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: July 26, 2008

Weather Data from the Bridge
Visibility: 3 miles
Wind Direction: 050
Wind Speed: 8 knots
Sea Wave Height: 0-1 foot
Swell Wave Height: 2-3 feet
Seawater Temperature: 7.8˚ C.
Present Weather Conditions: cloudy

Rescue crew retrieves a dummy man overboard in the Bering Sea. It is a maritime custom to refer to the man overboard as "Oscar"…this comes from an international regulation requiring the raising of the Oscar flag when a vessel is responding to a man overboard. This signal warns other vessels to stay clear and to be on the lookout for a victim in the water.

The rescue boat is brought back aboard the MILLER FREEMAN

Science and Technology Log
After leaving Captain's Bay early Friday morning, the trip to the rendezvous point with OSCAR DYSON took nearly 20 hours. During that time we had our mandatory fire, abandon ship, and man overboard drills. For our fire drill the Captain staged a mock fire, with smoke reported from the acoustics lab. The fire fighting team had to respond, find the point of origin of the fire and figure out how to treat it. A debriefing was held afterward so that responders could discuss strategies and learn from the experience.

The abandon ship drill is regularly performed so all crew are ready to respond to a severe emergency by mustering at their assigned stations and getting into survival suits to be ready to board life rafts. It's a good way for new crew members, such as me, to make sure they know

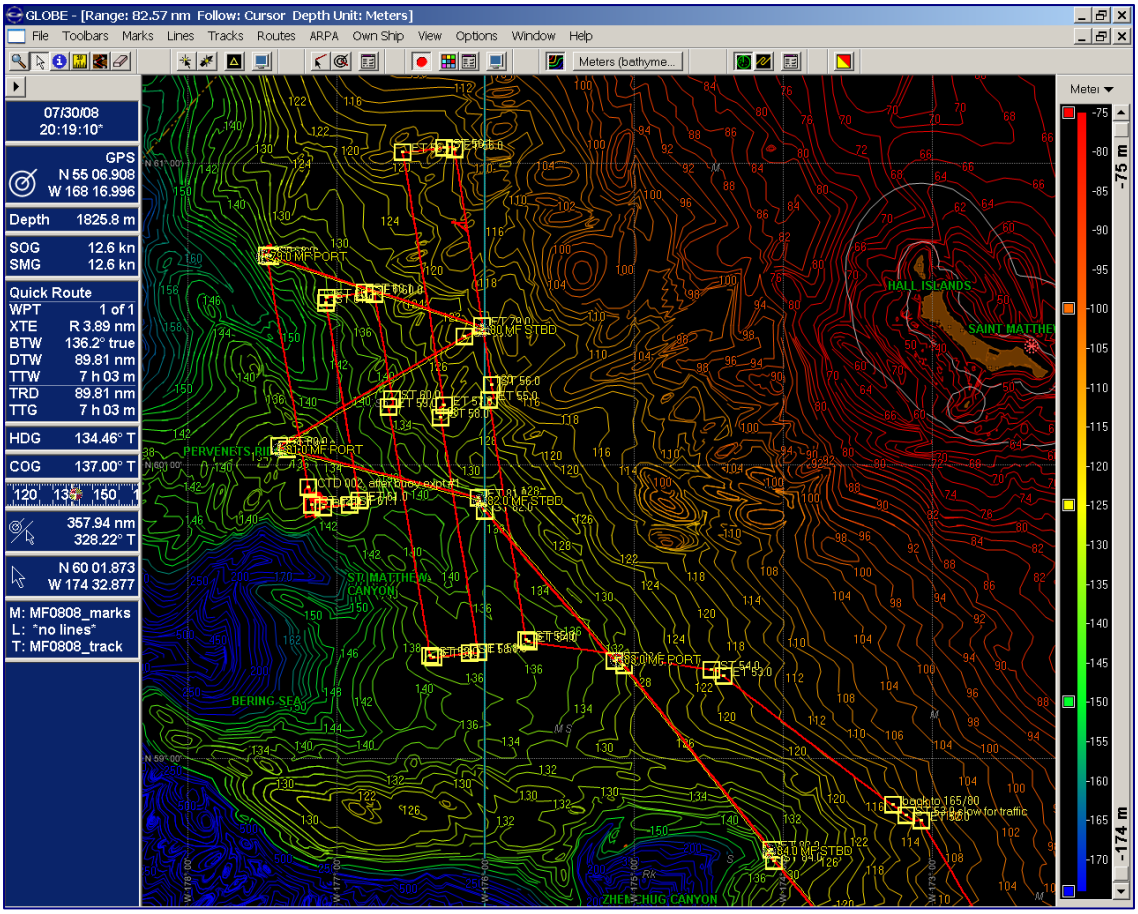
where to go and what to bring. We made our rendezvous with OSCAR DYSON late Friday evening in the Bering Sea and immediately moved into position to run the first side by side transect. We are working on a comparison study to determine whether acoustic estimates of pollock (*Theragra chalcogramma*) abundance made by MILLER FREEMAN and OSCAR DYSON are comparable. Pollock may have different behavioral responses to these vessels during surveys due to the differences in the amount of noise each vessel radiates into the sea from its propeller, engines, and other equipment. These behaviors could affect the acoustic estimates of abundance. OSCAR DYSON is taking over the task of acoustic pollock surveys in the Bering Sea and has been built under new specifications that require a lower level of radiated noise. MILLER FREEMAN has been doing the Bering Sea pollock surveys since 1977. This study is important because it will ensure that future biomass estimates will be continuous with those done in the past.

OSCAR DYSON from the bridge of the MILLER FREEMAN in the Bering Sea

MILLER FREEMAN taken from the bridge of the OSCAR DYSON in the Bering Sea

During this cruise the two ships will continuously collect acoustic backscatter data while traveling side by side along a transect line where pollock schools are known to occur. The distance between the two ships is maintained at 0.5 nautical miles (nm), while they travel at about 12 knots. Every 50 nm along the transect, the vessels switch sides. For this to happen one vessel will slow down and cross behind the stern of the other vessel, then catch back up on the other side. The beginning and end of each transect section must be carefully coordinated between the scientific team in the acoustics lab aboard each ship. At the same time officers on the bridge are in constant communication to coordinate navigation and maneuvering of the ships.

The remainder of our time on this cruise will be spent working with the OSCAR DYSON to cover as much of the study area as possible before returning to the port of Dutch Harbor. After the study is complete, the acoustic data collected by each vessel will be carefully compared to see if there is any consistent difference between them.



Transect path of MILLER FREEMAN

The figure above shows the final transect path of MILLER FREEMAN in the Bering Sea as straight lines in red. The parallel lines running nearly north and south were traversed from the east to the farthest westerly point. The zigzag red line across the parallel lines represents the path taken as we head back to the southwest on our return.

Other colored lines on the map are depth contour lines. Red lines indicate depths from -75 to -100 meters, yellow to -130 meters, green to -155 meters, and blue greater than -160 meters.

Personal Log

During these few days at sea the scientists onboard have taught me a lot about acoustic studies. It's a complex science that requires both an understanding of the physical science of acoustics and the technology involved, but also the biology, behavior, and ecology of pollock.

Northern fulmar, light morph

One of the opportunities I have especially enjoyed has been watching and photographing the seabirds. They are an important part of this ecosystem and one that can be observed without acoustics. We have seen mostly northern fulmar (*Fulmaris glacialis*) and black-legged kittiwake (*Rissa tridactyla*), but also an occasional long-tailed jaeger (*Stercorarius longicaudus*), and flocks of thick-billed murre (*Uria lomvia*).

Northern fulmar, light morph

Northern fulmar (*Fulmaris glacialis*) exhibit a lot of variation in color from very light, to light, and dark versions, with gradations in between. These different color morphs all mate indiscriminately.

They are gull sized birds with moderately long wings, a short, stout, pale bill, and a short rounded tail. A key characteristic is their dark eye smudge. They are common in the Bering Sea but also in the northeast Atlantic.

Fulmars are well known among commercial fisherman for scavenging waste thrown off fishing boats, which explains why they have been nearly constant companions to the MILLER FREEMAN on this cruise.

Fulmars are members of the family Procellariiformes, also known as the "tube-nose" birds, along with albatrosses, petrels, and shearwaters.

Northern fulmar, dark morph

The term comes from the tubular nostril, a structure that looks like a tube on top of their beak. Their beak, as you can see in the photo, is made up of many plates. This specialized nostril is an adaptation that enhances their sense of smell by increasing the surface area within to detect scent. They also have enlarged brain structures that help them process those scents.

Northern fulmar, close-up of tubenose

Learn More

http://bna.birds.cornell.edu/bna/species/361/articles/introduction
http://www.absc.usgs.gov/research/seabird_foragefish/seabirds/index.html