

I6S: 10 April 2019, -62.5°S 30°E

Dear Colleagues and Friends,

Belated greetings from the Southern Ocean!

Before starting our journey to the south the entire team safely made it to Cape Town, where for a few balmy days we savored the majestic scenery of Table Mountain, the region's vibrant music and its culinary delights. Waiting for us docked at berth A was our ship, the research vessel Thomas G. Thompson. We were greeted by the Captain and an impressive crew eager to facilitate our smooth transition to living and working on the ship. A couple of days before departure the Thompson was refueled and fully loaded with palettes of fresh goods to keep everybody well-nourished during the next 40 days (or so). Since no science party had to move out of the ship, we were able to board and begin loading right away the numerous pieces of equipment from our different groups. The ODF container arrived early on, as did the DIC van later secured on the back deck, whereas ODF's was transferred to the forward 02 deck. Just watching everybody work together so efficiently during the set-up days gave the privileged assurance of having an excellent team to face the likely upcoming challenges on this cruise. Most impressive is the overall collegiate, respectful and friendly atmosphere surrounding the Thompson since we started our journey.

A blessing in disguise, perhaps, resulted in a delayed departure by a few hours. Before setting sail around 4 PM on April 3, 2019 a scorching smell emanated from loose light bulbs in a switchboard panel; it had to be repaired with the help of a local electrician. We then enjoyed the magnificent, albeit brief, sailing experience of leaving the city and the Cape of Good Hope behind us, in a sunny afternoon of calm seas. But the test to our seaworthiness came up earlier than expected. Rough seas and strong gusty winds took a heavy toll on our progress to the south. Rolls during the storm left one of the main engines inoperable. After almost 26 hours of transit the Captain and I decided to turn around and pursue the purchasing of replacement parts. We were back to an area off Cape Town late in the afternoon of April 6. The needed pump was not available in South Africa. One was purchased from Caterpillar and scheduled to be hand-carried from Seattle to Cape Town. Meanwhile Meegan Corcoran, our benefactress Port Captain on her way back to the U.S., managed to locate, purchase and FedEx another spare part during a layover in Amsterdam! An arrival date for either of these parts was unknown, considering ongoing strikes in South Africa. We could only wait. But we also took advantage of the temporary impasse to conduct our test cast, originally planned to take place at a location farther to the south. With some minor hiccups for which we had plenty of time to iron out, all instruments and data acquisition protocols were successfully tested. Then we could only wait, and wait more, for the engine's parts. Fortunately, both items cleared customs and were available to our agent at about the same time. They were delivered to the boat around 8 PM on April 8, 2019.

With the affected engine fixed while underway, and a spare part in stock, we were ready to face our second southward crossing of the Agulhas Current Retroflexion. This time

Mother Nature was more merciful, allowing us to steam at an average speed of 12.5 knots. Against all odds, favorable cruising conditions prevailed for another 8 days, and counting! We crossed the Antarctic Circle paying due respect to king Neptune and celebrating the new Red Noses aboard. Shortly after, in the morning of April 16, we woke up to a smooth sea covered with grease ice, that rapidly turned into a patchy field of small-sized pancake ice. The Thompson's Captain and Mates very skillfully navigated towards the target 536-m isobath off Riiser Land near 31°E. At one point, still at water depths of about 700 m, we hesitated about continuing straight further south because patches of older sea ice ahead of us were moving fast to the southwest. Again, we were fortunate to find a long lead oriented almost across the local isobaths and only a little off the intended track. We followed it slowly at 2 knots for about two hours and stopped over the 530-m isobath to occupy our first station.

All things considered, our petition of compensatory ship time loss (5 days) due to engine problems was followed by an empathetic 2-day extension of our cruise. This is entirely the result of the prompt intervention and collaboration between University of Washington, GO-SHIP Program and National Science Foundation managers. In addition, our swift steam to the Antarctic shelf resulted in about 1-day gain. Therefore, with Station 1 we started I06S measurements at 8:47 UCT on April 16, 2019 with a net ship time deficit of about two days.

A punishing sampling pace was kept, as expected, along the planned short (39 nm) northwestward segment of nine closely-spaced stations (1 nm to 10 nm) across the Antarctic slope. These extenuating circumstances resulted in the general backlog of different samples, to be processed at a later time during the longer transits between stations 30 nm apart. Less than 24 hrs after starting Station 1, we completed station 9 at a water depth of 3776 m and changed course to continue due north along 30°E.

We have already surveyed the southernmost 330 nm of the long (1,980 nm) meridional segment of I06S, occupying 10 more stations in about 41 hours. In addition, our trained students have also assisted in the overboard deployment of two surface drifters, four ARGO floats and two SOCCOM floats.

Finally, we have been occasionally visited by humpback whales and Antarctic petrels, as well as cruised by large distant icebergs and enjoyed spectacular views of Aurora Borealis, sunsets, and bioluminescence. Eerie or not, the weather and sea have been extremely sympathetic to us since we left Cape Town the second time. I take it as a sign of a job well done, during the Crossing Ceremony, that is.

