

## ***Interactive comment on “Climate-driven change in a Baltic Sea summer microplanktonic community – desalination play a more important role than ocean acidification” by Angela Wulff et al.***

**Anonymous Referee #1**

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Dear Angela Wulff and Maria Karlberg, etc

Overall, this is an interesting paper and I really appreciate your study because there are few people focusing on the salinity recent years, let alone the combination effects of ocean acidification and desalination (a future scenario especially in high latitudes). Thus, your study can add one piece to this complicated puzzle with no doubt. Still, I have a few questions and suggestions.

First, just as you have mentioned in the manuscript, to reach the target salinity, you chose to mix the seawater of higher salinity with Milli-Q water simply. We can see that not only the salinity but also AT and the amount of dissolved inorganic carbon will change. So it may confuse readers which factor the experiment outcomes actually re-

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sult from. Although you have mentioned in the manuscript that “the reduced buffering capacity was not expected to affect the microorganisms in our experiment”, still, I suggest you have a supplementary experiment to distinguish the effect between salinity and alkalinity so you can illustrate clearly. After all, the carbonate system really concerns while taking ocean acidification study.

Second, the conclusion from your paper is that pCO<sub>2</sub> showed only minor (no) effects. However, according to the description in the manuscript, it seems not convincing. To mimic the scenario by the end of this century, the target pCO<sub>2</sub> is 960 μatm but the actual pCO<sub>2</sub> is far below this value (see Day 12 situation, eg. 833 μatm (SE 108) at salinity 6, and 579 μatm (SE 39) at salinity 3). In this case, the effect of high pCO<sub>2</sub> may be inadequate to appear. Therefore, it's better to adjust the flow rate and the position (depth) where ceramic air diffusers set or increase the amount of that so you can reach the target pCO<sub>2</sub>. In general, repeat the experiment again, if it's possible.

Besides, for the short term incubation like microcosms, why not take the batch culture into consideration as I wonder whether addition of nutrient in the halfway (like your experiment setup) will influence the final results. Maybe another choice is shorten the duration of incubation properly without nutrient supplement in the whole process. If it were me, I would do like this.

At last, I hope you could plot extra figures to show the change of growth rates and species diversity with time alone.

All in all, with slight modification, I would accept and recommend this paper to publish. With respect

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