

Interactive comment on “Hydrochemical variability at the Upper Paraguay Basin and Pantanal wetland” by A. T. Rezende Filho et al.

Anonymous Referee #2

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This paper presents a very interesting hydrochemical dataset for one of the major wetland of the world, still very poorly known. This is why I strongly support its publication. However, the way these data are analyzed and interpreted is not always clear and gives rise to questions that must be addressed before publication. The writing is also far from perfect. The most questionable aspect is the use of the PCA and EMMA to analyse the data. First, the variables used in the PCA (concentrations) are first classically standardized, and then "standardized" again using electrical conductivity (EC), this variable EC being also included in the PCA. I strongly suspect that this introduces bias in the results of the analyses. Second, nothing is said on the distribution of the concentrations: very often, the distributions of this type of data are very skewed, which can lead to hazardous results of PCA, especially when

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used to identify endmembers. The authors should consider performing the PCA on ranks to minimize these problems. Third, the underlying assumptions of the EMMA approach are not completely discussed, especially the fact that some variables (and particularly N species and Si, but also probably SO₄) may not be conservative during the transfer in these large rivers where, very likely, instream biological processes are very active. Considering these issues, the authors of the study should have been much more cautious in their interpretations and conclusions. The other weaknesses of the paper are linked to the writing: the introduction lacks general references on the hydrochemistry of large wetlands, and does not state clearly the scientific and applied implication of the work. The discussion and conclusion also lack of broader perspective. The English writing could be significantly improved. I have suggested some amendments in the file attached, but only for the first sections.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/9/C1422/2012/hessd-9-C1422-2012-supplement.pdf>

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