

Scientists find community involvement, not only enforcement, drives success of marine reserves

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In one of the most comprehensive global studies of marine reserves, a team of natural and social scientists from the University of Rhode Island and other institutions has found that community involvement is among the most important factors driving the success of marine reserves.

"We make a big mistake thinking that a marine reserve is just about coral, fish and other aquatic organisms," said Richard Pollnac, URI professor of anthropology and marine affairs, who led the study. "They are also composed of the people who can make them succeed or fail and who are either helped or hurt by them."

The study was published in the [Proceedings of the National Academy of Sciences](#) on February 22.

The researchers studied 127 marine protected areas in the Caribbean, Western Indian Ocean and the Philippines to identify the key factors that determine the success of marine reserves, which protect the marine environment by prohibiting fishing. Biological assessments were conducted at 56 of the reserves to determine their ecological health, while surveys of residents and community leaders in local communities discerned perceptions and opinions in all 127 reserves.

Among their results, the researchers found that the reserves where residents said they complied with the rules were more effective at

protecting [fish stocks](#) than those where the rules were often ignored. They noted, however, that compliance with reserve rules occurred not only due to surveillance and enforcement but also due to complex social interactions among community members and opinion leaders.

"The most successful reserves were those where the people said that most of the community follows the rules," explained Graham Forrester, URI associate professor of natural resources science and a co-author of the study. "Compliance with the rules is a measure of how a community feels about the reserve. It's their choice to follow the rules."

The researchers noted that their surveys indicated that it is vital to the success of any marine reserve that community members are participants in the process of setting up and monitoring the reserve.

Other research results were somewhat surprising.

The effect of human population density near marine reserves, for instance, differed significantly from location to location. As the researchers expected, greater population density negatively impacted reserves in the Caribbean, but it had no detectable affect at marine reserves in the Philippines. At reserves in the Western Indian Ocean, on the other hand, greater population density was correlated with healthier reserves and greater fish biomass inside the reserve compared with outside.

Study co-author Tracey Dalton, URI associate professor of marine affairs, said that it is not easy to explain these disparities. The positive effects in the Indian Ocean may be driven by increased fishing pressure outside the reserve or the result of people migrating to areas where the marine reserves are most successful.

"It's important to recognize that people are part of the ecology of marine

reserves," Pollnac said. "If you can demonstrate to them that the reserve will have more fish while also providing benefits to the community, and if you pay attention to the needs of the people, then there's a much greater chance that the reserve will be a success."

Provided by University of Rhode Island

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