



**NOAA Teacher at Sea  
Lynette Swiger  
Onboard NASA Ship LIBERTY STAR  
July 16 – 23, 2008**

**NOAA Teacher at Sea: Lynette Swiger**

NASA Ship LIBERTY STAR

Geographical Area: South Atlantic Ocean off the coast of Florida

Date: Monday, July 21, 2008

**Weather Data from the Bridge**

Winds: SW at 12 knots

Sea: SW at 2-4 ft.

Barometer: 29.90

Air Temperature: 80 degrees

Cloud Cover: 90%

**Science and Technology Log**

It is now 8:30 am. We sailed to the targeted North Carolina sites overnight and got everything set up for the day. The ROV was launched and our day began.

The water was clear and we saw several great sites, but there was a strong underwater current.

About ten minutes into the dive, the monitoring screens went haywire, beepers went off, and Lance knew something had occurred underwater that injured the ROV. After raising the ROV we found that a cable had been completely severed after somehow becoming entangled with the props. The

troubleshooting skills that Lance told me were essential for an ROV operator are now being put to good use as he splices the cable so that we can hopefully continue ROV dives tomorrow at the South Carolina sites. With this in mind, I will journal about

our fishing day yesterday as I didn't have space to include it in my journal last night.



Yesterday was a beautiful day. We had great ROV dives and the weather was wonderful. The temperature inside the ship is kept rather cool, so I often wear my fleece pullover. I don't



understand much about engines and other mechanical items, but I do know that without sufficient air conditioning, temperatures can quickly climb to over 100 degrees. So I have learned to appreciate the a/c. We work in the semi-darkness in order to better see the video screens, so it's always a pleasant surprise to open the hatch, feel the caress of warm air, smell the salt breezes, and see brilliant sunshine.

We spent "in between" time yesterday fishing while the camera trap did its documentation work underwater. This fishing is actually important because Michelle and Stacey evaluate fish samples to gain valuable knowledge. Stacey measures the length and weight of each fish and analyzes the otoliths to gain knowledge about age at maturity, growth rate, etc. Otoliths are the ear bones of fish, and they are bony

structures found just on top of the brain cavity. The otoliths have growth rings similar to trees and can be used to age fish in much the same way that a forester ages trees.

Michelle needs a core tissue sample of every fish to support a different research project. Based on a stable isotope analysis, scientists can identify where in the world a fish has been. This is because each area is unique and leaves its "signature" in the tissues of a fish. It is important to know where a fish has been in order to identify source populations, or places where they breed. This allows scientists to identify areas that need to be protected.

### **Animals Seen**

We hear conversations about sponges that are found in the ocean, but do you know whether they are plants or animals? How they eat? A sponge is an invertebrate. This means that it is an animal without a backbone. It attaches itself to rocks and other stationary objects, so it doesn't move from place to place. Sponges come in all shapes, sizes, and colors. They are supported by little

spiracles made of calcium carbonate that hold them up. They feed by **soaking up** particles and nutrients from the surrounding water – thus the name sponge! Some sponges are now used in medical research for anti-cancer drugs. They have few predators, so they are free to “soak up” the underwater ocean beauty without much fear of joining a predator for lunch.

I was interested to learn that animals compose most of the sea life we have been viewing. Michelle explained that sunshine cannot reach our diving depths, so plants can't receive sun energy for growth. Therefore, even though they may look like plants, the sea fans, the coral, the sea pens that look like pipe cleaners sticking up from the bottom, the sponges, etc. are all animals.

### **Vocabulary**

sponge, predator, spiracle, calcium carbonate, particles, nutrients, breed, stable isotope analysis, supply and demand

### **Career Connection**

Steve is our Fisheries Methods and Equipment Specialist. He is retired from the Navy, worked for awhile for Florida State University, and now works for NOAA. His job entails supporting the scientists with boat maintenance, diving, and shop work. That one sentence may not sound like much, but without his mechanical skills, the diving would be very difficult to maintain. He tinkered with engines and mechanics as he was growing up, and when he joined the Navy he became an engine room hand, an engine room supervisor, and began Navy diving. He admits that Lloyd Bridges in *Seahunt* provided his inspiration for learning to dive, but his Navy experiences provided him with many of the skills he uses today. For instance, he built the camera trap that NOAA uses for stationary videos. I asked if he has plans or blueprints for his projects, and he replied that he usually does not. Scientists give him the impetus of an idea and a vague description of what they need and he builds what he thinks will work. Sometimes his creations need revision or refinement, but that's what keeps the job interesting.

### **Question of the Day**

Coral is alive. It is composed of numerous polyps that secrete a substance that creates a hard shell surrounding the organisms. Coral slowly builds on itself until a large reef is finally formed. Reef fish, grouper, and snapper are fish that live in and around coral reefs because they prefer a structural habitat with holes and crannies where they can hide. Since these are fish that taste great, people frequently “invite” them to dinner!

- How would damage to a coral reef system affect the supply of these fish?
- If fish supply declines, what will happen to the price of the fish at the grocery store?
- How are the MPAs that protect coral reefs important to people?

### **Educational Link**

Teaching kids to work compatibly in a group is essential to success in the workplace. I see this with the science team as well as the crew members on the ship. Everyone has a job to do and every job, no matter how small, is important. Everyone understands his/her role whether it is directing, supporting, assisting, etc. One person must be a leader who directs, takes responsibility, includes everyone, and understands the entire scope of the project. Each person in a group should have a particular strength or ability that contributes to group success. Everyone is

important but everyone must learn to listen to the leader when it is their turn to support, and to lead with wisdom when they are in charge.

### **Personal Log**

I have become used to the motion of the ship and actually find it very soothing while sleeping. It's a sort of rocking motion similar to what a cradle probably feels like. Unless we run into stormy weather, it appears that all of those motion sickness remedies that I brought can be taken home unopened. What a relief! The ship is fascinating and is actually a self-contained hotel. Of course there's the galley, but this ship also boasts a nice lounge with a large screen television and a varied selection of DVDs and a relaxed eating area that also has a nice flat-screen television and satellite reception. There is a laundry room, engine room, work room, and of course the bridge. This ship is actually a NASA ship which is off duty just now and thus able to take on other contracted jobs such as the one we are currently doing with NOAA. The job of the Liberty Star and her crew is a wonderful story that I hope to cover tomorrow in my science log because it deals directly with the shuttle program. I hope to report tomorrow that our little ROV's injuries have healed and it is cleared to return to work! Lynn