

EPA weighs action on ocean acidification

By Shawn Gaynor

Jan. 28, 2009 (GNT) — According to scientists, the oceans of the world have become about 30 percent more acidic due to human carbon dioxide emissions — and this spells trouble for ocean life.

The Environmental Protection Agency agreed last week to review how ocean acidification, a result of atmospheric carbon dioxide pollution, should be addressed under the federal Clean Water Act.

Approximately half of the carbon dioxide emitted into the atmosphere from human activities over the past 200 years has been absorbed by the oceans and as a result has lowered average ocean pH by 0.11 units.

While the change is smaller than what is currently regulated under EPA clean water standards, scientist say further increases in ocean acidity could mean doom for many ocean creatures, and the overall ecosystems of the ocean.

“Global warming’s evil twin, ocean acidification, is the most insidious threat to our ocean ecosystems,” said Miyoko Sakashita, an attorney with the Center for Biological Diversity, who petitioned the EPA to examine the issue.

The petition, filed by the Center for Biological Diversity back in Dec. of 2007, called on the EPA to consider rule changes to the Clean Water Act that would consider new science about ocean acidification,

and lower the pH level regulated for water.

If the EPA decides to issue a rules change it would require states to designate water bodies that do not meet the new water-quality standards as “impaired” and take action to limit their pollution. This could lead to state-level regulation of atmospheric carbon dioxide emissions under the Clean Water Act.

Oceans store about 50 times more carbon dioxide than the atmosphere, and over time, roughly ninety percent of carbon dioxide emitted into the air from burning of fossil fuels will be absorbed by the ocean.

Unlike global climate change, ocean acidification takes place through a basic chemical reaction and therefore it is easier for scientists to accurately predict future ocean pH changes due to carbon-dioxide emissions.

The oceans currently absorb about 22 million tons of carbon dioxide per day. Scientists agree that the oceans will acidify an additional 0.4 pH by the end of the century under current carbon dioxide emission trajectories.

According to the studies cited by the CBD, the primary known impact of acidification is impairment of calcification, the process whereby corals, crabs, abalone, oysters, sea urchins, and other animals make shells and skeletons. Studies of



Rich in biodiversity, coral reefs like this one in Florida are under threat from increases in the ocean’s acidity. Photo courtesy of Tropical Conservancy.

marine species that build shells or skeletons from calcium carbonate nearly all experience deterioration when exposed to increasing carbon dioxide levels in seawater. In fact, studies have shown that at carbon dioxide concentrations likely to occur by 2030, the shells of many marine species would deform or dissolve.

Many species of phytoplankton and zooplankton, which form the basis of the marine food web, are also particularly vulnerable to ocean acidification. Already coral reefs worldwide have suffered mass die-offs as a result of ocean acidification.

“In just a few decades, ocean acidification will unravel a delicate balance of underwater diversity that took millions of years to build,” said Sakashita. “Absent quick regulatory action to address ocean acidification, we will likely see catastrophic impacts on our ocean ecosystems, including the near-complete loss of coral reefs.”

The ocean has been more acidic in some geologic periods. However, according to Sick Seas, a report published in the journal Nature in 2006, the current increase in ocean acidity is an unprecedented 100 times faster than any other rise in at least the last hundreds of thousands of years. The gradual nature of previous acidification cycles left time for marine life to adjust through evolution to the new conditions.

The EPA's letter responding to the CBD's petition agrees with the need for review in light of new science, and commits to a course of action.

"We plan to publish a Notice of Data Availability (NODA) by April 15th, and we plan to publish guidance regarding coral biocriteria by the end of 2009," stated the EPA. In return, the CBD will suspend a lawsuit file over EPA inaction on its 2007 petition.

When the EPA issues a NODA, it opens an issue to comment, solicits expert opinion, and considers new scientific data. After examining the science the EPA will determine whether the current water-quality criterion for pH under the Clean Water Act should be modified to address ocean acidification.

"EPA's commitment to review its water-quality criterion in light of ocean acidification marks an important step toward taking action under the Clean Water Act to begin to address this perilous threat," said Sakashita.

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