

Conservation risk highest off coasts of Canada, Mexico, Peru and New Zealand: research

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University of British Columbia researchers have identified conservation "hot spots" around the world where the temptation to profit from overfishing outweighs the appetite for conservation.

Combining [economic outlook](#) and fisheries population growth rates for all countries currently reported to fish in the ocean, UBC fisheries researchers William Cheung and Rashid Sumaila developed a conservation [risk index](#) to reveal the economic-conservation trade-offs of fishing.

Areas with the highest risk index – those most biologically and economically vulnerable to [overfishing](#) – include the northeastern coast of Canada, the Pacific coast of Mexico, the Peruvian coast, the south Pacific (offshore of New Zealand in particular), the southern and southeastern coast of Africa, and the Antarctic region.

"This index gives us a clear guide to determine the appropriate conservation and fisheries management policy for each region," says Cheung, an assistant professor in UBC's Fisheries Centre, who presented his research during a press briefing at the Annual Meeting of the American Association for the Advancement of Science (AAAS) in Vancouver, Canada.

"The most vulnerable area may need to be protected with special

management approaches – such as marine protected areas, while others may benefit from economic incentives to better manage the ecosystems – such as territorial use rights in fisheries, or TURFs," says Sumaila, professor and director of the UBC Fisheries Centre.

The index can also help conservation managers use scarce resources in a targeted, efficient and effective way to ensure the conservation of seafood and marine ecosystems, Sumaila adds.

"Fishing has a major impact on marine biodiversity, causing the depletion of many species," says Cheung, who grew up in Hong Kong and focused his earlier research on fisheries in the South China Sea – one of the most over-exploited areas in the world's oceans. "I witnessed how overfishing can damage marine ecosystems and the goods and services they provide – but in order to solve the problem, we need an understanding of both biology and economics. Biology determines whether a stock is more vulnerable to fishing, while economics determines how strong the incentive is to overfish the stock now."

The conservation risk index is based on two numbers: the discount rate and intrinsic population growth rate for fisheries. The discount rate for the [fisheries](#) is how much a dollar of fish would be worth now if one were to get this dollar one year later – similar to the long-term lending interest rate of central banks. The intrinsic [population growth](#) rate is the difference between the birth and death rate.

Cheung and Sumaila used published discount rates of countries that are reported to fish in the ocean and intrinsic growth rates for major exploited [fish](#) species to calculate the conservation risk index for each half degree square area of the world's oceans (2500 square-kilometres, roughly the size of Metro Vancouver or three times the size of New York City). The higher the conservation risk index number, the more vulnerable the area is.

Provided by University of British Columbia

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