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 6, 2009

Weather Data from Bridge (0800)
Visibility: 6 nautical miles
Wind: light
Wave Height: <1
Wave Swell: 2-3 ft
Ocean temperature: 15.9^{0}C
Air Temperature: 15.5^{0}C

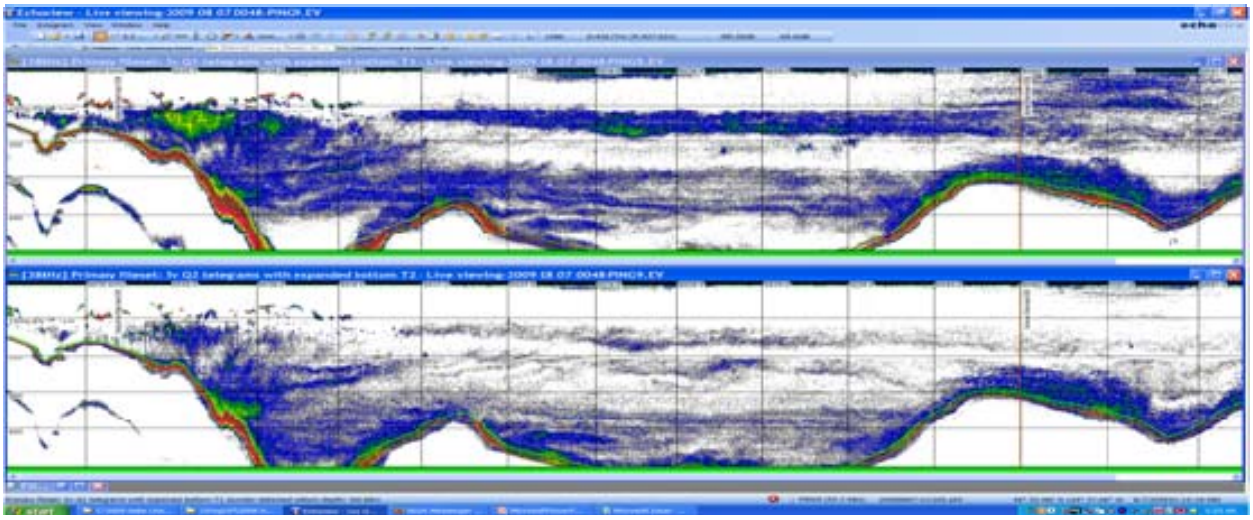
Science and Technology Log
Today the day started with a fish tow at 8:00 am. The acoustic scientists, Steve, Larry, and Chu, predicted the fish would be mostly myctophids, and wanted to be certain. The fisherman sent the net out and about an hour later the net was brought back. As predicted the net was filled with mostly myctophids. This is an important step in being able to determine the fish type and numbers using acoustic data only. Scientists will then be able to acoustically count fish populations for most schooling fish (Pollock, Pacific Hake, anchovies, and mackerel to name a few), with out using nets.

John and Melanie sexing and measuring the fish

After the nets are brought in the fish biologists (and me) get to work. We separate all the organisms into their own piles. We then count and weigh them, and log this into a computer using their scientific names. It's amazing how Melanie and John (the fish biologists) can identify and recall the Latin names of these organisms.

Question: Do we just fish in random locations?

Answer: No, the acoustic scientists choose to fish in locations that appear to be different from previous fishing locations. The parameters which make them different are depth, color intensity, or pattern of the markings on their computer screens. The scientists get real-time acoustic pictures as the boat travels along on a pre-determined path (called a transect). The more they can relate the graphs on the computer screens to the actual catch in the nets the less fishing which needs to be done.



Here is an acoustic image (2 frequencies) as seen on the scientist's screen. The bottom wavy line is the seafloor, and the colored sections above are organisms located in the water column.

The second fish tow of the day produced Pacific Hake and Humboldt Squid. We weighed all the squid first (then quickly returned to the ocean), and 10 were randomly selected for a stomach dissection. The stomachs contained pieces of squid, Pacific Hake, and other unidentifiable fish. Another purpose of this cruise is to determine the effects of the squid on the Hake, and by looking at the stomachs the scientists will be able to determine the relationship between the squid and hake.

Here is the second tow consisting of Pacific Hake and Humboldt Squid.

The third tow of the day involved an open net with a camera. The camera could record for an hour. The scientists then view the footage to estimate the size and quantity of the hake passing through the net. This is another method the scientists are using to verify their acoustic data.

I also had the chance to launch an XBT (Expendable Bathythermograph). This device is launched at the back of the boat. The sensor is released into the water and is attached by a tiny copper wire. As the sensor travels down the water column it sends the depth and temperature data to the bridge. This data is saved and used by physical oceanographers to better understand temperature profiles found in the ocean.

Personal Log

Today was a great day. The seas were calm, I slept well last night, and the food was great. I even got to exercise for 1.5 hours. The exercise room has a television hooked up to watch movies, and it made using the elliptical trainer and stationary bike much more enjoyable.

I also had a great time working with the fish biologists. We were throwing and catching squid like the professionals who work at Pike Place Market in Seattle. Best of all was dinner, freshly caught tuna, which I got to filet.

Here I am holding the delightful meal of tuna.

Animals Seen Today
Dolphin
Mola-mola
Albatross
Sheerwaters
Slender Barracudina
Ribbon Barracudina
Blackbelly Dragonfish
Pacific Hake
Lanternfish (myctophids)
Salps
Sunrise Jellyfish
Purple Cone Jellyfish
Wheel Jellyfish
Humboldt Squid
Black-eyed Squid
Pacific Hatchetfish
Spiny Dogfish shark

Question of the Day
Can you identify the following animals?

Answer to the last question: Lancetfish