

# Vancouver Sun

## Study weighs in on fish in sea: 2 billion tonnes; UBC researcher part of a scientific team that publishes first estimate of the total biomass

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Byline: Tara Carman

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Illustrations: Colour Photo: A new study finds fish are a buffer against climate change by preventing oceans from becoming too acidic.

We're often told that there are plenty of fish in the sea, but just how much is plenty? Two billion tonnes, according to a University of B.C. researcher.

Associate professor Villy Christensen from the UBC Fisheries Centre, along with a team of scientists from the U.S. and U.K., has published the first estimates of the total biomass of fish in the world in today's edition of the journal *Science*.

They also uncovered a previously unrecognized role of fish as a buffer against climate change. Because fish drink salt water, they ingest a lot of calcium that needs to be removed from their bodies or they get renal stones, Christensen said.

Fish excrete the calcium as pellets of a chalk-like substance, calcium carbonate. These pellets are sometimes called "gut rocks." This process is separate from food digestion.

The carbon dioxide emissions linked to global warming also make the oceans more acidic. Oceans that are too acidic kill coral, dissolve animal shells and harm zooplankton, the tiny animals near the bottom of the food chain, Christensen explained in an interview. The "gut rocks" produced by fish raise the pH of the ocean, making it less acidic.

"The oceans are a big buffer against climate change. If we had only land, we would have been fried by now. It's the oceans that keep the planet going."

Humans extract less than 100 million tonnes of fish from the ocean each year, about five per cent of what's there, Christensen said. About half the fish in the world are deep-water species living in the open ocean that humans don't harvest.

Two billion tonnes of fish is enough to sustain fisheries and play this role in the carbon cycle, Christensen said. But, there are big differences between the health of fish stocks in the open ocean and those on the coast, which he said researchers have cause to be concerned about.

Fisheries, like forests, need to be managed. If fishing were to cease altogether, the ocean would be full of older fish that don't process calcium as efficiently, Christensen said. At the same time, overfishing can upset the entire food chain. "Fisheries are good. Clearcutting is bad," he said.

"Basically, the ocean tells us, 'Don't mess with the ecosystem unless you know what you're doing.'"

That's what has happened, especially with the world's fisheries over the last 50 years."

Having more fish in the ocean benefits everyone, Christensen explained.

"[This is a] 'have your cake and eat it too' situation. If we have more fish in the system, it may buffer climate change, but it may also give us more food to eat."

tcarman@vancouversun.com

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