

# Scientists investigate how oil affects smallest organisms in Antarctic waters

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Jeroen Ingels, a researcher at the FSU Coastal and Marine Laboratory. Credit: Florida State University

New research by a Florida State University scientist has examined how oil and other hydrocarbons in Antarctica affect miniature organisms called meiofauna that slip through the sediment widely unnoticed to the casual observer.

Over five years, a team at the Australian Antarctic Division led by Jonny Stark, in collaboration with FSU Marine and Coastal Laboratory researcher Jeroen Ingels investigated how clean mineral lube oil, used mineral lube oil, synthetic lube oil marketed as being rapidly biodegradable and diesel fuel affected the smallest communities of organisms on the ocean floor in Antarctica. They found that certain types of [meiofauna](#) declined dramatically when exposed to these oils, except the biodegradable type.

The research was published in the *Journal of Experimental Marine Biology and Ecology*.

"The idea here was to look at what the different type of oils and fuel are and how they enter the sediment, how they affect the meiofauna community," Ingels said. "In Antarctica, different types of fuels are used to keep stations running and accidents can lead to those fuels spilling into the water and ice. We wanted to know what would happen to meiofauna in that scenario."

Meiofauna are miniscule invertebrates that live in both marine and fresh water environments. They are also at the base of the food web, so researchers have been eager to learn more about them.

In general, meiofauna communities had a varied response depending on the individual organisms.

Researchers found that certain types of meiofauna called nematodes drastically declined with all of the oils except the one marked biodegradable. Researchers saw their sample reduce from about 1,100 nematodes to about 500 nematodes over the five-year period when exposed to clean mineral lube oil, used mineral lube oil or diesel.

In contrast, another type of meiofauna—the copepods—didn't seem that

bothered by the presence of oil.

"It was a surprise that nematodes were more sensitive," Ingels said. "Usually copepods are more bothered by outside factors. However, copepods are more mobile and could have potentially swum out of the sediment and remain on top of the sediment, away from the oil underneath."

To run these experiments, researchers took [sediment](#) samples from the floor of the ocean and polluted them with four different types of oil and then put back under the ice in trays. They were checked periodically over a five-year period to see if there were significant changes in the meiofauna.

Researchers still are investigating what the long-term outcomes could be if a part of the food chain such as the nematodes was disrupted. But for now, Stark said the research suggests what types of [fuel](#) the research stations in the region could use that might pose less harm to the environment.

**More information:** Jonathan S. Stark et al. The effects of hydrocarbons on meiofauna in marine sediments in Antarctica, *Journal of Experimental Marine Biology and Ecology* (2017). [DOI: 10.1016/j.jembe.2017.07.009](#)

Provided by Florida State University

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