

# BIOGEOGRAPHY BRANCH

CENTER FOR COASTAL MONITORING & ASSESSMENT  
NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

## Seafloor Characterization of the U.S. Caribbean 2010 Field Season March 18-April 6, 2010

### Day 2: March 19, 2010

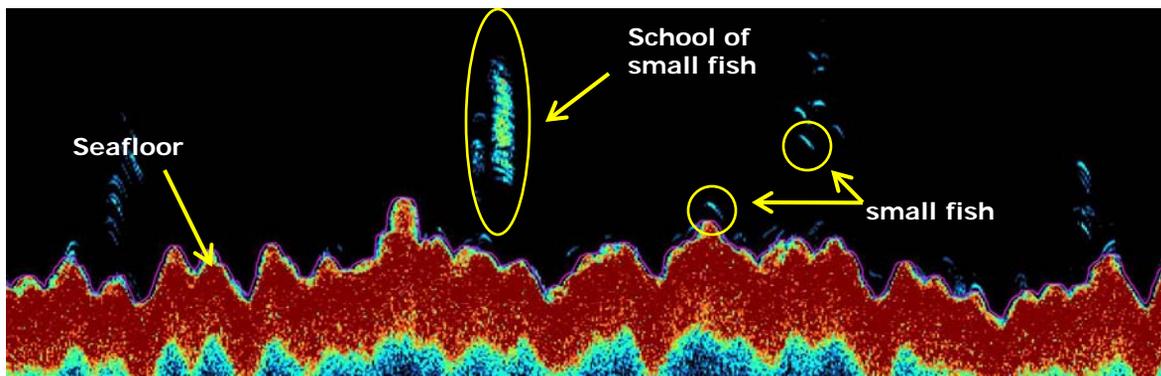
#### Fish Acoustics

If you had to guess how scientists observe fish underwater, the first thing that might come to mind would be scientific scuba divers or underwater vehicles. But there's another, very effective tool at the disposal of fish scientists. Sound. Scientists have been using sound to study fish for over 30 years; within the last decade it has become an effective tool for researchers studying coral reef ecosystems.

The process is pretty simple. Pings, pulses of sound, are transmitted from a transducer bolted to the bottom of the ship. Roughly three to six short pulses of sound are emitted per second at 128 microseconds, a speed that is literally faster than a blink of an eye.

The pings reflect, or echo, off anything that has a different density than the surrounding water. The strength of the echo indicates the size and hardness of the object-- a large reflection would indicate a large fish.

Today Chris Taylor, an ecologist with NOAA's Center for Coastal Fisheries and Habitat Research, detected both large and small fish, as well as a few large schools of smaller fish. "We are waiting to see large schools of large fish, which would indicate a spawning aggregation site," Taylor said.



Fish acoustic technology does a superb job of telling the size of individual fish and groups, but has limits where fish species identification is concerned. For example, species of similar size would have very similar echo returns, making them hard to classify using sound alone.

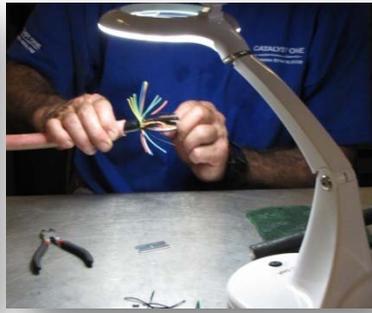
"This technology helps scientists find areas with high densities of fish so they can revisit them with divers, remotely operated vehicles and drop cameras," Taylor points out.

#### ROV Operations

The first run of the remotely operated vehicle (ROV) ran into a snag today when a portion of the 1,000 ft cable that connects the machine to the operating system brushed a rough patch of the seafloor. The screen immediately went black and an alarm sounded. ROV operators Lance Horn and Glenn Taylor quickly retrieved the machine. Closer inspection revealed a large tear in the thick pink plastic tubing near where the down weight was attached. Some of the delicate wires that power the ROV and control communication signals were damaged.

"We come prepared for this sort of thing," Lance Horn, ROV operations director from the University of North Carolina at Wilmington, said. "We had to remove about 100 feet of cable, but we will have the ROV up and running by tomorrow."

The eight-hour process to repair the cable required all the patience and skill of a surgeon, all while the ship rocked. First, layers of plastic and Kevlar and had to be carefully cut away to reveal two bundles of multi-colored wires. Each of the wires were trimmed of the damaged sections and reconnected before being tested to ensure power flowed smoothly. Finally, the repaired wires were enrobed in a waterproofing substance and left to set and harden overnight.



ROV operators Lance Horn and Glenn Taylor begin the process of repairing and replacing the damaged ROV cable (left). Inside of the cable are many small copper wires. Damaged portions of the wires are removed from the cable before both ends can be reconnected (right).

### DID YOU KNOW ...

- In the U.S., coral reefs are found in the waters of the Gulf of Mexico, Florida, Puerto Rico, Hawaii and the US Virgin Islands, as well as the Pacific territorial islands of Guam, American Samoa and the Commonwealth of the Northern Mariana Islands.

- Coral reefs are in decline due to an increasing array of threats—primarily from global climate change, unsustainable fishing impacts and land-based pollution.

- The decline and loss of coral reefs have significant social, cultural, economic, and ecological impacts on people and communities in the US and around the world.

For more information about coral reefs, visit:

<http://coralreef.noaa.gov/>



### MEET THE SCIENTISTS ...



#### Lance Horn

Horn is the operations director at the University of North Carolina, Wilmington's Undersea Vehicles Program. In addition to serving as a pilot and technician, he will oversee all ROV operations during the mission.



#### Glenn Taylor

Taylor is with the University of North Carolina, Wilmington's Center for Marine Science. He serves as the pilot and technician during ROV operations on the ship.

For more information about NOAA's Center for Coastal Monitoring and Assessment Biogeography Branch visit, <http://ccma.nos.noaa.gov/about/biogeography/welcome.html>