

# Unlocking mystery of the deep: Florida reef getting a road map

March 10 2009, By Cammy Clark

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Equipped with floating GPS units, side scan sonar and waterproof paper, college students dove 25 feet down into an underwater classroom with a pioneering assignment: create a three-dimensional, interactive map of a reef.

When completed, the map will show both the contour and biological life on Looe Key [reef](#), considered one of the most beautiful dive sites in the world.

"It's the first time this type of project has been done in the Keys," said Patrick Rice, director of marine sciences at the [Florida Keys Community College](#).

Just as a tourist map of Key West marks Ernest Hemingway's House and the Southernmost Point, the portion of Looe Key mapped by Rice's class will highlight points of interest such as spectacular coral head formations and known hangouts for Goliath grouper and other territorial [sea creatures](#).

"A lot of divers do underwater photography," said Lucja Jakuvowska, a student from Poland. "So if they come and can do only one dive on a certain dive site, they can just look at the map and go, 'Oh, I want to see this, this, this and this.' "

The 3-D underwater maps also will provide valuable [baseline data](#) for marine researchers, Rice said.

For years, federal agencies, including the National Oceanic and Atmospheric Administration and the U.S. Geological Survey, have mapped reefs in 3-D in the Keys.

"We are taking it to the next level by making it interactive and incorporating the biological data," Rice said.

The maps have the potential to work in conjunction with the new Google [Ocean technology](#), in which a person can zoom into a specific location in a body of water and see what it looks like, Rice said.

Stephan Becker, founder of Montreal-based Beautiful Oceans - which produces the 3-D underwater maps - said he also is excited about the potential of its use with the underwater iPhones in development.

"They can be your guidebook and guide," Becker said. "But our main goal for doing this is conservation, for which education is king."

The first 3-D maps were done in the Turks and Caicos. Before the points of special interest could be mapped, Becker said his crew first had to figure out how to get [GPS](#) coordinates from structures deep in the ocean. Microwave signals don't travel through water.

His crew came up with an idea: A diver collects data at depth, using a GPS unit floating directly overhead that is synchronized with the diver's watch. The latitude and longitude coordinates of the GPS are combined with the precise depth measurements provided by the diver to create the three-dimensional models.

Becker taught the method to Rice, and together they taught Rice's basic diving research class.

Each of the 14 students in Rice's class had specific tasks to accomplish

during their two approximate 45-minute dives at the east end of Looe Key reef known as the Towers. Some outlined the perimeter. Others took photographs or video of special features or creatures.

Student Nick Corby of Pennsylvania conducted a fish survey, coming up with 50 species that included stingrays. And one student operated the side scan sonar that produced high-resolution bathymetry.

The raw data was collected and combined using a quick grid program, which pumped out a topographical image. Video gaming software will be used to put in the color and points of special interest, and make it interactive with the photographs and video.

"You'll be able to take a simulated dive on Looe Key," Rice said.

Will Fox, dive operations manager at Looe Key Resort & Dive Center, said he has mixed feelings about the technology. Part of the experience of diving is being alone with nature. But he said he sees the benefits for divers with limited time wanting to see the highlights.

Rice's class mapped only about 100 yards squared - the area a diver can explore on one tank of air.

The ultimate goal is to map all of Looe Key reef, which is about 1½ miles long and ¼ of a mile wide, as well as the entire reef system of the Florida Keys that runs from Key Largo to the Dry Tortugas. It will take years, lots of students and funding.

"If this takes off like I think it will take off," Rice said, "there will be a lot of work for research divers in the Florida Keys."

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Citation: Unlocking mystery of the deep: Florida reef getting a road map (2009, March 10)  
retrieved 5 May 2024 from <https://phys.org/news/2009-03-mystery-deep-florida-reef-road.html>

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