

**Climate Change
Draft
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Goal: CORE will work with the ocean community to increase public and policymaker awareness of the central role oceans play in understanding the processes driving climate change and to secure increased funding support for ocean-related science, management, and education. The objective is to significantly improving our capacity to make accurate predications and forecasts of changes in ocean-related physical, biological, chemical, geological processes, as well as the economic and societal impacts associated with these changes.

Background:

Oceans are a key driver of the Earth's climate system, yet our understanding of their physical, chemical, biological and geological processes remain relatively poorly understood and inadequately represented in climate modeling efforts. This lack of knowledge significantly constrains our ability to predict how these processes will be altered as a result of the ongoing change, and more importantly, the impact these alterations will have on the ecological productivity of the oceans, human health, the global economy, and the long-term habitability of our planet.

We know today that that ocean and atmospheric processes make up a dynamic and closely coupled system, with oceans storing vast amounts of energy in the form of heat, as well as being a sink for much of the carbon dioxide emitted over the past century. We also know that ocean systems are undergoing significant short and long-term change over both large and small areas, as evidence by the increasing acidification of the oceans, climatic shifts and the global impacts of ENSO events, increasing hurricane frequency and intensity, impacts of continued sea level rise, and growing concern about possible abrupt climatic changes, particularly associated with ocean circulation patterns in the North Atlantic basin.

In recent decades, satellites and a worldwide network of meteorological stations have been closely observing and monitoring atmospheric changes over time and space, giving atmospheric scientists the data they need to make important inroads into understanding the complexities of atmospheric dynamics. No such comprehensive monitoring system exists for the oceans. A substantial commitment to an Integrated Ocean Observing System is essential if we are to significantly improve the quality of existing climate models. New technology and innovative ideas are available that will allow us to study ocean processes on temporal and spatial scales that have not been previously attainable, but these opportunities have not been capitalized upon due to the lack of adequate funding.

The cost associated with implementing a monitoring system to more clearly understand long-term climate variation and address the high level of uncertainty associated with this issue and its impacts is modest relative to the tremendous economic and societal benefits

associated with improved capacity to predict energy and water resource demands, the intensity and frequency of natural hazards, as well as potential human health ramifications associated with the transmission of diseases and viruses.

Action Plan: It is important to note that success in improving our capacity to understand and predict the processes and impacts associated with climate change are highly dependent upon fulfilling many of the other public policy priorities identified by CORE. Implementation of an Ocean Observatories Initiative and an Integrated Ocean Observing System, strengthening NOAA, enhancing ocean science infrastructure, expanding the Ocean and Human Health Initiative, increasing formal and informal education programs, and transitioning towards an ecosystem-based management approach, all make significant contributions to the broader national priority of addressing issues associated with climate change. It is also noteworthy that the Administration's Ocean Research Priorities Plan and Implementation Strategy identifies the ocean's role in climate as one of its six compelling issues in key areas of interaction between society and the oceans. Thus, CORE will take the following actions to elevate awareness of the ocean's role in climate change:

- Support increased funding for basic research into the processes that govern the ocean's role in climate (*should we reference the ACI here, and or the need for a competitive research program?*)
- Support a long-term commitment to the establishment of an Integrated Ocean Observing System as part of the broader Global Ocean Observing System of Systems.
- Support enhancement of NOAA's capacity to fulfill its role as the lead federal agency for climate research.
- Support enhancement of NASA Earth Science Programs
- Support a national strategy to modernize federal, state, and academic ocean infrastructure.
- *[This list of action is relatively broad and a determination needs to be made whether to narrow the scope of actions CORE can realistically pursue]*

Implementation Strategy: TBD

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