

Oceanography Seminar

Greg Guannel

Research Associate
The Natural Capital Project,
Stanford University

"The Importance of Setting and Timescale in the Delivery of Coastal Protection Services by Coral Reefs, Seagrasses, and Mangroves"

Coral reefs, seagrass meadows and wetlands protect communities, and deliver protection services by reducing the impacts of waves on coastal areas. Traditionally, engineers and scientists have quantified the protection services delivered by those habitats individually, even though they frequently co-exist. In this talk, we examine the role that coral reefs, seagrasses and mangroves play at reducing the impacts of waves at two different sites in Belize, during storm and calm periods, under current and future sea level conditions. Using different metrics for quantifying coastal protection (e.g., wave height, wave-induced currents, shoreline erosion, water level, etc.), we find that each of the habitats helps reduce the impact of waves, but that the coastline is more resilient if the protective services of all habitats are taken into account. We also find that the level of protection offered by certain habitats varies with setting (e.g., bathymetry, location and quantity of habitat present, etc.), the health of habitat and sea level conditions. These findings demonstrate how natural habitats can help protect coastal regions against the impacts of coastal hazards, and how conservation or restoration of natural habitats can be beneficial to coastal communities in the long term. These findings also highlight important research needs to improve our understanding and modeling of nearshore processes in the presence of natural habitats.

Thursday September 11, 2014 3:00 p.m. MSB 100