NOAA Teacher at Sea
Candice Autry
Onboard NOAA Ship THOMAS JEFFERSON
August 7 – 18, 2006

NOAA Teacher at Sea: **Candice L. Autry**
NOAA Ship THOMAS JEFFERSON
Mission: Atlantic Hydrography Survey
August 15, 2006

Weather
AM: SW winds 15-20 knots, Seas 1-2 feet
PM: W winds 10-15 knots, Seas 1-2 feet
Chance of showers

Crewmembers of the THOMAS JEFFERSON prepare the launches to set forth and collect data using side-scan sonar and multi-beam sonar.

Science and Technology Log
"Data Collection Begins!"
We have made it to our destination after a thirty-hour journey. It is exciting to get started with data collection, I am curious what is on the bottom of a busy harbor. After a brief safety meeting that kicks off the morning, we prepare to go out on the launches to begin the process of making a chart that will provide information about obstructions in navigable waters. The teamwork of the crew of the THOMAS JEFFERSON is inspiring to watch, each with a specific duty communicating and working together so that launches are safely deployed. Today two launches will collect data using side-scan sonar and multi-beam sonar technologies.

The launch is ready to start collecting data. Typically, a launch has a driver, another person to look out for water traffic, and a surveyor who observes the data being collected and who manipulates the computers connected to the "fish" below the launch.

Bernard Pooser behind the wheel of the launch. The route he drives in the harbor is very specific, and he must follow careful 'driving lines' that the surveyor also sees on one of the four computer screens inside of the launch. This job is much easier said than done, a real challenge!

Senior Surveyor Peter Lewit prepares to collect data utilizing side scan sonar. Side-scan sonar provides a picture that shows light and dark images that provide high-resolution images of obstructions on the seafloor.

The launch I am on today utilizes side-scan sonar, which incorporates sound navigation and ranging that is used for searching for objects on the seafloor. This technology transmits sound energy, which sends a beam from the "fish" (the instrument underneath the launch) that bounces off the seafloor and other objects. Once the sound energy hits the floor, it then bounces back to the fish in the form of an echo. These beams are sent in a fan-shaped pattern that sweeps the seafloor from underneath the launch to approximately 75 meters from either side of the boat (although distances can reach 100 meters). The strength of the echo is recorded as a "picture" that can be seen on a computer screen. If there is an object on the bottom of the seafloor, such as a protrusion, the return signal will be strong and will create a dark image on the screen. If the return signal has a weak return, then the image on the computer will look light. A tire on the seafloor, or a barge that has sunk is easily seen and depicted! These images are fascinating.

The benefit of side-scan sonar allows for high resolution of what is on the seafloor. The only drawback of side-scan sonar technology is that the depth of these obstructions cannot be ascertained. Determining the depth of an obstruction is where multi-beam sonar is applied. Multi-beam sonar utilizes fan-shaped sonar that records depths. This is done by recording the time it takes for the acoustic signal to travel from the receiver to the seafloor (or object on the seafloor) back to the receiver. The receiver is often referred to as a transducer. The multi-beam sonar transducer is attached underneath the launch.

The combination of side scan sonar and multi-beam sonar create for specific data that can be shared so that navigable waters are safe.

Surveyor Doug Wood observes four computer screens where data is being collected. The green triangle seen on the computer screen is showing multi-beam sonar information being collected. Multi-beam sonar provides the depth information for any obstruction.

Personal Log

"I have my sea legs!"

I must admit I was a bit nervous about being seasick! Our thirty-hour journey was difficult for me for only about three hours, right at the beginning of the trip. I am very happy for a short experience with seasickness! After getting my sea legs, it is interesting to realize that one can adapt quickly. Often I felt like I was being rocked to sleep as we made our way to our

destination through the waves of the ocean. After being on a ship for a couple of days, experiencing land is an interesting sensation. I missed moving around on water and felt as if I were on water even though I was on land! I do not really miss being on land at all.

NOAA Teacher at Sea, Candice Autry, enjoys pudding while taking a break from observing data collection using side-scan sonar. The Statue of Liberty is in the background!