

## ***Interactive comment on “Effects of the 2014 Major Baltic Inflow on methane and nitrous oxide dynamics in the water column of the Central Baltic Sea” by Jukka-Pekka Myllykangas et al.***

**Anonymous Referee #2**

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Review: “Effects of the 2014 Major Inflow on methane and nitrous oxide dynamics in the water column of the Central Baltic Sea” by J.-P. Myllykangas et al., 2017

Summary: The paper describes the MBI event of 2014 and its impact on the concentration patterns of N<sub>2</sub>O and CH<sub>4</sub> in the Baltic Sea, measured at 5 stations in the Gotland Basin. The findings and conclusions are consistent with previous results. This study contributes to the monitoring of greenhouse gas behavior under changing conditions and is therefore worth to be published. Although monitoring is not delivering the most exciting science on a short-term, it is indispensable for basic understanding in a long-term point of view and prediction of future changes. I recommend publishing with some minor corrections.

C1

Comments: The manuscript is in general well written and structured. Some parts could be more detailed. The literature cited is mostly adequate, citations need to be checked as discussion papers might be already published (see Bange et al. 2009, Walter et al. 2006).

The abstract is quite general; for a first overview it might be helpful to also include main results and numbers.

The Introduction part describes the processes very briefly and focus on the main pathways. For several statements (e.g. page 2, line 3-30) an additional citation of more recent publications would be preferable, as well as a more detailed description. The sentence “Both advective processes . . . (page 2 / 3, line 30 / 1) belongs more to the conclusions than to the introduction.

In the Material and Methods part please include a detailed error description and estimation, especially with view on the gas transfers between several plastic syringes. Please explain the advantages of storing the samples as described. Check the formula and its units. Please include information why those 5 stations have been chosen and link them to previous Baltic Sea monitoring programmes.

In the Discussion part the CH<sub>4</sub> dynamics in the EGB are not very clear described. Especially the CH<sub>4</sub>:PO<sub>4</sub> ratio approach could be more detailed as the figure is relatively complex.

Most of the figures are too small and included information is hardly readable. The information in the figure captures might be shortened or included in the text. Figure 4: if NH<sub>4</sub><sup>+</sup> and NO<sub>x</sub><sup>-</sup> have been measured at more than one station (BY15), it would be helpful to include the information into the overview Figure 2.

The information given in the supplementary part could be better introduced and referred to in the manuscript.