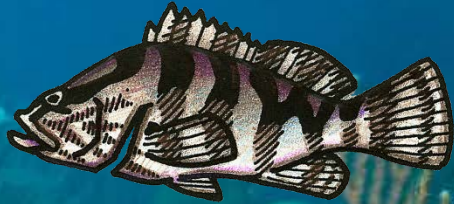


Caribbean Coral Reef Institute

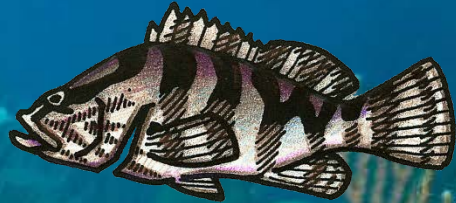


Benthic habitat mapping to improve modeling of marine species distribution in the U.S. Caribbean



October 18, 2011
San Juan, PR

Integrated GAP Analysis Program for Puerto Rico and the US Virgin Islands



USDA-Forest Service
PR DNER
NOS-CCMA
UPRM-Marine Sciences
CCRI
CariCOOS

GAP Analysis

Primary Objective:

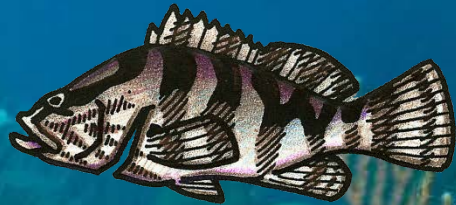
Match the distribution of important species to spatial coverage of management



GAP Analysis

Functional Practice -

Synthesis of available data on:



- Species distributions
- Habitat needs across spatial scales
- Ontogenetic & Spawning Movements
- Habitat Distribution, Abundance & Diversity
- Bathymetry and derived products
- Water Quality
- Ocean currents & temperature
- Spatial management coverage

Relevance to the US CRTF

Fundamental to Agency Missions

NOS, NMFS, NESDIS, CRCP

USGS, NPS, FWS

Forestry Service

Cornerstone for Key Initiatives

Coastal & Marine Spatial Planning

Essential Fish Habitat

Threatened Species Protection

Marine Atlas

Critical to Local Jurisdictions

Provides information and framework for
science-based management decisions

Partnerships Required



Caribbean Coral Reef Institute

Expertise on species-habitat associations,
modeling, mapping, etc.



Documenting Potential Past and Present Fish
Spawning Aggregation Sites around Puerto
Rico

High Resolution Habitat Mapping from Side-
scan Sonar – Southwest Puerto Rico

Fish Habitat Utilization through Ontogeny at
Mona Island

High Resolution Habitat Mapping

Deep (50-100 m) Mesophotic Coral Ecosystems



NOAA CORAL REEF CONSERVATION PROGRAM

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October 20, 2011

USVI & Puerto Rico Mesophotic Coral Ecosystems Mission

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Investigating **mesophotic** coral ecosystems in the waters surrounding the Caribbean islands of Puerto Rico and the US Virgin Islands (USVI) is the purpose of an upcoming NOAA-supported research mission. Mesophotic coral ecosystems—"meso" for middle and 'photic' for light—are the deepest of the light-dependent coral reefs and are found at depths of 50-100 m (100-330 feet) in the US Caribbean. It has been hypothesized that mesophotic coral ecosystems may serve as potential sources to reseed or replenish degraded shallow-water coral reef species.

Mesophotic coral ecosystems are largely unexplored mainly due to the depth limitations of conventional SCUBA diving. Advances in technical diving methods and instrumentation, such as mixed gas diving, autonomous underwater vehicles and remotely operated vehicles (ROVs), are providing easier access to study these ecosystems. These ecosystems are the focus of the upcoming research cruise being conducted by a team of scientists and students from the [University of Puerto Rico](#) and the [Caribbean Coral Reef Institute](#), in collaboration with the [University of North Carolina at Wilmington](#). In fact, this research team recently found extensive and biologically diverse mesophotic reefs off the southwestern coast of Puerto Rico. For more information on the recent work in Puerto Rico, see the [NOAA Press Release](#).

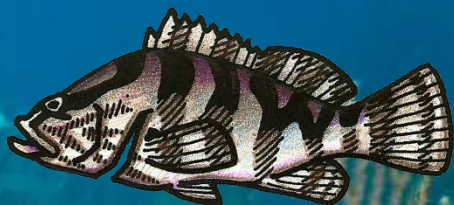


Some corals in the mesophotic zone grow in plate-like form to maximize light capture. In this image corals are found thriving at 50 meters (164 feet) among bright blue ascidians (known as sea squirts), light green algae (*Lobophora*), and red, orange, and brown sponges. Photo credit: H. Ruiz

[Resources for this Mission](#)

[Daily Mission logs including photos](#)

The upcoming mission will investigate mesophotic coral ecosystems found in the Mona Passage, off eastern Puerto Rico, and off the USVI islands of St. Thomas and St. Croix from April 15-May 5, 2011 aboard the *M/V Spree*. Researchers will utilize techniques such as photo transects, visual fish censuses, and ROV observations. To test for connectivity to other reefs in the region, researchers will collect corals for DNA analyses. They will also



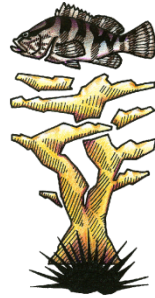


Caribbean Coral Reef Institute



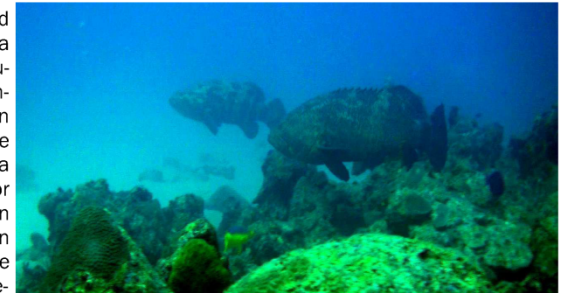
CCRI NEWS

October 2011



CCRI Helps Florida Locate Critical Black Grouper Spawning Aggregation and Document Deep Fish Populations

Black groupers are an important but overfished species within south Florida, including the Florida Keys National Marine Sanctuary and the Dry Tortugas National Park. While populations have increased in closed areas, fish are still vulnerable to fishing when they leave to form annual spawning aggregations. To predict the potential movements of black grouper, scientists from the Florida Fish and Wildlife Conservation Commission initiated a search for the spawning aggregation site. Thinking the site was located in waters too deep for conventional diving, they asked the Caribbean Coral Reef Institute to add their deep-diving capabilities to the search. Last March, a team of five scientists using mixed-gas rebreathers and a remotely operated vehicle (ROV) joined Florida scientists on a 5-day mission aboard the M/V Spree in an attempt to locate the spawning aggregation site. Efforts focused on Riley's Hump, located within the Tortugas South Ecological Reserve. After several days of searching, the black grouper aggregation site was finally found! Located in waters deeper than 165 ft, the fish were associated with a unique geological formation of large outcrops and boulders. Video taken provided data to characterize the site, to estimate relative size and density of groupers, while the reproductive behavior recorded confirmed the aggregation was indeed for spawning. In addition, the cruise offered the first opportunity for scientists to assess fish populations in areas too deep to be included in standard surveys. Results indicated that these populations were significant, with 39 species being identified. In addition to black grouper, frequently sighted species include the commercially important mutton snapper, almaco jack, cubera snapper, and scamp, suggesting that deep areas constitute important habitats that should



Black groupers at 180 ft, Riley's Hump FL (Photo: M. Nemeth)

Deep Mesophotic Coral Ecosystems

CCRI Study Sites

