

Using science to open way to 'blue economy'

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Today, scientists at the Natural Capital Project share new science and open source software that can calculate risk to coastal and marine ecosystems. These novel tools, described in the journal *Environmental Research Letters*, were used to design the first integrated coastal zone management plan for the Caribbean country of Belize.

Conducted with the Coastal Zone Management Authority and Institute in Belize and the World Wildlife Fund, the study offers a comprehensive explanation of the process used to calculate risk of habitat degradation in marine spatial planning.

With historic expansion of coastal and ocean development, ecosystems like coral reefs and mangrove forests are put at unprecedented risk. Yet, planners often lack good information about how human activities will impact shoreline and ocean habitats now and in the future. This study developed the information the Belizean government sought to make informed management decisions. The resulting science and software, which are free and accessible to anyone with a connection to the Internet, are useful to coastal planners anywhere.

The integrated ocean management plan paves the way for [coastal communities](#) and ocean resources to become the centerpiece of a "blue economy" an economy based on prosperous and sustainable development of coastal societies and natural habitats. The plan would reduce the area of marine habitat at high risk from damaging activities by 20%, while tripling the area available for coastal development, doubling space for marine aquaculture, and reducing controversial oil exploration and

dredging.

"Healthy marine ecosystems provide necessary habitat for many important marine species and also deliver important services to people, such as tourism, recreation, coastal protection, and food production," says Katie Arkema, lead author of the study and a Stanford University scientist working with the Natural Capital Project. "In Belize, we were able to harmonize development and conservation goals by strategically locating human activities to reduce the area of coral, mangrove and seagrass habitat at high risk while allowing for the expansion of several ocean sectors of cultural and economic importance. This produced a win-win outcome for the people and environment of Belize."

The approach used by Arkema et al. made an otherwise ad hoc process of zoning activities more efficient and evidence-based.

"Productive [marine ecosystems](#) are very important to the people and culture of Belize," says Chantalle Clarke-Samuels, one of the study's authors and the director of the Coastal Zone Management Authority and Institute in Belize. "This work helped us identify the best opportunities we have for development while ensuring these ecosystems still provide protection for our coasts, lobster for fishermen, and some of the best snorkeling and diving on the planet. It gave us the information we need to plan for our future. "

Provided by Stanford University

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