

## I07N Cruise Report – Week 4 (May 14 - May 20)

**Leg 2:** Departed Victoria on May 19, headed to Goa (India)



And here, we would probably end the past week's report ... ☺

... if the port call in the Seychelles lasted the whole week. But science operations ended on Tuesday morning and re-started after our departure from Victoria on Saturday afternoon. On Monday and Tuesday, we did stations 59-64 (6 CDT casts with depths ranging from about 900 to 3800 m) with no cancelations like during the previous week. We deployed a drifter at 7°S and a wave buoy at 6°S. Upon completing the last station of leg 1, we steamed to Victoria and anchored off shore. After clearing customs and being briefed by an NCIS agent, we disembarked and enjoyed the solid ground and the beauty of the island... Overall, the port stop worked very well, in particular for the moral onboard, because in the end people returned back safe, well-rested, and enthusiastic about the second leg of the cruise. So, we are all grateful for that. A photograph below shows some scientists onboard the Brown after their return. Yes, only some, 18 out of 26...

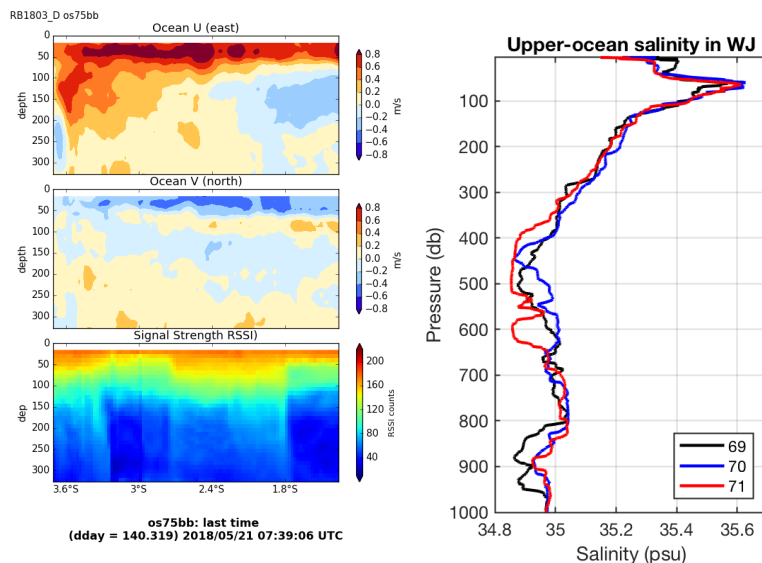


But do not worry. Nobody decided to stay or was left behind in the Seychelles! ☺ One person was taking the picture and the rest were either helping or watching Andy Stefanick and Jay Hooper to wire the rosette. We will definitely make another group picture after we complete all stations of the cruise. In Victoria, we were expecting an Indian scientist to board the ship and join the cruise. Unfortunately, the Indian participant did not arrive as his participation was eventually not approved by his institution. This, however, has no impact on our science operations, and we will continue as we did during the leg 1. The entire science team is

working together very well, everybody is very professional and responsible, knows the needs of each other, so help is always there when required.

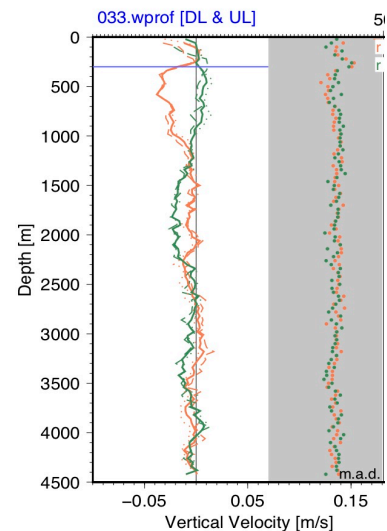
Since our departure from Victoria, we have completed 7 stations, which makes the total of 71 stations from the beginning of the I07N cruise. The first station after Victoria (#65) was done about 5 nm westward from the location occupied in 1995. The reason for that is that the original station 65 is

located within the territorial waters of Seychelles (within 12 nm zone of Denis Island), and we did not have MSR clearance to sample in the territorial waters. Since the beginning of the leg 2 we have already deployed 3 Argo floats, 2 drifters, and did 1 net tow. At station 69 we experienced a very strong surface current, because of which the ship drifted about 1 nm eastward while doing a CTD cast. The ship's 75KHz "Ocean Surveyor" ADCP showed the eastward component of the current with a strength of up to 1 m/s (see figure below on the left). We think this current is related to the strong eastward Wyrki Jets (WJ), forced directly by the equatorial westerlies.



The WJ occur during the monsoon transition periods of spring and fall, so our cruise happened to be at the right time to observe it. The WJ are associated with increased salinity, which is clearly seen in CTD casts at stations 69-70 (see the right figure on the left). Within the area of the WJ, in addition to CTD casts and underway measurements, we deployed 2 Argo floats at stations 69 and 71 and one drifter at station 70. The drifter deployment at this location was not pre-planned, so it is a "bonus" deployment that we decided to do while transiting this interesting oceanic feature.

Since we started talking about currents, and because the past work week was short, we thought it would also be interesting to bring everybody's attention to a very strong vertical flow we observed during the first leg of the cruise at station 33 (16.8°S). The vertical velocity ( $w$ ) is derived from LADCP data using a technique developed by Andreas Thurnherr from Lamont-Doherty Earth Observatory, University of Columbia (Amanda Fay is our onboard LADCP operator, but Andreas is the PI of LADCP measurements on GO-SHIP cruises). As displayed in the figure on the right, there was an instantaneous  $w$  of up to 4 cm/s between about 300-1000 m depth. Our initial guess was that we saw a signature of an internal wave, which was later confirmed by Andreas. Because the buoyancy period, which is the shortest possible period for  $w$  in the internal-wave field, is not long compared to the sampling time of a CTD/LADCP profile, the down- and up-cast data are processed separately. The figure shows that the amplitude of  $w$  is similar during the downcast (orange) and upcast (green).



Our research cruise continues and by the end of week 5 we expect to cross the Carlsberg Ridge and enter the Arabian Sea. Stay tuned!

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