



NOAA Teacher at Sea
Barney Peterson
Onboard NOAA Ship RAINIER
August 12 – September 1, 2006

NOAA Teacher At Sea: Barney Peterson
NOAA Ship RAINIER
Mission: Hydrographic Survey of Shumagin Islands, AK
Day 3: Wednesday, August 16, 2006

Weather Data from Bridge

Visibility: 12 nautical miles (nm)
Wind direction: 234°
Wind speed: 0 – 3 knots
Sea wave height: 1'
Seawater temperature: 11.7°C
Sea level pressure: 1011.8 mb
Cloud cover: 8/8 Height: 2000 -3000' Type: Stratus

Science and Technology Log

Yesterday I spent time in the Plot Room learning about the technology used to survey the surface of the earth underneath the ocean (bathymetry). For each survey the computers must have accurate, real-time information about the behavior of the ship on the sea surface (pitch, roll, speed) because all of this can effect the accuracy of sonar readings. The sonar (sound waves) is beamed from the bottom of the survey vessel and spreads out in a cone shape to the undersea surface. Bottom features that stick up closer to the sea surface reflect sonar waves and return echoes sooner so they show up as more shallow spots. Echoes from deeper places take longer to return, showing that the bottom is farther away at those places.

The data from each day's survey is downloaded into computers in the Plot Room. Survey technicians review the data line by line to be sure it all fits together and to "clean up" any information that is questionable. They use information about the temperature and conductivity of the water where the survey was taken to understand how fast the sonar waves should be expected to travel. (This information is critical for accuracy and is collected every 4 to 6 hours by a device called the CTD. The CTD is lowered from the ship and takes readings at specified depths on its way down through the water.)

When survey work is in deep water, it is done from the ship using equipment that can cover a wider area in less detail. The launches are used for shallow water work where it is more important to navigation to have finer detail information on water depths and underwater features of the earth surface.

Bonnie Johnston, a survey technician, spent about an hour explaining how the system works and showing me how they clean up data before it is sent off for the next stage of review, on its way to becoming part of a navigational chart. Computers used have two screens so survey technicians

can see a whole survey line of data and look closely at information on tiny spots at the same time without losing their place on the big screen. This helps to judge whether changes of depth are accurate according to trends on the sea bottom, or spikes that show an error in the echoes



My first view of the NOAA ship RAINIER at the dock in Seward, AK.

received by the sonar. The software also allows them to see data as 2-D, 3-D, color models, and to layer information to give more complete pictures.

Tomorrow we are scheduled to begin our actual survey work in the Shumagin Islands. In between making new surveys the technicians are kept very busy working with the data they have on hand. There are many steps

to go through to insure accuracy before data is ready to use for charts.

Personal Log

My first two days aboard the RAINIER have been a swirl of new faces and places. The only name I knew for sure before I arrived was Lt. Ben Evans who had exchanged email with me about the gear I would need. I was met at the Seward RR station by and welcomed onto the ship by Ensign Megan McGovern. She gave me a quick tour of the ship, including where to put my gear. I felt like a mouse in a maze: up and down steps, around blind corners, and through doorways. It has been much easier so far to find my way than I thought it would be. Reading books that use nautical terms has helped give me a background to understand port, starboard, fore, aft, head, galley, bridge, fantail, and flying bridge. Now I just need to remember where they all are.

Monday was taken up with a safety briefing, checking out equipment such as my flotation coat, personal flotation device (life jacket) for use in survey boats, hard hat, and immersion suit. I spent several hours reading Standing Orders that all persons aboard must read before being allowed to stay. I talked with the medical officer, and discovered where to eat and the times meals are served.

Tuesday we had a Fire/Emergency Drill at about 1030 (10:30 am) for which I reported as fast as I could to my assigned station on the fantail. We were checked off on a list and some crew members practiced with fire fighting equipment.



Ensign Megan McGovern and crew partner in full firefighting bunker gear for our first Fire/Emergency Drill.

Just as we finished that drill, the Executive Officer called an Abandon Ship Drill. Everyone rushed to quarters to get immersion suits, hats and any assigned emergency gear before reporting to muster stations. Again we were checked off and all accounted for before anyone could return



This is the 4.5 foot dogfish shark caught by a crewmember. This shark has no teeth even though it looked ferocious. released it after taking pictures.

to what they were doing before. These drills are an important part of shipboard life. They are required once a week and always within 24 hours of the ship sailing from port.

I am sleeping and eating well. The food is like camp and so are the bunk beds. So far I have seen lots of salmon: the stream in Seward was full of migrating Coho (silvers); the sea at Twin Bays was alive with jumping Pinks. Monday night one crew member, fishing from the fantail while we were anchored, caught and released a 4.5' dogfish (shark). The next day someone caught an 8 lb. silver. There are sea lions, otters, gulls, eagles, puffins and dolphins to watch. I hate to close my eyes to sleep because I know I will miss seeing something wonderful.

Question of the Day

What is the speed of sound through air? Does sound travel faster or slower through water?

Students email your answers to me at barney.peterson@noaa.gov

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