EGU22-10410, updated on 19 Jul 2022
https://doi.org/10.5194/egusphere-egu22-10410
EGU General Assembly 2022

Forest biomass - an uncertainty source of land use and land cover change related carbon emissions in the Amazon

Graciela Tejada[1], Luciana V. Gatti[1,2], Luana S. Basso, Guilherme A. V. Mataveli, Henrique L.G. Cassol, and Celso Von Randow

[1]INPE National Institute for Space Research of Brazil, General Coordination of Earth Science (CGCT), São Jose dos Campos, Brazil (gracielatejadap@gmail.com)

[2]Nuclear and Energy Research Institute (IPEN), SP, Brazil

Tropical forest plays a fundamental role in the ecosystem services maintenance. Amazon forests have been subject to intense land use and cover changes (LUCC), mainly in the Southeast portion. Like many tropical countries, more than 70% of Brazilian greenhouse gasses emissions come from LUCC. Under the framework of the CARBAM Project, atmospheric CO_2 measurements in four sites of the Amazon, show that there is a reduction in the Amazon forest capacity to absorb C in the proximities of previous deforested and degraded forest areas, such as the well-known "Deforestation Arc" in the Southeast amazon. There are many LUCC databases now available that allow to assess the deforestation, degradation and second forest dynamics and contribute to a better understanding of the carbon dynamics of nine years of in situ atmospheric CO_2 measurements. Nevertheless, in order to know how much CO_2 is released to the atmosphere due to LUCC, it is necessary to quantify how much carbon is stored in the forest biomass and to assess the biomass variability along the different datasets. Here we compared the forest biomass quantity of three biomass maps: the fourth national communication of Brazil map (official), a global map (Baccini et al. 2012) and a regional map for the Brazilian Amazon (EBA project). We found significant differences for the Brazilian Amazon: between the official biomass map and the regional map 27%, between the global and regional map 25% and the smallest difference was between the official and the global map (3%). Even though the official and the regional maps were obtained using the same data inputs, the official map refers to a potential biomass for 2010 and the regional map reflects the real biomass in 2016, this could explain the difference. The official and global maps represent the potential biomass, and as we used the mean forest area, the biomass content is similar. When comparing these maps at a deforested pixel level the differences could be larger. The spatial and temporal scale of biomass maps make it hard to estimate the CO_2 emissions of degradation and secondary forest loss and growth which are fundamental to understand the Amazon C balance under climate change and LUCC pressures.

Key words: Amazon, CO_2 emissions, forest biomass, land use and cover change, carbon balance