
Polar Ice Contaminated with Nanoplastics

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Decades-old ice in Northern and Southern Pole regions contain significant amounts of nanoscale plastic particles. Studying ice cores from Greenland and Antarctica, scientists have identified several types of nanoplastic particles, including particles that originate from tyres. As nanoplastics may cause toxic effects, the researchers address that remote and pristine areas may contain more nanoparticle pollution than expected.

Polar regions are regarded as some of the last areas on Earth that are pristine and relatively untouched by human influences. Yet, both North and South polar ice appear to contain significant amounts of nanoplastics, or plastic particles smaller than a micrometre in size. Nanoplastics may cause toxic effects in organisms, but since they're difficult to measure, the worldwide extent of nanoplastic pollution remained unclear until now.

Using new methods to measure nanoplastics, an international team of scientists have now identified nanoscale plastic particles in ice samples from Greenland and Antarctica. The samples were derived from 14-meter-deep ice cores from Greenland and sea ice cores from Antarctica. Researchers from [Utrecht University](#), the [University of Copenhagen](#) and the [Université Libre de Bruxelles](#) were involved in this [study](#).

Earlier studies had already suggested that nanoplastic can be carried over distances by wind and water currents. Still, the research team were surprised to find substantial quantities in their samples. Now we know that nanoplastics are transported to these corners of the Earth in these quantities. This indicates that nanoplastics is really a bigger pollution problem than we thought, said Dušan Materić, lead author of the study. In an earlier study, using the same techniques, his team identified nanoplastic particles in samples from the Alps.

Pollution dates to 1960s

Although Materić's team are the first to identify nanoplastics in polar ice, their results show that nanoplastic contamination has been taking place for decades. Our data suggest that nanoplastics pollution is not a new problem, said Materić. We are only now becoming aware of it, because we have recently developed the right method to measure it. In the Greenland core, we see nanoplastics pollution happening all the way from 1960s. So organisms in that region, and likely all over the world, have been exposed to it for quite some time now.

Different types of plastic

The teams identified several types of nanoplastic particles in polar ice. The most prominent nanoplastic type was polyethylene, which accounted for more than half of the particles. In the Greenland ice core, the team also found significant amounts of nanoparticles originating from tyre wear. The amount of nanoplastic particles appears to differ between the North and South ice core samples. The Greenland ice contained 13.2 ng/mL on average, whereas the Antarctic Sea ice contained 52.3 ng/mL.

Constraining sources

Given the large range of areas in which nanoplastics have now been identified, Materić and his team urge for more research into its toxicity and the extent of the pollution. The presence of nanoplastics in polar ice samples most likely involves a combination of complex processes that carried the particles. This could include both atmospheric and marine transport, (re)emission, deposition and ice incorporation. Further studies are clearly needed to better constrain the source of these contaminants to the polar regions.

Read the [original article](#) on Utrecht University.