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What's left?

The Emerging Shape of the Global Fisheries Crisis

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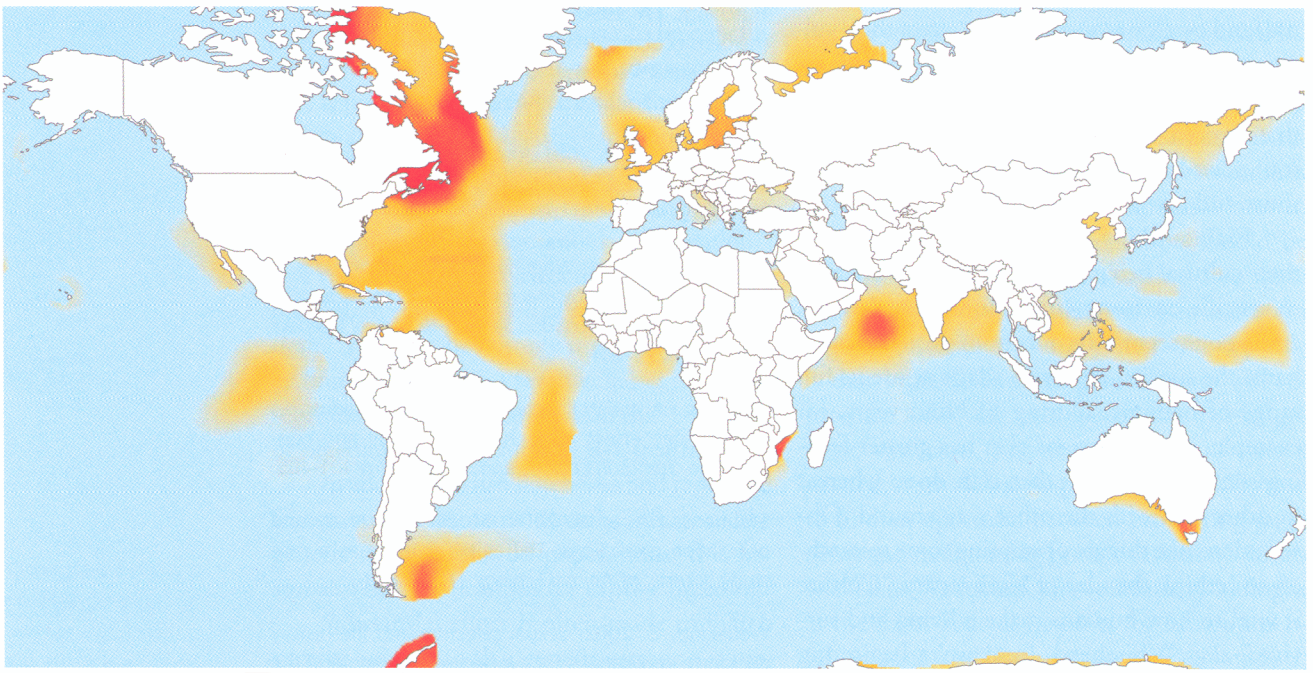
In physics, when scientists reach the limit of their instruments' resolution and encounter phenomena that are blurred, they build a bigger machine, a bigger microscope, telescope, or particle detector capable of clearly detecting the phenomena under discussion. The health of our global fisheries is like that "blurry" phenomenon. In the Sea Around Us Project (initiated and funded by the Pew Charitable Trusts), what we have done is build a bigger machine—one covering not a single bay or gulf but the world's oceans. This approach is new even though the data we used are not. We used huge amounts of existing data collected by colleagues in government, industry, and academia. They cover not one fish species but all species, especially "table fish," those we like to eat.

The project encompasses not 3 or 5 years of hard-to-interpret, fluctuating abundances but rather 50 or even 100 years, thus forcing us to confront long-term impacts and trends. For two centuries, we have been dissecting nature into ever-smaller pieces. Now, it is necessary to reassemble the pieces into the larger picture.

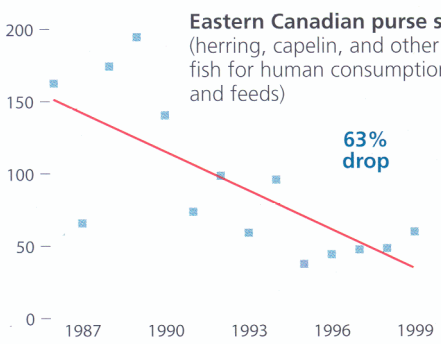
Smaller and smaller fish In the past 50 years, the average trophic level* (TL) of catch has dropped. For example in the Canadian Maritimes, the average TL fell from 3.7 (Atlantic cod, herring, pollack, and large lobster) in 1950 to 2.5 (Atlantic surf clams, scallops, herring, and shrimp) in 2000; mean size of catch went from 122 cm in 1950 to 33 cm in 2000.

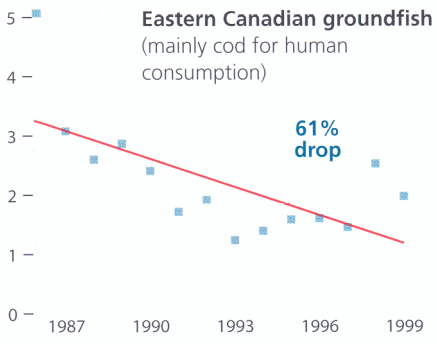


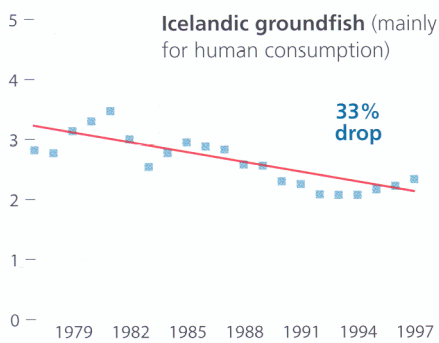
Trophic level decline: >1 0.5 to 1.0 no change/no data

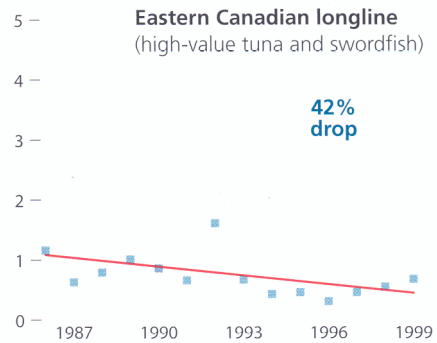
*Trophic level (TL) is an animal's relative position in the food web, e.g., herbivorous fish and crustaceans have a TL of about 2, whereas carnivorous fish, such as cod and tuna, have a TL between 3.5 and 4.5. Numbers are not whole because predators can consume prey on several trophic levels.

Tons of fish per ton of fuel





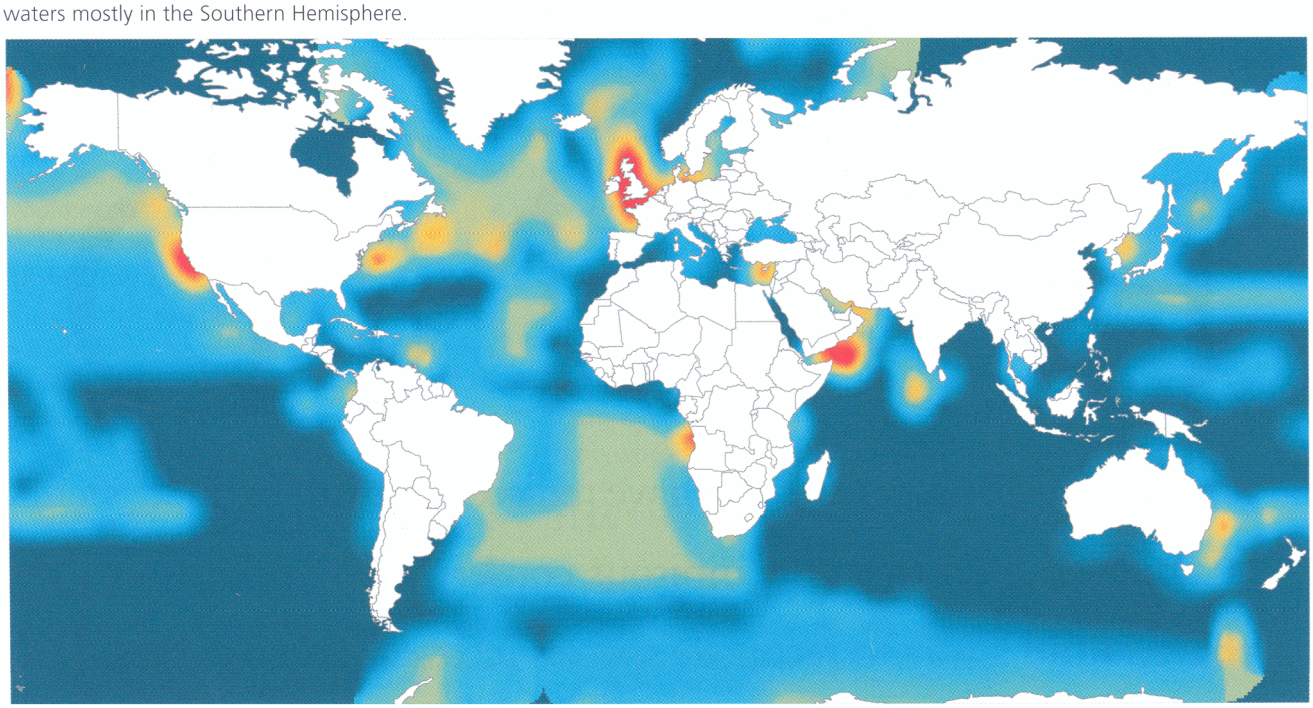




Ever more fuel

North Atlantic fisheries differ in their fuel intensities (reflecting relative abundance and value of target species), but all are bringing in fewer and fewer tons of fish per ton of fuel.

Slim pickings We have exhausted the fish stocks in most of the high productivity waters such as the North Sea and the Grand Banks in the northeast Atlantic—places with a long, rich fishing history. The remaining areas are typically large tracts of unproductive deep ocean waters mostly in the Southern Hemisphere.



Decades with maximum catch: 1950s 1960s 1970s 1980s 1990s to date (and areas as yet unfished)