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PISCO is a consortium of academic scientists at Oregon State University, University of California at Santa Barbara, University of California at Santa Cruz, and Stanford University. PISCO is dedicated to advancing the understanding of coastal marine ecosystems and to communicating scientific knowledge to diverse audiences.

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A companion 15-minute film, *The Science of Marine Reserves* produced by Sea Studios Foundation, is available from the PISCO Web site.

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# Overview:

## **m**arine environments

worldwide are in the midst of a transformation. There is increasing evidence that ocean ecosystems are being altered beyond their range of natural variability by a combination of human activities, including fishing, pollution, and coastal development. Because of these changes, a growing portion of the global community is inquiring about alternative management options for ocean environments.

Research shows that marine reserves are one tool that can help to prevent, slow, or reverse negative changes in the ocean. Marine reserves are places in the ocean that are completely and permanently protected from uses that remove animals and plants or alter their habitats. Increasingly, the public, governmental agencies, commercial groups, and scientists are discussing the idea of establishing more marine reserves to complement existing ocean management. The purpose of this report is to provide a summary of the latest scientific information about marine reserves.

Marine reserves produce different outcomes from other types of management. Reserves protect marine habitats in a particular place and the diversity of animals and plants that live in those habitats. Consequently, many animals and plants in reserves tend to live in greater numbers, grow larger, and reproduce more than their counterparts outside reserves. In contrast, other management strategies attempt to control only some activities or protect only a few species.

Many other kinds of marine protected areas – with names such as marine parks, marine refuges, or marine sanctuaries – exclude some, but often very few, extractive activities. Those areas do not generate the same effects as marine reserves because they provide far less protection.

Marine reserves are one tool for managing ocean ecosystems, but they cannot protect oceans from all human influences. Reserves alone may not address such pervasive problems as pollution and climate change, and they may have fewer direct benefits to some fishes and mammals that move long distances. However, the most recent scientific research shows that marine reserves usually boost the abundance, diversity, and size of marine species living within their borders. This booklet examines the causes and potential consequences of these biological changes.

# what is a marine reserve?

