



March 9, 2012

To whom it may concern:

Ocean acidification is the ongoing change in seawater acid-base balance resulting from ocean uptake of atmospheric carbon dioxide (CO₂) produced mainly from burning of fossil fuels. Average global surface seawater hydrogen ion concentration or acidity has increased by about 30% since the Industrial Revolution, decreasing ocean pH by about 0.1 units. pH is the scale used to measure acidity. This hydrogen ion concentration is expected to increase by an additional 100-150% during this century owing to current atmospheric CO₂ levels and expected CO₂ emissions. As a result, ocean pH will continue to decrease. The current average rate of ocean acidification is faster than has been experienced for at least the past 20 million years. Based on ocean time-series observations, the scientific evidence for ocean acidification is unquestionable.

The ocean acid-base balance is important in regulating the rate and function of marine chemical and biological processes. If CO₂ emissions continue to rise and the acidity of the world's oceans continues to increase, there may be drastic changes to the function and role of many marine organisms and ecosystems. At the same time, other stressors often induced by human activity, such as warming, deoxygenation, and pollution, pose additional pressure to marine ecosystems. Impacts of ocean acidification and other human-caused stressors are expected to reach far beyond that of the marine environment and will influence the health and well-being of human society through the goods and services the ocean provides.

The Ocean Carbon and Biogeochemistry Program (OCB; www.us-ocb.org) expresses grave concern about the potential far-reaching effects of ocean acidification on marine elemental cycles and biology. Ocean acidification could alter the ocean carbon, nitrogen, phosphorus, and metal (e.g., iron and copper) cycles, and marine biota from individual organisms to ecosystems could be negatively influenced. Such changes could alter marine biodiversity and food webs, as suggested by community composition around naturally occurring carbon dioxide vents and geological records showing that past, slower, acidification events decreased biodiversity markedly. Nevertheless, there are solutions to this problem, and the sooner we act, the better.

OCB urges national and international decision makers to take this threat seriously, and to carefully consider this environmental challenge in the context of sustainable development. OCB recommends that decision makers take actions that promote:

- Reduction of the current rate of ocean acidification by significantly lowering the absolute rate of anthropogenic carbon dioxide emissions
- Improvement of the current state of knowledge of this problem by commitment to research and long-term monitoring of the chemical, biological, and ecosystem impacts of ocean acidification and development of a global ocean acidification observation network
- Increased marine ecosystem resilience through implementation of ecosystem-based management approaches which include the reduction of other environmental stressors, such as hypoxia, pollution, and over-fishing
- Continued research to inform ocean acidification adaptation strategies for marine ecosystems and human communities

OCB's mission is to improve understanding of the evolving role of the ocean in the global carbon cycle, in the face of environmental variability and change, through studies of marine biogeochemical cycles and associated ecosystems. The organization consists of a community of self-identified researchers represented by a scientific steering committee and topical sub-committees, whose scientific coordinating and communicating activities are supported by a project office. Ocean acidification is a high priority research topic identified by OCB. The content of this letter reflects the opinion of the undersigned parties, but not necessarily that of any funding agency supporting OCB researchers.

The OCB Scientific Steering Committee (www.us-ocb.org/about/committees.html)

The OCB Ocean Acidification Subcommittee (www.us-ocb.org/about/subcommittees.html)

The OCB Project Office (contact: Sarah Cooley, scooley@whoi.edu)