

# B128-01 - Amazon Plays an Important Climatic Role and Deforestation is Promoting Important Changes and a Consequent Increase in the Carbon Balance

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## Abstract

We present a nine-year study designed to present both regional and temporal representation of Amazon Carbon Balance from 2010 to 2018 using 590 aircraft vertical profiles. Four locations were strategically chosen: the northeast (SAN), southeast (ALF), northwest (TAB\_TEF), and southwest (RBA) regions. Each of these regions represents a different deforestation scenario, land-use change, and climate impact. For instance, 37% of the region of influence at SAN site has already deforested; it also has shown the greatest changes in precipitation and Carbon emission. The changes in precipitation (P) and temperature (T) are mainly in the dry season for all sites. At the ALF site, 28% deforested, showed the greatest changes in temperature, and the second-highest carbon emission. On the other hand, the western Amazon sites (RBA and TAB\_TEF), accounted for an average of deforestation of 16%, presented near neutral carbon balance and lower changes in precipitation and temperature. The eastern Amazon (SAN + ALF) represented 22% of the Amazon area, presented 27% of deforestation and was the region where dry season presented more substantial changes in precipitation (reduced by 24-34%) and temperature (increased by 1.9-2.5 °C). As a consequence of these climatic and anthropic changes, the carbon flux emission at eastern Amazon was around ten times higher than at western Amazon (RBA + TAB\_TEF). Eastern Amazon was a carbon source during the 9-year analysis, of which 89% of the carbon flux comes from biomass burning. In the western Amazon, the low deforestation (~11%) showed less changes in dry season P and T and carbon sink in the Net Biome Exchange (NBE C Flux: Total C Flux less Fire C Flux). If the whole Amazon had the western NBE C flux, it could be removed from the atmosphere 0.74 Gt CO<sub>2</sub>y<sup>-1</sup>. Therefore, Amazon is becoming a carbon source mainly due the fire emissions, which represent two times the Amazon carbon sink, as a result of anthropic and climatic changes.

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