NOAA Teacher at Sea
Kathryn Lanouette
Onboard NOAA Ship *Oscar Dyson*
July 21 – August 7, 2009

NOAA Teacher at Sea: Kathryn Lanouette
NOAA Ship *Oscar Dyson*
Mission: Summer Pollock Survey
Date: Saturday, July 25, 2009

Weather Data from the Ship's Bridge
Visibility: 10+ miles (to the horizon)
Wind direction: 030 degrees (NE)
Wind speed: 15 knots
Sea wave height: 4-6 feet
Air temperature: 6˚C
Seawater temperature: 6.4˚C
Sea level pressure: 29.85 inches Hg and rising
Cloud cover: 8/ 8, stratus

Science Log
Why study walleye pollock?
Before even setting sail, I wondered why NOAA scientists were interested in studying walleye pollock. It turns out that walleye pollock is the largest fishery, by volume, in the USA. In one year, about 1 million metric tons of walleye pollock are fished, mostly from the waters of the Bering Sea.

Walleye pollock (*Theragra chalcogramma*)

Given that walleye pollock accounts for such a large percentage of the total fish caught in the United States, I was curious why I had never seen it on restaurant menus or rarely seen it at supermarket fish counters. It is because walleye pollock is usually processed into other things – like fish sticks, imitation crabmeat, and McDonald's fish fillet sandwiches. So it seems that walleye pollock is that mild white fish you often eat when you don't know for sure what kind of fish you are eating.

In addition to supporting a major multi-billion-dollar fishing industry, walleye pollock is a fundamental species in the Bering Sea food web. It is an important food source for Steller sea

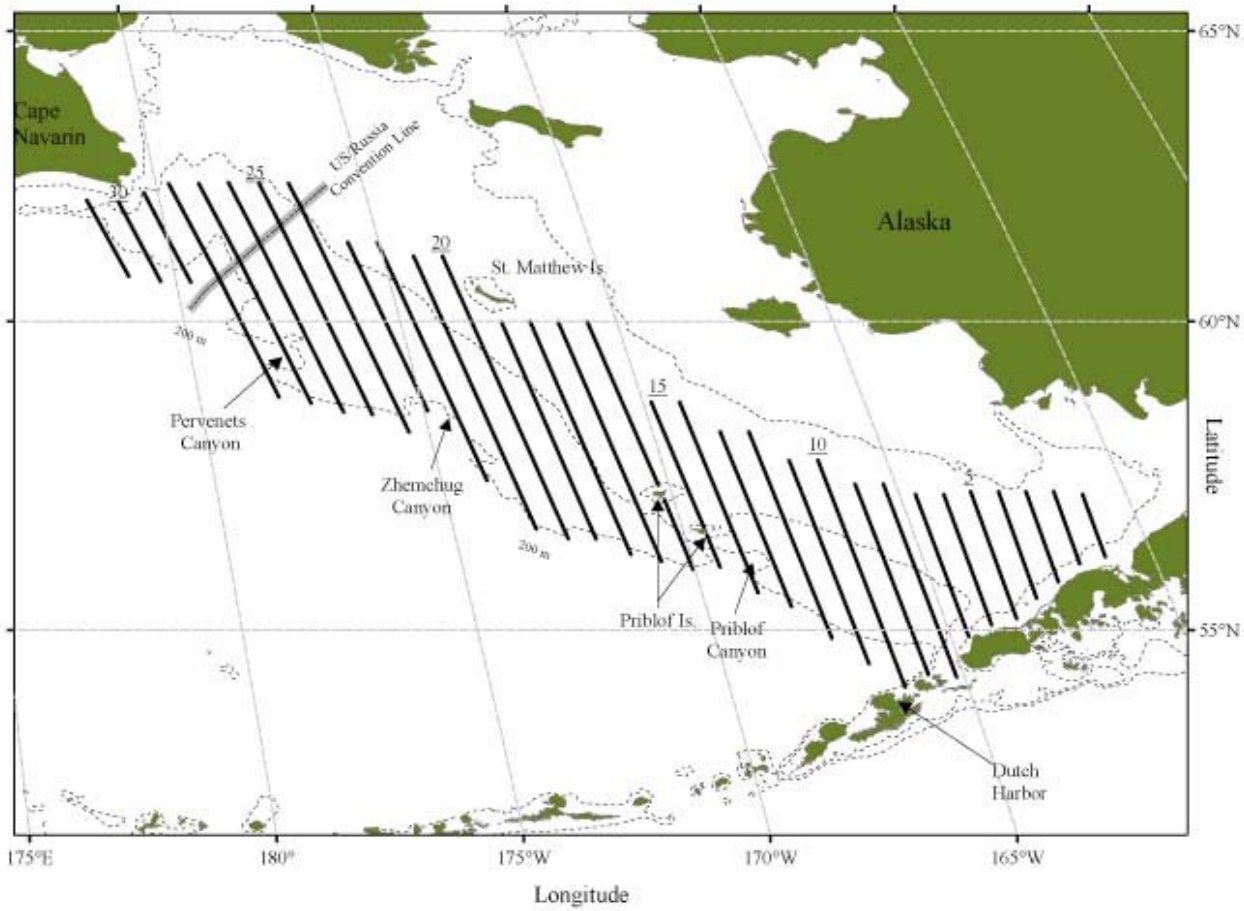
lions as well a variety of other marine mammals, birds, and fish. The population size, age composition, and geographic distribution of walleye pollock significantly affect the entire Bering Sea ecosystem.

What do scientists hope to learn about walleye pollock?

NOAA scientists are primarily interested in calculating the total **biomass** of walleye pollock. To estimate how many walleye pollock are in the Bering Sea, scientists **sample** the fish, recording their age, length, weight, male/female ratio, and geographic location. This information is used by North Pacific Fishery Management Council (NPFMC) to set sustainable fishing quotas for the following year. The NPFMC, whose membership comprises university, commercial, and government representatives, uses NOAA's survey data, fishery observer program data, as well as catch statistics from the commercial fishing industry, to determine how much walleye pollock can be fished in the coming year.

Where do scientists study walleye pollock?

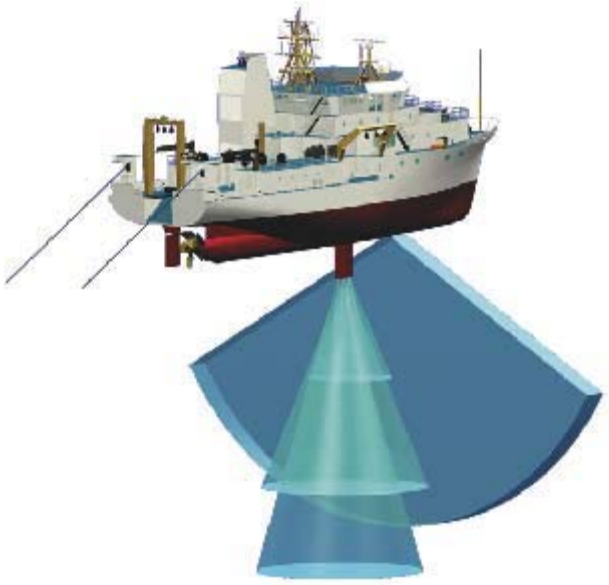
Every year or two, a NOAA research ship (usually the *Oscar Dyson*) travels throughout the Bering Sea, following approximately 31 **transect lines**. These transect lines can be anywhere from 60 to 270 miles long. These lines were selected because they include areas where either walleye pollock spawn in the winter or feed in the summer.



Above is a map showing the 31 transect lines of the walleye pollock survey area. I have joined the cruise that is sailing along the 8 transect lines closest to Russia.

As the ship travels along these lines, its sonar system uses sound waves to locate fish and other animals living below the water's surface. As the sound waves return to the ship, they create different images, depending on which animals are swimming in the water below. Using these images, the scientists decide whether or not they should lower the nets and sample the walleye pollock. They also continuously store digital data from the images, later using this information to estimate the total biomass of the fish species.

On this 18 day research **cruise**, the scientists are hoping to travel the last 8 transect lines (over 1,500 nautical miles). Each transect line takes us into Russian waters. On Thursday, we reached our first transect line. Within hours of traveling along this first line, many schools of walleye pollock were spotted. After the fish net was brought up, I was amazed at the number of fish that came sliding down the conveyor belt into the science lab. I helped weigh and measure hundreds of fish, a quick introduction to the whole process!



An illustration of the *Oscar Dyson* sending down sound waves (in order to "see" the animals swimming below the water's surface.)

Personal Log

We traveled into Russian waters today, crossing the International Date Line as we went. So technically, Saturday became Sunday this afternoon! But later in the evening, we completed the transect line, turned, and headed back into Saturday just as night fell. Luckily, the time never changes here on the boat. The scientists and crew live on Alaska Daylight Time (ADT), regardless of how far we travel to the north and west.

The mouth of a Pacific lamprey

I've see a few whales spouting but so far, I haven't been able to identify any. In the coming days, I am hoping to get a glimpse of their backs or flukes (tails). It has been exciting seeing so many animals – some of which I never even knew existed. A few of these animals look a bit scary, like this Pacific lamprey. Its mouth forms a suction and then all those small yellow teeth go to town, letting it feed on the blood and tissue of its prey. Even the small tongue in the back of its mouth is toothed!

Animals Seen
Hyperiid amphipod
Aequorea species jelly fish
Chrysaora melanaster jellyfish
Euphausiids (aka krill)
Pacific lamprey
Ptychogena species jelly fish
Short-tailed albatross

The rare short-tailed albatross

Here I am holding up a *Chrysaora melanaster* jelly fish (Luckily this species doesn't sting!).

New Vocabulary
Biomass – the total amount of a species, by weight
Cruise – nautical trip, for science research or fun
Quotas – a limited or fixed number or amount of things
Sample – to study a small number of species from a bigger group
Transect Line - a straight line or narrow section of land or water, along which observations and measurements are made

Question of the Day
Why are only some jellyfish species capable of stinging?