

RV SONNE - SO295 "NoduleMonitoring-2"

31.10. - 23.12.2022, Port Hueneme - Port Hueneme (USA)



6th Weekly Report (05. - 11.12.2022)

During the week of Dec. 5-11, our focus was to sample the collector impact area in the GSR area. In the GSR area, the PATANIA II collector had worked in three parallel lanes (Fig. 1). Each lane has a width of 80-100 m and a length between 150 and 300 m. In the side-scan sonar image, the tracks left on the seafloor can be seen very clearly. With this information, we divided the area for further work. The northern lane was chosen for sampling the species communities with the box corer and multicorer. The middle and southern lanes for work with the ROV. Figure 1 shows the planning work for the sampling on the computer. GIS software is used to pick coordinates and pass them to the bridge for the station plan.

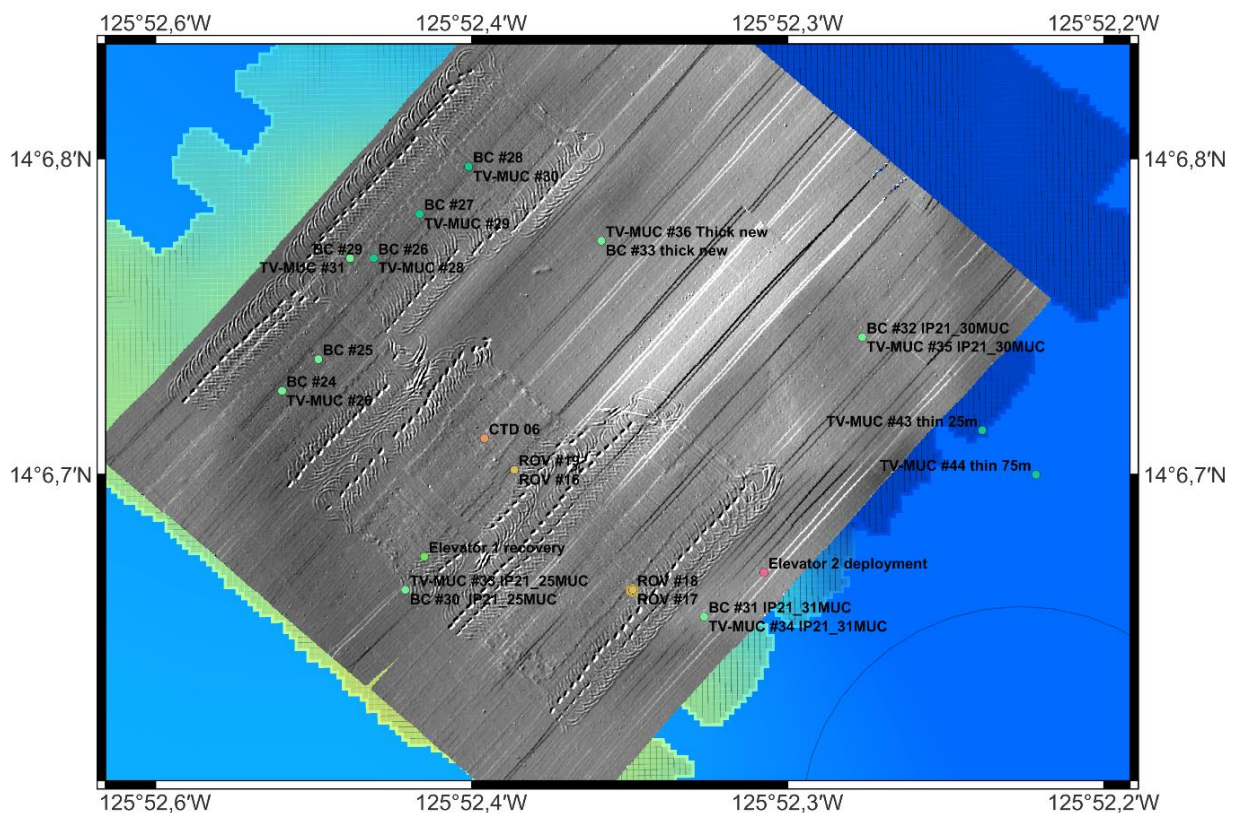


Fig. 1: Our GIS program shows the side view sonar map where the PATANIA II collector traces are clearly visible. The positions of the sampling devices can be seen on it.

Two more successful ROV dives took place on Dec. 5 and Dec. 7. On Dec. 5, work on the PATANIA II tracks in the Collector Impact Area was completed at the end of a series of four consecutive ROV dives. In a very efficient ROV deployment, not only were all experiments completed and equipment recovered (benthic chambers and profilers for respiration measurements, CUBE mesocosms for food-web experiments, 'passive samplers' for trace metal measurements), but additional profiling measurements with oxygens microsensors were also performed. After a dive-free Tuesday, so-called Food Pulse experiments were started in the Plume Impact Area on December 7. The experiments aim to quantify the recycling of particulate organic material from the water column in the benthic food web. More specifically, a possible influence of the deposition of sediments from the sediment cloud created by PATANIA on the uptake rates and the main groups of organisms involved will be investigated. For this purpose, algal biomass labeled with stable carbon and nitrogen isotopes was added to each of three plastic cylinders deployed on the seafloor. To capture the role of large substrate feeders in addition to microorganisms and small animals in the sediments, the cylinders were placed over holothurians (sea cucumbers) (Fig. 2). Five days later, the holothurians would then be collected and the trapped sediments sampled. By analyzing the concentration of stable isotopes in the tissues of the animals and in the fatty acids of the microorganisms, the amount of food ingested in each case can be determined. Unfortunately, the planned continuation of the work with ROV and AUV in the reference area was thwarted for several days by increasing winds and wave heights. Only on Sunday, 11.12. the work could be resumed. Since wind and waves calmed down only in the early Sunday morning, first a somewhat shorter dive was carried out, during which above all larger organisms (megafauna) were collected. For the following dive on 12.12., which is mainly dedicated to sampling and recovery of the food pulse experiments, we expect good conditions with less wind and calmer sea. From Tuesday on, unfortunately, more unsettled weather with stronger winds and higher waves is forecast. Hopefully we will still be able to make a dive or two to complete our data set.

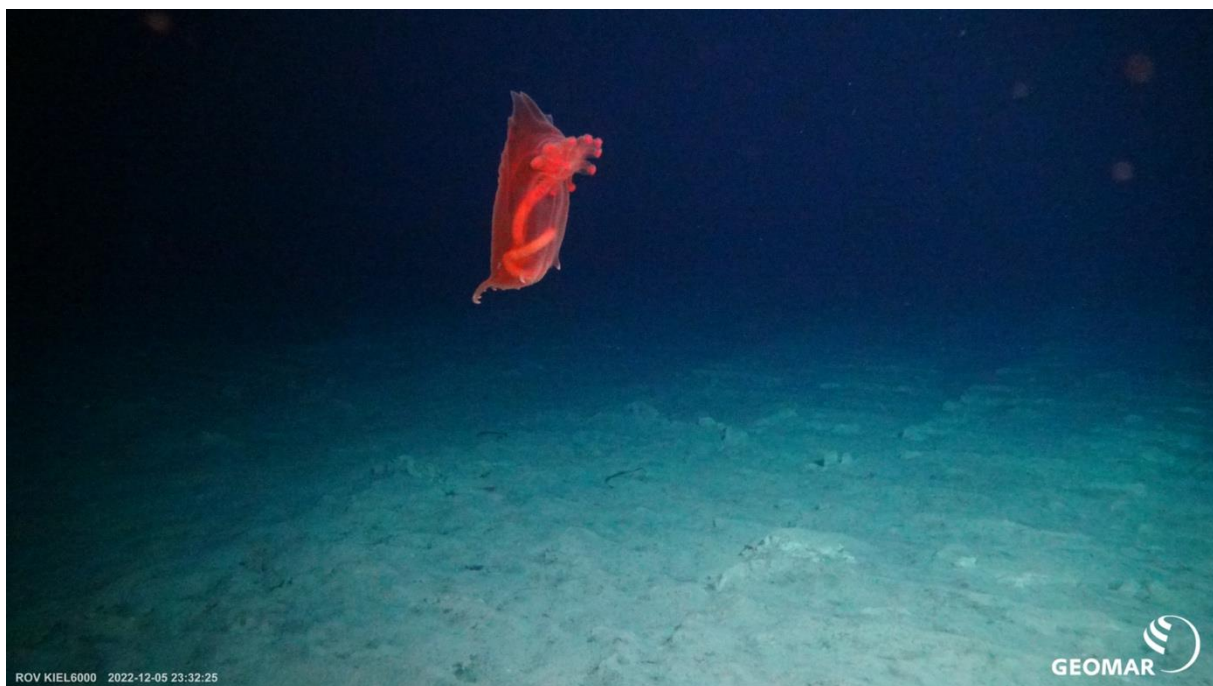


Fig. 2: ROV image of a deep-sea sea cucumber.

The second OFOS dive took place on 7 Dec in the GSR area was in the Collector Impact and Thick and Thin Plume area. The collector tracks were crossed diagonally, and the decreasing sediment cover was recorded. Some sea cucumbers were observed on the tracks themselves. Fish (mainly grenadiers) occasionally appeared in the Thick and Thin Plume area (Fig. 3).

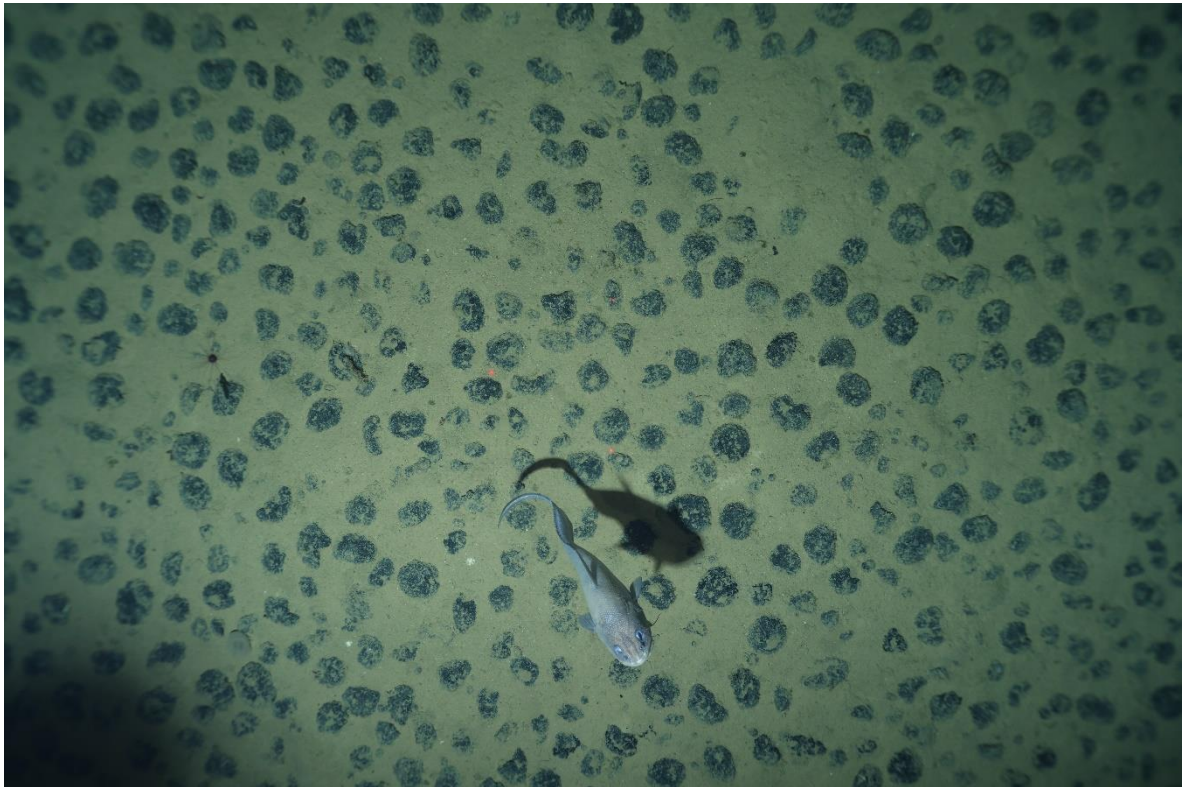


Fig. 3: OFOS image of a fish (grenadier) swimming towards the OFOS camera.

The 12th OFOS dive on Dec. 8 imaged increasing sediment deposition from the southeast toward the collector impact area. Three limestone craters were crossed at the beginning of the transect. Many sea cucumbers and sea anemones were observed throughout the dive (Fig. 4).



Fig. 4: OFOS image of a sea cucumber (Psychropotidae) in the Plume Impact area.

Due to the deteriorated weather situation, some equipment such as the AUV, ROV, and bottom water skimmer could not be deployed from 8-11 December. The time was used wisely to conduct the final sampling in the reference area with the multicorer and box corer.

5 multicorer and 5 box corer stations within the collector impact area were selected and sampled. In addition, 5 additional stations were sampled in the thick cover area, where the manganese nodules were covered by a thick sediment layer. On Dec. 9, we finished sampling the sediments in the Collector Impact area and started the sampling program in the reference area about 5.5 nm to the south. From 9 to 11 Dec, several multicorers and box corers were run.

On 11.12. the AUV could be launched again with the goal to document the collector impact area after the completed sampling with the multicorer and box corer in form of a photo series.

Greetings in the name of all participants,

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