

## ***Interactive comment on “Bacterial diversity and biogeochemistry of different chemosynthetic habitats of the REGAB cold seep (West African margin, 3160 m water depth)” by P. Pop Ristova et al.***

**Anonymous Referee #2**

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In this study the authors sought to determine how the distribution of benthic bacterial communities is related to the distribution of chemosynthetic fauna in the REGAB cold seep ecosystem. The application of an interdisciplinary approach combining porewater geochemistry, in situ quantification of fluxes and methane consumption with bacterial community fingerprinting, provided an excellent strategy for understanding microbial community patterns in ecosystems. The authors found that different biological habitats within the REGAB ecosystem were linked to the biogeochemical regimes of the underlying habitat. Microbial communities were further correlated to their in situ function by

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investigating anaerobic oxidation of methane and sulfate reduction. The bacterial community statistical analysis and comparison to the biogeochemistry was well done. The paper was also well written although I would like to suggest a few changes to improve the structure and readability of the data presented: 1. In the results section the biogeochemistry is split into different sections but these parameters are not discreet. Sulfide, ammonium, etc. are related to each other and to the fluxes discussed. It would be easy to read and to follow the story if this was one section without subheadings. Maybe not all sub-sections need to be combined but some need to be. 2. Figure 3 contains a lot of information that is difficult to read due to the small size. I also feel like the rate data and cell counts are redundant to table 2. Do you really need to present all of this data in both forms in the main paper? Some of this might be best in the supplemental material so that there is a better focus on the key results. Additional minor comments are below.

Specific comments: 1. The habitat description sounds like results. 2. Please be thorough in defining abbreviations. SR is not defined in the first results section or in the methods, e.g., pg. 8343, l. 10. 3. Pg. 8345, l.19, correct the spelling of microelectrodes 4. Heading of 3.1.7: please define TOU here. 5. Pg. 8366, l. 15: please correct the spelling of determination 6. Figure 3: please define the symbols displayed for H<sub>2</sub>S and sulfate and define SR in the legend.

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