

## ***Interactive comment on “Temporal and spatial mediated changes in subsurface microbial community assemblages and functions” by Madison C. Davis***

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I'd like to thank Reviewer 1 for their review and comments.

The Davis and Garey 2018 paper sought to characterize the microbial stratification in distinct hydrochemical layers to provide a "snapshot" of microbial stratification within the study site, Hospital Hole. This study sought to determine whether the distinct microbial and hydrochemical layers identified in the 2018 study have similar patterns of microbial community change over a two year time period (summarized in lines 6-11). The principal coordinate analyses allowed for the determination of structural changes within the microbial communities during the study period. Potential metabolic functions

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were used in addition to the principal coordinate analyses to determine if there were large shifts in functions (e.g. sulfur oxidizers to sulfur reducers) that may not be present at the taxonomic resolution, and to eliminate the complexity of analyzing changes for thousands of operational taxonomic units for five different groundwater regions. The taxonomic compositions may be added to supplemental materials at the editor's discretion.

The microbial communities were analyzed separately by layer based on the Davis and Garey 2018 initial findings, which is why there are 5 separate principal coordinate analyses plots. Additionally, the changes in structure over time were more easily shown between layers separately than on one plot.

Calculations for potential metabolic functions are described on lines 99-108, which highlights that each function is calculated separately. As mentioned by Reviewer 1, many bacteria can have more than one function (e.g. coupling sulfur and nitrogen cycling). This is why the functions were calculated separately and the percent abundance of functions does not total 100%. This can be clarified in text before publication.

Could Reviewer 1 please clarify how this manuscript may be presented more clearly? Specifically, which sentences in the text should be altered? Of these sentences, which lines and how could they be altered to avoid sounding like a report? Also, would the reviewer please clarify how these sentences could be improved so they do not sound "thin"?

I appreciate the feedback from Reviewer 1, and any clarifications provided to help improve this iteration of the manuscript before publication.

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