



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.

ECOSYSTEMS WITH LOWER INTEGRITY STORE LESS CARBON AND PROVIDE FEWER ECOSYSTEM SERVICES

Context and trends

The REDD+ mechanism addresses the reduction of emissions from forest deforestation and degradation, currently estimated to contribute to over 15% of global emissions.

The Convention on Biological Diversity (CBD) is fostering an international commitment to biodiversity based on ecological conservation as a frame for its sustainable use.

Ecosystems with high integrity have higher biodiversity and better condition compared with similar ecosystems with less integrity.

There is mounting evidence suggesting that ecosystem condition relates directly to its capacity to capture and store carbon as well as the provision of other ecosystem services.

Forests subject to some degree of degradation, like secondary forests, may show a transitory large capacity to absorb carbon while developing.

Policy relevance

The complexity of ecosystems means they provide us with a variety of goods and services simultaneously. They do so just by keeping themselves functional and structurally whole.

We propose that a reasonable policy for increasing and maintaining carbon storage in a given ecosystem would involve the measurement, management and conservation of ecosystem integrity. This will help us to recognize the nature and value of multi-functional ecosystems and landscapes, and build sustainable territories.

Evidence

Ecosystem integrity, as documented in Mexico with ground and remote sensing data, is correlated with changes in forest ability to absorb and store carbon as well as to the capacity to provide other ecosystem services (See factsheets 3 & 7).

Ecosystem integrity in Mexican forests positively correlates with carbon storage (in terms of biomass, see figure). For example, forests in the peninsula of Yucatan show both high values of ecosystem integrity and high values of biomass. On the other hand, forests close to the coast in the Gulf of Mexico show low



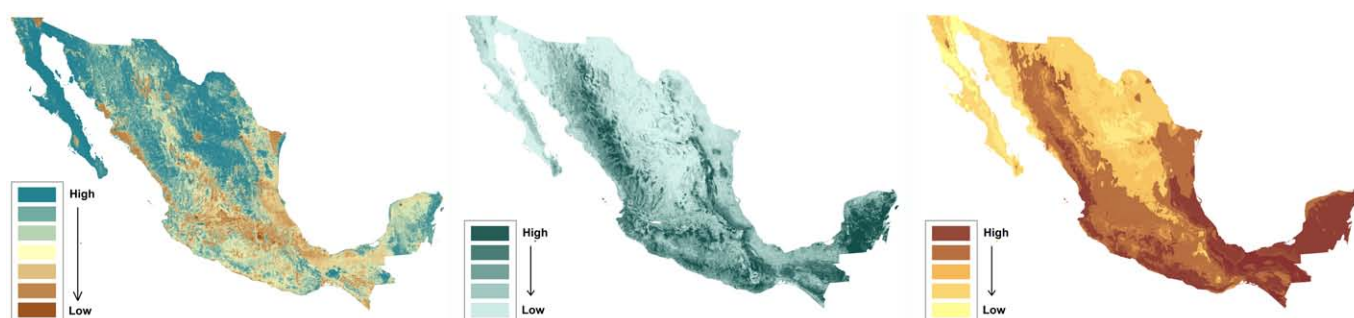


values of ecosystem integrity and also low values of biomass.

The relationship between ecosystem integrity and carbon storage in other types of ecosystem does not necessarily follow the pattern observed in forests. For example, arid lands in central Mexico have high values of ecosystem integrity but low biomass production, because of their intrinsic limitations (water stress), that only permit slow vegetation growth. So, our model of ecosystem condition is flexible enough to describe the ecological potential for carbon storage of different biomes.

Opportunities

- The evaluation of ecosystem integrity allows an assessment of the “health” of ecosystems relative to their “pristine” condition in the same location and, depending on the data used in its calculation, can take into account structural, functional and taxonomic components of biodiversity.
- Documenting ecosystem integrity dynamics is key to our understanding and our ability to better design suitable public policies to face the challenges of climate change and the construction of a sustainable culture.
- The analysis of ecosystem integrity versus carbon storage can be extended to other countries.

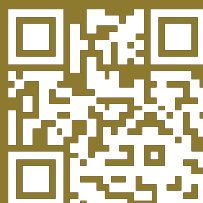


Ecosystem integrity and plant biomass in Mexico

Left: Ecosystem integrity

Centre: Biomass

Right: Correlation between ecosystem integrity and biomass



More information

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