

Case study of microplastics in the ocean

February 19 2015, by Andrew Merrington



Plastic: its ubiquity and longevity is having a significant impact on the marine environment. That's the diagnosis of one of the world's leading experts in the field, Professor Richard Thompson, who is providing evidence to show the escalating presence of microscopic plastic particles in our oceans. It is research that has catapulted Richard into an advisory capacity with policy-makers and conservation agencies worldwide.

"We live in a disposable society, where 30 per cent of the plastic we

produce is used for packaging that we throw away within a year of manufacture," said Richard, who has been researching the topic for more than 20 years.

"You can understand why we produce so much plastic – it's incredibly useful, it lasts a long time and is lightweight – but it's also creating a global waste management problem, and this is especially true in the [marine environment](#)."

Using archived plankton samples held at the Sir Alister Hardy Foundation for Ocean Science (SAHFOS), Richard and his team have showed that the abundance of small fragments of plastic, which they described as 'microplastic', has increased significantly since the 1960s. The findings of this first study on [microplastics](#) were published in the journal *Science* in 2004. Ten years on and there is global scientific interest on the topic of microplastics with hundreds of scientific publications. One of the most recent papers, co-authored by Richard, was an invited 'Perspectives' article published in *Science* to summarise a decade of work on the topic.

Since his first description of microplastics, and funded by bodies such as the Leverhulme Trust, his team have demonstrated that a range of organisms ingest microplastics and that in some contexts these particles can transfer contaminants from sea water to marine life. With funding from the Department for Environment, Food and Rural Affairs (Defra), one of Richard's current lines of enquiry is establishing the extent to which microplastics might cause harm in the marine environment.

He said: "We know that plastic undergoes continued fragmentation in the water. We can see the damage caused by large items when they're swallowed by animals or ensnared in them, but the evidence as to the potential impacts from microplastics needs further research. I'm constantly asked 'what should we do to reduce the problem of plastic

waste in our oceans?' and this has become a major strand of my work."

Richard has presented his findings to the UK House of Commons Science and Technology Select Committee, the European Parliament, and to US Secretary of State Senator John Kerry. Richard has also worked with the United Nations Environment Programme to identify 'Global and Regional Solutions to the Marine Debris Problem', and recently presented to the European Commission Conference HOPE (Healthy Oceans - Productive Ecosystems) and the International Resource Panel of the United Nations.

He said: "The interest from policy-makers has been substantial and I was particularly pleased to see our research translated into policy within the European Marine Strategy Framework Directive in 2010."

One of the keys to his success has been interdisciplinary collaboration. Much of his work has been done together with organic chemist, Professor Steve Rowland, and he is currently working with psychologist, Dr Sabine Pahl to examine factors that influence human behaviour in relation to littering (the MARLISCO project). One particularly rewarding element of this work was the instigation of a national competition where school children prepared a video on the problems of marine litter. He has also supported other artistic and educational projects, such as the creation of a supermarket stocked with items washed up on the beaches of the South West.

"In my opinion there is considerable hope we can resolve this problem," Richard said.

"We all use plastics every day, so whether it's a plastic bag we choose not to take home from the supermarket or a bottle we recycle, ultimately it will be the collective actions of many that will make the difference."

Provided by University of Plymouth

Citation: Case study of microplastics in the ocean (2015, February 19) retrieved 19 April 2024 from <https://phys.org/news/2015-02-case-microplastics-ocean.html>

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