

Why GAO Did This Study

Increasing carbon dioxide levels in the atmosphere and oceans are resulting in chemical changes referred to as ocean acidification. These changes may pose risks for some marine species and ecosystems, as well as for the coastal communities that rely on them for food and commerce.

FOARAM requires various federal entities to take specific actions related to ocean acidification.

GAO was asked to review federal efforts to address ocean acidification. This report discusses (1) the scientific understanding of the effects of ocean acidification; (2) the extent to which federal agencies have implemented FOARAM; and (3) additional actions, if any, that could be taken to advance the federal response to ocean acidification. To address these issues, GAO reviewed six summary reports on ocean acidification, other scientific studies, and agency documents, and interviewed key agency officials.

What GAO Recommends

GAO recommends the appropriate entities within the Executive Office of the President take steps to improve the federal response to ocean acidification, including estimating the funding that would be needed to implement the research and monitoring plan and designating the entity responsible for coordinating the next steps in the federal response. GAO provided a draft of this report for review and comment to the Executive Office of the President and the departments and agencies reviewed. None of the agencies commented on GAO's recommendations; several provided technical comments that were incorporated, as appropriate.

View [GAO-14-736](#). For more information, contact Steve D. Morris at (202) 512-3841 or morriss@gao.gov.

OCEAN ACIDIFICATION

Federal Response Under Way, but Actions Needed to Understand and Address Potential Impacts

What GAO Found

Ocean acidification could have a variety of potentially significant effects on marine species, ecosystems, and coastal communities, according to six summary reports that GAO reviewed. The reports were developed by federal agencies and others and were based on extensive reviews of the scientific literature. The scientific understanding of these effects, however, is still developing, and uncertainty remains about their scope and severity. Potential effects of ocean acidification include:

- Reducing the ability of some marine species, such as oysters, to form shells or altering their physiology or behavior. These impacts could affect some species' growth and survival.
- Altering marine ecosystems, for example, by disrupting predator and prey relationships in food webs and altering habitats.
- Disrupting the economy or culture of some communities, for example, by harming coastal fishing and tourism industries.

The National Science and Technology Council's Subcommittee on Ocean Science and Technology, in the Executive Office of the President, and several federal agencies have taken steps to implement the Federal Ocean Acidification Research and Monitoring Act of 2009 (FOARAM) but have yet to complete some of the act's requirements. For example, an interagency working group, which includes representatives from 11 agencies and is chaired by the Department of Commerce's National Oceanic and Atmospheric Administration, has been established. The working group has developed a research and monitoring plan outlining steps to advance the nation's understanding of, and ability to respond to, ocean acidification. However, the agencies involved have yet to implement several FOARAM requirements, including outlining the budget requirements for implementing the research and monitoring plan. Some agency officials told GAO that not providing budget estimates has prevented the agencies and Congress from accurately understanding the funding needed to implement the plan and how it compares with current funding levels.

Further action could be taken to advance the federal response to ocean acidification. GAO's previous work on interagency collaboration has found that a variety of mechanisms can be used to implement efforts involving multiple federal agencies by helping to facilitate collaboration. One possible approach, recommended by the interagency working group, is to establish an independent national ocean acidification program office to coordinate the next steps in the federal response. The working group, however, has not established such an office because it has been unable to reach agreement on how it should be funded. Until greater clarity is provided on the entity responsible for coordinating the next steps in the federal response to ocean acidification, completing important actions, such as implementing the research and monitoring plan, will be difficult.