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Creatures great and small: Study says warming Arctic Ocean a threat to zooplankton, right whales

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By Responsible Seafood Advocate

With ocean warming, food sources for North Pacific right whales are moving north – but so are commercial fishing fleets

As rising global temperatures push Arctic Ocean icecaps into retreat, large and small sea creatures – and the commercial fishing boats that follow them – are also migrating northward.

This mass migration toward the relatively narrow Bering Strait could lead to more ship collisions and fishing gear entanglements for the extremely rare and critically endangered eastern population of North Pacific right whales, according to a researcher at Duke University's Marine Lab.

"There's a really wide, shallow shelf (sea floor) that extends about 500 kilometers (310 miles) in the whale's primary feeding ground north of the eastern Aleutian Islands off Alaska," said Dana Wright, who is the lead author on a study that was published in *Ecological Applications* (<https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.2925>). "Cold meltwater from the sea ice in spring combines with currents that move up on the shelf to aggregate the zooplankton the whales



Zooplankton, tiny sea animals at the base of the food web, are on the move in the Arctic Ocean as the North Pole's ice cap retreats. Predators, including whales, will follow. Photo credit: NOAA.

eat in this area.”

For a filter-feeding whale, concentrated prey means more commercially valuable fish and some of the industrial-scale fishing fleets that follow them are moving north too.

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(<https://www.grantthornton.ca/insights/client-stories/membertou-first-nation-an-opportunity-to-grow/>).

“Ecosystem dynamics are changing,” said Wright. “Prey are responding to the changing climate, and species at the top of the food chain are too.”

Sightings of North Pacific right whales are exceedingly rare, but the animals are likely to have been moving north along with the zooplankton, according to Wright's modeling analysis of zooplankton and temperature data collected by NOAA Fisheries' Alaska Fisheries Science Center.

There are two populations of right whales in the Pacific, and the eastern group found in the waters off Alaska and the Canadian Pacific is thought to number just 30 animals, Wright said.

"They were the 'right' whale because, for their size, they had the most oil and baleen," Wright said. "And they floated because they had so much fat, so they didn't have to be processed immediately."



Balancing protection and production: Diving into the North Atlantic right whale conflict with lobster and crab fishing

A closer look at the conflict between North American fixed-gear fisheries and North Atlantic right whale protection measures.



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A critical habitat area was assigned in the southeastern Bering Sea in 2007, based on about a decade of Pacific right whale sighting data.

"So I was curious," Wright said. "Is this going to hold up under climate change, especially since the North Atlantic right whales seem to be shifting their distribution?"

Because the whale's rarity makes them hard to study, Wright led a study using the whale's food to determine if the protected area was enough and whether it was in the right place. There is currently a petition from the Center for Biological Diversity pending before NOAA to expand the protected area.

"But it's just a paper map," Wright said. "There are no restrictions or enforcement to date, but knowing more about potential drivers of shifting distribution for these animals is an important step toward having grounds for strategic, refined protections and management."

[Read the full study here \(https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.2925\).](https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.2925)

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