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EDITORIAL

Tropical deforestation and greenhouse gas emissions

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Carbon emissions from tropical deforestation have long been recognized as a key component of the global carbon budget, and more recently of our global climate system. Tropical forest clearing accounts for roughly 20% of anthropogenic carbon emissions and destroys globally significant carbon sinks (IPCC 2007). Global climate policy initiatives are now being proposed to address these emissions and to more actively include developing countries in greenhouse gas mitigation (e.g. Santilli *et al* 2005, Gullison *et al* 2007). In 2005, at the Conference of the Parties (COP) in Montreal, the United Nations Framework Convention on Climate Change (UNFCCC) launched a new initiative to assess the scientific and technical methods and issues for developing policy approaches and incentives to reduce emissions from deforestation and degradation (REDD) in developing countries (Gullison *et al* 2007).

Over the last two years the methods and tools needed to estimate reductions in greenhouse gas emissions from deforestation have quickly evolved, as the scientific community responded to the UNFCCC policy needs. This focus issue highlights those advancements, covering some of the most important technical issues for measuring and monitoring emissions from deforestation and forest degradation and emphasizing immediately available methods and data, as well as future challenges.

Elements for effective long-term implementation of a REDD mechanism related to both environmental and political concerns are discussed in Mollicone *et al*. Herold and Johns synthesize viewpoints of national parties to the UNFCCC on REDD and expand upon key issues for linking policy requirements and forest monitoring capabilities. In response to these expressed policy needs, they discuss a remote-sensing-based observation framework to start REDD implementation activities and build historical deforestation databases on the national level. Achard *et al* offer an assessment of remote sensing measurements across the world's tropical forests that can provide key consistency and prioritization for national-level efforts. Gibbs *et al* calculate a range of national-level forest carbon stock estimates that can be used immediately, and also review ground-based and remote sensing approaches to estimate national-level tropical carbon stocks with increased accuracy.

These papers help illustrate that methodologies and tools are indeed available to estimate emissions from deforestation. Clearly, important technical challenges remain (e.g. quantifying degradation, assessing uncertainty, verification procedures, capacity building, and Landsat data continuity) but we now have a sufficient technical base to support REDD early actions and readiness mechanisms for building national monitoring systems.

Thus, we enter the COP 13 in Bali, Indonesia with great hope for a more inclusive climate policy encompassing all countries and emissions sources from both land-use and energy sectors. Our understanding of tropical deforestation and carbon emissions is improving and with that, opportunities to conserve tropical forests and the host of ecosystem services they provide while also increasing revenue streams in developing countries through economic incentives to avoid deforestation and degradation.

References

- Gullison R E *et al* 2007 Tropical forests and climate policy *Science* **316** 985–6
- Intergovernmental Panel on Climate Change (IPCC) 2007 *Climate Change 2007: The Physical Science Basis: Summary for Policymakers*
<http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>
- Santilli M *et al* 2005 Tropical deforestation and the Kyoto Protocol: an editorial essay *Clim. Change* **71** 267–76