

# ***Interactive comment on “Dissolved Organic Carbon Driven by Rainfall Events from a Semi-arid Catchment during Concentrated Rainfall Season in the Loess Plateau, China” by Linhua Wang et al.***

## **Anonymous Referee #1**

Received and published: 11 March 2019

Dear Editor,

Thank you so much for the opportunity given to evaluate this manuscript. This manuscript discussed dissolved organic carbon transported by rainfall events based on high-frequency monitoring method on the Loess Plateau of China. The study area, Yangjuangou catchment, is a typical watershed of ecological restoration and soil and water conservation which has important scientific meaning for the Loess Plateau. This could contribute to a better understanding of carbon transport in hydrological process at catchment scale. Therefore, I suggest that the manuscript could be considered after a major revision. The detail comments are listed below:

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Q1 Page 2, line 41-45;

Please illustrate the detailed potential influences of DOC on the soil carbon pool, aquatic environments and climate change before enumerating the concentration ranges of DOC in different regions.

Q2 Page 2, line 62-64; page 2, line 79-81; page 2, line 88-89;

I think that the lack of the previous paper about DOC export in the Loess Plateau should be presented in a more concise way and it is better to combine the lack of previous research and put forward your own hypothesis.

Q3 Page 3, line 114;

Please introduce the time/period of sampling or monitoring, how much rainfall events were monitored and how many samples were collected in the section of Field Monitoring and Sampling. The specific rainfall events mentioned in 3.2.2 and the reason for selecting these events should also be explained in 2.2.

Q4 Page 4, line 136-140;

Please complete the name of the TOC analyser, like Vario TOC select or Vario TOC cube. I think it would be much better to describe what the 1% H<sub>3</sub>PO<sub>4</sub> solution is used for.

Q5 Page 4, line 143 and line 147-148; page 18, line 515;

The meaning of DOC concentration and discharge should be consistent throughout the paper. DOC concentration has been defined as the flow-weighted mean DOC concentration.  $C_i$  and  $Q_i$  were defined as the discharge and DOC in an individual runoff sample. However, the Y-axis in figure 5 corresponds to the discharge and DOC concentration of each sample. It is better to present flow-weighted mean DOC concentration in another way to distinguish it from the DOC in runoff samples and DOC in other studies.

Q6 Page 5, line 153-156;

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It would be better to use commas instead of semicolons. There should be a space between “7” and “and” (line 155-156). Do not use a colon to explain abbreviations (line 156).

Q7 Page 5, line 157-158;

Please use the version information of SPSS instead of Statistics Package for Social Science.

Q8 Page 6, line 193-194;

Why do you use the daily discharge instead of rainfall event discharge or flow rate analyse the relationship between discharge/flow and DOC concentration? I think the relationship between runoff and DOC concentration could be better explained by the DOC concentration of each runoff sample and its flow rate in the corresponding sampling period.

Q9 Page 6, line 224-227;

This part is the interpretation or analysis of the above results, and it should be included in the section of discussion with the citation.

Q10 Page 7, line 243; page 8, line 288;

What is the difference between DOC export and DOC flux? DOC export and flux were mixed in several parts of the paper affecting readers’ understanding of the study. Please explain the specific meaning of DOC export.

Q11 Page 7, line 245-247;

Substitute "uses" with “used”. As shown in figure 2-b, the DOC concentration looked like the average DOC concentration daily or per rainfall event, rather than the results of each collected runoff samples. This figure did not show the high-frequency monitoring in your study.

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Q12 Page 7, line 250-251;

Is the result of the greater DOC flux with a large discharge obtained from your study? If not, it is better not to compare the result about DOC flux in previous studies with the result of DOC concentration in your study.

Q13 Page 8, line 266-267, line 268-26, line 274-277 and line 300-301; page 9, line 308-310;

The above sentences are the description of the figures or tables and it is best to move those to the result section.

Q14 Page 8, line 268-269 and line 274-277;

Why do you take the 20mm rainfall amount as the break point to do the linear regression analysis respectively?

Q15 Page 8, line 288;

The subtitle is too broad and general. Rainfall, one of the most important factors affecting DOC concentration, has been mentioned in 4.1, but not been fully discussed.

Q16 Page 16, line 500, Figure 2;

Try to use shading or background fill to distinguish the values of sampling days instead of using different coloured dots.

Q17 Page 16, line 505, Figure 4;

Is the regression curve in the right side of figure 4 fitted according to all sampled rainfall events or according to >20 mm rainfall events? Please indicate (a) and (b) in the figure 4.

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