

# ***Interactive comment on “Distributed Temperature Profiling System Provides Spatially Dense Measurements and Insights about Permafrost Distribution in an Arctic Watershed” by Emmanuel Léger et al.***

**Emmanuel Léger et al.**

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"The paper entitled 'Distributed Temperature Profiling System Provides Spatially Dense Measurements and Insights about Permafrost Distribution in an Arctic Watershed' by Léger et al. provides a highly interesting strategy for obtaining spatially and temporally dense soil temperature measurements at flexible spatial scales. The strategy is tested and evaluated in an Arctic watershed near Nome in Alaska. This is a well documented and thorough study that contains valuable results. The methodology is sound and the assumptions are clearly identified. It is a good paper, which also brought some new

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data and knowledge on permafrost behavior in Alaska. Publication of this kind of paper will be very timely and beneficial for researchers working in the same field, as well as for many other researchers conducting a wide spectrum of environmental studies. The paper needs only minor revision, mainly regarding site description and readability of the figures. "

We thank this reviewer for the very helpful comments, which we have fully addressed in the revised manuscript. Please find below our response to each comment. The modifications (tracked in red) are in the attached manuscript.

"P2, L17 include "soil" Âž characterizing and monitoring soil temperature predominantly. . . "

We agree. Done.

"P2, L21 UTL-3 Scientific Datalogger (<https://www.geotest.ch/en/expertise/measuringmonitoring/utl-3-temperature-datalogger.html>) is frequently used in Europe and could be included in the list of loggers "

We added the name of this sensor when providing examples of temperature sensor/loggers and we referenced one study using it (line 24 on page 2).

"P2, L18-26 Consider to include one sentences briefly describing analog and digital temperature acquisition systems for ground temperature monitoring "

While historically analog measurements had the highest accuracy, current improvements in digital sensors will enable to reach similar accuracy. We added one sentence to clarify this (line 22 on page 2).

"P5, L13-14 and in presentation of results/discussion: I miss specific details related to soil type(s) at the study site. This is important in relation to the spatial variability of soil temperatures and corresponding interpretations. Some kind of information, e.g. soil profiles/variability in soil characteristics at the DTP sites could also be useful. "

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We added more details on page 5.

"P9, L15 Suggest to replace “coldest temperatures” with “lowest temperatures”. In also other parts of the manuscript (e.g P12, L2; P12, L13) “cold/warm temperatures” are used. Better write “low/high temperatures”. "

Done.

"Figures: The readability and quality of the figures should be improved. Please read carefully the guidelines regarding figure composition, figure content and figure captions provided by TC at [https://www.thecryosphere.net/for\\_authors/manuscript\\_preparation.html](https://www.thecryosphere.net/for_authors/manuscript_preparation.html)"

Thank you for this link. We improved Figures 1, 3, 5 and 6. Some of the fonts on Figure 3 are still relatively small to keep it on one single page, but we hope it is acceptable.

Please also note the supplement to this comment:

<https://www.the-cryosphere-discuss.net/tc-2018-264/tc-2018-264-AC2-supplement.pdf>

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Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-264>, 2019.

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