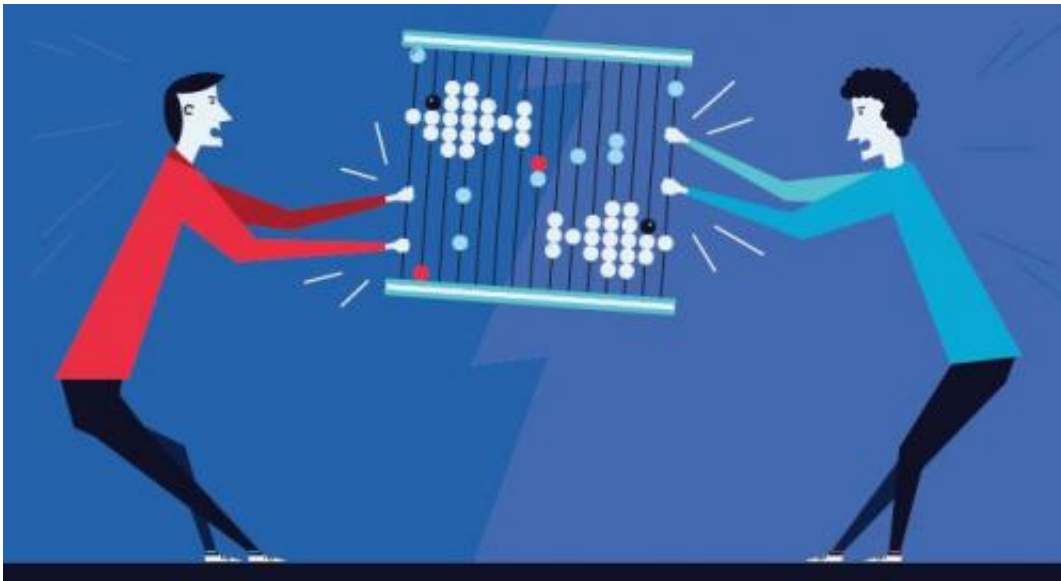


Using amount of fish caught as measure of fisheries health is misleading

February 22 2013, by Sandra Hines



Does catch reflect abundance?

Researchers are divided over the wisdom of using estimates of the amount of fish hauled in each year to assess the health of fisheries.

Credit: Feb. 21, 2013, issue of the journal Nature.

(Phys.org)—"The sea is a big place. Most fish are small. So it stands to reason that it is difficult to work out with any degree of accuracy just how many fish live in the sea. One way is to measure how many fish we

pull out of it. But is that the best way? Or even an accurate way?" asks an editorial in this week's (Feb. 21) issue of *Nature*.

The topic is featured on the cover of the journal and debated in two "Point/Counterpoint" commentaries, one jointly written by Ray Hilborn and Trevor Branch of the University of Washington, and the other by Daniel Pauly of the University of British Columbia.

The editorial continues, "In one piece, Daniel Pauly argues that 'catch data' of the number of [fish](#) caught are a vital tool for assessing the health of [fish stocks](#). In their counterpoint piece, Ray Hilborn and Trevor Branch warn that over-reliance on this measure misses important subtleties and can misleadingly distil the health of entire ecosystems down to a landed tonnage.

"This is far from an [academic debate](#). If scientists cannot estimate fish numbers, and so the health of stocks, there is little hope that this resource can be exploited in a sustainable fashion," the editorial concludes.

Both commentaries discuss the fisheries catch data published by the Food and Agriculture Organization of the United Nations. Data is collected by officials in about 200 countries on the amount, in weight, of haddock, bream, cod and more than 1,000 other species hauled in each year by [fishing boats](#).

Hilborn and Branch, faculty members with the UW's School of Aquatic and Fishery Sciences, say that the changes in the amount of fish caught does not necessarily reflect the number of fish in the sea. For example, new fishing regulations can reduce catch, or fishers might choose to fish less when the price of fish is low and the price of fuel is high.

They said they were surprised, for instance, to see Pauly in his

"Comment" piece still using "stock status plots" that rely exclusively on how many fish are caught to say if stocks are developing, exploited, collapsed or rebuilding.

That method has been shown to be seriously biased and rebutted by a series of papers in the scientific literature in recent years, Branch said, because it's only accurate one third of the time.

"Attempts to use catch data as an indication of fish abundance have spread alarm and confusion in policy circles, and fueled the perception among the public and conservation organizations that fisheries management is failing," the UW authors wrote. "A much better approach is to deduce the health of stocks region by region and fishery by fishery using scientific stock assessments, which collate all sorts of data – from the results of surveys conducted from research vessels to the catch per fishing effort, and the age and size distributions of the fish caught."

On the other hand Pauly counters that, "When only catch data are available, fisheries researchers can and should use these data to infer fishery status, at least tentatively" adding that catch data are the only data available for 80 percent of maritime countries.

Not so, Hilborn and Branch say. For example there are scientific assessments publicly available for 40 percent of the world's fisheries catch, mostly from developed countries.

Additional scientific surveys of fish abundance already exist for a number of other locations, but need to be assembled, something the two have recently begun working on with more than 20 countries, the Food and Agricultural Organization and the World Bank. They estimate that compiling stock data for another 40 countries, six to eight fisheries per country, will take 10 years and \$20 million.

Pauley's piece provides a different view of the costs and a warning: "For the vast majority of species, expert stock assessments can cost from around US\$50,000 to millions of dollars per stock – especially when research vessels are involved – so are often not feasible.

"If resource-starved governments in developing countries come to think that catch data are of limited use, the world will not see more stock assessments; catch data will just stop being collected," Pauly writes.

"We argue" said Hilborn and Branch, "that what is needed is a lot of hard work, of going to individual fisheries and working with local officials and fishermen to understand the status of these fisheries that are currently not evaluated."

The Nature editors write, "It is unquestionable that some fisheries have been horribly mismanaged, and some species driven to dangerously low levels," to which Hilborn and Branch agree. The editorial continues: "But equally, there are positive signs of change. There are examples of well-managed fisheries, and, more importantly, there now seems to be a political will to listen to scientists."

According to Hilborn and Branch, the facts now suggest that "on their own catch data cannot answer the question at the heart of [fisheries](#) science, how many fish are in the sea?"

Provided by University of Washington

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