

Kearsley, E., de Haulleville, T., Hufkens, K., Kidimbu, A., Toirambe, B., Baert, G., Huygens, D., Kebede, Y., Defourny, P., Bogaert, J., Beeckman, H., Steppe, K., Boeckx, P. & Verbeeck, H. (2013) Conventional tree height–diameter relationships significantly overestimate aboveground carbon stocks in the Central Congo Basin. *Nature Communications*, 4, 2269.

## **Conventional tree height–diameter relationships significantly overestimate aboveground carbon stocks in the Central Congo Basin**

### **Abstract**

Policies to reduce emissions from deforestation and forest degradation largely depend on accurate estimates of tropical forest carbon stocks. Here we present the first field-based carbon stock data for the Central Congo Basin in Yangambi, Democratic Republic of Congo. We find an average aboveground carbon stock of  $162 \pm 20 \text{ MgC ha}^{-1}$  for intact old-growth forest, which is significantly lower than stocks recorded in the outer regions of the Congo Basin. The best available tree height–diameter relationships derived for Central Africa do not render accurate canopy height estimates for our study area. Aboveground carbon stocks would be overestimated by 24% if these inaccurate relationships were used. The studied forests have a lower stature compared with forests in the outer regions of the basin, which confirms remotely sensed patterns. Additionally, we find an average soil carbon stock of  $111 \pm 24 \text{ MgC ha}^{-1}$ , slightly influenced by the current land-use change.