlands

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Project team & collaboration

The Arctic Marine Litter Action Plan was initiated in 2017 by Wageningen Economic Research and Leemans Maritime Consultancy and is currently being carried out in collaboration with Norut (Norway) who coordinates the MARP project¹ and in cooperation with Oceanwide Expeditions and Aktiv i Friluft (Svalbard).

Other collaboration partners will likely follow from 2018 onwards, such as the Norwegian Polar Institute and Salt (Norway), organisations in Iceland (University Centre of the Westfjords and possibly others), Russia (through contacts already established through the MARP project) Poland, the UK and Germany.

During the course of 2017, close cooperation on a policy level took place with the Dutch ministry of Infrastructure and Environment and the Ministry of Foreign Affairs. Further engagement with international fora such as the Arctic Council, OSPAR, ICES and FAO are planned for 2018.

Project background

Through ocean currents, large quantities of plastic litter items are continuously being picked up and deposited in the Arctic, both on the seabed, in the water column and on the beaches. The levels of plastic pollution is currently higher than what can be regarded as an acceptable level²

The litter items washing up on the shores of the Arctic mainly originates from sea-based activities in the region itself, particularly fisheries, but also from land-based or sea-based activities further away. Items originating from, for example, the Dutch North Sea coast have a more than 70% chance of ending up in the Arctic within a timespan of less than 3 years³.

The presence of plastics in the Arctic poses a serious threat to wildlife⁴. Animals of all sizes, from zooplankton to polar bears, can ingest plastics and associated chemicals resulting in damages of respiratory and digestive systems that can be lethal. They can also get entangled in for example trawl nets and ropes, which can lead to suffering and death. It also negatively affects recreational experiences, which has a direct impact on both locals and visitors, including the tourist industry in this area⁵.

One solution to this problem is to remove litter. This is being done throughout the Arctic at several locations, mostly by volunteers. But to put a halt to marine litter in the long run, cleaning up beaches is neither an effective nor a sustainable solution.

To put a stop to this, a more drastic approach is needed; one which gets to the heart of the matter by targeting the sources of litter in a collaborative effort. This strategy corresponds with the call by OSPAR for its member countries to set specific targets for the reduction of beach litter⁶ and develop action plans for marine litter to be implemented between 2014-2021⁷.

¹ <http://norut.no/en/prosjekter/marine-plastic-pollution-arctic-origin-status-costs-and-incentives-prevention-polarprog/>

² <http://www.mosj.no/no/pavirkning/forurensning/strandsoppel-svalbard.html>

³ www.plasticadrift.org/ / Erik van Sebille, pers. comm. (2017)

⁴ Helgesen V, Anundsen A, Høye B, Sandberg P. 2016. Havet kveles av plast. Dagbladet, 14.12.16.; UNEP. 2011. Plastic debris in the ocean.

⁵ Wyles KJ, Pahl S, Thomas K, Thompson RC. 2015. Factors That Can Undermine the Psychological Benefits of Coastal Environments: Exploring the Effect of Tidal State, Presence, and Type of Litter. Environment and Behavior

⁶ MOSJ. 2015. Strandsøppel på Svalbard (Beach Litter at Svalbard).

⁷ <http://www.mosj.no/no/pavirkning/forurensning/strandsoppel-svalbard.html>

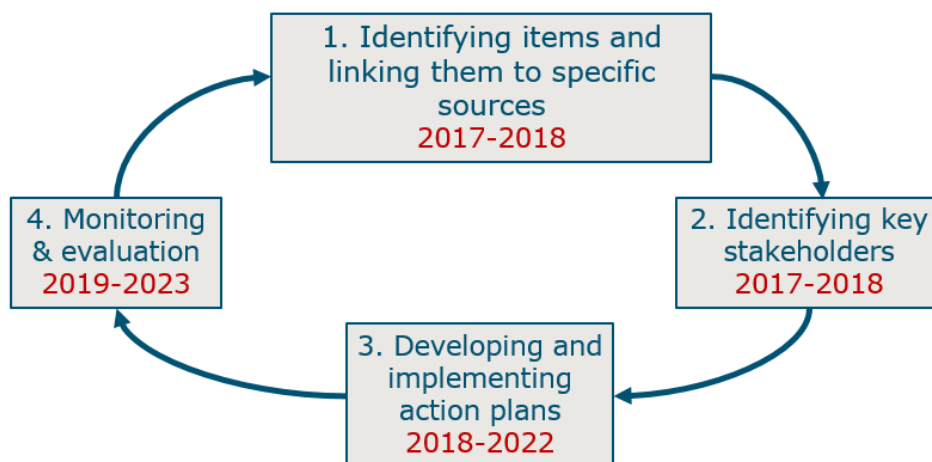
⁷ OSPAR. 2017. Marine Litter. <https://www.ospar.org/work-areas/eiha/marine-litter>

Approach and activities

Beach litter monitoring can be an important foundation to identify the items on beaches and to evaluate management targets to combat marine littering. However, monitoring data on beach litter is currently scarce in most of the Arctic. Next to this, the (OSPAR and other) data available does not provide knowledge at a detailed enough level that is useful for linking items to specific sources (i.e. categorising an item as a 'fishing net' instead of a fishing net from a specific type of fisheries).

Doing such a detailed analysis is a key first step in the Arctic Marine Litter Action Plan project. As detailed monitoring data was not available, fieldwork on Jan Mayen and Svalbard was planned in the summer of 2017. By identifying the exact type of litter items and tracing their sources, key actors will be identified and later on supported in defining strategies aimed at reducing pollution of these items in the Arctic. This will be done either by setting up new action plans or strengthening/linking existing initiatives by key stakeholders.

The Arctic Marine Litter Action Plan project therefore takes the following 4-step approach:



In the last step, local organisations and research stations in the area will be supported in developing a cost-effective monitoring structure that supports policy and evaluating management measures.

During 2017, the first step of the project was carried out, focusing on Jan Mayen and Svalbard, an island and archipelago in the Arctic. This included the following two activities:

1. Identifying items and linking the main categories of items to specific sources.
2. Looking into the reasons why fishing nets have ended up on the shores of Svalbard and which types of fisheries are involved.

The results of these analyses will be presented in the following section

Beach litter monitoring on Jan Mayen and Svalbard

During the summer of 2017, 15 beaches on Jan Mayen and Svalbard were sampled, where all litter items on 100m stretches were removed and later on analysed and categorised. Collection of litter took place either by project staff or volunteers. Litter collection was carried out during three Oceanwide cruises to Jan Mayen and Svalbard and during clean-ups around Isfjorden in Svalbard organised by Aktiv i Friluft.

The analysis of all collected items was carried out by Wouter Jan Strietman (Wageningen Economic Research, Eelco Leemans (Leemans Maritime Consultancy and Jannike Falk-Andersson (Norut), who have extensive experience in beach litter monitoring, both in The Netherlands and Norway.

The locations of the sampled beaches are shown in the map below:

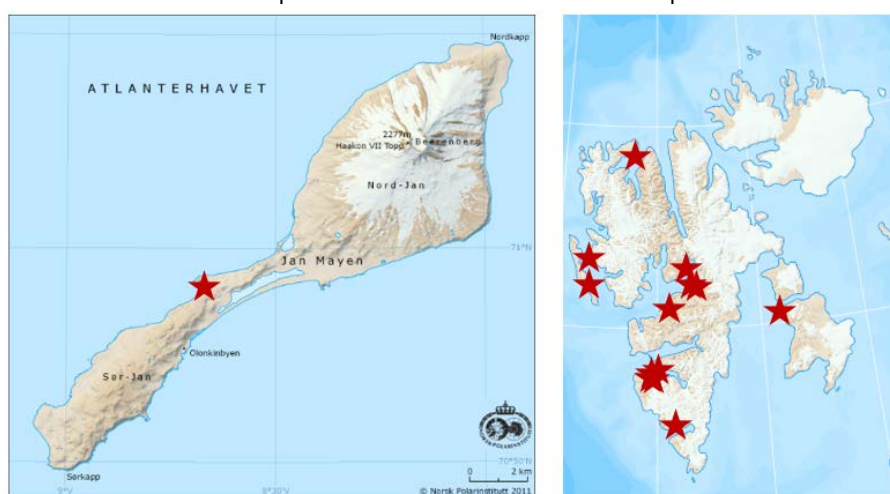


Figure 2. Locations of sampled beaches in Jan Mayen (left) and Svalbard (right). The method used to count and categorise beach litter items is the OSPAR Beach Litter monitoring protocol.

On each sample beach, 100 metres of beach would be marked and within this area, every single piece of litter collected. Litter was collected from the shoreline until the area where vegetation would start and/or where the beach would end (i.e. cliffs). The methodology used is shown in figure 3:

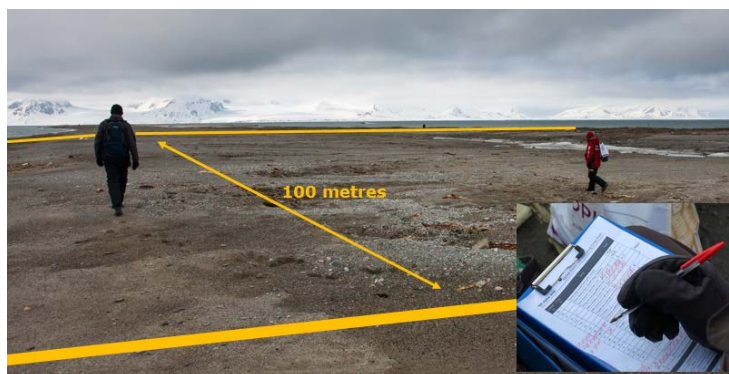


Figure 3. OSPAR beach litter monitoring methodology

To gain a more detailed view of the most commonly encountered items in this area, some specific items commonly encountered on the beaches of Svalbard and Jan Mayen but not specifically mentioned in the list of items as separate items were added to existing categories as subcategories. This was done to make it possible to link specific items to specific sources (i.e. in the OSPAR list, all types of fishing nets

are categorised 'nets and pieces of net', making it impossible to make a clear distinction between different types of gear, an important step in linking items to sources).

The number of items varied for every beach, depending on its location, local currents, width of the beach, the possible past presence of tourists (who may have collected litter), exposure to wind, etc. Therefore, a comparison between beaches in terms of the *number of items* is not possible. Instead, an overall analysis of the share of each litter item category in comparison to other categories was made.

Monitoring results Jan Mayen and Svalbard

In total, 5.676 litter items were collected and (where possible) identified and categorised. In terms of the number of items, the top 10 categories are as follows:

| # | Litter type | Share |
|----|--------------------------------|-------|
| 1 | All unidentifiable pieces | 56% |
| 2 | Nets and pieces of net | 6% |
| 3 | Caps/lids | 5% |
| 4 | Strapping band | 4% |
| 5 | String and chord | 3% |
| 6 | Industrial packaging/sheeting | 3% |
| 7 | Floats/buoys | 2% |
| 8 | Plastic bottles and containers | 2% |
| 9 | Plastic bags | 2% |
| 10 | Cotton bud sticks | 1% |
| | Other items | 16% |

Figure 4. Top 10 litter items and their respective share

As is presented in figure 4, the most commonly encountered litter items in Jan Mayen and Svalbard are unidentifiable pieces of plastic. An example of this category is shown below:



Figure 5. Unidentifiable pieces of plastic, collected at one beach

If we look further into the main categories, it is clear that a relatively large share (12%) of all the other litter items (or more than 25% of all identifiable items) is most likely fisheries related. These items are marked bold in the table below:

| # | Litter type | Share |
|----|--------------------------------|-----------|
| 1 | All unidentifiable pieces | 56% |
| 2 | Nets and pieces of net | 6% |
| 3 | Caps/lids | 5% |
| 4 | Strapping band | 4% |
| 5 | String and chord | 3% |
| 6 | Industrial packaging/sheeting | 3% |
| 7 | Floats/buoys | 2% |
| 8 | Plastic bottles and containers | 2% |
| 9 | Plastic bags | 2% |
| 10 | Cotton bud sticks | 1% |
| | Other items | 16% |

Other items in the table above might also be fisheries related, but could also be shipping related. Examples of such items are plastic sheeting, string and chord or items categorised under 'other items' (such as food packaging or other household waste).

Caps and lids

Another standout category is caps and lids. As of yet, it is not known where these items originate from. To gain further insight into the types and sources of caps and lids, an analysis is planned, similar to the one carried out by the North Sea Foundation⁸. This analysis is planned to take place in 2018 in collaboration with the North Sea Foundation (given that funding will be found to do this analysis). For this purpose, all caps and lids encountered on beaches in Svalbard and Jan Mayen were collected (also the ones outside of the 100m stretches), either by project staff, volunteers or the Jan Mayen station staff.

Fishing nets analysis

During the summer of 2017, a lot of volunteers have been collecting litter from the beaches around Svalbard. These cleanups have been initiated by organisations such as Aktiv i Friluft (Prosjekt Isfjorden), Sysselmannen and AECO (cruise passengers).

In early September 2017, 20.000 kilos of cleanup litter was stored at the local waste management facility, around 7000 kilos of which were fishing nets (35% of the weight). Of the remaining 13.000 kilos, a certain amount is also fisheries related, but the weight of these items (including buoys and ropes) has not been measured. Therefore, the percentage of fisheries related items in terms of weight will be higher than 35%. As such, in terms of weight, fishing nets make up the largest share of litter items collected on the beaches of Svalbard.

To find out why fishing nets end up on the shores of Svalbard and where they originate from, project member Wouter Jan Strietman (Wageningen Economic Research) and Klaas-Jelle Koffeman (ex-fisherman) carried out an investigation at

⁸ https://www.noordzee.nl/project/userfiles/StichtingDeNoordzee_DoppenRapport_2mb.pdf

the local waste management facility (Avfallsmottaket Longyearbyen) in early September 2017.

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The insights from a workshop, organised by the MARP project (www.marp.no) in 2016, where a group of researchers and fishers looked through a container of fishing waste in Longyearbyen, inspired this year's investigation to specifically look into the reasons why fishing nets have been ending up on the shores of Svalbard, and which types of fisheries are involved.

The aim of the investigation was to identify the type of fisheries involved and the likely reasons why these nets may have ended up in the sea. Around 2.000 kilos of fishing nets were analysed (out of a total of 7000 kilos), 43 pieces in total. Many of these discarded nets exceeded 10 square metres, some more than 80.

Every piece of net was first disentangled and then put on the floor of the local waste management facility for further investigation. All of the nets were thoroughly checked to see whether they had any signs of being torn or cut. Also, the type of fisheries involved and the age of the nets were examined.

Based on the examination, it became clear that almost all of these were actually parts of nets that had been replaced by new ones after they got damaged. It is not 100% clear why these replaced pieces of nets have ended up in the ocean; discarding could be a major cause, but at this moment this is pure speculation and will be discussed further with experts on this topic.

Next steps

The envisioned next steps in this project (from 2018 onwards) will be to:

1. Widen the project area to also include Iceland, (northern) Norway and Russia
2. Further identifying the exact sources of the most commonly found litter items throughout the Arctic and the reasons why these items have ended up in the sea;
3. Supporting key actors with defining strategies aimed at reducing pollution of these items in the area, with a particular focus on fisheries. This will be done in collaboration with local project partners and existing local initiatives. For this purpose, workshops are planned in 2018 and 2019;
4. Supporting local organisations and research stations in the area to develop a cost-effective monitoring structure that supports policy and evaluating management measures;
5. Further cooperation and engagement with local, regional and national stakeholders, as well as multidisciplinary scientific collaboration.

Forthcoming report & contact details

This memo is a shortened version of a report that will be published this year by Wageningen Economic Research.

Please don't hesitate to contact me if you have any further questions:

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With best regards,

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