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UBC researcher gives first-ever estimate of worldwide fish biomass and impact on climate change

By nisumaa

Are there really plenty of fish in the sea? University of British Columbia fisheries researcher Villy Christensen gives the first-ever estimate of total fish biomass in our oceans: Two billion tonnes.

And fish play a previously unrecognized but significant role in mitigating climate change by maintaining the delicate pH balance of the oceans, according to a study published in tomorrow's edition of the journal *Science*, co-authored by Christensen and a team of international scientists.

"By drinking salt water, fish ingest a lot of calcium, which needs to be removed – or they will get renal stones," says Christensen, an associate professor in the UBC Fisheries Centre.

The team discovered that fish do this by binding the calcium to bicarbonate, and then excreting it as pellets of calcium carbonate, a chalk-like substance also known as "gut rocks," in a process completely separate from food digestion. For an animation of this process, visit www.publicaffairs.ubc.ca/download.

As the calcium carbonate from these pellets dissolves, it turns the seawater more alkaline, which has relevance for ocean acidification, and is impacted by the ocean's exchange of carbon dioxide (CO₂) with the atmosphere.

To gauge the global impact of this process, Christensen and Simon Jennings from the UK's Centre for Environment, Fisheries and Aquaculture Science took two entirely different approaches to estimate the total biomass of fish in the world's ocean.

Jennings examined global ocean plant production and its efficiency as it moves through the food chain, while Christensen tallied global fish catches since 1950 and calculated how much fish there must have been in the oceans to support fisheries. The two approaches resulted in a close range of numbers: 0.8 to 2 billion tonnes.

"This study really is the first glimpse of the huge impact fish have on our carbon cycle – and why we need them in the ocean," says Christensen. "We must buck the current trend of clear-cutting of the oceans and foster these unrecognized allies against climate change."

Brian Lin, *EurekAlert*, 15 January 2009. [Article](#).

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