



## **Microplastics Influence Carbon Dynamics of Marine Surface Waters**

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The plastic invasion of marine habitats represents a global priority with impacts across ecosystems and societies. Although considered inert, plastic and microplastics can provide substrate and carbon source for the growth of microorganisms, thus interfering with marine nutrient and carbon dynamics. Despite the high and increasing abundance of microplastics in the ocean, their influence on the transformation and composition of marine organic matter is largely unknown.

In the European POSEIDOMM project ([www.poseidomm.eu](http://www.poseidomm.eu)) we explored the impact of microplastics on the microbial production and processing of organic matter in controlled surface marine conditions, both in microcosms and in a mesocosm experiment.

Following the addition of standard inert microplastic particles to microcosms and mesocosms, we observed an increased production of both dissolved and particulate organic matter, potentially linked to an increased microbial production or an enhanced transformation of pre-existing organic substrates.

Since much of the low-density plastic debris at sea is positively buoyant, surface plastic accumulation may have multiple effects on marine surface waters. Changes in the concentrations of organic matter in marine surface layers can modify the penetration of solar radiation, microbial activity and air-sea gas fluxes. By interacting with dissolved and particulate organic components in surface waters, microplastic accumulation can interfere with the aquatic cycling of carbon and nutrients.