

NATURAL SCIENCES SEMINAR

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4:00 PM

Chae Auditorium-New College of Florida

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Title:

**Can Caribbean Staghorn and Elkhorn (*Acropora* spp.)
Coral Populations Be Restored?**

Abstract:

Beginning in the early 1970s, scientists observed abnormal changes occurring in reef corals throughout the tropical western Atlantic Ocean and Caribbean Sea. One of the earliest reported changes was tissue loss revealing the stark white calcium carbonate exoskeleton that could not be explained by predation. The first outbreak of coral disease affected the elkhorn (*Acropora palmata*) corals at Tague Bay, St. Croix, U.S. Virgin Islands; partial to complete mortalities of elkhorn and staghorn (*A. cervicornis*) and their hybrid (*A. prolifera*) corals have severely depleted their populations throughout the Caribbean. Four categories of acute to subacute tissue loss (focal, multifocal, or diffuse), not associated with predation by corallivores, have now been identified on Caribbean acroporids, based on rate and pattern of tissue loss: white-band disease type I (WBD-I) with sloughing or straight tissue loss margin; white-band disease type II (WBD-II) with bleaching at tissue loss margin; white pox or white patch disease (WPD); and rapid tissue loss (RTL). Investigations on the nature and causal agents of these diseases have revealed several bacteria to be associated with the tissue losses and one shown by Koch's postulates to cause this type of damage; however, results of most studies have been inconclusive, indicating a possible role for abiotic pathogenesis and a need to use other diagnostic tools to identify the etiologic agent(s) and understand how and why tissue loss occurs. Because these species are branching and grow relatively fast, they are now being propagated asexually by reef scientists and managers to restore reefs and increase opportunities for natural spawning and recruitment. Staghorn fragments in nurseries and outplanted fragments sometimes succumb to tissue loss. New experiments and method developments began with the discovery, by molecular analyses, of rickettsia-like organisms (RLOs) in the tissues of staghorn corals; they were also present in diseased and apparently healthy acroporids sampled in the early 1980s at Tague Bay and are widespread in present populations of these corals. These bacteria kill the coral mucocytes they infect. Additional areas of research that may improve outplanting success and population recovery include examining mode(s) of infection, exposure to environmental stressors at different locations, genotype resistance, nutritional requirements of these corals, and the role of reef biodiversity in controlling tissue loss outbreaks.