

Plastics in the sediment record

Nicole R. Posth^a, Maya S. Dodhia^a and Karla B. Parga Martínez^a

^aDepartment of Geosciences & Natural Resource Management (IGN), Geology Section, University of Copenhagen, 1530 Copenhagen K, Denmark, nrep@ign.ku.dk

Sediments are considered a main sink of plastic in the aquatic environment (Woodall et al., 2014, Bergmann et al., 2017). The apparent recalcitrance of plastics implies a sediment archive of a distinctly anthropogenic material and raises discussion of plastics as a marker of our presence on Earth (Zalasiewicz et al., 2016). However, the extraction and identification of plastic from sediment is challenging. Particularly, small grains remain in suspension and can form aggregates. Plastic degradation in oxygenated and light-penetrated environments is better understood than their stability in sedimentary environments that act as sinks. The efficacy of sampling methods and uncertainties in degradation processes in sediment therefore present key challenges to defining a sediment record of plastics and its long-term stability in these systems.

Herein, we present our work on the plastic record in Greenlandic sediment, targeting micro- and nanoplastics (MNP) in fine-grained sediment (Parga Martinez et al., 2023). We discuss our findings as well as limitations to reconstruct reliable records of this pollutant in the complex sedimentary system. We also present the biogeochemical influence of plastics deposition in the sediment and the implications for transformation of the polymers over time (Rogers et al., 2020, Dodhia et al., 2023). We conclude with insight to current and future work.

References

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