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Clean Water Act Will Be Crucial to Addressing Ocean Acidification

By Miyoko Sakashita

Last month, with great fanfare, the Environmental Protection Agency finally announced the obvious: Carbon dioxide emissions threaten the public health and welfare. This decade-overdue "endangerment finding," the first step toward regulating carbon dioxide under the Clean Air Act, highlights the important role existing law can play in tackling the climate crisis.

But the Clean Air Act is by no means the only such law that can be targeted to address carbon dioxide emissions. Just two days before the endangerment announcement, the EPA quietly began a separate process, which if properly implemented to its logical conclusion, would lead to regulation of carbon dioxide emissions due to their impacts on water quality. On April 15, in response to a petition by the Center for Biological Diversity, the EPA published in the Federal Register a notice soliciting information on how changes in seawater pH brought on by ocean acidification might be regulated under the Clean Water Act.

The oceans serve as an important buffer to global warming because they absorb huge amounts of carbon dioxide from the atmosphere, thus slowing the warming of the planet. Indeed, the oceans take up about 22 million tons of carbon dioxide each day. Until recently, this "free" sequestering of our emissions by the ocean was generally viewed as a positive. But recent science has shown that using our oceans as a carbon sink comes at great cost.

As the oceans absorb carbon dioxide, the gas reacts with seawater causing it to become more acidic. This process - termed ocean acidification - impairs the ability of marine animals to build their protective shells and skeletons. With each American adding about 40 pounds of carbon dioxide to the oceans every day, the global oceans are about 30 percent more acidic now than in pre-industrial times. On the current trajectory, the acidity of the oceans will increase 100 to 150 percent by the end of the century. In last month's Federal Register notice, the EPA acknowledged that "oceans will become more acidic over time and overall, the net effect is likely to disrupt the normal functioning of many marine and coastal ecosystems."

Although the worst consequences are predicted for the future, ocean acidification is already affecting our oceans. A recent survey off the

California coast revealed that waters affected by ocean acidification are upwelling onto large portions of the continental shelf in northern California. As a result, fish and other animals along the West Coast are already being exposed to corrosive water during some seasons.

Nearly all marine animals studied to date from corals to shellfish have had adverse reactions to ocean acidification. I've spoken with shellfish farmers on the Pacific Coast who are having difficulty raising oysters in waters that appear to be more acidic in recent years. Scientific reports predict that the world's coral reefs will be destroyed within a few decades by the effects of ocean acidification coupled with global warming. A recent study projects that by 2016 portions of the Arctic will become sufficiently acidified that the shells of mussels will dissolve faster than they can grow. But the scariest thing about ocean acidification is that it threatens the smallest ocean creatures, certain plankton that form the foundation of the marine food web. As go the plankton, so goes the planet.

Scientists such as NASA's Jim Hansen tell us that carbon dioxide in the atmosphere will need to be stabilized below 350 parts per million to avoid extinctions on land and at sea from climate change and ocean acidification. Yet right now the atmospheric carbon dioxide concentration is at 386 parts per million and rising. Put simply, we have already crossed the danger point and are accelerating toward the abyss. If there is to be a future for our oceans, our climate and ultimately ourselves, we must sharply reduce our emissions.

While sufficiently strong new domestic climate legislation and international agreements are welcome and necessary to address global warming and ocean acidification, we need not and must not wait for such measures before acting as we already have the legal tools at hand to begin to address the problem of ocean acidification.

The Clean Water Act's express goal is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The Clean Water Act aims to eliminate pollution no matter its source, and it explicitly regulates changes in pH, a measurement of acidity. Section 303(d) of the Clean Water Act requires states to create a list of impaired waters - those waters for which existing pollution controls are insufficient to meet water quality standards. Accordingly, an unacceptable change in seawater pH triggers a duty to designate ocean waters as impaired. Coastal states, including California, Oregon and Washington, are all currently evaluating information on ocean acidification as a part of a biennial review of their impaired waters list. If a water body is classified as impaired, then states are required to establish limits for pollutants causing the impairment and allocate total maximum daily loads among all point and non-point sources. Here, that could translate into controls on carbon dioxide pollution.

Pollution controls for carbon dioxide under the Clean Water Act could take many forms. For example, a total maximum daily load calculation should set target levels of carbon dioxide below 350 parts per million and then

allocate loads consistent with meeting that target among sources. There could be cooperative regional or national approaches, as have been used to reduce atmospheric mercury pollution. Moreover, carbon dioxide targets and allocations can complement targets and requirements under the Clean Air Act or any new legislation aimed at capping greenhouse gases.

One impediment to coastal states properly reviewing whether their ocean waters are impaired by acidification is that EPA's governing pH criterion, adopted in 1976, is woefully outdated. The current standards allow a change of 0.2 pH units from natural variation, changes that if brought on by acidification would likely be catastrophic to marine ecosystems. With its recent notice, the EPA is soliciting data until June 15 that will be used to evaluate whether a revision of the seawater pH criteria is needed to protect marine life from acidification. States must update their own water quality standards to conform to the EPA's criteria or provide a scientifically defensible alternative. It is against these standards that all pollution controls under the Clean Water Act are based, including total maximum daily loads.

Even though the EPA's current pH criterion is underprotective, allowing a 60 percent change in acidity, or 0.2 pH units, ocean acidification is occurring so rapidly that acidification levels once predicted for century's end are already being measured and the criterion is being exceeded. A recent scientific publication demonstrated that seawater pH off Washington's Olympic Peninsula has declined by more than 0.2 pH units over the past decade. With ocean acidification, the future is now.

The benefits of using the Clean Water Act as an approach to addressing ocean acidification are two-fold. Most importantly, the law is already on the books so we need not wait for some uncertain and likely inadequate cap and trade bill. Second, federal and state agencies already have the expertise and structure in place to implement the law. The Clean Water Act has been successfully applied to traditional and emerging pollution problems for over three decades. Although we've only recently come to recognize carbon dioxide as a form of water pollution, the Clean Water Act, properly applied, is an essential tool in reducing this most dangerous of pollutants.

Miyoko Sakashita is an attorney with the Center for Biological Diversity and runs the organization's ocean acidification efforts.

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