

EPIC2001 Ronald H. Brown  
Report #2  
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The RHB departed San Diego about 4 pm local time on September 5 and set a course for the EPIC2001 experimental area. A reasonably efficient course takes us through the national waters of Mexico, so we are unable to acquire data except for test/calibration purposes. After rounding the southern tip of Baja California, we set a course that would take us into international waters a few days before reaching the experimental area at 10 N 95 W.

On September 8 we stopped for approximately 3 hours to test various systems including the CTD, the MMP (University of Washington modular microstructure profiler), the SPMR (University of California at Santa Barbara solar radiative flux ocean profiler), and the balloon sounding system. All tests were successful. Conditions were already quite tropical with air temperature around 28.5 C and sea temperature around 30.5 C. Late on September 9 it began to rain intermittently.

Approximately 0800 GMT on September 10 we entered international waters at about 14 N and 103 W and began recording data. Weather was rapidly worsening and it turns out we were in the center of a tropical disturbance that was fast becoming a tropical storm (later named *Ivo*). Winds increased steadily and reached a peak of 18 m/s (half hour average) at 1800 GMT before declining rapidly. We received about 30 mm of rain in this event (over about 12 hours). The CSU group recorded some dandy C-band radar images of a tropical cyclone in its formation stages. The ETL flux system showed a peak cooling rate of the ocean of 700 W/m<sup>2</sup> at 1800 and the average net heat loss of the ocean was 266 W/m<sup>2</sup> for the day. This is about 10 times the typical daily average in the tropics. The driving rain did cause one unfortunate event by shorting out a connector on the cloud radar/radiometer van and shutting off the power. When power was restored, the computer that controls the microwave radiometers was sick and we are investigating ways to rebuilt its capabilities. The radar and mailbox radiometer are functioning normally. The Doppler lidar, ceilometer, wind profiler, and various ship systems are functioning normally. The UNAM chemistry and aerosol system is running, but a problem has been encountered with the gas chromatograph that is intended for analysis of DMS concentrations in the sea water samples from the CTD rosette. Amparo Martinez is presently awaiting advice from the manufacturer on diagnosing the problem [see below].

On September 11 at 2200 GMT we reached the TAO buoy at 12 N 95 W and John Shanley commenced replacement of a guano-fouled rain gauge. Apparently the anti-bird spikes had failed (or had fallen off) and the rain gauge became a prime bird resting spot for the large local seabird population. The weather is once again fine with near surface air temperature about 27.5 C, RH 80%, and sea temperature about 28.6 C. Winds are from 315 at 3.0 m/s. A CTD was done at this site and another one at 11 N on the way to the next buoy.

On September 12 about 0130 GMT we had a short radio conversation with the R/V New

Horizon. They expect to arrive in the experimental area about 1 day after we do. Despite the tragic events in New York and Washington DC, we intend to continue with our scientific efforts as planned.

We arrived at the buoy at 10 N 95 W at about 1400 GMT and commenced work on that buoy. One sensor was replaced in the meteorological package and a thermistor chain was attached below the buoy by divers from RHB. We then began operations in circle of radius 5 nm centered at 09 56.0 N 95 00.0 W. Waterside operations consist of drops by the MMP every 20 min. interrupted by short drops by the SMPR every hour during the day. For these operations the ship goes slow ahead at about 1 kt into the wind, which is optimal for atmospheric sampling. When reaching the edge of the circle, the ship powers up and relocates to the downwind edge of the circle and starts a new slow-into-the-wind leg. Preliminary results suggest about 50 drops a day to 300 m for the MMP and 7-10 for the SMPR (daytime only) to 100 m depth. The CSU group is launching 6 sondes a day, with about one-third losing GPS lock after launch (i.e., no wind profile).

On September 13 we talked by radio with the NCAR C-130 and the NOAA P-3 while they were in the general area. On September 14 about 1500 GMT the C-130 came right by the ship at an altitude of 100 ft. Amparo Martinez got the gas chromatograph working so she can begin analyzing sea water samples for DMS. The UNAM system is fully functional except for an SO<sub>2</sub> gas analyzer, which has a pump problem.

General Status report on Measurement Systems as of September 14

1	Air-sea flux system	100%
2	Solar and IR fluxes	100%
3	Bulk meteorology	100%
4	Ceilometer	100%
5	0.92 GHZ wind profiler	95%
6	Raingauges (4 epic)	100%
7	35 GHZ cloud radar	100 %
8	20, 31 Ghz radiometers	100 %
9	90 GHZ radiometer	100 %
10	IR thermometer (upward)	Out
11	Mini-MOPA Doppler/H2O lidar	100%
12	Aerosol and air chemistry	75%
13	MMP	100%
14	SPMR	100%
15	Rawinsondes: thermodynaics	6
16	Rawinsondes: winds	5
17	C-band Doppler radar	100%
18	CTD	1
19	ADCP	100%
20	Terrascan	100%
21	IMET	100%
22	SCS	100%
23	Thermosalinograph	100%
24	AOMLCO2 system	100%
25	Flourometer	?
26	CIRMS (APL IR SST )	100%
27	APL 2-m sea temperatuere	100%
28	Portable radiation package (BNL)	100%