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OK**Non-CO<sub>2</sub> volatile carbon emissions and net ecosystem exchange in Amazônia**Jim Greenberg<sup>1</sup>Alex Guenther<sup>2</sup>VEGA BUSTILLOS, J.O.W. ← Oscar Veja<sup>3</sup>Peter Harley<sup>4</sup>GATTI, L.V. ← Luciana Vanni-Gatti<sup>5</sup>

At present, the global CO<sub>2</sub> budget requires the addition of a large, unidentified terrestrial sink in order to balance. After peatlands, forests contain the largest terrestrial reservoirs of carbon. Landuse changes in forested areas, therefore, represent a significant potential impact on the global carbon cycle. The net exchange of CO<sub>2</sub> between ecosystems and the atmosphere is a measure of the net ecosystem exchange of carbon (NEE). The net flux of CO<sub>2</sub> should be into young, rapidly growing forests; out of areas of recently cleared forest areas (as the organic matter decomposes); but near zero for mature or primary forests.

The estimation of the net carbon exchange is complicated by the potential for missing a significant exchange of non-CO<sub>2</sub> carbon. Living and dead organic matter emit a variety of volatile organic compounds (VOCs), including carbon monoxide, methane, isoprene, monoterpenes, methanol, acetone, acetaldehyde, formaldehyde, many VOCs related to damage of plant tissue, etc.

We have measured several of these non-CO<sub>2</sub> VOC emissions at the landscape level in various states in Amazônia, including Amazonas (near Balbina, primary and secondary forest), Rondônia (recently cleared forest and pasture as well as primary forest) and Pará (near Santarém, primary and secondary forest). The atmospheric concentration profiles of these VOC emissions were used to estimate hourly and daily emissions; a biogenic emission model was used to extrapolate these emissions to an annual flux. This annual emission estimate was then used to gauge the importance of non-CO<sub>2</sub> VOC emissions to NEE in Amazônia.

<sup>1</sup> P.O.Box 3000, Boulder, Colorado, USA 80307-3000, Tel: 303-497-1454; Fax: 303-497-1477,  
E-mail: [greenber@ucar.edu](mailto:greenber@ucar.edu); <sup>2</sup> NCAR; <sup>3</sup> IPEN; <sup>4</sup> NCAR; <sup>5</sup> IPEN.

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