

Water samples reveal microplastics in remote Patagonian fjord system

December 3 2020, by Emily O'hara



Microplastics come in different colors and shapes. Credit: [Oregon State University](#)/Creative Commons

New research has found microplastics in every sample taken from a vast fjord system in remote Chilean Patagonia, showing the immense global scale of marine plastic pollution. Cristóbal Castillo and his research team

from the Universidad de Concepción published their findings last month in the *Marine Pollution Bulletin*.

Microplastics are plastics that are less than five millimeters in length, or smaller than a sesame seed. Microplastics can expose living beings to harmful chemicals, some of which have been linked to a multitude of health problems, including various cancers. These particles can accidentally or knowingly be ingested by marine life and humans.

In the new study, the authors searched for the presence of microplastics in fjords—long, deep, and narrow bodies of water often set in U-shaped valleys created by glaciers, which flow into the [open ocean](#).

Onboard the scientific vessel Sur-Austral, lead author Castillo and his team set out on a five-day expedition, traveling through the extensive system of waterways surrounding the Martínez-Baker Channel in Chilean Patagonia. This far-reaching system penetrates 75 miles into the mainland, and navigating these steep fjords is no easy task. They found plastic [pollution](#) in every water [sample](#) they took, concluding that this issue has become more far-reaching than many would have imagined.



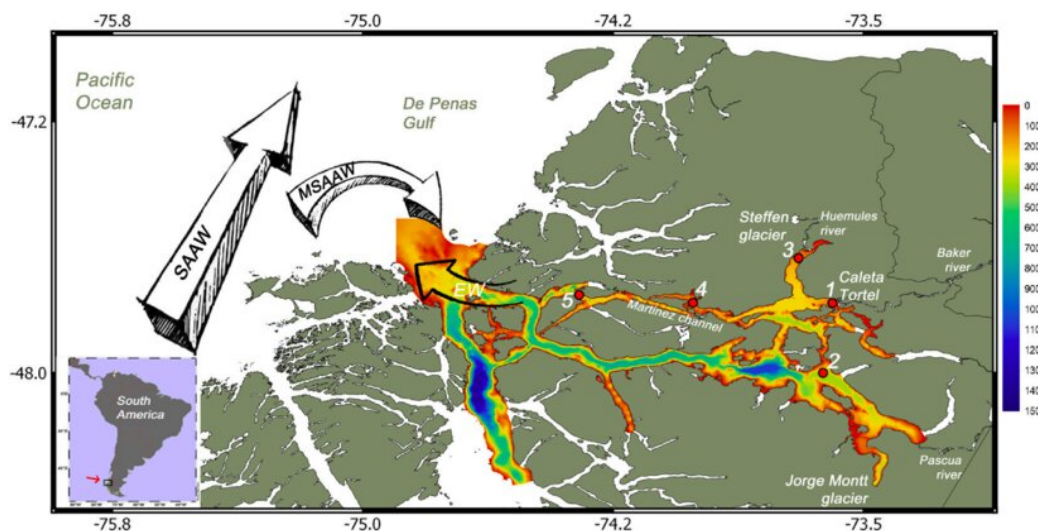
Fjords are long, deep, and narrow bodies of water. Credit: [Geir Halvorsen](#) /Creative Commons

This study focused on 30 water samples taken from five sites. Castillo and his team found [microplastic particles](#) in all 30 samples. The sample sites were strategically chosen: some were near the mouth of the fjord, close to the [ocean](#), and others were closer to headwater sites where glacial streams enter the fjord. This range allowed them to observe sites with different combinations of glacier meltwater and ocean water. They analyzed each sample to determine the proportion of different types of microplastics.

The authors honed in on the distribution of microplastics in different locations and at different depths, which helped them discover the sources of microplastics in the fjords. The highest abundance of microplastics was found to be from subsurface ocean currents, which can transport plastic pollution into the pristine fjords. The lowest abundances of microplastics were discovered to be connected to the paint from local boats.

The sampling map below shows the crew's sample sites, with two sites notably being near glaciers, and one near a small village close to the mouth of the Barker river, known as Caleta Tortel, with a population of only 523. The group found that the ocean is the main source of [microplastic](#) pollution, with the village as a secondary source.

Peter Deneen, the narrator of the Watershed Progressive, previous editor of GlacierHub, and a journalist who covers microplastic pollution, shared his thoughts on the new research. "I wish I could say there was a surprising find here, but as has become the case with plastics studies, you can pretty much pick a place on Earth, look there, and you'll find the modern human signature is present—a microplastic footprint, from the Mariana Trench to the High Arctic." He continued, saying "Only, we need a new word because footprints go away over time. A plastic footprint doesn't go away, it only breaks down further and becomes more and more intractable."



The study sampling map. The five sampling sites are indicated above. Credit: C. Castillo, et al./Marine Pollution Bulletin

This study proves that pollution entering the oceans across the globe reaches even the most near-pristine areas. Humans have polluted the oceans so thoroughly that it even appears in this remote area with only one small village. Oceans, and secondarily the small village, not the glaciers, are the source of the microplastic pollution. Deneen reminded GlacierHub that "with regard to our atmospheric carbon, glaciers play the role of defenseless innocent bystanders. Here, too, we see them play that role with society's plastic pollution."

As an emerging field of study, continued research into microplastics is key to a deeper understanding of their effects on human and aquatic health, and for a more complete insight into how extensive this issue is. The discovery of microplastics in remote areas is a wake-up call: No place is safe.

More information: Cristóbal Castillo et al. Water column circulation drives microplastic distribution in the Martínez-Baker channels; A large fjord ecosystem in Chilean Patagonia, *Marine Pollution Bulletin* (2020). DOI: [10.1016/j.marpolbul.2020.111591](https://doi.org/10.1016/j.marpolbul.2020.111591)

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