

Tropical regions to be hardest hit by fisheries shifts caused by climate change: UBC research

Major shifts in fisheries distribution due to climate change will affect food security in tropical regions most adversely, according to a study led by the Sea Around Us Project at The University of British Columbia.

In the first major study to examine the effects of climate change on ocean fisheries, a team of researchers from UBC and Princeton University finds that climate change will produce major shifts in productivity of the world's fisheries, affecting ocean food supply throughout the world. The study is published today in the journal *Global Change Biology*.

“Our projections show that climate change may lead to a 30 to 70 per cent increase in catch potential in high-latitude regions and a drop of up to 40 per cent in the tropics,” says lead author William Cheung, a researcher at the University of East Anglia in the UK who conducted the study while at UBC.

“Many tropical island residents rely heavily on the oceans for their daily meals. These new findings suggest there's a good chance this important food source will be greatly diminished due to climate change.”

Previous studies have looked at how climate change affects global food supply but were limited to land-based food sources. These studies

have also predicted that tropical areas will see a decline in land productivity.

The team, led by UBC Fisheries professor Daniel Pauly, also found that regions with the highest increase in catch potential by 2055 include Norway, Greenland, Alaska and the east coast of Russia. Meanwhile, regions with the biggest loss in catch potential include Indonesia, the United States (excluding Alaska and Hawaii), Chile and China.

While greater catch potential in colder regions might appear beneficial, the authors caution that more research is needed to account for the multitude of dynamic factors that affect every ecosystem.

“We need to keep the big picture in mind when looking at the ‘winners’ and ‘losers’ of climate change,” says Pauly. “Major shifts in fish populations will create a host of changes in ocean ecosystems likely resulting in species loss and problems for the people who now catch them.”

“While warmer waters might attract new species to colder regions, the rise in temperature might make the environment inhospitable to current species in the region that cannot move to even higher latitudes. Often these species are important to the diets and culture of native subsistence fishermen.”

The team’s projections also show that Canada’s overall catch potential will remain approximately the same. The west coast may see a decrease of almost 20 per cent from 2005 to 2055 while the east coast may get a 10 per cent boost.

The study analyzed 1,066 species ranging from krill to sharks that constitute roughly 70 per cent of the world’s catch. The authors used models that include a large number of environmental and biological factors that affect fisheries. They ran these models through two climate change scenarios, one more conservative than the other, and measured the impact of the scenarios on fish distribution from the years 2005 to 2055. The authors did not include the highest emission level scenario considered by the Intergovernmental Panel on Climate Change, which would have produced even more dramatic results.

For a summary of this study, visit www.seararoundus.org/about/

This study is a product of the Sea Around Us Project, a scientific collaboration between the Pew Environment Group and The University of British Columbia. The Sea Around Us Project assesses fisheries impacts at ecosystem, ocean basin and the global level and searches for policy solutions to the challenges they pose. The results of this work are accessible on the web, offering ecosystem data, distribution maps and catch data for more than 1,000 species, historical trends and peer-reviewed publications.

The Pew Environment Group is the conservation arm of The Pew Charitable Trusts, a non-governmental organization headquartered in the United States that applies a rigorous, analytical approach to improving public policy, informing the public and stimulating civic life.

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