

***Interactive comment on “Effects of cyanobacterial-driven pH increases on sediment nutrient fluxes and coupled nitrification-denitrification in a shallow fresh water estuary” by Y. Gao et al.***

**Anonymous Referee #1**

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The authors present data from laboratory experiments with intact sediment cores from a tributary to Chesapeake Bay. They treated the cores with increased water pH, mimicking the conditions during a heavy cyanobacterial bloom typical for the area, and measured changes in nutrient fluxes and nitrogen mineralisation processes. Although the number of cores per treatment was quite low, the experiments were carefully conducted to take into account the different processes. The results are very convincing and the data and the conclusions are presented in a clear and logical way. It was a pleasure to read this paper! Consequently, my comments are really minor (there are

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some typos but I do not comment those). Chapter 2.1 Study sites and collection of cores: Please add the depth of the sites already here. How did you filter bottom water (pore size)? Also the depth of the “surface sediment” for nitrification (2 cm) could already be told here. Chapter 3.9 Effect of pH on potential nitrification; there probably are no data on pH on Archaea, are there? Table 1: the chlorophyll unit must be  $\mu\text{g/l}$  – even in a middle of a cyano bloom the chlorophyll cannot be 78  $\text{mg/l}$  Table 4, Fig 3, Fig 4, Fig 6: using just “control” and “pH1” and “pH2” is confusing. I understand you have used this notation because they vary between the experiments, but could you find a way of giving the actual values? For example two rows, one for Powerline site and one for Budds site? Or maybe in the figure legend? The original pH of the site is given in Table 1, but that is not the control pH, which complicates the matter (at least it did for me!)

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