

The mission of the U.S. CoML is to serve as an unbiased source of sound scientific information to support the needs of the nation by assessing and explaining the changing diversity, distribution, and abundance of marine species, as well as the functional role of marine biodiversity in the U.S. and its territories and commonwealths, in the past, present, and future.

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Making Ocean Life Count

CENSUS
OF MARINE LIFE
UNITED STATES



OVERVIEW OF U.S. CENSUS OF MARINE LIFE

The Census of Marine Life (CoML) is a broad global scientific initiative that supports research at the frontiers of our oceans: the hottest undersea vents, the deepest and darkest depths, the farthest animal migration patterns, and the richest species abundance. Census projects engage more than 2,000 scientists and ocean professionals from 80 countries. The Census of Marine Life has discovered more than 5,300 new, undescribed marine animals since 2003. This global effort, coordinated by an international Scientific Steering Committee, is implemented by national and regional committees, one of which is the U.S. National Committee (USNC). The USNC helps the overall Census to identify national and regional priorities, build partnerships, explore sources of funding, and promote the Census to local audiences. The USNC is also working with Congress, federal agencies, the academic community, and private sector partners to establish a long-term, sustained program on marine biodiversity.



U.S. Program Goals

Research and Exploration

- Assess biodiversity and better understand its functional roles in maintaining ecosystem value.
- Foster the development, adaptation, and application of biosensor technologies that identify the abundance, distribution, movement, and diversity of marine species.
- Improve public understanding of ocean exploration as a driver of discovery, technology, and scientific collaboration.

Tools and Technologies for Monitoring and Projecting Ecosystem Change

- Establish and maintain a marine biodiversity data management system that is space and time referenced and linked to ocean observing systems.
- Develop improved tools to apply marine species data to marine biodiversity research.
- Use historical records, baseline information, and predictive models to explain long-term and future changes in marine ecosystems.

Educational Information

- Increase public awareness about the oceans by incorporating marine biodiversity information into formal and informal education.
- Engage the scientific community to advance ocean literacy.
- Disseminate information on marine species to support resource management and U.S. policy development.



Scientific Application

The Census of Marine Life projects and scientists are exploring the oceans, making discoveries and generating information critical to understanding our oceans and making it available to decision makers so they can manage and conserve living marine resources for future generations. Seventeen international projects address marine biodiversity research from three principal perspectives:

What lived in the oceans in the past?

The History of Marine Animal Populations (HMAP) project analyzes historical records to understand how the oceans became what they are today. Records show industrialized fishing gear decimated the Atlantic bluefin population from 1910 to 1950. The species, which virtually disappeared from the region in the early 1960s, is still rare today.

What lives in the oceans now?

Ocean Realm Field Projects have achieved a host of record breaking discoveries and revelations that stretch the frontiers of marine knowledge. Some highlights include:

- Finding 20,000 kinds of bacteria in a single liter of sea water
- Identifying over 50,000 seamounts worldwide, of which only 325 had been at least partially sampled
- Establishing 'listening curtains' that track numerous species on their migrations from Alaska to Baja, California



- Performing the first marine organism DNA barcoding on a ship at sea, revolutionizing the speed at which researchers identify organisms
- Locating, with new ship-based technology, 8 million herring swimming in a school the size of Manhattan Island off the coast of New Jersey
- Discovering the hottest hydrothermal vent ever recorded (407 °C – a temperature at which lead easily melts)
- Releasing the most comprehensive list of known species in the Gulf of Maine – 3,317 species in all, ranging from plankton to whales – aiding regional management practices
- Offering the oil and gas industry insight into methane hydrate habitats by studying cold seep communities
- Using marine animals as oceanographers, collecting data from elephant seals, tuna and 19 other species as they migrate, mate and feed
- Concluding the number of large fish in the world's oceans has declined by 90 % in the past 50 years and warning of the possible extinction of sharks in just a few decades
- Encountering a shrimp believed to have been extinct some 50 million years ago on an underwater peak in the Coral Sea

What will live in the oceans in the future?

The Future of Marine Animal Populations (FMAP) project utilizes mathematical modeling approaches to forecast how human and natural activities will alter ocean life in the future. FMAP prioritizes changes driven by the fishing industry and climate change – both of which alter the nature of marine ecosystems.



For more information on any of the U.S. Census of Marine Life programs, please visit our website at www.CoML.us

Ocean Biogeographic Information System (OBIS)

As national, regional, and international projects gather and expand existing or new datasets to answer what lived, lives and will live in the oceans, they are assembled into OBIS, the Census of Marine Life data management infrastructure. Since 2000, OBIS has grown to 14 million records of 80,000 species from 232 databases. OBIS maps species occurrences over space and time. Coupled with other components of the Integrated Ocean Observing System, its contents will become a powerful tool for resource management and policy development.

The Future of THE CENSUS OF MARINE LIFE

It is imperative that we understand the ocean's rich marine biodiversity and how it may be affected by human activities. This will require a sustained national program beyond the initial ten years, supported by substantial increases in public and private investment. With lasting financial support, the U.S. program of the Census of Marine Life can continue to research unexplored marine ecosystems, explain the dynamic role of species over space and time, and provide information needed by resource managers, policy makers, and ocean educators to preserve and protect ocean resources for future generations.

