Global fisheries have expanded so rapidly over the past half-century that the world is running out of places to catch wild fish, according to a study conducted by researchers in Canada, the United States and Australia.

The findings, published Thursday in the online journal PLoS ONE, are the first to examine how marine fisheries have expanded over time. Looking at fleets' movements between 1950 and 2005, the five researchers charted how fishing has been expanding southward into less exploited seas at roughly one degree latitude each year to compensate for the fact that humans have depleted fish stocks closer to shore in the Northern Hemisphere.

During that same period the world's fish catch increased fivefold from 19 million metric tons in 1950 to a peak of 90 million in the late 1980s, before declining to 87 million tons in 2005. It was 79.5 million tons in 2008, according to the U.N. Food and Agriculture Organization, the most recent year for which figures are available.

Daniel Pauly, a co-author who serves as principal investigator of the Sea Around Us Project at the University of British Columbia Fisheries Centre, said the global seafood catch is dropping "because there's essentially nowhere to go." The fact that fish catches rose for so many decades "looks like sustainability but it is actually expansion driven. That is frightening, because the accounting is coming now."

The authors - including lead author Wilf Swartz, who is a doctoral student at the university, and National Geographic Society ocean fellow Enric Sala - write that this relentless pursuit for seafood has left "only unproductive waters of high seas, and relatively inaccessible waters in the Arctic and Antarctic as the last remaining 'frontiers.'"

"The focus should move from looking for something new to looking at what we have and making the most sustainable use out of it," Swartz said in an interview.

Although the analysis largely confirms what researchers, activists and policymakers know, it could provide new ammunition to those seeking to curb fishing of some of the world's most imperiled species.

Last week, for example, negotiators at the International Commission for the Conservation of Atlantic Tunas - which oversees dozens of fish stocks in the Atlantic Ocean - imposed new restrictions on vulnerable species such as oceanic whitetip and hammerhead sharks. But it stopped short of deep cuts in the annual catch of imperiled bluefin tuna in either the eastern or western Atlantic.

"People are beginning to look at science and understand if we don't start managing these fisheries properly we're going to be in trouble, not only because of ecological reasons but because they're important sources of food and income," said Russell Smith, assistant secretary for international fisheries at the National Oceanic and Atmospheric Administration.

But some of the nations that have traditionally sought out the most seafood, or depend on it as a primary food resource, are resisting steep cuts in fishing quotas.
Masanori Miyahara, who headed Japan's delegation to ICCAT last month, said his country backed policies that reflected the current state of individual fisheries.

"We will take leadership in taking decisions based on science and compliance," Miyahara said, adding that no scientific evidence suggests the need for a drastic cut in the total catch of bluefin tuna in the Atlantic.

By contrast, he added, "The science on oceanic whitetip [sharks] is very clear. We must stop [taking] the fish."

National Fisheries Institute spokesman Gavin Gibbons, whose group is the largest seafood trade organization in the United States, said the global depletion of wild fisheries helps explain why farmed fish accounts for about half of the world's seafood production. But he noted that it is still important to make distinctions between fish stocks: his group backs a ban on taking bluefin tuna from the Mediterranean but does not support some groups' call for a moratorium on fishing in the bluefin tuna's Gulf of Mexico spawning grounds.

"There's no need to stop commercial fishing in all oceans," Gibbons said. "You have to manage what you're doing effectively."

While 80 percent of the bluefin tuna caught in the Atlantic ends up in Japan, it has emerged as a hot-button issue in the United States and elsewhere. This week the advocacy group Center for Biological Diversity called on consumers, chefs and restaurateurs to boycott the fish and places that serve it, including the District's Sushi Taro restaurant. Farmers & Fishers restaurant in Georgetown also recently offered bluefin tuna on its menu.

Sushi Taro did not return a call for comment Thursday. A representative of Farmers & Fishers said that bluefin tuna has not been served in the restaurant since that occasion. Dan Simons, managing partner for the Farmers & Fishers restaurants, said in an earlier statement that "we'll be more diligent to ensure mistakes don't happen with regards to serving sustainable fish to our guests. We have committed to work to serve fish in support of the Ocean Foundation's guidelines, and applaud them on their efforts to help protect our oceans."

Catherine Kilduff, one of the group's staff attorneys, said: "Bluefin tuna are teetering on the brink of extinction. If regulators won't protect these magnificent fish, it's up to consumers and restaurants to eliminate the market demand, and that means refusing to eat, buy or serve this species."

Replacing wild fish altogether would not be easy, Gibbons noted. Ray Hilborn, a University of Washington professor of aquatic and fishery sciences, recently estimated that switching from wild fish to an equivalent amount of animal protein from pigs, cattle and chickens could take land resources equal to 22 times the existing rainforest.

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