

Expedition SO280 (GPF 20-3\_087)

- IceDivA

Emden - Emden

Weekly report 4

25<sup>th</sup> - January 31<sup>st</sup> 2021



## The Secrets of the Seabed and Josephine

On Monday and Tuesday of the new week we were still fully occupied with our station work at 32° N and were able to complete a third full deep-sea station along our latitudinal gradient. The northern working areas continue to be impractical from with regards to weather conditions. According to our expedition motto "IceDivA - spontaneous, creative and multiflexible!", there was another round of "weather chess" with the captain.

The low pressure areas in the North Atlantic are stubborn and a look at the weather map reveals high waves in front of the Bay of Biscay and Mid-Atlantic Ridge. While we are able to "hide" on the edge of the storm with our station work this week, we receive impressive images from our colleagues on board the R/V METEOR, which is parallel to us, near the Azores. While the working area of the METEOR at the "Mid-Atlantic Ridge" cannot cope with the weather, there are deep-sea basins outside the storm front and this week we seek protection behind "Josephine" in the small strip of international waters on the edge of the EEZs of Madeira and Portugal. Separated by a chain of seamounts, including Josephine and Erik, the "horseshoe basin" with a depth of up to 4800m is where we currently find ourselves.



**Figure 1** from left to right: Nicole Gatzemeier, Karen Jeskulke and Saskia Brix inspecting samples in the cooling room. Who will discover the animals in the sediment? Photo: Mia Schumacher (GEOMAR); Imagine swimming through honey! How does it have to feel for this little isopod that is actively paddling across the deep sea sediment? Munnopsids swim with their rear paddle legs while the four pairs of forelegs are used for walking. Photo: Nicole Gatzemeier (Senckenberg). Tiny shells of 2 or 3 mm in size connect with their byssos to anything they can hold onto the sedimentary plains - even sea cucumbers are used as taxis! Photo: Nicole Gatzemeier (Senckenberg).

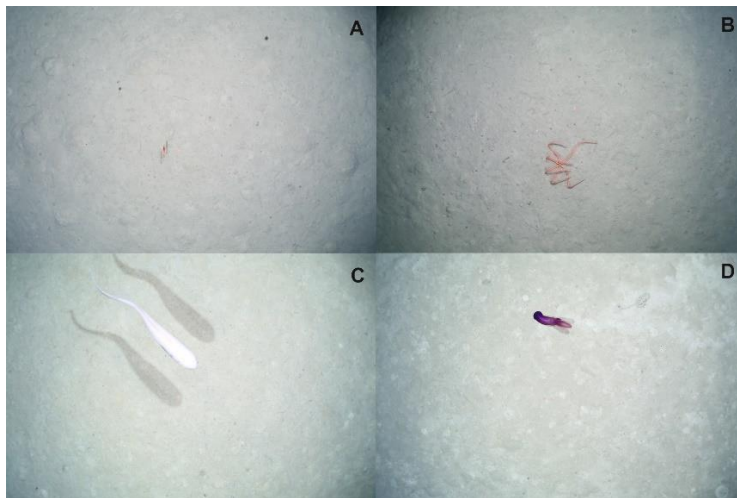
We study not only latitudinal gradients, but also geographical barriers between the deep sea basins, which is a central question in the EU project iAtlantic and our neighbouring projects IceAGE and DIVA. In addition, the work in the horseshoe basin complements the sampling of the seamounts that took place during MAPS project (Madeiran Archipelago Pre-Seamount Stages).

On Thursday around 6:00 p.m. we reached our latest point in the horseshoe basin and started with a deep CTD down to 20m above ground, enabling the best resolution for bathymetry. While the seamounts "Josephine" and "Erik", are in international waters in the MPA area declared according to OSPAR, we started our station work outside

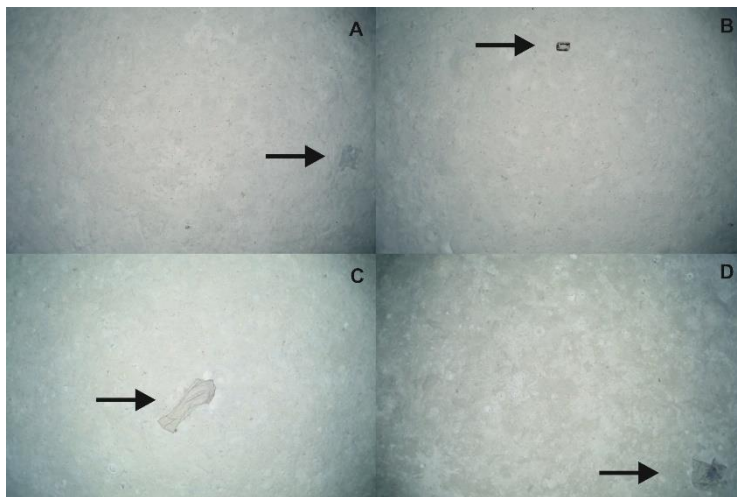
the declared area. All gear was successful, in optimal weather conditions, and the station was successfully completed on Saturday evening.

The way back to the north leads us “via” Josephine. We are currently using Sunday to map Josephine, so to speak, “on the way back to Emden” while the large equipment is stowed in the containers in preparation for the poor weather. Safety first and since we expect heavy seas, everything has to be stowed on deck. Work in the laboratories can continue inside the ship, until it is no longer possible. Sunday evening/Monday morning we will finally say goodbye to our “good weather hole” by Josephine and begin the one-week transit to Emden.

Thanks to our evasive manoeuvres, we were able to operate four complete deep-sea stations and complete the ARGO25Pilot project station. We are very happy about this and thank the ship, the crew, and the control centre for the flexibility in the planning.



**Figure 2:** OFOS snapshots of our IceDivA stations:  
 Animals  
 A) Caridean shrimp OFOS #45  
 B) Brittle star OFOS #45  
 C) Liparid fish OFOS #58  
 D) Holothurian OFOS #91



**Figure 3:** OFOS snapshots of our IceDivA stations:  
 Litter  
 I) Plastic sheet #45  
 J) Brown glass bottle OFOS #45  
 K) Trousers OFOS #58  
 L) Plastic sheet OFOS #91

On behalf of everyone we on board we send a greeting ashore!  
 Sunday January 31st 2021

Saskia Brix & James Taylor  
 Chief scientist team, Senckenberg am Meer