



**NOAA Teacher at Sea**  
**Megan Woodward**  
**Onboard NOAA Ship *Oscar Dyson***  
**July 1 – 18, 2009**

**NOAA Teacher at Sea: Megan Woodward**

NOAA Ship *Oscar Dyson*

Mission: Bering Sea Acoustic Trawl

Geographical Area: Bering Sea

Date: Tuesday, July 7, 2009

**Weather/Location**

Position: N 56.18.292; W 171.46372

Air Temp: 7.3 (deg C)

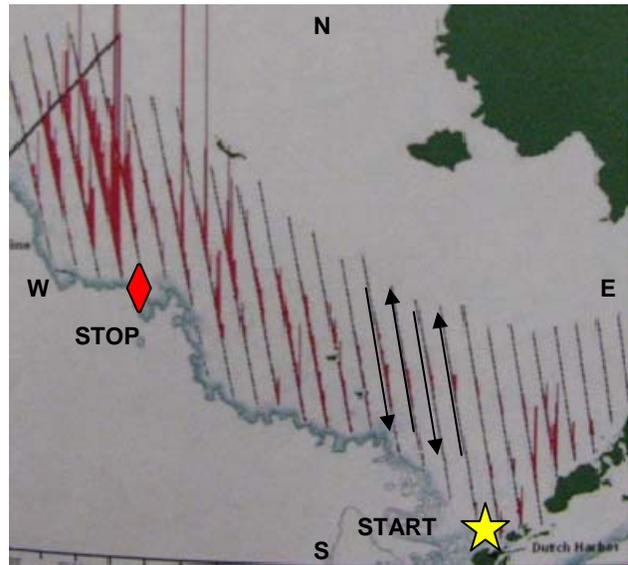
Water Temp: 6.9 (deg C)

Wind Speed: 17 knots

Weather: Overcast

**Science and Technology Log**

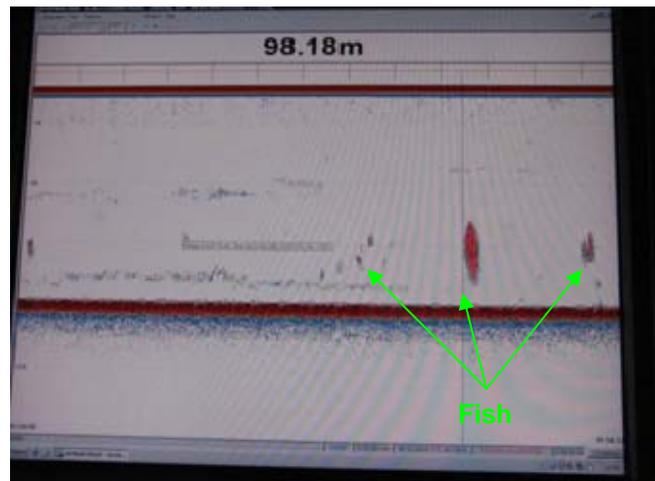
We are traveling on designated lines in the north/south direction looking for pollock (travel lines are illustrated above). The samples we pull in are compared to the amount of fish found in the same location over 20+ years. The process used to “go fishing” is not as easy as one might think. Several things need to align for a successful trawl to take place. As of today, I have been a part of three successful trawls. Below is an explanation of the fishing process.



This map depicts the path the *Miller Freeman* will take on our cruise.

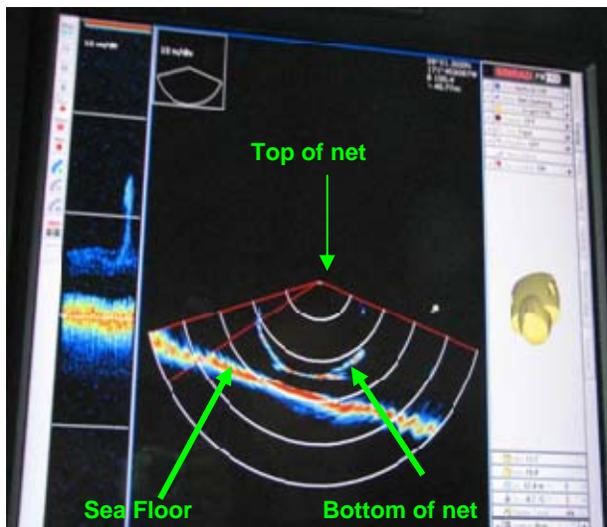


This is the acoustics lab. The top screens are displayed in the bottom monitors as needed. The top two left monitors show the acoustic return from the 5 frequencies (pings) sent out.

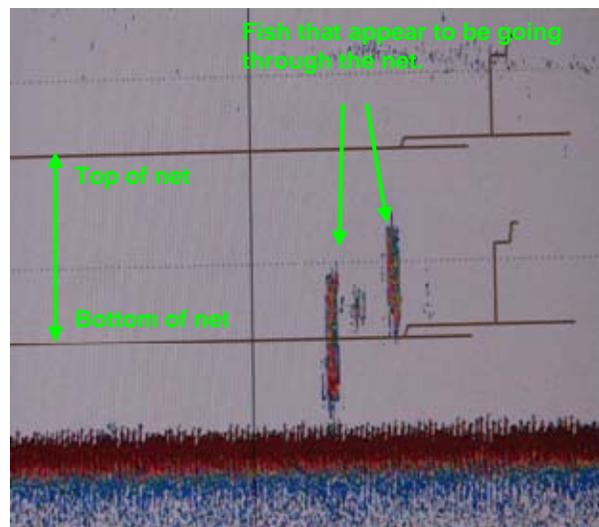


This is an acoustic screen showing a return typical of pollock. The several clusters with the trail of return on the left are showing a good fishing opportunity. The dark red across the middle of the screen is the sea floor.

1. The Fisheries Research Biologist and his team recognize a series of acoustic returns as potential pollock schools while sitting in the **acoustics lab**. Then they decide if the amount of fish being seen is enough to fish on. If yes, go to step 2.
2. Next the team questions if the weather conditions are calm enough, are the fish far enough off the bottom of the sea floor, and have we traveled at least 30 miles from our last fishing point. If conditions are aligned, move to step 3.
3. The team contacts the **bridge** to prepare the crew for fishing. The bridge receives the exact location (longitude/latitude) the nets should enter the water for the best possible fishing. By now we have traveled over the top of the fish we saw on the acoustic screen. A decision must be made about the best direction to travel so the nets work properly: Do we flip a u-turn and fish up the line, or do we circle back to where we saw fish and retrace our path on the line? The water's current and prevailing winds impact how the nets will function, which are some of the deciding factors in choosing the direction we will tow the nets. Fishing in motion, continue to step 4.
4. Up to the **wheelhouse**. Here the lead fisherman, the ship's Officer of the Deck (person in charge of driving the ship) and the fisheries team can work together to create the best fishing scenario. The same acoustic information can be viewed in the wheelhouse as in the acoustic lab. Based on the depth of the acoustic return, the fisheries team can inform the fisherman how far to lower the nets in the water. Keep going to step 5. We almost have fish...we hope!
5. Once the net is in the water, there are two acoustic screens closely watched. These are pictured below with the explanation of the information received. The net is continually raised or lowered based on the depth of the return. A trawl lasts for 20 minutes and covers 1 mile on average. The fisheries team is aiming for 300 fish per trawl. They are careful to not over fish. Almost done, bring the fish aboard.



This screen shows the return from a signal that sweeps left to right like a pendulum. The bottom of the net is the  $\frac{1}{2}$  circle shape. During a trawl you can see if a school of fish enters the net.



When the net is in the water, there is return from the top and bottom of the net. This screen shows a vertical return. We can see we are at the correct depth, but maybe we are too far to the left or right.

6. The final step is bringing the nets back in and unloading the fish. If all went as planned, the next few hours will be spent in the fish lab collecting information about the sample. Unfortunately the system is not perfect. It's possible to bring in a **water haul** or a **stuffed sausage**. Neither one is good news.

### Personal Log

Now that I have participated in three trawls, I'm feeling much more comfortable with the whole fishing process. Rather than looking at the acoustic screens with a puzzled look, I'm able to recognize what the return from a school of pollock looks like. Jellyfish show up on the screen as blue-green clusters, and have been present in the top 40 meters of water the majority of time we've been at sea. I can only imagine how many of those creatures are down there.



Hauling in the net

There seems to be a bit of humor in all we do at sea. There are two awards given out based on the **hauls** we bring in: The water haul and the stuffed sausage awards. You really don't want to be the recipient of either one. The water haul award goes to the team that brings in the haul with the least fish (mostly water). This happened yesterday when we attempted to catch pollock close to the surface. There wasn't but a single pollock in the net. Of course there were numerous jellyfish.



This fur seal followed the boat for about 30 minutes while we were trawling for pollock. He was hoping for a free dinner.

The stuffed sausage is just the opposite of a water haul. As you may have guessed, the stuffed sausage award goes to the team that brings in the most over-stuffed net. If we were looking to make money off of our catch, this would be considered a success. However, we really only want a sample of about 300 fish. A stuffed sausage means too many fish were brought in. It is possible to be the "winner" of both awards.

### Animals Seen

- Red-legged kittiwake

- Blacklegged kittiwake
- Albatross
- Fulmar
- Fur Seal
- Capelin (they smell like cucumber)
- Spiny Lumpsucker

### **New Vocabulary**

Acoustic Lab - AKA “The Cave” because there are no windows. This is where the Fisheries Research Biologist and his team watch the acoustic return monitors.

Bridge/Wheelhouse: - This is where the officer on duty drives the ship using several navigational tools. Named the wheelhouse because the ship’s steering wheel is found here. The bridge is located on the top level of the ship. The Methot and trawl nets are also operated from the bridge.

Haul: - This is how the fish are referred to when they are caught in the net. One might ask, “How was the haul?” “It was a (big haul, small haul, water haul, stuffed sausage).”

Water Haul - A net lacking fish following a trawl.

Stuffed Sausage - An overstuffed net, too many fish caught.



**The center bird is a blacklegged kittiwake, identified by the black wing tips, white underwing and the light gray color on its back.**