



NOAA Teacher at Sea
Bryan Hirschman
Onboard NOAA Ship *Miller Freeman*
August 2 - 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 of leg 3: North Pacific Ocean from Newport, Oregon to Port Angeles, Washington

Date: August 13, 2009

Weather Data from Bridge (0800)

Visibility: 10 nautical miles

Wind: 6 knots

Wave Height: 1 ft

Wave Swell: 1-2 ft

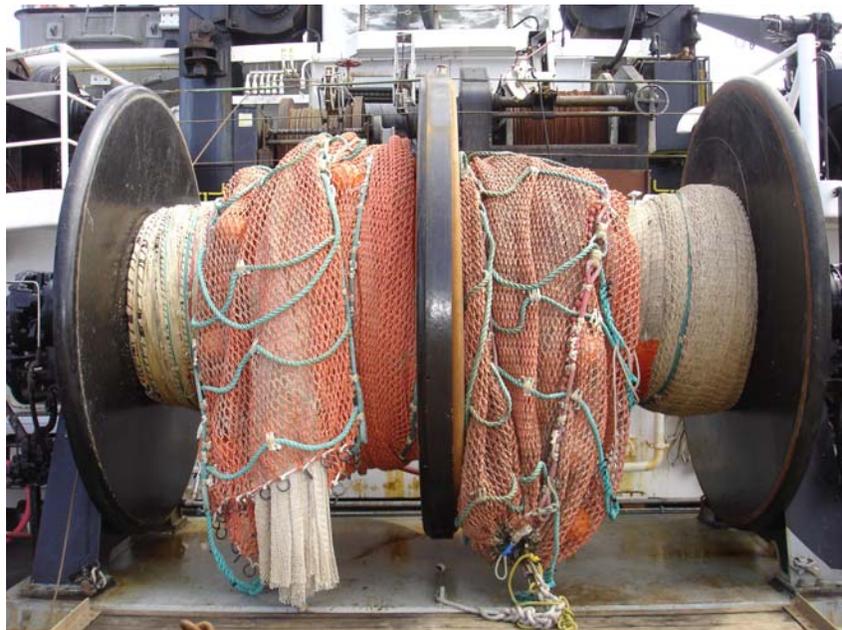
Ocean temperature: 15.2⁰C

Air Temperature: 14.2⁰C

Science and Technology Log

Life at sea can be very unpredictable. One minute everything is working great, and the next minute problems occur. Last evening a problem occurred with the net reel.

The net reel is a large bull wheel that the nets roll into and out of when lowered in the water. The reel is spun by a huge engine that pulls the nets in when they are loaded with fish. This net reel is anchored to the boat with 16 huge bolts and nuts. Four of the bolts were found last night to be weakened during one of the daily inspections of ship's mechanical instruments. The crew is constantly inspecting each piece of equipment to ensure the safest working conditions.



This is the net reel. The unit attaches with four bolts in each corner

Once this problem was seen all fish tows were canceled. We will be heading into port four days early to fix the problem.



A correct assembly of the bolts on the net reel



An incorrect assembly of the bolts on the net reel

Once in port the entire net reel will have to be lifted by crane and all the bolts will be replaced. The reel will then be lowered back in place and locked in place with nuts.

Even though we are not fishing, other work on the ship is still occurring. The XBT (Expendable Bathythermograph) is deployed at regular intervals. This device sends depth and temperature data to a science laboratory to be recorded and used later (discussed in more detail in log 2).

The HABS (Harmful Algal Bloom Sampling) research is also still being completed by Nick Adams, an oceanographer with NOAA. He takes water samples approximately every 10 nautical miles (1 nautical mile = 1.15 miles). After collecting the samples, he filters them for toxin and chlorophyll analysis. He also collects seawater for phytoplankton numeration and identification. His main focus is on toxin-producing genera, such as *Pseudo-nitzschia* and *Alexandrium* which are responsible for Amnesic Shellfish Poisoning and Paralytic Shellfish Poisoning, respectively. At the end of the cruise, Nick will be able to create a map of the concentrations and locations of toxin-producing phytoplankton. This will then be compared with data from years past to determine patterns and trends.

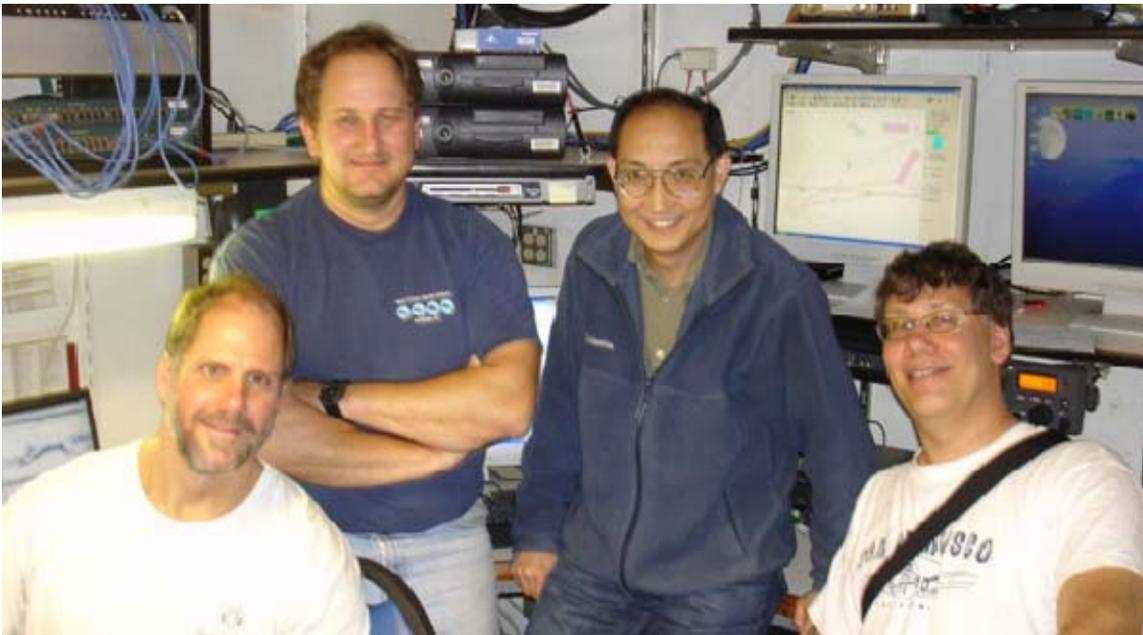
The phytoplankton themselves are not harmful to humans, but as they accumulate in the food chain there can be human-related sickness. If we eat the organisms that are eating the plankton that produce toxins, we can become ill. Not much is known about the cause of the toxin producers, but with more research like Nick's, scientists continually increase their understanding and ultimately hope to prevent human sickness from these phytoplankton.



These are toxin-producing phytoplankton. At left is *Pseudo-nitzschia* and on the right is *Alexandrium*.

Personal Log

I am saddened to be cutting my journey earlier than expected, but I will leave the ship with fond memories of Pacific Hake, Humboldt Squid, and all the wonderful people who work on the ship. I am particularly grateful to the seven scientists who have gone out of their way to make me feel at home on the ship and have answered all of my questions. They are: the acoustic scientists: Dr. Dezhang Chu, Larry Hufnagle, and Steve de Blois; the fish biologists: Melanie Johnson and John Pohl; the oceanographers: Steve Pierce and Nick Adams. They are each extremely dedicated and passionate about their research and equally passionate about protecting our oceans and the organisms living there.



Scientists Steve de Blois, Larry Hufnagle, Dr. Dezhang Chu, and John Pohl

Challenge Yourself

Volunteers play an integral role in supporting the environmental stewardship conducted every day by the National Oceanic and Atmospheric Administration. Across the United States and its coastal waters, opportunities exist for volunteers to take part in research, observation and educational roles that benefit science, our citizens and our planet.

Visit this website to see where you can help:

<http://www.volunteer.noaa.gov/>

