NOAA Teacher at Sea
Mark Friedman
Onboard NOAA Ship RAINIER
June 9 – 20, 2008

NOAA Teacher at Sea: Mark Friedman, Marine Biology teacher from Animo Leadership High School, Los Angeles, CA
NOAA Ship RAINIER
Mission: Hydrographic survey and ocean bottom features mapping *(see vocabulary help at end)*
Geographic area: SE Alaskan marine waters, especially inside passage, Sitka and Kodiak areas
Dates: Sunday, June 8, 2008 and Saturday, June 9, 2008

Science and Technology Log
This is a NOAA (National Oceanographic and Atmospheric Administration) ship based out of the U.S. Northwest. This ship is primarily dedicated to the construction and updating of marine navigational charts that are of importance to marine commerce, navigation and general recreation. To do this they use SONAR waves emitted from the bottom of the launch boats. *(Underwater sound waves travel at 1500 meters per second, four times as fast as sound in air.)* Data obtained by the ships surveyors are sent to marine map makers (cartographers) in Seattle and also NOAA'S base in Silver Spring, Maryland where they are processed and constructed and made available to the public in paper or digital format.

NOAA Teacher at Sea, Mark Friedman, helps deploy the CTD prior to surveys in SE Alaskan environs.

June 8
Arrived Juneau Alaska. Greeted at the airport by the ship's XO (Executive Officer). Onboard I was issued a bunk (or a rack as mariners call it) and given a ship tour. Once settled I visited the town, including a significant museum of history, artifacts and anthropology of the indigenous peoples and early European settlers.

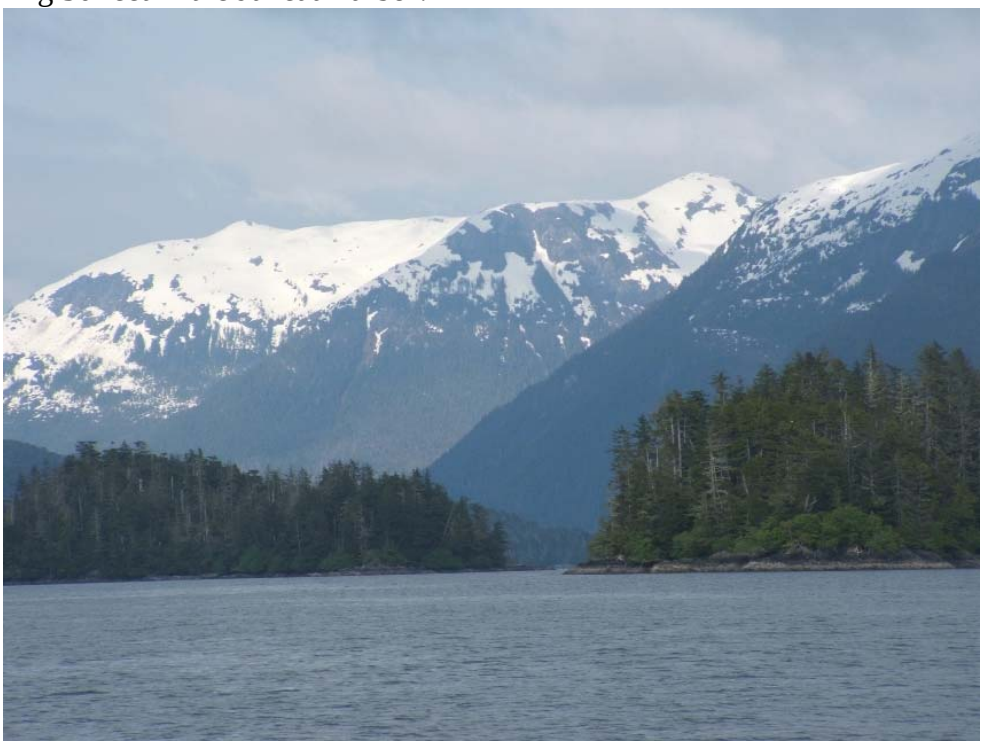
Juneau is a stopping off point for many of the Northwest cruise ships cruising the inside passage.

June 9
Safety instructions: multiple videos on asbestos, personal safety, fire emergencies. Drill practice: Abandon ship, Man overboard. Survival suit issued along with multiple style life vests, hardhat. Underway from Juneau 1600 for destinations near Sitka to begin depth soundings for marine navigational chart additions and corrections

All is well. Bright outside and it's nearly 9pm Wednesday night. Sunset is at 10pm and sunrise at 3:15am. It is a long day by our usual Los Angeles standards.

The water is 41 degrees (so you don't want to fall in or risk hypothermia (rapid loss of base body temperature (Who can guess the temperature of hypothermia?) which rapidly sets in) and the air a cool and misty 51 degrees.

Green conifers line the banks and small islands proliferate in the inner passage here just south of Sitka. The inside passage was made by a combination of glaciers, volcanic and plate tectonic action (subduction of North American and Pacific plates). The tide differential from high to low can be extreme…nearing 30 feet in the Juneau harbor!



Snowcapped mountains surround the inside passage south of Juneau, AK

Spruce and pine trees abound, and snow-capped mountains on either side of us rise up majestically as we move along at about 12 knots (nautical speed terminology, or about 15 mph). The spruce are afflicted by the same type of exponential pine beetle growth that is devastating California and Southwest evergreens. No drought up here so scientists have no hypothesis yet as to the cause.

I had to get up at 4am yesterday (even earlier than my usual 5am school day rise) for a wild ride thru close straits (aptly named Peril) (must get there at high tide so there is enough clearance

beneath and currents are not as dangerous with increased volume of water) entering Sitka for our first series of data collection, cartography of inside passage.

There is an important heavy emphasis on safety and special cold water survival suits and vests, have been issued to all crew members, followed by instruction donning them and knowing out stations to report to for such rises as “fire onboard” and “man overboard.” We have already had an abandon ship drill.

RAINIER to the Rescue

Yesterday after I joined three boats of marine surveyors which go out to surrounding areas in 29-foot launches to begin data collection thru the use of sonar, the RAINIER saved two fisherpeople whose boat had taken on water and was rapidly sinking.

The bridge of NOAA Ship RAINIER

RAINIER heard their MAYDAY and was within 2 miles so they sent a rapid launch to the scene and got there even before the Coast Guard. Fortunately the fisherpeople had on their survival suits so they were not in too much shock when they were rescued. It brought home to me the importance of these survival suits that are like insulated neoprene wetsuits that are watertight. I'm always wearing some type of floatation vest while on deck or in the launch, colored bright orange for easy sighting when bobbing up and down in choppy seas.

Personal Log

I saw some favorites yesterday too...but not too close. Sea otters and whales but too far away to identify. The most common up here now are the humpbacks.

The gray whales that have migrated up from Baja California, the ones that can bee seen off the California coast are already further north feasting on that yummy krill, a marine crustacean key to the food web).

And the ship's cuisine—fine and more than plentiful prepared by multiple professional chefs...lots of healthy food and Tapatio, my newfound hot sauce delight thanks to my Mexicano and Latino students.

Fortunately there is a gym so I hopefully won't come back TOO much heavier. Crew and staff of about 50...mostly young, lots of women for a big change from my last extended marine experience six years ago on the R/V New Horizon out of Scripps Institute of Oceanography in San Diego.

Vocabulary and Marine Terminology
Hydrography- the science of measuring, describing and mapping the sea bottom, mudflats and the positions of stationary objects (seamounts, shipwrecks, etc.)
Cartographer- makes nautical charts for the aid of moving ships on the ocean
Echosounder- high resolution instrument to record depths of ocean bottom using SONAR (SOund Navigation And Ranging - similar to some marine mammals use of echolocation). Also a side-scan sonar can be used and is on the RAINIER.
CTD- Instrument to collect and register conductivity (flow of electrical current), temperature and depth. Deployed by ship launches in each surveyed area to obtain data and make calculations on sound speeds of sonar under various conditions (deeper, warmer and saltier water increases the speed of sound waves due to density)
Sound speed- Sound travels at a speed of 1500 meters/second faster than thru air that is 380 meters per second. (This enables whales to communicate over hundreds of m8iles of water)

Get Your Hands Wet
To learn HOW TO MAKE YOUR OWN HYDROGRAPHIC PROJECT, go to:
http://oceanservice.noaa.gov.education