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Modelling the global biological microplastic particle sink

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Forty percent of the plastic produced annually ends up in the ocean. What happens to the plastic after that is poorly understood, though a growing body of data suggests it is rapidly spreading throughout the ocean. The mechanisms of this spread are not straightforward for small, weakly or neutrally buoyant plastic size fractions (the microplastics), in part because they aggregate in marine snow and are consumed by zooplankton. This biological transport pathway is suspected to be a primary surface microplastic removal mechanism, but exactly how it might work in the real ocean is unknown. We search the parameter space of a new microplastic model embedded in an earth system model to show biological uptake significantly shapes global microplastic inventory and distributions, despite its being an apparently inefficient removal pathway.