Two-thirds drop in large fish numbers in 100 years

January 16 2015

Grouper (Epinephelus laevis) in Madagascar. Credit: IRD / P. Laboute

Overfishing has significantly reduced the populations of larger species of

marine fish. In fact, stocks of large fish have declined by two-thirds in one century. These findings come from an international research team who carefully analysed more than 200 ocean ecosystem models across the globe, to assess the evolution of the world fish biomass from 1880 to 2007. The scientists highlighted a collapse in stocks of tuna, grouper, sharks and other top predators, with a chain reaction on a global scale, affecting the food webs and ecosystem equilibrium.

Man is held responsible for the extinction of numerous species. Human impact can be felt both on the earth and in the sea. In fact, a worldwide study reveals that in just one hundred years, the stocks of large fish species have dropped by two-thirds. And this decline is gathering speed. More than half (54%) of this biomass loss occurred in the last forty years, in other words since the start of industrial fishing in the 1970s.

The world's oceans under scrutiny

The international team, made up of researchers from IRD and their Canadian, Italian and Spanish counterparts, analysed 200 models simulating marine ecosystems across the world, over a period from 1880 to 2007. These models were produced using data on the habitat, ecology and feeding conditions of more than 3,000 fish species. The scientists extracted more than 68,000 estimates of the fish biomass at different points on the globe and at various points in the period under study. They were thus able to retrace the evolution of fishery resources over space and time, revealing the collapse of top predator populations in the last century.

Man prefers big fish

The researchers blame overfishing. Tuna, groupers, skate, sharks and swordfish are favourites among consumers, encouraging fishers to go

after these large fish species. They first seek out these high-value catches, and then tend to deplete fish stocks. Huge numbers of these species are now threatened with extinction.

Chain reactions

The loss of these top predators has a ripple effect on the whole food chain. It disturbs the balance of the populations of their prey species - small fish, jellyfish, etc. - which then proliferate. In fact, the study has shown that sardines and anchovies have seen their numbers double over the last century. The study also demonstrates that the trophic structure of marine ecosystems changed on a global scale over the twentieth century, with oceans that were previously predominated by large fish species now transformed into spaces dominated by small fish.

Is this finding really all that worrying for fishing? There is a mixed response to this question: small fish have short life cycles and are more vulnerable to environmental fluctuations.

More information: Christensen, V., Coll, M., Piroddi, C., Buszowski, J., Steenbeek, J., Pauly, D. "Fish biomass in the world ocean: A century of decline." *Marine Ecology Progress Series*, 2014, 512, 155-166. fdi:010062928

Provided by Institut de Recherche pour le Développement (IRD)

Citation: Two-thirds drop in large fish numbers in 100 years (2015, January 16) retrieved 9 April 2024 from https://phys.org/news/2015-01-two-thirds-large-fish-years.html

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