



**NOAA Teacher at Sea  
Rebecca Bell  
Onboard NOAA Ship DELAWARE II  
August 13 – 28, 2008**

**NOAA Teacher at Sea: Rebecca Bell**  
NOAA Ship DELAWARE II  
Mission: Ecosystems Monitoring Survey  
Geographical area of cruise: North Atlantic  
Date: August 14, 2008

**Weather Data from the Bridge**

Time: 134628 (GMT)  
Latitude: 40.33.06N  
Longitude: 72.47.36W  
Air Temp °C: 22.1  
Sea Water Temp: 22.3 °C

**Science and Technology Log**

We sailed from Woods Hole, MA on Wednesday, August 13, 2008 on the first of three legs as part of the Ecosystem Monitoring Program. There are two main objectives of the cruise. The first is to see how well the fish population is doing by sampling and counting fish larvae. The number of fish is important to the fisheries industry- those folks who bring cod and other fish to your table. The second objective is to monitor the zooplankton population. Fish feed on the zooplankton, so a healthy zooplankton population may mean a healthier fish population. We also are monitoring the physical properties of the water; in this case, salinity and temperature. These influence where fish larvae and zooplankton can survive and where and how far they can be dispersed.



**NOAA Ship *Delaware II***

There are 125-130 sites randomly selected for sampling. At each site, a pair of bongo nets are dropped and the two samples are collected side-by-side, for a total of 250-260 samples. One sample is designated for the ichthyoplankton (fish larvae) study, and the other for the study of zooplankton composition, abundance and distribution.

Near-surface along-track chlorophyll-a fluorescence, which indicates abundance of phytoplankton (i.e. food for the zooplankton), water temperature and salinity are constantly measured with the vessel's flow-through sampling system. We will also be collecting a separate set of samples as we approach the Chesapeake Bay. These will be used to study aging of fish larvae.

Zooplankton include both unicellular and multicellular organisms. Many can easily be seen with the naked eye. Zooplankton can be classified in a number of ways. One way is to classify them by life history. **Holoplankton** are those that are planktonic during their entire life cycle (lifers). **Meroplankton** refers to those plankton in a developmental stage, like eggs and larvae (short-timers). These larvae will grow into larger organisms such as jellyfish, mollusks, fish, starfish and sea urchins, crustaceans, copepods and amphipods.

The term "plankton" comes from a Greek word for "wanderer" or "drifter".<sup>1</sup> This may imply that these organisms are passively moved about by currents. However, many can power around on their own, using several different methods such as cilia, muscle contraction, or appendages on the head, thorax or abdomen. They also move vertically in the water column, up toward sunlight during daylight hours and downward at night. Krill (whale food), on the other hand, do the opposite- travel downward during the day and up at night.

The first two samples contained a vast number of salps. A salp is holoplanktonic and is related to sea squirts (urochordates). They are filter feeders, catching bacteria and extremely small plankton in mucous-covered "nets" that act as sieves. Salps are an important part of the ocean food chain.

Samples 3-5 show a greater variety of organisms- comb jellies (ctenophores), arrow worms (Chaetognatha) fish larvae and amphipods.

Samples 6-8 are dominated by copepods. There are salps, too, but not nearly as many (about 1/3 fewer) as we saw in the first 2 samples.

So I am looking at these results and wondering: Are there patterns to the distribution of these assemblages? Are salps found in warm water or cooler water? Does temperature matter at all? Do they like deeper water? Higher or lower salinity? Combinations of any of these? Are they found where another organism is found?

### **Personal Log**

We began our first work shift today, er, last night, um, this morning at 3 a.m. I work the 3 a.m. to 3 p.m. shift. That means to bed around 7pm., rise and shine at 2:30 a.m. Well, rise, anyway. Not much shining till later.

As I sat on the deck in darkness, waiting to reach our first sample site, I spotted the light from another ship on the horizon. I watched as the light traveled up a wave, then down a wave then up, up, up, up, still up. I could not believe how high it was going, knowing we were doing the same

thing. It's a good thing it doesn't feel like that. We are now heading south, back towards the Chesapeake Bay. It is getting hotter and muggier, just like home.

We saw dolphins today. A large leatherback turtle was spotted from the bridge. The 3pm- 3am. shift reported seeing flying fish.

### **Animals Seen Today**

- Salps
- Amphipods
- Copepods
- Ctenophores
- Chaetognaths (arrow worms)
- Fish larvae
- Sea butterfly
- Dolphins
- Gulls (4 species)

<sup>1</sup> Source: Online Etymology Dictionary [www.etymologyonline.com](http://www.etymologyonline.com).