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# Animals Eat Ocean Plastic Because of Smell Like Food

A new study sheds light on why so many seabirds, fish, whales, and other critters are gobbling up plastic debris. And it's not quite what scientists thought.



This black-footed albatross dines on plastic garbage in the Hawaiian Leeward Islands. And now  
PHOTOGRAPH BY FRANS LANTING, NATIONAL GEOGRAPHIC

By Laura Parker

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As the oceans fill with plastic debris, hundreds of marine species eat astonishing  
why so many species, from the tiniest zooplankton to whales, mistake so much of it for f

explored.

Now a new study explains why: It smells like food.

Algae are consumed by krill, a small crustacean that is the primary food source for many animals. Even though, down naturally in the ocean, they emit a stinky sulfur odor known as dimethyl sulfide (DMS). It turns out that floating plastic debris provides the perfect platform on which algae grow, and as they break down, emitting the DMS odor, sea birds, following their noses in search of krill, are led to a new study published November 9 in [Science Advances](#). Instead of feeding on krill, the birds are attracted to the plastic debris.

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“DMS is the dinner bell,” says [Matthew Savoca](#), a doctoral student at the University of California, San Diego, and the lead author of the study. “When people hear the dinner bell, we know food is going to be in that area. Once the birds’ noses have told them this is where they should expect to find krill, they go there, and their threshold is down for what the food is.”

Plastic debris has been accumulating rapidly in the world’s ocean, roughly doubling in the last decade. A recent global analysis measured ocean plastic at a quarter of a billion metric tons, much of it in the form of small particles. More than 200 animal species have been documented consuming plastic, including birds, marine mammals, and fish. Seabirds are especially at risk; a study published last year by scientists in Australia found that [seabirds have consumed plastic](#).

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Scientists have long known that ocean plastic is consuming marine life. Sea turtles, for example, often mistake flimsy, clear plastic for jellyfish. Other animals, including fish, gobble bits of rice-sized microplastics. The new study shows that wave action because they resemble the small particles they are attracted to. (See [this kind map of ocean plastic pollution](#).)

But the study of how odors might play a role in marine life’s decision-making is the first of its kind. Savoca teamed up with a scientist who studies bird decision-making and a food and wine chemist to determine if the birds were actually attracted to the plastic.

“This does not disprove that plastic might look enticing to birds,” says Savoca.

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smell that gets animals foraging in the area and turns their layer on top of it. It is far more likely that a seabird will eat food.”

[Chelsea Rochman](#), an evolutionary biologist at the University of California, San Diego, led the study on the toxic effects of plastic consumed by fish, called the study. She says the study provides a better understanding why marine animals are eating plastic.

“Throughout the literature on plastic debris, you see researchers write statements like ‘choosing’ to eat plastic debris without a proper test or explanation of why,” she says. “They don’t go into the details of why.”

Savoca’s team decided to focus on birds already severely affected by plastic consumption: shearwaters. They began the study by placing buoys of micro plastics in bags in Monterey Bay along the California coast. After three weeks, they retrieved the buoys and tested them in the lab for DMS.

“They reeked of sulfur,” Savoca says.

It didn’t take long to identify DMS as a strong predictor of plastic consumption among seabirds. The study found that DMS drew marine animals to plastic as if it was krill. Odor extraction tests confirmed that plastic acquired a “DMS signature” in less than a month. The team also found, not surprisingly, that birds attracted to the DMS odor are the albatrosses, petrels, and shearwaters that are most susceptible to plastic consumption.

Many of those birds nest in underground burrows, and juvenile birds spend more time underground than birds that nest above the surface. Consequently, burrow-nesting birds rely much more on smell to get around.

“We should be paying more attention to those species,” Savoca says.



[Laura Parker](#) is a staff writer who specializes in covering climate change and marine environmental issues.

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PHOTOGRAPH BY STEVE WINTER, NATIONAL GEOGRAPHIC CREATIVE

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