



**NOAA Teacher at Sea  
Rita Larson  
Onboard NOAA Ship *Rainier*  
August 10 – 27, 2009**

**NOAA Teacher at Sea: Rita Larson**

NOAA Ship: *Rainier*

Mission: Hydrographic Survey

Geographical Area of the Cruise: Kachemak Bay, AK

Date: August 15, 2009

**Weather Data from the Bridge**

Latitude: 59° 36. 952'N

Longitude: 151° 24. 490'W

Sea Water Temperature: 9.4°C (49°F)

Air Temperature:

Dry Bulb: 13.3°C (56°F)

Wet Bulb: 12.2°C (54°F)

Visibility: 10

Wind: Light



**Beautiful Kachemak Bay**

**Science and Technology Log**

The one unique feature I witnessed here at Kachemak Bay is a phenomenon called glacial flour, which was mixed in with a very strong tidal rip current. If you can imagine a grayish white top layer almost like foam on a good cappuccino and as soon as you motor through it, you could see the normal clear Alaskan water underneath in its wake. There was a definite line between the outgoing bay waters and the in-coming seawaters. This was really awesome to see up close and for the first time! The *Rainier* uses specialized sonar systems and equipment, such as the CTD, which collects conductivity, temperature, and pressure samples. This instrument collects the necessary correction factors to aid in the post processing of the sonar data in determining the bottom depth.



**I am deploying and retrieving the CTD. (Picture taken by Asst. Survey Tech. Nick Mitchell)**

One factor that is considered while collecting bathymetric data is that fresh water is less dense than salty ocean water, so it will float or suspend on the top of the ocean water. Because these



**Less dense fresh water suspended over the denser salty ocean water.**

differences in sound speed through the water can have a major impact on the accuracy of the soundings generated by the sonar. The CTD cast is used to detect these differences and measures the sound speed at various depths to correct the sonar readings.

Another influence while collecting bathymetric data is glacial flour. Glacial flour is known as clay-sized particles of rock, generated by glacial erosion. This material is very small and creates a suspended silty covering over the ocean waters. While collecting data in Kachemak Bay, which is located in Cook Inlet, we experienced a current shift during high tide, which was heavily emerged with glacial flour. More than

likely, the flour came from the Kenai Fjords Glaciers, which are located north of Homer, Alaska. Normally, during mid-summer, it is expected to flood and have high standing water in glacial areas. When the glaciers melt, the glacial flour also mixes with glacier till and erodes into the oceans. Since the glacier mix is fresh water, this blanket of glacial flour suspends on top of the ocean water until it becomes sediment on the bottom of the ocean floor.



**Above left: Mid-summer melting from snow capped mountains.**

**Above: This is during high tide on August 15, 2009 with evidence of glacial till.**

**Left: This is the same water; two hours later after the tides and currents had changed.**



## Personal Log

While surveying, it is hard to ignore the beauty that is all around you. When the sun is shining and the wind on your face, Alaska is just breathtaking. It is still hard to believe I am working in Alaska for NOAA all the way from Woodbridge, Virginia. Every day brings wonderful first-time experiences and I am so glad to be a part of it. It is nice to have this opportunity to become the captain of your destiny and navigate towards your own TAS (Teacher at Sea) adventures.



Here I am driving the launch! (Pictures taken by Seaman Surveyor, Steve Foye.)

## New Term/Phrase/Word

Sailors use charts, navigational tools, and landmarks, to help find their way around the oceans. While surveying today, we came across a landmark called a **“Lighted Day Mark”** which signifies, on nautical charts, hazards or changes in the directions of channel patterns.



A “Lighted Day Mark” landmark which signifies a hazard or change in the direction of channel patterns.

## Did You Know?

Did you know that there are eight active volcanoes around Cook Inlet, Iliamna, Redoubt, Double Glacier, Spurr, Hays, Douglas, Four Peaked, and Mt. Augustine? Today, while we were surveying, Mt. Augustine was venting or letting out steam, gases, and ash. We were able to observe this volcanic activity through the binoculars. If you would like to see it visit (<http://www.avo.alaska.edu>).