NOAA Teacher at Sea
Jill Carpenter
Onboard NOAA Ship DELAWARE II
September 5 – 15, 2006

NOAA Teacher at Sea: Jill Carpenter
Onboard NOAA Ship DELAWARE II
Mission: Herring Hydroacoustic Survey
Day 3: Thursday, September 7, 2006

Weather Data from Bridge (docked in Woods Hole for calibration and Advanced Fisheries Towed Vehicle testing—no weather data.)

Science and Technology Log:
Today was a very exciting day aboard the DELAWARE II. Scientists and crewmembers worked together to deploy the Advanced Fisheries Towed Vehicle (AFTV) into the water for the first time in order to complete initial testing. The AFTV was delivered to the NOAA pier yesterday and loaded on the aft deck of the DELAWARE II. Chief Scientist Bill Michaels explained to me how he designed the AFTV in collaboration with Deep Sea Systems International. This new piece of scientific research equipment utilizes the latest underwater technology to improve measurements in support of NOAA's strategic goals (e.g., Essential Fish Habitat, Stock Assessment Improvement Plan). The AFTV is presently configured for verification of acoustic targets in the water column during NOAA's Herring Acoustic Survey (RV DELAWARE II cruise DE200615). The AFTV provides a universal platform in which acoustical, optical and environmental sensors are integrated. The AFTV electronics convert these data to ethernet signals that are transmitted through the 2000 m of fiberoptic cable to a laptop providing network ready information. For example, real-time underwater video images during cruise operations can be viewed from a computer on land provided satellite transmission. The advantage of this towfish is that new technologies, such as newly developed sensors, can be readily plugged into the towbody's ethernet-based electronics to

TAS Jill Carpenter in front of the AFTV.


Intricate knot work is used to protect scientific equipment.

accomplish various cruise objectives. The AFTV can be reconfigured during future cruises for marine habitat classification (video mosaics and acoustic classification of the seafloor).

We also had the chance to learn how to use the Fisheries Scientific Computer System (FSCS). This computerized system is used for electronically recording data from the biological sampling that will be completed on board. Nancy McHugh, a fisheries biologist and FSCS administrator from the Northeast Fisheries Science Center, showed us how to operate the system and record our information accurately. In the past, data had to be hand-recorded, and errors were not caught until months later. Nowadays, using the FSCS allows us to digitally record measurement data, such as lengths and weights, in real time and gives us the advantage of computer-audited data which flags the scientists for potential errors.

Afterwards, Dr. Jech explained the ship's Scientific Computer System (SCS) located on the bridge of the ship. This PC-based system continuously collects information from more than a hundred sensors on board. Information about the ship's location and route, weather conditions, ocean conditions and biological sampling is gathered, recorded and synchronized on these computers. We also practiced entering data into computers using the SCS Event Log program which documents all operational events, such as each time the scientists lower sensors into the water or collect fish samples.

Personal Log:

Jill Carpenter, Teacher at Sea, on the bow of the NOAA ship DELAWARE II.

It was great to witness the experimental launching of a new piece of scientific equipment. I think my fifth graders would be really excited to witness firsthand this underwater vehicle being placed in the water. It looks like a large yellow plastic box with metal pipes that make up the frame. Attached to the back are "wings" that help to stabilize it, and in the front are spotlights and video equipment to take pictures of fish. It is controlled by joysticks and computers on board the ship. It is like an underwater robot. Very cool!

I think it is also an invaluable learning experience for me to see the process of scientific experimentation happening right here on board the ship. Between the calibrations, setting up the Scientific Computer System, and launching the AFTV, I have witnessed scientists and crewmembers informally using various scientific methods to find better solutions and problem solve when the unexpected arises. It is exciting to see science experiments happening every day, with real people in a real-life context, instead reading about it from a worksheet or having that intangible image in my mind of a mad scientist in a white lab coat stirring a beaker of something bubbling. Science is accessible to everybody! You don't have to be in a

fancy laboratory or have the latest equipment. It can be done inside or out, on a boat or in your backyard. Science encompasses so many fields and is available to anyone with a curious mind. I am excited to share this realization with my students and make science more real to them.

Sailboats, Woods Hole, MA.

Question of the Day:
Two words that I am using aboard the ship are “starboard” and “port”. What do these two words mean? Where do they come from, and why are they important to use when on board a ship?