



**NOAA Teacher at Sea  
Christy Garvin  
Onboard NOAA Ship RAINIER  
June 1 - 8, 2005**

**Log 4**

Day 4: Saturday, June 4, 2005  
Latitude: 56 deg 59 min N  
Longitude: 135 deg 17 min W  
Visibility: 5 nautical miles  
Wind Direction: 300 deg  
Wind Speed: 10 kts  
Sea Wave Height: 0-1 ft  
Swell Wave Height: 0 ft (we are in a protected bay)  
Sea Water Temperature: 53deg F  
Sea Level Pressure: 1009.8 mb

**Science and Technology Log**

On the RAINIER, the crew works right through the weekend, so the workday began at 0800; again, four launches were deployed to run survey lines and take bottom samples. I was assigned to launch RA-3, and we worked an area on survey sheet Y.

Launch RA-3 ran approximately 40 miles of hydrography using the Sea Bat 8101 Multibeam Echosounder. The Sea Bat is a 240kHz echosounder that measures the relative water depths across a wide swath that is perpendicular to the launch's track. The system is comprised of 5 main parts: the sonar processor, the sonar head, the sonar processor to sonar head signal and control cable, a color monitor, and a computer mouse. The transmit array, which is a projector section of the sonar head, transmits a pulse of sound energy that travels through the water and is reflected by the sea floor or any object in its path. The reflected signal is received by the hydrophone section of the sonar head, digitized, and then sent to the sonar processor for beamforming. The processor then generates a video display of the ocean floor that can be viewed on the color monitor. The Sea Bat can "see" approximately 300 meters, but it is more accurate in depths of 150 meters or less.

The physical process of running survey lines with the Sea Bat is nicknamed "mowing the grass;" this is because the launch actually follows the parallel lines drawn by the survey techs and the launch's path resembles an individual mowing a lawn. The survey lines are displayed on a computer screen so the survey tech can highlight a given line for the coxswain to follow. As the launch approaches the line, the survey tech logs the computer data for each line. Lines vary in length from a few meters to several kilometers.

**Personal log**

I learned to drive the launch today, and it was a lot of fun. I was able to “mow the grass” for about an hour, and I also drove during a man overboard drill.

**Previous question of the day: What is refraction?**

Answer: Refraction is the bending of a sound wave. In the case of sound traveling through water, different temperatures and pressures cause sound to travel at different speeds; this in turn causes the waves to bend.

Until tomorrow,

Christy