

## ***Interactive comment on “Impacts of beaver dams on hydrologic and temperature regimes in a mountain stream” by M. Majerova et al.***

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The manuscript by Majerova et al. entitled “Impacts of beaver dams on hydrological and temperature regimes in a mountain stream” reports on the fortuitous investigation of beaver colonisation on a small tributary in Northern Utah. The occurrence of an earlier investigation on the Creek by Schmadel provides baseline hydrological and temperature data prior to beaver colonisation, allowing a before-and-after comparison of thermal and hydrological regimes over the course of beaver dam construction. Given the current focus of river restoration and ‘re-wilding’ of landscapes, the manuscript is very topical and has the potential to add important information to help river managers understand the impacts and benefits of restoration efforts, and in par-

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ticular beaver management as adopted by the state of Utah, on the river environment. The manuscript does a good job of making the most of the rare opportunity to study this event, and is generally very well written and engaging. However, I feel there are a few clarifications and limitations to the methodology which should be addressed to provide perspective to the results.

Generally, my comments are in line with Reviewer 1 with respect to tracer recovery results and methods and I am also of the opinion that differences in climate and hydrological conditions between years, and resultant changes in water resource management (i.e. irrigation) should be addressed to ensure that these factors are not compounding perceived beaver dam effects. In addition, I feel that the use of a single temperature and pressure logger at locations used to represent overall reach and sub-reach conditions may be stretching the data and conclusions reached; particularly so when no detail of how the locations were chosen, or in what conditions (depth of water, location in the channel) they have been placed within. For example, why are there differences in upstream and downstream logger locations between dams, as reported in Table 2? There appears to be large differences in the distance the loggers were placed away from the dams, ranging for example from 8m to 81m upstream of dams. Would the differences in placement and location of the loggers not have an effect on the temperature data collected, and hence conclusions reached? Without an explanation of why and how the loggers were placed where they were, I do not have confidence that they are representative of the temperature conditions found in these locations, and hence provide sufficient information on the effects of beaver colonisation on hydrologic and temperature regimes. As stated by Reviewer 1, given the incomplete data and explanation of hydrological conditions and methods, I feel the current draft of the manuscript is more of a ‘qualitative’ study, which although interesting, does not meet the expected aims of the manuscript as it stands.

Minor comments: Please state the units of the stream bed slope on page 843, line 24 (I assume %?). An explanation of how subbreaches were determined would be

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beneficial on page 845, line 24. How often were groundwater surface levels monitored, as detailed on page 846, line 20-23? Were these the only measures of groundwater, or were pressure-level loggers used as well? What is the n of the data presented in Figure 8? If groundwater was only manually measured using a dip meter, was sampling equal throughout the years and seasons? More detail on methods please. Without a better explanation of the locations of the loggers, I do not currently have confidence that the data shown in Figure 10 represents the variability in temperature differences between dams, as stated by the authors, but instead, could be a relict of logger placement; more detail is needed to qualify this statement. Air temperature and data from a 'control' location (e.g. upstream) of the beaver dams should be added to Figure 11 if possible to put the data in context with the atmospheric and hydraulic conditions during this study period. The authors may wish to consider using more descriptive rather than numerical names for their upstream and downstream temperature loggers (PT515 and PT1252) to help improve the flow of the manuscript and assist readers in immediately grasping their locations.

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