Journal #6

January 14,2005

1. 142200Z January 05
2. Position: Lat: 24-00.0S, LONG: 150-00.0W
3. Course: On Station
4. Speed: 11.4 kts
5. Distance: 92.0 NM
6. Steaming Time: 08H 06M
7. Station Time: 15H 54M
8. Fuel: 2,768 gals
9. Sky: Cu, 3
10. Wind: 005-T, 10 Kts.
11. Sea: 005-T, 1-2 Ft
12. Swell: 170-T, 3-4 Ft
13. Barometer: 1013.3 Mb
14. Temperature: Air: 31.0 C, Sea: 27.2 C
15. Equipment Status: Normal
16. Comments: CTD deployed at station 17

MASTER, R/V ROGER REVELLE

Another warm day of calm seas, but we can feel the air cooling slightly and there are many clouds on the distant horizon and we can see the rain storms. As we go further south along 150°W longitude and get closer to the "roaring forties" the weather will continues to get colder and the seas will increase in size. I'd like my students to see if they can remember from our class discussions and lessons on global wind driven currents if they can guess why the latitudes south of 40° might be called the "roaring forties"? What types of phenomena are occurring that the seas might become rougher and the waves larger?

One of the groups working on the cruise are from the Rosenthiel School of Oceanic and Atmospheric Sciences in Coral Gable, Florida. Dr. David Cooper is a consultant for this project and Charlene Grall is a technitian. They are doing CFC sampling from the CTD rosette. The Rosenthiel School has been involved in the CLIVAR program from the beginning and even before as part of JGOFS (The Joint Global Ocean Flux Study) which is the "ancestor" of CLIVAR.
One of the things being looked at by both JGOFS and CLIVAR is the carbon cycle. The oceans contain some 50 times as much carbon dioxide as the atmosphere, and small changes in the ocean carbon cycle can therefore have large atmospheric consequences. Such changes are believed to have had important feedback effects on climate during the transitions to and from the ice ages; they may also have important consequences during the climate changes predicted to occur in the next 50 - 100years, as a result of rapidly rising levels of carbon dioxide and other greenhouse gases. Computer models indicate that the

oceans are currently taking up at least a third of the man-made carbon dioxide, by dissolving it in water that then loses contact with the atmosphere because of sinking or vertical mixing. Biological processes complicate the oceanic carbon cycle; although they probably do not affect the present uptake of man-made carbon dioxide. In other words, phytoplankton in the ocean have an affect on the uptake of CO2 in the oceans, but do not affect it all that much right now. However one of the things being looked at by some scientists is whether we could increase phytoplankton production enough by artificially adding iron to the oceans and have them take up more CO2 out of the atmosphere. We will talk about this in more depth later.

On Monday I will take some plankton samples during the CTD cast and see what we have on the surface out here. I will direct my students to a website where they can see and compare satellite data of "Ocean Color" or chlorophyll levels and see if I should be in an area with a lot of plankton or in an area with little or no plankton and how that compares to my tow results.

For more information on the Rosenthiel School of Oceanic and Atmospheric Sciences and JGOFS go to: http://ioc.unesco.org/oceanteacher/resourcekit/module1/globalprograms/jgofs/intro.htm

My students should be doing a websearch on the Carbon Cycle and writing a summary of what it is and how it is involved with global warming for their journals, their journals should have diagrams of the carbon cycle as well as links for additional information. They can google: carbon cycle, global warming and greenhouse effect.