Plastic disappearing from oceans, scientists say, but why?

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Plastic seems to be disappearing from the world's oceans, and scientists are not sure why.

Exposure to waves and radiation from the sun can cause plastics to break down into micro-fragments, but scientists say those fragments are stable and durable enough to last for hundreds of thousands of years.

And yet, in a new study published in the Proceedings of the National Academy of Sciences, a team of researchers reports that about 9100 to 32,000 tonnes of plastic debris is floating on the surface of our oceans - significantly less than they expected to find.

Resin pellets that are sometimes found in oceans. *Photo: AP*

After analysing 3070 samples of sea water from around the world, the researchers found that there had been no significant increase in the amount of plastic in the surface water of the world's oceans since the 1980s, even as the amount of plastic produced worldwide had more than quadrupled.

More plastic in the world almost certainly means more plastic in our oceans. But if the buoyant plastic is not floating on the surface, where is it? Members of the research team, led by ecologist Andres Cozar of the University of Cadiz in Spain, don't claim to have the answer, but they do identify a few clues for future science detectives to follow up on.

For example, they found far fewer fragments of plastic debris 5 millimetres and smaller than their computer models predicted. That led them to conclude that it was probably the smallest pieces of plastic that were making their way deeper into the water.

Floating debris in the Pacific Ocean. *Photo: AP*

The authors say mesopelagic fish, which live in the hazy twilight zone 200 to 1000 metres beneath the ocean's surface, may be mistaking these bits of plastic for zooplankton of the same size. Perhaps the fish are gobbling them up at night when they come to the surface to feed, and then taking the plastic down to the deeper ocean where they spend most of their lives.

Over time, the plastic may sink deeper when excreted or when the fish dies.

The researchers also note that recent studies have shown bacterial populations growing on plastic micro-fragments, weighing them down and causing them to sink.

But these are just a few possible answers to the missing plastic question, and the authors note that there are probably others.

Angelicque White, an ocean ecologist at Oregon State University who was not involved with the study, warned that it was very hard to get a solid reading on what might be going on with plastics and our oceans.

"Plastic is widely distributed throughout all ocean basins, but the concentrations are really patchy from spot to spot and hot spots are driven by ocean circulation," she said.

She added that we still had a lot to learn about how plastic functioned in the ocean: "Microbes thrive on plastic; plastic is habitat; plastic is eaten by organisms ... It is not clear at all if this is always harmful or if most of the ingested plastic is passed."

A spokeswoman for the United States' National Oceanic and Atmospheric Administration's Marine Debris Program, Dianna Parker, said studies like this one could help inform her group's future work.

"Every study we see that comes out gets us a little closer to the answers on the marine debris problem," she said. "It is such a new problem, so studies like this help us figure out where to focus our efforts."