



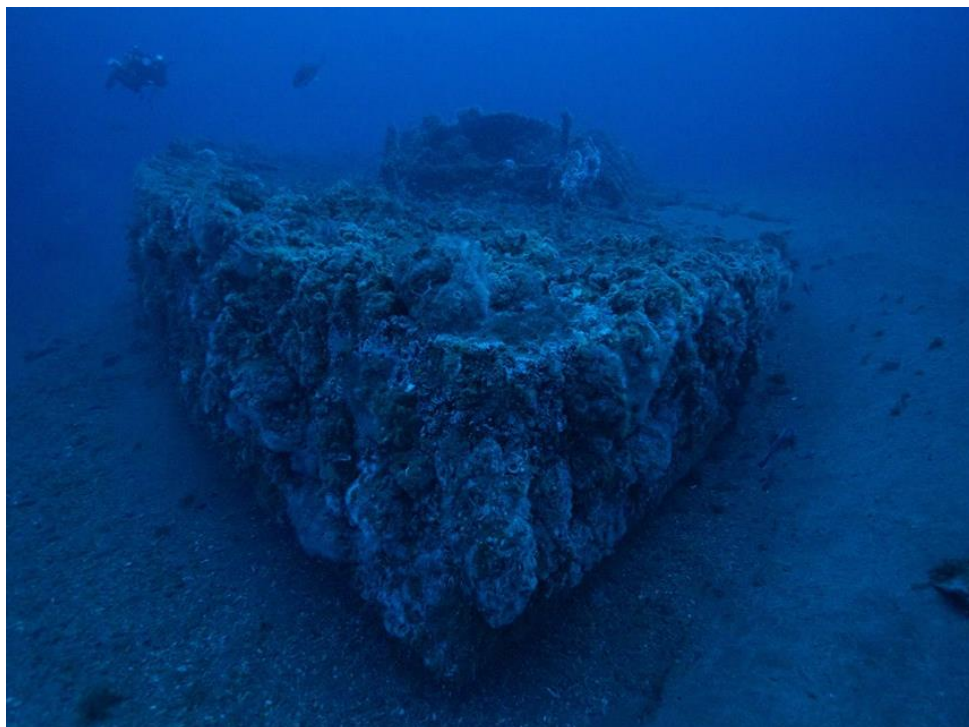
Science Needs Assessment Climate Change

Conservation Issue

Climate change is intensifying both globally and regionally, impacting all sectors of America's physical, social, economic, and environmental well-being. Monitor National Marine Sanctuary (MNMS) protects a one-mile diameter column of water, from the bottom to the surface, surrounding the shipwreck of the *USS Monitor*. Rising water temperatures and sea levels, ocean acidification, shifting species, and altered weather patterns all have the potential to impact the remains of the *USS Monitor*.

Description

The *USS Monitor* is considered a non-renewable historical resource that could be made vulnerable due to climate change. Strategy RM-3 of the Resource Monitoring Action Plan section of the MNMS management plan notes that monitoring environmental changes (e.g., ocean acidification) within MNMS and the surrounding ecosystem is a critical component of sanctuary management and will provide a better overall understanding of the sanctuary, as well as the surrounding region.



The wreck of the *USS Monitor*, a Civil War era ironclad, is a valuable historical and cultural resource that has the potential to be influenced by climate change. Photo: NOAA

Data and Analysis Needs

1. Methods for tracking archaeological, biological, and ecosystem change within and surrounding MNMS
2. Identification of stakeholders for engagement and research collaboration
3. Biological communities found living on and around the USS *Monitor* and how these change over time
4. Continued monitoring of the USS *Monitor* shipwreck remains for changes due to environmental factors

Potential Products

- Predictive modeling of environmental factors for potential management decision use
- Scientific papers and reports
- Education materials aimed at public audiences
- Public engagement opportunities
- New partnerships
- Communication and outreach materials aimed at a stakeholder and community member audience that focus on the effects of climate change on the USS *Monitor*



In addition to direct, detrimental effects on the USS *Monitor*, climate change impacts such as ocean acidification have the potential to affect and alter biological communities that live on the shipwreck. Photo: NOAA

For more information about this assessment, contact monitor@noaa.gov.