Science & Technology

It’s Snowing …Microplastics

(Another reason to think twice before eating snow)

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Columbia Creative

Microscopic shards of plastic from degraded water bottles, shopping bags, synthetic clothing, and other waste are floating in the atmosphere and falling back to earth in raindrops and snowflakes, say recent studies.

In an effort to determine the levels of microplastics in New York State’s precipitation, a group of researchers led by Marco Tedesco, a climate scientist at Columbia’s

Lamont-Doherty Earth Observatory, is soliciting the help of ordinary citizens. This winter, Tedesco's team is recruiting dozens of New York residents to collect fresh snow samples, remove any tiny bits of plastic from the snow using special filtering kits, and then mail the extracted materials to Columbia for chemical analysis.

"We want to know exactly what kinds of plastic are prevalent in snowfall in different parts of the state," says Tedesco. "Then we'll look for clues to where the plastic originates."

The effort, which is scheduled to begin in mid-January, is part of a larger citizen-science project that Tedesco launched in 2018 called X-Snow. For an earlier phase of the project, scores of New Yorkers volunteered to regularly measure the depth of snow near where they live and to evaluate its other physical qualities, such as relative fluffiness or slushiness. This information will help scientists improve the remote-sensing techniques they use to estimate the depth of snow around the world and the rate at which it's melting.

Tedesco says that the new initiative, called PlastiX-Snow, was inspired by a number of studies that over the past few years have detected plastic in precipitation in such disparate locations as Denver, Paris, Tehran, and Dongguan, China. Last spring, scientists found plastic fragments in snowfall in the Arctic — evidence that the fragments are capable of traveling vast distances on wind currents.

"We are not sure how these plastic fragments are getting into the air," says Tedesco. "Are they blown off the surface of water bodies? Or are they being lifted off the ground by wind at landfills or industrial sites? If so, which ones? By assessing the types of plastic that are deposited by snowstorms at particular times and locations, we aim to learn more."

And then there are the health ramifications. Scientists have for years warned that microplastics could eventually find their way into our food and water supply. By assessing the concentration of microplastics in precipitation across New York, PlastiX-Snow may help public-health officials identify areas where crops, reservoirs, and aquifers should be tested for polymers.

The Columbia team will also be investigating whether plastic pollution affects the speed at which snow melts. This is an important question, Tedesco says, because snow reflects a tremendous amount of sunlight back into the atmosphere and thus plays a critical role in regulating the earth's climate.

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