

Life Under the Sea

Georgia Tech team lives underwater to study coral reefs.

Here are excerpts from the journal Hay kept during the mission. A more detailed journal is available at gtresearchnews.gatech.edu/resor/rh-w04/default.htm.

Day One

As you approach the Aquarius at night, it is a lot like approaching a strange spaceship you find in your corn field. Faint lights glow off in the distance, and as you get closer there are the strange, low-frequency murmurs and throbbing sounds of compressors and pumps. There is a Darth Vader-like breathing sound made as air enters and exits the wet-porch on the back of the Aquarius as waves pass overhead. You see shafts of light before you can tell where they come from. Clouds of fish swirl around. Then, finally, you see Aquarius with lights glowing from view ports.

Day Two

By 6 p.m. at this depth and time of year, it is truly dark. To free our hands for working — driving nails to fasten cages to the reef — we strapped small flashlights to our mask straps and were able to work productively for the extra two hours in darkness. Because we are running on 25-hour work cycles (six hours out, a mandatory four in, three out, then another mandatory 12 hours in), we end up going out one hour later each day.

Day Three

Against the Aquarius light and outline, we could see thousands of fish completely filling the water column. There were what looked to be more



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Gorgia Tech Professor of Biology Mark Hay led a six-person team of scientists on a 10-day underwater research mission in November 2003 in the Florida Keys aboard the Aquarius ocean laboratory owned by the National Oceanic and Atmospheric Administration (NOAA).

The mission began the researchers' two-year investigation on how grazers, specifically parrotfish and surgeonfish, affect seaweeds and corals in the Florida Keys National Marine Sanctuary. Using Aquarius, a 47-foot cylindrical lab, gave the researchers an ideal platform from which to set up their experiments and make observations.

Aquarius is a one-of-a-kind underwater ocean laboratory deployed three-and-a-half miles off-shore, at a depth of 60 feet, next to spectacular coral reefs. Scientists live in Aquarius during 10-day missions using saturation diving to study the ocean. Aquarius is operated by the National Undersea Research Center (NURC) at the University of North Carolina at Wilmington.

Above: A diver looks in through the Aquarius porthole.



than 100 reasonably large barracuda, several large snapper and then dense clouds of smaller fish. It was a striking sight to see how many fish were attracted to the lights, sounds and structure of the Aquarius.

One wonders what these and other Caribbean waters were like before fishing removed so many of the larger consumers. During my 26 years of diving, there has been a dramatic decline in the numbers, types and sizes of fish on reefs, but maybe I started well after the decline. Maybe this would have been common 200 years ago. I'm delighted to get to see it now. I wish my sons, Hunter and Kyle, could have been on the swim in to the Aquarius tonight. I fear that there are few chances to see these sights now, and that these chances will be even fewer in the future.

Day Four

We are concerned about moray eels being inadvertently captured in our cages and thus getting our fish.... We noted one in Cage 17 today, though it was not especially large, and we can probably get him to leave with minimal hassle.

Cage 24 has a lot of structure and holes in it. We have seen a big eel in there. This morning there was a large hole blasted directly through the chick-



en wire where something came out through the top of the cage and a second hole in the side where something came back in. In both cases, it looked like a rocket had gone through the cage material. These are impressive animals.

Day Five

During the afternoon dive, the current picked up more, and at dusk, high densities of jellyfishes started washing through. As these came over the reef, the yellowtail snapper and bar jacks were rising up in the water column and attacking the small fish that were sheltering in the jellyfish tentacles.

There were often frenzied predators around each jelly, but as this started and the snapper and jack focused on their prey, larger jack and barracuda started going after the snapper and smaller jacks. In most cases the frenzied fish dispersed as the larger predators approached, but there appeared to be a few successful strikes by the larger predators.

Day Six

We are beginning to get the predictable suite of undesirables at the cages — sharks, big jacks, big grouper and snapper, and holes in the cages from big eels. Once fish swim into the open cage and start getting freaked-out that they can't find their way out, their activity attracts the predators.

I spent several minutes this morning convincing a 5-foot nurse shark that it needed to go elsewhere and leave the cages — and the fish in them — alone. It amazes me that fish will stay against the cage edge and get sucked through the mesh by these sharks. All the prey need to do is stay away from the edge, but they don't. I guess destructive behavior is not just a human trait.

Day Seven

On the way to the site this morning, I was pulling along the excursion line — not paying



Snappers swarm around the Aquarius underwater laboratory in the Florida Keys. Inset: Researchers had to eat dehydrated and pre-packaged food while living aboard the Aquarius underwater laboratory based in the Florida Keys.



A diver checks a cage that researchers installed as part of an investigation on how grazers, specifically parrotfish and surgeonfish, affect seaweeds and corals in the Florida Keys National Marine Sanctuary.

Left: This barracuda was among the sea creatures observed by Aquarius mission researchers.



The Aquarius researchers had to undergo decompression at the end of their mission. They initially got 70 minutes of oxygen treatment while lying in bed. It helps wash out the nitrogen in their bodies.

adequate attention — and ran my forehead into a jellyfish. I was lucky that it was a moonjelly and not one of the cauliflower jellies. It stung at the time, but went away before long.

We have seen some massive cauliflower jellies. One that came over us today had tentacles extending 10 to 12 feet down through the water column and could have easily hit one of us without us seeing the body first. I had not seen this species before, and on this expedition have seen many.

Day Eight

Our wet suits are mashed, shrunken, inefficient and fighting back. We are freezing, despite multiple wet suits. They are rubbing the skin off our bodies in places and causing rashes in others... We need to dry out.



Space was limited for researchers inside the Aquarius underwater laboratory based in the Florida Keys.

Day Nine

After considerable discussion (about the diving conditions), we were allowed to go out after giving a promise to abandon the effort if things were too bad. Once out, the visibility was poor, but it was not hard to maneuver. There was surge, but it was not bad. The hard directional currents of earlier in the week were tougher on us.

We did use our safety reels at each cage site — hooking a line to the excursion line, swimming the reel to the cages and affixing it, then working them and reeling ourselves back to the line.

Day Ten

We emerged to bright sunshine, a warm day and fresh cinnamon bread. It was nice to be back on top, but we'll miss the time in and under the water. Later, we had lunch — good Mexican food and a beer. The diving physician had to go with us to be sure no one showed signs of decompression, but he was willing to do this so we were “paroled” from the National Undersea Research Center base. **RH**

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IMAGE COURTESY OF MARK HAY



This reef crab was among the sea creatures observed by Aquarius researchers.