

Study reveals abundance of microplastics in the world's deep seas

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The deep sea is becoming a collecting ground for plastic waste, according to research led by scientists from Plymouth University and Natural History Museum.

The new study, published today in *Royal Society Open Science*, reveals around four billion microscopic plastic fibres could be littering each square kilometre of deep sea sediment around the world.

Marine [plastic debris](#) is a global problem, affecting wildlife, tourism and shipping. Yet monitoring over the past decades has not seen its concentration increase at the sea surface or along shorelines, despite experts knowing that more is being created.

However, the current study indicates this may be because microplastics

have sunk to the ocean floor, with the number of fibres recorded in the deep seas up to four times greater than in shallow and coastal waters.

"The puzzle for marine scientists has been to establish where plastic debris is going. Part of the answer is that much of this waste is breaking down into fibres invisible to the naked eye and sinking to the sea floor," said Dr Lucy Woodall, zoologist at the Natural History Museum. "It is alarming to find such high levels of contamination, especially when the full effect of these plastics on the delicate balance of deep sea ecosystems is unknown."

The study, which also involved the University of Barcelona, the University of Oxford and the Scottish Association for Marine Science, focussed on deep-sea sediment and coral samples collected by Dr Woodall and other scientists from 16 sites in the Mediterranean Sea, Atlantic and Indian Oceans.

Analysis of the non-natural particles at Plymouth University confirmed microplastics were abundant in all the samples (ranging from 1.4-40 pieces per 50ml of sediment), were commonly around 2-3mm in length and were mostly blue, black, green or red in colour.

Rayon - a manmade non-plastic polymer used in personal hygiene products and clothing - contributed to 56.9% of the total fibres seen, with polyester, polyamides, acetate and acrylic among the others recorded.

Professor Richard Thompson, Professor of Marine Biology at Plymouth University, coordinated the study and led the identification process. He said: "The deep sea habitat extends to more than 300 million km² globally, so the discovery of previously under-reported microplastics suggests there may be even greater accumulation than was previously suspected. A range of shallow water organisms are known to ingest

microplastics, and the extent of their harmful effects will likely be influenced by their relative abundance. The discovery of substantial quantities in [deep-sea](#) sediments is of considerable relevance to our understanding of the potential of these particles to cause harm in the marine environment."

More information: The deep sea is a major sink for microplastic debris, *Royal Society Open Science*, [rsos.royalsocietypublishing.org ... /10.1098/rsos.140317](https://rsos.royalsocietypublishing.org/doi/10.1098/rsos.140317)

Provided by University of Plymouth

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