

Fish droppings help balance ocean's acid levels

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THE ASSOCIATED PRESS
JANUARY 16, 2009 AT 12:23 PM EST

WASHINGTON — The ocean's delicate acid balance may be getting help from an unexpected source – fish.

The increase in carbon dioxide in the atmosphere not only drives global warming, but also raises the amount of CO₂ dissolved in ocean water, tending to make it more acid and potentially a threat to sea life.

Alkaline chemicals such as calcium carbonate can help balance this acid. Scientists had thought the main source for this balancing chemical was the shells of marine plankton, but they were puzzled by the higher-than-expected amounts of carbonate in the top levels of the water.

Now researchers led by Rod W. Wilson of the University of Exeter in England report in the journal *Science* that marine fish contribute between 3 per cent and 15 per cent of total carbonate.

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And the contribution may be even higher than that, say the researchers from the United States, Canada and England.

They report that bony fish, a group that includes 90 per cent of marine species, produce carbonate to dispose of the excess calcium that they ingest in seawater. This forms into calcium carbonate crystals in the gut, and the fish then simply excrete these “gut rocks.”

The process is separate from digestion and production of feces, according to the researchers.

The team estimated the total mass of bony fish in the ocean at between 812 million tons and 2.05 billion tons, which they said could produce about 110 million tons of calcium carbonate per year.

The carbonate produced by fish is soluble and dissolves in the upper sea water, while that from the plankton sinks to the bottom, the team noted.

The research was funded by the U.K. Biotechnology and Biological Sciences Research Council, The Royal Society, the U.S. National Science Foundation, the Natural Sciences and Engineering Research Council of Canada, United Nations Environmental Program, the Pew Charitable Trust and the U.K. Department of Environment, Food and Rural Affairs.

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