



**NOAA Teacher at Sea**  
**Eric Heltzel**  
**Onboard NOAA Ship RONALD H. BROWN**  
**September 26 – October 22, 2005**

**Log 8**

**NOAA Teacher at Sea:** Eric Heltzel  
**NOAA Ship** RONALD H. BROWN  
**Mission:** Stratus 6  
**Wednesday, October 5, 2005**

**Weather Data from Bridge, 07:00**

Temperature: 19.5 degrees C  
Sea level Atmospheric pressure: 1010 mb  
Relative Humidity: 90.5%  
Clouds cover: 8/8, stratocumulus, altostratus  
Visibility: 9 nm  
Wind direction: 230 degrees  
Wind speed: 6kts.  
Wave height: 3 – 4'  
Swell wave height: 3 – 5'  
Seawater Temperature: 19.5 degrees C  
Salinity: 34.7 parts per thousand

**Science and Technology Log**

Notice that the seawater temperature declined from 28.7 to 18.8 degrees C between yesterday and today. We crossed the equator last night so this must have something to do with it. I went to Doctor Weller and asked for an explanation:

At this latitude and at this season we are still under the influence of the southeast Trade Winds. Wave motion generates and moves at 90 degrees to the wind direction. Now the Coriolis Effect comes into play causing waves to deflect to the left in the southern hemisphere. That means that the prevailing wave direction is from northeast to southwest south of the equator.

As the winds move into the northern hemisphere wave movement is still at 90 degrees. However, now the Coriolis Effect causes waves to deflect to the right, from southwest to northeast. So this time of year the wave motion in the two hemispheres is 180 degrees to one another. As the surface waters move apart, deeper ocean water comes to the surface to fill the area evacuated by the surface wave motion. This water is coming from greater depths and is colder. This accounts for the lowering of the seawater temperature. Dr. Weller suggests that this action brings nutrients to the surface which should enhance feeding opportunities for marine life.

Vertical and horizontal motion of ocean water causes constant exchanges of heat energy. These exchanges are between water of different temperatures and also the atmosphere. Currents, waves, upwelling, evaporation, and winds are just some of the

factors that influence heat exchanges on planet earth. These processes are critical to maintaining global climates. Dr. Weller's Upper Ocean Processes Group seeks to better understand these relationships.

### **Ship Crew Activity**

I went to the Bridge this morning to gather weather and sea condition data. The Officer of the Deck was LTJG Silas Ayers and the Watch Stander was Ordinary Seaman Phil Pokorski. The Bridge Officer always has a crewmember with them whose job it is to be lookout to scan the ocean and report what can be seen. This could be another ship, debris, or whales. The crewmember takes a sighting and determines the distance and bearing. Avoiding collision is an important job for the Officer of the Deck.

While there, the three of us engaged in a discussion of nautical measurements and their equivalencies. LTJG Ayers went to the Chart Room and extracted a reference book. Here are the values we found:

Fathom = 6 feet, 2 yards, 1.8288 meters

Cable = 720 feet, 240 yards, 219.4560 meters

Statute Mile = 5280 feet, 1760 yards, 1609.344 meters

Nautical Mile = 6,076.11548556 feet, 1852 meters, 1.150779448 statute miles

League = 3 statute miles, 4830 meters

(As in 20,000 Leagues under the Sea)

Being a Jules Verne fan, I've often wondered how far 20,000 leagues really is. Now I know that it is 60,000 statute miles. But nowhere is the ocean nearly that deep. Phil then pointed out that Verne was referring to horizontal distance traveled while submerged in the Nautilus. Finally the title of his tale makes sense to me.

### **Personal Note**

Starting last evening I was hearing a squeaking sound. At first I thought it was my deck shoes squeaking on the tile deck floors. Then I notice that even when I wasn't moving the sound persisted. I was beginning to wonder if being at sea and wearing a motion sickness patch wasn't causing me to be hallucinatory. I looked and looked for the source of the sound. I finally asked Dr. Weller if he could hear it and fortunately he said yes. It is the sound generated by the Sea Beam, the ocean floor profiler. I was relieved to know that it wasn't just me hearing this sound.