

## ***Interactive comment on “Winter stream temperature in the rain-on-snow zone of the Pacific northwest: influences of hillslope runoff and transient snow cover” by J. A. Leach and R. D. Moore***

**R. Jackson (Referee)**

rjackson@warnell.uga.edu

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This is an excellent and interesting paper regarding the effects of snow and snowmelt events on winter stream heat budgets. It is a well written and logical presentation of a well-designed set of stream temperature and energy budget measurements. My only suggestions are aimed at making the findings easier to digest and interpret.

One thing that is a little confusing is the use of the term surface energy fluxes relative to the term lateral energy fluxes. The surface fluxes include subsurface fluxes (e.g. bed

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conduction and friction) and the advective fluxes can include surface inputs of variable source area runoff. It might be clearer to use the term “vertical energy fluxes” and define what is included therein and the term “lateral energy fluxes” and define it as advective fluxes from surface runoff and interflow.

Section 3.2.5 Stream Energy Budget would be better named “Lateral Heat Fluxes Calculated as Residual of Stream Energy Budget”

Figures 3, 4, and 6. ( time series graphs) – I suggest spreading the x-axis out so the time series are easier to see and interpret. Consider displaying the discharge data on a log scale so it is easier to see the differences in the low flows.

Figure 4. I suggest adding to the caption something like: “Note the difference in scales of the total heat fluxes and the vertical components.”

Figure 5 is difficult to interpret. Would it be better to show distributions of the ratios for different ranges of flows? There are so many points crammed near zero that is hard to make sense of anything other than the fact that the flux ratios are much more variable and more likely to be negative and more likely to have high error at low flows.

Is it possible to show air temperature in Figure 6 along with the groundwater temperatures?

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