

Interactive comment on “The global carbon budget 1959–2011” by C. Le Quéré et al.

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In our paper we used three different approaches to calculate emissions from Land Use Change (LUC); a bookkeeping model, estimates of fire emissions in deforestation zones, and Dynamic Global Vegetation Models (DGVMs). The LUC numbers presented are based on merging the results from the bookkeeping method (which includes multiple fluxes associated with LUC) and fire based estimates which are most useful to determine year-to-year variability in the flux to the atmosphere due to deforestation. So anomalies in satellite-based fire activity in deforestation zones are added to results from bookkeeping method.

In our paper we have described this as: “In this paper, we only use emissions based on deforestation fires to quantify the interannual variability in ELUC. We calculate the anomaly in these emissions over the 1997–2011 time period, and add this to average

C294

ELUC estimated using the bookkeeping method. We thus assume that all land management activities apart from deforestation do not vary significantly on a year-to-year basis. Other sources of interannual variability (e.g. the impact of climate variability on regrowth) are accounted for in SLAND.”

Specifically, the response to question 1 is that the same method was used as in van der Werf et al. (2010), with annual updates available from <http://www.globalfiredata.org>. So the fire anomalies used here are only those associated with deforestation and peat fires, not savannas or other types of burning. With regard to sentence quoted in the end of question 1, the full sentence reads “Global CO₂ emissions from Land-Use Change activities were 0.9 ± 0.5 PgC in 2011, with the decrease of 0.2PgCyr^{-1} from the year 2010 estimate based on satellite-detected fire activity.”. The satellite data is thus used to estimate the anomaly (in this case a decrease), not the total number as suggested by C. Potter.

Following the above (and answering question 2), savanna and other types of fires were not included in the estimate presented here. In the revised version we will re-emphasize that the fire data was used to calculate the anomaly, not the total flux. And that is was restricted to fires burning in deforestation regions

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