

Antarctica: the final frontier for marine biological invasions?

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A new study looking at the implications of increased shipping activity and the impact on Antarctic marine biodiversity is published this week in the journal *Global Change Biology*. The research is an important step

in the quest to understand whether invasive species, introduced by shipping, will find the Antarctic marine environment more hospitable as Antarctica's climate changes.

Analysis of ship location records, scientific databases and reports by researchers from British Antarctic Survey (BAS) and the University of Cambridge reveal that ship traffic in Antarctic waters has increased up to 10-fold since 1960s. This could mean that there is a greater risk that animals and plants, such as mussels and seaweed, could be transported to Antarctica.

The marine ecosystem in the Southern Ocean became largely isolated when the circumpolar current formed 15-30 million years ago. The region is considered to be biologically unique and conservation of Antarctic ecosystems is a global priority. Invasive species have the potential to alter the balance between species. In other parts of the world this has led to the collapse of fisheries and diminished ecosystem services.

This work provides the first holistic view of the risk of non-[native species](#) to the Antarctic marine environment. It informs future conservation management and policy.

Arlie McCarthy, lead author and marine ecologist at British Antarctic Survey and the Department of Zoology, University of Cambridge, says:

"We know that at present physical barriers, such as sea ice cover, ocean currents and water temperature, prevent non-native species establishing themselves in [marine ecosystems](#) around Antarctica. However, we need to understand the wider implications of changing environmental conditions and increased ship activity. Our study will help us determine the scale of the risk.

We know that some [invasive species](#) such as mussels, tunicates, bryozoans, and crabs that live on ship hulls have been observed in the Southern Ocean. There is no confirmed record of these becoming established as a population as yet but this is a threat for the future."

Very few studies of 'hull fouling' on Antarctic-going vessels have been carried out. Professor Lloyd Peck of British Antarctic Survey says:

"This work is an important early step towards protecting the unique biodiversity living on the seabed around Antarctica from human-introduced non-native species. Before effective measures can be taken, the risk must be quantified.

We need much more understanding of these issues and more effort to gauge the risks and develop the best conservation measures we can to at least try and minimise any future biodiversity losses in the Antarctic marine environment."

Dr. David Aldridge, the Department of Zoology, University of Cambridge says:

"Invasive species are recognised as one of the biggest drivers of global biodiversity loss. While life in Antarctica may have once been relatively protected from the invasion of non-native marine [species](#), our study reveals that human-mediated global change is increasing the likelihood of exposing life in the Southern Ocean to new and unprecedented challenges".

More information: Arlie H. McCarthy et al, Antarctica: The final frontier for marine biological invasions, *Global Change Biology* (2019).

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