

## GOMECC-3 weekly summary report

Ahoy land dwellers!

Well, time flies when you are having fun, as they say...the third Gulf of Mexico Ecosystems and Carbon Cycle (GOMECC-3) cruise is underway and has just completed its second week. In all, we will occupy just over 100 stations, completing the first gulf-wide assessment of ocean acidification (OA) trends and dynamics in coastal waters of the Gulf of Mexico. Twenty-four scientists from ten different institutions are participating in the effort. The survey includes 11 cross-shelf transects where the full water column will be sampled and a comprehensive suite of biogeochemical parameters that affect or are affected by ocean acidification will be measured. The transects connect the coastal and ocean end members, allowing us to study how properties transition.

Between transects, the ship is taking extensive measurements of surface water conditions with highly automated instruments sampling the coastal ocean predominantly at depths between 30 and 100m and discrete sampling of select parameters every 3 hours. Further details on operations, participating institutions and cruise track can be found at <http://www.aoml.noaa.gov/ocd/gcc/GOMECC3/>. Also check out our blog at <https://gomecc3.wordpress.com> where we are chronicling our cruise, talking about all the different analyses we are doing on board and posting pictures etc.

It seems like a lifetime away since we left the US Naval Base in Key West, FL, after 3 days of intense work setting up all our equipment for the cruise. Despite the more restricted access to non-federal employees, we didn't have any issues gaining access to the base and the ship (we submitted clearance requests for all participants in advance).

We set off under blue skies and flat seas, which made for a very easy adaptation to being underway. We have a truly multidisciplinary scientific crew onboard, with areas of expertise covering chemistry, physics, biology and remote sensing, all of us working towards the common goal of determining the impact of OA in the waters of the Gulf of Mexico. For the first time in the GOMECC cruises, we are incorporating a suite of biological samplings, using hand held and towed "bongo" nets of varying mesh sizes. We hope to characterize the phytoplankton and zooplankton communities and generate a base line for future cruises.

The core of our operations, though, remains with the rosette, a package with 24 10L Niskin style bottles, and dual sensors for Conductivity, Temperature, Depth (CTD) and oxygen. Our scientists have nicknamed the rosette Barb. So far, she has proven to be a very hard-working and reliable lady, with her sensors in top shape and no mistrips to report in over 40 stations.

We have just completed line number 4 and by now we have a well established routine in which stations come fast and furious for a day and a half, and then we have about a day of transit to the next line, enough to take a breath and catch up on sample analysis, while at the same time taking discrete samples.

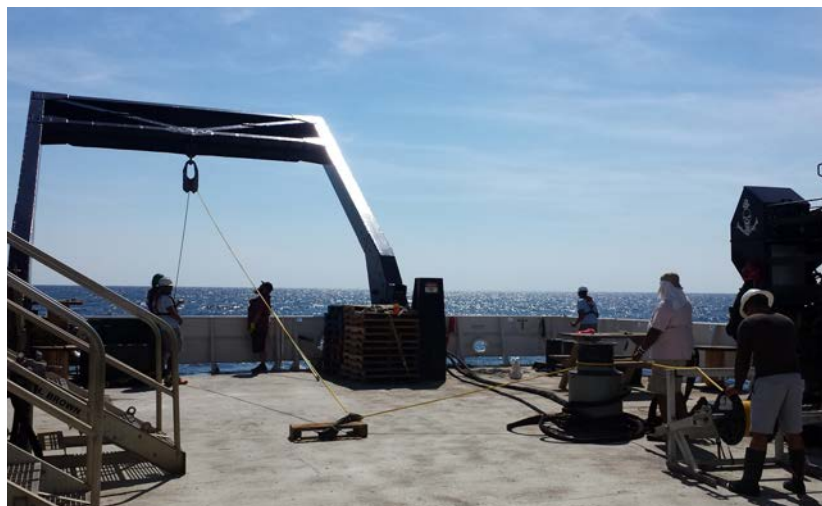
Life on board couldn't be more pleasant with the crew and scientists getting along very well. The beautiful weather and flat seas we've been having since the beginning have certainly helped ease the worries of the first timers and helped people work in good spirits to the point where sampling the rosette is being looked forward to as a time to get together.

As we were headed toward the last station of the Louisiana Line, we were alerted that we would be passing right by a monitoring buoy equipped with OA sensors that had just been moved to this location. This was a great opportunity to validate the buoy's measurements using our own and we quickly arranged for a small boat trip to the buoy so we could collect some in-situ samples right next to it using a hand-held Niskin bottle (Picture 1).



*Picture 1. Small boat operation to deploy a hand-held Niskin as close to the OA buoy as possible to collect validation samples.*

There have been no major issues with equipment so far since the beginning of the cruise. To keep us a little bit on our toes, the winch we were using to deploy the bongo nets that collect zooplankton samples decided that it was time for a break and, quite literally, broke down on us in the middle of the night as we were starting the Galveston Line. There was a moment of doubt about the feasibility of the Bongo net tows as we looked for a solution and considered the impact to our science objectives if they could not be done. But thanks to the excellent work of the ship's deck and survey crew, a solution was found and a line was set up to be used from the A-frame and we were able to collect samples from the remaining stations in the line. The engineers have been working hard to repair the winch in the meantime (it is also our back-up winch for the CTD deployments) and we were pleased to hear that there is now an excellent chance that we will be able to re-use the winch again.



*Picture 2: Team work to get the bongo net tows back to operational mode: 3 deck crew members and the survey tech assist two of our scientists in the deployment of the bongo net using the A-frame of the ship.*

We've also been religiously deploying drifters for the CARTHE project (see picture below). Their data will be used by scientists back at the University of Miami to study currents in coastal areas. The

scientists on board have been given the liberty to decorate the body of the drifters and their creativity has been put the test.



*Picture 3: Jesús Cano Compairé deploys the drifter he decorated at station 45, aka NPS PAIS (Padre Islands), where we took samples as part of our collaboration with the National Parks Service.*

We are now steaming towards line 5, tentatively called “Tampico line”, our first line in Mexican waters, and we are very excited to see what our carbon measurements tell us about OA conditions in these, for us, uncharted waters.

Onwards!

Leticia and Denis,  
Chief-scientists GOMECC-3  
<http://gomecc3.wordpress.com/>