

# Fish excretions fight climate change: Scientists

BY LENA SIN, VANCOUVER PROVINCE    JANUARY 15, 2009

VANCOUVER — Scientists have discovered that fish guts play a major role in the marine carbon cycle, making them unexpected allies against climate change.

Previously, UN scientists have warned that when the ocean absorbs more carbon dioxide emissions from the atmosphere, it also becomes more acidic, threatening coral reefs and other sea life.

This new study, to be published Friday in the journal *Science*, shows fish excretions of calcium carbonate can offset this acidity.

"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," said Villy Christensen, associate professor at the University of B.C. Fisheries Centre. "We must buck the current trend of clear-cutting of the oceans and foster these unrecognized allies against climate change."

Until now, scientists believed the ocean's calcium carbonate, which dissolves to control the acidity, or pH, of sea water, came from the external "skeletons" of plankton.

The new findings now show that fish are responsible for producing three to 15 per cent of marine calcium carbonate.

The team of researchers from Canada, the U.S. and U.K., say the estimate is conservative and could be three times higher.

By continuously drinking sea water, fish are ingesting an excess of calcium, which they turn into calcium carbonate crystals in their guts. They then simply excrete these unwanted "gut rocks" in a process that's separate from digestion and production of feces.

The fish that produce calcium carbonate are "bony fish," a group that includes 90 per cent of marine fish species, but not sharks or rays.

As part of the study, Christensen helped answer the daunting question of how many fish are in the sea.

Christensen and colleague Simon Jennings from the U.K.'s Centre for Environment, Fisheries and Aquaculture Science conducted independent studies and came to similar conclusions.

They estimate there are between 812 million and two billion tonnes of fish in the ocean.

Lead author Rod Wilson of the University of Exeter says it's vital that scientists build on the research.

"We have really only scratched the surface of knowing the chemistry and fate of fish carbonates," said Wilson. "Given current concerns about the acidification of our seas through CO<sub>2</sub> emissions, it is more important than ever that we understand how the pH balance of the sea is normally maintained."