



**NOAA Teacher at Sea
Mike Laird
Onboard NOAA Ship RAINIER
July 24 - August 13, 2005**

Log 4

Day 5: Friday, July 29

Time: 13:00

Latitude: 55° 53.36' N

Longitude: 158° 58.4' W

Visibility: 10 nautical miles (nm)

Wind Direction: Light Airs

Wind Speed: Light Airs

Sea Wave Height: 0'

Swell Wave Height: 0'

Sea Water Temperature: 12.2° C

Sea Level Pressure: 1013.5 mb

Cloud Cover: Sky 8/8 covered; Lower-level: cumulus, stratocumulus

Mid-level: altostratus

Science and Technology Log

Today I am on a team that is going ashore to set up two horizontal control-data collection stations. The horizontal control team is responsible for establishing accurate latitude and longitude coordinates for the location of the survey soundings. The RAINIER uses a Differential Global Positioning System (DGPS) to acquire precise readings for every collected depth sounding. The remote location of the Mitrofanina Island work area has introduced an infrequently encountered challenge for the horizontal control team. The two Coast Guard operated DGPS Beacon Stations that are closest to the work area (one on Kodiak Island and one in Cold Bay) are too far away (we are on the outer fringe of their transmitting capability) for the signal to reach the launches in some of the more isolated, shielded areas. As a result, we are out setting up the horizontal control data collection stations.

The first station is set up over an existing benchmark and will record data transmitted directly from a GPS satellite. The receiver will record readings for six hours, shut down for twenty-four hours, and resume recording for a final six-hour time period.

Finished with the first station, we travel across the bay to a point that extends out into the ocean. We will set up the second horizontal control data collection station at this location. However, there is not an existing benchmark, so we must establish one. First, we drive three-foot sections of metal rod into the ground (normally benchmarks are fixed in rock but there is none at this site). We sink two sections and decide that is enough to hold the benchmark in place for the two months that it will be in use (for a permanent benchmark the rod is driven until it can go no further). The brass cap is then stamped

with a name (SPIT) and date (2005) and affixed to the top of the rod. We are now able to set up the second station. The receiver will follow the same collection pattern: collecting signals for six hours, resting for twenty-four hours, and collecting for another six hours.

At the end of the collection period, the data from the sensors will be uploaded to an onboard computer and transmitted to the National Geodetic Survey in Washington D.C. where corrections to account for error introduced by things such as the atmosphere are applied. The corrected data, returned to the ship, will establish very accurately (within cm) the latitude and longitude for the site. One final correction is made to the data before the site can be used. This error source is the satellite itself and comes from the satellite's perceived position (where it thinks it is in the sky) as compared to its actual position. The precise location is monitored by the United States Air Force. Final corrections using this information will provide pinpoint accuracy (within mm) of the benchmark's location. A temporary, or "fly-away", DGPS station can now be placed at this benchmark and transmit signals easily received by the launches.

Personal Log

Yet another beautiful day! Once on shore the mosquitoes were terrible – swarming in clouds around our heads. A little bug dope, the warm sun, and cool breeze soon took care of this problem. A great day to be out working!