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There Will Be Acid

Over the past few days, scientists have released a series of studies suggesting that the world's oceans are acidifying much faster than anyone thought possible. As an increasing amount of carbon-dioxide gets emitted into the atmosphere, the oceans have, in turn, been absorbing more of it, which causes the pH of the water to fall. Lower pH makes it hard for marine organisms to build shells out of calcium carbonate, a potentially deadly problem for shellfish, coral, and some kinds of plankton. (Last week, the Center for Biological Diversity sued the EPA over this very issue, using the Clean Water Act as a pretext.)

So how fast are we talking about? The ocean off the coast of Washington State is acidifying ten to 20 times faster than existing climate models had projected, according to a new paper published by researchers at the University of Chicago. The researchers found that the decreasing pH of ocean water at their monitoring site corresponded with a decline in mussel populations, presumably because the mussels had difficulty building shells.

The Southern Ocean around Antarctica is also acidifying at a distressing rate, according to a new paper by two Australian researchers. The study predicts that a tipping point in Southern Ocean acidification will take place when atmospheric carbon-dioxide levels reach 450 parts per million (see here for a recent debate among climatologists over what constitutes a "safe" level of CO2 in the atmosphere). At that point, the researchers argue, seasonal pH minimums will be low enough to disrupt the life cycle of several important species of hard-shell plankton. These plankton are at the base of the Antarctic marine food chain, so anything that harms them could eventually harm a lot of other species, including penguins, which have joined polar bears on the list of charismatic polar species put at risk by global warming.

Shockingly, oceans aren't the only bodies of water growing more acidic. Researchers in Kansas recently discovered that even *groundwater* is absorbing large amounts of carbon dioxide and becoming more acidic as a result. Groundwater that's more acidic dissolves rocks more quickly and picks up naturally-occurring heavy metal contaminants in the process. So rising atmospheric CO2 levels could make some people's well water unsafe to drink. If there were a prize for the least-expected unpleasant consequence of climate change, this is a discovery that would surely be a contender.

--Rob Inglis, *High Country News*