

## ***Interactive comment on “Reviews and syntheses: Greenhouse gas emissions in natural and agricultural lands in sub-Saharan Africa: synthesis of available data and suggestions for further studies” by D.-G. Kim et al.***

**A. V. Borges**

alberto.borges@ulg.ac.be

Received and published: 14 October 2015

Kim and co-authors report an important data compilation of soil-atmosphere fluxes of greenhouse gases (GHGs) from the African continent that is probably the least studied on the globe despite the vital importance of the corresponding ecosystems such as the second largest evergreen tropical forest in the World.

We would like to comment the way the river/stream data are classified per country in Table S1. The unit that matters for hydrology and river biogeochemistry (including ex-

C6495

change of GHG with the atmosphere) is the river basin and not the country where the measurements were made. For instance, for the Congo River, the river basin comprises ten African countries (Angola, Burundi, Cameroon, Central African Republic, Democratic Republic of the Congo, Republic of the Congo, Rwanda, South Sudan, Tanzania, and Zambia). In Table S1, the data for Congo River are attributed to the Republic of the Congo although the data reported by Borges et al. (2015) were in fact acquired in the Democratic Republic of the Congo, a country that has the largest share of the Congo basin (60%). Similarly, the data on the Zambezi basin reported by Teodoru et al. (2015) were acquired in both Zambia and Mozambique, although the Zambezi basin comprises eight African countries (Angola, Namibia, Botswana, Zimbabwe, Zambia, Tanzania, Malawi, and Mozambique).

We would like to also highlight that lakes are important features of the African landscapes (in addition to rivers/streams) since these are among the largest in the world (Tanganyika, Victoria, Malawi, Kivu, Edward, Albert, etc. . .), and deserve further investigation with regards to GHG exchange. Some data are available for Lake Kivu (Borges et al. 2011; 2014). Data from Lake Kariba (Delsontro et al. 2011) and CH<sub>4</sub> from Ivory Coast lagoons (Koné et al. 2010) could also be included in the synthesis of aquatic fluxes.

Alberto Borges & Steven Bouillon

### References

Borges A.V., G. Abril, B. Delille, J.-P. Descy & F. Darchambeau (2011) Diffusive methane emissions to the atmosphere from Lake Kivu (Eastern Africa), *Journal of Geophysical Research - Biogeosciences*, 116, G03032, doi:10.1029/2011JG001673

Borges A.V., C. Morana, S. Bouillon, P. Servais, J.-P. Descy, F. Darchambeau (2014) Carbon cycling of Lake Kivu (East Africa): net autotrophy in the epilimnion and emission of CO<sub>2</sub> to the atmosphere sustained by geogenic inputs, *PLoS ONE* 9(10): e109500. doi:10.1371/journal.pone.0109500

C6496

Borges AV, Darchambeau F, Teodoru CR, Marwick TR, Tamooch F, Geeraert N, Omengo FO, Guérin F, Lambert T, Morana C, Okuku E & Bouillon S (2015) Globally significant greenhouse gas emissions from African inland waters, *Nature Geoscience*, 8, 637-642, doi:10.1038/NGEO2486

Delsontro T et al. (2011) Spatial Heterogeneity of Methane Ebullition in a Large Tropical Reservoir, *Environmental Science & Technology* (Impact Factor: 5.33). 12/2011; 45(23):9866-73.

Koné Y.J.M., G. Abril, B. Delille & A.V. Borges (2010) Seasonal variability of methane in the rivers and lagoons of Ivory Coast (West Africa), *Biogeochemistry*, 100, 21–37

Teodoru C. R., F. C. Nyoni, A. V. Borges, F. Darchambeau, I. Nyambe & S. Bouillon (2015) Dynamics of greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O) along the Zambezi River and major tributaries, and their importance in the riverine carbon budget, *Biogeosciences*, 12, 2431–2453

---

Interactive comment on *Biogeosciences Discuss.*, 12, 16479, 2015.