NOAA Teacher at Sea
Elizabeth Eubanks
Onboard NOAA Ship DAVID STARR JORDAN
July 22 – August 3, 2007

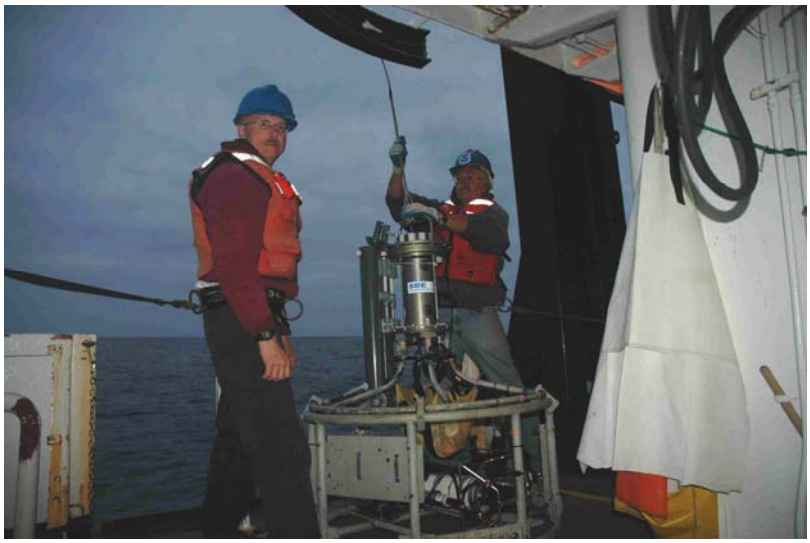
NOAA Teacher at Sea: Elizabeth Eubanks
NOAA ship DAVID STARR JORDAN
Mission: Catch rates of pelagic sharks comparing J hooks to Circular hooks in support of The Relative Abundance of Sharks Survey
Date: Day 11, August 1, 2007, Wednesday
Pacific Ocean – West of San Nicholas

Weather Data from the Bridge taken at 1300 (1pm) - Deep Sea Temp at (2000) 8pm
Visibility: 10 miles
Air temperature: 17.4.0 degrees C
Sea Temperature at 500 m: 4 degrees C
Sea Temperature at surface: 15.2 degrees C
Wind Direction: 300 W
Wind Speed: 13 kts
Cloud cover: cloudy–stratus
Sea Level Pressure: 1014.7 MB
Sea Wave Height: 1-2 ft
Swell Wave Height: 3-4 ft

Science and Technology Log

Make use of all or your resources! Yes, this ship is charted to study sharks, but as mentioned previously there are many other research projects going on. Dr. Russ Vetter and Eric Lynn are administering a CTD apparatus twice daily in the proximity of where the long lines are set: every night at 2000 (8pm) and every morning at 0500 (5am).

CTD stands for Conductivity, Temperature and Depth. This machine costs approximately $15,000



NOAA scientists, Eric Lynn and Dr. Russ Vetter prepare to lower the CTD. Notice the green cylinders on the left side of the CTD – they are bottles for water samples.

and helps give scientist data to evaluate.

The apparatus is dropped from a J Frame, a crane-like structure, from the ship into the ocean, while being guided by E. Lynn and R. Vetter who are strapped to the ship. *See photos above and below.* The apparatus contains two bottles, similar to a large thermos. Both bottles are open all the way down, depending at what depth the CTD drops to. On this trip it has ranged between 250m and 1,000m down. Once it gets to its destination the scientist pushes a button on their computer that is connected to the bottles and tells them to fire. This action shuts the bottles trapping water samples inside. One bottle is used for maximum depth water collection and the other is used for water sample collections at 10m. They have boxes filled with water samples that will be taken back to San Diego for testing by other scientists.

There are many other structures on the CTD that measure, salinity, temperature, depth, oxygen levels and fluorescence. Fluorescence measures how much chlorophyll is in the ocean and can be compared to the oxygen levels.

Chemical Scientists who work for NOAA have put CO_2 detection equipment on board many of the NOAA ships including the NOAA ship DAVID STARR JORDAN. The scientists do not travel with the ship, but come and check the data quite often. Global warming and CO_2 levels in the atmosphere have been a hot topic. Many, many years ago when scientists were determining what to do with all the extra CO_2, they had thought about pumping into the ocean. Thinking has changed a lot since then. Now scientists realize that the extra CO_2 in the ocean is just as detrimental to the ocean as it is to the atmosphere. *We're all connected, we're all affected.*

The CTD being lowered from the J Frame on the NOAA ship DAVID STARR JORDAN

A very simple way to think about this is to think of the age-old science experiment of when you put a tooth in a bottle of soda and after a short time the tooth dissolves. When CO_2 is added to ocean water it creates a carbonic acid. Our bones are made of the mineral

calcium (Ca) which keeps them hard and allows them to support our bodies. Sea creatures that have bones or a shell count on Ca as well. Can you imagine what would happen to a clam that didn't have enough Ca to make a shell? Or could you imagine a clam that had a shell and the acidic ocean water ate it up? These are things we need to imagine. Because of the increase in CO_2, our average ocean *Ph* has dropped from ~ 8.1 down to 7.8, thus making the ocean more acidic. What I write here is only a first stepping stone to so many various things that are occurring with an increase of CO_2 levels on our planet.

Personal Log

I can recall sitting in my classroom sometime in March or April. Maggie, a student, was in the room and it was well over an hour after school. I checked my email as I do routinely and there it was, the long awaited message from NOAA. I was a little nervous opening it, but did rather quickly. I was so excited to find out that I had been chosen to participate and immediately shared the news with Maggie, Rob and Dr. Finely the principal of my school. Anticipation filled my life until I got my assignment which was to board the NOAA Ship ALBATROSS IV in July, out of Woodshole, Mass to do a sea scallop survey.

Of course I started reading all of the logs teachers had written. I prepared myself for working 12-hour shifts and measuring scallops. In May, when the staff at NOAA realized I would be in San Diego and that there was an opening on the NOAA Ship DAVID STARR JORDAN, they called and asked if I wanted to work with sharks.

It only took me 24 hours to accept that position and then I had new logs to read and new things to anticipate. I was extremely excited and equally as nervous. Would I get sick? Would people be nice? Would I feel safe and comfortable? Would I like the jobs I needed to do? Was I capable of doing the jobs? Oh no – I am not so great with the metric system, will people think I am stupid if I have to think and research before making a conversion? How much will I miss Rob? Will I like boat life? Then my questions even got more specific. Will have enough food? Which snacks should I bring? What does closed-toed shoes mean-- can I wear Keens? Do I bring a towel? How many hobby supplies or books should I bring? How many girls will be there? Do we have to share a room with a guy (really I didn't know)? You can imagine all of the questions I had and they didn't stop until I had spent 24 hours on the ship and then I understood.

Here I am 11 days into this amazing adventure that has far surpassed anything I imagined. I have 2 more nights to get a giant "rock" (from the ocean waves) to sleep and 3 days to live **on** the Pacific Ocean. We only have 2.5 sets left to do. Amazing. – I am going to enjoy every bit – starting right now – I am going to enjoy some of the great folks on board. Amazing

Oh happy day,
Elizabeth Eubanks

Please direct your emails (questions for me and answers to my questions) to the email address listed below. I will **NOT** be checking my yahoo email account until I return to land!

elizabeth.eubanks.atsea@jonems.jordan.omao.noaa.gov

Please note: the NOAA person that is uploading my logs has been on vacation. She is currently uploading them now. If you would like to continue answering questions from my logs, you may do so up until August 14, 2007 to get extra credit. Please use my hoocaca@yahoo.com account on and after August 3, 2007

Question of the Day
3 questions

What are some things YOU can do to further prevent the ocean from becoming more acidic?

What is a terapod?

What are some things that you anticipate about the upcoming school year?

Question of the trip
Which hook, the J or Circle will catch more sharks?
Please make a hypothesis. Utilize resources to justify your hypothesis. ---------Yes, you get extra credit for this.