

GOMECC-2 Cruise Update #3

The personnel transfer when Rik got off and I got on seems like so long ago, but it was a beautiful day there off of Miami, and we have continued to have fair weather and easy seas, which has meant for clear skies when we collect above-water radiances for our collaboration with the NPP VIIRS cal/val team and excellent conditions for station deployments and lab work. In a few hours we will begin the first station of the 'W' line that extends from nearshore (~45m) off Cape Cod and extends to >4000m where we will collect samples that provide calibration information for our sensors and additional hard-to-get data for Western Boundary Studies. I want to particularly thank Lt. Rachel Kotkowski for her excellent command of AOML's R/V Hildebrand during the personnel transfer and scientists Mark Emond and Sumit Chakraborty on the ship for their participation in the data collection for the NPP cal/val.

Our transect off of the LEO-15 site consisted of five nice stations in shelf waters (25-50m), with boundary conditions established by a shelf-break station (100m), and two deeper stations (1300 and 2400m). During transit to this line we noticed a lot of unusual variability in the underway salinity record provided by the ship's TSG sensor. Subsequence comparisons of the data from this sensor with TSG sensors on the pCO₂ system confirmed the existence of a problem but replacement of the ship's TSG sensor with a new one, and extensive investigation of the communication system reporting data from the ship's TSG has not yet identified the problem. For underway records, we have switched to recording data from the pCO₂ system. It is possible that the problems with the ship's TSG are a result of running the system in turbid water off the Mississippi River, although similar issues do not seem to be arising with the pCO₂ system.

Our first two transects of this leg of the cruise were the Western Boundary transect from ~Jupiter, FL to the Bahamas, and a transect off Georgia. In between these lines, we transited along the 50m contour with underway sampling every two hours. Satellite imagery from the Ocean Optic group at NRL and input from Mitch Roffer alerted us to the presence of very low temperature water on the shelf between Cape Canaveral and Jacksonville. The satellite data showed that we probably sampled the eastern edge of this cool water. Underway pCO₂ and temperature sensors showed substantial variability over relatively short time intervals as we transited the coast along the Fla/Ga border, suggesting we were encountering filaments along the edge of the feature. We have appreciated all the remote sensing support we have received through NRL Ocean Optics and NOAA Coastwatch.

The highlight of the Georgia Line was the successful communication with the Gray's Reef pCO₂ buoy coordinated by Sylvia Musielewicz of PMEL. Shortly before we occupied station near the buoy it began a 24 hour period of hourly sampling and we were able to monitor water conditions for slightly over three hours, serendipitously capturing data for a time period that included four of the buoy's six-minute

observing periods. We have another 'buoy occupation site' coming up at the end of the cruise off of New Hampshire.

We have had relatively few problems with other instruments. The CTD water sampler failed altogether at Station 43 (30 50.8N, 79 25.7W, 810m), after signaling some problems by failing to advance the bottle count after some bottles were fired. Efforts are underway to double-check data from those earlier 'warning' stations to be sure bottles that may have tripped at the wrong depth are clearly identified. The water sampler was replaced quickly and efficiently by Andy Stefanick, Jay Hooper working with Chief Survey Technician Johnathan Shannahoff and Electronics Technician Clay Norfleet, and the cast repeated so all planned water samples were collected.

In addition to the nice weather, wildlife interactions have enriched our days. The most recent encounter is a small bat that joined the ship off of New Jersey. A few days ago a Brown Booby spent considerable time resting on the instrument frame at the bow of the ship, and soaring along the bow feeding on flying fish. Even more exciting was the Wahoo dinner we had a few days ago, courtesy of expert fishers (and fish cleaners) among the crew and science party.

Arrival in Boston is looking like mid- to late afternoon on the 13th, with a lot of samples to process as we come off the New Hampshire line. We do seem on track to complete all planned sampling, thanks to the diligent efforts of FOO Paul Chamberlain, CO Mark Pickett and all the crew to work with us in meeting our science goals as efficiently as possible. Right now, people are in pretty good shape overall although several groups have indicated that sample bottles were not sufficient to cover both the underway and station samples. It is not clear if this was a problem with advance planning or not, but it something to consider before the next cruise of this sort. In the meantime, all hands are doing a great job of reporting data with more than 50% of all preliminary data already in the data managers' hands and many groups completely up-to-date. This allows Rik to sit in Miami and ponder the meaning of it all as it comes to him over the internet.

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