

Interactive comment on “Global carbon budget 2014” by C. Le Quéré et al.

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Le Quéré et al found that “CO₂ emissions from LUC have remained constant at around 1.5 ± 0.5 GtC yr⁻¹ between 1960–1999, and decreased to 0.9 ± 0.5 GtC yr⁻¹ during 2004–2013.” We bring to the attention of the authors that, using a spatially explicit remote –sensing based approach, Achard et al (2014) reported that “Losses of forest cover and Other Wooded Land cover result in estimates of carbon losses are similar for 1990s and 2000s at 887 MtC yr⁻¹ (range: 646–1238) and 880 MtC yr⁻¹ (range: 602–1237) respectively”. Moreover the carbon losses estimate from deforestation for 2000s from Achard et al (2014) is close to Harris et al estimate (2012) which is using another (independent) spatially explicit remote –sensing based approach. Both estimates from Achard et al. (2014) and Harris et al (2012) of carbon losses for the 2000–2010 period are in agreement with the estimate from Le Quéré et al reported for period 2004–2013.

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However the average estimate from Achard et al. (2014) of carbon losses for the 1990-2000 period is much lower (0.88 GtC yr^{-1}) than the estimate from Le Quéré et al before 1999 (1.5 GtC yr^{-1}). One of the potential explanation of the high CO₂ emissions estimate from LUC for the pre-2000 period stands in the use of FAO FRA data by Le Quéré et al, which are not spatially explicit and have different levels of quality depending on countries capabilities for reporting forestry information. As example, we can point out the annual estimates of net forest cover change for Indonesia reported in FAO FRA-2010: $1,914 \times 10^3 \text{ ha yr}^{-1}$ during 1990-2000, $310 \times 10^3 \text{ ha yr}^{-1}$ during 2000-2005 and $685 \times 10^3 \text{ ha yr}^{-1}$ during 2005-2010. This highly variable trend is considered as not reflecting the reality from most other studies over this country (e.g. Margono et al, 2014; Stibig et al, 2014).

References: Achard F. et al. Determination of tropical deforestation rates and related carbon losses from 1990 to 2010. *Global Change Biology* 20, 2540–2554, 2014. Harris N. et al. Baseline map of carbon emissions from deforestation in tropical regions. *Science*, 336, 1573–1576, 2012. Margono M. et al. Primary forest cover loss in Indonesia over 2000–2012. *Nature Climate Change*, 2014. Stibig H-J et al. Changes in tropical forest cover of Southeast Asia from 1990 to 2010. *Biogeosciences*. 11, 247-258, 2014.

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