

Interactive comment on “Modeling insights from distributed temperature sensing data” by C. R. Buck and S. E. Null

Anonymous Referee #2

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This paper presents a temperature model that incorporated DTS measurements and attempts to highlight the utility of DTS data in improving temperature predictions and evaluating hydrological processes. Unfortunately, based on my understanding of the model set up, it does not appear that much can be determined from the model predictions. Due to the extremely short model reach (< 1.5 km), a very short section of the study reach being investigated right below the upstream boundary (~ 0.8 km), and a large volume of water (~ 0.71 m³/s) needing to be heated and cooled, I am concerned that the model predictions are actually not predictions. Rather, they are likely a propagation of the temperature boundary condition. Further, the calibration/estimation of flows makes the predictions (particularly below the PCO) very difficult to interpret. The confidence in the information regarding the actual channel geometry is also not clear.

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This is key because much of the interpretation regarding the importance of solar radiation in predictions will be related to the volume of water and the surface area of the channel versus the depth of the water column. It is also important that this assessment is completed on model predictions and that the importance of individual heat fluxes be considered. Correlations should not be the justification for these claims. More specific comments are provided below.

Specific Comments:

p. 10002 Introduction - The comments regarding the use of DTS data as input data versus calibration data is confusing. (e.g., line 15, line 11 vs. 18-19). Many of the claims (e.g., line 27-28) are too broad and do not appear to have evidence backing them up.

p. 10006 line 1 - If there was enough macrophyte growth to cover the cable, what were the consequences on mixing laterally in the channel? How did this influence the energy budget? Did this impede radiation from penetrating to the bed? How did this influence the parameter BEDALB calibration?

p.10008 Section 3.3 - Nothing really stated here about calibration. Methods for this are included in the results and discussion.

p.10013 line 19-24 Based on one DTS cable placed in the middle of a channel doesn't really provide this either.

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