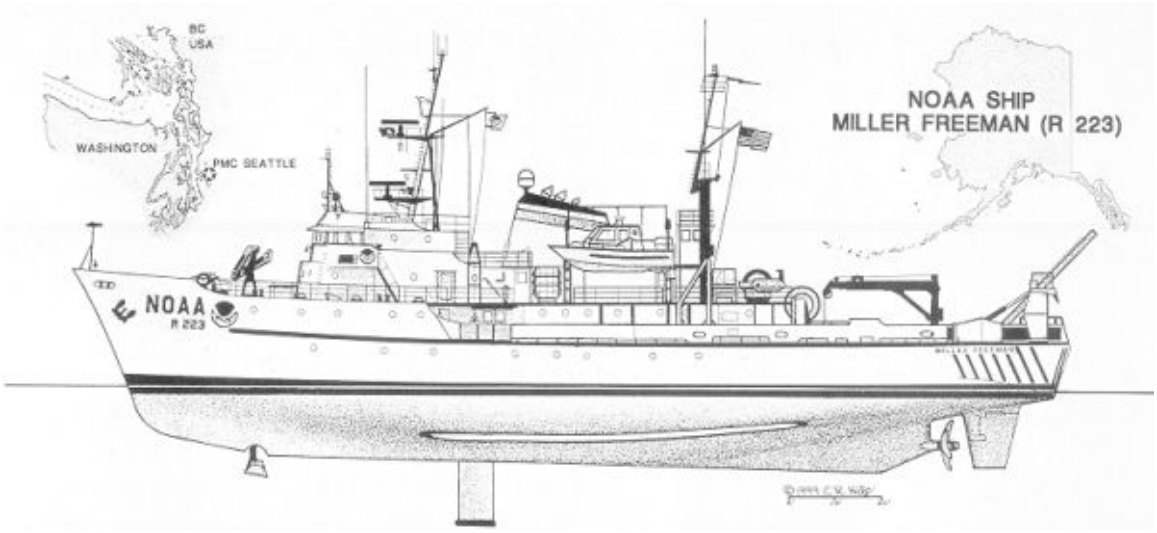
NOAA Teacher at Sea
Bryan Hirschman
Onboard NOAA Ship *Miller Freeman*
August 1 – 17, 2009

NOAA Teacher at Sea: Bryan Hirschman
NOAA Ship *Miller Freeman* (link: http://www.moc.noaa.gov/mf/)
Current location of ship: www.shiptracker.noaa.gov (choose *Miller Freeman*)
Mission: 2009 United States/Canada Pacific Hake Acoustic Survey
Geographical area: North Pacific Ocean from Newport, Oregon to Port Angeles, Washington
Date: August 4, 2009



Weather Data from the Bridge (0800)
Visibility: 10 miles
Wind: 2 knots
Wave Height: <1 ft
Wave Swell: 3 ft
Ocean temperature: 15.5^0C
Air Temperature: 15.5^0C

Science and Technology Log
We will be conducting several types of oceanographic sampling during our cruise: 2-3 Pacific hake tows per day (weather permitting), an open net tow where fish are viewed through a camera, **XBT**s: Expendable Bathythermograph (take temperatures at various depths), **HABS**: Harmful Algal Bloom Sampling, **CTD**: Conductivity, Temperature, and Density(also at various depths), and a Multiple Opening Plankton Net(collects living organisms at various depths). We will also release a **Surface Drifter:** floats with currents and sends information about currents via satellite.

The tows, XBTs and HABS are done from 7:00 am to 9:00 pm, while the CTD and plankton net are used during nighttime hours. By working in daytime and nighttime shifts the scientists are maximizing the boat's usage.

I was fortunate enough to help with the plankton net last night. Five samples were collected while I observed. Each sample was labeled and preserved for later use in a laboratory. Observed were amphipods, copepods, shrimp, and crab larvae.

Here I am holding a Pacific Hake.

Our first Pacific hake tow came at approximately 8:00 am. The acoustic scientists use four transducers that are attached to the bottom of the boat. Each transducer sends out pulses of sound at a different frequency toward the bottom of the sea floor. The sound pulse then travels back to the boat and is recorded onto graphs. Fish and other biological organisms also reflect sound pulses. Each type of fish gives off a different signal depending on its size, shape, and orientation. The fish are then identified on a computer using acoustic analysis software. The strength of the sonar signal helps determine the biomass and number of fish. When the chief scientist see an interesting aggregation of fish to tow on, he calls the bridge (the brains of the boat--this is where the boat is controlled) and reports the latitude and longitude of where he wishes to fish. The ship then turns about and the deck hands work to lower the tow net and prepare to collect fish at the depth the scientists observed the fish.

After the fish are collected, the Pacific hake are weighed and counted. A sub-sample of about 300 Pacific hake is sexed and lengthed. Another sub-sample of about 50 Pacific hake is weighed, sexed, and lengthed; sexual maturity is determined by observation of the gonads, and ear bones are removed – this will enable scientists to determine the age of the fish. About 10 Pacific hake have their stomach contents sampled as well. All this information is collected and used by Fishery Biologists to determine the population dynamics of the overall Pacific hake stock. The acoustic scientists also save all their data in an acoustic library. This will help

scientists to analyze the Pacific hake biomass (population) while minimizing how many live specimens they need to collect.

In total we completed three tows today. That's a lot of Pacific hake to measure, weigh, and sex.

Personal Log
The ship is loud. Sleep was hard to come by last night. Living in quiet Vermont has made me a light sleeper. I need to work on adjusting to the constant noise.

The food and staff are great. Everyone takes pride in their ship and the work which is done on the ship.

Question of the Day
Can you identify the beast in the picture to the right?

Animals Seen Today
Pacific Hake
Humboldt Squid
Myctophids
Breaching Whale (too far away to identify; most likely a Humpback)

Can you identify the animal I'm holding?

Here, I've got a Humboldt Squid.