

Interactive comment on “The full greenhouse gases budget of Africa: synthesis, uncertainties and vulnerabilities” by R. Valentini et al.

R. Valentini et al.

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Received and published: 19 October 2013

We have replied into two separate files to the comments of both referees. Here you can find attached the following files, updated in order to respond to the referees' requests: - the updated manuscript - the updated tables - the updated Figures 2, 3 and 5

Interactive comment on Biogeosciences Discuss., 10, 8343, 2013.

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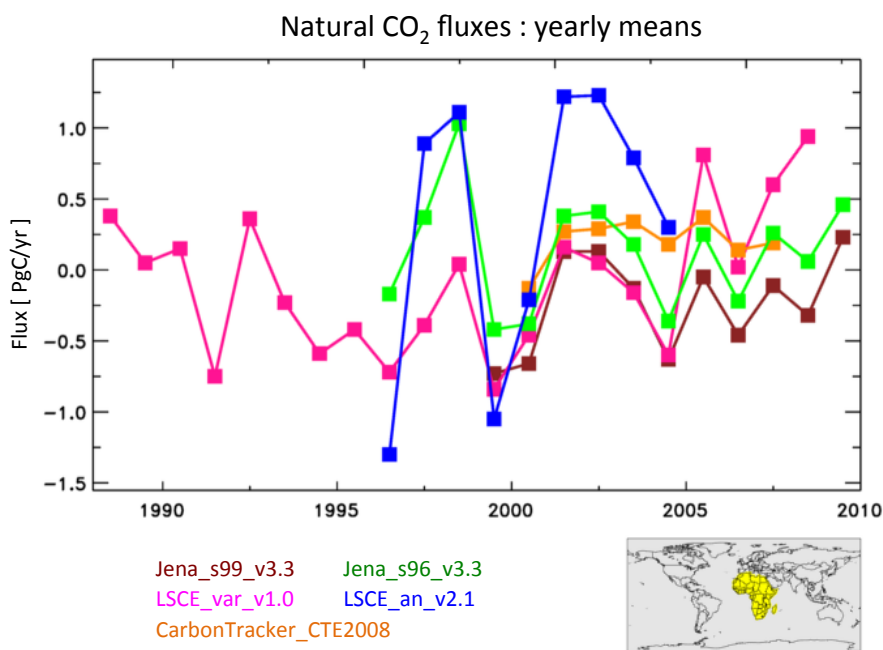


Fig. 1.

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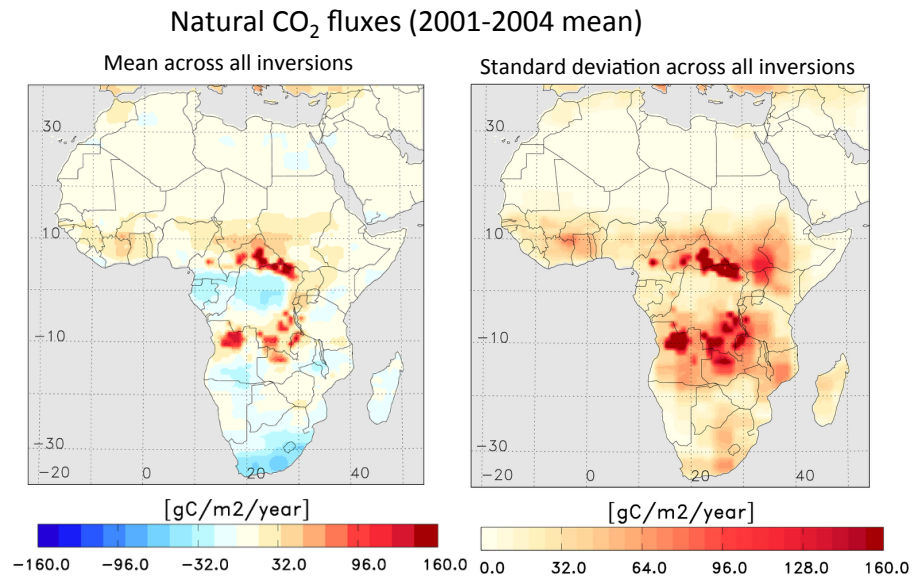


Fig. 2.

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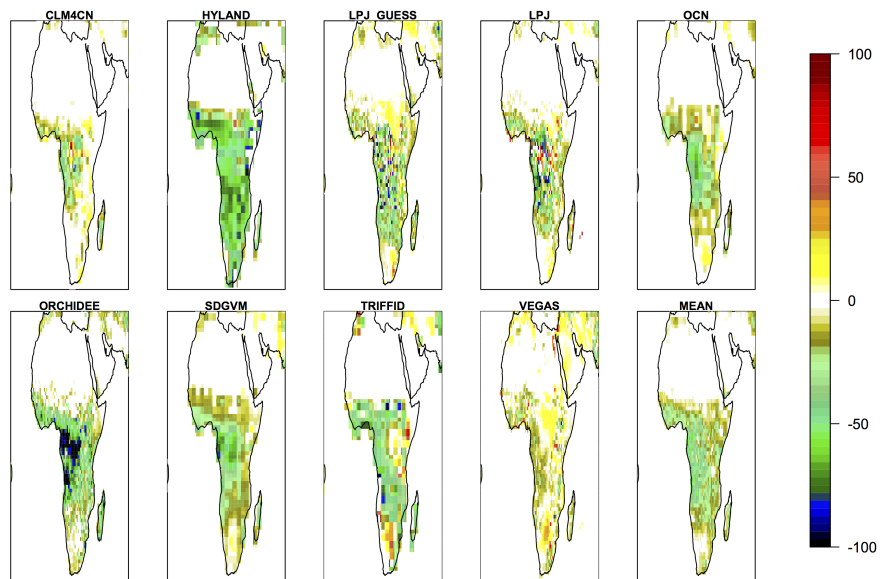


Fig. 3.

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1 Table 1. GHGs emission sources for five different African Regions.

2

Region ^a	EMISSION SOURCES (PgCO ₂ -eq)					Net Emissions
	Anthropogenic fossil fuel emissions	Per capita ^b emissions (MgCO ₂ -eq)	Agriculture	LUCC	Total Emissions	
NORTH AFRICA	0.34[22]	2.1	0.12[36]	0.05[36]	0.5144	0.0384
EASTERN AFRICA	0.15[26]	0.8	0.27[4]	0.20[6]	0.64[28]	0.21[9]
WESTERN AFRICA	0.28[26]	1.3	0.30[7]	0.38[26]	0.9812	0.51[26]
CENTRAL AFRICA	0.02[96]	0.4[5]	0.06[26]	0.45[8]	0.55[44]	1.18[26]
SOUTHERN AFRICA	0.43[26]	8.2[4]	0.05[26]	0.01[26]	0.49[26]	0.08[26]
Total	1.20[26]	0.82[26]	1.11[5]	3.19[26]	2.23[8]	0.95[4]
Total by Bombelli et al.	0.93[8]	0.46[5]	1.49[5]	2.86[8]	2.58[5]	0.32[9]

3

4

5

^a According to the United Nations geographical sub-regions for Africa from the United Nations Statistics Division: <http://data.un.org/Data.aspx?ds=SDG>.
^b Per capita values are estimated on the base of UN World population prospect, the 2010 revision (2014).

Fig. 4.

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The full greenhouse gases budget of Africa: synthesis, uncertainties and vulnerabilities

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Abstract

This paper, developed under the framework of the RECCAP initiative, aims at providing improved estimates of the carbon and GHG (CO₂, CH₄ and N₂O) balance of continental Africa. The various components and processes of the African carbon and GHG budget are considered, including data uncertainties, ecosystem flux measurements, models and atmospheric inversions) were integrated. The related uncertainties were quantified and current gaps and weakness in knowledge and in the monitoring systems are discussed in order to guide research in the future requirements. The consistency of the results suggest that Africa is probably a small sink of carbon on an annual scale, with an average value of -0.61 ± 0.58 Pg C yr⁻¹. Nevertheless the emissions of CH₄ and N₂O may turn Africa into a net source of radiative forcing, due to the CO₂-equivalent terms. At sub-regional level there is significant spatial variability in both sources and sinks, mainly due to the diversity of biomes represented and differences in the degree of anthropogenic impacts, mainly in Southern African Africa in the main source region and central Africa, with its evergreen tropical forests, as the main sink. Emissions

Fig. 5.

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