

We appreciate the constructive and thoughtful feedback provided by the Reviewer, which has helped us to improve the manuscript. Our point-by-point responses are provided below in blue text following each comment, reproduced in black.

### Reviewer 1 Comments (RC1)

In this manuscript, the authors present and explain the data collected by their Atmospheric Surface Flux Stations (ASFS) during the SPLASH campaign in the East River Watershed in Colorado. They provide thorough background on the surface energy balance which provides sufficient information for understanding the various measurements and data products from ASFS which are described in the remainder of the paper. The authors go into detail on the set up of the sites, the data collection process, and the data processing. Given the information in their manuscript, I was able to easily understand their data sets and believe any scientist could successfully use these data with the guidance of the paper. Additionally, the data sets themselves are high quality, well documented, and sufficiently cleaned/QC'd.

I have a few small recommendations for improvement of the paper:

- In section 5.4, I believe equations 9 and 10 would benefit from a bit more explanation, specifically explaining all parameters in the equations. For example, in equation 9, I was unable to find the meaning of  $T_s$ ; is this the temperature at the surface? Similarly in equation 10, is  $z_{\text{soil}}$  the depth of soil? This may be common notation, but if the  $n+1$  and  $n-1$  written as superscripts in the numerator of equation 10 are not exponents (i.e. are these time indexes?), it may be beneficial to explicitly note this.

We agree these equations could be communicated more clearly. Several changes will be made:

- $T_s$  is the surface temperature that was defined in Eq. (7). We will add a statement beneath Eq. (9) identifying this.
- In Eq. (10),  $z_{\text{soil}}$  is the same  $z$  as previously stated so we will drop the subscript for consistency.
- We will make a note in text of the notation for  $n$ , as you suggest.
- We will also add a useful reference to the introduction of these equations, Morris (2018), which reviews this approach alongside direct observations of soil heat flux.

Morris, S: Variability of ground heat flux at Tiksi station, M.A. Thesis, Department of Geography, University of Colorado, Boulder, Colorado, USA, 82 pp., 2018.

- In Figures 4b and 4c, the units of the Soil Depth are reported in meters with a range of 50 m, whereas in the manuscripts the soil probe is said to be 0.5 m in length. I believe this discrepancy is a simple typo, but if not, some explanation of how these measurements were taken should be added.

Thank you for catching this. This is indeed a typo in the figure labels and the correct units are of course centimeters. However, to be consistent with the relevant text and the rest of the figure (4e and right-side axes of 4b,c), we will update the figure to keep label as is (in meters) and change the units of the plotted data to meters.

Other minor technical correction: In line 49, SAIL stands for the Surface Atmosphere Integrated *field* Laboratory, please add the word "field".

Thank you for catching this. We will make this change.