



**NOAA Teacher at Sea  
Mark Silverman  
Onboard NASA Ship LIBERTY STAR  
June 7 – 14, 2006**

**NOAA Teacher at Sea:**

Mark Silverman  
NASA Ship: M/V  
FREEDOM STAR  
Mission: South Atlantic  
MPA's: Pre-closure  
evaluation of habitat and fish  
assemblages in five proposed  
no fishing zones  
Day 3: Friday, June 9, 2006



Sunrise revealed rough seas aboard the FREEDOM STAR off the coast of South Carolina.

**Weather Data from Bridge – AM**

Visibility: Good  
Wind direction: SW/W  
Average wind speed: 20 knots  
Wave height: 8-10'  
Air temperature: 72°F  
Cloud cover: 70%  
Barometric pressure: 1009.8 mb

**Weather Data from Bridge - PM**

Visibility: Good with a slight haze  
Wind direction: SE  
Average wind speed: 9.5 knots  
Wave height: 3-4'  
Air temperature: 74°F  
Cloud cover: 20%  
Barometric pressure: 1010 mb



Water washed across the deck creating hazardous working conditions.

**Science and Technology  
Log**

Morning dawned revealing seas of 8-10 foot with occasional 12-foot swells causing unsafe conditions on deck. Waves were rolling onto one side of the ship's deck and across the other. Several members of the field party were seasick as a result of the weather. A joint decision was made to scrub

the morning mission by Principle Investigator Andy

David, Capt. Exell and Craig Bussel, the ROV pilot, due to the unsafe conditions on deck.

Conditions improved after mid-day and we began a survey of the South Carolina site B in an area overlapped by Options 1 and 2. The fish trap was deployed first, with 450 ft of blue spectra line tethered to high-flyer floats to facilitate retrieval. While it soaked the 4-camera array was deployed, using a similar float system, and retrieved



Waves splashed over the transom as we tried to hold position for the morning mission.

after 30 min. In order to collect physical data, the CTD was also deployed and retrieved successfully. After about 90 min. the fish trap was retrieved. 7 red porgies and a gray triggerfish were recovered and measured. Three measurements were recorded for each fish: standard length, fork length, and total length. Since the fish were blown up by the pressure change they were cleaned for the galley.



The "girls" hold an animated discussion while going over data using a PDA.

In the 3 hours between the beginning of the mission and the ROV run the current was determined to have swung 180

degrees, by a drift test. The initial

current was 1.3 knots to the south. By afternoon the current was 1.3 knots to the north. In order to run into the current with the ROV, so as to improve visibility of the camera views and keep the ROV free of the props we took some time to reorient the transect path to start

on the opposite, north, end of the transect. Next, the ROV was deployed, but the dive had to be aborted due to a problem with the camera. The camera problem was resolved and the ROV was launched a second time for a 2 hr+ transect. The transect, which ranged from



Steve Matthews, fisheries methods and equipment specialist, coordinates crane operations during deployment of the 4-camera array.

197' to 227' deep, was very successful. A varied terrain was seen consisting of pavement



Sunset, in stark contrast to sunrise, over calm seas as another day aboard FREEDOM STAR draws to a close.

crevices of hard compacted sand and isolated, scattered rocks and hard bottom. At least one object appeared to be of human origin. In addition to video, still pictures are taken once per minute to survey the bottom composition. Most of the fish seemed to be concentrated in the rocky areas. A surprising number of fish would orient to even very small pieces of structure. Many of the same species of fish were seen that are mentioned in the Day 2 log as well as several new species of interest. These included Lionfish (an introduced species that is native to the Pacific and Indian Oceans), tilefish, razorfish, and several others that still need to be identified. Abundant numbers of scamp, amberjack, big eyes, red porgies, and butterfly fish were observed. Additionally, several interesting invertebrates were seen, including a Holothuroidea (Sea Cucumber) and an Asteroidea (starfish).

FREEDOM STAR then transited, over night, approximately 131 mi. to the North Carolina Options off of Cape Fear, North Carolina.

### Personal Log

I slept soundly as the ship tossed and turned during the night in a building sea. As we reached our destination in the morning and FREEDOM STAR slowed the roll and pitch became extreme. Although several members of the team were seasick, so far I felt fine. I ate a light breakfast out of respect for the conditions. As the sun rose in beautiful shades of rose, the waves rose as well, splashing over and washing across the deck. We had the morning free since it was too dangerous to work. Feeling a bit queasy, several of us returned to our racks. After a nap I felt much better and seas were beginning to lay down.

I was given the opportunity to participate in several of the deployments and found out it's not as easy as it looks. Hardhat and life jacket in place, I baited and launched the fish trap...a bit prematurely, but all went well. I also tossed the high-flyer for the camera array...not so well. It whipped back and dented the radar reflector, much to my embarrassment. Andy, kindly, reassured me that most of them wound up this way after being taken to sea. Repairs were made later using a hammer and duct tape. Next, I assisted in taking pictures during the ROV dive. 1, 2, 3...Craig, the pilot would slow down...using the laptop I took a picture once a minute. I even managed to photograph some fish, including a lionfish. Noting how much Craig, the pilot, enjoyed his work, I asked if the ROV had a name and was told it's the Hela Dive 118. He then offered to let me try piloting one day. I'm very excited and can't wait! I requested soft sand after my experience with the high-flyer, LOL. Several dolphin (the fish) came up to the boat and I

managed to hook one! It ran toward the operations area and had to be broken off to avoid entanglement...Oh well. We did see some dolphin (the flipper type) in the wake too! I shot lots of photos, I wish I could share them all. Another beautiful sunset and all and all it was an adventuresome day and I'm getting tired, so...

Hasta mañana,  
Mark

### **Question of the Day**

#### Answer to yesterday's question:

Yesterday's question is very controversial and is the impetus for this mission. There is currently no right answer. Hopefully the data we collect will help shed light on this complicated issue. The Scientist and crew are dedicated to providing concrete, unbiased data to create sustainable fisheries for the future.

#### Today's question:

Today we encountered an introduced species, the lionfish. Nonnative species have plagued the freshwater ecosystems of South Florida for years. What are some of the possible impacts resulting from the introduction of nonnative species to marine ecosystems of the Southeast Atlantic basin?

### **Addendum1: Glossary of Terms**

Standard length: Measured from the front edge of the mouth to the forward edge of the caudal fin.

Fork length: Measured from the front edge of the mouth to the center of the fork of the caudal fin.

Total length: Measured from the front edge of the mouth to the farthest point of the upper caudal lobe.

Caudal fin: The tail fin of a bony fish (Class Osteichthyes).

Drift test: Used to determine how the ship will move in the wind and current conditions by shutting down propulsion and using the GPS to note direction and speed of travel.

Rack: Bed

High-flyer: a buoy with a tall pole topped by a radar reflector to facilitate retrieval.

Sustainable Fisheries: a fishery where the numbers of fish remain at suitable levels to support commercial and recreational fishing.

### **Addendum2: An Interview with Andy David, Principle Investigator**

Andy David is an affable man. He is a walking encyclopedia of facts about fish, wildlife, environmental issues and marine science. I found Andy to be patient while teaching, yet focused and determined about his work. I interviewed him in the galley after lunch as we transited between study sites. The interview is paraphrased. I did not have a tape recorder to get accurate quotes and used notes. Any inaccuracies are the fault of the interviewer and not Andy.

Q: What and where did you study?

A: I have BS in Chemistry and Biology from Stetson University in Central Florida. My MS in Marine Science was done at USF in Saint Pete.

Q: Do you have a PhD?

A: My PhD is near completion at FSU. I am nearing completion of my dissertation.

Q: How did you come to work for NOAA?

A: I am from Panama City and moved back after college due to my wife's work. I took a temporary 1-year position on the [NOAA] redfish project at \$17,000 a year with no benefits and stuck with it. Sixteen years later here I am.

Q: What are your current projects?

A: I currently have four projects, The South Atlantic fisheries project, a Gulf of Mexico fisheries project which is completed, [an investigation of] trolling in closed areas in the Gulf, and a multibeam mapping project on Pulley Ridge in the north Dry Tortugas in



Andy confers with Darin Schuster, one of the crane operators as the camera array is recovered on day 3.

60-100 meters of water.

Q: Would you recommend a career in fisheries science to current high school students?

A: It's a great job. You can tailor your studies to what you like. The stress level is low, the dress is casual (points to his shorts, rubber clogs, and t-shirt smiling), and the work is interesting. There are boring things as in any job, but generally it's really interesting. New

projects always come up. It's not usually mundane.

Q: How would you recommend that a student prepares for this career?

A: Take all the math and science you can. English is important too...it all comes down to expressing what you found in an understandable way or you're just spinning your wheels. Don't worry about Marine Biology [courses] in 9<sup>th</sup> grade. Take good general science and wait to learn the fancy stuff, all the names and stuff, in grad [graduate] school. You don't need to go straight through. You can

get a Bachelors degree, get an entry-level job, and see if you like it.

NOAA supports returning to school

and helps with tuition. You can blend your work with your Masters thesis project.



Andy gives the science team an animated briefing on the first evening of the cruise.



Andy assists in the recovery of the ROV at the South Carolina Option on day 3.