

# ***Interactive comment on “Biogeochemical and suspended sediment responses to permafrost degradation in stream banks in Taylor Valley, Antarctica” by M. N. Gooseff et al.***

**M. N. Gooseff et al.**

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Response to Reviewers: We thank two anonymous referees for carefully reviewing this manuscript and for providing valuable insights that will significantly strengthen this work. The following document details the authors' response to these reviews including clarifications and additional analyses that will be performed to improve this manuscript. Here we respond to the general comments. All minor/editorial comments from the reviewers will be fully incorporated into any future drafts of this manuscript.

Response to Referee 1: The first referee made several suggestions for changes in each of the sections of the manuscript. The first change they suggested was to acknowledge

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in the introduction that overland flow from permafrost degradation can occur within a desert landscape due to slip planes forming at the active layer/permafrost boundary. This will be clarified in future versions of the manuscript. In the results section this reviewer suggested that we quantify the aggregation/degradation occurring in the stream reach due to the thermokarst. This topic is the focus of another manuscript that includes many additional field measurements and Lidar scan analysis currently in preparation (Sudman et al, in preparation). For future versions of this manuscript we will highlight a few of these key findings including results that suggest the channel geomorphology is stabilizing following the disturbance which addresses the reviewer's question about the pulse versus press nature of this disturbance. In the discussion section of the manuscript we will add additional discussion about the effects of sediment related scour on microbial mats, as suggested by the referee. We will make use of the MDV LTER algal database and previous work performed in the MDV (Kohler et al 2015) regarding extreme flows and algal communities to expand this section. We will also utilize results from a recent study in the MDV that investigated the effects of nutrient additions on stream mats (Kohler et al. 2015, in review) to expand on the potential impacts of the nutrient additions from the thermokarst disturbances on the microbial mat communities.

Kohler, T, David J. Van Horn, Joshua P. Darling, Cristina D. Takacs-Vesbach, and Diane M. McKnight. 2015. Nutrient treatments alter microbial mat colonization in two glacial meltwater streams from the McMurdo Dry Valleys, Antarctica. *FEMS Microbiology Ecology*, Submitted.

Kohler, T.J., Stanish, L.F., Crisp, S.W., Koch, J.C., Liptzin, D., Baeseman, J.L., McKnight, D.M., 2015. Life in the main channel: Long-term hydrologic control of microbial mat abundance in McMurdo Dry Valley streams, Antarctica. *Ecosystems*.

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Interactive comment on Biogeosciences Discuss., 12, 14773, 2015.

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