



**NOAA Teacher at Sea  
Marilyn Frydrych  
Onboard NOAA Ship *Delaware II*  
September 15 – 25, 2008**

**NOAA Teacher at Sea: Marilyn Frydrych**

NOAA Ship *Delaware II*

Mission: Atlantic Herring Hydroacoustic Survey

Geographical area of cruise: New England Coastal Waters

Date: Tuesday, September 16, 2008

**Weather Data from the Bridge**

41.27 degrees N, 70.19 degrees W

Partly Cloudy Wind out of the W at 19 knots

Dry Bulb Temperature: 26.0 degrees Celsius

Wet Bulb Temperature: 20.9 degrees Celsius

Waves: 2 feet

Visibility: 10 miles

Sea Surface Temperature: 21.6 degrees Celsius

**Science and Technology Log**



**The Neuston net hanging from a pulley on the A-frame. suit (Photo courtesy Jacquie Ostram)**

Today started slowly since we were still in transit to our starting position. All morning there were 15 to 20 terns and gulls flying nearby.

Occasionally we'd spot land birds. A small yellow-rumped warbler actually flew into the dry lab area of the boat. It was far from where it belonged and probably wouldn't make it back.

The terns skimmed the water surface, but never actually seemed to touch the water. Our bird scientists, Marie-Caroline Martin and Timothy White, decided they would deploy a Neuston net to try to determine what the birds were eating.

The fishermen, who do all the deploying of instruments, hung the net from the A-frame pulley on the starboard side and swung it out over the water. For 20 minutes it bounced in and out of the water never getting more than a foot or so above or below the surface. The Neuston fine mesh net is about 10 feet long and has a mouth about 4 feet by 2 feet. When the fishermen brought it in, it mostly held salp and jellyfish,

but also some small crustaceans which looked like miniature shrimp about ½ in. long. The jellyfish were small, without stingers. Marie

carefully washed the contents of the net down to its opening with a salt water hose. Then she used her unprotected hands to slide her catch into a glass jar about the size of a medium peanut butter jar. She graciously separated a few of the crustaceans for us to observe.

About 11:30 a.m. we finally reached our starting point. The plan was to do parallel north-south transects. We would cross the east-west transects without stopping. We fished with a huge net off the stern. The chief scientist, Dr Michael Jech, decided when to fish. Sometimes he put the net in to prove that there were no herring there and the echoes he was receiving were correct. Other times he saw a new signature on the screen and checked to see what it might have been. Still other times he recognized the herring signature (he's about 90% accurate) and fished to determine sizes, sexes, and stomach content. At other times he had predetermined stations where fishing had been good in the past.



**Jim Pontz, a fisherman, working the A-frame.**

At each 90 degree turn we deployed a CTD - conductivity, temperature, and depth instrument. The instrument measured how easily electricity can flow through the seawater, its conductivity. From this and the temperature and pressure (or depth) the salinity of the water can be determined. The equations involve the 5<sup>th</sup> power of both temperature and pressure. They appear to be Taylor's series approximations. The CTD is also used to calculate the speed of sound



**A herring in a clothes basket. Note the brilliant blue stripe on top.**

which is important for the accuracy of the sonar equipment. Only the crew may actually deploy instruments. None of the scientists touch the instruments going over the side. The scientific crew's job was to communicate via a handheld radio with the fishermen working the winch and the one putting the instrument into the water. We told them when to start after we had initialized the computer programs and when to haul back the CTD as it came within a few feet of the ocean bottom. We could simultaneously look at a cam on a nearby monitor showing what was happening at the A frame. I watched the first time this was done, but with everyone's help soon caught on and was doing it myself.

The second time I helped with the CTD we attached a Niskin water bottle to the bottom of the CTD and signaled to have it stopped about half way back up the ever present bottom layer isotherm. We paused for about a minute as it filled with the surrounding water. At that point

both ends were wide open. A fisherman dropped a messenger, a heavy round metal doughnut, down the line to the bottle. It tripped a lever which then allowed the lids connected with tremendously strong elastic bands to snap shut. The tube is a little larger than a 2-liter soda bottle. When we were given the retrieved bottle, we washed out a small, maybe 1-cup, bottle 3 times with the seawater from the Niskin bottle before we filled and capped it and replaced it in its position in a crate. The water can be used to calibrate the salinity readings the CTD recorded and to determine various other chemicals at that spot of collection in the ocean.



**Jacquie Ostrom at her post radioing the fishermen when to start the CTD. mf**



**Sunset silhouetting the CTD bottle balancing against one arm of the A-frame. (Photo courtesy Jacquie Ostrom)**

### **Personal Log**

Today being the first full day at sea I was introduced to a wonderful daily ritual. Each morning at about 10:30 the chiefs brought out from the oven their first baked dessert of the day. Today's was the most perfectly seasoned peach cobbler I've ever tasted.

Once toward evening we spotted dolphins around the ship. We could occasionally see them jumping through the air. A pair played in the bow wake for a short while. About the same time the crew pointed out to us some three or four pilot whales about 100 yards off the starboard stern. I hadn't expected to see so much sea life. This is turning into a very memorable adventure.