March 25, 2010 - Week #3: CLIVAR A13.5 Update

We have continued sampling and measuring various parameters routinely. We have experienced much smoother sailing conditions during the past week and have just passed the Tropic of Capricorn (about 23¹/₂ degrees south). The weather has finally warmed up with clear and bright skies. At this point we have reached the halfway point of our sampling stations and have been at sea for 23 out of the 42 scheduled days.

This week's update focuses on the measurements being made of oceanic tracers including chlorofluorocarbons (CFCs), Helium, Tritium, and Carbon-14. The presence of these compounds in the environment is largely due to human activities. CFCs have been used as refrigerant and in aerosols. Most of the tritium and Carbon 14 present in the environment was produced from nuclear weapon testing in decades past. These tracers exist in the atmosphere and dissolve in the surface layer of the ocean and are then transported by water movement to the ocean depths. Based on measurements of these substances in the ocean, we can obtain better estimates of the rates and pathways of ocean circulation and mixing processes and how these might be changing

The week also saw the release of the first of eight ARGO SOLO floats. There are also 18 surface drifters to be deployed during this cruise. After release, the floats will cycle from about 2000 meters depth in the ocean to the surface every 20 days or so, transmitting data back to shore on the vertical profiles of physical properties (temperature and salinity) of the ocean. The surface drifters provide information on the speed and direction of ocean currents, and ocean surface and atmospheric measurements.

The Atlantic Ocean covers an area of 82 million square kilometers (32 million square miles) with an average depth of 3,600 meters (11,812 feet), being the second largest ocean after the Pacific. It is also one of the busiest sea routes in the Western and Eastern Hemispheres. We are therefore on an intellectually challenging and physically stimulating cruise, providing an ideal experience in how modern oceanographic research is done. We are still on schedule and the work has gone well so far.