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The global tree restoration potential

Jean-Francois Bastin^{1,*}, Yelena Finegold², Claude Garcia^{3,4}, Danilo Mollicone², Marcelo Rezende², Devi...
 + See all authors and affiliations

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The potential for global forest cover

The restoration of forested land at a global scale could help capture atmospheric carbon and mitigate climate change. Bastin *et al.* used direct measurements of forest cover to generate a model of forest restoration potential across the globe (see the Perspective by Chazdon and Brancalion). Their spatially explicit maps show how much additional tree cover could exist outside of existing forests and agricultural and urban land. Ecosystems could support an additional 0.9 billion hectares of continuous forest. This would represent a greater than 25% increase in forested area, including more than 500 billion trees and more than 200 gigatonnes of additional carbon at maturity. Such a change has the potential to cut the atmospheric carbon pool by about 25%.

Science, this issue p. 76; see also p. 24

Abstract

The restoration of trees remains among the most effective strategies for climate change mitigation. We mapped the global potential tree coverage to show that 4.4 billion hectares of canopy cover could exist under the current climate. Excluding existing trees and agricultural and urban areas, we found that there is room for an extra 0.9 billion hectares of canopy cover, which could store 205 gigatonnes of carbon in areas that would naturally support woodlands and forests. This highlights global tree restoration as our most effective climate change solution to date. However, climate change will alter this potential tree coverage. We estimate that if we cannot deviate from the current trajectory, the global potential canopy cover may shrink by ~223 million hectares by 2050, with the vast majority of losses occurring in the tropics. Our results highlight the opportunity of climate change mitigation through global tree restoration but also the urgent need for action.

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