



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 15 2010

OFFICE OF
WATER

Ms. Miyoko Sakashita, Attorney
Center for Biological Diversity
351 California Street, Suite 600
San Francisco, CA 94104

Dear Ms. Sakashita:

On April 15, 2009, U. S. Environmental Protection Agency (EPA) published a Notice of Data Availability (NODA) containing data and information provided by your organization regarding the potential effects of ocean acidification on aquatic life, and simultaneously solicited data and information from the public that may be useful to the Agency in our decision to re-evaluate and revise the marine pH water quality criterion. EPA has carefully reviewed all of the information received from the public during that process and has now completed a review of the comments received. Based on comments received during the NODA process, the Agency has decided not to revise the marine pH criterion at this time for reasons detailed in the enclosed memorandum.

EPA appreciates the opportunity to be able to present this important issue to the public, and the solicitation of information was valuable in assisting the Agency in our assessment of the issues. Thank you for your interest in EPA's water quality criteria program and efforts to address ocean acidification. If you have any questions, please contact Joe Beaman at 202-566-0420 or beaman.joe@epa.gov or Lisa Huff at 202-566-0787 or huff.lisa@epa.gov in the Office of Science and Technology.

Sincerely,

A handwritten signature in black ink that reads "Peter S. Silva".

Peter S. Silva
Assistant Administrator

Enclosure

Memorandum Detailing EPA Decision on Re-evaluation and/or Revision of the Water Quality Criterion for Marine pH for the Protection of Aquatic Life

Center for Biological Diversity
351 California Street, Suite 600
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On December 17, 2007, EPA received a petition from the Center for Biological Diversity (CBD) asking EPA to revise its recommended Clean Water Act (CWA) Section 304(a) (1) recommended national marine pH water quality criterion for the protection of aquatic life and also asking EPA to publish information and provide guidance on ocean acidification. Following careful consideration of the petitioner's request and supporting information, the Environmental Protection Agency (EPA) published a Federal Register (FR) notice of data availability (NODA) on Ocean Acidification and Marine pH Water Quality Criteria at 74 FR 17484 (April 15, 2009). The NODA was issued through a Federal Register (FR) Notice to solicit additional scientific information and data to fill data gaps to inform EPA's next steps and determine whether changes in existing criteria are warranted. EPA's current CWA 304(a) (1) recommended criterion for marine pH is: *"pH range of 6.5 to 8.5 for marine aquatic life (but not varying more than 0.2 units outside of the normally occurring range). This criterion applies to open-ocean waters within 3 miles of a State or Territory's shoreline where the depth is substantially greater than the euphotic zone"*.

In the FR notice, EPA also provided information on ocean acidification, including a bibliography of the information submitted by CBD, and solicited additional information pertaining to the availability of marine pH monitoring data, monitoring methodologies and implementation of marine pH water quality standards. EPA also requested information, science and data from the public on the general subject of ocean acidification. In this NODA, EPA requested only information and data relevant to addressing ocean acidification under the CWA, and not other statutes such as the Clean Air Act.

The 60-day comment period on the NODA ended on June 15, 2009 and resulted in over 17,000 responses (as form letters) expressing general support for EPA's effort to address ocean acidification but providing no technical input. Comments were also received expressing a viewpoint that the CWA and marine water quality criteria for pH are not appropriate tools for addressing ocean acidification. Twenty responses (from academia, state agencies, environmental non-governmental organizations, and industry groups) to the NODA provided the Agency with substantive technical input including scientific references, methods for measuring carbon dioxide and pH and data demonstrating natural pH variability.

Substantive comments received from the public could be divided generally into 4 categories:
1) Marine pH criteria – One commenter stated that other factors besides pH such as carbonate ion concentration, are important in determining the carbonate mineral saturation state, which is

the parameter directly related to health of calcareous organisms. One commenter also stated that any criteria revisions should consider regionally specific patterns (e.g. upwelling, current trends – El Nino) to account for areas of higher variability in shallow coastal areas. Another commenter stated "EPA should develop new ocean water quality criteria for pH based not only on the documented sensitivity of flora and fauna, but also on regionally specific patterns of exposure to seawater that has become "acidified" or undersaturated with respect to carbonate due to human influence- such as the seasonal upwellings observed on the West Coast by Feely et al. (2008)." Conversely, one commenter asserted "marine water quality criteria are used to regulate discharges from wastewater treatment facilities to the marine environment. Compared to atmospheric CO₂, plant discharges are extremely negligible.... more stringent pH criteria could have unintended consequence of producing meaningless permit violations or unnecessary chemical additions to discharges. If water quality criteria are used to regulate atmospheric CO₂, specific language should...make it clear the criteria do not apply to wastewater treatment plant discharges."

2) Monitoring pH – A comment asserted that it was necessary to monitor other chemical parameters (e.g. using dissolved inorganic carbon (DIC)-partial pressure of CO₂ (p CO₂), total alkalinity [TA]) besides pH since pH is not always a good predictor of biological impacts. One commenter stated that it is important to understand the water chemistry that controls the calcification rate in corals since it is controlled by the calcium carbonate ion concentration and saturation state rather than pH. Several commenters also commented that open-ocean monitoring is better understood than shallow coastal waters.

3) There were also some general comments regarding ocean acidification. A commenter stated that pH alone is narrow indicator of ocean acidification since the relationship between elevated atmospheric CO₂ and the resultant pH in marine systems involves the interaction of several other parameters, and is not a causal relationship. A commenter also stated that "the Pacific coast is more vulnerable to ocean acidification due to its shallow aragonite concentration horizon and strong seasonal upwelling".

4) Establishing a baseline- Comments from the academic sector stated that long-term trends cannot be established for direct ocean pH at this time due to data quality issues with calibration procedures and standards, therefore pH is modeled using dissolved inorganic carbon (DIC), partial pressure of CO₂, and/or titration alkalinity (TA). Also, trends in coastal regions are different than in the open ocean since primary production and/or circulation can complicate the interpretation of trends.

These comments illustrated well uncertainties in the use of marine pH as sole indicator for ocean acidification. After the NODA comment period closed, the Agency received additional input from NOAA (added to docket) that was helpful in our assessment of the need to re-evaluate the marine pH criteria. Importantly, this additional information indicated that one general marine pH criterion (as in the current criterion form) would not suffice for all coastal regions, as there are significant regional differences in natural diurnal and seasonal pH, DIC and TA ranges and

associated biological responses. Additionally, this information indicated that, in most coastal regions, the data to characterize diurnal and seasonal variability are so limited that short term trends in carbon system parameters and pH cannot be determined. Consequently, without additional monitoring, it would be difficult at this time to establish a national water quality criterion that accurately reflects the impacts of ocean acidification water quality criterion for coastal waters within the 3-mile statutory limit where the water quality standards for states, tribes and territories apply.

An additional approach EPA considered was the establishment of regional criteria for all coastal waters. In this regard, the National Oceanic and Atmospheric Administration (NOAA) experts have identified several high quality datasets that states, territories, and tribes may want to consider when deciding to refine their respective current marine pH Water Quality Standard to reflect an accurate long-term baseline against which the impacts of ocean acidification may be assessed. Currently, however, EPA does not believe that the datasets are sufficiently extensive to support derivation of marine pH criteria recommendations for shallower coastal areas where pH fluctuates naturally.

Therefore, after careful consideration, EPA has decided to not revise the existing Section 304 (a) (1) marine water quality criterion for pH at this time. In reaching this decision, EPA used the information collected through the NODA process as well as additional information from NOAA.