NOAA Teacher at Sea
Ginger Redlinger
Onboard NOAA Ship RAINIER
July 15 – August 1, 2007

NOAA Teacher at Sea: Ginger Redlinger
NOAA ship RAINIER
Mission: Hydrographic Survey –Baranof Island Project
Date: July 18, 2007
Peril Strait to Biorka Island

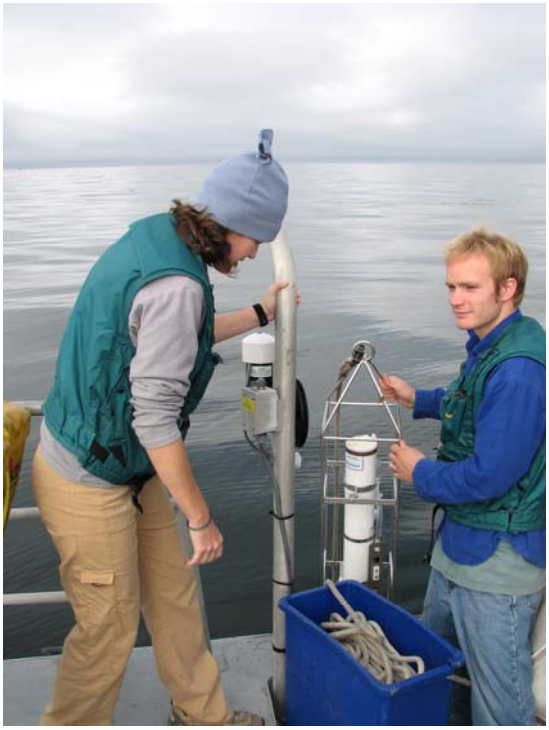
Weather Data from the Bridge 0800
Visibility: 10 Nautical Miles
Wind directions: 325°
Wind Speed: 10 Knots
Sea Wave Height: 1 – 2 feet
Seawater Temperature: 13.9° C
Sea level Pressure: 1009.2 millibars (mb)
Cloud cover: Partly Cloudy

Science and Technology Log
Today's Mariner word: Fiddly (Pronounced Fid-lee) the fiddly is the room above the engine compartment.

Wow – what a day. At 0800 hours we were briefed on our day's work plan. I was joining an experienced pilot (Coxswain) and two survey technicians on a research boat to take sound velocity readings in an area off the coast of Baranof Island.

First, we had the launch the boats from the ship. The experience boat crew and I watched as the ship's deck hands lowered the boats from their racks by crane to the side of the ship at a level that allowed us to climb aboard. (A few feet above water level). The deck hands held the boat in position from above by crane, and on the sides to keep it from rocking back and forth and bouncing against the ship. Additional hands held ropes attached to the hooks and cables that we were going to release fore and aft hooks once the boat was in the water. Of course, the boat pilot needed to get the engine running right when the boat hit the water to keep it in the correct position against the side of the ship. Launching while underway is challenging, and must be done correctly in order to ensure everyone's safety. The boat's personnel released the hooks and the deck personnel winched the hooks back to the starting positions. Deck hands on ship held the boat in position with ropes fore and aft. Once everything on the boat was checked and running the aft line was called in, then the bowline, and we were underway. This was another example of the amazing teamwork I have witnessed everyday on this ship.

When we arrived at our survey area the technicians used a CTD to take an initial reading of the speed of sound at the surface of the water, then lowered it again to take the same reading at a much lower depth. (If you remember the last journal entry, this is the same process used to correct for the speed on sound on the RAINIER.) The readings are entered into the boat's computer prior to taking any readings.



Survey Techs Hertzog & Boles prepare to measure sound velocity with CTD.

While we took readings along our survey lines I asked the survey crew a question, "what about large mammals, won't they interfere with the sonar readings? The answer was "yes, if a whale is below us it would appear as a shadow on the computer screen. Algal blooms and kelp beds can also effect the quality of the readings."

We tracked back and forth across our survey area. The direction and length of each survey line was determined the day before, and provide to the boat's survey technicians. No whales, algal blooms, or kelp beds today. Part of NOAA's mission is to provide useful information to commercial navigators, and that includes fishermen. We were very careful to adjust our movement across survey lines to avoid interfering with the fishing vessels.

During our time on the boat I asked the crew questions about their background, the Coxswain (person who pilots the boat and ensures our safety) has been at sea for over 30 years. He is amazing. He taught me how to pilot the board correctly. My first try was not very successful. The second time I was much better. I guess you could say that he is a good teacher, and a good seaman.

Survey Tech Boles monitoring the data recorded by the ELAC transducer

The two survey technicians on board track and record data. They have different backgrounds, but bring important skills to the task of gathering and reading data. The first, a young woman, has a degree

in geology and works as a cartographer for the United States Geologic Service. She is working on this boat this summer. The other is a young man from Tennessee who received his certificate in Geographic Information Systems.

I have to admit, without the man who piloted the boat and kept it on a narrow track of water fighting swells, currents, and avoiding fishing boats – the rest of us wouldn't have been able to take readings. Everyone has something critically important to do.

Coxswain Foye keeping the boat on the correct lines to record data.

How did we get the data from the boat to the on-ship computers? The data is cabled in from the boat to the plotting room where all the cartography hardware and software is located. (One way is to plug in a cable and download!) The database contains recent and historical charts made of waters that NOAA surveys. The FOO (remember, Field Operations Officer) showed me a chart created in 1924 of the same area. The technology used back then was lead lines and sextants. They would start by moving to a location, and then drop a lead line until it hit the bottom, counting the fathoms from surface to seafloor. After recording it, they pulled up the lead line, and then traveled along as straight a path as possible, recorded latitude and longitude, and took another reading. I didn't count all the readings taken in this fashion on the old map, but there were well over one hundred readings in the small section we were surveying, and the old map covered a region much greater – the entire coastline and out to sea in the area we are working. The FOO then did an amazing thing by overlaying the new map readings over the old map – it was amazing how accurate the old map still is!

You can find out more about early navigation and see maps made a long time ago at http://www.photolib.noaa.gov/library/explore1.html

Coast & Geodetic Survey:
http://www.photolib.noaa.gov/cgs/index.html

Soundings (depth readings):
http://www.photolib.noaa.gov/cgs/soundings.html

For information about prior work done in this area:

Prior work in this area was done by the C&GS EXPLORER:
http://www.photolib.noaa.gov/htmls/theb3139.htm
http://www.photolib.noaa.gov/htmls/theb3935.htm
http://www.photolib.noaa.gov/htmls/ship0197.htm
http://www.photolib.noaa.gov/htmls/theb0121.htm
(Thanks to Commander Noll for the links)

The need for accurate navigation information is as important now as it was back then. Personal and commercial craft need to know where it is safe and where it is dangerous. The FOO and I talked about how nice it would be someday to have a holographic representation of an area you are navigating (whether it is sea, lake, or river) that would allow you to see the bottom of the sea, the coastline, and the cloud layers. Maybe future mariners, oceanographers, and technicians can make that available for everyone.

Questions of the Day
Topic 1: There are additional corrections that the survey team includes in the analysis of the tracking data. Besides velocity of sound readings, what other data about the water in an area would be important to take into account? Hint: The moon has something to do with it.

Topic 2: Where can you earn a certificate in Geographic Information Systems (GIS), or a degree is Geology or Oceanography in the Northwest? Where else can you learn about GIS? Where can you learn the skills you need to work with the engineering crew, deck crew, or the Officer Corp in NOAA?

Topic 3: Can you name the earliest cartographer of this area, and when he did his work? Who else has surveyed this area?