

# Car tyres are major source of ocean microplastics – study

**Wind-borne microplastics are a bigger source of ocean pollution than rivers, say scientists**

**Damian Carrington** *Environment editor*

@dpcarrington

Published on

Tue 14 Jul 2020 16.00 BST

More than 200,000 tonnes of tiny plastic particles are blown from roads into the oceans every year, according to research.

The study suggests wind-borne microplastics are a bigger source of ocean pollution than rivers, the route that has attracted most attention to date. The analysis focused on the tiny particles produced by tyres and brake pads as they wear down.

It is estimated that 550,000 tonnes of particles smaller than 0.01mm are deposited each year, with almost half ending up in the ocean. More than 80,000 tonnes fall on remote ice- and snow-covered areas and may increase melting as the dark particles absorb the sun's heat.

Microplastic pollution has polluted the entire planet, from **Arctic snow** and **Alpine soils** to the **deepest oceans**. The particles can harbour toxic chemicals and harmful **microbes** and are known to harm **some marine creatures**. People are also known to consume them **via food** and **water**, and to **breathe them**, but the **impact on human health** is not yet known.

Earlier work suggested microplastic particles could be **blown across the world**, but the new study is the first to quantify the effect. The scientists concentrated on fine tyre and brake dust as there is better data on how these are produced than tiny microplastics from other sources, such as plastic bottles and packaging.

“Roads are a very significant source of microplastics to remote areas, including the oceans,” said Andreas Stohl, from the Norwegian Institute for Air Research, who led the research. He said an average tyre loses 4kg during its lifetime. “It’s

such a huge amount of plastic compared to, say, clothes,” whose fibres are commonly found in rivers, Stohl said. “You will not lose kilograms of plastic from your clothing.”

Airborne transport has received much less attention than rivers because only the smallest particles can be blown by the wind and their size makes them difficult to identify as plastic. “The really small particles are probably the most important in terms of health and ecological consequences because you can inhale them and the very small particles can probably also enter your blood vessels,” Stohl said.

The research, [published in the journal Nature Communications](#), used two methods to estimate the amount of fine particles shed by tyres and brakes. The team then used well-established atmospheric circulation models to assess how they are blown around the globe.

Stohl acknowledges significant uncertainties in the data, such as how rapidly the particles fall to the ground in rain. The study suggests the finest particles can remain airborne for a month. But he is confident the results are the right order of magnitude. The next step is to accelerate development of measurement techniques for fine particles so that real-world samples can be checked.

Deonie Allen, at the University of Strathclyde in Scotland, and not part of the research team, said: “This very well conducted research shows there is an awful lot of microplastic pollution coming from sources that most people have never even thought of. This is one of the first long-distance transport modelling papers and it shows how far these pollutants can move and how important the atmosphere is at part of the plastic pollution cycle.”

Erik van Sebille, at Utrecht University in the Netherlands, said: “The study shows how interconnected pristine remote areas are with what we’re doing in our cities and on our roads.” Sebille studies [microplastic flows in the oceans](#) and is planning to work with Stohl’s group to develop a global picture of plastic pollution, which will help determine how best to tackle the problem.



Revealed: microplastic pollution is raining down on city dwellers

[Read more](#)

“We should be concerned,” he said. “We don’t still know really what the harm is of all these microplastics, but the precautionary principle says that we had better be careful and safe about these things.”

Stohl said the issue of tyre and brake pollution is likely to get worse before it gets better as electric cars become more common: “Electric cars are normally heavier than internal combustion engine cars. That means more wear on tyres and brakes.”

Reducing microplastic pollution from vehicles is difficult, he said: “The manufacturers will have to respond somehow, if this really becomes a matter of concern.” In the meantime, Stohl said people should reduce the use of plastics they can do without and ensure the rest is recycled.

## Microplastic pollution in oceans vastly underestimated – study

This article is more than 1 month old

**Particles may outnumber zooplankton, which underpin marine life and regulate climate**

Plastic pollution is known to harm the fertility, growth and survival of marine life. Photograph: Louisa Gouliamaki/AFP via Getty Images

**Damian Carrington** *Environment editor*

@dpcarrington

Published on

Fri 22 May 2020 06.01 BST

**3269**

The abundance of microplastic pollution in the oceans is likely to have been vastly underestimated, according to research that suggests there are at least double the number of particles as previously thought.

Scientists trawled waters off the coasts of the UK and US and found many more particles using nets with a fine mesh size than when using coarser ones usually used to filter microplastics. The addition of these smaller particles to global estimates of surface microplastics increases the range from between 5tn and 50tn particles to 12tn-125tn particles, the scientists say.

Plastic pollution is known to harm the fertility, growth and survival of marine life. Smaller particles are especially concerning because they are the same size as the food eaten by zooplankton, which underpin the marine food chain and play an important role in regulating the global climate. The new data suggests there may be more microplastic particles than zooplankton in some waters.

“The estimate of marine microplastic concentration could currently be vastly underestimated,” said Prof Pennie Lindeque, of the Plymouth Marine Laboratory in the UK, who led the research.

She said there may well be even smaller particles than those caught by the fine mesh nets, meaning the numbers “could be even larger again”.

Another new study shows how microplastics have entered the food chain in rivers, with birds found to be consuming hundreds of particles a day via the aquatic insects on which they feed.

Microplastic pollution has contaminated the whole planet, from **Arctic snow** and mountain **soils** to **many rivers** and the **deepest oceans**. It is also

being **consumed** and **inhaled by people**, and the health impacts are as yet unknown.

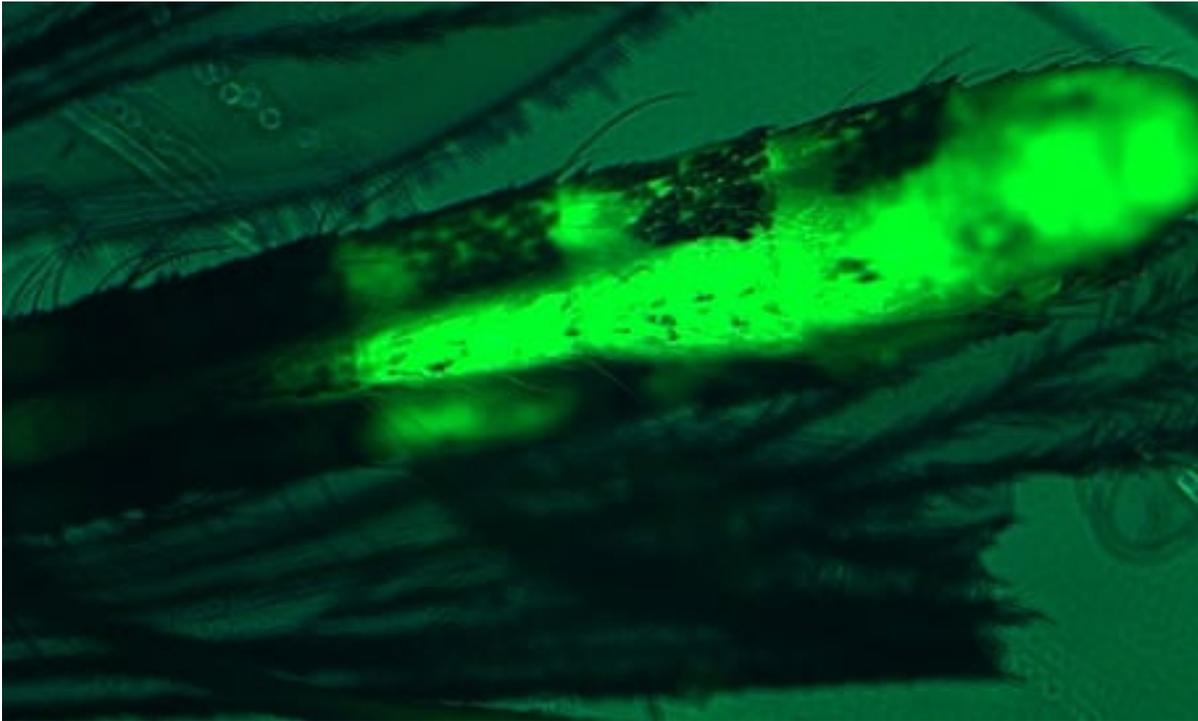
Research published in the last month has found microplastics in **greater quantities than ever before on the seabed** and suggested that hundreds of thousands of tonnes of microplastics could be **blowing ashore on the ocean breeze** every year.

The research by Lindeque's team, **published in the journal Environmental Pollution**, used nets with mesh sizes of 100 microns (0.1mm), 333 microns and 500 microns. They found 2.5 times more particles in the finest net than in the 333 micron net, which is the kind usually used to filter microplastics, and 10 times more than in the 500 micron net.

The surface trawls off the coast of Plymouth in the UK and the coast of Maine in the US showed similar results, suggesting they are representative of waters near populated land. The particles were dominated by fibres from textiles such as ropes, nets and clothing.

“Using an extrapolation, we suggest microplastic concentrations could exceed 3,700 particles per cubic meter – that’s far more than the number of zooplankton you would find,” Lindeque said. These tiny animals are among the most abundant species on the planet.

Dr Ceri Lewis, a marine biologist at Exeter University, who was part of the team, said: “Understanding more about the smaller microplastics is important as it is these smaller particles that are more likely to be ingested by the zooplankton that form the basis of marine food webs.”



Microplastics can spread via flying insects, research shows

### [Read more](#)

The research on microplastics in rivers, [published in the journal \*Global Change Biology\*](#), analysed the droppings and regurgitated pellets of white-throated dippers at 15 river sites in south Wales. The scientists said the results were startling.

They found that the birds, which feed on river insects, were eating about 200 pieces of plastic a day. These were mostly fibres, and a quarter were larger than 500 microns.

The team also found that the dippers were feeding thousands of plastic fibres to their nest-bound chicks during their development. Previous research by the scientists had shown that [half of the river insects](#) contain microplastic fragments.

Prof Steve Ormerod, of Cardiff University, who led the work, said: “In almost 40 years of researching rivers and dippers, I never imagined that one day our work would reveal these spectacular birds to be at risk from the ingestion of plastics. It is a measure of how this pollution problem has crept up on us.

“Dippers are the world’s only songbirds able to dive and feed on river insects, but that wonderful adaptation also means they have no escape from this

pollution.”

The impact on the health of the birds is not yet understood. “It is imperative we understand whether microplastics add to the other pollution problems that affect dippers and other river organisms, and we use that knowledge to guide remedial action,” Ormerod said.