

## Powell Basin

[25. March 2019] Out of the heavy sea ice of the Weddell Sea, we have spent the past week in open water and loose sea ice in the Powell Basin. So far, we have conducted a short bathymetric survey, deployed a lander, completed an oceanographic transect and collected geological and biological samples.

With Polarstern being able to move easily between ice flows and in open water, we are at last able to work at a high pace and have samples and data flowing at a good rate. The goal is to get as much science done as possible in the remaining two and a half weeks.

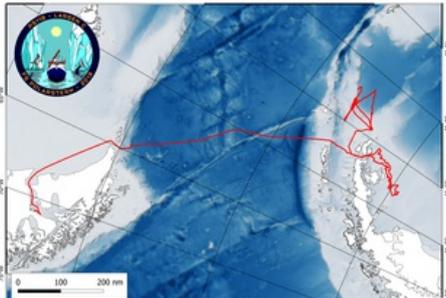


Fig. 1: Cruise plot. (Graphic: Karte: S. Dreutter; Logo: A. Purser)

Once we had left the Weddell Sea, cruise planning became significantly more straight forward as distances and durations correlated better. Within the heavy sea ice of the Weddell Sea, it was almost impossible to predict the cruise progress. Influenced by winds and tides the pressure of the ice changed causing pressure ridges to form or leads to open. Hence we were either blocked by walls of ice or could easily travel on waterway. Therefore, compared to the time in the Weddell Sea, work-life on board became a lot more predictable in the Powell Basin this last week.

The first thing we did on our way to the Powell Basin was to deploy a lander on the shelf half way between the Antarctic Peninsula and the Powell Basin. A lander is a device that is left at the seafloor to autonomously collect data and sample until it is picked up again. Once this was done, we did a bathymetric survey at the western end of the South Scotia Ridge, a tectonic ridge that connects the Antarctic Peninsula under water with the South Orkney micro continent, and also separates the Powell Basin from the Scotia Sea to the north. The Ridge was chosen as a scientific target because ecosystems are expected to vary considerably between different habitats in close proximity due to canyonated slopes, rugged terrain, and sediment covered canyon floors. Our results in return help to better understand ecosystem and habitat distribution in the Area of the Antarctic Peninsula. From an oceanographic point of view, the Ridge represents the northern boundary for bottom water masses from the Weddell Sea entering the Powell Basin from the southeast, circulating clockwise in the enclosed basin. As such, it separates water masses in the Weddell Sea from those in the Pacific Southern Ocean to the west.

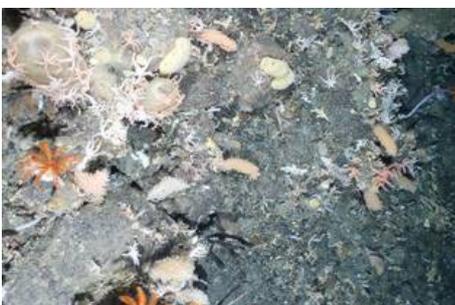


Fig. 2: OFOPS image from the western South Scotia Ridge. (Photo: A. Purser)

### Contact

#### Science

 Boris Dorschel  
 +49(471)4831-1222  
 [boris.dorschel@awi.de](mailto:boris.dorschel@awi.de)

#### Scientific Coordination

Rainer Knust  
 +49(471)4831-1709  
 [Rainer Knust](mailto:Rainer.Knust@awi.de)

#### Assistant

Sanne Bochert  
 +49(471)4831-1859  
 [Sanne Bochert](mailto:Sanne.Bochert@awi.de)

### More information

#### Related pages

[» Research Vessel and Icebreaker Polarstern](#)  
[» Weekly Reports Polarstern](#)



Fig. 3: OFOBS image from the western South Scotia Ridge. (Photo: A. Purser)

After the bathymetric reconnaissance survey at the western end of the Ridge, we deployed a glider. A glider looks a bit like a small torpedo and dives buoyancy driven up and down while continuously collecting information of the water column. Then, we measured and sampled an oceanographic transect from the Ridge eastward into the Powell Basin. At the most basin-ward position, we collected sediment samples. Once finished, we continued the oceanographic transect south-westwards back onto the shelf to finish close to the lander position. In this way, we were able to characterise different water masses in the Powell Basin giving us a snapshot of the current oceanographic conditions in this oceanographically under-sampled area.

Back on the shelf, we recovered the lander and completed all sampling activities at the last biological station that was part of the biological transect we had started in the Weddell Sea and that was mentioned in earlier weekly reports. All further biological sampling will be opportunistically targeted sampling on interesting sites we discover.

As it happens, there should be no shortage of sites. In the night from Saturday to Sunday, we performed an extended OFOBS survey on the slopes of the Ridge mentioned above. Even at first glance, it was clear that the slopes of this ridge are teeming with life! The rugged terrain with vertical cliff faces, terraces and crevasses was almost entirely colonised by sponges, brittle stars, starfish, corals and other organisms. I still think it is quite a privilege to be the first to set eyes on this seafloor hidden beneath hundreds of metres of water. Here also a big thank you to the ship and especially the winch operators that provided excellent support for the OFOBS operation, flying OFOBS without damage through very rough and challenging terrain.



Fig. 4: Humpback whales close to the ship. (Photo: B. Dorschel)

While we keep on doing our science, we also enjoy the amazing view of Clarence Island in the distance and the fascinating close encounters with humpback whales that seem to be attracted by us. At least for me, I can state that whales definitely make you happy!

In the meantime, preparations for our return have already started. Freight lists have to be completed and a cruise report has to be written. Never the less, we have more than ten days left for science and we will be very busy using this time.

Surrounded by whales and on behalf of all expedition participants, I sent best regards from the Powell Basin.

Boris Dorschel