



**NOAA Teacher at Sea  
Mary Ann Penning  
Onboard NOAA Ship ALBATROSS IV  
July 9 – July 20, 2007**

**NOAA Teacher at Sea: Mary Ann Penning**

NOAA ship ALBATROSS IV

Mission: Sea Scallop Survey

July, 17 2007

North Atlantic Ocean

**Weather Data from the Bridge**

Visibility: 4 nautical miles (nm)

Wind direction: 278 degrees

Wind speed: 6 knots (kts)

Sea wave height: 1 foot

Swell wave height: 3 feet

Seawater temperature: 25.2 degrees C

Sea level pressure: 1017.1 millibars (mb)

Air Temperature: 24.9 degrees C

Cloud cover: hazy

**Scientific Log**

For a person who has rarely eaten scallops, I'm really getting an up close and personal look into the lives of these mollusks. Dr. Deborah, aka Dvora, Hart is our resident scallops' expert traveling and working on this trip. She has studied scallops for eight years and travels internationally speaking on behalf of scallops everywhere. She is an intermediary between the

science side of scallops and with the fishermen and the fishing industry. While incorporating her

mathematics background, she works closely with our Chief Scientist Victor Nordahl developing these surveys. Talking with her over the course of the trip and just listening



**Dvora Hart is counting astropectin, a type of sea star (also called starfish), for sampling.**

to her wealth of knowledge have taught me a lot about scallops in such a short time. She is passionate about scallops and knowledgeable about other organisms that we saw on the trip. In a nutshell or should I say “in a scallop shell”, I’ll share what I’ve learned about scallops in just a little less than two weeks.

Scallops have been around for millions of years. Five to ten million years ago, in the Chesapeake Bay area, there used to be a shallow sea. Much later, scallop fossils, found by Indians living in this area, were used for bowls. In fact Virginia’s state fossil is a scallop measuring up to 200 mm, named *Chesapecten jeffersonius*, obviously named after Thomas Jefferson. I didn’t even know there were state fossils!



**These sea stars, also known as starfish, are classified as *Astropecten americanus*.**

Sea scallops like living in about 40 – 80 meters of water in the Mid-Atlantic. It is neither too warm in the summer nor too cold in the winter at these ocean depths for them to develop. In deeper water, one of their nemesis, *Astropecten americanus*, a type of starfish, will eat the baby scallops whole. (There are over 100 different species of *Astropecten* around the world.) Scallops swim, eat phytoplankton, and spawn when their food source is higher in the

spring and fall. They can range in size from a few centimeters to 15 centimeters from their hinge to their tip. The family of scallops includes our Atlantic Sea Scallops, (called Giant Scallops in Canada), Bay Scallops, and Calico Scallops.

In the US, the scallop industry wholesale at the dock brings in about \$400 million dollars, while the retail value is worth about \$800 million. All fisheries in the northeast bring in about 1.2 billion dollars and scallops and lobsters are responsible for about one third each, while all other fish comprise the other third. Full time scalloping permits can range in the three to four million dollar range; one can somewhat understand why these permits would be highly desirable. There are a limited number available.

In 1998, only 12 million pounds of sea scallops were caught in the U.S. Since 2002, they have been bringing in over 50 million pounds each year. Why the change? Part of it is skill, part of it is good luck, but the main reason is that areas were closed for three years

to allow the baby scallops to grow to bigger sizes. In some of our surveyed areas that have been open to harvesting scallops, we have seen fewer and smaller scallops. In Elephant Trunk, which just opened for scallop fishing in March, we have generally seen more scallops which are bigger. Data collected over time by surveys such as this one have supported the closings and reopening of areas.

This sea scallop survey is collecting data about sea scallops and other species to manage the sea scallop fishery properly in the southern part of the range of sea scallops. Our trip has spanned from New Jersey to the tip of North Carolina and back again. We have targeted underwater areas such as Hudson Canyon, Elephant Trunk, and a station on the edge of Norfolk Canyon to name just a few. The NOAA National Marine Fisheries Service manages the area from 3 miles to 200 miles across the continental shelf. The waters from shore to three miles out are managed by the various states and operate under different rules. The restrictions for scallop fishing are managed by a fishery management board comprised of 19 representatives from various states.

Scallop boats are allowed to retrieve about one fourth of the total scallops a year. If they catch more than that, they fish out too many of the big ones in an area. If they catch too few a year, more will die from natural causes. It takes about four years to deplete an area of scallops. (The four inch rings in their dredges allow smaller scallops to escape.)

My interview with Dvora has spanned the entire cruise. As we have asked questions, whether kneeling in the pile on the fantail or in the workrooms or at the dinner table, she has been generous with her information and we have become more aware and knowledgeable about scallops and their economic impact on the US.

### **Personal Log**

Thinking back over the trip, there have been some exciting highlights. Three that come to mind are the following. I finally went up to the bridge, about 1:00 AM one morning to see how the operations are run at night. I had been up there during the day and so I was familiar with the equipment during the daylight. I walked into a quiet, dark room with only red lights showing. (I understand they don't destroy your night vision.) The side doors were open and a cool breeze was coming in. It was hazy outside; I thought I couldn't see any stars, something I had hoped to see. The officer in charge said to look straight up and there were definitely some stars to see. He helped me find the big dipper



**Scientists in front of the NOAA map showing the location of the scallop sampling stations.**

through the haze. After craning my neck for awhile, I stepped to the starboard side and I found Cassiopeia, like a big, wide “W” in the sky. He brought out a star chart to help me identify the constellations. Even though I was tired, it was definitely worth staying up a little later than usual.

Another job I learned how to do was check the inclinometer when the dredge came up on deck. (I had to wear a hard hat for safety.) It is a device which checks the dredge’s towing efficiency. A hand held wand type device transfers information from the inclinometer, which is stored in a protective steel tube at the top of the dredge. Once back in the workroom, I would download the information onto a computer and print out a copy in graph form. We could see from the graph if the dredge flipped when it went into the water. If it did, then we would have to turn around and retow. This happened only twice that I am aware of during the entire trip. The Chief Scientist ultimately analyzes all the data.

And I learned how to shuck a scallop! We could shuck scallops for the galley in our down time if the scallops came from an open area. I’ve had them smoked, baked, sautéed, and even raw, marinated in special sauces. Not that I’m a connoisseur now, but I’ve certainly learned to enjoy them.

### **Questions of the Day**

Estimate how many miles we will have traveled on our entire trip. Remember we have zigzagged on our course from Woods Hole to the southern end of Virginia and back. We left Woods Hole on the afternoon of July 10th and we will be returning at 7:00 AM on Friday, July 20<sup>th</sup>.

How many gallons of diesel fuel does the ship hold? The ALBATROSS IV is a 187 foot long vessel with a breadth of 33 feet, and a draft of 17 feet 3 inches. (It displaces 1115 tons of water.)

How does the ship get fresh water?