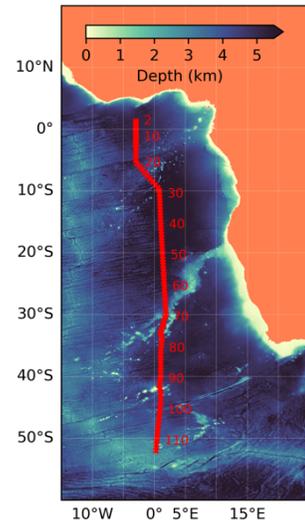


A13.5 2024 Cruise Update: Part 7 of 7

After 52 days at sea, and well over 6,000 km traveled, we have made it to our final destination: Cape Town, South Africa. We had to stop slightly short of our goal due to a combination of fog and icebergs limiting our speed, but still ventured far into the Southern Ocean, reaching a maximum latitude of 52°S. On our way back we deployed our final floats, made underway measurements, and packed up the labs.

Stations completed: 7 (total: 113/117) ✓
Stations skipped: 4
Core Argo deployed: 4 (total: 4/4) ✓
BGC Argo deployed: 1 (total: 11/11) ✓
EM-Apex deployed: 2 (total: 7/7) ✓
SVP Drifters deployed: 6 (total: 18/18) ✓
Underways taken: 18 ✓



Final cruise track: 113 completed stations.

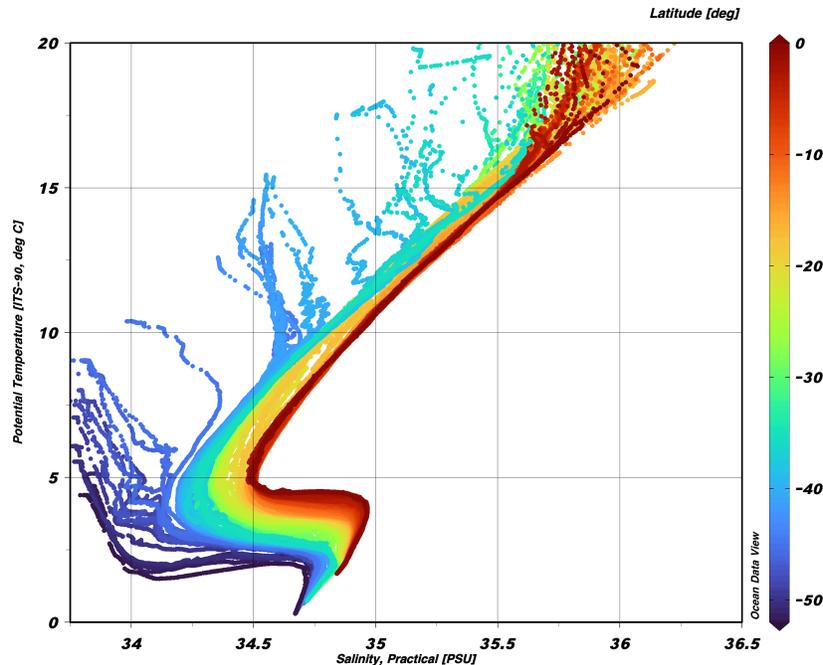
This past week has been one of transitions. We started out at 48°30'S, heading southward into the beauty of a field of icebergs, with sometimes dozens visible from the upper decks. While normally this wouldn't have posed much of a problem, the combination of icebergs and fog dropped our speed to a crawl, especially at night. The ship's radar was able to pick out icebergs and most bergy bits,* but would not reliably warn us of growlers† that could still damage the ship. Our speeds therefore dropped to as low as 2 knots during some of the transits between stations. Thankfully the weather was calmer, so when the fog lifted we could often run at our normal speed even while sampling on deck. Due to these delays, and the chance of similar delays on the return trip north, our last station, number 113, was at 52°S – only 2° and 4 stations shy of our goal of 54°S!



Todd Jensvold (Langseth), Eric Wisegarver (NOAA/PMEL), Evan Josza (UW/CICOES) and Christian Saiz (CIMAS/AOML) deploying the final CTD rosette of the cruise.

* A real term! Bergy bits are “small icebergs”, with profiles from about 1-5 m above sea level and areas similar to that of a house.

† Another real term! Growlers are “miniature icebergs”, with profiles less than 1 m above sea level and the approximate area to that of a truck.



T/S diagram from the downcast data of all southern hemisphere CTD stations (6-113). You can see strong fronts at about 37°S (subtropical front) and 42°S (subantarctic front). In the final station, at 52°S, the surface temperature was less than that of Circumpolar Deep Water, the water mass at approximately 34.7 PSU and 3°C.

After we finished sampling the final station of the cruise, we transitioned into underway samples. These are conducted through the ship's inline system and occurred every four hours – six times a day – for the first three days of our journey back (3/17-3/19). While the order of underway sampling doesn't matter, speed is still important, as the ship is moving through the water while samples are being taken. Our average speed to complete all variables – fCO₂, pH/TA, DIC, d¹³C, oxygen, and nutrients – was 8 minutes. Along the way we also deployed the final floats of the trip: four Core Argos and one EM-Apex.



The last science operation of the cruise: Koray Ergun (Langseth) and Jesse Anderson (ESR) deploying an EM-Apex float off the aft deck.

For the last few days, we transitioned again to packing up the labs. After the storms of last week, we had calm seas again and were able to do much more work than we had expected – even stacking D-containers from the individual labs on the main deck so that we can move them into our storage van. One of the major challenges of packing is that while most of the labs and vans are on the same level, the fCO₂ system, is set up in a lab one level above the main deck, and the storage van for the CFCs is one level above that. Fortunately, the last few days have

been calm enough that we have been able to pack almost everything, with only a few items remaining from the CFC lab to be lifted using the ship's crane once we safely docked in port.

Over the next two days we'll be tying up loose ends. Individual cruise reports are in and will be compiled, and a preliminary report will be out soon. Our official demobilization days are March 24th and 25th, and we will be finishing up packing, making sure everything being offloaded from the *Langseth* actually gets off, and ensuring that those items remaining behind until the ship is next in the U.S. are clearly labeled. Many of us will be spending some time afterwards in South Africa, while some need to get home right away. While all of us are excited to stand on dry land again, our time on the cruise was rewarding and we hope all treasure the friendships made and the data collected on this transect.



Joshua Kasinger (Langseth), Ian Smith (AOML/CIMAS), Jay Hooper (AOML/CIMAS), Christian Saiz (AOML/CIMAS), and Kristian Furnes (UiO) stacking D-containers using the ship's A-frame for loading into the storage van.

Until the next one,
- Zach and Jesse

Mar. 23, 2024



A13.5 2024 Science Party. Photo by Todd Jensvold (Langseth).