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Troubled Waters

As the global population booms, equitable access to healthy food sources is more important than ever. But, a study conducted by researchers at UC Santa Barbara shows that wealthy countries' industrial fishing fleets dominate the global oceans. This skew in power and control has important implications for how our planet shares food and wealth.

"We were really excited to use a novel and open source of data that helped us drastically improve the resolution at which we can observe and analyze global patterns of industrial fishing behavior among countries," said Caroline Jablonicky, a researcher at the Marine Science Institute and co-lead author of "Wealthy countries dominate industrial fishing." It is published in the journal Science Advances.

For this study, the researchers examined 22 billion data points of tracking data from fishing vessels that had been analyzed using machine learning technology.

"Advanced machine learning techniques allow us to identify fishing behavior without needing an analyst to look at the tracks of every single vessel," said co-author David Kroodsma of Global Fishing Watch, the organization visualizing and openly sharing in near-real time the global fishing data used in this research. "It would take an analyst years, if not decades, to make the same number of judgments about vessel behavior."

According to the researchers' findings, about 97 percent of trackable industrial fishing that happens on the high seas (international waters that do not belong to any

one nation) is controlled by wealthy nations. Furthermore, vessels registered to wealthy countries were found to be responsible for 78 percent of trackable industrial fishing in the domestic waters of less-wealthy countries, a practice employed when the wealthy countries' demand for fish exceeds its domestic supply or these wealthy nations otherwise wish to seek out new supplies of fish.

China, Taiwan and Japan top the list of a very small number of wealthy countries whose industrial fishing dominates the high seas, with China and Taiwan together responsible for a little more than half of all the trackable industrial fishing in the shared waters. Meanwhile, China, Taiwan and South Korea were also found to be the top three industrial fishing countries fishing in the domestic waters of less-wealthy nations; their vessels were detected in 45 percent of all non-landlocked nations' waters.

As the world's people become more dependent on the ocean for sustenance, this lopsided dominance of industrial fishing becomes a larger matter of concern, according to the researchers. The ocean's fisheries are viewed as an international resource to be shared and as a buffer against food insecurity.

"Seafood keeps millions of people on our planet a hair's breadth away from diseases associated with malnutrition," said Douglas McCauley, an assistant professor in the Department of Ecology, Evolution, and Marine Biology and co-lead author of the report. "This means that accurately describing these patterns by which seafood is shared matters as much for our own future as it matters for the future of fish."

However, the researchers said, opinions continue to vary on the issue of wealthy countries' dominance in industrial fishing. Some argue that the revenue less-wealthy countries receive from selling access to fish in their domestic waters is beneficial to these countries, and wealthy foreign industrial fisheries often process and sell back the low-value fish to the less-wealthy countries, in effect using their advanced and more efficient fishing technology to provide food to countries who may not have the resources to gather enough fish for themselves.

Meanwhile, others contend that the dominance of wealthier countries in industrial fishing diminishes the less-wealthy countries' right to control their own food systems, which, in turn, could divert food away from populations where food insecurity and malnutrition remain problems. Furthermore, the more dominant industrial fishing operations could outcompete local and domestic fishing operations,

which provide a direct supply of food and income to local fishers.

This type of detailed data-driven visibility is unprecedented in other natural resource markets. “We cannot track assets in mining or forestry with anywhere near the precision that we are now able to track fishing vessels,” McCauley said. “This is a game changer when it comes to empowering both international leaders and on-the-ground citizens to make intelligent decisions about how best to manage the future of their own marine resources.”

The United Nations is currently negotiating a first-of-its-kind international treaty to benefit biodiversity on the high seas and the people that depend upon these resources. Next steps for the researchers involved in this project include engaging with the UN to make this data readily available for decision making associated with the design of this treaty.

About UC Santa Barbara

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