

IAF EARTH OBSERVATION SYMPOSIUM (B1)  
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

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EARTH OBSERVATION FOR ARCTIC OCEAN PLASTIC DEBRIS

**Abstract**

Little research has been conducted on the extent of plastic debris in the Arctic Ocean because sea ice coverage during winter makes it challenging. Nonetheless, detecting plastics in sea ice is a relatively novel approach to understanding how much plastic is entering the Arctic Ocean via ocean currents and ‘leaks’ from existing plastic Gyres. When sea water freezes, it traps micro and macro plastics in the ice until it unfreezes allowing plastics to recirculate again. Being able to monitor these hotspots that frequently trap plastics would help determine the best mitigation methods for preventing plastics from entering the

oceans. Plastics in the Arctic typically get trapped because of Earth's thermohaline circulation pushing currents upwards from the equator and bringing plastics from the other oceans into the Arctic. A second mechanism affected is the ice-albedo feedback loop that regulates Earth's climate and ocean temperatures below sea level. As plastics are replacing sea ice, the number of reflective surfaces disappears, further perpetuating sea ice loss. The aim of the paper is to propose a compatible strategy with Arctic conditions to monitor and track plastic pollution using Earth observation technologies. Having an integrated solution can compensate for the data gap between technologies, providing data year round. With the acquired time series and near real-time data, information can be disseminated to inform relevant stakeholders.