

Review revised version Rooks et al. 2019 – reviewer 3

The authors adjusted and improved the manuscript according to most the reviewers comments. The supplementary pdf with track-changes was also useful to check the adjustments. However, not all previous reviewer comments have been sufficiently addressed. In my (professional) view, the authors should be more careful in upscaling and translating the potential denitrification rates to ecosystem level.

Title: Sink is a confusing term, at least to me; and also “high” is vague, “high” compared to what? Why not change it to (something like): “Nutrient removal through denitrification is a common feature of boreo-arctic sponges.”

Paragraph 4.4: If you want to upscale to *in-situ* conditions, the rates should be adjusted to ambient nitrate concentrations. The easiest way is a linear relation (first order kinetics) between nitrate concentrations and denitrification rates, resulting in 10 times lower denitrification rates under ambient nitrate concentrations. If you assume that nitrification is not driven by nitrate concentrations, then this should be discussed and justified.

P26, L14-16: pumping and non-pumping rates are swapped for the Arctic sponges.

P26: L19: add under anoxic conditions. As also discussed in the paragraph below and I agree with this discussion, this value is based on theoretical extremes. So is there any ecosystem relevance to this number? I would also remove this from the abstract.

Table 1: Could you add a column with denitrification rates under anoxic conditions as well? Next to visualization of the data in Fig.2, it is useful to have all numbers presented in text and tables, so these numbers can be used by others. I commented this before. I would also use a similar order of sponges in table and figure 2 (*Parva* and *Hentscheli* are swapped)..