

Review of: The water column of the Yamal tundra lakes as a microbial filter preventing methane emission

General Comments:

This manuscript contains information that appears to be of considerable value in understanding the role of methane production and consumption in both deep and shallow Yamal tundra lakes. It likely has valuable application to understanding these processes in thermokarst lakes across the arctic. However, there are some significant adjustments/edits needed. With some minor edits/changes, I feel it can be accepted.

Specific Comments:

Lines 93-95: As stated in my previous review, I think a more clearly outlined hypothesis/research statement at the end of the introduction would be helpful. There is a wealth of information presented here, but it is not immediately clear how some information relates to the stated goals. I would suggest using a number list, eg: “The present work was aimed at elucidation of the similarities and differences in the rates of the methane cycle processes by examining: 1) the rate of hydrogenotrophic methanogenesis, 2) the rate of methane oxidation, 3) Etc.”

Line 165: In your response to my previous review, you stated “on the basis of our radioisotope studies, it is impossible to carry out a full-fledged balance calculation of methane production”. I think it would be valuable to explicitly state this early on in the text. Be clear that only a small portion of the total methane production is actually being quantified here because any readers might not be aware of this.

Line 281: Table 3 – This is just showing hydrogenotrophic methanogenesis right? I assume yes? Clarify please. You use the symbol MG-h later in the text.

Technical Corrections:

Lines 44-47: “Thermokarst lakes are widespread in West and East Siberia, in Alaska and Northern Scandinavia (Grosse et al., 2013; Kravtsova and Rodionova, 45 2016; Vonk et al., 2015; Wik et al., 2016). Thermokarst lakes are also common in Northwestern Canada and the Hudson Bay Lowlands (Marsh et al., 2009).” Would read better as “Thermokarst lakes are widespread in West and East Siberia, in Alaska and Northwestern Canada, the Hudson Bay Lowlands, and Northern Scandinavia (Marsh et al., 2009; Grosse et al., 2013; Kravtsova and Rodionova, 45 2016; Vonk et al., 2015; Wik et al., 2016).

Lines 71-72: Consider changing: “they oxidize this greenhouse gas and decrease methane emission into the atmosphere” to “they oxidize methane, thereby decreasing emissions into the atmosphere”

Line 165: (MG) should be (MG-h) to be consistent with further down in the text (eg. line 407)

Lines 349 – 428: Paragraphs are indented, inconsistent w/ rest of the paper