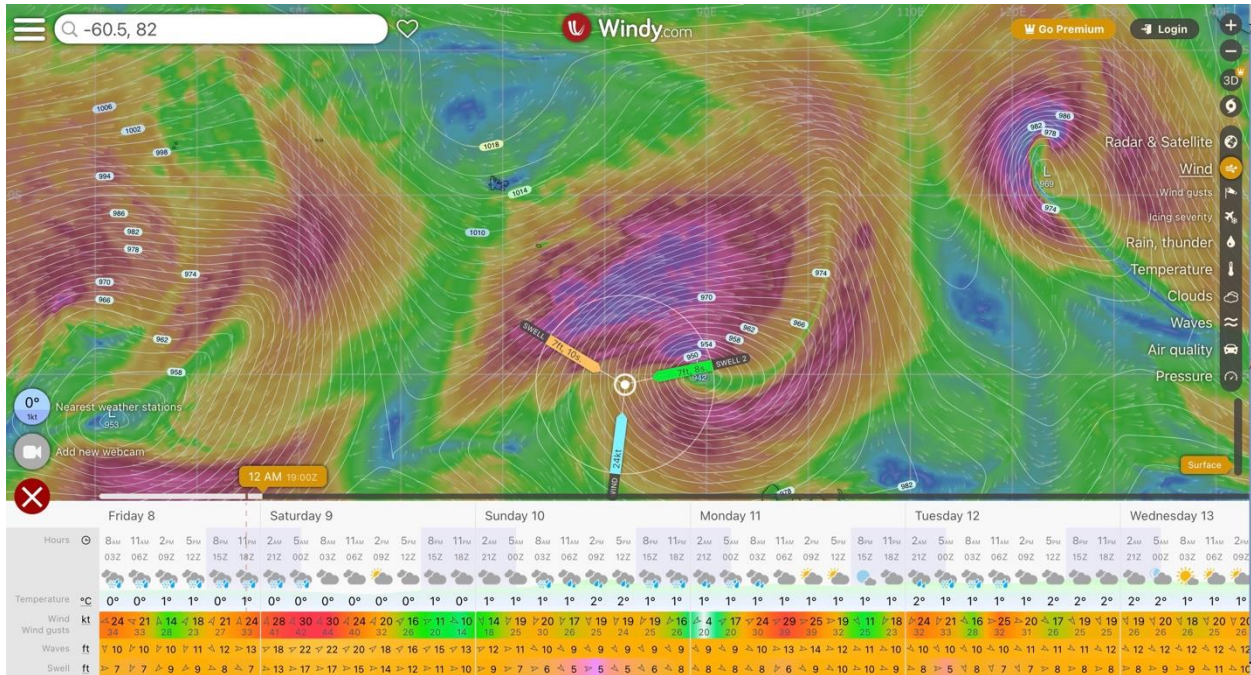


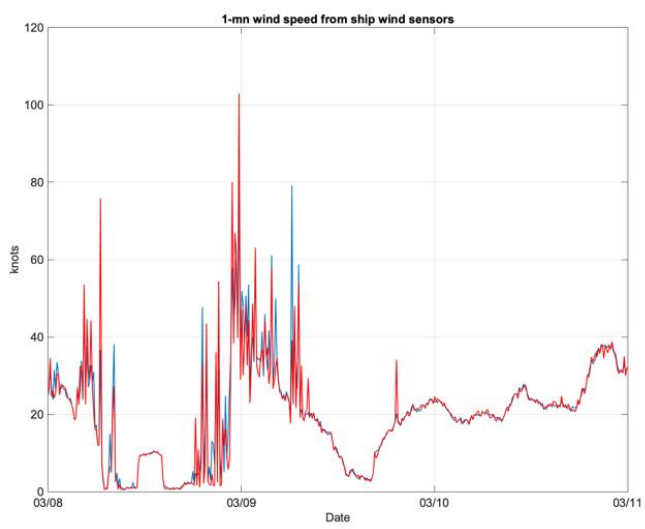
GOSHIP I08S 2024 cruise, weekly update #3: “Treacherous seas”

The weather in the Southern Ocean continues to wreak havoc on I08S. Since our last update, we’ve continued to be plagued with delays due to poor weather conditions. We lost around 30 hours of time from a storm on Mar. 8-9<sup>th</sup> (Figs. 1 and 2). Once conditions were workable again, we resumed at station 20 and were able to complete three stations before another storm rolled in. We were forced to run south yet again, losing another ~10 hours in the process. We then started working at station 23, which was the start of our trek over the Kerguelen plateau. Due to another impending storm, we then transited north, passing four stations on our way. We worked back down the line so we could complete these stations as the weather deteriorated north, but remained workable more south. Another storm kept us waiting south of our next station (29), and we resumed work after another 36-hour delay.



**Fig 1. (above)** The Mar. 8-9<sup>th</sup> storm we encountered on the Kerguelen plateau. The storm developed fully around *R/V Thompson*, which experienced confused seas on western side of storm travelling eastward. During the last part of the storm, tilt sensors on the ship reached their maximum values of 35 degrees.

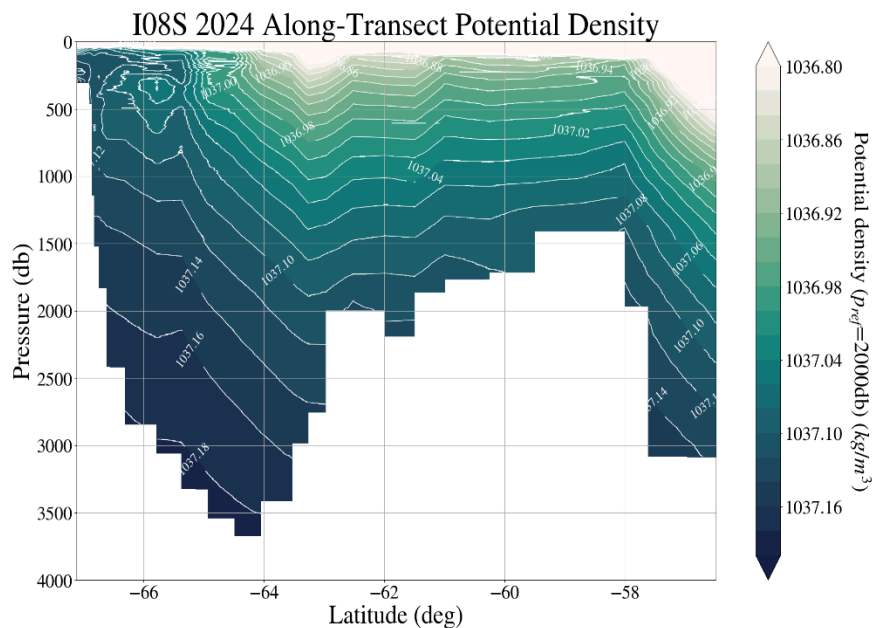
**(right)** Wind speed measured from both sonic anemometers on top of *R/V Thompson*’s bridge. Low wind speed on mid-day Mar. 8<sup>th</sup> corresponds to eye of the storm. Higher wind speeds on Mar. 9<sup>th</sup> were experienced on the west side of the storm. Wind was low at the end of Mar. 9<sup>th</sup> but seas remained high preventing CTD work until the early morning of Mar. 10<sup>th</sup>.



Because of our extensive weather delays, we have been forced to alter our original cruise plans. We have strategically been combining bio casts with the core casts at our shallower stations when not all bottles were needed for the core measurements. At deep stations, we can collect all water for bio casts and require three dedicated bio Niskins from the core cast for this purpose. Most of the bio samples can be taken from remaining water after all core measurements, and the surface samples can be taken from the underway seawater line while we are on station. We are also working on creating an updated station list with increased spacing to make up for lost time.

Since our last update, we've deployed one more BGC Argo and one more Core Argo float. Our total thus far is three BGC Argo and five Core Argo floats deployed. There is little to report in terms of issues with the CTD casts themselves. On station 26, the SeaSave program that interprets and displays the CTD sensor data had a glitch and stopped during our downcast. After an all stop, we were able to restart the system without needing to return to the surface, so we continued the cast from here. We realized this would likely cause a problem with the LADCP data for this cast, but the remaining CTD sensor data was recorded and saved (just split between two files). Because we had already lost so much time, it was decided we would continue with the cast and forgo starting over, which would've added another three hours to the station amidst looming weather conditions.

On a brighter note, we have begun some preliminary analyses of data collected. As we hoped to observe, potential density determinations show Antarctic Bottom Water as it travels from its formation location into the deep ocean (Fig. 3). We are looking forward to analyzing more of the data as it comes in.



**Fig. 3.** Depth profile of potential density along the I08S cruise track thus far. Figure produced by: Tatsu Monkman

While the past week has been quite challenging, we have been blessed with some incredible nature sightings to lift our moods. While stopped at one station, we were visited by a curious penguin that circled the ship for quite some time, and almost everyone awake was out on the back deck observing.



**Fig. 4.** A group of scientists (**left**) observes a curious penguin (**right**).  
Photo credits: left – Katelyn Schockman; right – Jenn Magnusson.

We've also been fortunate enough to see the Southern lights during intermittent times when the stormy clouds have given way to clearer night skies. The lights have come and gone throughout the night, and scientists have spent the evenings star gazing and taking some incredible photos of the views.



**Fig. 5.** Southern lights off the back deck of the *R/V Thompson*.  
Photo credit: Hayden Kinkade.

We are continuing work from station 29 now that the last storm has passed. Hopefully our next update brings news of calm seas and a productive week.

Cheers,  
Katelyn and Seb