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Acidic oceans worsening, experts warn

CO2 impact coming faster than seas can adapt, they say

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Manmade emissions of carbon dioxide are making our oceans more acidic — and thus threatening corals and shellfish — at a rate unseen in at least 800,000 years, a blue-ribbon panel of scientists reported Thursday.

"Ocean acidification is a growing global problem that will intensify with continued CO2 emissions and has the potential to change marine ecosystems and affect benefits to society," the panel warned in its report for the National Research Council and Congress.

Concerns about coral
View an interactive on coral bleaching, types of reefs and how coral reproduces.

Oceans absorb about a third of manmade CO2, a process that reduces CO2's impact on temperatures but which also decreases the pH of the seas, thus making them more acidic. pH is a measure of how alkaline or acidic something is. A pH of 7 is neutral, while higher numbers are more alkaline and lower numbers are more acidic.

"The average pH of ocean surface waters has decreased by about 0.1 unit — from about 8.2 to 8.1 — since the beginning of the industrial revolution," the scientists said in noting earlier research. Moreover, models project "an additional 0.2-0.3 drop by the end of the century, even under optimistic scenarios," they added.

"It is important to note that the concentration of atmospheric CO2 is rising too rapidly for natural ... processes to maintain the pH of the ocean," the experts stated. "As a consequence, the average pH of the ocean will continue to decrease as the surface ocean absorbs more atmospheric CO2."

Congress recently passed a law to fund federal research into acidification but the panel said more needs to be done, and more quickly, because specific impacts on specific species are still not well understood.

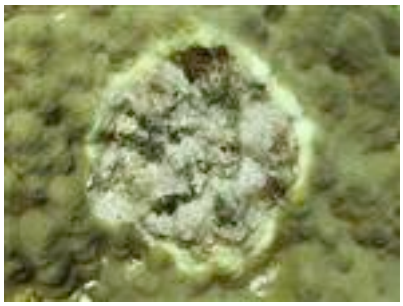
"Despite the potential for socioeconomic impacts to occur in coral reef systems, aquaculture, fisheries, and other sectors, there is not currently enough information to assess these impacts, much less develop plans to mitigate or adapt to them," the experts wrote.

"A global network of robust and sustained chemical and biological observations will be necessary to establish a baseline and to detect and predict changes attributable to acidification," they added.

Shrinking oysters

Testing done so far is not hopeful. One of the most recent studies has been on oysters along the West Coast.

Brian Gaylord, a biological oceanographer at the Bodega Marine Laboratory of the University of California at Davis, looked at the impact of more acidic oceans on larval and juvenile Olympia oysters.



Stress signs

View images taken by researcher John Bruno and others of coral reefs stressed by disease, warming seas and other factors.

Even with small changes in acidity, seawater becomes corrosive to the shells of marine organisms. "Similar to what happens in carbonated soda, increasing carbon dioxide in seawater makes it more acidic," he said in a statement summarizing his research,

His testing used lab seawater with present-day CO2 ocean concentrations, as well as lab seawater that used higher CO2 levels that scientists say could occur by 2100.

In the higher CO2 environment, the larval shells at day 9 of their growth were 16 percent smaller than those reared in the present-day seawater conditions.

A week later, the difference was 41 percent and the smaller oysters never caught up.

"One and a half months after being transferred back to normal seawater, juveniles that had come from the high carbon dioxide environment were still 28 percent smaller than oysters reared for the entire experiment in control conditions," Gaylord said.

Worldwide, oysters have already been impacted by development along coastlines — 85 percent of shellfish reefs have been lost, taking with them valuable services like filtering water and creating natural buffers from storms and even boat wakes.

"Oysters have gone extinct in many areas, especially in North America, Australia and Europe," said David Garrison, director of the National Science Foundation's biological oceanography program, which funds Gaylord's research.

The Associated Press and Reuters contributed to this report.

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