

***Interactive comment on “Carbon dynamics in  
aboveground coarse wood biomass of wetland  
forests in the northern Pantanal, Brazil” by  
J. Schöngart et al.***

**J. Schöngart et al.**

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We appreciated the reviews of our manuscript and are thankful for the valuable and constructive comments made by the two reviewers to improve our analysis and presentation of the obtained results.

In this response letter for the manuscript bgd-2008-0029 we indicate how we address the comments and critics of the reviews in order to meet the quality standards of Biogeosciences to submit a revised version of this manuscript.

1. Response to the review bgd-5-S1033

Specific comments:

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We will include a sentence highlighting the novelty of dendrochronology in the Pantanal region in the first part of the introduction.

We will emphasize less on *Vochysia divergens* and more on the tree species community of the studied stand (Nascimento & Nunes da Cunha 1999, Arieira & Nunes da Cunha 2006, Nunes da Cunha et al. 2006).

Technical corrections:

p. 2105: We will specify the area of the stands dominated by *Vochysia divergens* in the total Pantanal (3%) and specifically in the study region (about 40%). Thus, we think that the studied four 1-ha plots are representative for this forest types of the studied region in the Northern Pantanal, but not for the whole Pantanal as there are other forest types as a consequence of different climatic, hydrological and edaphic conditions as well as land use changes. Stand 1, which represents much less *V. divergens* might be another forest locally called "campo-cerrado"; due to different soil conditions, especially soil texture (Ariera 2005), while stands 2-4 stock on gley soils.

P. 2105, line 24. We will rephrase this sentence to indicate clearly that all species form annual tree rings as a consequence of the seasonal rainfall variability.

We will replace figure 1 with a map indicating the location of the Pantanal and a second map with the location of the 4 studied plots. We dropped the figure with data on precipitation and water level measurements (already published by Nunes da Cunha & Junk 2004) and included the source of data in the methodology (National Institute of Meteorology- INMET, National Agency of Waters - ANA).

2. Response to the review bgd-5-S1024

General statistical comments:

(1)Allometric models We will exclude the allometric models which only use 2 predictors (equation 3, 4 and 5 by Brown et al. (1989), Chambers et al. (2001) and Chave et al. (2005)) and only apply equations 1 and 2 as suggested by the reviewer. To include

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an error propagation we will consider standard deviation of the specific wood densities and also the standard deviation of the tree heights for those individuals where height has been estimated by the non-linear regression models (Figure 2). We will compare and discuss the variation of diameter, height and wood density of our plot data with those use by Cannell (1984) and Chave et al. (2005).

(2) Validation of allometric models Unfortunately we cannot validate our data because there are no direct biomass estimations available. However, as we only use 2 allometric models using three independent predictors such models result in good estimates as diameter, height and wood density are the most important ones (Chave et al. 2004, 2005)

(3) Error propagation We will read the suggested articles and include an error propagation (see also point 1: allometric models)

(4) Data fit We will perform other non-linear regression diameter-height relationships by *Vochysia* and other species to increase  $R^2$ . Also we will apply the statistical techniques (AIC and/or CP) as suggested by the reviewer.

(5) figure 5a We will modify this figure and only use the data set with tree ages directly determined by dendrochronology to establish the relationship between tree age and C-stock in the AGWB. This relationship we will show separately for *Vochysia* and for other species.

Minor concerns (1) We will focus on the Kyoto protocol in the introduction, discussion and conclusion (thanks for the literature indicated).

(2) Site selection Sites were selected to establish a chronosequence

(3) Chronosequence We will do this.

(4) Growth We do not agree with this statement since we used the current diameter increment (CDI) estimated by the models in Figure 3 for *Vochysia* and other tree species.

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(5) Turnover We will drop figure 5b, and substitute this figure indicating the age structure. Estimates of the mean residence time of carbon in the wood biomass will be restricted to stands 3 and 4 which already achieved the equilibrium showing a negative exponential function of age structure.

(6) We do not know studies determining the C-content in tropical wood. Elias & Potvin (2003), show for tree species from temperate forests, that fast-growing tree species have lower C-content in the wood (around 45%) than slow-growing tree species (around 50%).

Minor comments: We will include all minor comments suggested by the reviewer.

We hope that these modification sufficiently address the comments of the reviewers to submit a revised version of our manuscript.

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Interactive comment on Biogeosciences Discuss., 5, 2103, 2008.

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