



## Beach observations of plastic and marine litter along the Northwest Passage

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Marine litter and microplastics are everywhere. Even the Arctic Ocean, Svalbard and Jan Mayen Island are contaminated as various publications confirm. Little, however, is reported about marine waters and shores of the Canadian Arctic Archipelago. This poster presents the results of a privately funded citizen science observation to scan remote beaches along the Northwest Passage for marine litter pollution.

The observations were conducted while enjoying the 2019 Northwest Passage sailing expedition of the *Tecla*, a 1915 gaff-ketch herring drifter. The expedition started in Ilulissat, Greenland, on 1 August and ended in Nome, Alaska, on 18 September. After crossing Baffin Bay, the ship continued along Pond Inlet, Navy Board Inlet, Lancaster Sound, Barrow Strait, Peel Sound, Franklin Strait, Rea Strait, Simpson Strait, Queen Maud Gulf, Coronation Gulf, Amundsen Gulf, Beaufort Sea, Chukchi Sea and Bering Strait. The vessel anchored in the settlement harbours of Pond Inlet, Taloyoak, Gjoa Haven, Cambridge Bay and Herschel Island. In addition, *Tecla*'s crew made landings at remote beaches on Disko Island (Fortune Bay, Disko Fjord), Beechey Island (Union Bay), Somerset Island (Four Rivers Bay), Boothia Peninsula (Weld Harbour), King William Island (M'Clintock Bay), Jenny Lind Island, and at Kugluktuk and Tuktoyaktuk Peninsula.

Following the categorization of the OSPAR Guideline for Monitoring Marine Litter on Beaches, litter observations were conducted without penetrating the beach surfaces. Beach stretches scanned varied in length from 100-400 m. No observations were conducted at inhabited settlements or at the abandoned settlements visited on Disko Island (Nipisat) and Beechey Island (Northumberland House).

Observations on the most remote beaches found 2-5 strongly bleached or decayed items in places such as Union Bay, Four Rivers Bay, Weld Harbour, Jenny Lind Island (Queen Maud Gulf side). Landings within 15 km of local settlements (Fortune Bay, Disko Fjord, Kugluktuk, Tuktoyaktuk) or near military activity (Jenny Lind Island, bay side) showed traces of local camping, hunting or fishing activities, resulting in item counts between 7 and 29. At the lee shore spit of M'Clintock Bay, significant pollution (> 100 items: including outboard engine parts, broken ceramic, glass, clothing, decayed batteries, a crampon and a vinyl record) was found, in contrast to a near-pristine beach on the Simpson Strait side. The litter type and concentration, as well as the remains of a building and shipwrecked fishing vessel indicate that this is an abandoned settlement, possibly related to

the construction of the nearby Distant Early Warning Line radar site CAM-2 of Gladman Point. DEW Line sites have long been associated with environmental disturbances.

Given the 197 beach items recorded, it can be concluded that the beaches of the Canadian Arctic Archipelago, which are blocked by sea ice during most of the year, are not pristine. Truly remote places have received marine pollution for decades to centuries. Where (abandoned) settlements are at close range pollution from local activities can be discovered, while ocean currents, wind patterns, ice rafting, distance to river mouths, and flotsam, jetsam and derelict also determine the type and amount of marine litter along the Northwest Passage.