

## RV SONNE - SO 293 "AleutBio"

Aleutian Trench Biodiversity Studies

24. July – 06. September 2022

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

### 5<sup>th</sup> Weekly report

15. August – 21. August 2022



During the past week we finalized the second transect across the Aleutian Trench (station areas 8-10) and steamed to the hadal station area 11 where we plan to spend again about three days at the third hadal station area with > 7000 m depth (Fig. 1).

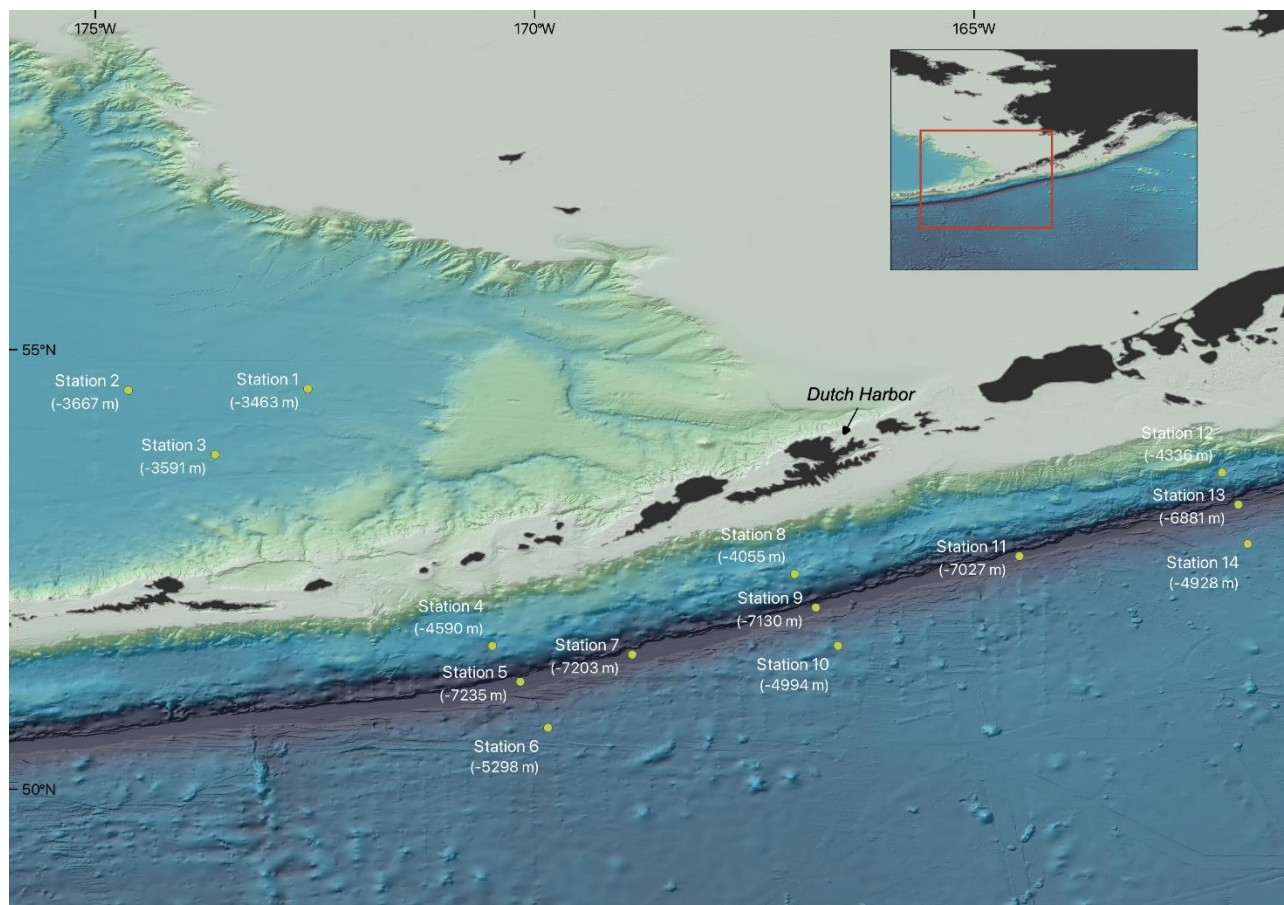


Figure 1: Bathymetric map of the station areas planned during the AleutBio (SO293) expedition.

Station-area nine was given special attention, as hadal samples were also taken with corers and EBS from both sides of the slope.

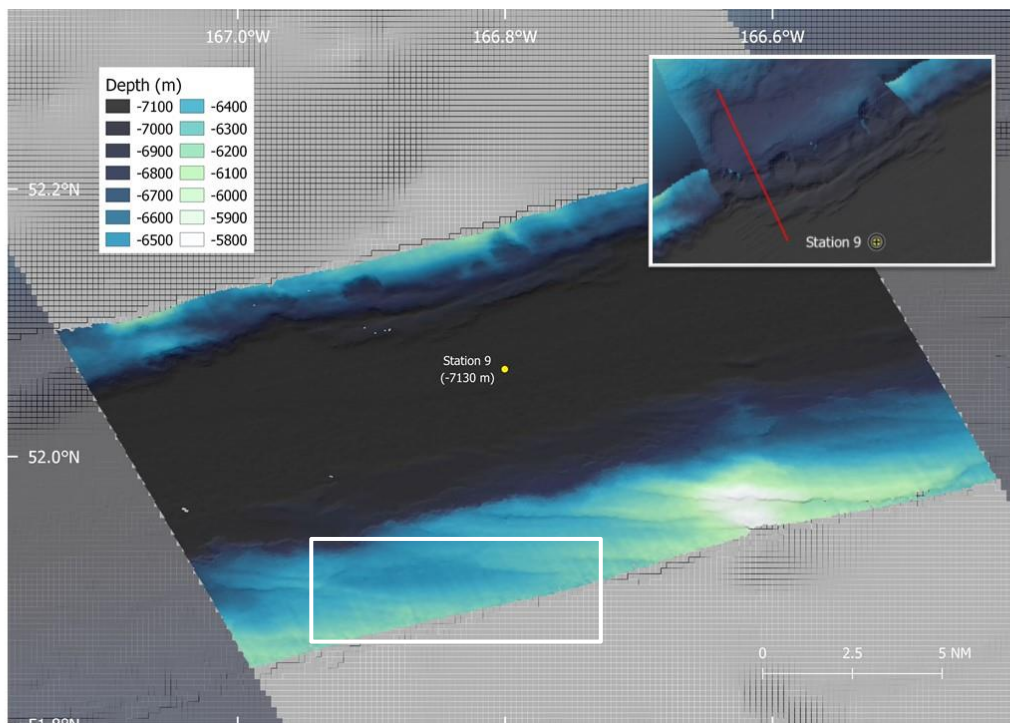


Figure 2: Bathymetric map of the station area 9 with areas sampled on the northern and southern slopes.

Shortly after sending off the last weekly report, the EBS caught a very nice specimen of the holothurian *Psychropotes* sp. from station 8, the same species was then also collected in the AGT and was also seen on six of the OFOS images.

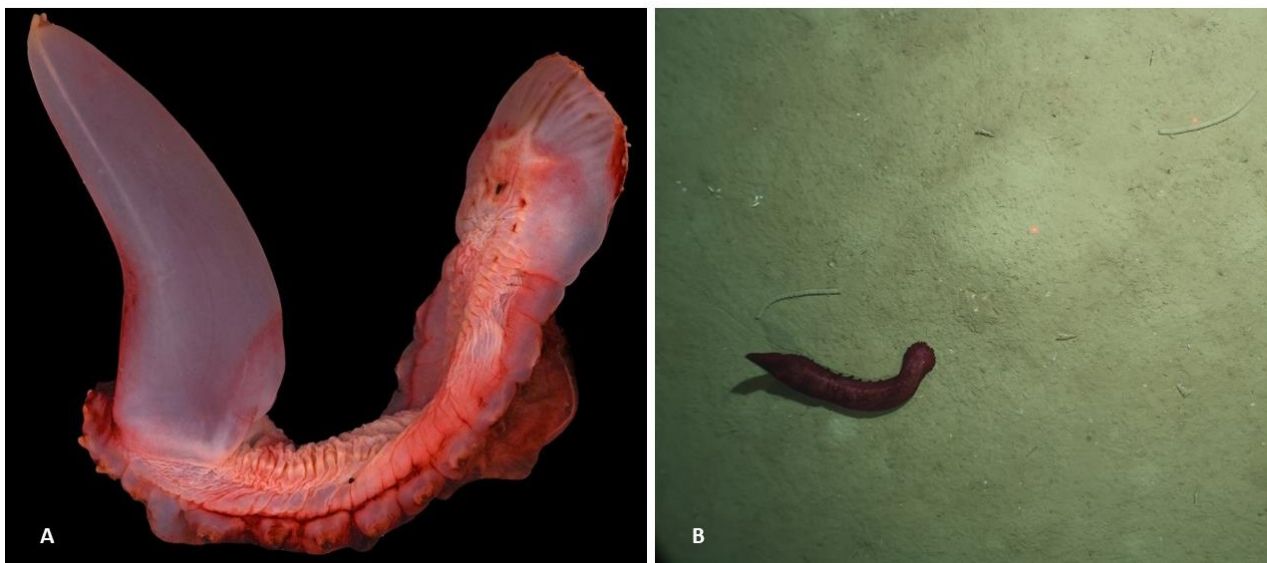


Figure 2: *Psychropotes* sp (A) of about 30 cm length, caught at station eight of the AleutBio expedition and also seen on the OFOS images (B).

However, as we reported about echinoderms in the last weekly report, we now would like to concentrate on macro- and megabenthic taxa which are very commonly caught in our samples, Cnidaria and Polychaeta. Based on preliminary observations of both groups, the benthic macro- and megafauna of the stations in the Bering Sea appear to be very different from the one of the Aleutian Trench.

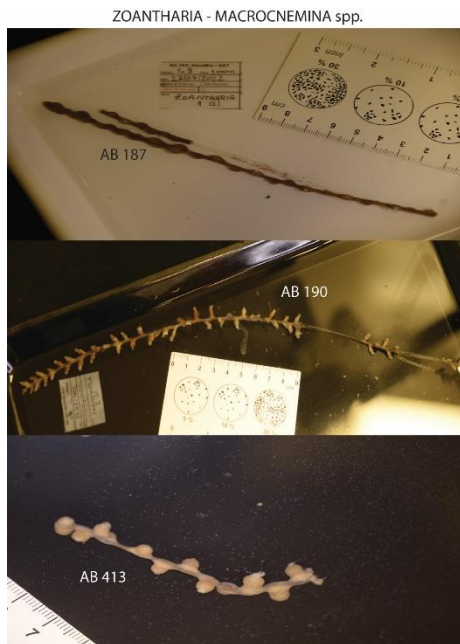


Figure 3 Overview of *Macrocnemina* spp. collected from Stations #1 and #2 in the Bering Sea.

The phylum Cnidaria consist of six classes: Anthozoa, Cubozoa, Myxozoa, Hydrozoa, Scyphozoa and Staurozoa and occur in all world's oceans from the tropics to the Arctic and Southern Ocean and from shallow waters to deep sea. During the AleutBio expedition we sampled this phylum between 3500 m to 7200 m mainly with the Agassiz Trawl (AGT). While the Bering Sea is dominated by poriferans and the Aleutian Trench by echinoderms. Regarding cnidarians, Zoantharia of the suborder Macrocnemina Haddon & Shackleton, 1891 (Fig. 3) were particularly abundant in the Bering Sea. *Macrocnemina* sp. found were associated to the glass-sponge (Hexactinellida) which resulted particularly abundant in the two stations examined. Along the Aleutian Trench low abundance and diversity was reported at hadal station 5, while a moderate diversity was reported at the lower slopes of the trench (stations 4,6). Among benthic cnidarians, anthozoans are dominant with the presence of both octocorals (pennatulaceans – Fig. 4) and hexacorallia (“solitary corals”, scleractinians). Except for the hadal station, relatively high abundance of planktonic cnidarians (Scyphozoa) was reported from all stations.

Polychaets are collected along with other benthic macrofauna with several different gears, namely the BC (box corer), the EBS (epibenthic sledge) and also, the AGT (Agassiz trawl), though the latter is mostly used for the collection of larger megafauna such as the cnidarians. The macrofauna samples are not fully sorted yet; however, we already realize that both species richness and population densities in certain groups seems to differ between the Bering Sea and stations in the Aleutian Trench. In the Bering Sea, the macrofauna was dominated by Annelida (Polychaeta) whereas in the trench Annelida and Crustacea most important. Echinodermata were most numerous at all stations in the trench area; however, this might be a result of the pre-sorting process focused on larger organisms. Mollusca were more or less equally represented across all studied stations so far.

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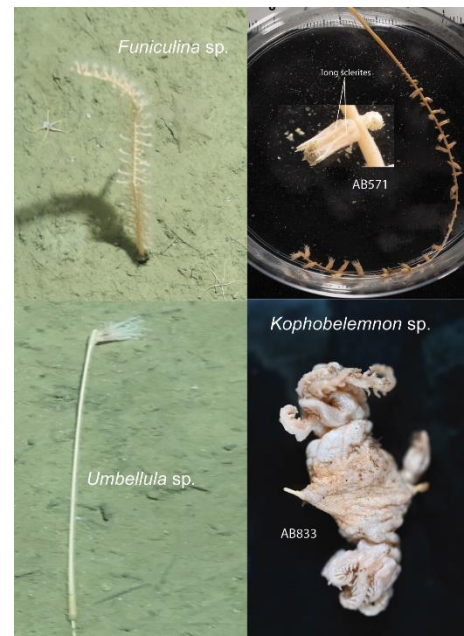


Figure 4 Overview of pennatulacean (sea-pen) species collected with the AGT, and photos taken with the OFOS.

Among polychaete annelids, 24 different polychaete families were retrieved from the BC samples, whereas it was 32 from the EBS. At station 7-10 (AGT, hadal station) large numbers of peanut worm tubes, members of Sipuncula, were seen on the sediment surface (OFOS, and surface of BC sample) and eventually also dominated in samples from all gears. They were tentatively identified as *Phascolion* cf. *lutense* Selenka, 1885, *P.* cf. *pacifica* Murina, 1957, and mostly as species of the genus *Nephasoma* (Figure 5). These peanut worms have a widespread distribution in the world's oceans, but their great abundance in these deep-sea stations has not been well described, if at all.

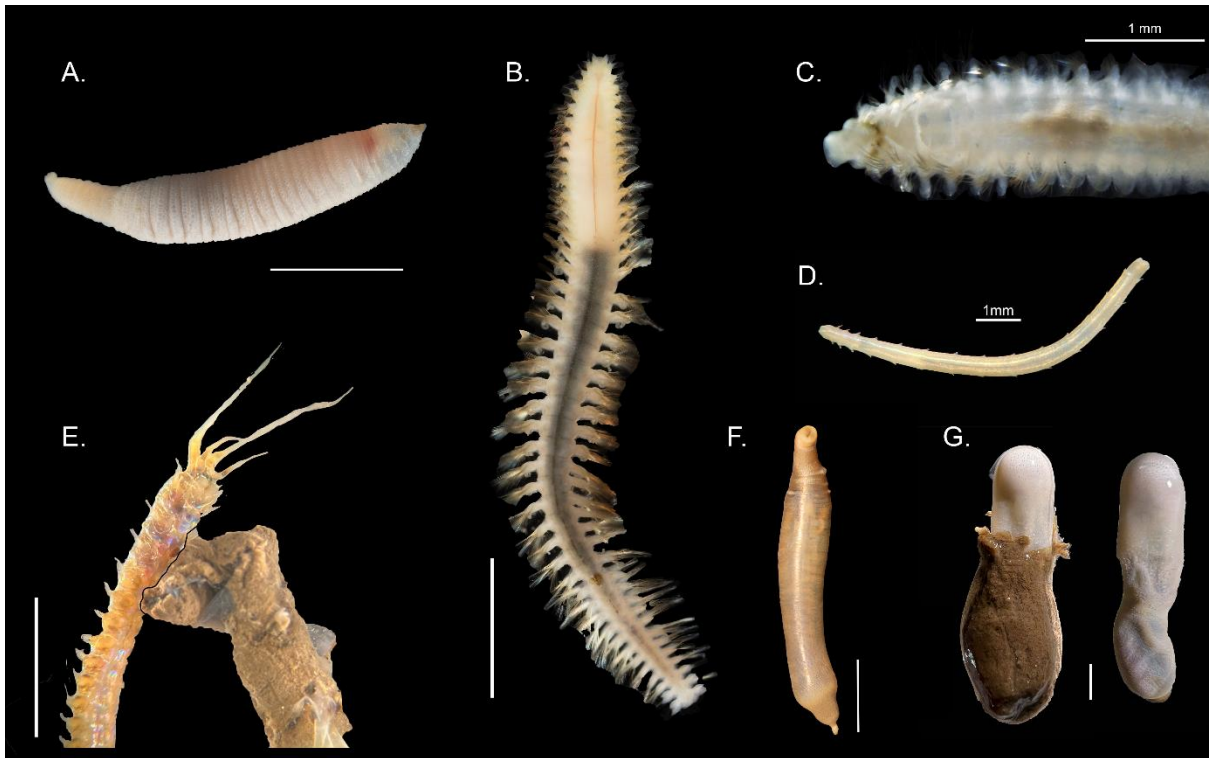


Figure 5. All scale bars are 5 mm unless otherwise noted. A. A grub-like worm, *Travisia* sp., from the Aleutian Trench. B. Abundant nephtyid worm from the Bering Sea. C. Spionidae worm from the Bering Sea sans palps. D. Fauviolopsid worm like that which are abundant in most abyssal sites. E. Decorator tube worm with its tube. F-G. Peanut worms, *Golfingia* sp. and *Phascolion* sp., that were found in high numbers near the Aleutian Trench and in the Bering Sea.

The highlight of this week was the discovery of a relatively large monoplacophoran, an single-valved, limpet shaped and untorted mollusc. So far we have found only a single specimen, but we hope for further discoveries among the unsorted material which will be processed in the home laboratories. Nevertheless, monoplacophorans are rare. One single specimen was also found in the Kuril-Kamchatka trench during our previous expeditions, and we are very curious whether these specimens might belong to the same species.



Figure 6. A rare deep-sea monoplacophoran, collected at hadal depths at AleutBio station 9 in the Aleutian Trench, shown in different views.

All are well and send greetings home.

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

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