Fact sheet 2
September 2015

ROBIN
Role of Biodiversity in Climate Change Mitigation

BIODIVERSITY HAS A POSITIVE EFFECT ON CARBON STOCKS AND CARBON SEQUESTRATION

Key findings

Diversity matters as it increases carbon stocks and carbon sequestration in tropical forests.

Recommendations

- Biodiversity should be considered an integral component of policies and practices that will reduce the impact of climate change (e.g. REDD+), and not just a requirement related to co-benefits and safeguards.
- Mitigation initiatives in mature tropical forest should take into account possible trade-offs between carbon stocks and carbon sequestration in the decision process.
- Biodiversity proxies can be developed using remote sensing data to monitor changes in carbon stocks and biodiversity over large areas. These proxies would need to be verified with field data.

ABOUT ROBIN

ROBIN has assessed the role of biodiversity in terrestrial ecosystems in South and Mesoamerica in mitigating climate change. It has evaluated socio-ecological consequences of changes in biodiversity and ecosystem services under climate change.

Evidence

We carried out a series of studies in forest sites spanning the complete latitudinal and climatic gradient across the lowland Neotropics. In these studies we assessed how climate and soils determined forest diversity, and how the environment and diversity together influence forest carbon stocks (i.e. how much carbon is stored in the standing forest) and carbon sequestration (i.e. rate at which carbon is removed from the atmosphere and taken up in forest biomass).

We focussed on three components of diversity: taxonomic attributes (e.g. tree species richness), functional attributes (e.g. stem wood density) and structural attributes (e.g. stem diameter).

We found that in tropical forests the amount of carbon stocks increases with the average stem diameter and the number of large trees. Across large environmental gradients, tree diversity has a positive effect on the carbon stocks of tropical forests, in which sites with higher species richness show higher levels of carbon stocks.

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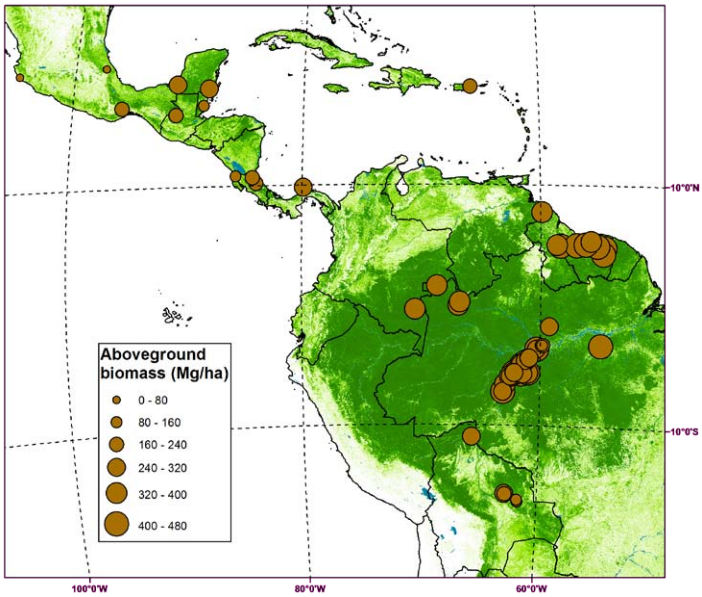
All three components of diversity are important for carbon sequestration. Carbon sequestration was higher in forests dominated by trees with productive tissues (soft and cheap leaves, softer wood), and tall species. We also found that tropical forests with higher carbon stocks have lower rates of carbon sequestration.



Map of vegetation cover in Latin America showing the location of the 60 study sites. The size of the circles shows the amount of aboveground biomass (Mg/ha)

ROBIN outputs

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More information

www.robinproject.info

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