NOAA Teacher at Sea
Lisha Lander Hylton
Onboard NOAA Ship DELAWARE II
June 29 – July 11, 2008

NOAA Teacher at Sea: Lisha Lander Hylton
NOAA Ship DELAWARE II
Mission: Surfclam and quahog survey
Geographical area of cruise: Off the coast of the northeast United States
Date: Saturday, July 5, 2008; Stations 72-82

Weather Data from the Bridge

Today's weather e-mail:

UNCLAS //N03144//
MSGID/GENADMIN/NAVMARFCSTCEN NORFOLK VA//
SUBJ/WEAX/NOAAS DELAWARE II//
July 5th, 2008 REF/A/MSG/NOAAS DELAWARE II/022000ZJUL08//
REF/B/WEB/NOAA SHIP TRACKER/041747ZJUL08//
NARR/REF A IS MOVREP. REF B IS NOAA SHIP TRACKER PAGE.//
POC/SHIP ROUTING OFFICER/-/NAVMARFCSTCEN/LOC:NORFOLK VA
/TEL:757-444-4044/EMAIL: MARITIME.SRO(AT)NAVY.MIL//
RMKS/1. METEOROLOGICAL SITUATION AT 051200Z:
A LOW PRESSURE SYSTEM OVER THE LABRADOR SEA WITH A COLD FRONT
EXTENDING ALONG THE NORTHEASTERN SEABOARD HAS AN ASSOCIATED
STATIONARY BOUNDARY ALONG THE TRAILING EDGE OF THE COLD
FRONT WHICH EXTENDS INTO THE MID ATLANTIC STATES. STRONG HIGH
PRESSURE REMAINS ANCHORED IN THE NORTH CENTRAL ATLANTIC.
2. 24 HOUR FORECAST COMMENCING 060000Z FOR YOUR MODLOC AS INDICATED
BY REFERENCES A AND B.
A. SKY, WEATHER: PARTLY CLOUDY TO MOSTLY CLOUDY WITH ISOLATED
SHOWERS AND THUNDERSTORMS.
B. VSBY (NM): 7, 3 TO 5 IN SHOWERS, 2 TO 4 IN THUNDERSTORMS.
C. SURFACE WIND (KTS): SOUTHWESTERLY 5 TO 10, INCREASING 10
TO 15 GUSTS 20 LATE PERIOD.
D. COMBINED SEAS (FT): SOUTH-SOUTHWEST 2 TO 4, BUILDING 4
TO 6 LATE PERIOD.
3. OUTLOOK TO 48 HOURS: WIND SOUTHWESTERLY 10 TO 15 GUSTS 20 INCREASING
15 TO 20 GUSTS 25 EARLY PERIOD, DECREASING 10 TO 15 GUSTS 20 BY LATE PERIOD.
SEAS SOUTH-SOUTHWEST 4 TO 6, BUILDING 5 TO 7 EARLY PERIOD.
4. FORECASTER: AG2(AW/SW) SCOTT//

V/r,

Command Duty Officer
Naval Maritime Forecast Center Norfolk

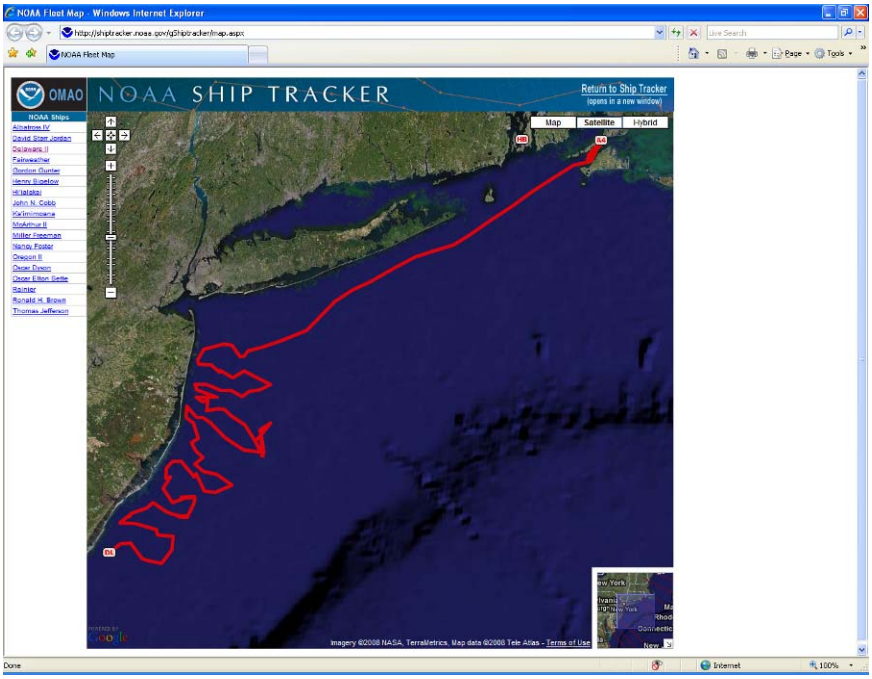
http://www.weather.navy.mil
http://www.nlmoc.navy.smil.mil

PLA:
NAVLANTMETOCCEN NORFOLK VA

Science and Technology Log

Ship Tracker

NOAA has a Web site that can show you the path of each of its ships in near real time. Below is the track of the DELAWARE II from June 30 – July 5, 2008. The red line shows exactly where the DELAWARE has gone.



If you'd like to track the DELAWARE or any other NOAA ships yourself, then go to this Web site:

http://shiptracker.noaa.gov/ship.aspx?ship_code=DESCSACQ2K&timeframe=cc&mapservice=st_nmao

Clam Surveys

On the DELAWARE II our team is in the process of conducting a clam survey. This particular fishery survey is on clams. After dredging, collecting, sorting, counting, measuring and weighing (clam with shell and shucked clam meat only) – the data obtained is recorded and entered into computers filed under the specific station number that was dredged. All data is then sent to a central data base. The compiled data can then be compared to past surveys.

Lisha holding sea specimens retrieved from clam dredge

If the actual meat weight, size, quantity or quality of clams collected has reduced in comparison to past surveys, this could be an indication that some factor is influencing the reduction. Possible influencing factor: Clams are being over-fished.

However, clam fisheries are a very important part of the economy, especially in the northeastern part of the United States. Many people depend on clam fishing for a living. As long as clams are not over-fished, the balance between economy and ecology can remain stable. Not only could this affect the clam population, but other marine life in this particular ecosystem could be affected as well because in an ecosystem ~ all living and non-living things in the environment must interact and work together for the ecosystem to be productive. This is why it is vital that NOAA scientists continue to survey and keep track of the productivity in our ocean environments for future generations.

Lisha in the clam dredge towing out the dark, clay sediment.

We document and record the data on all marine life that is pulled out from the dredge. These species are important documentation in clam surveys because in an ecosystem, all living organisms (and non-living things) depend on each other, interacting to produce food chains and food webs.

Early this morning, we entered 2 separate stations, just a few miles apart. These 2 stations were loaded with a huge quantity of very healthy, large sized, heavy meat clams. Vic noticed that not only did these 2 stations contain lots of large, healthy clams but that there was a lot of clean,

sand sediment with very little other types of sediment. Sediment is defined as organic matter or mineral deposited by ice, air, or water. Sediment can be mud, clay, rock, gravel, shell fragments, silt, sand, pebbles or dead organic material (called detrius). The various sediments are sometimes mixed and are found in various textures, consistency and colors. Unlike these 2 sandy stations, the 69 stations we had already dredged all contained various other types of sediment. Above and to the right are some pictures of a prior station that contained sediment of dark, hard clay.

Lisha, Mark Harris and Richard Raynes in the clam dredge towing out the remains of the mud sediment.

Vic instructed the crew at this point that we needed to get a sediment sample from the two nearby stations that we were fixing to dredge. I was asked to retrieve it with the aid of Jimbo Pontz and Lino Luis who operated the bottom grab (a device used to lower down into the ocean operated by an electric cable, for the purpose of retrieving sediment.)

Lisha "gearing up" in safety equipment

First, Vic instructed me to "GEAR UP"; safety gear is a major priority on all NOAA ships. I was given a safety harness to put on, along with a life jacket, and a hard helmet.

Then, the bottom grabber was lowered into the water and it collected the samples, towed back up by Lino Luis and emptied by Jimbo Pontz. I collected 2 cups of the sand sediment at both locations, prior to the dredge being hauled back up to the deck. Note how clean and "new" the sand sediment looks. It is not mixed with a lot of other sediments. Sure enough, we again

collected a huge load of healthy, large size, weighty meat clams covered in the same sediment seen in the picture above.

Lisha collecting the sediment sample that was hauled in by the bottom grab.

The Bottom Grab

Big Question of the Day

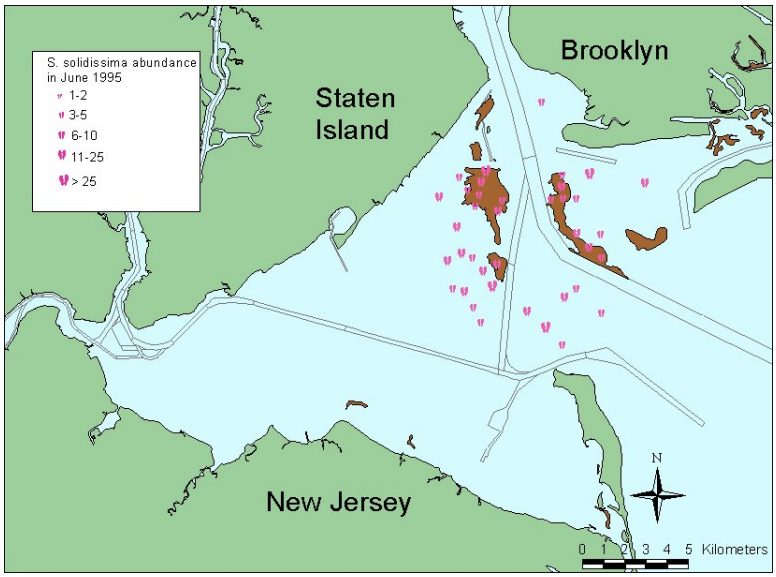
Science Researchers have concluded that over the past century, sea level is rising at increasing rates, (possibly linked to Global Warming). Global warming is defined as the observed increase in the earth's air and oceans in recent decades due to greenhouse gases and the theory that this temperature rising will continue to increase. The rising of sea level causes an "environmental change". Some environmental changes on Earth occur almost instantly, due to Natural Disasters (like a hurricane or other massive storm events). Scientists that study environmental changes due to past storm events are called Paleotempostologists. Other environmental changes can take decades, centuries, or thousands of years (like the rising of sea level). These environmental changes often cause new sediment to be deposited on top of older sediment.

The adult, large, healthy, meaty-weight surf clams found today in the location where we sampled medium to coarse-grained sand were retrieved at stations offshore in cold and deep water; (the depth recorded by Jakub Kircun – Seagoing Technician as 70 feet). *Could it be that environmental changes on the ocean floor are taking place due to the rise of sea level?*

Could the medium to coarse-grained sand sediment sampled today possibly be a new layer of sediment due to rising sea levels causing a relocation of some marine species (like surf clams)?

The following research is derived from this Web site:
* http://www.csc.noaa.gov/lcr/nyharbor/html/gallery/sgspisul.html

* "Surf clams utilize an unusual behavior in response to stress: they leap from the sediment surface in order to relocate. Surf clams have been observed using this avoidance behavior in response to crowding and the presence of predators.



Abundance of surf clams in New York Harbor in June 1995

Surf clams are mostly oceanic in distribution, preferring turbulent waters at the edge of the breaker zone. They can be found in some estuarine areas, but their distribution is limited by salinity (Fay et al. 1983). In New York/New Jersey Harbor, surf clams are found predominantly in the area where the harbor opens into the Atlantic Ocean. Juvenile clams prefer medium to fine, low organic sands averaging 9 to 25 meters in depth. Adults prefer medium- to coarse-grained sand and gravel, burying themselves just below the sediment surface. They are often found at evenly distributed positions relative to one another, with spacing interval negatively correlated to density. Additionally, adults often remain in their juvenile burrows unless they are displaced by storm events (Fay et al. 1983). Predation by crabs, gastropods, and bottom-feeding fish have been observed to limit development of beds in nearshore areas colonized by larval surf clams, relocating to colder, deeper water."

New Term/Word/Phrase
Ecosystem: an environment where living and non-living things interact and work together.
Bottom Grab: A device used to lower onto the ocean floor for the purpose of gathering sediment.

Something to Think About
Are surf clams relocating?

Animals Seen Today
Asterial boreal
Lady crab
Eel
Moonsnail
Shark eye northern snail
Stargazer fish
Whelk
Sea cucumber