

Title: Changes in the Carbon Cycle of Amazon Ecosystems During the 2010 Drought

Authors: Christopher Potter 1*, Steven Klooster², Cyrus Hiatt², Vanessa Genovese ²,
Juan Carlos Castilla-Rubio ³

¹ NASA Ames Research Center, Moffett Field, CA USA

² California State University Monterey Bay, Seaside, CA USA

³ Planetary Skin Institute, Silicon Valley, CA, USA

Abstract. Satellite remote sensing was combined with the NASA-CASA carbon cycle simulation model to evaluate the impact of the 2010 drought (July through September) throughout tropical South America. Results indicated that net primary production (NPP) in Amazon forest areas declined by an average of 7% in 2010 compared to 2008. This represented a loss of vegetation CO₂ uptake and potential Amazon rainforest growth of nearly 0.5 Pg C in 2010. The largest overall decline in ecosystem carbon gains by land cover type was predicted for closed broadleaf forest areas of the Amazon River basin, including a large fraction of regularly flooded forest areas. Model results support the hypothesis that soil and dead wood carbon decomposition fluxes of CO₂ to the atmosphere were elevated during the drought period of 2010 in periodically flooded forest areas, compared to forests outside the main river floodplains.

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