Biogeosciences Discuss., 12, C4402–C4403, 2015
www.biogeosciences-discuss.net/12/C4402/2015/

Biogeosciences
Discussions
Open Access

Interactive comment on "Carbon dynamics in highly heterotrophic subarctic thaw ponds" *by* T. Roiha et al.

Anonymous Referee #1

Received and published: 17 August 2015

This manuscript is focused on the carbon dynamics and subsequent biological patterns in arctic thaw ponds during both late winter and late summer. The strengths of this paper are the inclusion of winter sampling, as well as the partitioning of carbon fractions and microbial communities. All of these are unusual in the limnological literature, and will advance our understanding of these thaw ponds in new ways.

Some comments that I have made in an effort to improve the clarity of the manuscript:

The second paragraph of the Introduction could use some better organization to clarify main ideas. It opens with a turbidity and nutrient statement about thaw ponds, then expands to detailed and widely ranging comments on carbon dynamics, and ends with light limitation. It is all great information but quite a bit to process- I think some better organization with a clear focus on the major points will help. Also, please clarify when

literature references are broader (e.g., Hudson et al. deals with what is happening in boreal lakes, not these ponds) versus specific to thaw ponds.

Please clarify how you define the depth of the thermocline. And in the Results, you say the thermocline was situated at 1.6 m- do you mean where it started? This was unclear. One could squint at the figure and decipher it, but that still leaves it unclear overall.

I found the implications for the issue described at the top of p. 11712 a little unclear- can you clarify from where then the water was sampled (just under ice, so then mixing was likely a bigger issue?). It says the other samples were from 1 m below the ice.

While at times the methods seem a little unconventional to me, the authors do a good job clarifying what they did so that the reader can decide on the quality- I think this is okay.

The description of the interpretation of the PCA seemed a little oversimplified to me- you say PC1 is more carbon, but PC2 did correlate with a couple of the carbon quality metrics as well as DOC, and PC1 was with TP. I would suggest some further clarification and elaboration on these patterns.

On p. 11727, line 7-9, isn't it also possible that TSS and TP are correlated because particulate organic matter (e.g., bacteria, phytoplankton) contain P?

Interactive comment on Biogeosciences Discuss., 12, 11707, 2015.