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

Log 9

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

Weather Data from Bridge, 07:00

Temperature: 19.1 degrees C
Sea level Atmospheric pressure: 1012 mb
Relative Humidity: 78%
Clouds cover: 8/8, stratocumulus
Visibility: 12 nm
Wind direction: 160 degrees
Wind speed: 6kts.
Wave height: 3 – 5'
Swell wave height: 3 – 5'
Seawater Temperature: 18.3 degrees C
Salinity: 35.2 parts per thousand

Eric on the bridge of the RON BROWN

The Stratus Buoy

Science and Technology Log

The science team from the Upper Ocean Processes Group is busy preparing instruments to be deployed on the mooring of the Stratus 5 Buoy. Each instrument must be physically examined to ensure that it is properly mounted in its' rack. Then these instruments are awakened to make sure that they are working properly. They are hooked up to a computer so that their operation and calibration can be tested.

Today I had a look at a mechanical current meter. These were designed by Senior Scientist, Dr. Bob Weller as part of his Doctoral work at Scripps Institute. The instrument is housed in an aluminum cylinder that is 2 ½ feet long and 7" in diameter. The canister is water tight utilizing two interior rubber seals. Extending from one end is a 3' long PCV mast that has two propeller mounts

on it. At each mount are two sets of propellers on either side of the hub. The two mounts are set at 90 degrees to one another. When water flows through the propellers revolutions are measure and the data is stored in a chip inside the canister. The number of revolutions per given unit of time gives the velocity of the current. Having two sets of propellers set at 90-degree angles allows the direction of the current to be determined.

There is also a second type of current meter that uses measurements of sound waves to determine current velocity. Several of these will be deployed on the mooring along with the mechanical current meters. Using two types of instruments allows the team to compare results. The mechanical units have been used for about 20 years and they are known to be reliable and accurate. Placing the acoustic velocity meter nearby will help determine the accuracy of these devices.

Questions to Consider

Why are all the instrument cases cylindrical in shape?

Why is a “sacrificial zinc anode” placed on each end of the mechanical current meter?

How could the direction of a current be determined using two sets of propellers at 90-degree angles to one another?

Why build canisters out of aluminum?