

Small particles of plastic have found a home in Arctic snow, scientists say

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This undated photo provided by the Helmholtz Centre for Polar and Marine Research at the Alfred Wegener Institute shows snow samples from Tschuggen, Switzerland, locked and ready for transport to Davos. Scientists at the institute say they have proven that plastic exists in the snow of the Alps and the Arctic. Photo by: Juerg Trachsel/WSL-Institut für Schnee- und Lawinenforschung SLF via AP

BERLIN, Germany — Some of the most remote parts of the planet have surprising amounts of plastic particles, scientists say.

Scientists have found an abundance of tiny plastic particles in Arctic snow, they report. It indicates that so-called microplastics are being sucked into the atmosphere and carried long distances.

The researchers examined snow collected from several sites with a process designed to analyze their samples in a lab. The snow was taken from the Arctic, northern Germany and the Alps mountain range in Switzerland and along the border of Germany and Austria. Snow was also collected from the North Sea island of Heligoland, which is part of Germany.

"While we did expect to find microplastics, the enormous concentrations surprised us," Melanie Bergmann said. She is a researcher at the Alfred Wegener Institute in Bremerhaven, Germany. She co-wrote the study.

The scientists' findings were published on August 14 in the journal Science Advances.

Created When Human-Made Materials Break Apart

Microplastics are created when human-made materials break apart. They are defined as pieces smaller than 5 millimeters (under 1/4 inch). Previous studies have found them in the air in Paris, France; Tehran, Iran; and Dongguan, China.

The research demonstrated the fragments may become airborne in a way similar to other particles. They might travel like dust and pollen.

There is growing concern about the environmental effects of microplastics. However, scientists have yet to determine what impact, if any, the particles have on humans or wildlife.

Bergmann said the highest concentrations of microplastics were found in the Bavarian Alps, the mountains along the German-Austrian border. One sample had more than 150,000 particles per 1 liter (0.26 gallon.)

The Arctic samples were less concentrated. However, the third-highest concentration in the samples the researchers analyzed, with 14,000 particles per liter, came from an ice floe in the Fram Strait off eastern Greenland, she said. Most of the island of Greenland is within the Arctic Circle.

On average, the researchers found 1,800 particles per liter in the samples taken from that region.

Large Amounts Tied to Methods Used By Researchers

Martin Wagner is a scientist at the Norwegian University of Science and Technology in Norway. He wasn't involved with the study. He said the extremely high concentrations could be partly tied to the methods the researchers used, which allowed them to identify microplastics as small as 0.011 millimeters. That is smaller than the width of a human hair.

"This is significant because most studies so far looked at much larger microplastics," he said. "Based on that, I would conclude that we very much underestimate the actual microplastics levels in the environment."

"Importantly, the study demonstrates that atmospheric transport is a relevant process moving microplastics around, potentially over long ranges and on a global scale," Wagner said. "Also, snow may be an important reservoir storing microplastics and releasing it during snow melt." The role of snow has not been looked at before, he said.

Varnish, Tires, Textiles

Bergmann said the microplastics detected in the study included items such as varnish. It's a coating that may have been used on cars and ships. They also found particles from rubber in tires and materials that could have come from textiles or packaging.

The authors suggested that the airborne distribution of microscopic plastic particles has so far been neglected as a source of contamination. It should be monitored in standard air pollution monitoring models, they said.

"We really need to know what effects microplastics have on humans, especially if inhaled with the air that we breathe," Bergmann said.

Quiz

- 1 Which two of the following sentences from the article include CENTRAL ideas of the article?
1. *Scientists have found an abundance of tiny plastic particles in Arctic snow, they report.*
 2. *Previous studies have found them in the air in Paris, France; Tehran, Iran; and Dongguan, China.*
 3. *There is growing concern about the environmental effects of microplastics.*
 4. *Bergmann said the microplastics detected in the study included items such as varnish.*
- (A) 1 and 2
- (B) 1 and 3
- (C) 2 and 4
- (D) 3 and 4
- 2 Which statement would be MOST important to include in a summary of the article?
- (A) Scientists published their study on microplastics on August 14 in the journal Science Advances.
- (B) Scientists collected snow for their study from Heligoland, which is a German island in the North Sea.
- (C) Scientists used technology that allowed them to look at microplastics as small as 0.011 millimeter.
- (D) Scientists state the results of their study indicate that microplastics must be monitored like air pollution.
- 3 Which of the following MOST concerned scientists about the microplastics they observed?
- (A) the fact that the microplastics seen in this study were smaller than the ones found in previous studies
- (B) the large concentration of microplastics and the fact that they can move through air
- (C) the locations where the microplastics were found in this study, including France, Iran and China
- (D) the original sources of microplastics, including varnish, rubber tires, and packaging and textile materials
- 4 How do microplastics affect humans and wildlife?
- (A) Scientists are very fearful of the effect that microplastics have on the environment, and they are hoping to pass laws banning microplastics.
- (B) Scientists are very fearful of the effect that microplastics have on the environment, and they are planning to do further studies to assess the damage microplastics have done.
- (C) Scientists are uncertain about the effect microplastics have on humans and wildlife, but they are concerned that microplastics are being inhaled.
- (D) Scientists are uncertain about the effect microplastics have on humans and wildlife, but they are not worried because microplastics have been found only in remote places.