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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 #2

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Review of Wulff et al.: Climate-driven change in a Baltic Sea summer microplanktonic community – desalination play a more important role than ocean acidification. The paper reports of an experiment where pCO2 and salinity have been altered. The main result is that the projected reduced salinity (due to increased freshwater runoff) will have more effects on the plankton community than increased CO2 concentration / reduced pH.

The outline is clearly explained and it is a well written story. The main problem lies in the fact that salinity was adjusted with dilution of MilliQ, reducing salinity from 6 to 3 (50%). Firstly, this is problematic as the other treatment, increased CO2, kept the original water. There was addition of inorganic nutrients to the MilliQ to compensate

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Discussion paper

for its loss by diluting, but otherwise the basic chemistry of the low salinity treatment was altered beyond the salinity effect. The authors are aware of this, e.g. pointing out that the alkalinity was different, but there might be more differences that currently is not taken into account, e.g. the DOC pool. A more elegant way would have been to dilute also the high CO2 treatment with artificial sea water (MilliQ with added sea salt) in a similar manner.

Another issue is the shock effect in this relatively short term experiment. The authors state the CO2/pH is quite variable in the study area, presumable affected e.g. by upwelling (high in CO2) and primary production (reducing CO2). As such the rapid change in the high CO2 treatment is probably something the plankton community may experience in a relatively short time frame. A drastic reduction in salinity (50%), however, might be more of a chock. Although the salinity change would be within the tolerable salinity window of the main species, I would expect an immediate effect of increased respiration, causing reduced growth, due to acclimation to the new salinity (for example adjusting membranes and osmoregulation). These possible indirect effects of the low salinity treatment should at the very least be discussed. Although work with cultures is not directly comparable, acclimation period over several generations is normally used for determining a species salinity tolerance (e.g. one month used in Yamaguchi et al 1997, J . Plankton Res 19: 1167-1174), so drawing any long-term conclusion from this experiment is questionable.

Minor comments: P6, L21. Variable fluorescence is normally denoted Fv (or you should use ΔF throughout). P9, L19-20, Testing the obvious defeats the purpose of statistics (if you dilute, of course there will be a treatment effect).

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