

***Interactive comment on* “Temporal variations in microbial activities and carbon turnover in subtidal sandy sediments” by S. I. Böer et al.**

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We thank you for your general comments on our manuscript. Please find our statements below.

i) The single site sampling does not allow evaluating how representative are the results at the ecosystem scale.

All complex time series studies are of limited spatial extent, as it is not possible to cover both spatial and temporal variability of different environmental parameters. This is particularly true for time series studies in sediments where the sampling effort and subsequent treatment of the samples is generally more time consuming and difficult

than for studies in the water column. Our samples derived from sediment of several pooled sediment cores; therefore we believe that our results are representative for the sampling site. We are aware that we are looking at a single site and that these results should of course not be generalized for the entire ecosystem, however please note that this is the first study (at least to our knowledge) that investigates temporal variations in bacterial carbon turnover in sandy sediments over longer time scales at all and thus may give first insights into these variations. When comparing our data to other publications, we see that our results are within the range of turnover rates observed for other sandy sediment sites, however these studies lacked the time (and partly also depth) resolution we cover in this present study. We tried to show what we think may be most interesting and special for coastal sands in terms of microbial carbon cycles and temporal variations. We intended this study to serve as a first basis to investigate whether these temporal patterns we saw generally exist, but we did not intend to scale up our results to the entire ecosystem “sand”. The manuscript will be carefully revised to avoid such an impression.

ii) Despite the large number of methods used the results remain rather descriptive.

The purpose of the analysis was to look for factors governing temporal patterns in subtidal sands which has never been done before for the microbial component in such complexity. Hence, this is an exploratory approach rather than a descriptive one. In addition, we tried to come up with carbon budgets as good as possible. This may be called descriptive, but it is relevant for biogeochemistry and our knowledge of nutrient cycles to attempt such budgets.

As a consequence the discussion contains too many assumptions regarding: i) the mechanisms at stake to explain the variations of the activity rates measured, ii) the interpretation of the calculated correlations among variables and iii) the consequences

of the rates and microbial densities measured at a larger scale.

Again, this is the first study to investigate temporal patterns in microbial activities in sandy sediments in such high complexity. Of course we tried to draw conclusions based on what is already known about this ecosystem, however only if our data supported these. Also we have of course compared our findings to available data from other studies that used similar approaches; however we did not draw any general conclusions on the functioning of sand flats. We are aware that we are looking at a single site; still our findings may not be seen isolated from what is known about sands in general and of course we evaluated our data against the background of this general knowledge. During the revision of this manuscript, we will make sure that we do not make speculations that our data does not support.

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