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 the entire day of Oct. 23 at that location (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 until reaching the buoy location at 20 S 85 W when the frequency was increased to every 4 hours (beginning 0000GMT on Oct 23). A sample rawinsonde profile is shown in Fig. 2; a strong subsidence inversion typical of stratocumulus regions is visible at a height of about 900 m. This trace is ambiguous about cloud base because the relative humidity approaches 100% but doesn't appear to reach it. Fig. 3 is a photograph taken at the same time as the sounding. The cloud ceilometer return for the day is shown in Fig. 4. A brief drizzle event is visible as light contours below the cloud at 0400.

Data from the aerosol system are shown in Fig. 5. In this case we show data from the transect from the Gulf of Panama to 20 S (290 to end of 296). Note the lowest aerosol concentrations in the precipitation region of the Gulf of Panama; the high values off N. Peru (about 300/cm^3) are typical of larger values usually found at the WHOI buoy site. A general trend appears in the transect south with the number of smaller particles increasing after a minimum on JD 293 but the number of larger particles is decreasing (possibly because of the lower wind speeds the last few days). However, on our arrival at the DART buoy site, aerosol concentrations dropped abruptly. This drop is associated with a 'pocket of open cells' (POC) cloud spatial structure that was visible on satellite images. Particle concentrations recovered to 200/cm^3 by the end of the day on October 23.

Major oceanographic activities centered on changing the sensors on the DART/Tsunami buoy. The preliminary report on findings in the Ecuador/Peru coastal region is nearing completion.

The ship will depart at 1200 GMT on October 24 and head west to the WHOI buoy at 20 S 85 W (est. 1800 on 10/26/2007).

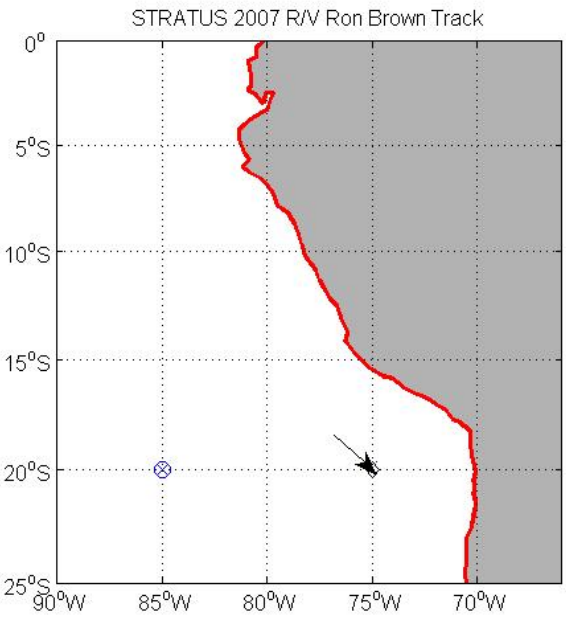

Figure 1. RHB cruise track on JD296 (Oct. 23). The diamond at 75 W is the SHOA tsunami buoy; the circle/plus at 85 W is the WHOI buoy.

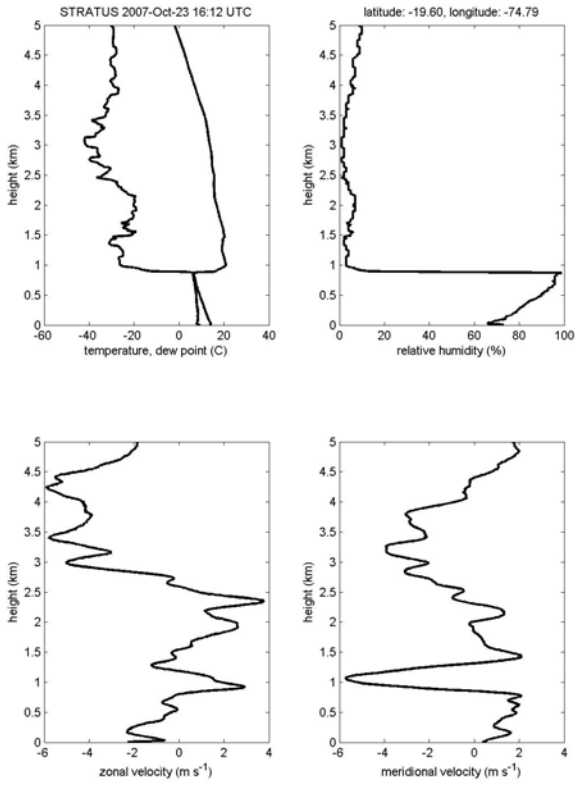

Figure 2. Rawinsonde profile 1600 GMT October 23.

Figure 3. Photograph of stratocumulus clouds 1600 GMT October 23 at 20 S 75 W.

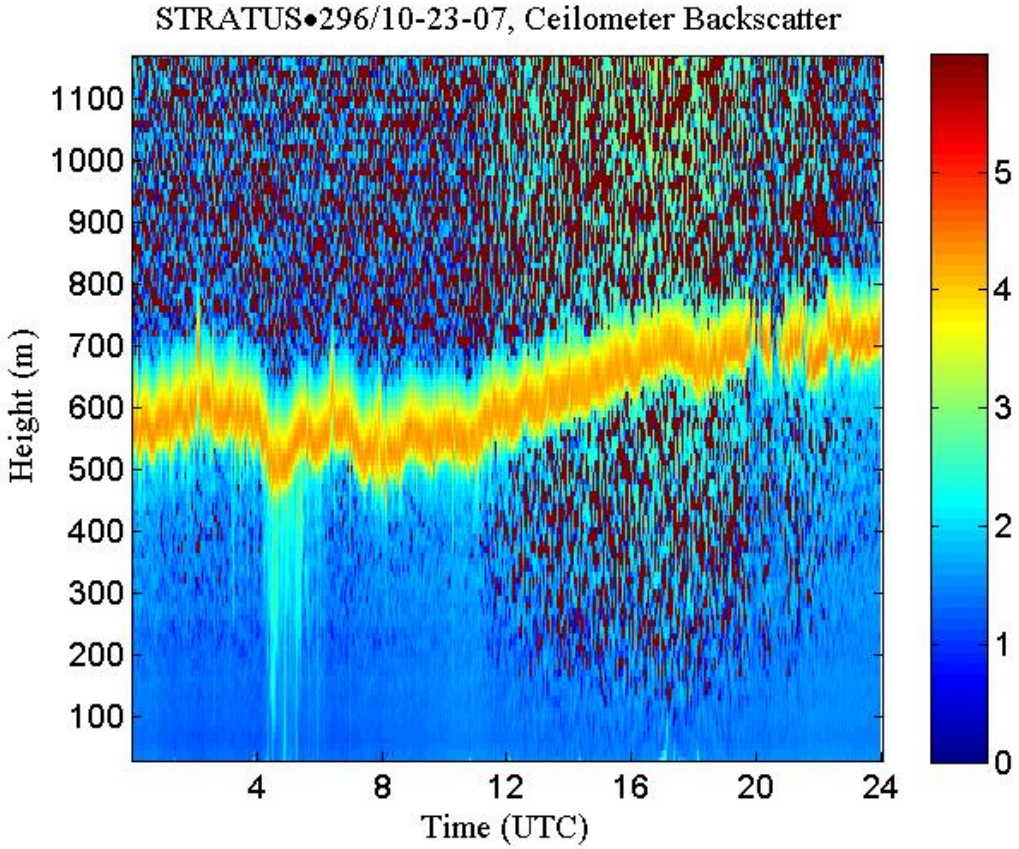

Figure 4. Time height cross section of ceilometer backscatter signal for October 23.

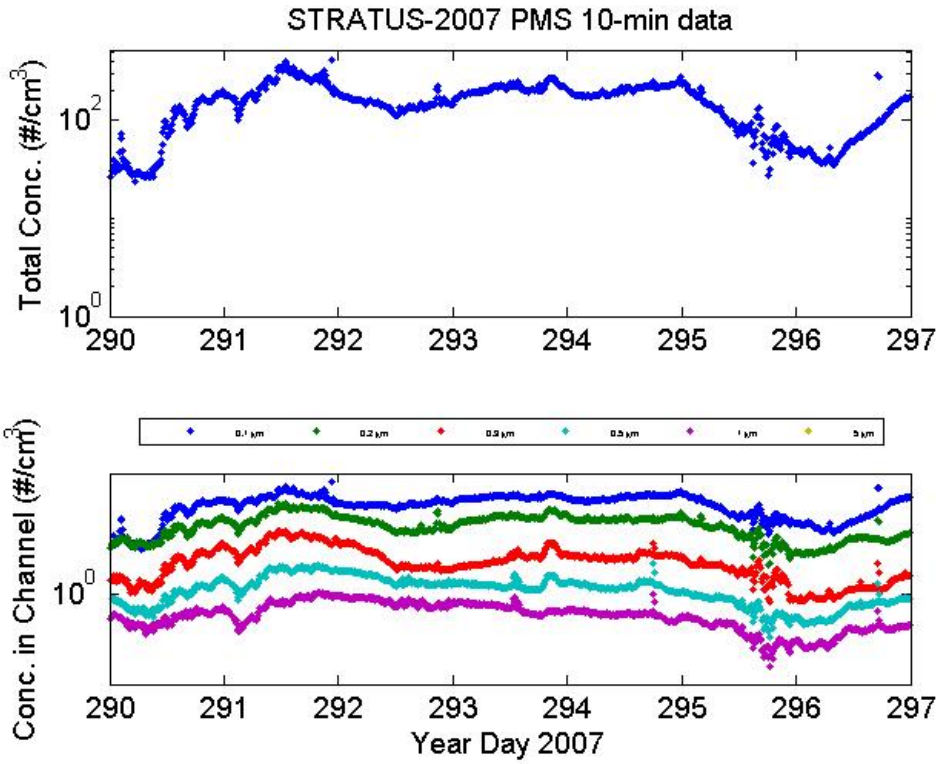

Figure 5. Time series of aerosol concentrations from Oct 17 through October 22. Upper panel: Total concentration for sizes from 0.1 to 5 micrometer. Lower panel: size resolved concentrations.

Figure 6-8. Photographs of operations at the DART buoy, October 23.

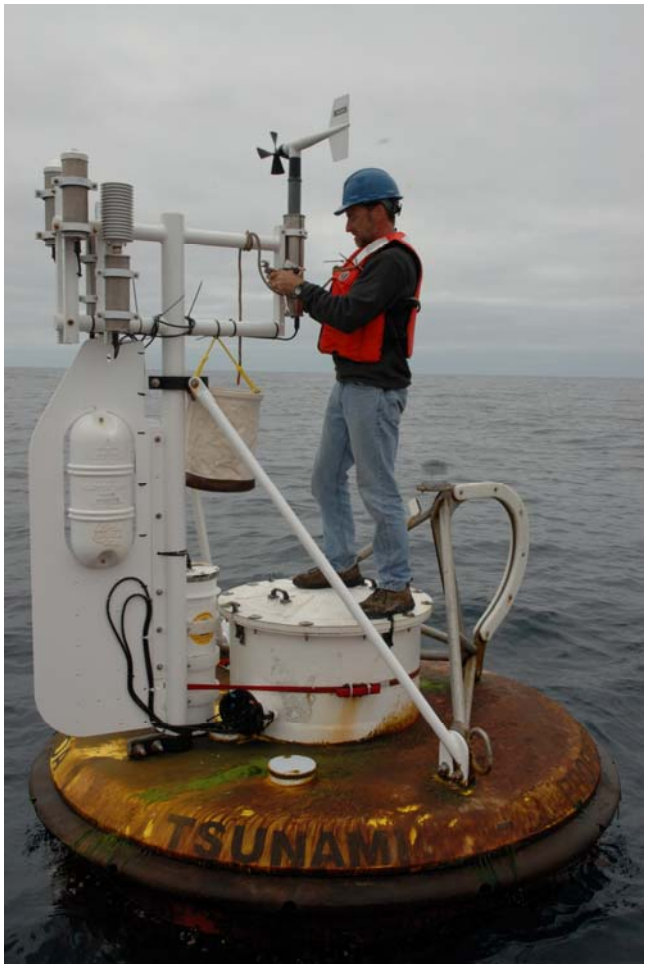

Figure 6-8. Photographs of operations at the DART buoy, October 23.