

RV SONNE

## SO 293 AleutBio

Aleutian Trench Biodiversity Studies

24. July – 06. September 2022

Dutch Harbor (Alaska, USA) – Vancouver (Canada)

## 2. Weekly report

25. July – 31. July 2022



During this work week, 2 stations were completed in the Bering Sea and work began on the third station. After 23 hours we reached Station 1, which was completely successfully sampled with all instruments. After the deployment of the CTD for the sound velocity correction of the multibeam echo sounder data, as well as for the water column characterization, we mapped a 5 x 5 nautical mile working area in order to obtain high-resolution bathymetric data and to be able to determine the exact positions for the deployments of the collecting systems as well as the towed equipment.

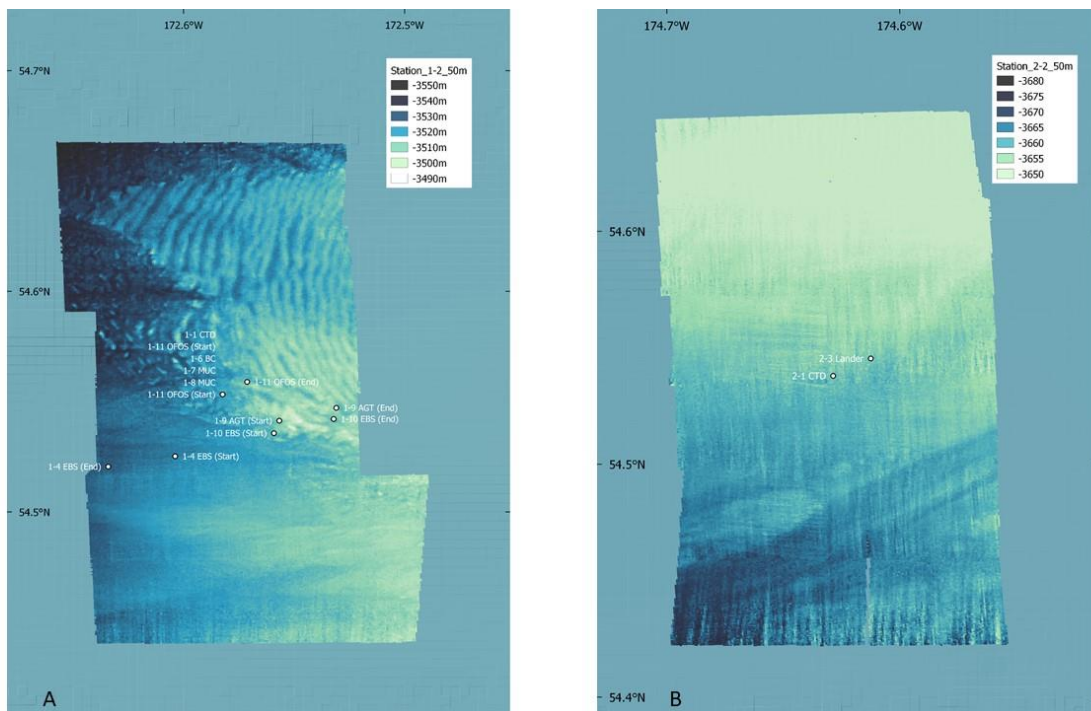
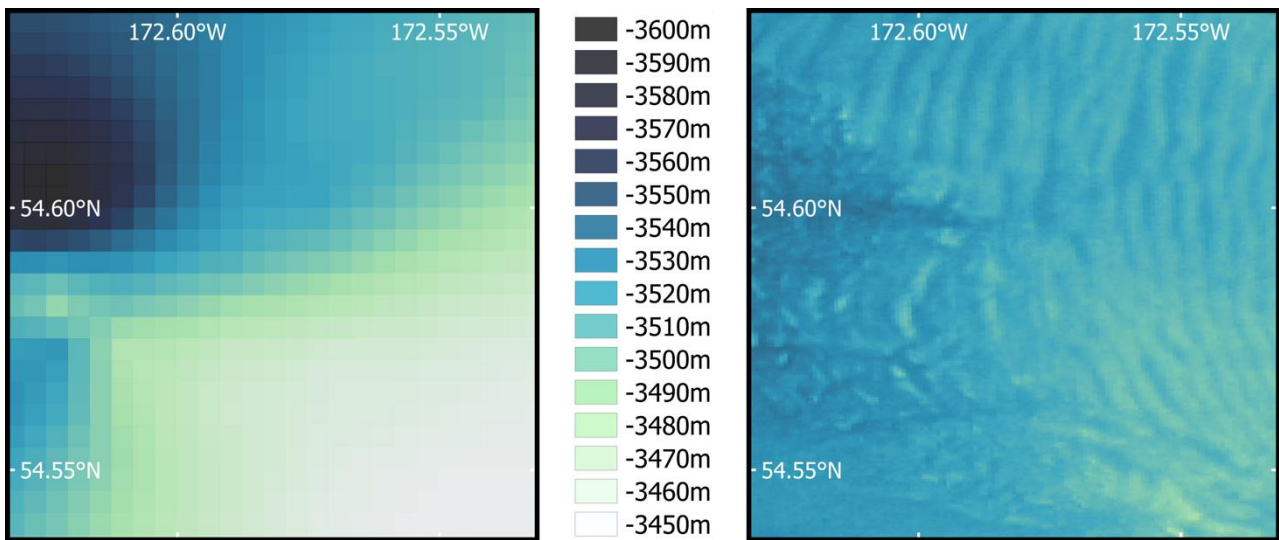


Figure 1: Bathymetric maps of station regions 1 (A) and 2 (B) produced during this expedition.



## Satellite Altimetry (GEBCO)

## SO293 Bathymetry (MBES)

Figure 2: Section of the GEBCO map (left) and the bathymetric map of Station Region 1 produced during this expedition (right).

The maps (Fig 2) illustrate the new increase in knowledge of the seafloor topography compared to the prior GEBCO data. Previous existing data showed much less finescale topographic variation and even suggested structures that are not reflected in the new maps produced by this expedition.

The seafloor surveys were then followed by the deployment of equipment in the water column (multinet) and on the seafloor (box core, multicorer, epibenthic sled, and Agassiz trawl) to sample meio-, macro- and megafauna.

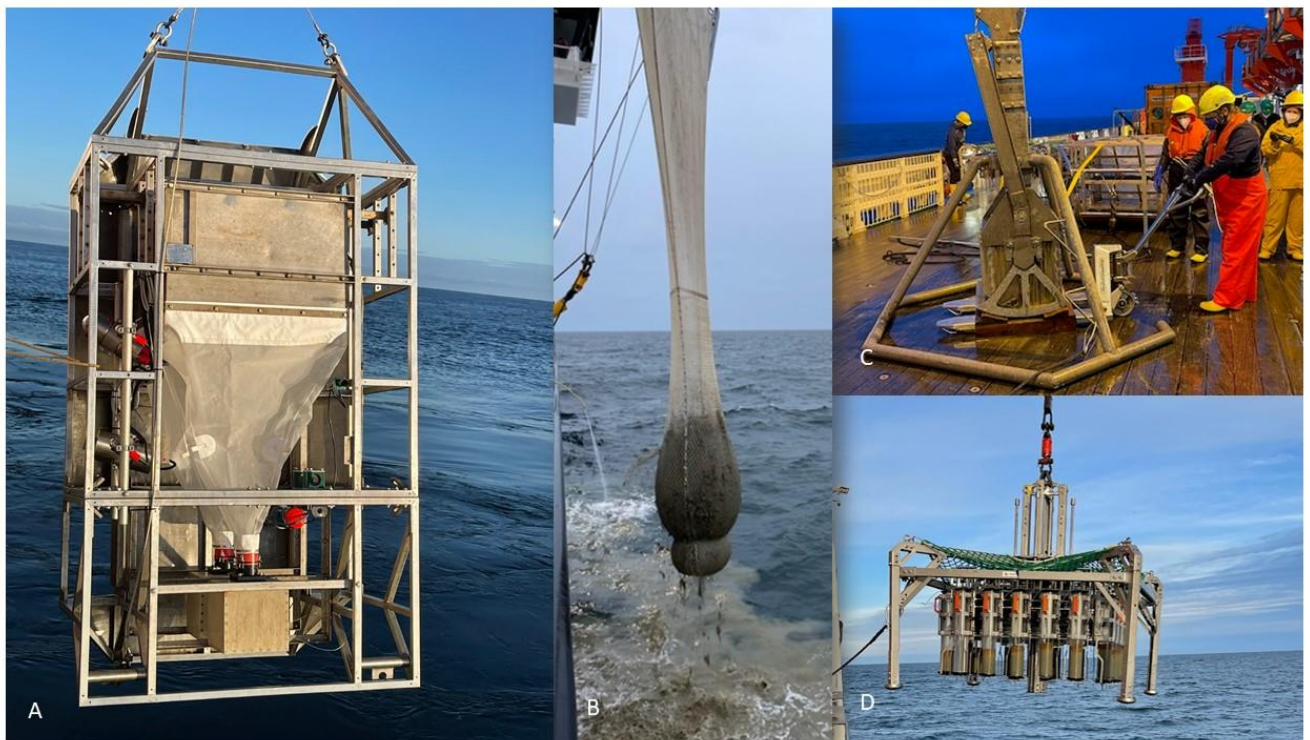


Figure 3: Benthic devices A epibenthic sled, B Agassiz trawl, C box corer, D multicorer.

The epibenthic sledge in particular collected very nicely preserved organisms of the intermediate size class, the macrofauna, such as peracarid crustaceans, which were also very abundant in the four catches at our first two stations.



Figure 4: Initial images of peracarid crustaceans: A Isopoda (*Ischnomesidae*), B Cumacea (*Diastylidae*) and C Mysidacea (*Mysidae*).

The seafloor was visually analyzed with the OFOS (Ocean Floor Observing System) for faunal composition and density of megafauna. A comparison of the Station 1 and Station 2 showed very different characteristics, from sampling and especially the OFOS. At Station 1, many large protists (xenophyophores, giant unicellular organisms related to coated amoebae), elpidiid holothurians („sea pigs“) and octocorals were visible on the underwater images, while Station 2 showed a dominance of echinoderms, especially of regular and irregular sea urchins and sea cucumbers, and xenophyophores were much more sparse. The benthic samples also showed differences in sediment, especially the Agassiz trawl recovered larger quantities of sticky mud in Station 1 compared to Station 2.

Interestingly, at both stations we found larger burrows, sometimes with several holes side by side, which have already been described in the current literature as phenomena of unknown origin. Many of these holes contained marine isopods that may have used them to hide from predators, such as the grenadier fish frequently detected in OFOS images.

We deployed a free-fall lander for biogeochemical measurements on 7/28, but recovery was not successful on either 29 July nor 30 July. Therefore we had to abandon the lander system and steam on to Station 3.

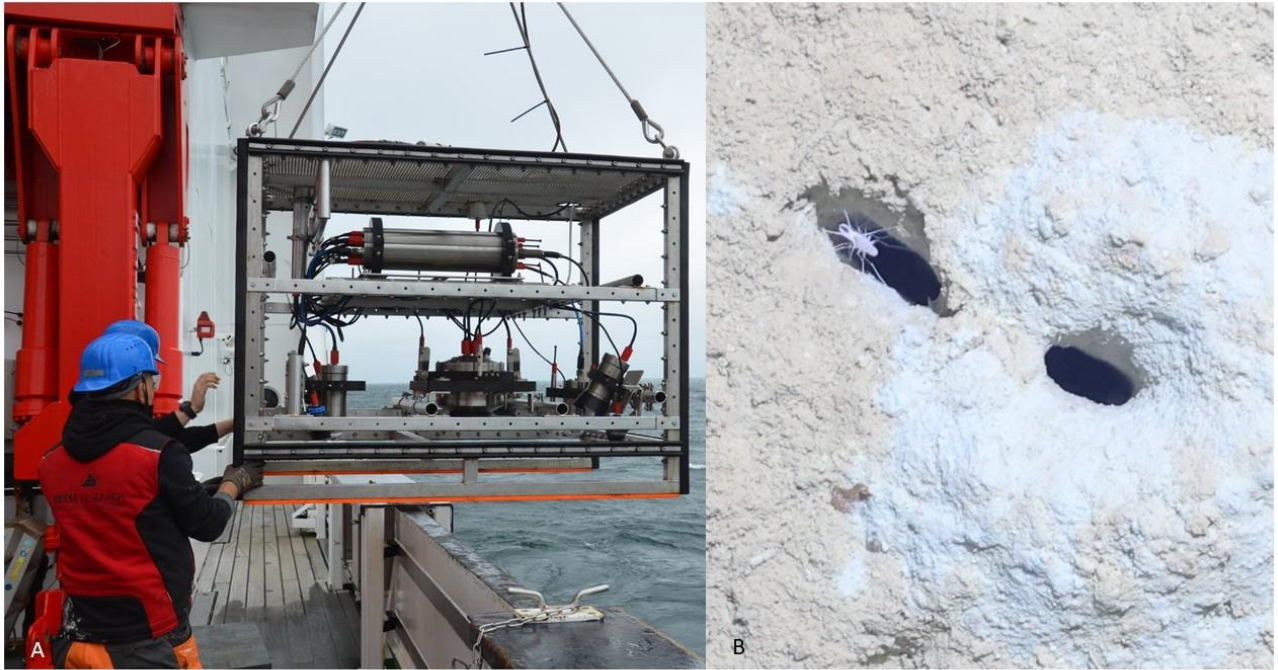


Figure 5: A, The OFOS; B Ominous holes in the deep seafloor with marine isopod at upper left, presumably of the family Desmosomatidae (Asellota, Janiroidea).



Figure 5: Freefall lander system on board FS Sonne before deployment.

All are well and send greetings home.

Angelika Brandt (on behalf of all scientists of the expedition AleutBio)

A handwritten signature in blue ink that reads "Angelika Brandt".

Angelika Brandt  
(Senckenberg Research Institute and Natural History Museum Frankfurt)