Deep sea mining plans could interfere with fish populations forced to move due to climate change

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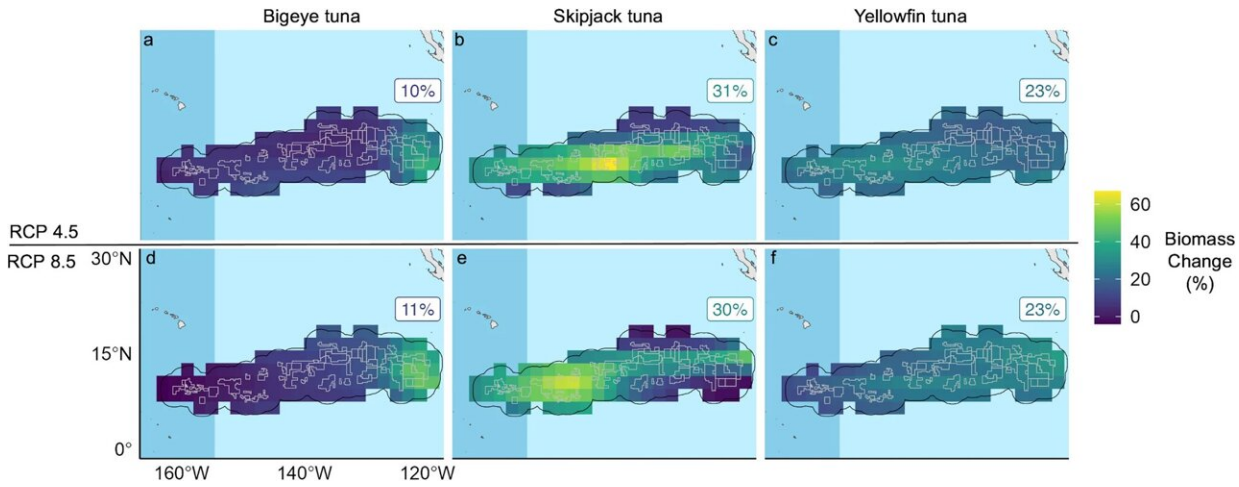

Percentage change in the biomass of tuna for the Clarion-Clipperton Zone by the mid-21st century (average of 2044 to 2053) relative to present (average of 2009 to 2018). Three species of tuna are included from left to right: bigeye tuna (*Thunnus obesus*), skipjack tuna (*Katsuwonus pelamis*), and yellowfin tuna (*T. albacares*). The black line around the CCZ denotes 200 kilometers from deep-sea mining exploration contract-area boundaries. This buffer was used as several modeling studies have suggested that midwater sediment plumes may spread over such distances. The buffer was created using the geoprocessing tool Buffer in qGIS v3.8. All maps are split into the two relevant RFMOs: the Western and Central Pacific Fisheries Commission (WCPFC) (dark blue) and the Inter-American Tropical Tuna Commission (IATTC) (light blue). Percentage values on the top right of the CCZ in each panel represent the percentage changes in tuna biomass for the entire CCZ. **a–c** are under Representative Concentration Pathways (RCP) 4.5 and **d–f** represent RCP 8.5. Credit: *npj Ocean Sustainability*

(2023). DOI: 10.1038/s44183-023-00016-8

A team of marine biologists and oceanographers from the University of California, the University of British Columbia, the University of Hawaii and the South Atlantic Environmental Research Institute, has found evidence suggesting that fish such as skipjack, yellowfin tuna and bigeye have been changing their migration patterns due to climate change and have begun moving into areas where people plan to start deep sea mining.

In their paper published in the journal *npj Ocean Sustainability*, the group describes their work that involved studying the implications of deep-sea mining on marine life.

Over the past several years, as deep-sea technology has improved, various companies around the world have begun viewing the deepest parts of ocean floor as viable mining sites. Prior research has shown that sending down vessels capable of collecting polymetallic nodules (fist-sized rocks containing high concentrations of desired metals) should be viable, allowing for deep-sea mining. Such rocks have been found to harbor copper, cobalt, nickel, and manganese.

Proponents of such mining have suggested that conducting mining operations in areas where there is little life to disturb represents a "clean" type of mining. Most expeditions to the deepest parts of the oceans have found little evidence of sea creatures at the bottom. Still, others around the world have proposed that deep-sea mining be heavily restricted, or banned outright, because of the harm that could be caused to ecosystems that have not been very well studied.

Now it seems there may be a new wrinkle to the deep-sea mining

proposal—the team with this new effort has found evidence that suggests many types of fish that until now have not migrated through or even too such areas, have increasingly been seen in such deep-sea areas.

The work by the team in this new effort involved studying wildlife in the Clarion-Clipperton Zone—a deep part of the Pacific Ocean, south-east of Hawaii. The 1.1m sq km parcel has been divvied up into pieces and doled out as contracts for deep-sea mining operations.

To assess the impact of mining in the area, the research team looked at total biomass in the area under climate change models scenarios. In so doing, they found it likely that bigeye, skipjack and yellowfish biomass would increase in the area by approximately 0 to 11%, 30 to 31% and 23%, respectively, by the middle of this century. They further suggest that mining the ocean floor at the same time would almost certainly disrupt the ability of such fish to survive.

More information: Diva J. Amon et al, Climate change to drive increasing overlap between Pacific tuna fisheries and emerging deep-sea mining industry, *npj Ocean Sustainability* (2023). DOI: 10.1038/s44183-023-00016-8

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