

Interactive comment on “Spatiotemporal characterization of dissolved carbon for inland waters in semi-humid/semiarid region, China” by K. S. Song et al.

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Page 6565 Paragraph 2.2: How many samples and how often were the lakes/water bodies sampled (some info in the tables but not all and not mention in the text and figures)?

Response: Thanks for the comments. The author may not clearly give this information. 211 water samples were collected during the field campaigns from late August to early October 2011 for spatially characterizing DOC, DIC and CDOM, 26 of the waters were sampled once in these field campaigns. 196 samples were collected from Shi-

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toukoumen Reservoir ($n = 100$) and Chagan Lake ($n = 96$) for characterizing dissolved carbon temporally, altogether, 5 field campaigns were conducted in each water. This information will be added in the revised manuscript.

How where the samples transported, any cooling device and kept dark, from the field to the laboratory?

Response: The authors thank for the concerns. Yes, as the reviewer guessed, all water samples were kept in a portable refrigerator powered by the vehicle, which make sure all the samples were free from solar radiation; generally it took two to three days from the field to the laboratory. The necessary information is added in the revised manuscript.

How long time between sampling, filtering and analysis?

Response: The authors thank for the concerns. Samples generally were filtered directly after coming back from the fields and the rest was kept in refrigerator for one night, and then was filtered for DOC testing and CDOM absorptions measurement with UV-VIS spectrometer (Shimadzu, UV-VIS 2050 PC) within one day.

Where the GF/F filters pre-rinsed with DI-water before filtering the samples?

Response: The authors thank for the concerns. In this work, GF/F filters (0.7 μm) were pre-combusted, and all samples were filtered at low pressure through GF/F filters, and then through a pre-rinsed Millipore membrane cellulose filter (0.22 μm) for CDOM absorption measurement.

What is the precision of the chemical analysis?

Response: The authors thank for the question. Replicate analysis for DOC, DIC presented a measurement error of 4.7%. Chl-a and TSM laboratory measurement errors are 8.6% and 6.3%, respectively (Song et al., 2013). TN and TP were tested by the testing and analyzing center for Northeast Institute of Geography and Agricultural Ecology, Chinese Academy of Sciences, they strictly follow the standard operation protocol

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for these two parameters measurement.

The 153 independent samples, independent from what?

Response: Thank for the comment. Here the authors tried to prove the stable correlation between DOC, DIC and salinity for these waters being investigated. Thus, independent samples were collected to test the stability of the relationship between DOC, DIC and salinity. Here "independent" means these samples were collected specifically to test the stable relationship between DOC, DIC and salinity, which were independently from these samples where we found the strong association between DOC, DIC and salinity.

Results (and Discussion) section: Please write in past tense when describing your results.

Response: Thank for the valuable comments. The authors adopted the reviewer's suggestions and these two sections have been rephrased.

As I understand the Study area, fresh water are open water and out-flow water while brackish water are terminal water and non-outflow water. If yes, then for simplicity stick to one of the classifications (fresh and brackish water) when describing your results (figures, tables and text). If not, please explain any difference between them.

Response: Thank for your valuable comments. Yes, your understanding about the study area is correct, so the authors have incorporated your suggestion and consistency was achieved with fresh and brackish water for the revised manuscript.

Please use statistical power analysis ($1 - \beta$) while testing differences between groups. p-values gives the probability of being wrong, $1 - \beta$ the probability of being right.

Response: Thank for the suggestions. Your kind suggestion on statistical power analysis was adopted in our revised manuscript, β was calculated for our statistical analysis.

Please state values of interquartile range (IQR) or robust-CV while writing about varia-

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tion.

Response: Thank for your valuable comments. Your advices have been considered in our revised manuscript.

Page 6574 Line 8: I urge that you use partial least square (PLS) instead of MLR, since PLS are less sensitive to autocorrelation between variables.

Response: The authors really appreciated your valuable comments. With respect to the reviewer's suggestion, we tried PLS regression, however due to limited variables (precipitation, temperature and evapotranspiration), PLS did not work for our case study, thus we failed to apply PLS regression in our revised manuscript, and still use MRL in our study.

Page 6575 Line 4-24: Are there any wetland/marsh land, or any other soil with higher amount of organic carbon, around the lakes/water bodies?

Response: The authors thank for the reviewer's comments. Actually the soils in the eastern part of Songnen Plain are more fertile (fresh waters are located) than those in the western part of Songnen Plain where brackish water are located. As can be seen from Fig.1, saline soil are abundant in the western part of the Songnen Plain, and these waters surrounded by saline soil generally show high DOC and DIC concentration. We did analysis to examine if wetlands in each watershed have impact on DOC or DIC concentration (Table 2). Our findings indicated that wetlands do not exert significant impact on DOC or DIC concentration for this case study, which may be due to the climatic-hydrological conditions play a more important role for DOC and DIC concentrations in these waters.

Table 1-3: Why are not DIC and DOC included in the tables?

Response: The authors thank for your comments. DOC and DIC are the main concern for our study. In the original version of the manuscript, since most of the figures are relevant to DOC and DIC concentration, including DOC and DIC will cause redundancy

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since their characteristics were illustrated in these figures. In the revised manuscript, DIC and DOC were incorporated in tables since some of the figures were removed as suggested by the second reviewer. Thanks again for the comments.

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