Daily Science Report
Stratus2007 Cruise
NOAA Ship Ronald H. Brown
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Summary of Recent Activities

The ship departed Panama as planned the morning of October 16. Observations were officially begun on October 18. The ship reached 20 S 75 W by the end of October 22 and spent almost two days at that location before departing to the west on October 24 and arriving at the WHOI buoy at 20 S 85 W on about 1200 GMT October 26 (Fig. 1). The ESRL observations include air-sea fluxes/near-surface bulk meteorology, cloud ceilometers, radar wind profiler, scanning Doppler C-band precipitation radar, a microwave radiometer for column water vapor/liquid, and aerosols in the 0.1 to 6 micrometer range. Rawinsonde launches were every 6 hours on October 26 (4-hourly launches began at the end of October 26). A sample rawinsonde profile taken at early morning local (1600 GMT) is shown in Fig. 2. A strong subsidence inversion typical of stratocumulus regions is visible at a height of about 1500 m; the relative humidity profile indicates a deep decoupled layer almost 1 km thick . Fig. 3 is a photograph taken at 1800 GMT. This photograph shows high thin clouds at the peak of afternoon warming. The cloud ceilometer return for the day is shown in Fig. 4. Drizzle events are visible as the milky-looking vertical streaks; a strong event is visible at 1130. The thicker clouds, stronger winds, and warmer water have reduced the net heat flux to the ocean to 80 W/m^2 (compared to 120 W/m^2 in the more coastal location of the DART buoy).

In Fig. 6 we show the data from the aerosol system for the period from October 22 through October 26. Note the lower aerosol concentrations (JD 295.5 to 296.5) which corresponded to the POC in that period. The total aerosol count decreased at the end of this period (JD 298), but notice that the larger size particles actually increased in concentration. Wind and smaller aerosols decrease again at the end of the period.

Major oceanographic activities centered on preparing for the next stage of buoy operations. The aft deck is now loaded with an array of subsurface sensors in preparation for deploying the new mooring. A drifter was deployed at 0030 GMT and an ARGO float at 0130 GMT. A deep CTD was done shortly after arriving at 20 S 85 W. The ship will remain at the WHOI buoy at 20 S 85 W for the next five days.

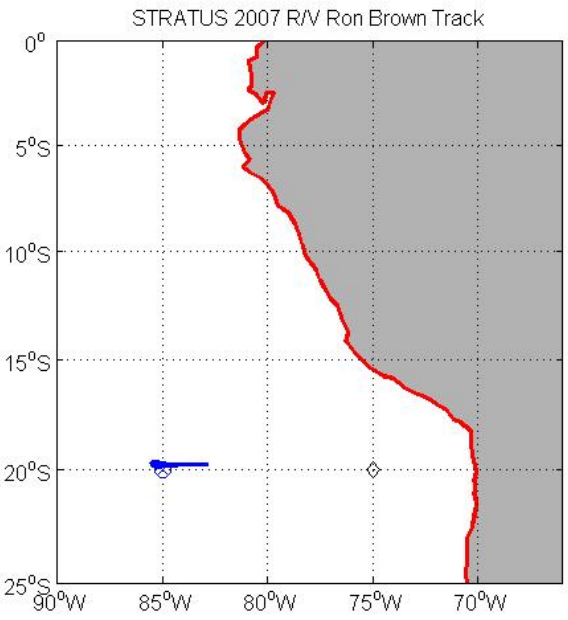

Figure 1. RHB cruise track on JD299 (Oct. 26). The diamond at 75 W is the SHOA tsunami buoy; the circle/plus at 85 W is the WHOI buoy.

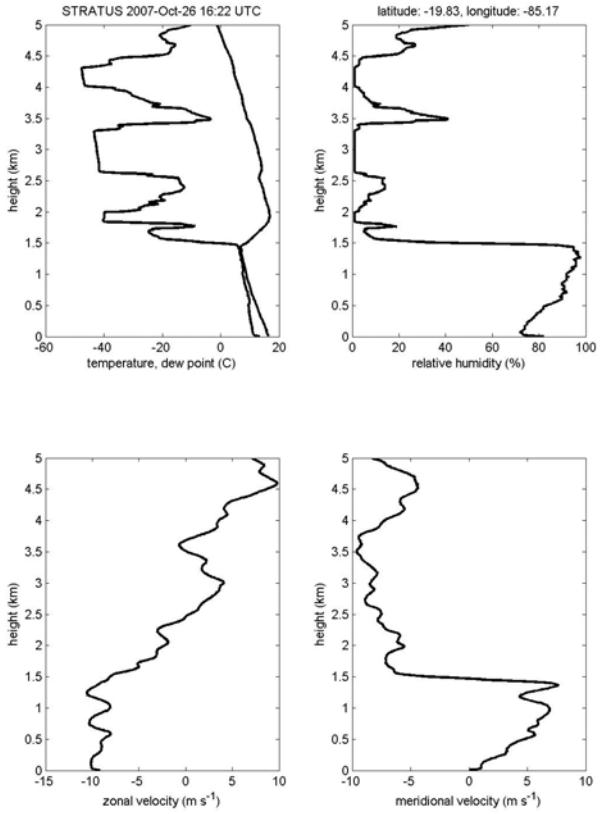

Figure 2. Rawinsonde profile 1600 GMT October 26.

Figure 3. Photograph of stratocumulus clouds 1800 GMT October 26 at 20 S 85 W.

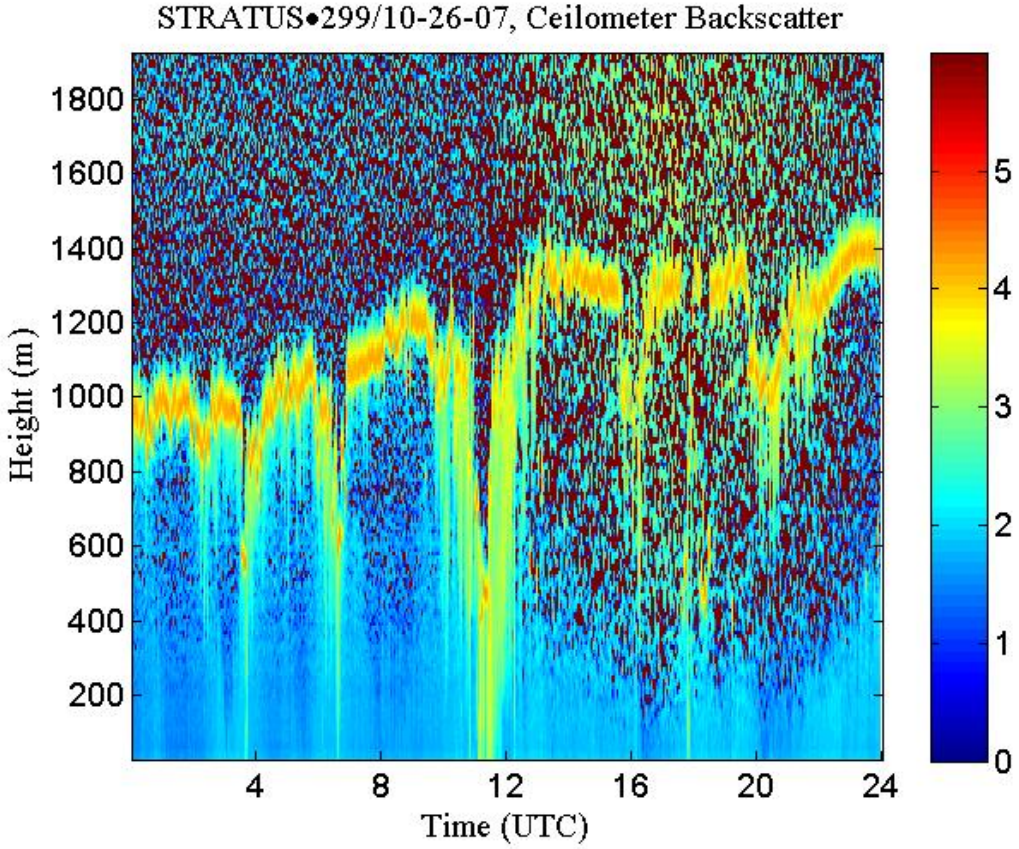

Figure 4. Time height cross section of ceilometer backscatter signal for October 26.

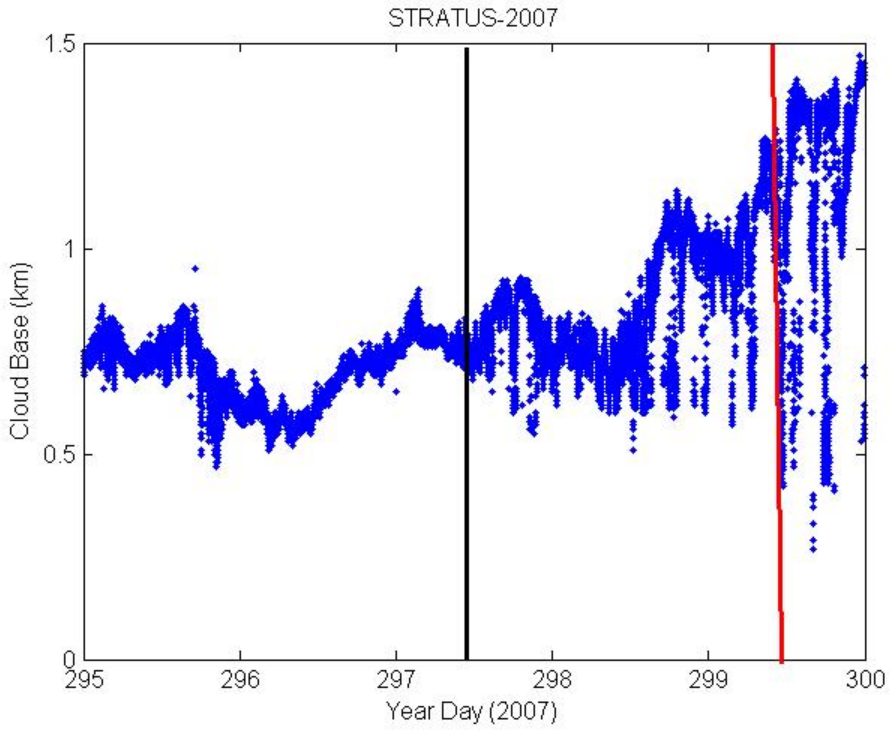

Figure 5. Time series of ceilometer cloudbase height from October 22 through October 26. The black vertical line denotes departure from 20 S 75 W; the red vertical line denotes arrival at 20 S 85 W.

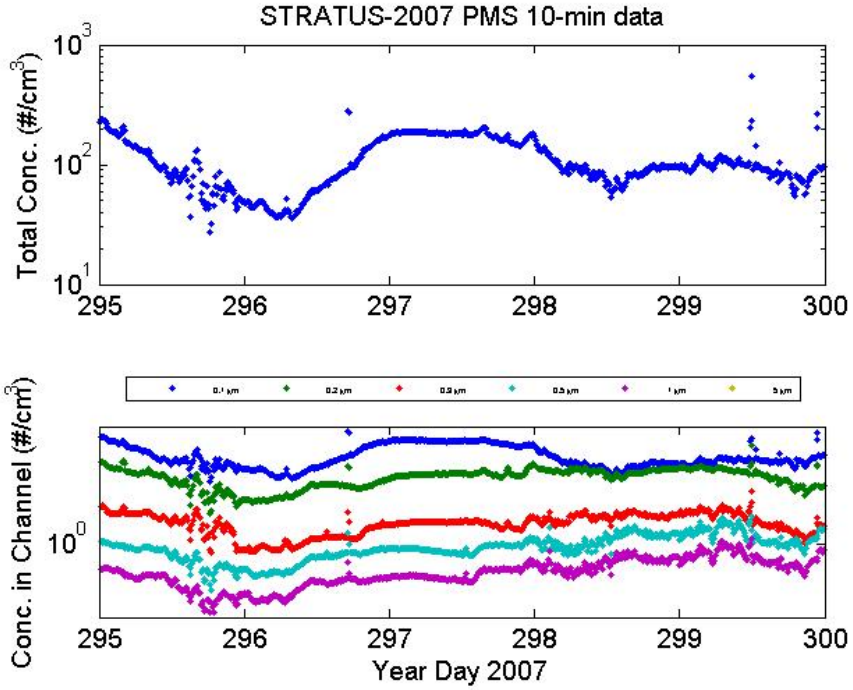

Figure 6. Time series of aerosol concentrations from October 22 through October 26. Upper panel: Total concentration for sizes from 0.1 to 5 micrometer. Lower panel: size resolved concentrations.

Figure 7. Photograph of WHOI buoy being position prior to launch on the aft deck of the Ronald H. Brown .