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Interactive comment on "Dam tailwaters compound the effects of reservoirs on the longitudinal transport of organic carbon in an arid river" *by A. J. Ulseth and R. O. Hall Jr.*

Anonymous Referee #1

Received and published: 6 May 2015

General Comments:

This is a well written manuscript that describes temporal and spatial patterns (above reservoirs, below reservoirs, and in reservoir tailwater reaches) in DOC and POC concentration, flux, composition, and bioavailability in an arid river of the Western US. The approach applied is technically sound and the results are placed in the context of existing literature. I expect that this manuscript will be of interest to scientists studying carbon cycling in large rivers.

Specific Comments:

1. Without first reading the manuscript, it is unclear what is meant by the last sentence

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of the abstract. While it is important to acknowledge the limitations of the work, I found this sentence to distract from the overall value of the work, and recommend that it be revised or removed from the abstract.

2. Pg. 6087, line 6-8: In addition to stating that higher SR values indicate lower molecular weight DOC, I recommend stating that lower SUVA values indicate less aromatic DOC.

3. Section 2.4: Further explanation of the bioassay experiments would be useful. For example, does using a 0.2 um filter remove microbes, whereas the 0.7 um allows microbes to pass through the filter?

4. Section 2.7: It would be helpful to provide additional data to assess the accuracy of the flux models. For example, were normal probability plots and/or plots of model residuals vs. predicted values examined to assess the assumptions of normality of the distribution and the independence and homscedasticity of the residuals? See Helsel and Hirsch (2002; http://pubs.usgs.gov/twri/twri4a3/html/toc.html) for an excellent discussion of regression model diagnostics.

5. Too much emphasis is sometimes placed on small differences in the amount or composition of OC, without incorporating uncertainty in model estimated values. For example, the changes in annual DOC loads of 200-244 Mg/yr from below the dams though the tailwater reaches are small relative to the total DOC loads. While there may be statistically significant differences, it is unclear if they are within the error associated with the regression models. Therefore, it would be helpful to report confidence intervals associated with the model-derived load estimates.

Technical Corrections:

1. The first sentence of the abstract is not clear. A suggested revision is: "".…, but less is known about how river reaches directly below dams contribute to OC processing."

2. Section 3.2: I recommend either switching figures 3 and 4 or the order in which the

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results presented in these figures are discussed. Currently, figure 4 is referenced in the text prior to referencing of figure 3.

3. Pg. 6091, line 28: change "was" to "were"

4. Section 4.2: Given that both longitudinal patterns in DOC and POC are discussed, I recommend changing this heading title to "Longitudinal OC dynamics".

5. Pg. 6095, line 12: Change to: "All SUVA254 values were <......"

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Interactive comment on Biogeosciences Discuss., 12, 6081, 2015.