NOAA Teacher at Sea
Philip J. Hertzog
Onboard NOAA Ship RAINIER
July 24 - August 13, 2005

Log 3

Day 3: July 27, 2005
Time: 1800 hours
Latitude: 55˚ 53.3' N
Longitude: 158˚ 58.4' W
Visibility: 10 nm
Wind Direction: light
Wind Speed: airs
Sea Wave Height: 0 feet
Sea Water Temperature: 12.2˚ C
Sea Level Pressure: 1012 mb
Cloud Cover: 2, cumulus

Science and Technology Log

The RAINIER is now anchored for the next several days in Cushman Bay on the north side of Mitrofania Island. Today the ship's crew began their first full day of mapping the bottom of the waters surrounding the island. The Captain assigned me to observe operations on board one of the RAINIER's six survey launches. The launches are small craft equipped with sonar and computer equipment to collect bottom data as seen in the following photographs:

Each launch has a crew of three and four launches go out at a time. On my launch, Ensign Brianna Welton serves as the hydrographer in charge with Matt Boles as the Assistant Survey Technician. Able Body Seaman Corey Mussey drives the launch and makes sure it stays on course using a computer screen directs him where to go.

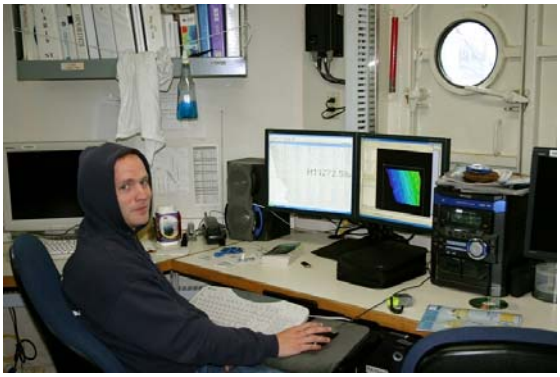
A winch lowered our launch into the water. We jumped about two feet from the side of the ship to get into the launch. We carried no equipment in our hands or on our backs and wore life jackets to ensure we safely crossed the deep water.

Once underway, Ensign Welton turned on the Differential Global Positioning System (DGPS). The DGPS uses satellite signals to determine our location and even can tell our direction and speed. Unfortunately, our DGPS did not work correctly and Ensign Welton and Matt Boles struggled over the next 2 hours to trouble shoot the problem. When out at sea and hundreds of miles from the nearest repair shop, the crew of the RAINIER has to become creative to solve problems in order to achieve their mapping mission. The DGPS problem finally got fixed after the antenna was taken apart and the connecting cables cleaned. Matt told me that whenever one starts a new field survey, you commonly find problems that must be fixed due to the difficulties of working in the harsh environments found at sea and in Alaska.

With the DGPS fixed, the crew sent a SEACAT probe through the water column to the bottom to collect temperature, salinity and pressure data. Sonar mapping works by bouncing sound waves off the bottom and measuring how fast the waves return to the ship. Sound travels through salt water at 1435 meters per second, but its speed can be changed by temperature, salinity or pressure. The computer takes the data from the SEACAT and makes corrections to the sonar data so we have a better measurement of the bottom depth.

We spent the rest of the day running transects to map the bottom. Transects are long, parallel lines that are spaced to ensure we cover the entire bottom of the area being mapped with some overlap. To better understand what "running a transect" means, think about mowing your lawn. When you mow the lawn, you run the mower in parallel lines, but you always go over part of the path you mowed before in the previous line. Just like mowing, the sonar is able to map the entire bottom of the map area by using a transect pattern.

Around 4:30 pm we returned to the RAINIER and the deck crew winched the launch back on board. I handled the stern line and threw it to a deck hand on the ship. I also attached the hook from the winch onto the launch, but I didn't do it correctly on my first try. You have to be careful because the launch weighs 14,000 pounds and the seas can bounce it around. I got too close to the block and tackle on the winch, but Ensign Welton pulled me back and showed me how to properly connect the cables. To the right here is a picture of Ensign Welton correctly hooking up the launch.



Once the launch returned to the RAINIER, the mapping crew's duties were not finished. After supper, the crew down loaded the launch's computers onto the ship's main frame and "cleaned up" the data. Clean up consisted of looking at the data and matching it with maps on the main frame computer. The survey technician also had to correct the data with tidal information and look for false sonar signals to remove from the data set. Upon finishing clean up, an officer checked the work for quality. Here is a picture of Dan Boles, Matt's older brother, cleaning up some data.

Personal Log

I had a great time today going out on the launch and learning what the survey crews do. The landscape overwhelms one with large open areas of water surrounded by mountains covered in green, low lying vegetation. MountVeniaminof dominates the background with its glacier covered dome that rises 7,075 feet above sea level.

As we traveled in the launch, I could see whales blowing spray out their blow holes in the distance and pink salmon jumping out of the water. At the end of work, we took 10 minutes to fish off the launch and Matt caught a ling cod while I had one on the hook that got away.

I enjoyed talking to Matt Boles and learning about how he ended up on the RAINIER with his brother Dan. Matt has a two year college degree in computers and Dan has a Bachelors degree in geology and French. I see a lot of potential for my own students to get jobs aboard ships like the RAINIER and to have a great time exploring wild places like Matt and Dan.

The sun sets around 11:00 pm and I went out on the fly deck to get these photographs:

Question of the Day

Why do temperature, salinity and pressure change the speed of sound in water?