

## **2016 I09N Cruise report, week 5**

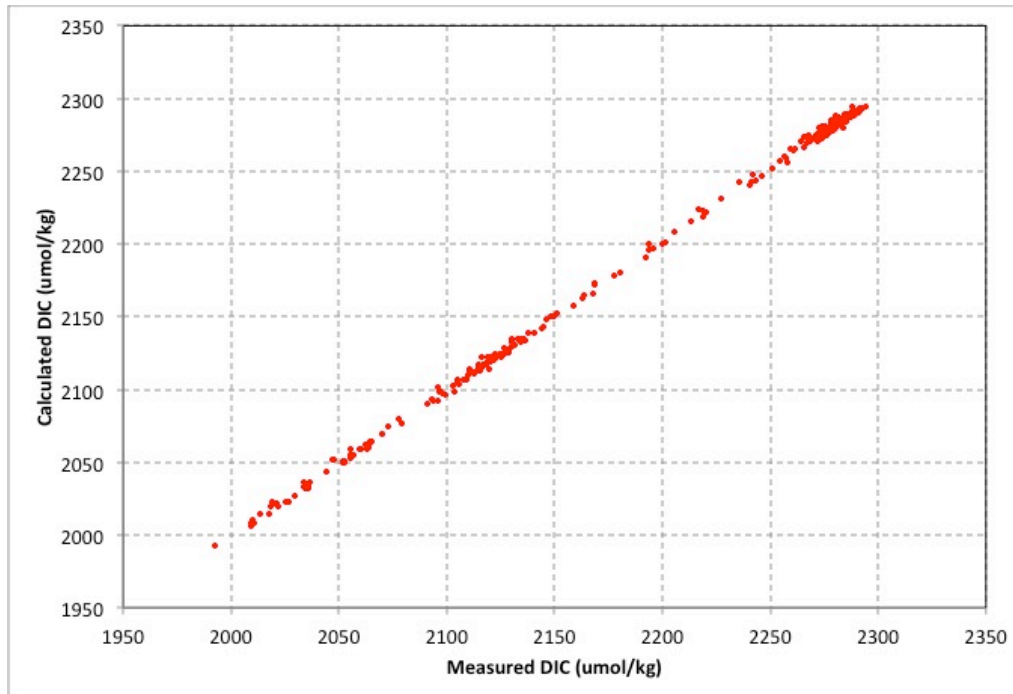
Mission accomplished! We are happy to report that we have now completed all of our science objectives...and then some!

We finished our last station on Sunday afternoon at 19:50. We are now in transit to Phuket, Thailand, where we expect to arrive on Thursday April 28<sup>th</sup> at 08:00 am local time.

In this last week we completed the “bow tie” section of the cruise. We have been so lucky weather- and instrument-wise that over the first 4 weeks we gained enough time to be able to add 2 bonus stations. Since our last planned station was at the border of the Indian EEZ, we couldn't add any extra stations further north. Instead, we extended the bow tie section westward to re-occupy two additional stations from the I01E WOCE line. We went as far west as possible without entering Sri Lankan EEZ waters, up to 84.75W, and then continued with the rest of our planned stations. These two extra stations allowed us to sample an area with particularly high carbon in the bottom waters and fresher surface waters. There should be some interesting results from these samples.

Over the last 5 weeks we have done a total of 113 stations, plus trace metals casts, optics casts and continuous underway sampling (while on station and in between stations). Even leftover water from the niskins was used for unplanned measurements to be run back in our labs. We have an excellent quality dataset to work with when we get back to land. As we moved northwards we observed a freshening of surface waters, a drop in subsurface oxygen levels, high carbon concentrations in the western region, and I'm sure we have a lot of interesting biogeochemical information that will come from all the samples to be ran back in our home labs.

On this cruise we have had two groups in charge of carbon measurements (NOAA for underway pCO<sub>2</sub> and DIC, and UCSD for pH and alkalinity). GO-SHIP is one of the few programs where the CO<sub>2</sub> system is over-determined (i.e. where we measure more than 2 of the 4 parameters that characterize the carbonate system). This enables us to evaluate not only the carbon exchange with the atmosphere, or changes in carbon storage over time, but also to evaluate the quality of the measurements themselves (e.g. by comparing measured DIC against the value calculated from pH and alkalinity). Below you can see preliminary results for this comparison. The average difference between measured and calculated DIC values is  $2.1 \pm 1.8$   $\mu\text{mol/kg}$ . This speaks highly of the quality of the measurements. Great job!



Measured Dissolved Inorganic Carbon (DIC,  $\mu\text{mol/kg}$ ) against DIC calculated from measurements of total alkalinity and pH (on the total scale) for this cruise.

I think everyone on board agrees that this has been a very successful cruise. It feels good to go home with a sense of accomplishment, but it probably feels even better just to know that we will be setting foot back on land in just a couple more days.

Don't forget to check our blogs for new entries:

<http://goship-i09n-2016.blogspot.com/>  
<http://fayamanda.weebly.com/i09n-cruise-blog>

We want to thank everyone on board, science and ship's crew alike, for a great cruise. Thank you also to the people back on land who provided shore-side assistance.

Leticia and Carmen, Chief-scientists I09N.



The science crew of the RR1604, GO-SHIP I09N cruise. Picture courtesy of Matt Durham