



NOAA Teacher at Sea
Robert Lovely
Onboard NOAA Ship GORDON GUNTER
March 31 – April 12, 2008

NOAA Teacher at Sea: Robert Lovely
NOAA Ship: GORDON GUNTER
Mission: Document Fish/Coral Associations
at Pulley Ridge and the West Florida Shelf
Date: April 5, 2008
Geographical area of cruise: Gulf of Mexico

Weather Data from the Bridge

Visibility: 7-8 miles
Wind Direction: 140 degrees (SE)
Wind Speed: 13 knots
Sea Wave Height: 1-2 feet
Swell Wave Height: 2-3 feet
Seawater Temp.: 24.7 degrees C.
Present Weather: Clear



This sea anemone was part of a remarkably diverse community found on Pulley Ridge at a depth of about 212 feet.

Science and Technology Log

Today we made three two-hour ROV dives on Pulley Ridge. We documented an impressive amount of biodiversity along three transects at depths that ranged from about 190 to 225 feet. Downward still images of the bottom were taken at regular four minute intervals; forward facing



***Agaricia* sp., a hermatypic (reef-building) coral we found at about 215 feet.**

still shots were taken whenever something of interest presented itself; and a continuous forward-looking video recording was made of the entire transect. The ideal cruising speed for the ROV video recording is a very slow one-half knot, which presents significant challenges for the people on the bridge. In fact the Commanding Officer, LCDR Brian Parker, remarked on how good a training exercise this cruise is for his team. Upon our return to port, and for weeks afterwards, fishery biologist Stacey Harter will analyze the video to derive density estimates for the fishes observed. She will determine the area covered by each video transect and count individuals of each species that

intercepted our transect line. Abundance estimates then can be extrapolated per unit area. Others will use similar techniques to determine the aerial extent of living corals. These data, in turn, will be useful to authorities responsible for managing the fisheries.

Pulley Ridge is a drowned barrier island system that formed about 14,000 years ago, when sea levels were lower because a larger portion of the Earth's water was locked up in glacial ice. While the presence of photosynthetic corals, such as *Agaricia* spp. was patchy on our dives, we did encounter large fields of green algae in relatively high densities. This species no doubt is the *Anadyomene menziesii* described by Robert Halley and his group at the USGS. These striking seascapes resembled large fields of lettuce. At the southern end of Pulley Ridge this green algae dominated the seabed. As we



The green algae, *Anadyomene menziesii*, dominated large areas in the southern portion of Pulley Ridge.



A red grouper (*Epinephelus morio*) at rest in a small pit on Pulley Ridge.

moved northward from station to station, however, it occurred in much lower densities, and we began to see higher proportions of the calcareous green algae *Halimeda* spp. Various species of red coralline algae were also common on Pulley Ridge.

Apart from the abundance of *Anadyomene menziesii*, the other striking observation one makes on this deep coral reef is the presence of conical-shaped mounds and pits. These structures are almost certainly constructed by fish, such as the sand tilefish (*Malacanthus plumieri*) and red grouper (*Epinephelus morio*). Sand tilefish in particular burrow into the coral rubble and pile it up for cover. Red grouper are also industrious excavators.

The mounds and pits introduce an element of topographic relief into an otherwise flat seascape along the top of Pulley Ridge. Because so many other species of fish are attracted to these structures, I would suggest that (at least among the fish) sand tilefish and red grouper represent



Our ROV disturbs the nap of a loggerhead turtle (*Caretta caretta*).

keystone species in this unique ecosystem. In other words, the removal of these two species would have a significant impact on the rest of the community.

Other fauna we observed today on Pulley Ridge were typical of what one might encounter on a shallow-water reef, including sponges, tunicates, lobsters, bryozoans, amberjacks, angelfish, reef butterflyfish, snapper, barracuda, and a loggerhead turtle.

Personal Log

My favorite place on the ship is the boatswain's chair way up on the bow. No one else seems to know about it, for I have yet to find it occupied when I want to use it. It is the quietest, most scenic spot on the ship.

Whenever I get a chance, I sneak up there to watch the flying fish. They are flushed by the ship, and some of them can remain in flight for long periods, perhaps 20 seconds or more. If I am especially lucky, I also get to watch dolphins riding our bow. This is a real treat because they seem so playful.



A pod of dolphins bow-riding the GORDON GUNTER.