Coral reef resilience to climate change in CNMI; field-based assessments and implications for vulnerability and future management

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**Project Summary and Progress to Date.**

Scientists agree that climate change poses the single greatest long-term threat to coral reefs. Among other impacts, climate change is expected to result in more frequent severe tropical storms and more frequent and severe coral bleaching events. Coral reefs are also under great pressure from human activities, like overfishing and coastal development, that increase the sensitivity of organisms on reefs to climate change threats. There is now unprecedented pressure on the natural resilience of coral reef systems; their ability to endure and recover from stress events. Managers thus have to provide for sustainable use and maintain cultural values associated with coasts while supporting reef resilience by limiting human impacts.

Our proposed research focuses on assessing the resilience potential of coral reefs in the region of the Commonwealth of the Northern Mariana Islands (CNMI) in the West Pacific. The three project objectives are:

1. Assess the relative resilience potential of a total of ~60 fringing reef sites around the islands of Rota and Tinian in CNMI (Rota is the focus for this funding).
2. Prepare reports and map and table graphics to aid in communicating our results to manager partners and present and discuss our results in meetings with managers.
3. Communicate advances in methods as well as our results and process to practitioners in the broader Pacific and Caribbean.

The outcomes will help managers to use their limited resources to target actions in CNMI that support and build reef resilience. Specific anticipated outcomes include: 1) data for key ecological indicators and proxies of anthropogenic stress at a total of 35 fringing reef sites around the island of Rota to add to the 35 surveyed sites around Saipan in 2012, 2) tables and maps showing relative resilience potential among the total pool of sites as well as for the sites around each island, 3) a report detailing the outcomes of the research as well as suggestions for near and long-term management actions to support reef resilience, and 4) open access papers in international peer-reviewed marine ecology and management journals.

This project has just started so progress thus far is limited to planning our fieldwork and engaging with our local manager partners in CNMI. Partners of the project include NOAA Fisheries and the NOAA Coral Conservation Program via Steven McKagan and the CNMI Division of Environmental quality via Steven Johnson.