Biogeosciences

Discussions

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Interactive comment on "Sedimentary alkalinity generation and long-term alkalinity development in the Baltic Sea" *by* Erik Gustafsson et al.

Anonymous Referee #1

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This manuscript reports alkalinity development in the Baltic Sea since 1970 based on two models. I am, however, not convinced about the results as there is a lot of extrapolation, and the calculations are done without an error analysis. For instance, it is said that 260Gmol/y of the additional TA source can not be explained but there is no error bar. In fact, most of the numbers given have no error bars. My other major concerns are: 1. Sulfur in umol/g is converted to umol/cm3 using measured porosity but this can not be done using porosity alone. 2. The results are integrated to 25cm and extrapolated to basin scale. But, how reliable is the age model and how homogeneous is the sediments in the Baltic Sea? I would expect a lot of variability in both but the uncertainty is not evaluated. 3. It is said that borate is ignored because it is expected to have a low contribution to TA. I am surprised. What is the basis for

such a statement? My minor concern is the statement that the Baltic Sea today forms the largest anthropogenic dead zone is the world. It is not true. There are many dead zones in the Baltic Sea so the authors must have summed them up. If one sums up separate dead zones in other seas, such as the East China Sea, the total area is much larger. In fact, the dead zone off the Changjiang river mouth alone is now larger.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2018-313, 2018.