

Trace metals in the air make big splash on life under the sea

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In the ocean, a little bit of metal can go a long way.

A new Cornell University-led study shows that trace metals, deposited by aerosols like dust and other particles in the atmosphere, have a hefty impact on [marine life](#), affecting biological productivity and changing the [ocean ecosystem](#).

The paper, "Aerosol Trace Metal Leaching and Impacts on Marine

Microorganisms," was published in *Nature Communications*.

The sources of such [aerosol particles](#) range from volcanoes, wildfires and [desert dust](#) to anthropogenic causes, like the burning of fossil fuels. After being spewed up and undergoing chemical reactions in the atmosphere, these particles often make their way to remote ocean regions, where they are deposited via precipitation or dry deposition.

"In a pollution event or a dust storm, and even in these faraway places, atmospheric deposition can be the most important source of new metals," said lead author Natalie Mahowald, the Irving Porter Church Professor of Engineering and Atkinson Center for a Sustainable Future faculty director for the environment.

Some metals prove to be insoluble and drop to the [ocean](#) floor, while others are taken up by various biota—the little guys," in Mahowald's words—like phytoplankton and bacteria, which make up 80 percent of marine life and act as circulators of oxygen and nutrients throughout the ecosystem.

"If you change the ecosystem structure at this scale—this is where all the productivity occurs—it will cascade up and impact the fish and the animals we see more easily," Mahowald said.

While previous research has focused on the pivotal role of iron in the oceans, Mahowald and her team examined the effects of iron and other metals, including aluminum, manganese, zinc, lead, copper, nickel, cobalt and cadmium. Many of these metals, such as copper, can be toxic pollutants, but the researchers found that the metals sometimes function as nutrients, depending on how, where and with what they are mixed.

More information: Natalie M. Mahowald et al, Aerosol trace metal leaching and impacts on marine microorganisms, *Nature*

Communications (2018). [DOI: 10.1038/s41467-018-04970-7](https://doi.org/10.1038/s41467-018-04970-7)

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