

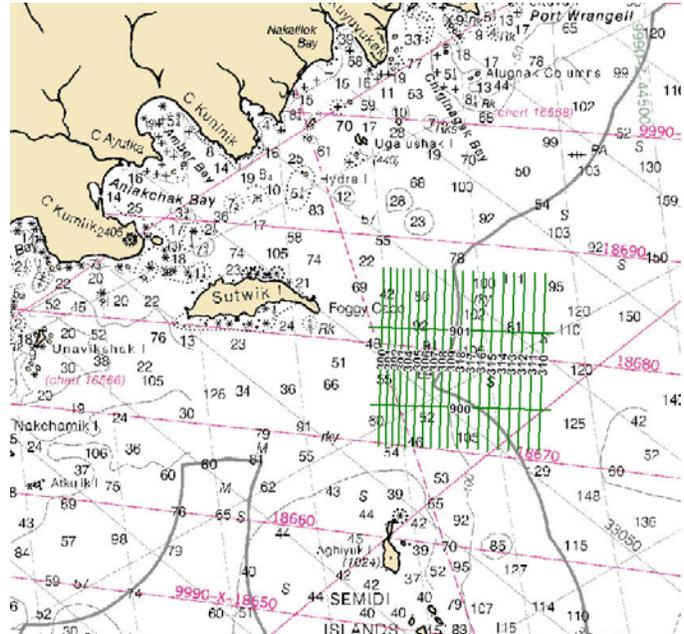


**NOAA Teacher at Sea
Jacquelyn Hams
Onboard NOAA Ship RAINIER
July 22-August 11 2006**

July 26, 2006

**Weather Data
0900**

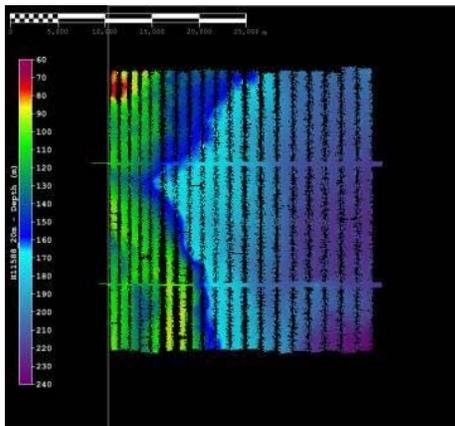
Weather: Partly cloudy
 Visibility: 10 nm
 Wind direction: 275
 Wind speed: 20 knots
 Sea Wave height: 2.3 ft.
 Swell waves direction: 225
 Swell height: 4.5 ft.
 Seawater temperature: 10.0 degrees C
 Sea level pressure: 1008.9 mb
 Temperature dry bulb: 10 degrees C
 Temperature wet bulb: 9.4 degrees C



Hydrography survey lines in green for July 26, 2006

Science and Technology Log

The mission of the day is to conduct a hydrographic survey from the RAINIER



Bathymetry along survey area

around the Semidi and Chirikof Islands. This requires the crew to determine the sound speed of the water column, in order to correct depths measured by the ship's multibeam sonar for refraction. To determine the sound speed profile, the RAINIER uses a CTD (conductivity, temperature, and depth) sensor called a SEACAT. A CTD is an instrument that is deployed from a vessel to detect and record properties of seawater as it is lowered through the water column. The principle measurements are conductivity, temperature, and pressure. From these measurements depth and salinity can be derived. Sound speed is computed from depth, salinity, and

water temperature.

To take a sound speed cast, the ship or launch is maneuvered into a position such that the line or wire on which the CTD is lowered will not end up tangled in the propeller. The

SEACAT is secured to a winch wire or line. The sensor is exposed and the instrument is turned on.

The SEACAT is placed just below the water's surface for two minutes to allow the sensor to obtain its initial readings. The SEACAT is lowered one meter per second through the water column until it reaches the seafloor. Then it is hoisted back to the surface. As the instrument runs through the water column, the sensor obtains **conductivity**, temperature, and pressure data.

Once the SEACAT is aboard, it is connected to a computer and the sensor data is downloaded using a special program. A survey technician or junior officer uses the program to analyze the data. If the data looks reasonable, the launch or ship will begin or continue to acquire soundings.

Personal Log

Early this morning, the RAINIER encountered tanker traffic. The Polar Eagle is a tanker ship that was headed toward the RAINIER. Following communications between RAINIER officers on the bridge and Polar Eagle officers, the Polar Eagle passed around the stern of the RAINIER so that RAINIER could stay on course and continue surveying.



Around 1600, Aghiuk Island was visible from the bridge. This is a dramatic island with jagged volcanic peaks.



Aghiuk Island

At 1815, as the RAINIER survey continued, we had a magnificent view of Mt. Chiginagak (snow covered) on the Alaskan Peninsula.



Snow covered Mt. Chiginagak on the Alaskan Peninsula

Lesson of the Day: Surveying

Terms of the Day: Conductivity, cast, hydrography, sounding

Bonus question: Explain how depth is determined given conductivity, temperature and pressure data.

Recommended reading: <http://www.moc.noaa.gov/ra/index.html> (RAINIER website)