

***Interactive comment on “Density and distribution of megafauna at the Håkon Mosby Mud Volcano (the Barents Sea) based on image analysis” by E. Rybakova (Goroslavskaya) et al.***

**Anonymous Referee #2**

Received and published: 12 February 2013

This study present data on megafaunal community associated with different habitat on the Hakon Mosby Mud Volcano (HMMV) based on images analyses. The aim is to compare the composition, density and distribution of the megafauna according to the percentage of coverage by bacterial mats and siboglinid tubeworms. Data are interesting but the methodological approaches concerning species identification and especially macrofaunal taxa, as well as data analyses have to be clarified. The manuscript has to be edited concerning figures and tables order in the text. The result section should be more structured.

Specific comments: Introduction : The introduction is long; particularly the part related

C8141

all the researches performed on the HMMV. Reference Decker and Olu 2010 is not appropriate at this state and should be removed(P 17479 L19). Material and methods P 17481 L12-13 :As the area of images varies a lot from 1 to 8 m<sup>2</sup>, the altitude should also vary from 1.5 m to several meters. It could be assume that the fauna visible and that can be identified vary a lot according to the altitude. If all images have been analyzed, independently of the altitude, this induced a bias in the analyses. This is a very important point that need to be clarified. Table 2/Fig 5,6,9: I wonder how the small macrofauna:, amphipoda, isopoda, and Thyasiridae bivalves usually buried in the sediment is visible over an altitude of 1 m high. Even Pygnogonida could be very difficult to distinguish among siboglinids or within the microbial mats. P 17482 and 17483: Data analyses are confused. I suggest to redefine habitat categories mixing bacterial mats and siboglinid tubeworms in MDS and ANOSIM and to perform a single test with all habitat types. The result of the MDS (Fig3a) are not convincing. Authors should perform Spearman correlation between diversity indices and the % of bacterial mats or siboglinid as in Bergquist et al. 2005.

Results Results should be more structured. P 17483 L22 to P 17490 L3 : All this part should be included in a first paragraph dealing with HMMV and from P 17490 L5 to P 17490 L23 in a second paragraph on the comparison between HMMV and the background. P 17484 L 4-5: “Variations in the mean density of selected taxa, area coverage by bacterial mats and pogonophorans and the sediment colour are shown on Fig. 8”.Fig 8 should be re-named Fig 3.

P 17484 L 15-17:”Figure 3a indicates two groups of images similar to groups revealed by ANOSIM. Some images with a coverage of 0–10% by bacterial mats fell out of revealed groupings.” Grouping is not easily recognizable.

P 17484 L 20-21: “The mean densities of these species in areas of different coverage by bacterial mats are presented in Table 4.”Table 4 should be re-named in table 3 and conversely.

C8142

Tables 2, 3 and 4: Categories should be clarified for siboglinid: < 50% is from 10 to 50 % ?

P 17488 L 2-3: "The mean density of selected taxa in areas with different combination of bacterial mats and tubeworms was evaluated based on the OFOS transect III." Why this comparison is done only on the transect III ?

P 17488: "3.2 Comparison of megafauna from three zones inside the volcano caldera" This part should be included in the discussion.

Figure 4 and 7: pictures could be in a larger format.

Figure 8: The color of the sediment does not seem to be an important parameter and should be removed from all analyses. This figure should be introduced at the beginning of the results, as present raw data ((except classification into three "zones") that quite clearly show differences among habitats.

---

Interactive comment on Biogeosciences Discuss., 9, 17475, 2012.

C8143