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Interactive comment on “Multivariate benthic ecosystem functioning in the Arctic – benthic fluxes explained by environmental parameters in the southeastern Beaufort Sea” by H. Link et al.

Anonymous Referee #2

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I see one fundamental problem with this paper, and numerous errors.

The fundamental problem is that the benthic flux measurements (providing the key data for this MS) were not carried out sufficiently well. First, to have a saturated oxygen level in the overlying water above all cores from all stations means that in situ oxygen conditions were far from being maintained. Since it is very well known that oxygen has a strong influence on both magnitude and direction of benthic nutrient (and sometimes also oxygen) fluxes, this is not acceptable. Second, to have only three data points in the calculation of each flux are way too few. The authors can in this way only get a very weak impression of the linearity of the concentration vs time plot from the flux

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incubations, and a poor estimation of the flux. Thirdly, to freeze samples for dissolved silicate during storage is not recommended since it will very likely cause sample artefacts such as irreversible polymerisation (giving incorrect concentrations). Also, one or a few figures showing the development of solute concentrations versus time during flux incubations should have been shown as well as a Table with the fluxes, and a better description of how fluxes, and the uncertainty of them, were calculated from the incubation data. The figure with fluxes in the MS is obscure, and it is very hard to see what the flux rates really are in that figure. All in all, this means that I do not trust the benthic fluxes reported in the MS. Furthermore, since any statistical and multivariate analysis of unreliable fluxes is not meaningful, a review of such statistical and multivariate analysis does not make sense to do.

The MS also contains numerous other errors such as unclearly written text, scientifically incorrect statements, too many speculations not supported by observational evidence or data, and sometimes lack of citing key references.

I am afraid that I cannot recommend anything else than rejection of this MS.

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