The Cryosphere

Discussions

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# Interactive comment on "Open system pingos as hotspots for sub-permafrost methane emission in Svalbard" *by* Andrew Jonathan Hodson et al.

**Anonymous Referee #1**

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The Ms "Pingos as hot spots of methane emissions" is a very interesting ms about the groundwater flow related to the special features of pingos. The Ms is very well written, the results are presented and discusses in concise manner. Almost perfect. . ..

Only one major drawback I realized at the end of the study: The emissions or flux of methane from a water body (river, sea, lake) is related to the difference between the measured concentrations (Cw) and the equilibrium concentration (Cequ) of methane in this water; and the gas-water transfer velocity (k). $J = (C_w - C_{equil}) \times k$ Thus, the calculation and assumptions drawn are wrong, and this part has to be corrected! Also, the way the flux / emission is finally calculated should be explained in the M&M section.

References: Striegl RG, Dornblaser MM, McDonald CP, Rover JR, Stets EG (2012) Carbon dioxide and methane emissions from the Yukon River system. Glob Bio-

geochem Cycl 26 Wanninkhof R (2014) Relationship between wind speed and gas exchange over the ocean revisited. Limnol Oceanogr: Methods 12:351-362

Interactive comment on The Cryosphere Discuss., https://doi.org/10.5194/tc-2020-11, 2020.