



NAILING REFORESTATION TO THE GROUND AS A NATURAL CLIMATE SOLUTION

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THE NATURE CONSERVANCY**

NATURAL CLIMATE SOLUTIONS

Actions that avoid or capture additional emissions through:

- improved management
- protection
- restoration

of forests, agricultural lands, grasslands, and wetlands.

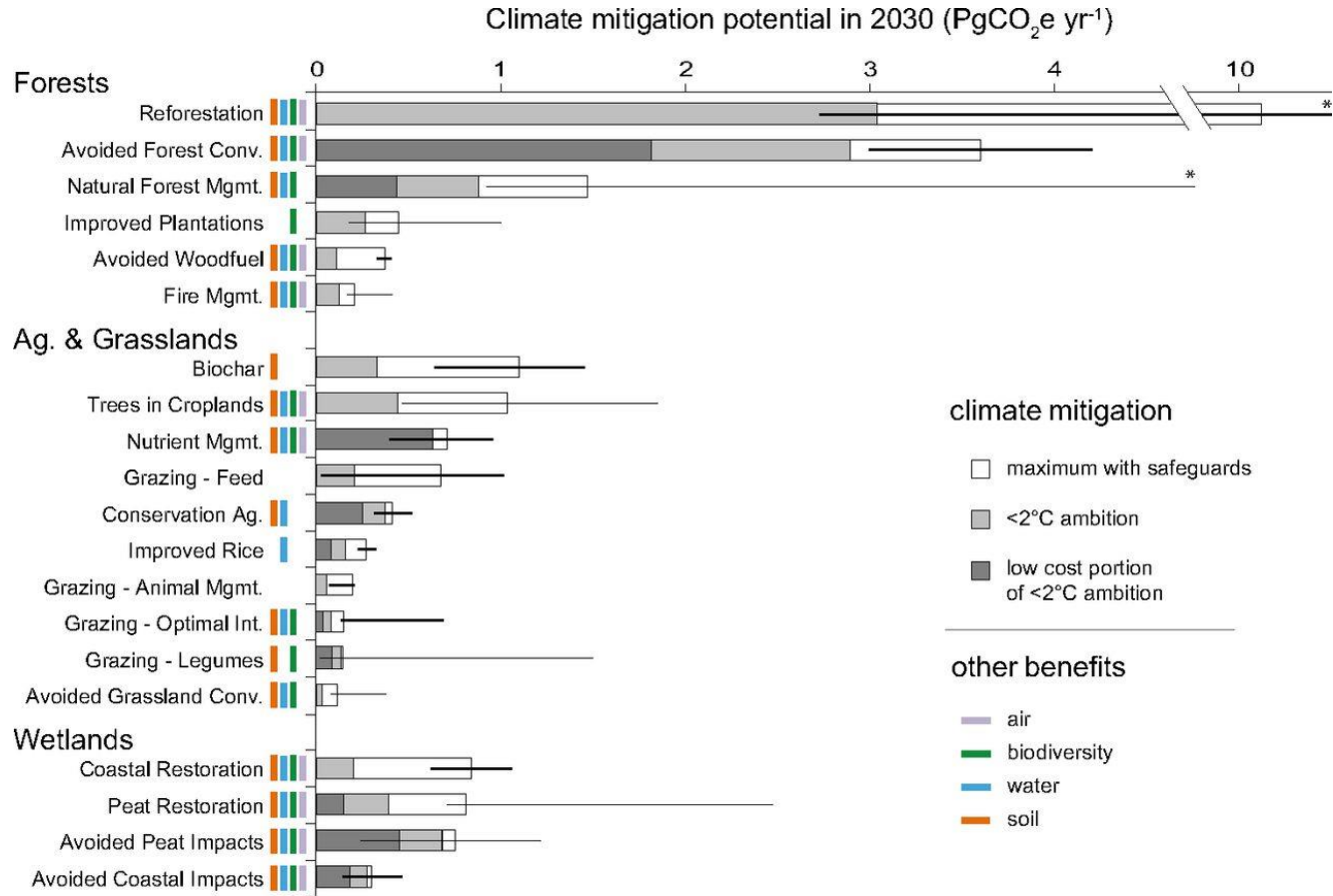


NATURAL CLIMATE SOLUTIONS

Deployable now and can provide multiple co-benefits (conservation of biodiversity, sustainable livelihoods, clean air and water, etc.)



RESTORATION OF FOREST COVER = LARGEST* OPPORTUNITY



NEWS / SWITZERLAND

World Economic Forum leaders pledge to plant 1 trillion trees

To help fight climate change and promote biodiversity, Davos leaders launch a campaign to plant one trillion trees.

by Jonah Hull  

23 Jan 2020

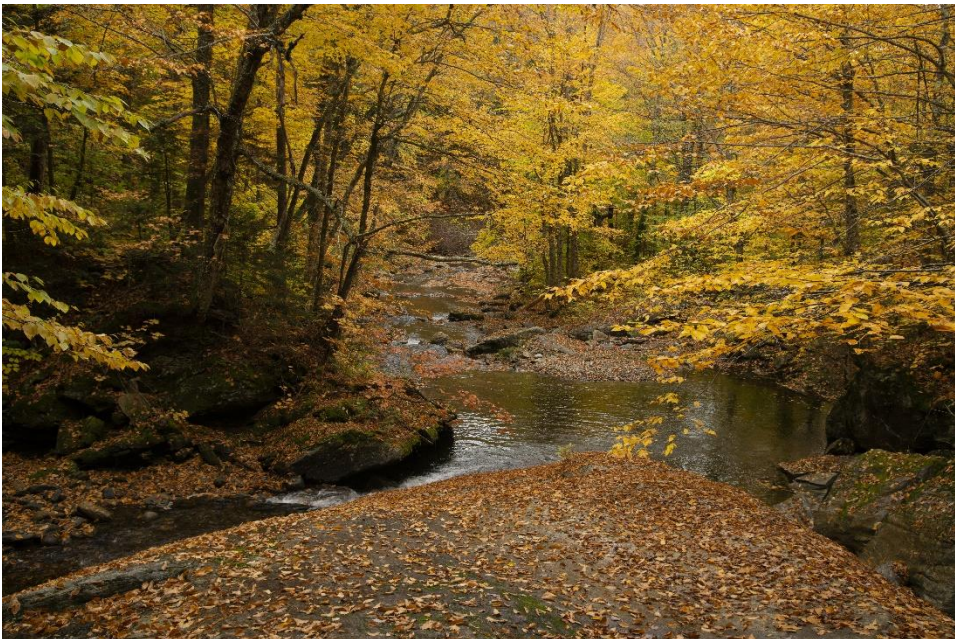


Photo credit: Eamon Mac Mahon



Photo credit: Larry Moskovitz/TNC Photo Contest 2019



Restoration of forest cover is a tool

- not “the” tool
- with the potential for wise use or mis-use

Restoration of forest cover

Transition from $< 25\%$ to $> 25\%$ forest cover in places that historically supported forests

(~afforestation, ~reforestation, ~ forest restoration)

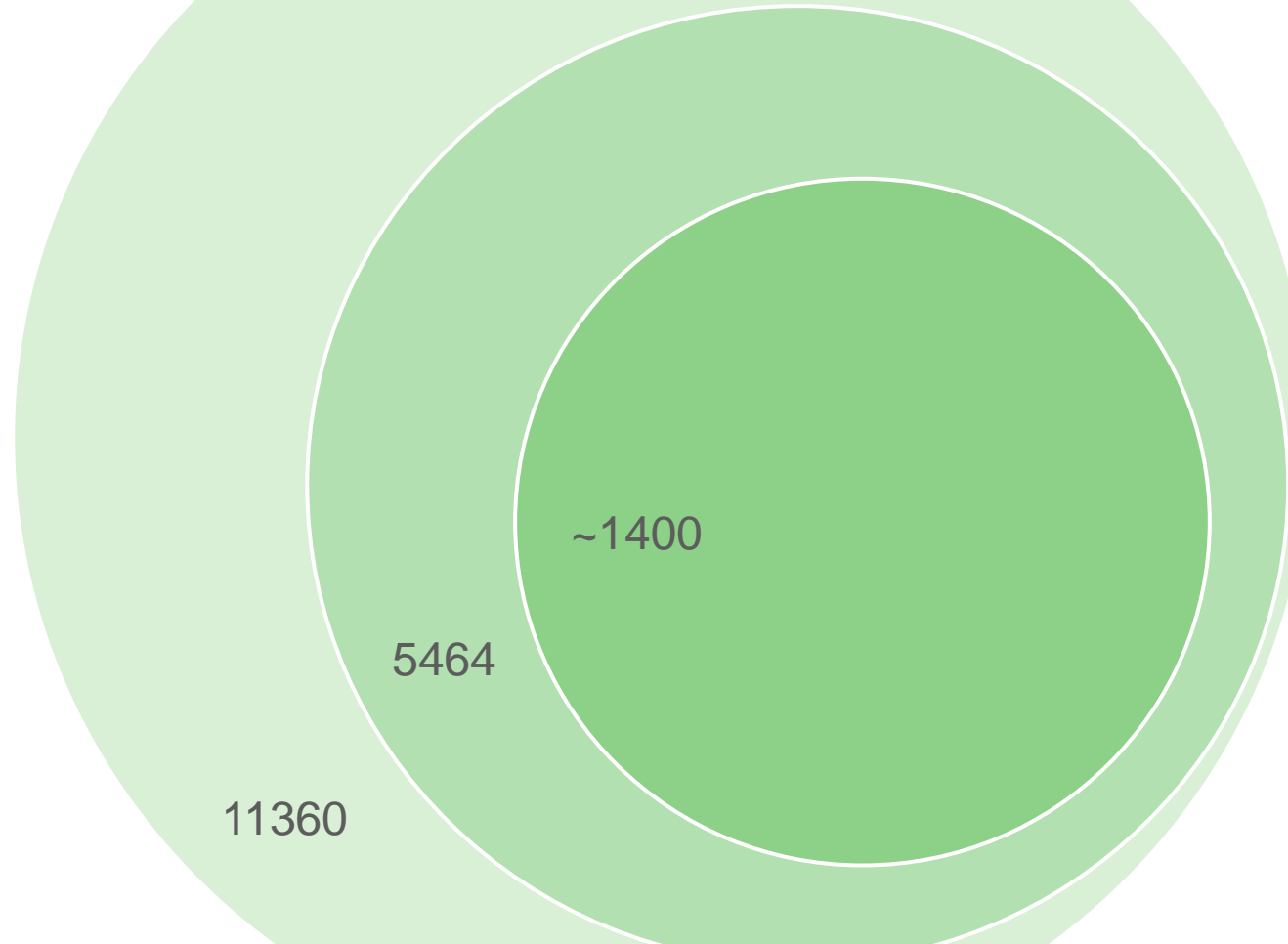
Take homes

- 1) Restoration of forest cover = promising natural climate solution
- 2) Multiple options for restoring forest cover (where/how) and we need customizable menu to understand the costs, co-benefits, and climate mitigation trade-offs among approaches
- 3) But there are other natural climate solutions too, such as protection of intact forests.
- 4) Reduction in fossil fuels is the most critical action
- 5) To use restoration of forest cover to its highest potential as a climate solution, we need robust estimates of mitigation potential AND a dynamic system of global monitoring

How do we get robust estimates of reforestation potential?

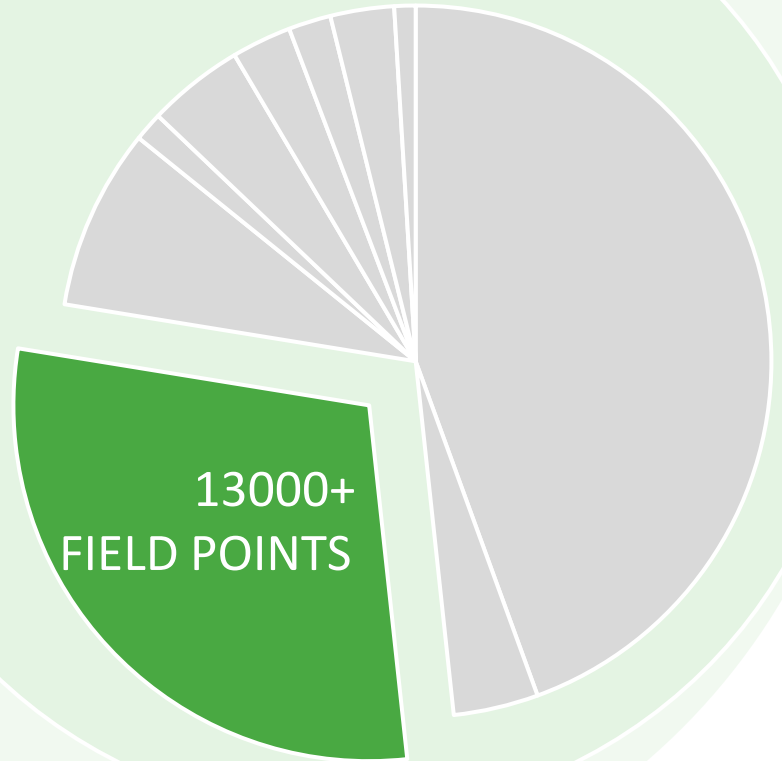
RATES + AREA OF OPPORTUNITY

FIND THE RELEVANT LITERATURE

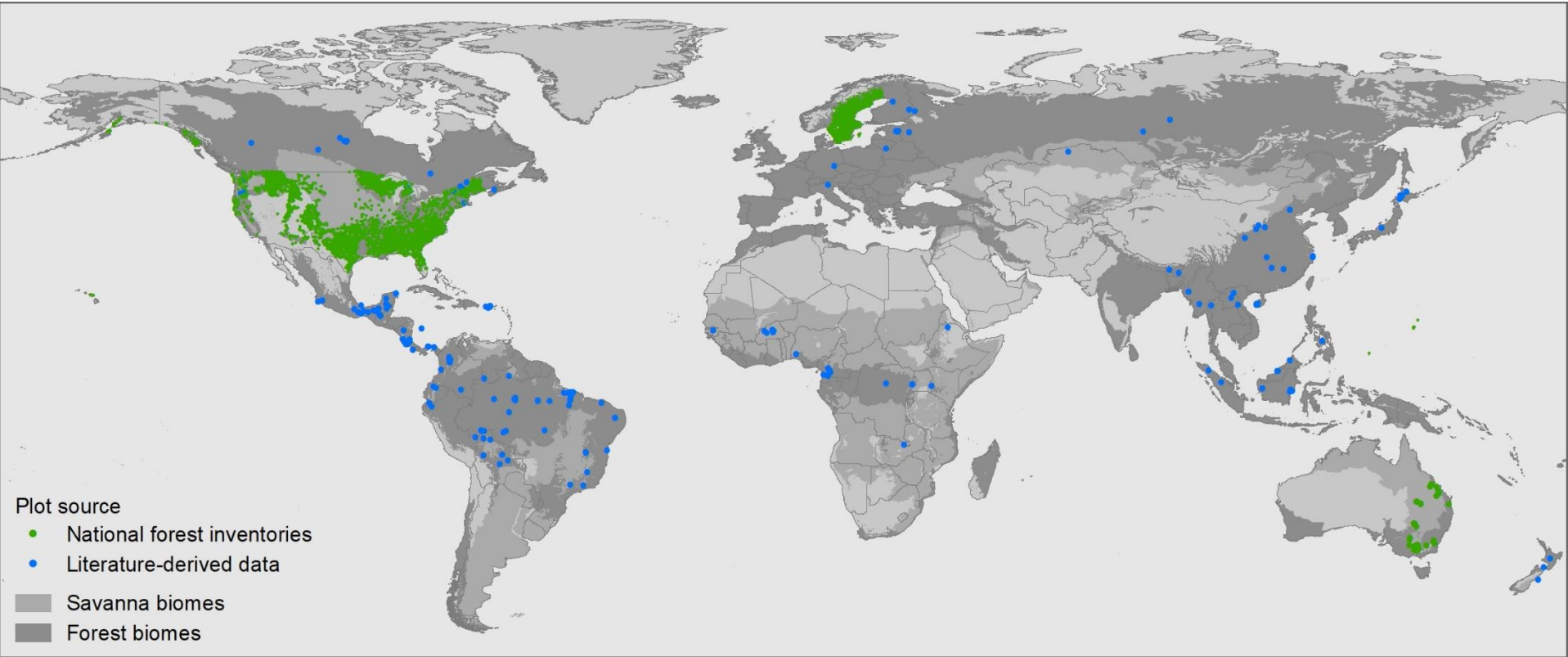


GLOBAL NATURAL FOREST REGROWTH

the recovery of forest cover on cleared lands through spontaneous regrowth after cessation of prior disturbance or land use



ABOVEGROUND FIELD DATA + 66 COVARIATES

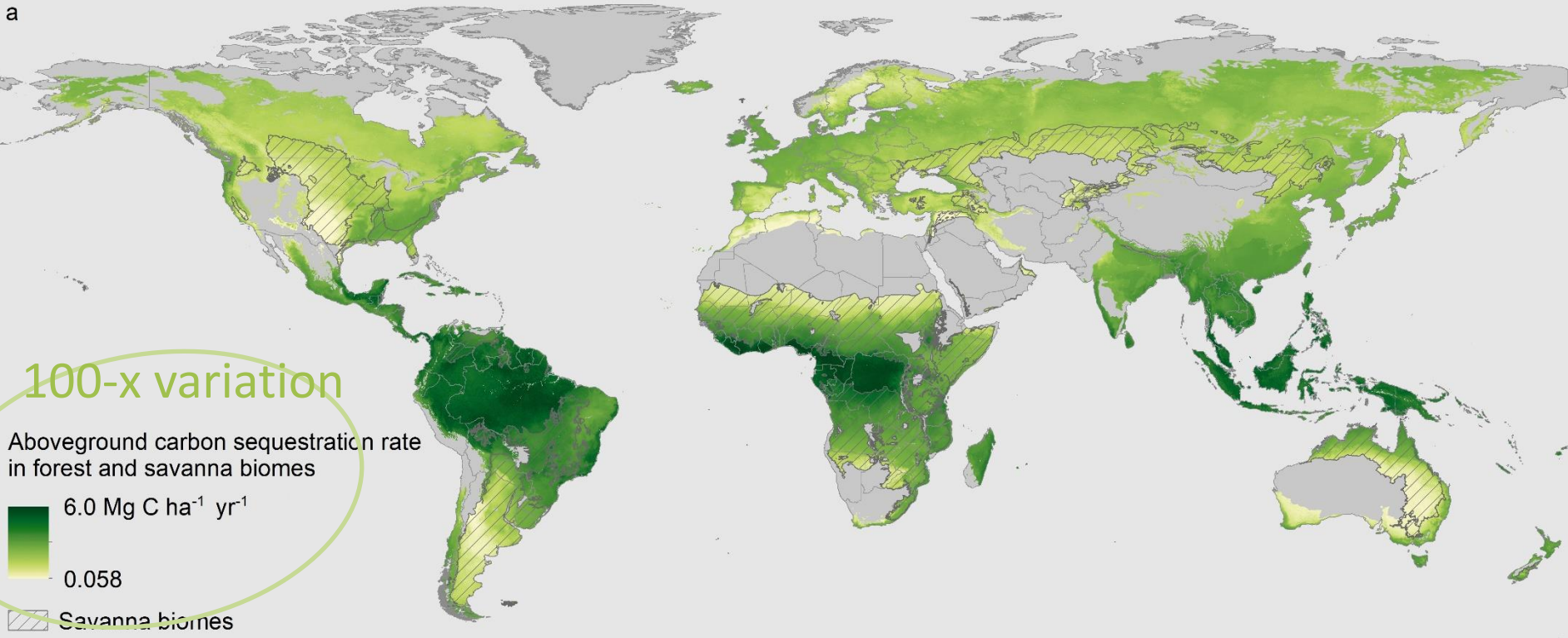


climate • soil nutrient/chemical/physical • radiation • topography • nitrogen deposition

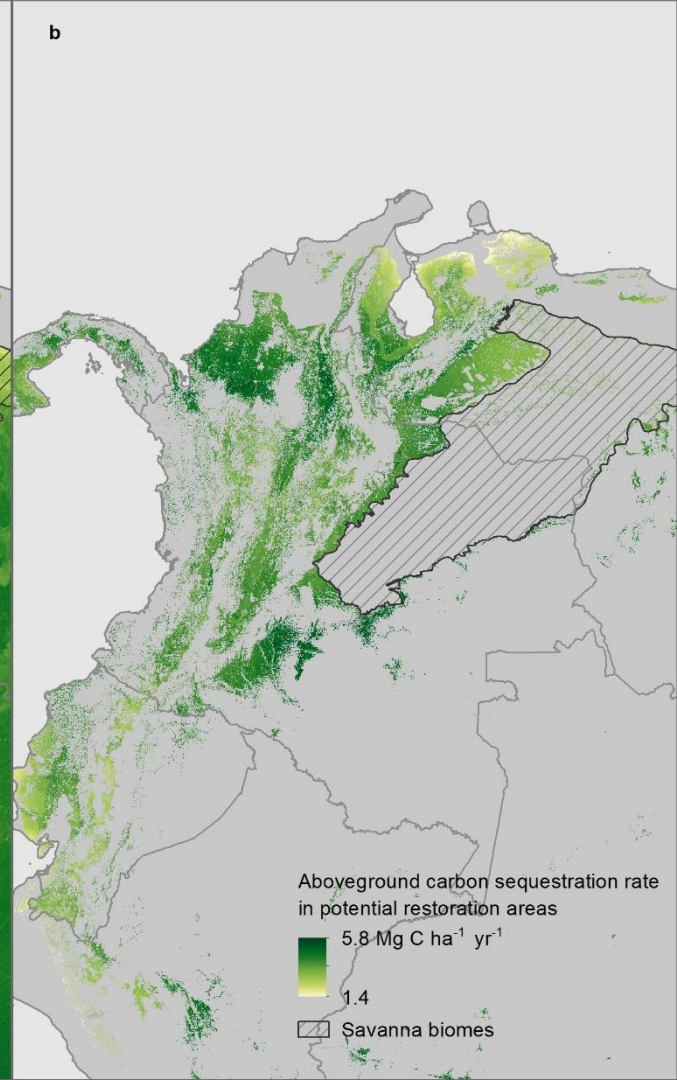
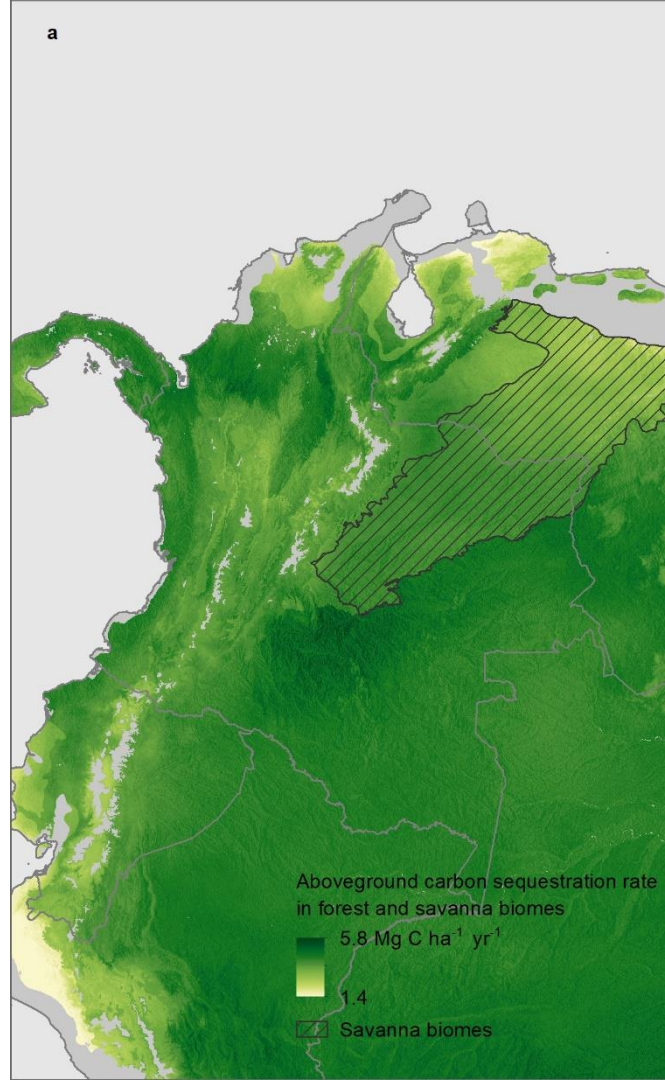
SPATIALLY-EXPLICIT CARBON ACCUMULATION POTENTIAL IN FORESTS < 30 YEARS

1-km scale

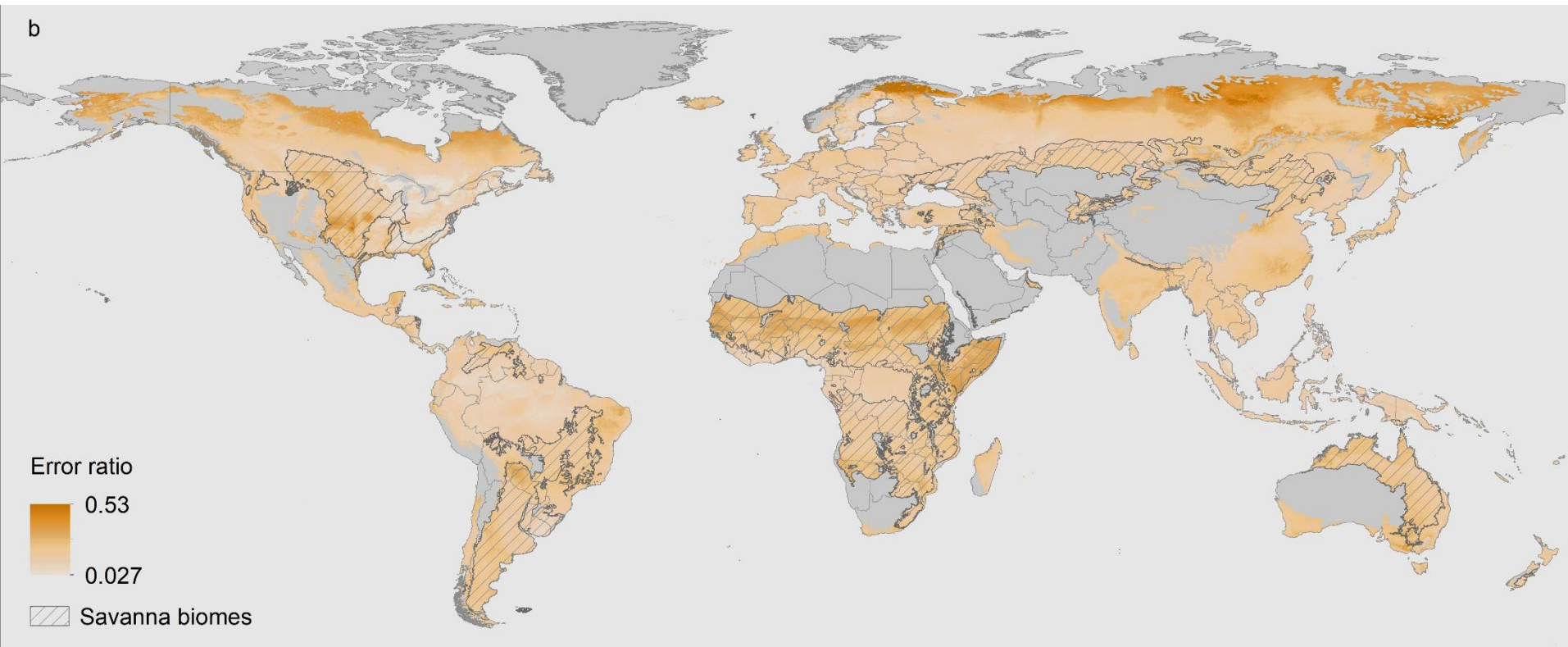
a



1.7x variation in country



AREAS OF UNCERTAINTY CAN BE **IMPROVED** THROUGH TIME



AREAS OF UNCERTAINTY CAN BE **IMPROVED** THROUGH TIME

FORC: A GLOBAL DATABASE OF FOREST CARBON STOCKS AND FLUXES

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How do we get robust estimates of reforestation potential?

RATES + **AREA** OF OPPORTUNITY

OUR GOAL = MOVE FROM BIG
NUMBERS TO STATE-LEVEL MENUS
TO INFORM LOCAL CONVERSATIONS
AND FACILITATE CUSTOM ANALYSES

NCS US STUDY

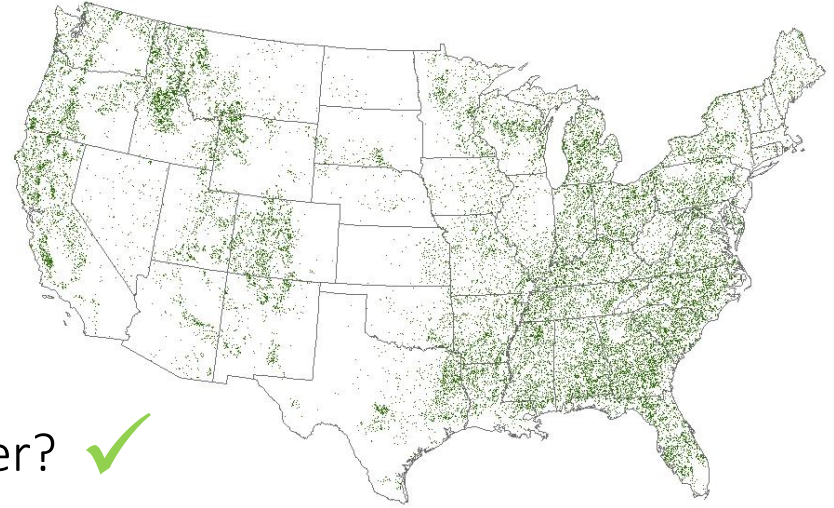
Ecologically-appropriate for > 25% tree cover? ✓

Not currently a forest? ✓

Not a city, road, or good agricultural land? ✓

= OPPORTUNITY

(307 Tg CO₂/yr, 63 Mha)



A MENU OF OPTIONS

Natural lands: (1) Non-stocked forests, (2) shrub cover, (3) protected areas

Post-fire restocking: (4) Areas that burned and may need assistance recovering

Agricultural lands: (5) Challenging croplands and (6) pasture lands (some with challenging soils)

Frequently flooded landscapes: (7) Areas that experience flood events an average of one in five years.

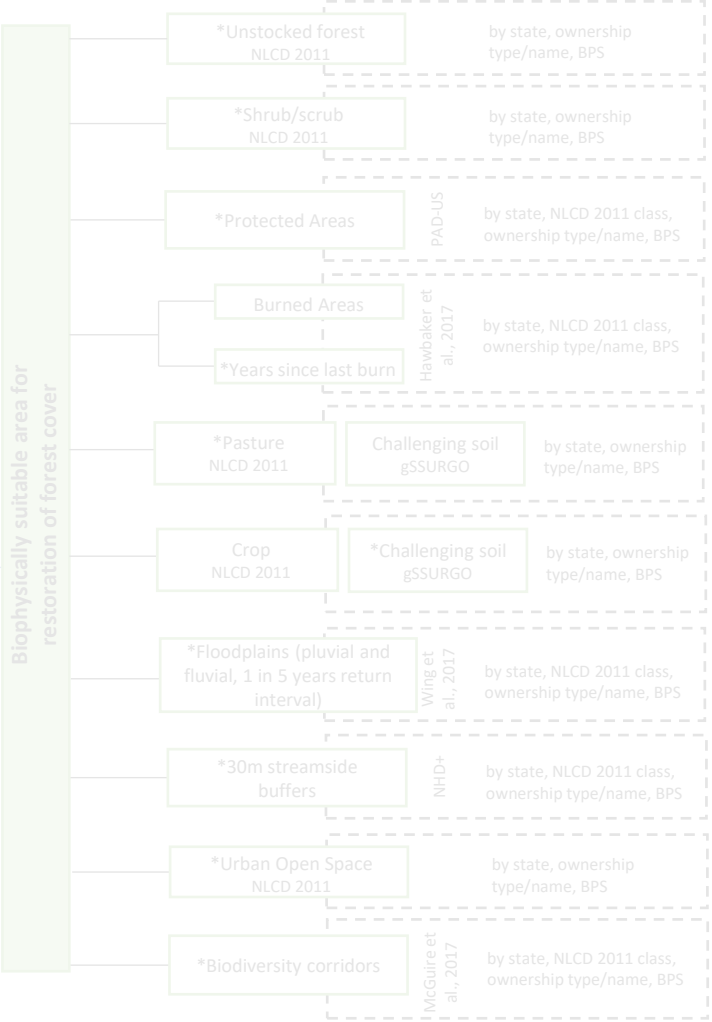
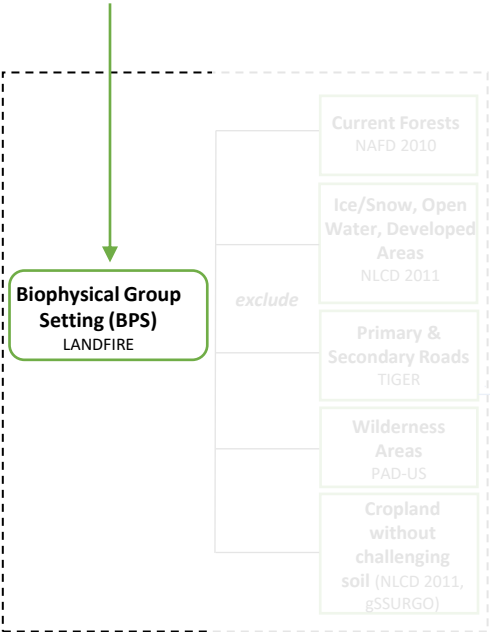
Riparian buffers: (8) Areas near streams to help shade and partially protect streams from the impact of adjacent land uses.

Urban open space: (9) Parks, roadsides with room for additional tree cover

Biodiversity corridors: (10) Easiest paths for species to follow while trying to keep pace with climate change.



Yes, >25% tree cover is appropriate

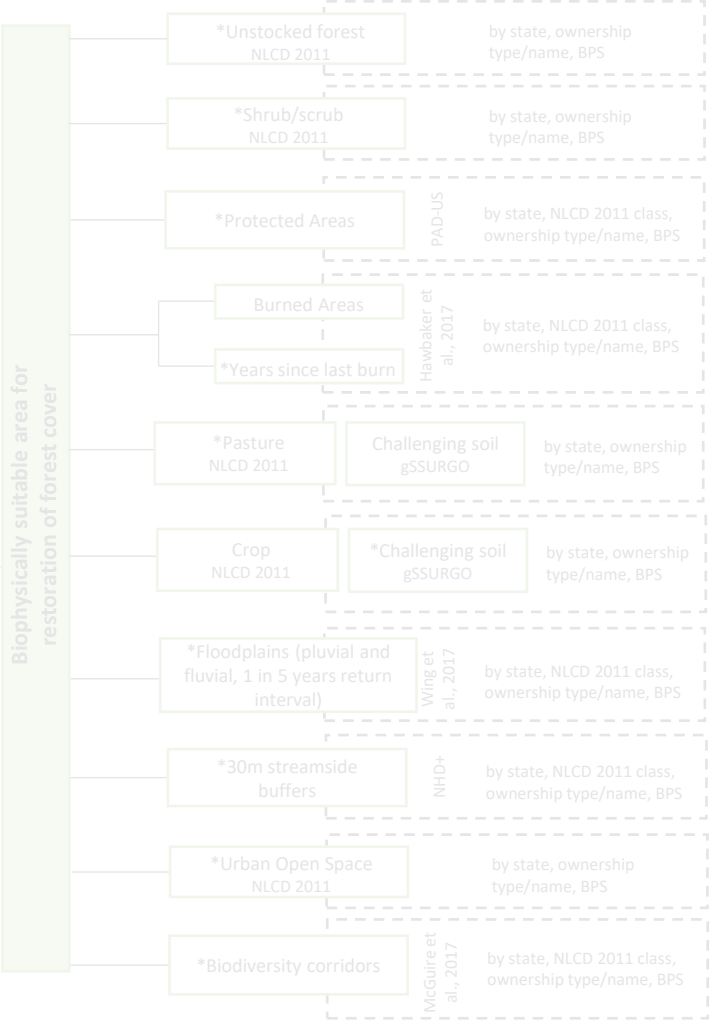
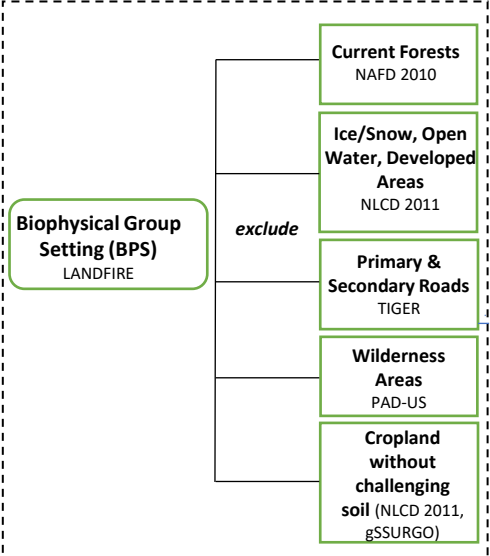


NATURAL LAND USE

LOWER VALUE

CO-BENEFITS

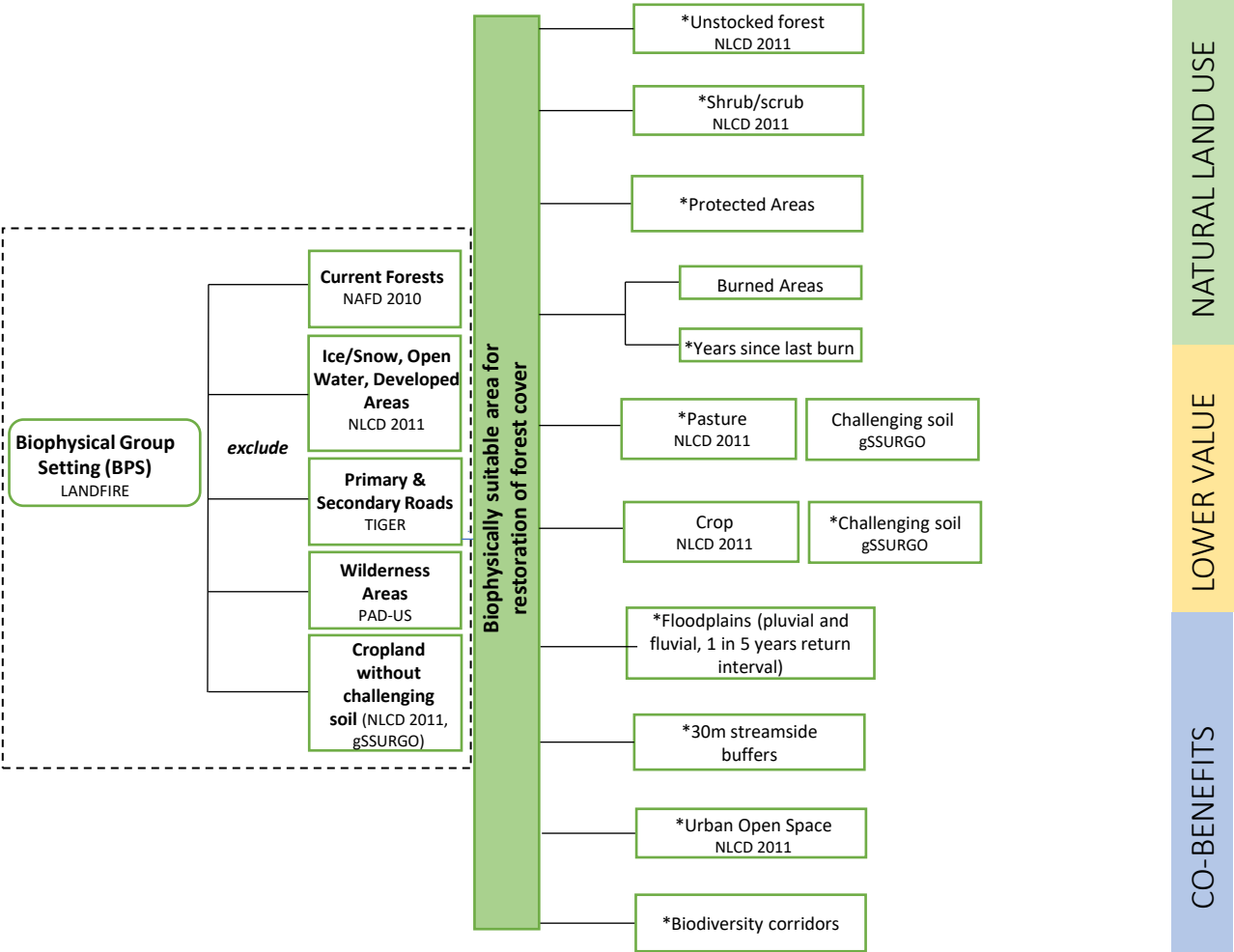
Remove locations that are not appropriate for additional trees



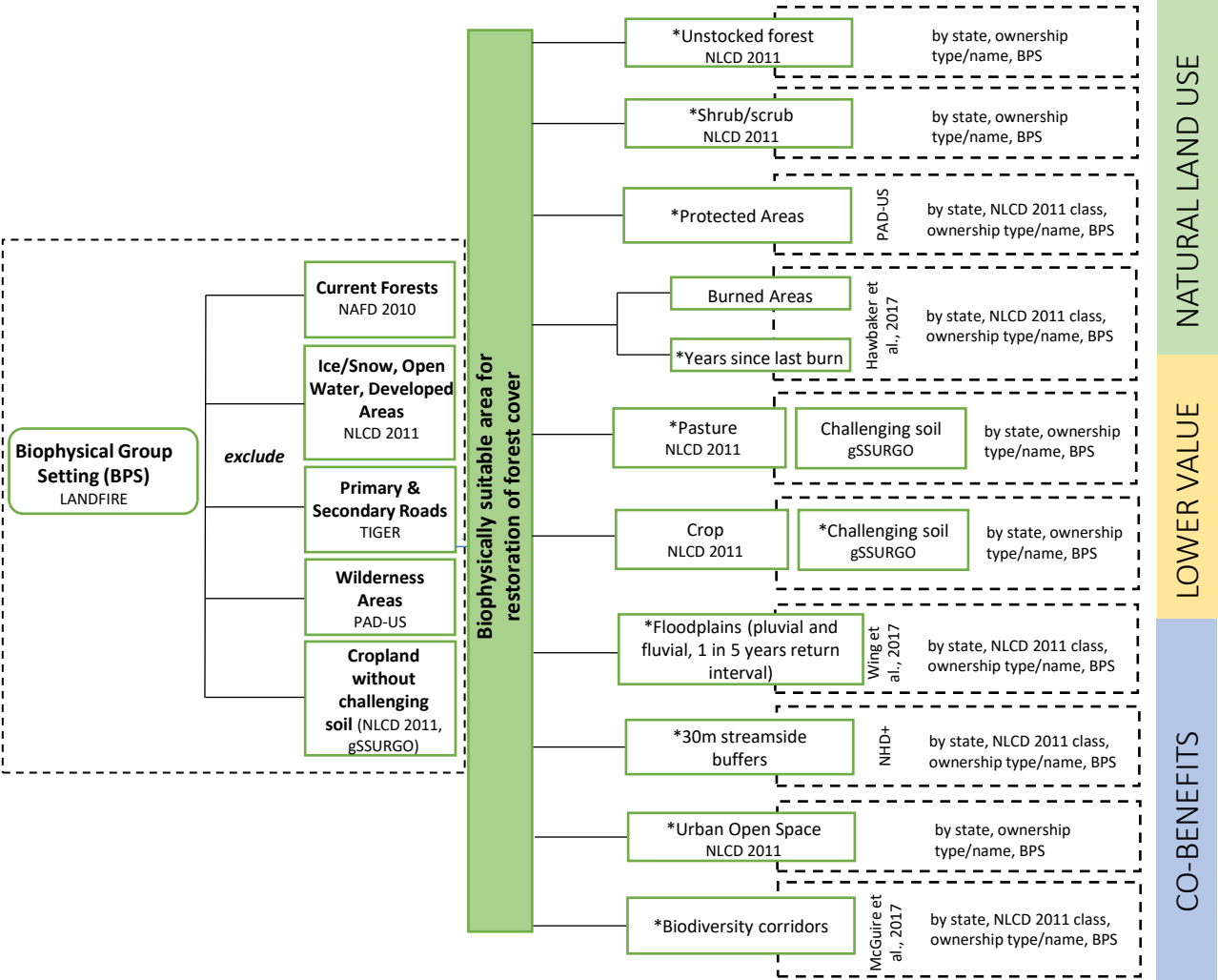
NATURAL LAND USE

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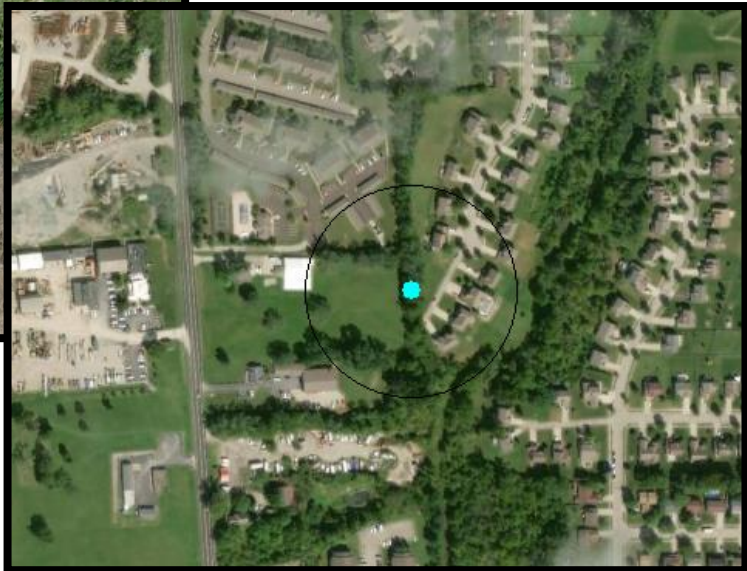
CO-BENEFITS



Partition opportunity into each of the “menu” options



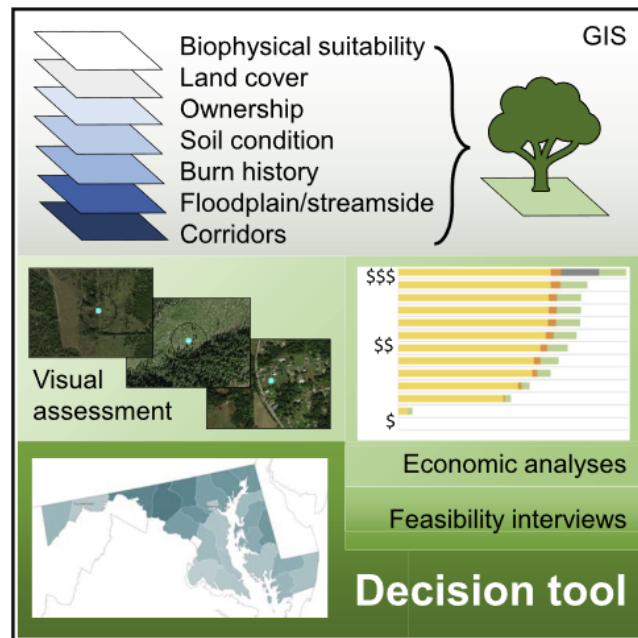
By state – who owns the land, how the land is used, and what the native forest type would be



One Earth

Lower cost and more feasible options to restore forest cover in the contiguous United States for climate mitigation

Graphical Abstract



Authors

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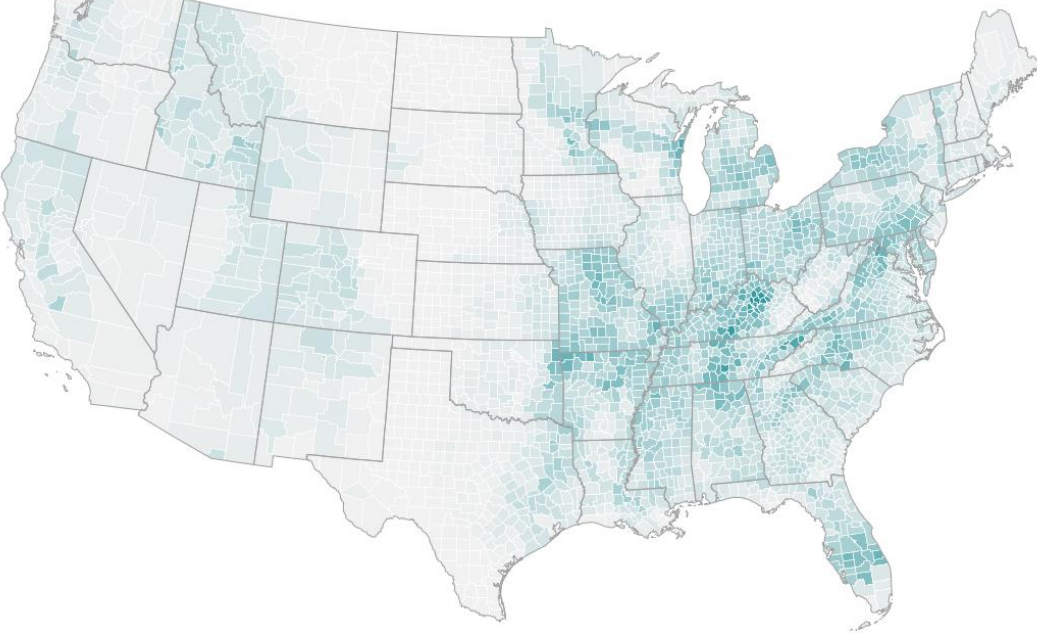
susan.cook-patton@tnc.org

In Brief

To inform decisions about where to deploy restoration of forest cover as a climate solution, we produced maps of opportunities across the contiguous United States. We found up to 51.6 Mha of opportunity for new forest, which we divided into 10 different classes to compare their carbon capture, costs, co-benefits, and feasibility. We found that the opportunity class with the strongest potential differed by state but that many opportunities fall in lower-cost and more feasible locations.

Highlights

- Restoring forest cover in the US can be a cost-effective climate solution



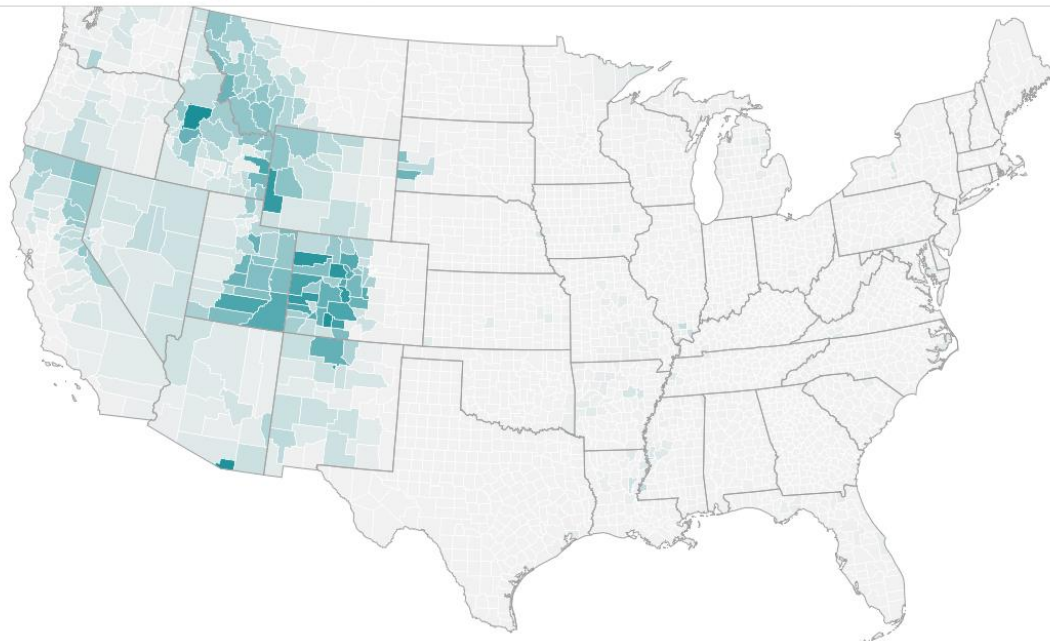
There are up to 133 million acres of opportunity in the United States to restore forest cover for climate mitigation.

Reforesting these areas with approximately 68 billion trees could capture 333 million tonnes of CO₂ per year, equivalent to removing 72 million cars from the road.

Low High

Total Opportunity  Acres 

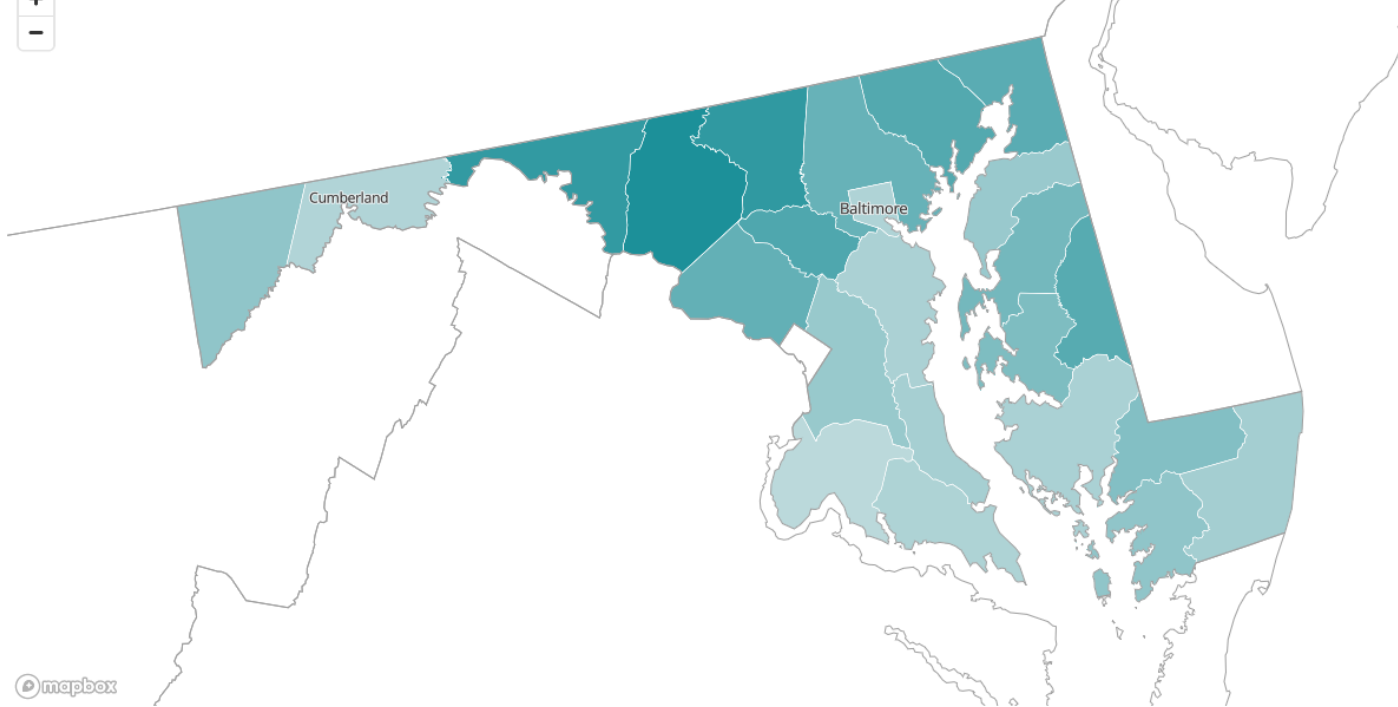
Scale by county area 



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State Summary

County Summaries

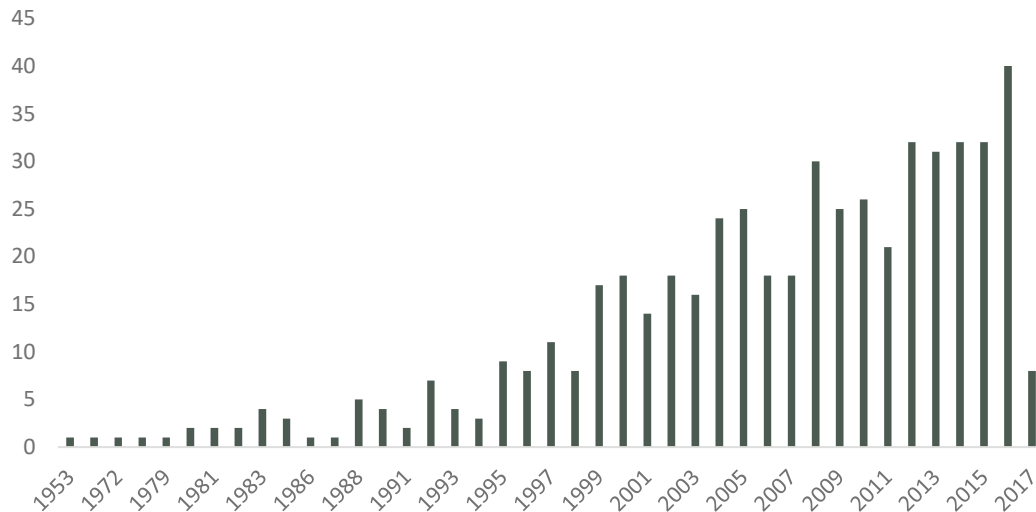
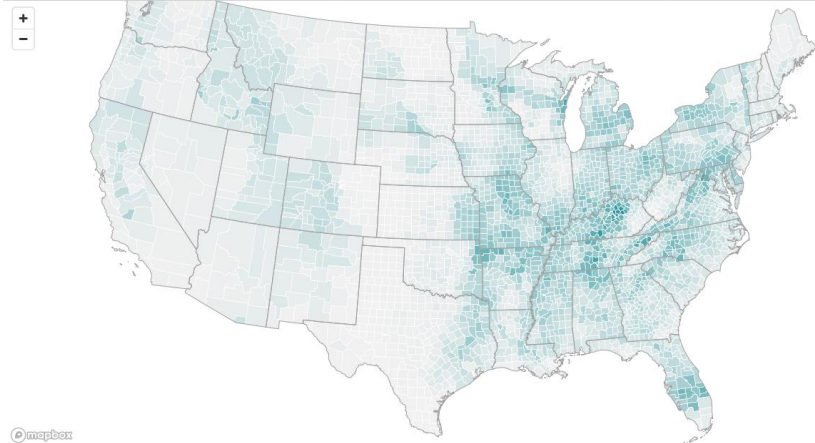
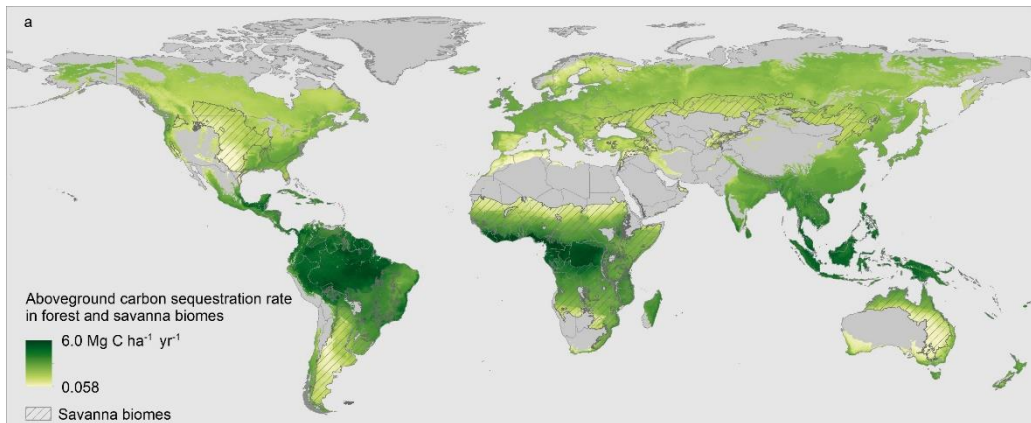
Advanced Query

Opportunities ⓘ

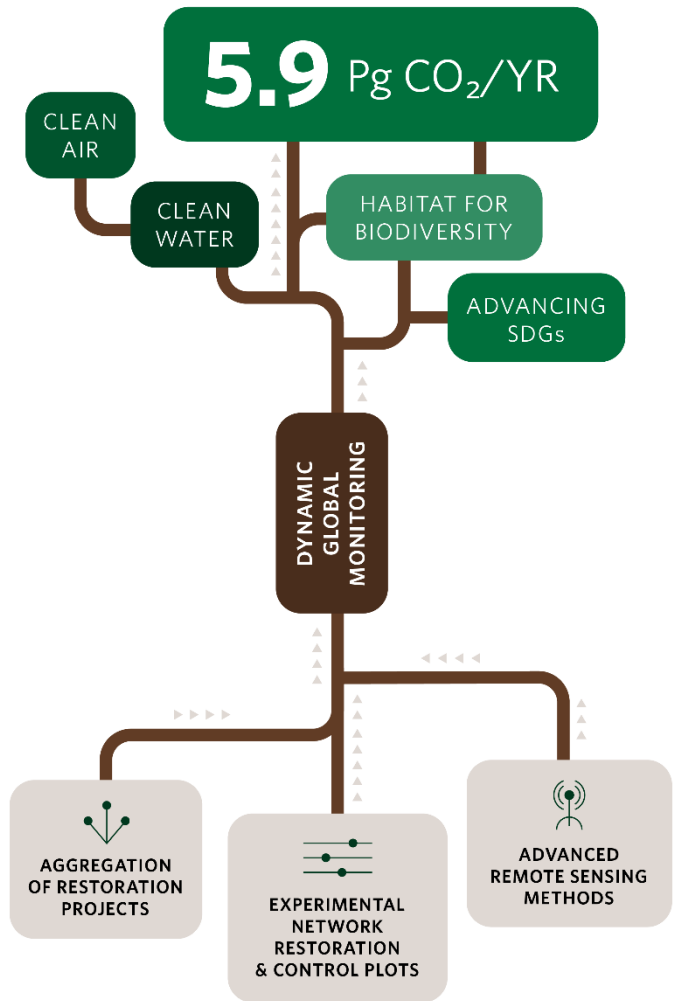
Opportunity	CO ₂ (t/yr)	Acres
Total opportunity	4,550,000	1,150,000
Corridors	176,000	45,200
Floodplains	393,000	103,000
Forest	147,000	36,400
Marginal Cropland	440,000	113,000

Ownership ⓘ

Ownership	CO ₂ (t/yr)	Acres
Total opportunity	4,550,000	1,150,000
Federal	24,800	6,520
State	50,400	12,800
Private	4,300,000	1,090,000
Other	175,000	44,300



2006, 2010, 2011



All three pillars are necessary

Each pillar enhances the others

A low-angle shot of a massive, ancient tree trunk covered in vibrant green moss. The tree's thick, gnarled branches spread out across the top of the frame. Sunlight filters through the dense canopy of bright green leaves, creating a soft, ethereal glow. In the background, a forest of tall, slender trees stretches into the distance. A semi-transparent white banner is overlaid across the middle of the image, containing text.

Questions?
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