

Interactive comment on “Influence of environmental factors on spectral characteristic of chromophoric dissolved organic matter (CDOM) in Inner Mongolia Plateau, China” by Z. D. Wen et al.

Anonymous Referee #3

Received and published: 21 July 2015

General Comments:

This study presents a robust dataset from the Hulun Buir Plateau, China. The study compares water chemical and optical properties of flowing (river water) to lake type (terminal water) surface waters within the region. The work is valuable as for (1) results from such detailed water chemical and optical analyses are rare for the Hulun Buir Plateau, despite the very high carbon load. The data allows for future comparison with data from other regions, and is especially suitable for a comparison with data from remote sensing. (2) The comparison of flowing to lake type waters indicates that a reduction of hydrological flow associates with strong changes in the water quality, DOC

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and CDOM, which may relate to the efficacy of the evaporation as well as to changes in the nutrient cycling. This is of potential interest to a large scientific audience. The manuscript needs some revision (see specific comments below). However, I do not see that this revision would affect the overall structure and validity of this study. I consider the revisions therewith to be minor. Finally, the authors have succeeded in making this work well accessible for an English speaking audience that I consider to be valuable.

Specific Comments:

(A) Please replace "terminal waters" with a well-defined term that best describes your lake type systems.

(B) Please present some more detailed geomorphological and some hydrological data (metric): estimates of discharge, flow, for the river dataset, river widths, as well as a lake size distribution and some estimates of average lake depths are needed. The data can be rough estimates of means (table or text), but one does need to know the spatial scales of the surface waters addressed in order to use the study.

(C) Please add some basic information on the genesis (formation) and on the dynamics of your surface water network. In specific, are there regular or extreme events (e.g. rainfall events) that alter the geomorphological structure and geometry of your surface water network? Are some of the waters ephemeral?

(D) Carbon balance: Since you argue that plateau lakes play an important role in the global carbon balance, an actual rough estimate of the bulk carbon storage in plateau lakes would help your argument. You do have the carbon concentrations. You could compare a rough estimate to estimates from other regions.

(E) The "vital contribution" (Abstract: P5896-L24), or "potential implications" (Conclusions: P5915-L5) of your study for carbon cycling have to be specified. / Here some specific examples: you show that highest DOC and nutrient levels associate with what you currently refer to as "terminal waters". Based on your data, it seems that a shift

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towards high DOC and nutrient levels, and potentially also towards high carbon emissions may develop where flow is reduced in the future (e.g. construction of reservoirs, reduced precipitation, irrigation, landuse changes). - Would you agree? Please discuss. I suggest 3-4 sentences in the discussion, not more, since the focus is mainly on CDOM.

(F) Regarding Figure 4 and similar to (E) but with a focus on CDOM: I found your Figure 4 highly informative. Could these patterns change over time? E.g. if the land use or nutrient load changes.

Technical Corrections:

5997/18 Please introduce all abbreviations. 5899/7 "in_two" 5901/2-3 Please check transition: "Because .., the water samples.." 5901/6 "The surface water ..": sentence needs to be rewritten (grammar) 5901/22 "within two days" 5901/22 Consider to write integers out from one to nine (one, two, three, ..), and indicate higher integers as arabic numbers (10, 11, ..). Throughout the manuscript. 5902/20 Either ".. by a UV spectrophotometer ..", or ".. by UV spectrophotometry .." 5904/8 "A positive relationship .." 5904/8 Are the "Hulun Buir Plateau waters" your entire dataset? Is this correct? Please specify, it is somewhat unclear as you discuss differences between terminal and river waters in both the previous as well as precedent sentences. 5907/2 This is about CDOM absorption data and environmental data. Please consider to replace or remove the very generic term "species". Alternatively, please define what you mean with "species". 5908/26 "potentially due to recovery from acid deposition" 5914/21 "paddy field"

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 5895, 2015.