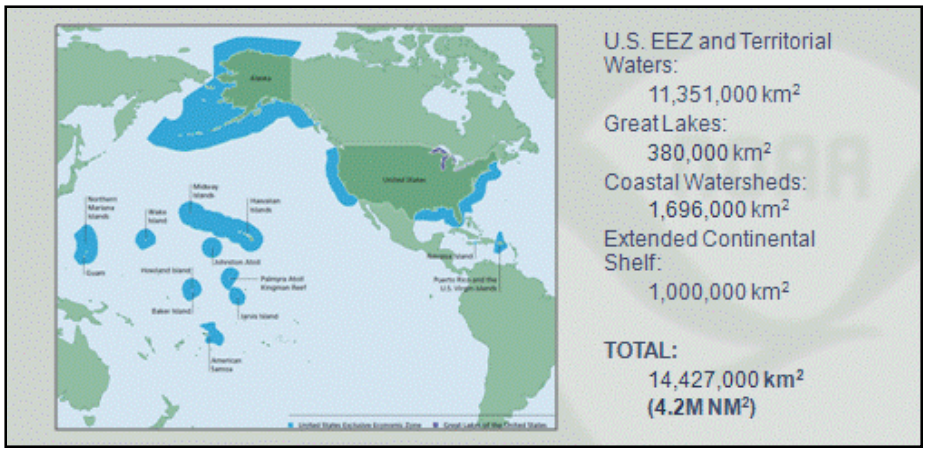
Mapping America's Coasts and Oceans

The Challenge

Accurate mapping of our coastal watersheds and the seafloor and lake bottoms of U.S. jurisdictional waters is critical to meeting our Nation's economic, security, environmental, and social needs. With over half the Nation's population living along the coast, accurate maps will support coastal community resiliency and smart investment decisions regarding construction of public and private infrastructure including highways, railways, port facilities, hospitals, water and sewer plants, businesses, and homes. The Nation's economic reliance on safe and efficient maritime transportation is well established as more that 95 percent of U.S. foreign trade by weight moves by sea and two billion tons of cargo move each year through U.S. ports, and by the year 2020, U.S. container traffic is expected to at least double. The effects of climate change on coastal and ocean environments and the imperative that we responsibly manage our coastal and marine natural resources will only increase the need to acquire robust geospatial mapping data.



The challenge was succinctly stated by Dr. Bob Ballard, discoverer of Titanic, when he stated, "We have better maps of Mars than our own oceans...", noting that only five percent of the Earth's oceans have been mapped to modern standards. In the Arctic, a region with rapidly escalating human activity, only one percent has been mapped to modern standards. High-resolution mapping has revealed the surfaces of near-Earth planets and their larger moons to resolutions of better than 100 meters, and in the case of Mars, to better than 10 meters. But only a small part of the ocean floor has been mapped to 100-meter resolution.

The ocean and coastal mapping community has the collective responsibility to map an enormous area of U.S. jurisdictional waters, including our coastal watersheds, the Great Lakes, the U.S. EEZ and Territorial Waters continental shelf. Using current technology and data management techniques, mapping the full extent of U.S. jurisdictional waters would take significant additional resources and several decades to complete.

The Opportunity

Given this challenge, there is an opportunity to lead the development of a bold, partnership-based vision for ocean and coastal mapping that looks 20 to 30 years into the future. The mapping community must develop a plan to collaboratively map U.S. ocean and coastal areas, and use the resulting data to meet the broadest suite of mandates and missions (Federal agency mapping coordination is now codified in the 2009 Ocean and Coastal Mapping Integration Act). An integral component of this vision will be catalyzing a technological revolution in all steps in the coastal and ocean mapping process, including data collection, processing, management, dissemination, and the creation of useful products for decision makers.

There are significant economic, environmental, and security benefits to aggressively and systematically mapping the full extent of U.S. jurisdictional waters, including our coastal watersheds, ocean seafloor, and Great Lake bottoms. It is our challenge to develop a vision that defines the future of ocean and costal mapping and then build a persuasive business case for realizing that vision. This vision should capture the public's imagination and attract Congressional support, and the business case should be compelling and assertively drive ongoing and future efforts (see text box).

The Partnership

This vision will be beyond the capability of any one organization to fulfill, therefore, engaging a broad partnership is imperative. The development of a persuasive business case must include input from all relevant federal mapping agencies, the states, industry, non-governmental organizations, academia, and international organizations. This broad partnership can work together to develop a solid vision for the future, and most importantly collaborate on answering the question of why coastal and ocean mapping so crucial to the future prosperity and security of this Nation, and all nations.

The Business Case for Mapping America's Coasts and Oceans

- Identify and mitigate coastal hazards
- Adapt to coastal climate change impacts, including sea level rise
- Create economic stimulus and jobs that will accompany the development and deployment of major innovations in coastal and ocean mapping technologies
- Improve management of marine protected areas
- Understand the extent and diversity of coastal and marine habitats
- Inform marine spatial planning
- Improve national security within our nation's waterways and ports
- Provide for safe navigation
- Support efficient global maritime trade
- Support the development of offshore renewable energy sources
- Support the discovery and exploitation of mineral resources
- Preserve our maritime heritage and other archaeological interests
- Support basic science research and ocean exploration
- Support local and state coastal management decisions through improved understanding of the human footprint within coastal ecosystems
- Improve risk assessments of geological hazards, such as submarine landslides, earthquake fault activity, tsunamis, and volcanoes

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