SESSION 8: MEQ Topic Session Using environmental indicators to assess baselines, targets, and risk of plastic pollution in the North Pacific

S8-RecordedOral-1 (PaperID=15060)

Evaluating species as bioindicators for plastic pollution in North Pacific food webs

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Synthetic marine debris has become a ubiquitous component of the Anthropocene ocean. Plastic ingestion by marine wildlife was first reported half a century ago and since that time, roughly one thousand species have been reported to consume this debris. This study focuses on plastic ingestion by marine organisms in the North Pacific Ocean. We assess the scope of the problem and identify key bioindicator species to develop a monitoring program for plastic debris in North Pacific food webs. Using data from 1969-2020, our meta-analysis confirmed that foods webs in the North Pacific are among the most polluted globally; roughly half of all fish and seabirds surveyed in the region had consumed plastic, and more than three-quarters of sea turtles and bivalves. While there is not enough standardized data to assess if the problem is worsening, standardization and reporting of methods are improving over time. Using a rubric- evaluation approach, we evaluated 335 species for their potential to serve as bioindicators of plastic pollution in North Pacific food webs. Linking our results and suggested bioindicator species to other monitoring programs worldwide will be paramount to track humanity’s progress on mitigating plastic pollution in the marine environment.