Current status on marine litter indicators in Nordic waters

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Project: Marine litter in Nordic waters
Collection and exchange of common knowledge and experiences on research, monitoring and assessment of marine litter in Nordic waters, by:
- Establishing Nordic network of experts.
- Providing information on marine litter indicators that can be used for establishing monitoring activities and prioritization of actions in Nordic waters.
- Two workshops:
  - WS I - common knowledge status on Marine Litter in the Nordic Countries, and indicators relevant for EU MSFD (November 2013, Göteborg, Sweden).
  - WS II - Status for monitoring and Future ACTIONS (November 2014, Oslo, Norway).

Marine litter in different regional seas
Long-range transport with ocean currents and from local sources, land-based and from activities at sea, contribute with inputs of marine litter to the Nordic waters.

Skagerrak - a potential depositional area
Amount of beached litter seems to be highest in the Skagerrak region compared to the Baltic Sea and North Atlantic/Arctic supporting that this region is a depositional area. High densities of litter can also be found at some remote beaches in Arctic (e.g. Svalbard) probably due to long-range transport with ocean currents.

Nordic studies on marine litter indicators
Various studies as part of either research or existing monitoring have provided information on occurrence of marine litter in Nordic waters from Baltic Sea to the Arctic.

<table>
<thead>
<tr>
<th>Marine litter indicators</th>
<th>Baltic Sea and Belt Sea</th>
<th>North Sea, Skagerrak and Kattegat</th>
<th>North Atlantic and Arctic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaches</td>
<td>DK, FI, SE</td>
<td>DK, NO, SE</td>
<td>NO, FO, IS</td>
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<tr>
<td>Water column</td>
<td>-</td>
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<td>Sea floor</td>
<td>DK, SE</td>
<td>DK, NO, SE</td>
<td>NO, FO</td>
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<tr>
<td>Biota</td>
<td>-</td>
<td>DK, NO, SE,</td>
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</tbody>
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- Beaches: Monitoring and beach clean-up activities,
- Sea floor: ROV video transects, manned submersible, trawl surveys and fishing for litter,
- Biota: Stomach contents in fulmars,
- Microplastics: Water column, sediment, fish, benthic invertebrates.

Conclusions:
- There has been and are on-going studies (research and monitoring) that demonstrate ubiquitous occurrence of marine litter, inclusive microplastics, both on beaches, in water column, at sea floor, and in biota in Nordic waters (Baltic Sea, North Sea and Arctic).
- Results of these studies are not always comparable as different methodologies for sampling and analyses are employed. There is a need to find out to what extent the monitoring data can produce comparable datasets.
- These studies provide a basis for initiation of activities on marine litter indicators for MSFD monitoring and national management plans in the Nordic countries.