

Ecological Integrity of Avoided Deforestation Projects in the Green Transition

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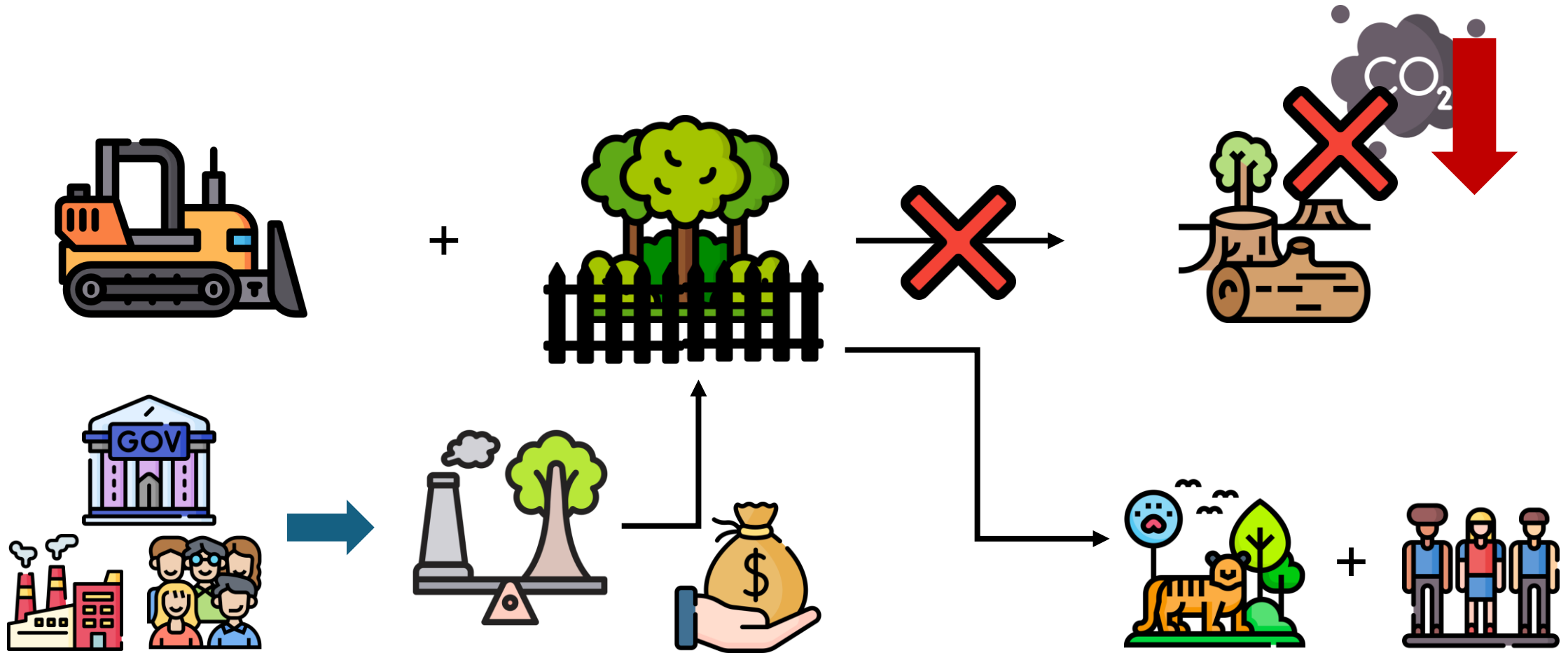
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Avoided deforestation projects & their popularity



One of the most popular natural climate solutions & often seen as a good way to find forest conservation

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The age of extinction Carbon offsetting

Revealed: more than 90% of rainforest carbon offsets by biggest provider are worthless, analysis shows

Investigation into Verra carbon standard finds most are 'phantom credits' and may worsen global heating

- **Nowhere else to go: Alto Mayo, Peru, at centre of conservation row**
- **Greenwashing or a net zero necessity? Scientists on carbon offsetting**
- **Carbon offsets flawed but we are in a climate emergency**

The age of extinction is supported by

The research into Verra, the world's **leading carbon standard** for the rapidly growing **\$2bn (£1.6bn) voluntary offsets** market, has found that, based on analysis of a significant percentage of the projects, more than 90% of their rainforest offset credits - among the most commonly used by companies - are likely to be "phantom credits" and do not represent genuine carbon reductions.

<https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe>

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RESEARCH ARTICLE | SOCIAL SCIENCES | f t in

Overstated carbon emission reductions from voluntary REDD+ projects in the Brazilian Amazon

Thales A. P. West, Jan Börner, Erin O. Sills, and Andreas Kontoleon

Edited by Eric F. Lambin, Stanford University, Stanford, CA, and approved August 12, 2020 (received for review March 6, 2020)

September 14, 2020 | 117 (39) 24188-24194 | <https://doi.org/10.1073/pnas.2004334117>

29,503 | 30

Conservation Biology

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A global evaluation of the effectiveness of voluntary REDD+ projects at reducing deforestation and degradation in the moist tropics

Alejandro Guizar-Coutiño, Julia P. G. Jones, Andrew Balmford, Rachel Carmenta, David A. Coomes

First published: 17 June 2022 | <https://doi.org/10.1111/cobi.13970>

Article Impact statement: Carefully targeted carbon finance can help slow tropical deforestation, benefitting biodiversity and slowing climate change.

Platts VCM prices dip across all segments in 2023



Source: S&P Global Commodity Insights

Improvements in the system → limit to high integrity carbon credits



Shouldn't forest carbon projects also benefit the forests themselves?



Carbon integrity



Social integrity



Carbon integrity



Ecological integrity gap

A healthy ecosystem should be:

- More resilient to change and human pressures
- Maintain ecosystem processes and functions
- Support biodiversity (e.g. seed dispersers, pollinators)

Ecological integrity in forests should include:

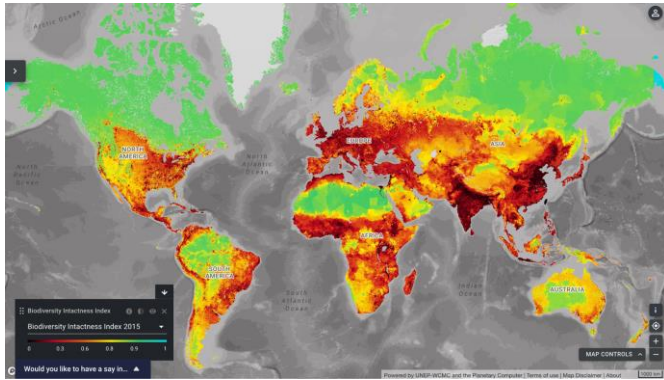
- Composition
- Structure
- Function

Have existing carbon projects managed to maintain ecological integrity?



Quantifying ecological integrity

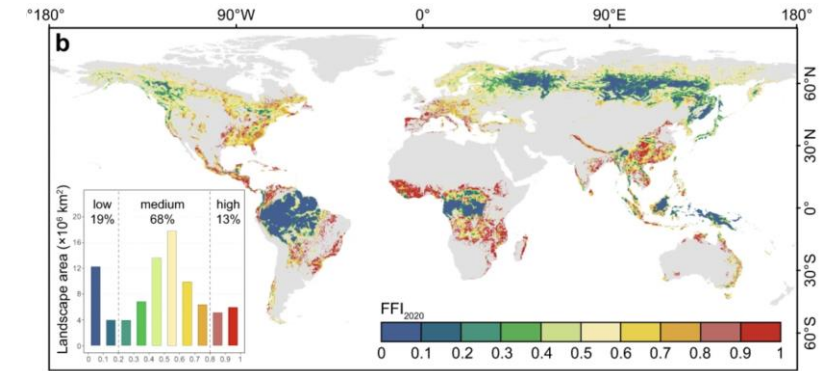
Biodiversity Intactness Index¹



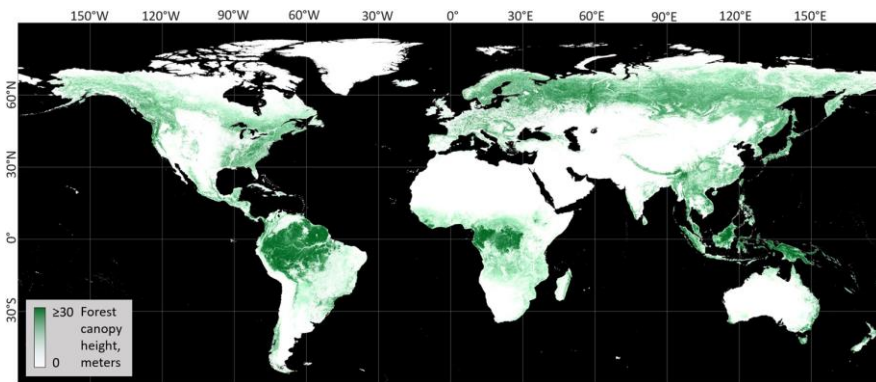
Forest Landscape Integrity Index²



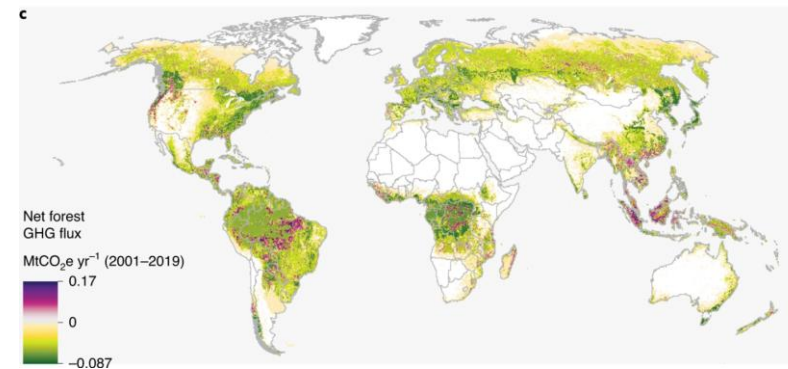
Forest Fragmentation³



Canopy Height⁴



GHG Net Flux⁵



1. United Nations Environment Programme (UNEP). Biodiversity Intact Index. (2022).
2. Grantham, H. S. et al. Anthropogenic modification of forests means only 40% of remaining forests have high ecosystem integrity. *Nat. Commun.* 11, 5978 (2020).
3. Ma, J., Li, J., Wu, W. & Liu, J. Global forest fragmentation change from 2000 to 2020. *Nat. Commun.* 14, 3752 (2023).
4. Potapov, P. et al. Mapping global forest canopy height through integration of GEDI and Landsat data. *Remote Sens. Environ.* 253, 112165 (2021).
5. Harris, N. L. et al. Global maps of twenty-first century forest carbon fluxes. *Nat. Clim. Change* 11, 234–240 (2021).

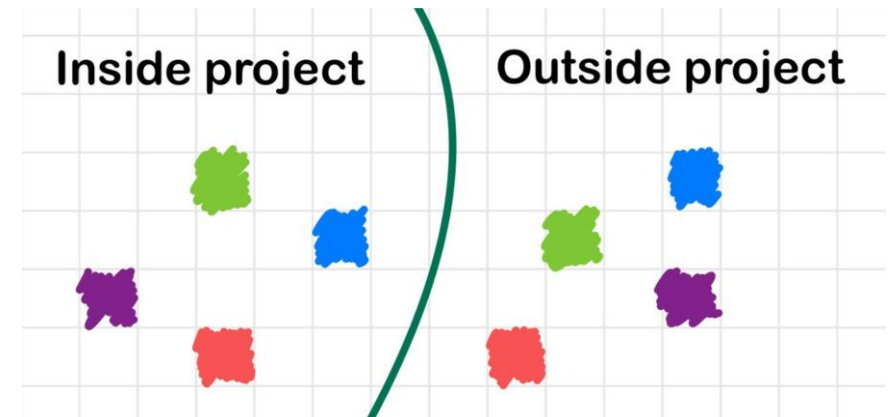
Approach

Dataset:

Global dataset of 196 projects (Verra, EcoRegistry, ACR, CAR, ACCU) → matches for 116 projects

Method:

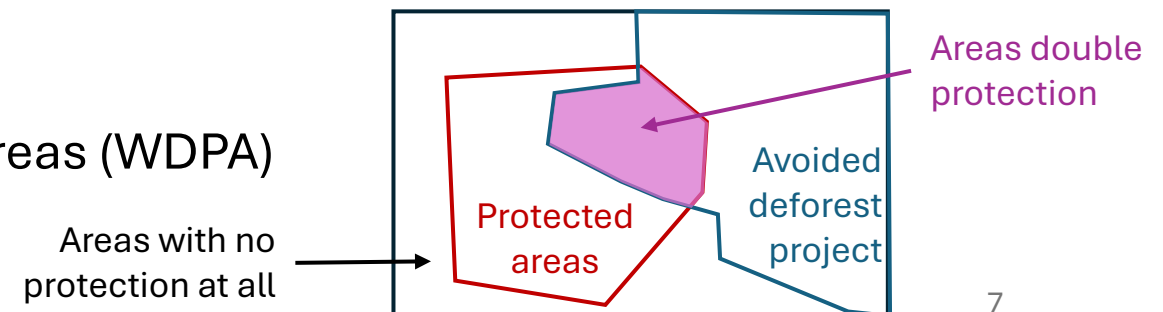
1. Pixel-level propensity score matching on 8 socio-ecological covariates
 - Biomass carbon, annual precipitation, elevation, slope, human footprint, GDP, pop density, travel time to urban
 - Excluded 10 km buffer to avoid leakage zones
2. Linear models on well-matched data to assess ecological integrity



Additional consideration:

Some projects & controls overlap with Protected Areas (WDPA)

Enabled 4 key comparisons:

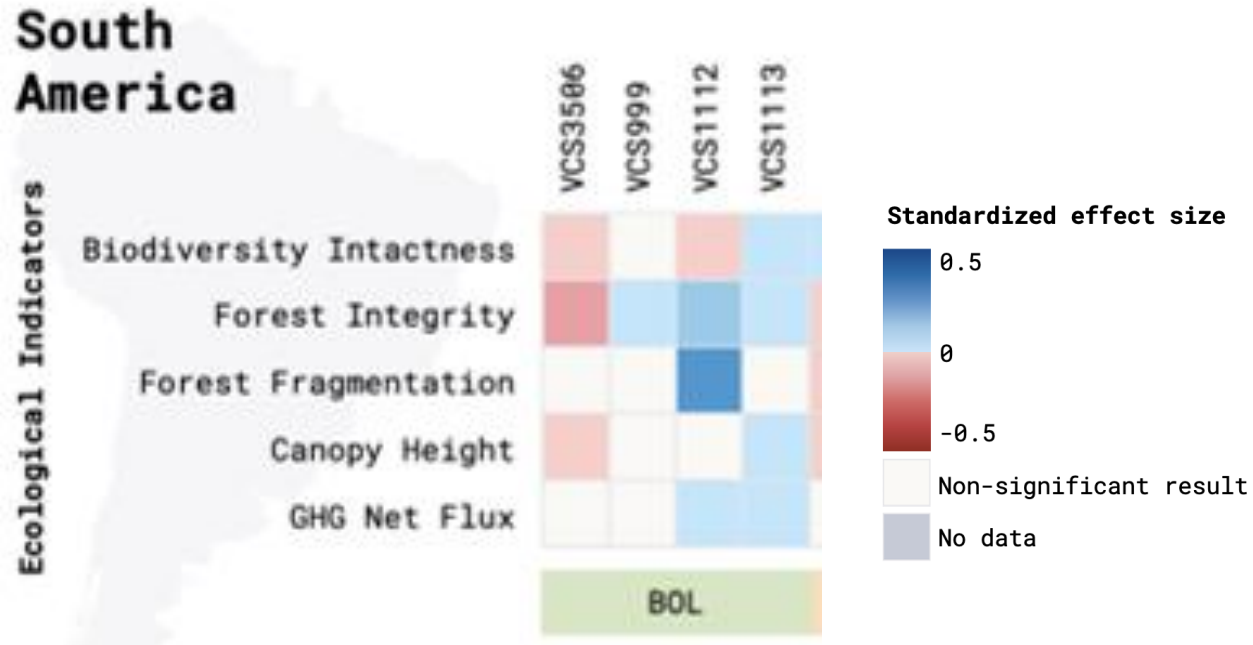


What we found

Areas with no protection at all

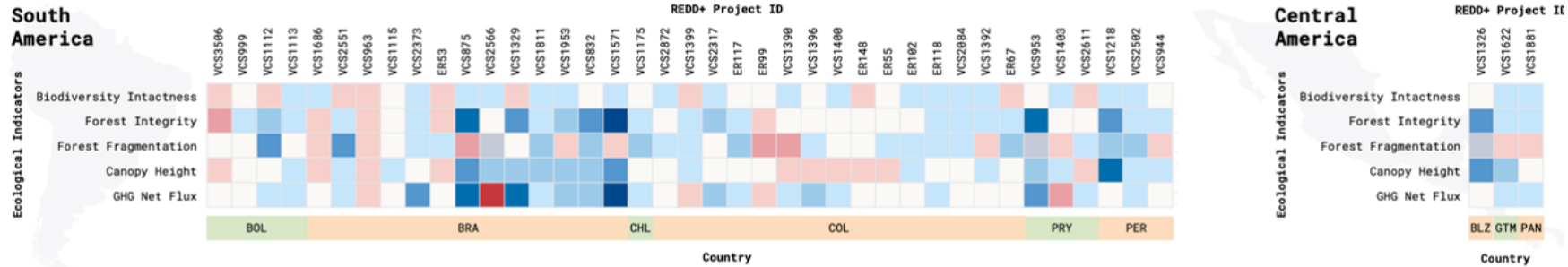


Comparing avoided deforestation projects against unprotected forests around

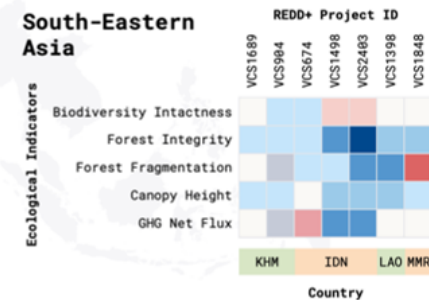
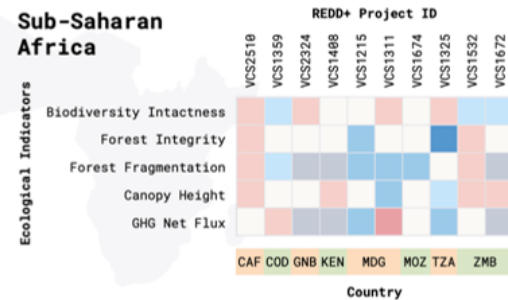
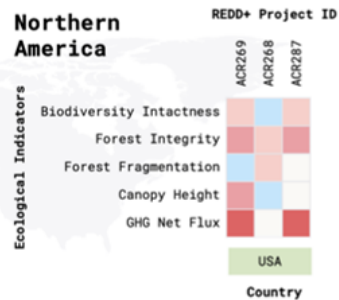


What we found: very mixed results

Comparing avoided deforestation projects against unprotected forests around



Generally heterogenous patterns

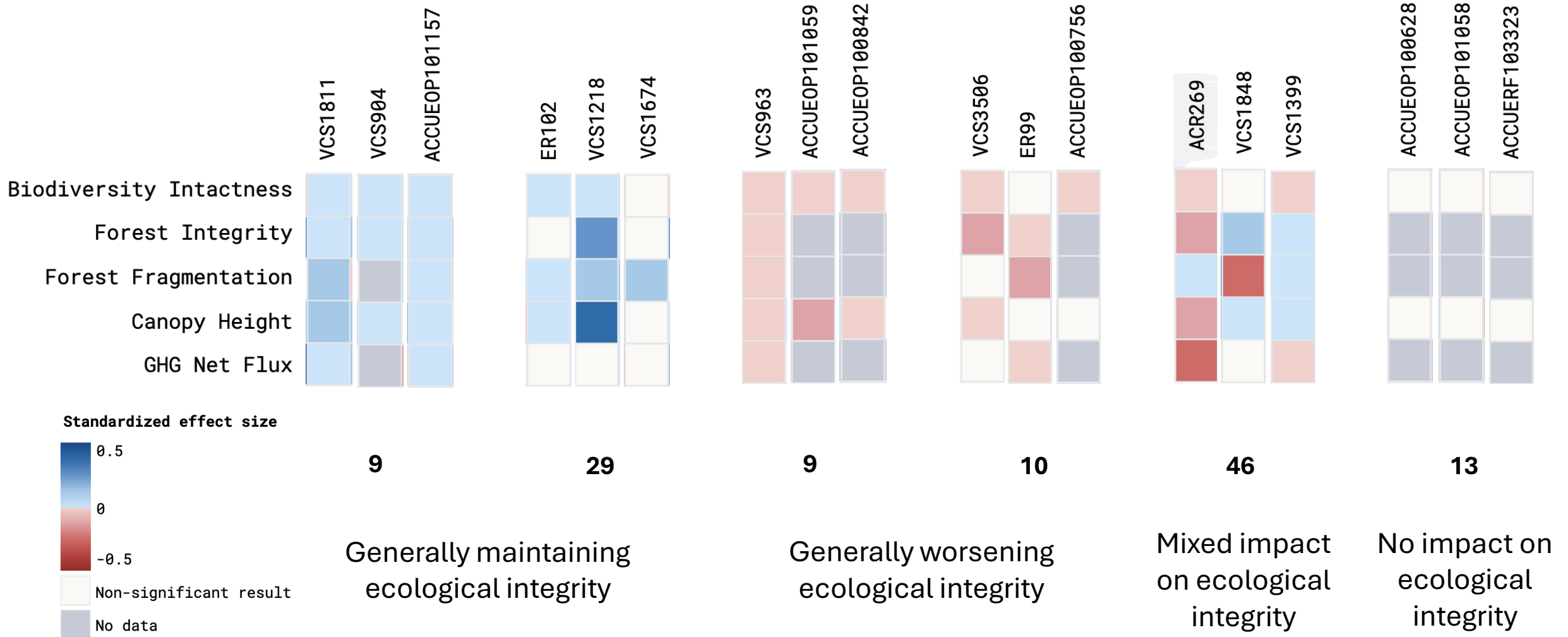


Standardized effect size



What we found: very mixed results

Comparing avoided deforestation projects against unprotected forests around



What we found: very mixed results

Comparing avoided deforestation projects against unprotected forests around

Some general spatial patterns

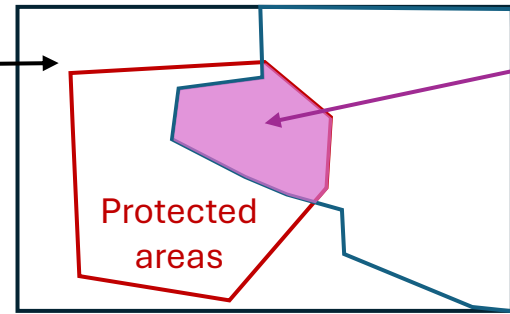


Suspect it's also effect of overall higher levels of deforestation risk around avoided deforestation locations

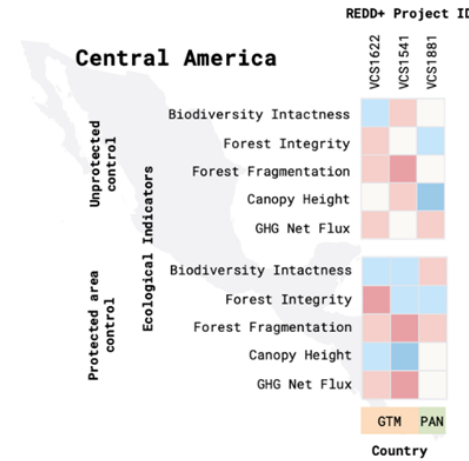
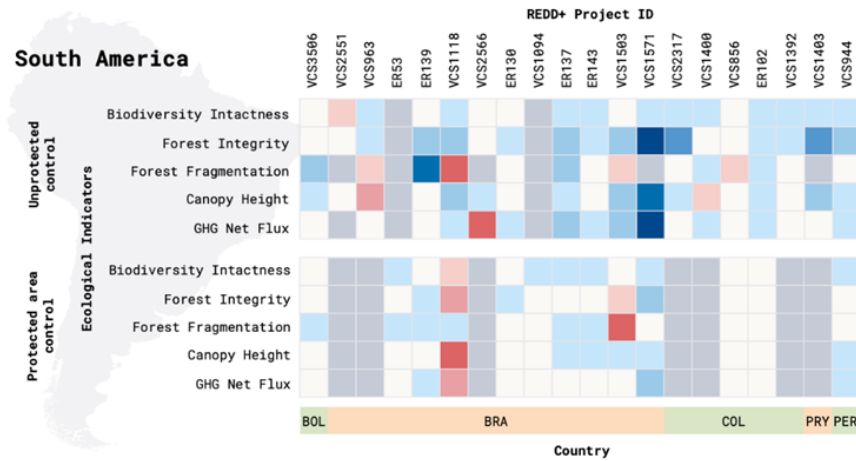
What we found: stacked protections

Comparing avoided deforestation projects with PA recognition

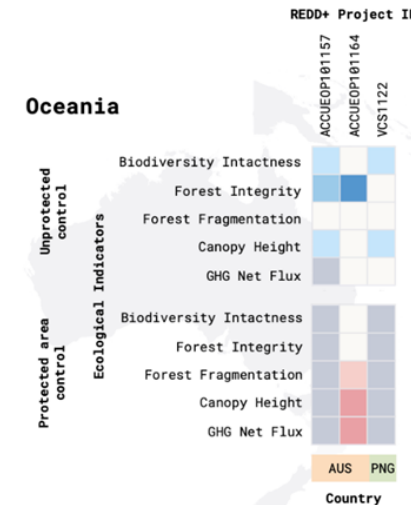
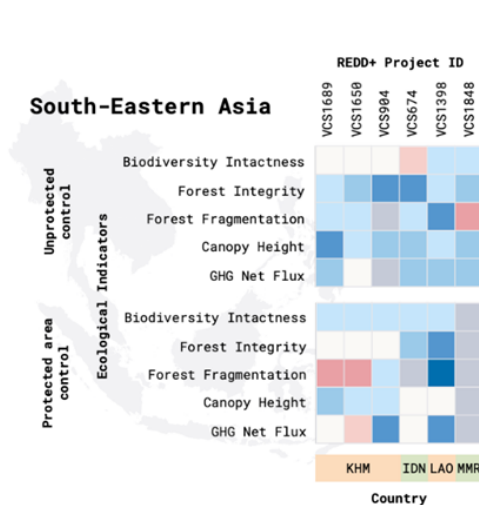
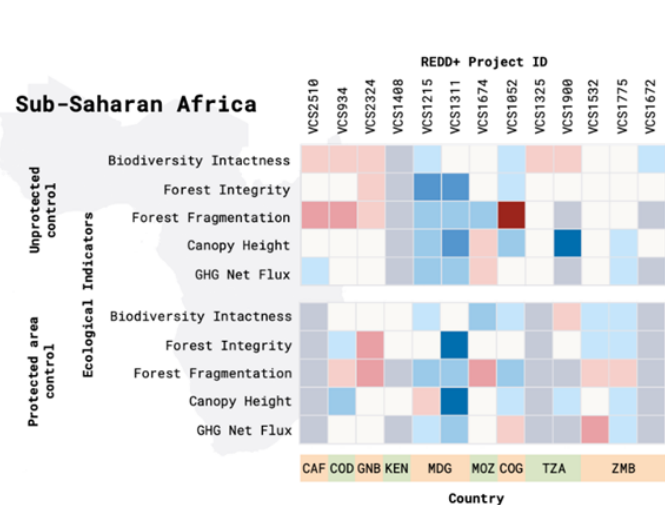
Areas with no protection at all



Areas double protection



Pretty heterogenous too, but higher percentage of blues than ones without PAs



Additionality issue or increased effectiveness?



Implications

- Ecological integrity not guaranteed in avoided deforestation projects
- Avoided deforestation project + formal protection = Better conservation outcomes
 - But does it break additionality rules?
- Multi-indicator scorecards can:
 - Provide a mechanism to evaluate ecological integrity
 - Support development of higher-integrity credits

We need to extend our definition of what high-integrity is before the next controversy

Thank you for your time

Questions?

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