NOAA Teacher at Sea
Katie Turner
Onboard NOAA Ship MILLER FREEMAN
July 10 – 31, 2008

NOAA Teacher at Sea: Katie Turner
NOAA Ship MILLER FREEMAN
Mission: Eastern Bering Sea Pollock Survey
Geographical area of cruise: Bering Sea
Date: Friday, July 18, 2008

Science and Technology Log

The Vessel
NOAA Ship MILLER FREEMAN is a 215 foot fishery and oceanographic research vessel, and one of the largest research trawlers in the United States. She carries up to 34 officers and crew members and 11 scientists. The ship is designed to work in extreme environmental conditions, and is considered the hardest working ship in the fleet. She was launched in 1967 and her home port is Seattle, Washington.

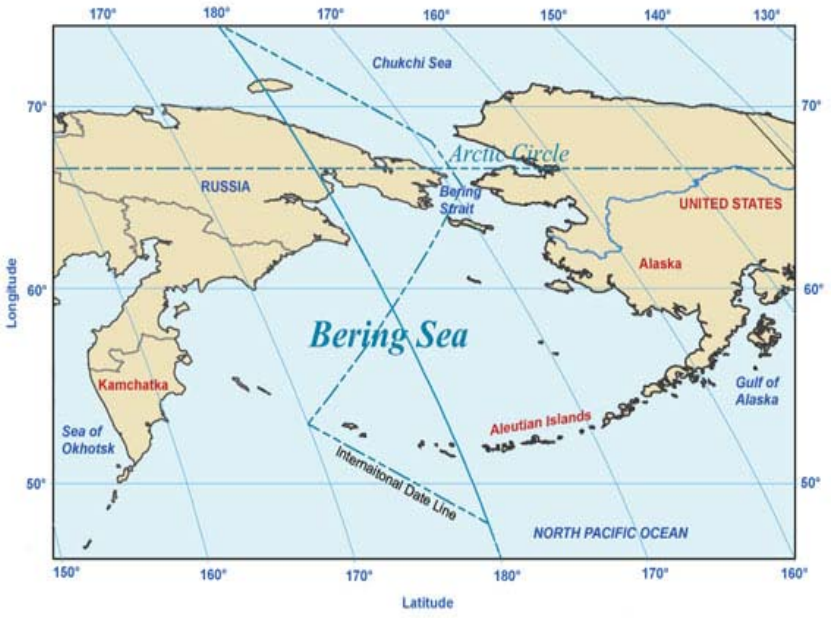
NOAA ship MILLER FREEMAN at the dock in Dutch Harbor, Alaska (July 2008)

MILLER FREEMAN has traditionally been used to survey walleye pollock (*Theragra chalcogramma*) in the Bering Sea. These surveys are used to determine catch limits for commercial fisherman. In 2003 NOAA acquired a new fisheries research vessel, the NOAA Ship OSCAR DYSON. OSCAR DYSON is to eventually take over MILLER FREEMAN's research in Alaskan working grounds, allowing MILLER FREEMAN to shift her focus to the west coast. OSCAR DYSON was built under a new set of standards set by the International Council for the Exploration of the Sea (ICES), which reduces the amount of noise generated into

the water below, while MILLER FREEMAN is a more conventionally-built vessel which does not meet the ICES standards. The assumption is that marine organisms, including pollock, may avoid large ships because of the noise they make, thus altering population estimates. It is therefore important for scientists to know the difference between population estimates of the two ships. This is done through vessel comparison experiments, in which the two ships sample fish populations side by side and compare their data. The primary purpose of this July 2008 cruise is to complete a final comparison study of the two ships and measure the difference in the pollock population data they collect.

The Location

The Bering Sea covers an area of 2.6 million square kilometers, about the size of the United States west of the Mississippi. The maximum distance north to south is about 1,500 kilometers (900 miles), and east to west is about 2,000 kilometers (1,500 miles). The International Date Line splits the sea in two, with one half in today and the other in tomorrow. The area is also bisected by a border separating the Exclusive Economic Zones (EEZ) of Russia and the United States. The EEZ is the area within a 200 mile limit from a nation's shoreline; where that nation has control over the resources, economic activity, and environmental protection.



A map showing the location of the Bering Sea

More than 50% of the U.S. and Russian fish catch comes from the Bering Sea. It is one of the most productive ecosystems in the world. The broad continental shelf, extensive ice cover during the winter, and the convergence of nutrient-rich currents all contribute to its high productivity. It is a seasonal or year round home to some of the largest populations of marine mammals, fish, birds, and invertebrates found in any of the world's oceans. Commercial harvests of seafood include pollock, other groundfish, salmon and crab. The Bering Sea has provided subsistence resources such as food and clothing to coastal communities for centuries.
From http://www.pmel.noaa.gov/np/pages/seas/bseamap.html

Repairs and Delays

While all aboard were anxious to begin this Bering Sea Cruise, the ship could not sail until crucial repairs could be made. During the previous cruise a leak was discovered in the engine cooling system that brought the ship in from that cruise early. The location of the leak was the big mystery. After days of testing and a hull inspection by divers the leak was located. It was in

a section of pipe that runs hot water from the engine through the ship's ballast tanks and into a keel cooler on the outside of the ship's hull, where it is cooled before circulating back to the engine. This turned out to be a very labor intensive job and workers spent days draining and cleaning the tanks before the leak could be repaired.

In the meantime, a repair to one of the engine's cylinders required a part that had to be shipped from Seattle via Anchorage (about 800 miles northeast of Dutch Harbor). To complicate the arrival of this part, a nearby volcano erupted, spewing ash 50,000 feet into the path of flights to and from Dutch Harbor.

Image of the eruption of Okmok, taken Sunday, July 13, 2008, by flight attendant Kelly Reeves during Alaska Airlines flights 160 and 161.

Alaska has many active volcanoes. The Aleutian Island arc, which forms the southern margin of the Bering sea, comprises one of the most active parts of the Pacific's "ring of fire". This tectonically active area has formed due to the subduction of the Pacific plate beneath the North American plate.

Volcanoes of the Aleutian Islands, from the Alaska Volcano Observatory web site at http://www.avo.alaska.edu/volcanoes/aleutians.php

So far we do not have a definite departure schedule. Each day spent at the dock is one day less for the scientific team to complete the goals of the cruise. Meanwhile, OSCAR DYSON is

completing its survey in the Bering Sea, and anticipates the arrival of MILLER FREEMAN to complete the comparison study.

Personal Log

Anchorage high school teacher, Katie Turner, arrives at the pier in Dutch Harbor, Alaska

NOAA Teacher at Sea, Katie Turner, gets a tour of the bridge and quick navigation lesson from Ensign Otto Brown

I arrived in Dutch Harbor on July 9th with a forewarning that repairs to the ship would be necessary before heading out to the Bering Sea, and that I would have some time to explore the area. I have managed to keep busy and take advantage of opportunities to interview the crew, hike, and find my way around town. The weather in Dutch Harbor has been exceptional with many sunny days.

Chief Scientist Patrick Ressler explains how he uses acoustic equipment to study pollock in the Bering Sea.

It's uncommon for a NOAA research ship to spend so much time at the dock, and we attracted the attention of a newsperson from the local public radio station. Commanding Officer Mike Hopkins and Chief Scientist Patrick Ressler were interviewed by KIAL newsperson Anne Hillman while MILLER FREEMAN was delayed for repairs in Dutch Harbor.

You can listen to the story at: http://aprn.org/2008/07/11/unalaska-plays-host-to-noaa-research-vessels/

Unalaska Island has few trees and along with other islands on the Aleutian chain is known for its cool and windy weather. There are no large mammals such as bear on the islands but small mammals, such as this marmot, are common along with many species of birds and a wide variety of wildflowers, which are in bloom this time of year.

Above: A marmot spotted on a ridge alongside the road up Mt. Ballyhoo on Amaknak Island.

Right: A Bald Eagle guards the crab pots stored near the pier.

Below: The view from Mt. Ballyhoo on Amaknak Island. Lupine, a common plant found on the island, is in bloom in the foreground.

Black Oystercatchers take flight over the harbor.

Learn more about the Bering Sea ecosystem at these Web sites:

http://www.avo.alaska.edu/volcanoes/aleutians.php
http://www.worldwildlife.org/what/wherewework/beringsea/index.html
http://www.nature.org/wherewework/northamerica/states/alaska/preserves/art19556.html
http://www.panda.org/about_wwf/where_we_work/europe/what_we_do/arctic/what_we_do/marine/bering/index.cfm