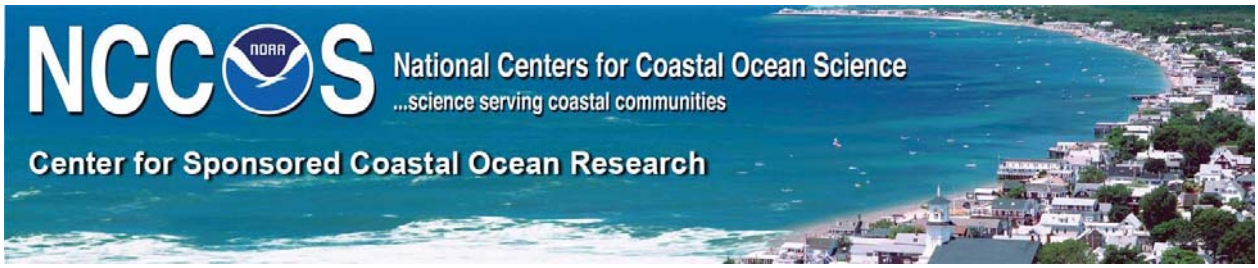

CARIBBEAN CORAL REEF INSTITUTE

ISSUE:
Coral reefs, one of the most valuable and spectacular environments on earth, are also one of the most productive and diverse marine ecosystems. Coral reefs are also valuable assets that contribute to a healthy economy by providing food, jobs, and protection from storms. They create habitat for many fish and invertebrate species with commercial value, support tourism and recreational industries, and shelter coastlines from storm disturbance. Coral reef related activities provide a significant economic benefit for many regions of the United States and the rest of the world.

Scientific evidence indicates that coral reefs are deteriorating rapidly worldwide. Symptoms of this decline include the loss of hard corals, an increased abundance of algae, and conspicuous bleaching episodes and disease outbreaks. Scientists and managers still lack critical information about many of the causes of coral decline, but evidence points to stresses caused by a variety of human factors (see inset above). Human impacts act separately and in combination with natural factors such as hurricanes, high water temperature, and disease to stress corals and degrade reef systems.

Shelf edge spur-and-groove reef[1]

Human Activities Affecting Caribbean Decline of Corals

- Overfishing
- Coastal development
- Sedimentation
- Nutrient over-enrichment
- Increased turbidity
- Pollution
- Ship groundings

Puerto Rico possesses exceptional and beautiful coral reefs. With a linear coastline of 620 km, it is surrounded by over 5,000 km^2 of easily accessible (< 20 m depth) coral reef ecosystems. However, high population density and intense land uses have resulted in adverse impacts to the reefs, including sedimentation, eutrophication, and pollution. The effects of overfishing and algal growth further compound these adverse impacts. As a result, there is an ever-increasing need to strengthen resource management capacity through timely, state-of-the-art science and monitoring activities to ensure the long-term sustainability of Puerto Rico's coral reef ecosystems.

APPROACH:
The Caribbean Coral Reef Institute (CCRI) is one of three coral reef institutes administered by NOAA's Center for Sponsored coastal Ocean Research (CSCOR) that funds scientific research and monitoring of Puerto Rico's coastal reefs. The goal of CCRI is to engage in research and ecosystem assessment activities applicable to the improvement of coral reel management strategies and that help build resource management capability within Puerto Rico. CCRI also fully utilizes the resource base of the Greater Caribbean region when implementing its activities.

The Mayagüez Campus of the University of Puerto Rico (UPR – M), in collaboration with the Puerto Rico Department of Natural and Environmental Resources (DNER), established CCRI in 2004 at the Magueyes Island Marine Laboratory in facilities provided by the UPR – M and implemented through a Cooperative Agreement between CSCOR and UPR – M. The goal of CCRI is to integrate the research capabilities of UPR – M, DNER, and the scientific community at large to provide resource managers with information needed to help the agency fulfill its mandate to manage and conserve Puerto Rico's coral reefs.

The core strength of this program is that its research and ecosystem assessment activities are run as a competitive selection process in a partnership between UPR-M and the Commonwealth's DNER. Within this framework and to achieve its objectives, yearly priorities for the annual proposal competition are set through a consultative process between the two main partners and other related agencies and organizations with interest in Puerto Rico's coral reef resources. This process will provide resource managers with timely, highest quality scientific information. Presently, CCRI is focusing in five major areas of activity:

- Basic assessment of resources
- Understanding of reef processes
- Enhancing MPA process
- Impacts of water quality on coral reef health
- Dynamics of coral diseases and syndromes

MANAGEMENT AND POLICY IMPLICATIONS:
CCRI's partnership between the UPR – M and the DNER ensures that state of the science information is made available in a timely manner to the agency responsible for the protection of coral reefs in Puerto Rico. The close collaboration in CCRI between scientists and managers results in scientifically sound management strategies and policies. Finally, CCRI also provides a mechanism through which management practices can be evaluated and modified as necessary in order to maximize their effectiveness.

Data collection along a reef transect[2]

ACCOMPLISHMENTS:
The institute was created in 2004 with an initial investment of $1.4M and subsequent annual budgets of $500K. Since its inception, CCRI has provided valuable information to local resource managers on the design and implementation of marine protected areas, the status of key fisheries related species. In FY2005, CCRI issued its first peer-reviewed announcement of opportunities to fund research on Puerto Rico's coral reefs. The selected 2-year projects were implemented in FY 2006 and will be completed by 2008.

CCRI has also entered into several partnerships other local, commonwealth, and federal agencies to leverage its activities and further it goals and objectives. One key partnership is with NOAA's Undersea Research Program in which CCRI will maintain a dive locker to make the latest technologies in deep water diving available to scientist and managers in Puerto Rico and the Greater Caribbean.

FOR MORE INFORMATION CONTACT:
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Note: CCRI is a CSCOR coral reef core program contributing to the mission of NOAA's Coral Reef Conservation Program.

Photos by: (1) Emmanuel Irizarry and (2) Hector Ruiz, UPR-M.