

Comments on RV1.

The authors have addressed some of the review comments well, but the manuscript remains several arguments to be justified.

I share with Referee #1 about the concern that whether the degradation of “terrestrial DOM components” can be discerned by PARAFAC, given the fact that DOM produced during microbial process can also contribute to those components labeled as terrestrial materials in PARAFAC. The authors addressed this question by adding the sentence “[Addressing this point would require the characterization of DOM at the molecular level \(e.g., Kim et al., 2006\)](#)”. Thus, I don’t think it is suitable to emphasize “terrestrial DOM” in the title of this manuscript. I insist that the concepts of “terrestrial”, “not autochthonous origin”, and “Long-term reactive carbon, LTRC”, should not be interchangeable.

Meanwhile, the results presented in this work consistently show that biological activities, both primary production and bacterial respiration, are significantly elevated in Argo-urban streams than Forest-grassland streams. I think it is better to highlight this confident information rather than presenting an arguable statement. I would recommend the title to be something like “Increased biodegradable carbon pool in the human-disturbed streams in Alpine fluvial networks”.

As I mentioned in my original review comments, this study did not include spring and summer seasons when the temperature is higher in the field. The authors have added wet/dry season information, but they should rationalize temperature effect as well. Certainly, the season information should be reflected in the abstract. The authors should also explain why the field temperature for the collected samples in this study was 6~10 oC (Line 126) but the lab incubation experiments were conducted at 20 oC (Line 148), and how this would affect the results.

Other comments:

Line 71: lead to increased CO₂

Line 383: a shift in the molecular weight to what?

Line 279-280, SRP 29.3 ug/L is not consistent with Figure 2B. It appears to be about 35 ug/L in Figure 2B.

Table 2, Figure S1: C2 Max Em is 489 or 498?

Figure 1: Denote sites with different color or label, to indicate Argo-urban and Forest-grassland type, respectively, corresponding to Table 1.

Figure: Suggest to include a figure to show the plots of STRC and LTRC with incubation time, and to show how the decay constant was derived. This can be included in the supplemental materials.

Table: It would be more informative if the authors can provide a table to list the original parameters for figures 2, 3, and 5, by presenting detailed numbers rather than just showing average and range in the figures. This can be included in the supplemental materials.