

## ***Interactive comment on “Porewater $\delta^{13}\text{C}_{\text{DOC}}$ Indicates Variable Extent Of Degradation In Different Talik Layers Of Coastal Alaskan Thermokarst Lakes” by Ove H. Meisel et al.***

### **Anonymous Referee #2**

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Meisel et al. characterized OC concentrations and degradation beneath two thermokarst lakes in Northern Alaska. They find DOC characteristics originate within individual sediment facies, with little evidence of potential exchange between facies. Using stable isotopes, the authors identify DOC in the lake sediments as showing more evidence of processing compared to the underlying, deeper talik sediments. The findings provide a nice dataset of OC characterization and DOC processing beneath two thermokarst lakes, and their classification of sediments into two primary units (lake sediment and taberites) both fit in with and expand upon previously published research. The paper is well written, and I recommend publication with only a few minor edits.

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#### Minor comments:

The term “layers” should be replaced by “facies,” which is the technical term for sediment/geological layers with the same attributes and has been previously used in the context of thermokarst lake sediments (e.g. Farquharson et al., 2016, doi: 10.1016/j.sedgeo.2016.01.002). In thermokarst lake sediment literature, the “deeper talik” facies of former permafrost thawed in situ is referred to as “taberite” (e.g. Grosse et al., 2007, doi: 10.1016/j.geomorph.2006.08.005; Heslop et al., 2015, doi: 10.5194/bg-12-4317-2015; Walter Anthony et al., 2014, doi: 10.1038/nature13560).

Line 17: Remove “up”

Line 62: (Anthony et al., 2014) should be (Walter Anthony et al., 2014)

Figures 2 and 3: The yellow numbers and label, and the light blue “Silicon” label, are hard to read on the white background. Colors with higher contrast would be better.

Figure 4: Same comment as Figures 2 and 3; the yellow is difficult to read on the white background.

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