



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

Log 12

NOAA Teacher at Sea: Eric Heltzel
NOAA Ship RONALD H. BROWN
Mission: Stratus 6
Sunday, October 9, 2005

Weather Data from Bridge, 07:00

Temperature: 18 degrees C
Sea level Atmospheric pressure: 1018 mb
Relative Humidity: 65%
Clouds cover: 8/8, stratocumulus
Visibility: 10 nm
Wind direction: 130 degrees
Wind speed: 15kts.
Wave height: 5 – 6'
Swell wave height: 6 – 8'
Swell direction: 140 degrees
Seawater Temperature: 18.6 degrees C
Salinity: 35.3 parts per thousand
Ocean depth: 4500 meters

Science and Technology Log

After Dr. Lundquist and I have a successful radiosonde launch we return to the computer terminal and watch the measurement data come in. My favorite display is a color-coded graph showing temperature, dew point, and relative humidity graphed against the altitude of the radiosonde. The main area of study is taking place where we are in the eastern Pacific off the coast of northern Chile. In this area there is a large, semi-permanent layer of stratus clouds. The effects these clouds have on the ocean temperature, and vice versa, is one of the reasons for choosing this area to study.

As the balloon ascends from the ship the temperature cools at the dry adiabatic rate. The dew point goes down but not as rapidly. Usually at an elevation of about 600 meters the dew point and temperature intersect. On the same screen green line showing relative humidity hits 100% as we would expect. This marks the base of the cloud layer.

As the radiosonde ascends another 200 to 400 meters the temperature shoots way up, as much as 8 degrees C. This indicates the top on the cloud layer where the sun is shining brightly. As the balloon continues to ascend the temperature once again cools consistently at the dry adiabatic rate. It's about negative forty degrees C at an altitude of 20 kilometers. In this part of the atmosphere the relative humidity approaches zero and the dew point stays well below the air temperature. This suggests the upper air is

descending and is stable. The bottom 800 meters is referred to as a marine boundary layer.

Despite the constant cloud cover there is very little precipitation in this area. Temperatures at the ocean level are surprisingly cool as evidenced by most of the crew wearing long pants and jackets or sweatshirts. Atmospheric and oceanic data in this area are very sparse. One goal of the Stratus Project is to gather more information so we can better understand the interrelationships between ocean and atmosphere.

Personal log:

As I write this I am on my watch in the main science lab. I'm preparing to launch a Drifter in about 15 minutes and I will launch a weather balloon at 13:00. It's really fun to throw things into the ocean and release balloons into the atmosphere and see where they go.

Our ETA at the Stratus mooring site is 17:30. We are approaching the end of our southerly leg of our cruise. There are about six days of work scheduled at the buoy site. It should be interesting.