NOAA's Coral Reef Research Institutes

Coral Reef Research for Understanding, Management, and Conservation

Hawaii Coral Reef Initiative (HCRI)
National Coral Reef Institute (NCRI)
Caribbean Coral Reef Institute (CCRI)

Marine reserves have proven to be a succesful tool for protecting coral reefs worldwide. (Photo credit - NOAA)

Seventy percent of the worlds' reefs are listed as threatened or destroyed and 20% of those are damaged beyond repair. (The Status of Coral Reefs of the World: 2004).

The Value Of The Coral Reef Institutes

Coral reef ecosystems are economically, biologically, and culturally valuable. This diverse ecosystem supports a vast array of organisms that depend on coral reefs for habitat and food. Reefs provide physical barriers to coastal erosion, and protection from storm waves and tsunamis for billions of dollars in property and for tens of millions of coastal residents and their communities.

Reef ecosystems form the economic backbone for many recreational and tourist areas as well as important and valuable commercial and recreational fisheries. Their biodiversity is of immense utility to humankind, exceeding that of tropical rainforests.

The 1998 Executive Order on Coral Reef Protection (E.O. 13089) represented a formal response to the precarious state of US coral reef resources by requiring agencies to examine their actions affecting coral reefs and by establishing the US Coral Reef Task Force to oversee Federal efforts to study, manage, and conserve the nation's coral reef resources.

Leveraging the Federal Investment

As a result of E.O. 13089, Congress appropriated funds to support coral reef research initiatives which resulted in the creation of the Hawaii Coral Reef Initiative (HCRI), the National Coral Reef Institute (NCRI), and the Caribbeand Coral Reef Institute (CCRI).

The interagency Task Force supported the passage of the Coral Reef Conservation Act of 2000 and the creation of the National Oceanic and Atmospheric Administration's (NOAA) Coral Reef Conservation Program (CRCP).

The CRCP is a multi-office program that uses the diverse expertise across NOAA to help protect important coral reef ecosystems. NOAA's Center for Sponsored Coastal Ocean Research (CSCOR) is a partner in the CRCP and administers the Institutes. It is the CSCOR mission to lead the development of predictive multidisciplinary coastal ecosystem research that explains and predicts the impacts of natural and anthropogenic influences on coastal regional ecosystems, communities, and economies and allows for informed actions.

Coral reefs have been called the "rainforest of the sea" because they are home to a large number of marine species. (Photo credit - NOAA)

A green moray eel makes its home in coral crevices, which provide a good hiding place to ambush prey. (Photo credit - E. Weil)

Bridging the Gap Between Science and Management

Devoted to enhancing management effectiveness through research, outreach, education, and conservation, the three Coral Reef Institutes are unique and have valuable, efficient, and productive programs that:

- Identify critical threats to coral reefs that are region specific
- Enhance flexibility in determining priorities and allocating funding
- Focus on and respond to local, regional, and national management needs
- Are subject to rigorous peer review
- Adapt to local socio-economic, cultural and management regimes

Regional Ecosystem Coral Reef Research

The US Commission on Ocean Policy and the Pew Oceans Commission has called for increased investment in research, science, and education and greater collaborations at all levels to address increasing threats to coastal environments. The Coral Reef Institutes constitute a consistent vital national resource for coral reef science, education, management, and conservation.

The Institutes provide a direct link between researchers and resource managers, providing information for managers to make sound policy and decisions. They build capacity through equipment procurement, graduate and undergraduate training, sponsoring workshops and symposia, and research collaborations. By concentrating on important and unique management and policy challenges, scientific contributions are made that better allow decisions on both local and national scales.

US coral reefs are found in the Atlantic, Caribbean and throughout the Pacific. Their annual economic worth is more than US $250 billion. (Photo credit - E. Weil)

In addition to research and monitoring, HCRI supports public outreach, briefings for decision-makers, and internships and fellowships. (Photo credit - D. Pence)

Hawaii Coral Reef Initiative

The Hawaii Institute is implemented as the Hawaii Coral Reef Initiative Research Program (HCRI). HCRI works with county, state, and federal agencies, community-based organizations and the private sector to support monitoring and research activities to build capacity to more effectively manage Hawaii's coral reef ecosystems. Results provide resource managers with information to help effectively and efficiently manage Hawaii's coral reefs. Without further solution-oriented research and monitoring, Hawaii's coral reefs will continue to decline.

Hawaii's reef ecosystems have critical national significance. They are home to 5,000 marine plants and animals, 25% of which are found nowhere else in the world.

HCRI goals include:

- Assess coral reefs and related ecosystems and the major threats to their integrity
- Build resource management capacity
- Develop database and information systems
- Conduct public awareness programs
- Train present and future scientists and managers

HCRI accomplishments include:

- Assessing the economic and non-economic value of Hawaii's coral reefs
- Identifying the status of fish populations, the threat of invasive algal species and their relationship to poor water quality and disturbed coral communities
- Identifying the impact of land-based sources of pollution on coastal ecosystems
- Maintaining the health of exploited fish stocks in protected areas
- Describing the population dynamics of keystone coral reef species

This clown fish uses the sea anenome for protection from predators, and in turn, increases water circulation for the anenome. (Photo credit - NOAA)

Visit the HCRI website at
http://www.hawaii.edu/ssri/hcri/

National Coral Reef Institute

The NCRI facility at Nova Southeastern University in Ft. Lauderdale, Fla. (Photo credit - NCRI)

NCRI
NATIONAL CORAL REEF INSTITUTE

The objective of the National Coral Reef Institute (NCRI) is the protection and preservation of coral reefs through basic and applied research on coral reef assessment, monitoring, restoration, and biodiversity, coupled with education and training of scientists, managers, and educators. NCRI focuses on US coral reefs worldwide and within Florida reef systems.

NCRI provides scientific synthesis and evaluation criteria of existing programs for use by the research and management community.

Photo credit - E. Weil

NCRI goals include:

- Identify constraints in current scientific undestanding of reefs
- Provide scientific focus to emerging and innovative approaches
- Identify, conduct, and fund theoretical and applied programs of coral reef research
- Assist in coral reef management, public policy, and disputes resolution

NCRI accomplishments include:

- The Southeast Coral Reef Evaluation and
- Monitoring Project (SECREMP)
- Population Dynamics of the threatened species, staghorn coral (*Acropora cervicornis*), in southeast Florida
- Coral, soft coral, and sponge restoration and recovery following reef injury
- Coral spawning prediction
- Mapping of coral reef ecosystems

Visit the NCRI website at
http://www.nova.edu/ncri/

Staghorn (*Acropora cervicornis*) and elkhorn (*Acropora palmata*) corals are listed as threatened under the Endangered Species Act. NCRI is evaluating ways to restore these fragile species. (Photo credit - E.Weil)

Critical to the Caribbean's tourist economy, reefs provide fishing and diving opportunities, seafood, and sheltered waters for swimming and boating. (Photo credit: E. Weil)

Caribbean Coral Reef Institute

The Caribbean Coral Reef Institute was created to sponsor scientific research and monitoring programs that address short and long-term priorities for understanding and managing the coral reef ecosystems of the US Caribbean. The coastal areas of the Caribbean are densely populated, and coral reef ecosystems are variably degraded, with up to 80% coral loss in some sites. CCRI's activities address the major threats to coral reefs within an ecosystem context, including human socio-economic dimensions, and enhancing our understanding of the biological and physical processes that structure coral reefs and impact the health of the ecosystem.

The Caribbean is a hot-spot of coral diseases and bleaching events that are becoming more frequent and more intense.

CCRI goals include:

- Develop, implement, and administer research and monitoring activities that improve the management of coral reef ecosystems.
- Interact as appropriate with the Federal and Commonwealth agencies as well as other public and private organizations.
- Fully utilize the resource base of the region to collaborate and conduct research and monitoring activities on coral reef ecosystems.

CCRI accomplishments include:

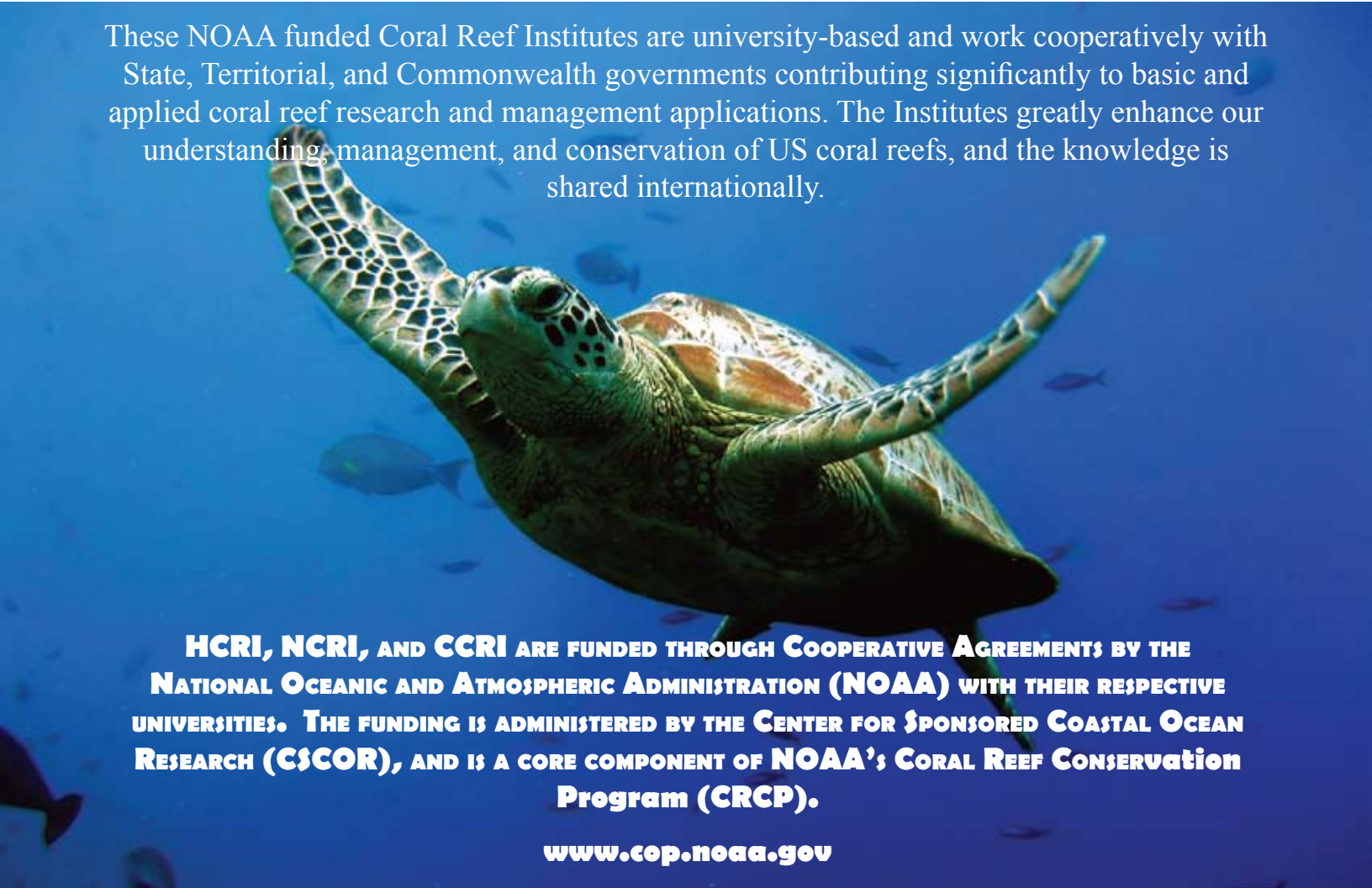
- Monitoring coral and reef fish communities
- Locating and monitoring vulnerable fish spawning aggregations
- Developing sociological and biological criteria for planning and establishing MPAs
- Bilingual blogs on Caribbean MPAs and Fish Spawning Aggregations
- GIS-based modeling of land disturbance and sedimentary runoff

Visit the CCRI website at
http://ccri.uprm.edu/index.html

Touching coral can damage its protective mucus layer, leaving it susceptible to disease. The dying coral head above shows the result of human misuse.

(Photo credits - NOAA and E.Weil)

These NOAA funded Coral Reef Institutes are university-based and work cooperatively with State, Territorial, and Commonwealth governments contributing significantly to basic and applied coral reef research and management applications. The Institutes greatly enhance our understanding, management, and conservation of US coral reefs, and the knowledge is shared internationally.



HCRI, NCRI, and CCRI are funded through Cooperative Agreements by the National Oceanic and Atmospheric Administration (NOAA) with their respective universities. The funding is administered by the Center for Sponsored Coastal Ocean Research (CSCOR), and is a core component of NOAA's Coral Reef Conservation Program (CRCP).

www.cop.noaa.gov