What is "forest?" Response to Guariguata *et al.*

Francis E. Putz[1] & Nophea Sasaki[2,3]

[1] Department of Biology, University of Florida, Florida, USA
[2] Harvard Forest, Harvard University, Massachusetts, USA
[3] Graduate School of Applied Informatics, University of Hyogo, Kobe, Japan

Keywords
Forest definition; forest degradation; carbon loss; remote sensing; climate change agreements; deforestation.

Correspondence
Nophea Sasaki, Graduate School of Applied Informatics, University of Hyogo, Kobe, Japan.
Tel: +81 (78) 367-8616; fax: +81 (78) 362-0651.
E-mail: nop.kankyo@ai.u-hyogo.ac.jp

Received: 27 August 2009; accepted 3 September 2009.

doi: 10.1111/j.1755-263X.2009.00076.x

We agree with Guariguata *et al.* (2009) that monitoring changes in carbon stocks is more important than trying to agree on what constitutes a forest and that unless timeframes are specified, defining forest degradation will remain problematic. We also share the hope that in recognition of recent advances in remote sensing and ground-based monitoring methods, the way forest is defined under the Kyoto Protocol will become irrelevant during the next commitment period of the Climate Change Convention. Nevertheless, if climate change policy makers opt to continue to employ Kyoto-like definitions and continue to disregard degradation (i.e., losses of carbon from forests that remain forests), then adoption of the definition we proposed (i.e., increasing the minimum canopy cover of "forest" from >10–30% to >40% and changing the minimum height of a "tree" from >2–5 m to >5 m; Sasaki & Putz 2009), will result in less carbon loss that will go unaccounted.

Given that direct, frequent, and reliable measurement of forest carbon stocks is critical to the success of Reduced Emissions from Deforestation and Degradation (REDD), continued efforts are needed to reduce the uncertainties surrounding these estimates. Fortunately, remote sensing techniques are already available for tracking changes in forest canopy cover that correspond to as little as the loss of 1–2 trees per hectare; further improvements in precision are imminent with modifications of sensors already on orbiting satellites, improved image processing methods, and new satellites coming on line. In addition to better monitoring, efforts at halting degradation will benefit from increased awareness of environmentally sound forest management options (e.g., reduced-impact logging), efforts at recovering carbon stocks in degraded forests will benefit from better understanding of restoration methods, and both will require more effective enforcement of laws designed to protect the environment.

Given the ultimate goal of the REDD initiative, we suggest that the focus be changed from forest carbon to ecosystem carbon, so that the ample carbon stocks in naturally nonforested areas (e.g., savannas and herbaceous wetlands) are duly acknowledged. But even with that broadening of scope, we are concerned that unless we are careful, the focus on carbon in the Climate Change Convention will lead to conflicts with the Convention on Biological Diversity and to continued disregard of the Convention to Combat Desertification. These misgivings notwithstanding and acknowledging that there are modes of degradation that do not involve reductions in standing stocks of carbon, we defend our effort to clarify the importance of carbon losses from forests that remain forests.

References

Guariguata, M.R., Nasi R., Kanninen M. (2009) Forest degradation: it is not a matter of new definitions. *Conserv Lett* doi: 10.1111/j.1755-263X.2009.00075.x.

Sasaki, N., Putz F.E. (2009) Critical need for new definitions of "forest" and "forest degradation" in global climate change agreements. *Conserv Lett* **2**, 226–232.

Editor: Dr. Jos Barlow

