

## Scientists to Study Coral Reefs Worldwide: Marine Scientists Going Down for the Count

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Three world-class oceanographic research institutions today announced a collaboration to conduct a global census of coral reef ecosystems aimed at estimating the numbers of reef species and determining their vulnerability to human stressors. Scientists at Scripps Institution of Oceanography, the Australian Institute of Marine Science (AIMS) and the Pacific Islands Fisheries Science Center (PIFSC) of the National Oceanic and Atmospheric Administration (NOAA) will participate in this unprecedented global census of coral reefs (CReefs), one of 17 projects of the Census of Marine Life, a global network of researchers in more than 70 nations engaged in a 10-year initiative to assess and explain the diversity, distribution and abundance of marine life in the oceans.

Coral reefs have been dubbed the rainforests of the sea because they are highly threatened repositories of extraordinary biodiversity, but little is known about the ocean's diversity as compared to its terrestrial counterpart.

Nancy Knowlton of Scripps Oceanography, CReefs lead principal investigator, said, "We don't even know to the nearest order of magnitude the number of species living in coral reefs around the globe. Our best guess is somewhere between 1 and 9 million species based on comparisons with the diversity found in rainforests and a partial count of organisms living in a tropical aquarium." What little information there is available is based on just a few groups, mainly corals, fishes and some molluscs.

"Even more importantly, we do not have any clear understanding of how many reef-associated species can survive various levels of reef degradation," said Julian Caley of AIMS.

There is a lack of understanding of even the broad dynamics of reef collapse and recovery, which makes it difficult to predict what will happen to coral reefs as a consequence of human activities.

"Reef decline worldwide is troubling. Just within the last three decades, declines of 80 percent in coral cover have been reported for Caribbean reefs, and even apparently healthy reefs have suffered measurable degradation," said Russell Brainard of NOAA. Such losses are of special concern because many reefs occur off the coasts of developing countries and island communities, where people depend on them for their livelihoods and physical protection.

The CReefs project will endeavor to answer the following questions:

How many different species exist on the world's coral reefs?

What are the prospects for maintenance of species diversity on reefs suffering from various levels of human impacts?

How much and what kinds of information are required to manage reefs to effectively preserve biodiversity?

How much reef area must be maintained for different levels of diversity to persist?

Knowlton explained that in addition to traditional taxonomy, researchers will utilize new DNA-based technologies that will greatly speed the scientists' ability to detect new marine species in samples of reef rock, sediments and water.

Because much of the existing information on reefs is scattered and often difficult to access, CReefs will play a crucial role in bringing together what is known by providing a website for global coral reef ecosystem biodiversity.

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