



Supplement of

On the ability of a global atmospheric inversion to constrain variations of CO₂ fluxes over Amazonia

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Table A1. Comparison of standard deviation of the misfits between the mole fractions observed and simulated from the inversions prior and the estimate of the standard deviation of the observation errors (i.e. of the transport model errors) for hourly values in the configuration of the **R** matrix.

Station	Standard deviation of the misfits Model – Observation			
	Prior	INVSAm	MACCv10.1	2 * (Standard deviation of the model error)
ABP	4.4	1.5	1.6	2.2
MAX	2.1	1.1	1.5	2.0
SAN	4.6	4.0	4.6	9.6
GUY	4.0	3.5	4.1	3.3

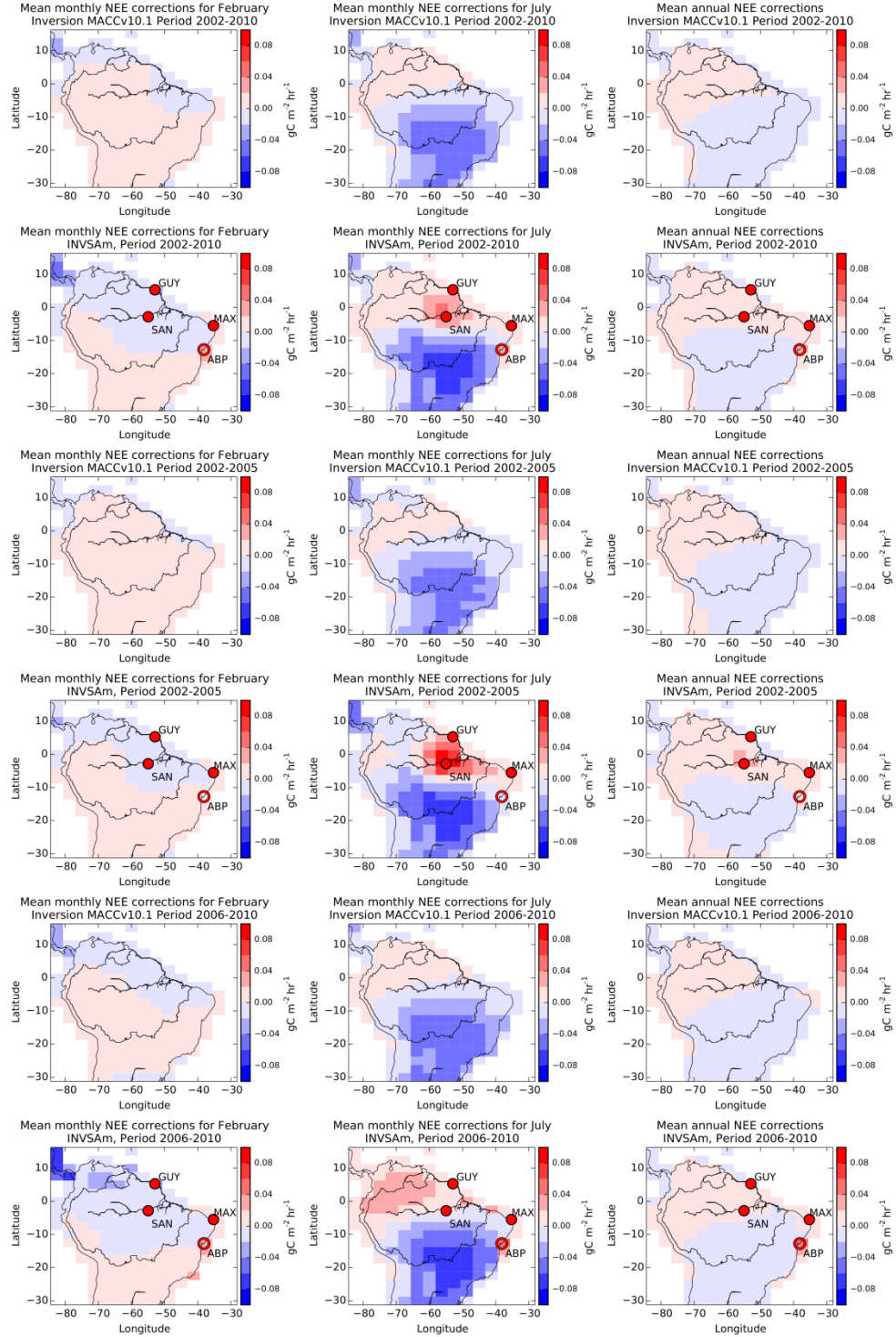


Figure S1. Spatial distribution of mean flux corrections at the transport model resolution ($3.75^{\circ} \times 2.50^{\circ}$) to ORCHIDEE from INVSAm and MACCv10.1 over the study region: mean for (left column) February, (middle column) July, and (right column) annual mean for the period 2002–2010 (rows 1,2), for 2002–2005 (rows 3,4), for 2006–2010 (rows 5,6). Filled circles indicate

locations of sites with continuous measurements; and open circles indicate locations of sites with discrete air sampling.

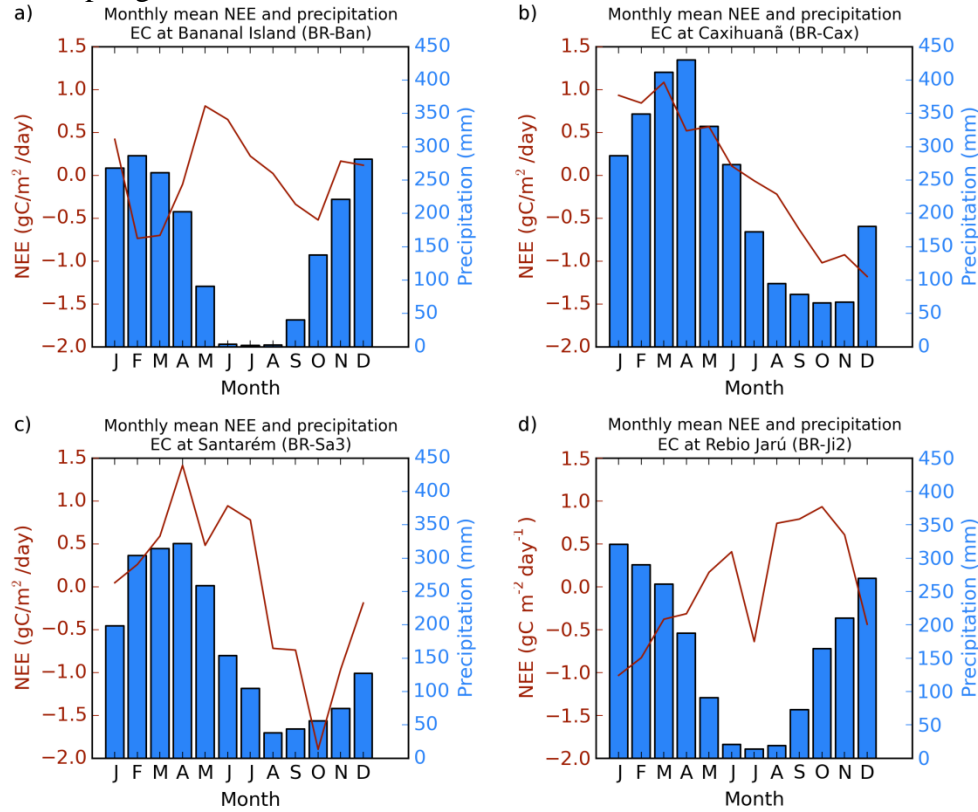


Figure S2. Red: Monthly mean NEE measurements from EC stations at (a) Bananal Island (BR-Ban), (b) Caxihuanã (BR-Cax), (c) Santarém (BR-Sa3) and (d) Rebio Jarú (BR-Ji2). Blue: mean monthly precipitation at the respective station, calculated with data from Tropical Rainfall Measuring Mission (TRMM 3B43 (v6) product) for the same periods for which EC data are available. Location of the EC stations is shown in Fig. S3. For the site at BR-Ban data were available for the period 2000-2002. It is located in a floodplain, in an area of transition between forest and savannah vegetation. A full description is found in Borma et al. (2009). At BR-Cax data were available for 2001-2002. The station is located in an area covered by terra firme humid forest, described by Carswell et al. (2002). At BR-Ji2 data were available for 2000-2002, and is also located in a terra firme humid forest von Randow et al. (2004). At BR-Sa3 data shown were collected at the Tapajós km 83 tower site, an area covered by tropical humid forest, over 2001-2002. A description of the site can be found in Goulden et al. (2004) and Miller et al. (2004).

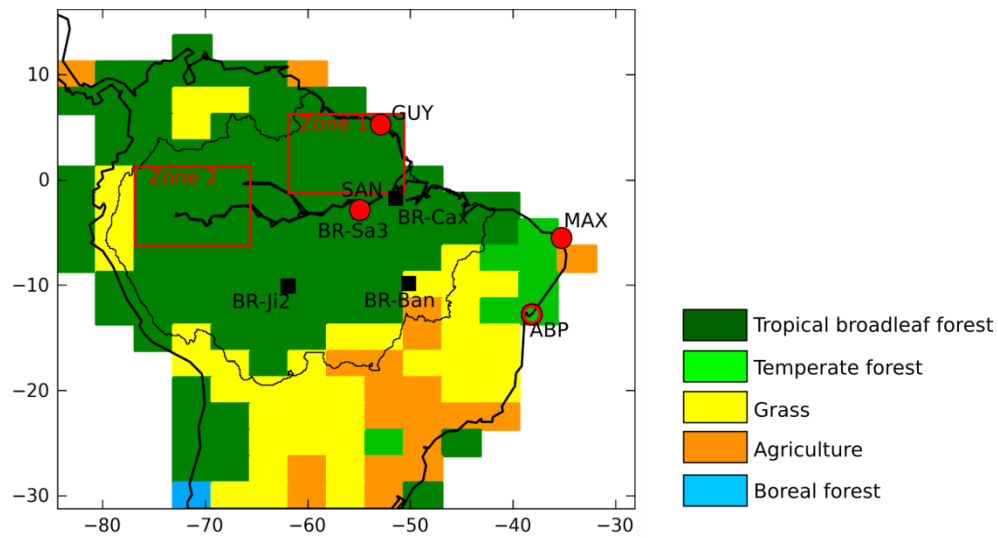


Figure S3. Dominant PFTs for each transport model grid cell (i.e. $3.75^{\circ} \times 2.50^{\circ}$) according to the ORCHIDEE vegetation map over the study region. Circles indicate location of the new four surface sites assimilated in INVSAM: open circles show location of sites with discrete air sampling; filled circles show location of sites with continuous measurements. Squares show locations of the EC measurement stations referred to in Fig. S2. Zones 1 and 2 indicate areas for which the NEE is presented in Figs. 7c and d.

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