Climate mitigation and the future of tropical landscapes

Resource
2010

Themes

External link


Summary

Land-use change to meet 21st-century demands for food, fuel, and fiber will depend on many interactive factors, including global policies limiting anthropogenic climate change and realized improvements in agricultural productivity. Climate-change mitigation policies will alter the decision-making environment for land management, and changes in agricultural productivity will influence cultivated land expansion. We explore to what extent future increases in agricultural productivity might offset conversion of tropical forest lands to croplands under a climate mitigation policy and a contrasting no-policy scenario in a global integrated assessment model. The Global Change Assessment Model is applied here to simulate a mitigation policy that stabilizes radiative forcing at 4.5 Wm−2 (approximately 526 ppmCO2) in the year 2100 by introducing a price for all greenhouse gas emissions, including those from land use. These scenarios are simulated with several cases of future agricultural productivity growth rates and the results downscaled to produce gridded maps of potential land-use change. We find that tropical forests are preserved near their present-day extent, and bioenergy crops emerge as an effective mitigation option, only in cases in which a climate mitigation policy that includes an economic price for land-use emissions is in place, and in which agricultural productivity growth continues throughout the century. We find that idealized land-use emissions price assumptions are most effective at limiting deforestation, even when cropland area must increase to meet future food demand. These findings emphasize the importance of accounting for feedbacks from land-use change emissions in global climate change mitigation strategies.
**Authors**

Thomson, Allison M.
Calvin, Katherine V.
Chini, Louise P.
Hurtt, George
Edmonds, James A.
Bond-Lamberty, Ben
Frolking, Steve
Wise, Marshall A.
Janetos, Anthony C.

**Journal**

Proceedings of the National Academy of Sciences of the United States of America

**Editors**

Rosenzweig, Cynthia

**Search resources**

Search

Apply

Reset

**Other resources**

- [Land use, forest cover change and historical GHG emission](#) [12]
- [Historical and projected deforestation rates 1990 -2020 for Santo Island / Vanuatu](#) [13]
- [Detection and Quantification of Deforestation during 2000 – 2013 on Choiseul, Solomon Islands](#) [14]
- [Land Use in a Future Climate Agreement](#) [15]
- [Mapping the potential for REDD+ to deliver biodiversity conservation in Viet Nam: a preliminary analysis](#) [17]
- [REDD Feasibility Study for Central Suau, Milne Bay, Papua New Guinea](#) [18]
- [REDD Feasibility Study for East Rennell World Heritage Site, Solomon Islands](#) [19]
- [Guidelines on Development Submission and Assessment of Reference Levels](#) [20]
- [REDD plus cookbook: how to measure and monitor forest carbon](#) [21]

**Source URL:** http://theredddesk.org/resources/climate-mitigation-and-future-tropical-landscapes

**Links**

[3]