



NOAA Teacher at Sea
Julianne Mueller-Northcott
Onboard R/V *Hugh R. Sharp*
May 11 – 22, 2010

NOAA Teacher at Sea: Julianne Mueller-Northcott

University of Delaware R/V *Hugh R. Sharp*

Mission: Sea Scallop Survey: Leg III

Port of Departure: Lewes, Delaware

Date: May 11, 2010

Weather Data from the Bridge

Overcast, rainy, in the 50s

Science and Technology Log – Data Collection/Sampling Methodology

For NOAA's scallop survey, it is divided into three different legs or cruises, each sampling a different area along the east coast. This cruise that I am on is the first in the series. During this time, since we will be working around the clock, we will probably do somewhere between 150-200 dredges and the NOAA team will sample about 500 total for the season. But how do scientists determine where to dredge? How can they be sure that the sites that are sampled will give them an accurate representation of the number of scallops on the sea floor?

To determine where to sample, scientists use the Stratified Random Sampling Design. This is the method for determining the average number of an animal in a given area. This sampling technique is based on the fact that the scallop population density depends on the ocean depth. Scallops like to hang out in 50-100 m of water. Scientists break up the coastline that their studying into different "strata" or quadrants. And then instead of a totally random sample in a given area, the stratified random sampling design uses a computer to select more collection sites in the depths where you would be likely to find the most scallops, since that is what scientists are interested in.

Scallop Fisheries

The US scallop fishery is an economically important fishery, maybe second only to the lobster industry in the Atlantic. One question that one of my students asked was, "Is the scallop population growing or is it in danger?" I asked our chief scientist that question this afternoon. His response was very promising, that the scallops are doing very well. Part of the reason for their success is due to the regulations that are set in place, the same regulations that are based on the data collected by this trip. One type of regulation that has been helpful is the temporary closure of certain areas. These closures give scallops in a particular area a chance to grow. So if during a scallop survey cruise, scientists notice a lot of young scallops in a given area, that data will get reported and maybe lead to the temporary closure, meaning that you can't fish for scallops there for a couple of seasons. Then after some time for the animals to grow, the area will be reopened. By rotating these closed areas, it allows the time necessary for population growth. Astrid B. asked the following question, "Does the dredge hurt the ocean bottom?" Our dredge is fairly small, about eight feet across. But a commercial fishing boat has two dredges that are about 15 feet wide that go down at the same time. And at a given time, there might be as many as 500 boats out fishing for scallops. Before and after photographs have shown that the dredges do impact the bottom. It works to flatten everything in its path, including living organisms. It also affects an important habitat. Fish species like cod like to hang out around the nooks and



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crannies that are created by benthic creatures, but without that important living structure, the cod population doesn't have the habitat it prefers (which may be an explanation for why that population has been slow to recover). While more research needs to be done to find out how long it takes for the substrate to recover and return to its pre-dredge state, dredging does have some pretty clear impacts on the sea floor habitat.

Brandon O had a fun question, "What is the funniest thing that got brought up by the dredge?" The chief scientist said that once they brought up pieces of an airplane in a dredge. I asked if it hurt the dredge and it didn't because the plane was made of light aluminum. And then he said that they have also found mammoth teeth. That is very cool! A long time ago this whole area was not covered by water, but instead it was land for woolly mammoths to walk over. I think this is especially neat after just seeing lots of skeletons of mammoths at the Natural History Museum during our trip to New York City over vacation. I can't wait to find out what will be the most interesting thing we'll find during this trip!

Personal Log

We just officially set out to sea! It was a long day waiting for all the preparations to be finalized and for the water to be high enough so we could leave port. It is a chilly day, with the wind blowing on the ocean and a little drizzle coming down—but so exciting to be moving and heading out! Lots of students had many questions for me about food, especially considering my mantra, "Fish are friends, not food." So far so good, lots of chicken, pasta and the most unbelievable snack cabinet—featuring all sorts of goodies that we never keep at home (Oreos, cheese-its, candy bars, soda). And then today, I saw for the first time--the ice cream freezer. An entire freezer, dedicated to the storage of frozen treats—what a beautiful concept! As it turns out, there used to be a treadmill on the boat, but they had to move it off to make room for the ice cream. I like where their priorities are and it is clear that I won't be going hungry!