NOAA Teacher at Sea
Jenny Holen
Onboard NOAA Ship OSCAR ELTON SETTE
September 17 – 21, 2006

NOAA Teacher at Sea: Jenny Holen
NOAA Ship: OSCAR ELTON SETTE
Mission: Hawaiian billfish larval and eggs survey
Day 4: Wednesday, September 20, 2006

Weather Data from Lab
Location: 2 miles off Keauhou, Hawaii
Depth: 77.75 m or 233 feet
Water Visibility: Clear & gorgeous
Water Temperature: 26.61 C
Salinity: 34.59 PSU
Wind Direction: 223.02, south-west
Wind Speed: 4.01 knots
Air Temperature: 26.5 C
Cloud Cover: rain clouds in distant above islands hills

Vials of preserved mahi-mahi larvae captured with an Isaacs-Kidd net off the Kona coast of the Island of Hawaii, during a plankton research cruise aboard the SETTE.

Science & Technology
Yesterday, the routine was very similar to Monday. The NOAA ship was 45 miles out, performing plankton tows from 6 a.m. to about 7 p.m. We did not catch much billfish larva or eggs, but we did catch a lot, I repeat, a lot of little fish. We were even catching baby tropical fish that must have got caught on the giant seaward current that runs offshore of the big island. Unfortunately, I got very sea sick "again" mid afternoon, and wasn't able to do much but take photographs of the plankton. I did how ever, get some "killer" microscopic photography shots and some very cool, short videos of live plankton species in action.

OSCAR ELTON SETTE traveled through the night and we finally got back to the Kona coastline, about 1-2 miles offshore, where it was calm. I, finally, got to sleep that night without being seasick! In the morning, the island rose out of the mist and exposed beautiful hues of tropical greens against the dashing blue sky and crystal clear turquoise waters. Today, sadly our last day, we are performing plankton tows amongst the coastal "slicks." Now what is a slick you ask? Well, according to Russell, one of the lead scientists with us from La Jolla, California, the slicks are formed due to wind currents coming off the island that gently push down on the waters surface forming a glassy phenomenon amongst a rippling environment. Here, due to the stillness and protection, millions of larva fish and some human trash harbor. The fishermen who are catching baitfish usually troll their nets through here. The interesting aspect that Russell talks

about behind these slick communities is that they "are aged." Some are very young because the spot has been recently open, and some are more mature and older because nothing has bothered them.

TAS Jenny Holen getting ready to repeat the hourly toss, from sunrise to sunset, of the Isaacs-Kidd net while aboard the SETTE.

Today, we hunt through these slicks in hopes of finding billfish marlin eggs and larva. We hit one slick that gave us a bunch! Then we spent the rest of the day getting nothing, and hunting for that original slick. I got many more photographs with my Olympus Mic-D microscope of which both Bob and Russell got copies. One fun thing the scientist and I did today was "pose" in the laboratory for National Geographic pictures taken by David the author of *Archapelago*. We were still searching for eggs in the newly caught plankton and doing our work, he just made the station and set-up look good. It would be SO cool to end up in an article of *National Geographic*. That I'll have to show off and frame! At 3 p.m., I left the ship in view of waving hands and smiling faces from all the crew. It was sad, but what an unforgettable experience I have had these past four days.

Personal Log

After being sick for the last 2 days, barely being able to walk through the ship to my room, let alone type on a computer, I finally took some Bonnie medicine from the ships nurse, Sarah. After three days out at sea, doing the same thing every day, every hour, I start to realize the required monotony and dedication of scientific research. In order to accomplish a desired goal of finding out a particular question, such as which billfish eggs and larva turn into which adult species; a lot of repetitive analysis and trials must be done in order to come to a clear consensus or even obtain part of an answer to the overall question. Having been a tall ship sailor for two years, my mind wonders to historical maritime scientific expeditions, such as the three-year voyage of H.M.S. Challenger in the 1800's; John Steinbeck's journey through the Sea of Cortez; Darwin's five-year Galapagos voyage on the H.M.S Beagle; and even to Nathanial Bowditch grasping celestial navigation with no background experience out at sea. These men not only had to endure

TAS Jenny Holen taking a break from the rigorous microscopic search for billfish larva and eggs aboard the SETTE 45 miles out from the Big Island of Hawaii.

environmental changes of heat, wind and rain while trying to collect scientific samples, but also had to compensate research time versus sailing obligations when seas became rough, or duty called. Imagine, instead of simply taking pictures of the plankton found (with your Mic-D microscope), you had to literally draw each organism with only a magnifying glass as an aid.

It is just incredible how far we, as mankind, have come towards uncovering the mysteries of the ocean within only the past 200 or so years. Yet, it is even more astounding to know how much we have yet to still uncover. Imagine a plate showing only a 10% sliver of a colorful picture underneath. There is no way we would be able to guess what the picture is displaying. This is our world's ocean knowledge. There is so much work to be done and to discover that it is essential for the next generation and the one after that to know that they can still be a Jacques Cousteau or a Charles Darwin, discovering and revealing secrets only the giant whales can see. Imagine marveling at a newly discovered specimen in admiration of the diversity of the sea. As with all maritime sailors, ocean goers, and even pirates, the ocean is our home. I had an opportunity on the NOAA ship OCSAR ELTON SETTE to simply look closer at it and view its secrets for just a brief moment along the great span of time.

Question of the Day
"How does a Hawaiian sunset make a green flash?"

According to Karl Mangels the Commanding Officer of the NOAA ship OSCAR ELTON SETTE, a green flash is due to an angle refraction of light from the sun as it is setting. Only to be seen in the tropics during clear skies, the angle at which we are positioned on the earth compared to where the sun is creates a light refraction where we see a green spot were the sun just set. Kind of like the colors of rainbow's and rain. In accordance with Hilo's Bishop Museum, "as our atmosphere bends the sun's rays, they are also dispersed or broken up into different colors." Green flashes are thus the result of "colored arcs of light above and below the bright orange disk of the sun."

http://www.bishopmuseum.org/planetarium/greenflash.html