



**NOAA Teacher at Sea
Methea Sapp-Cassanego
Onboard NOAA Ship DELAWARE II
July 19 – August 8, 2007**

NOAA Teacher at Sea: Methea Sapp-Cassanego

NOAA Ship: DELAWARE II

Mission: Marine Mammal Survey

Day 5: Monday, July 23rd

Weather Data from Bridge

Visibility: less than ½ nm

Wind Direction: West – Southwest

Wind Speed: 5-10 mph

Swell height: 3-5 feet

Science and Technology Log

Although the weather is not especially nice today, at least we have a new project to work on. Today is Tucker Trawl Day! The trawl consists of a trio of long finely meshed nets which are mounted one above the other on a heavy metal frame. The frame is then tethered to a wire cable which runs up to a crane. Also mounted on the frame is a flow meter, which is used to measure the amount of water that has passed through the net, and a Seabird mini-logger sensor which records time, depth and temperature.

Deployment of any piece of equipment requires careful coordination between numerous members of the ships crew and scientists, as the boats position, and speed must be carefully controlled. Meanwhile the crane operator and those physically preparing the nets will oversee proper operation of the nets and its sensors along with the depth and speed of its ascent and descent. Back in the dry lab several other hands are at work preparing the sampling jars, labels and documentation for the incoming specimens.

It does not take long before everyone is in place and the net is lowered. The trawl will be lowered to the seafloor at which point a device called a messenger will be snapped on to the wire cable. The messenger is a heavy brass cylinder (about the size of a small fist), which runs down the cable and hits a special releasing lever near the trawl's metal frame. Release of this lever closes the bottom net and opens the middle net. Deployment of a second messenger then closes the middle net and opens the top net. Control of the opening and closing of the three individual nets allows researchers to take samples at specific depths. After several minutes the Tucker Trawl begins its ascent. It should be noted that the Tucker is not used to sample fish; therefore, we are not expecting to capture any vertebrates. The speed of the trawl is fairly slow so that fish have plenty of time to get out of the net's way. What we are hoping to capture are Copepods. These tiny lipid-filled zooplankton are the primary food source for the endangered right whale. (For more information regarding copepods and right whales please read my log from July 21st 2007)



Deployment of the Tucker Trawl enables researchers to sample zooplankton at various depths. The cod ends of each of the three nets have been tied with white rope and are visible in the right-hand photo graph.

Once the trawl is on deck we use a low-pressure saltwater hose to rinse the nets. We work our way from the mouth of the net downward so that every organism is rinsed into the narrow end of the net which is called the cod end. Then the cod end is carefully untied and its contents rinsed into a fine mesh sieve. The gauge of the mesh sieve is large enough to flush phytoplankton out of the sample while retaining zooplankton. The sieves are then shuttled to the dry lab where the contents are raised with seawater and formalin. Later these same jars will be shipped to a lab in Poland where the samples contents will be sorted, identified and counted. All copepods in the sample will also be tallied in accordance to one of six life stages.

Aside from physically enabling us to put masses of copepods in jars the results of the Tucker Trawl are also compared to the results from the conductivity/temperature/depth sensor (CTD) and video plankton recorder (VPR). (Please see my log dated July 21st for further explanation and photos). Furthermore Tucker Trawls are also used to help indicate the likelihood that whales are in the area; empty trawls mean no whale food and few if any whales. Naturally, packed trawls signify ripe feeding grounds which may be worth staying on to survey.



Kate Swails, Biologist in the Office of Protected Resources rinses the Tucker Trawl contents from a sieve into formalin filled jars. The samples will eventually be shipped to Poland for full analysis.



This soft-ball sized deep sea sponge was unintentionally caught in the Tucker Trawl.