Ocean Infrastructure for U.S. Leadership

Submitting Organization: RECOS – The Ocean Coalition
Affected Government Agencies: NOAA, NSF, NASA, Navy, DOE, BOEM
Corresponding Appropriations: CJS, DoD, Energy & Water, Interior

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Background: U.S. ocean research has been outpaced by other nations. The number of U.S. research ships is declining and replacements are of a lesser capacity and capability even though ocean science needs are expanding. Autonomous/uncrewed craft are a supplement to traditional ships, not a replacement. Likewise, the present observational systems (sensors/platforms) were designed decades ago and are not yet fully deployed. The present ocean observational network is insufficient to measure, model and verify carbon sequestration, or to serve as a reliable basis for prediction of extreme events. There is no Arctic observing system. The U.S. needs affordable sensors and platforms to expand research from the seafloor to space with local to global coverage to ensure national security and economic prosperity.

Despite the proven economic and national security benefits associated with a strong U.S. ocean science capacity, the U.S. is lagging behind other countries on expeditions able to collect critical ocean data. In the last 50 years, the U.S. Academic Research Fleet has decreased from 34 to 17 ships, and ocean research vessels are retiring faster than the U.S. is able to construct new ones. In comparison, China has built 64 research vessels, most of them in the last 10 years. The U.S. has three research icebreakers, none of which are operational as of December 2024; China has three, a fourth coming in 2025, a fifth in final design, and Russia has more than 40. Note that China is not even polar adjacent. The U.S. also faces chronic funding challenges for continuing landmark ocean observing assets that are critical to understanding the linkage between the ocean and weather, such as NOAA's Argo program.

Sustained and new ocean infrastructure, enabled by a modern research fleet capable of global access, is essential for a U.S. presence in strategic oceanic regions, including the Arctic as ice free shipping routes and national security interests emerge. Ocean research drives technological advancements in robotics, data analytics, and scientific innovation that supports the Blue Economy that contributes an estimated $2.5T USD annually to the global economy, facilitates international partnerships and scientific diplomacy, and enhances understanding of oceanic and earth systems. In-water observations complement remote sensing and satellite data to provide a wide-scale, continuous view of the ocean to monitor parameters like sea surface temperature, sea level changes, ocean currents, toxic algal blooms, sea ice, marine debris and oil spills, which are difficult or impossible to observe from ships alone.

Innovation in industry and federal partners must be encouraged AND funded to enable U.S. leadership in the growing ocean economy and expanding needs for ocean domain awareness. While some of this can be accomplished with autonomous or uncrewed vehicles, regional to ice-breaking ships remain essential for deploying technologies and making observations not easily automated. Modernization of ocean research and cyber infrastructure will allow the U.S. to regain leadership and influence.

Recommendation in Legislation: RECOS supports the building of two icebreakers, four global class ocean research vessels, sustained investments in new technologies to observe the ocean at cellular to global scales, and strategic research investments from seafloor to space over the next decade.