



Forest Carbon

Dynamics and Causes of Loss in Amazonia

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AMAZONIAN NETWORK OF GEOREFERENCED
SOCIO-ENVIRONMENTAL INFORMATION

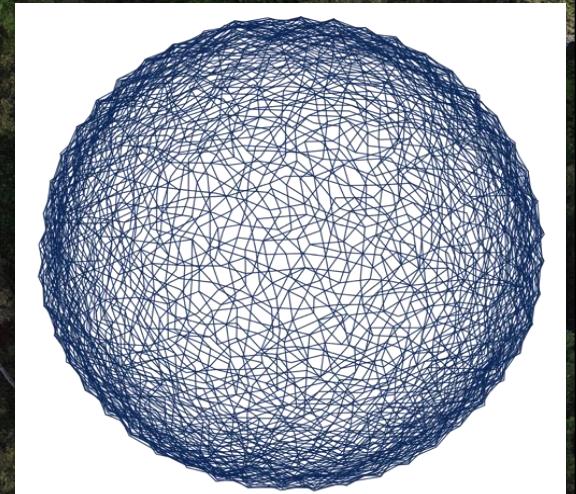


COORDINADORA DE LAS ORGANIZACIONES
INDÍGENAS DE LA CUENCA AMAZÓNICA



Woodwell
Climate
Research
Center

ORIGIN Story



COP15
COPENHAGEN
UN CLIMATE CHANGE CONFERENCE 2009

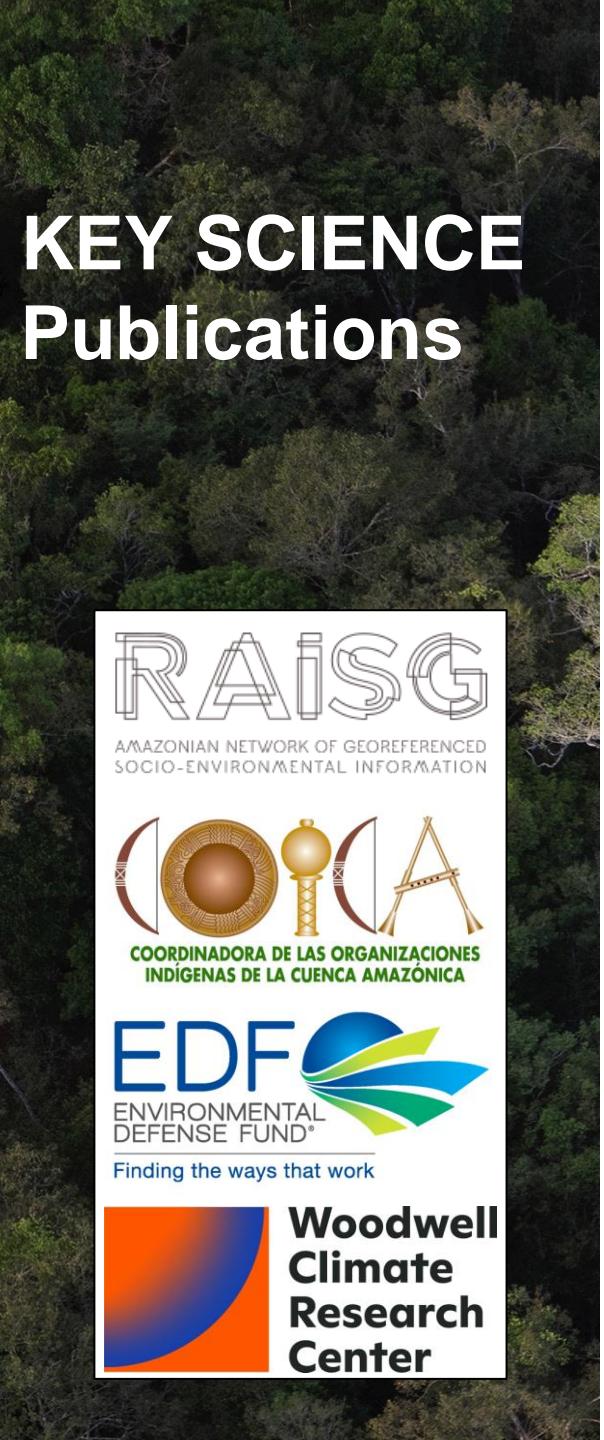


“How much carbon is stored in the forests of our territories and other protected lands where our people live?”

KEY SCIENCE Questions



- **How much carbon is stored** in the forests of Indigenous Territories and Protected Areas occupied by Indigenous Peoples and Local Communities (IPLCs)?
- **What role have IPLCs played** in maintaining forest carbon stocks through time?
- **What are the primary causes of carbon loss** inside protected lands versus outside?



KEY SCIENCE Publications



Forest carbon in Amazonia: the unrecognized contribution of indigenous territories and protected natural areas

A Policy Focus submission to *Carbon Management* (2015) 5(5–6), 479–485



Wayne Walker^{1*}, Alessandro Baccini¹, Stephan Schwartzman², Sandra Ríos^{3,7},
María A. Oliveira-Miranda^{4,7}, Cicero Augusto^{5,7}, Milton Romero Ruiz^{6,7}, Carla Soria Arrasco^{3,7},
Beto Ricardo^{5,8}, Richard Smith^{3,7}, Chris Meyer², Juan Carlos Jintiach⁹ & Edwin Vasquez Campos¹⁰

Carbon sequestration is a well-known process in the Amazon Basin, however, until recently, the impact of indigenous territories (ITs) and protected natural areas (PNAs) on forest carbon dynamics was not fully understood. Here, as part of a novel network of NGOs and indigenous organizations (NGO) network, we show that the Amazon Basin's 3000 ITs and PNAs stores more than 100 Gt of carbon, equivalent to Indonesia combined, and, despite being under threat from oil and gas extraction, mining, and deforestation, a conservative risk assessment indicates that the majority of this carbon at risk, encompassing 10% of the Amazon Basin, is located in Brazil and Peru combined. Internationally, the Amazon Basin's ITs and PNAs are therefore critical to ensuring the long-term integrity and climate stability of the Amazon.

The role of forest conversion, degradation, and disturbance in the carbon dynamics of Amazon indigenous territories and protected areas

Wayne S. Walker^{a,1} , Seth R. Gorelik^a, Alessandro Baccini^a, Jose Luis Aragon-Osejo^{b,c}, Carmen Josse^{b,c}, Chris Meyer^d, Marcia N. Macedo^{a,e} , Cicero Augusto^{c,f}, Sandra Rios^{c,g}, Tuntiak Katan^h, Alana Almeida de Souza^{c,f} , Saul Cuellar^{c,i}, Andres Llanos^{c,j}, Irene Zager^{c,k}, Gregorio Díaz Mirabal^h, Kylen K. Solvik^a, Mary K. Farina^a, Paulo Moutinho^e, and Stephan Schwartzman^d

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Edited by Carlos A. Nobre, University of São Paulo, São José dos Campos, Brazil, and approved December 23, 2019 (received for review August 5, 2019)

Maintaining the abundance of carbon stored aboveground in Amazon forests is central to any comprehensive climate stabilization strategy. Growing evidence points to indigenous peoples and local communities (IPLCs) as buffers against large-scale carbon emissions across a nine-nation network of indigenous territories (ITs) and protected natural areas (PNAs). Previous studies have demonstrated a link between indigenous land management and avoided deforestation, yet few have accounted for forest degra-

effective, scalable, and have track records of success. In regions like the Amazon Basin, the contributions of indigenous peoples and local communities (IPLCs) to the conservation of tropical forests provide such a model. For millennia, Amazon IPLCs have served as the de facto guardians of what is now the largest remaining tract of tropical rainforest on the planet. Today, an estimated 1.7 million people belonging to some 375 indigenous groups live within ~3,344 indigenous territories (ITs) and ~522 protected natural areas

The background of the image is a dense forest of green trees, with a large, leafless tree standing prominently in the center. The text is overlaid on this natural background.

What have we learned?

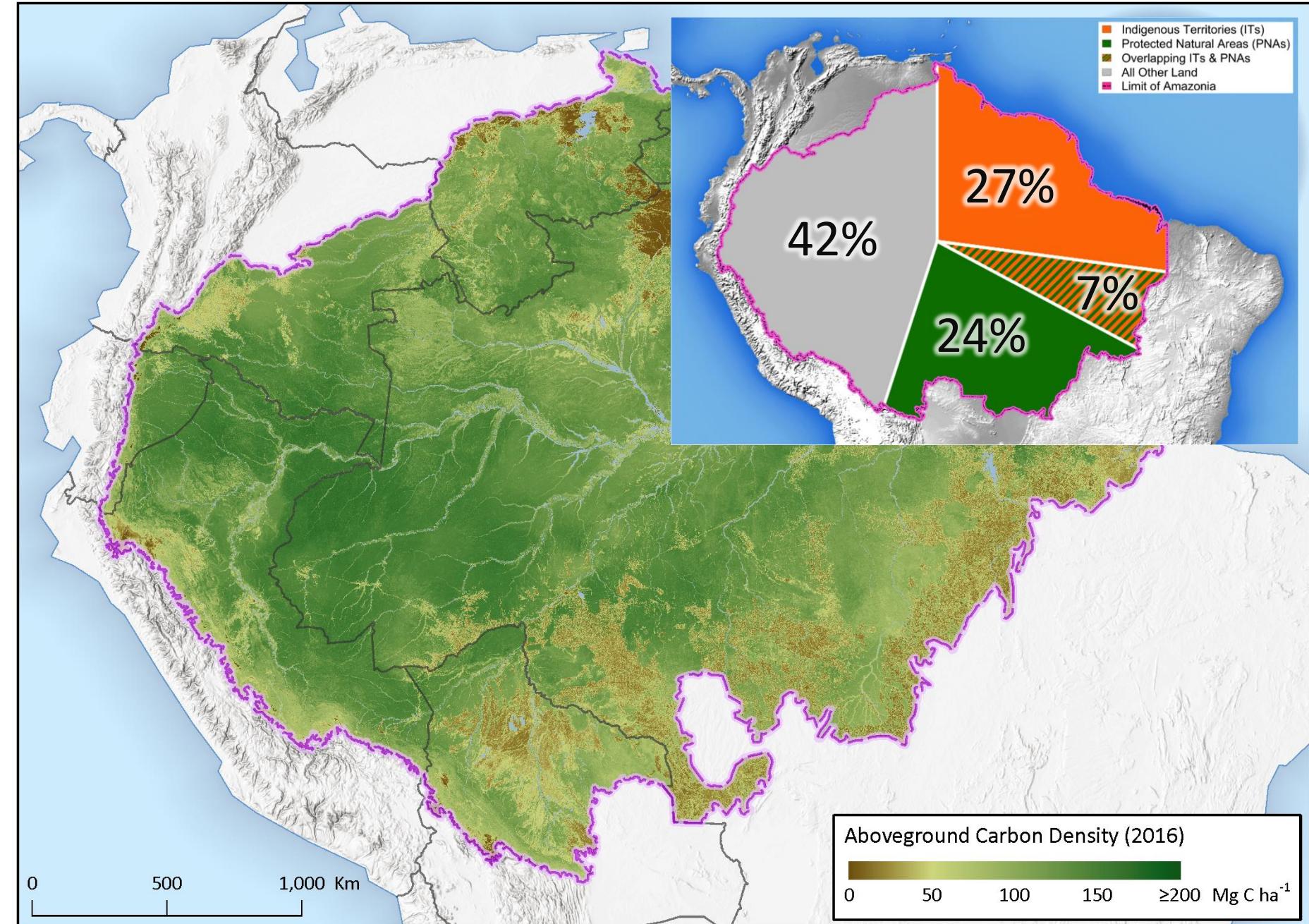
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Carbon Storage

75
Billion Tons

58% stored in
protected lands
(ca. 2016).

34% in indigenous
territories alone.



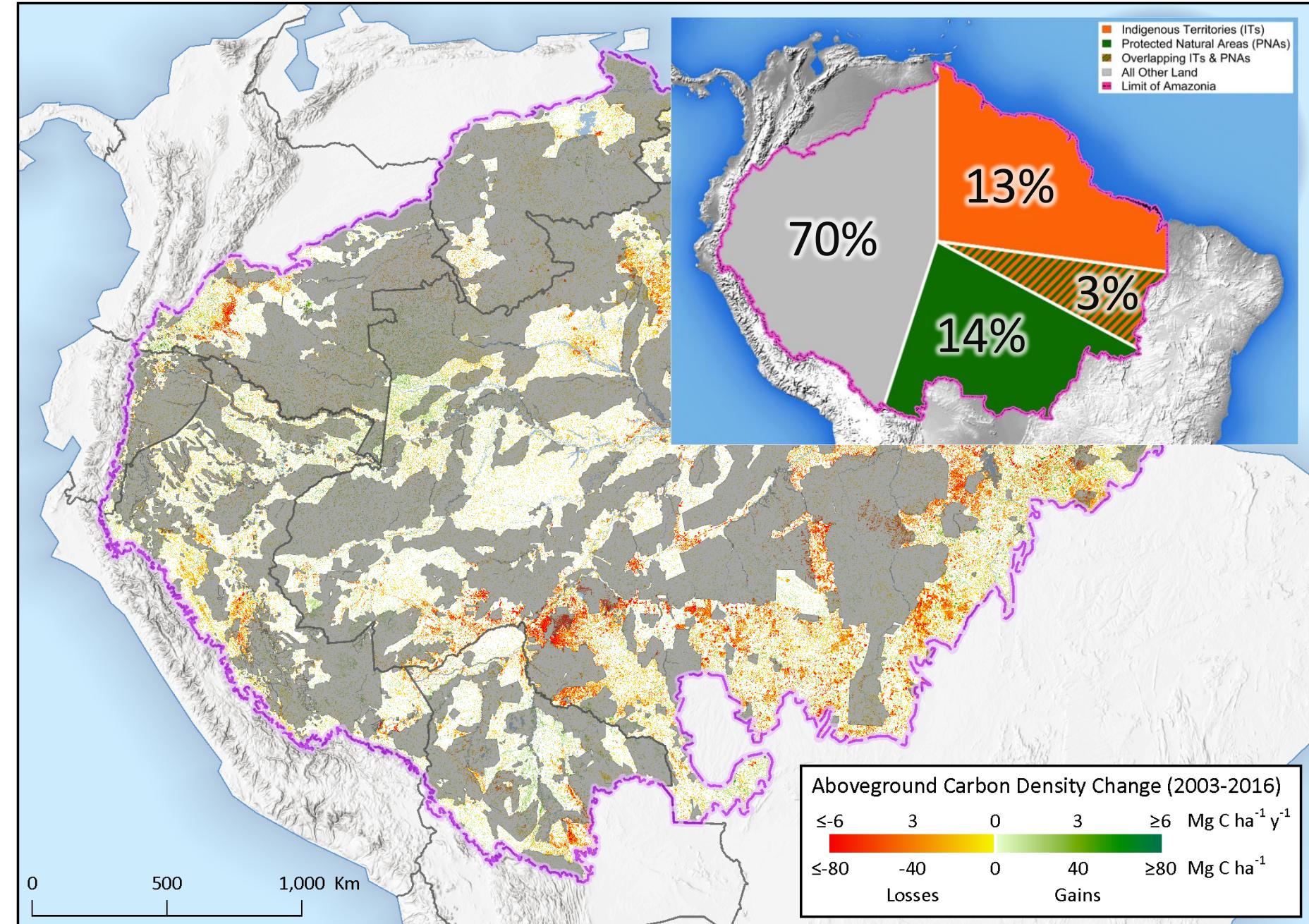
AMAZONIA

Loss in Storage

3.1
Billion Tons

30% from
protected lands
(ca. 2016).

16% from
indigenous
territories.



The background of the image is a dense forest of green trees, viewed from an elevated angle looking down at the canopy.

What if we also consider gains?

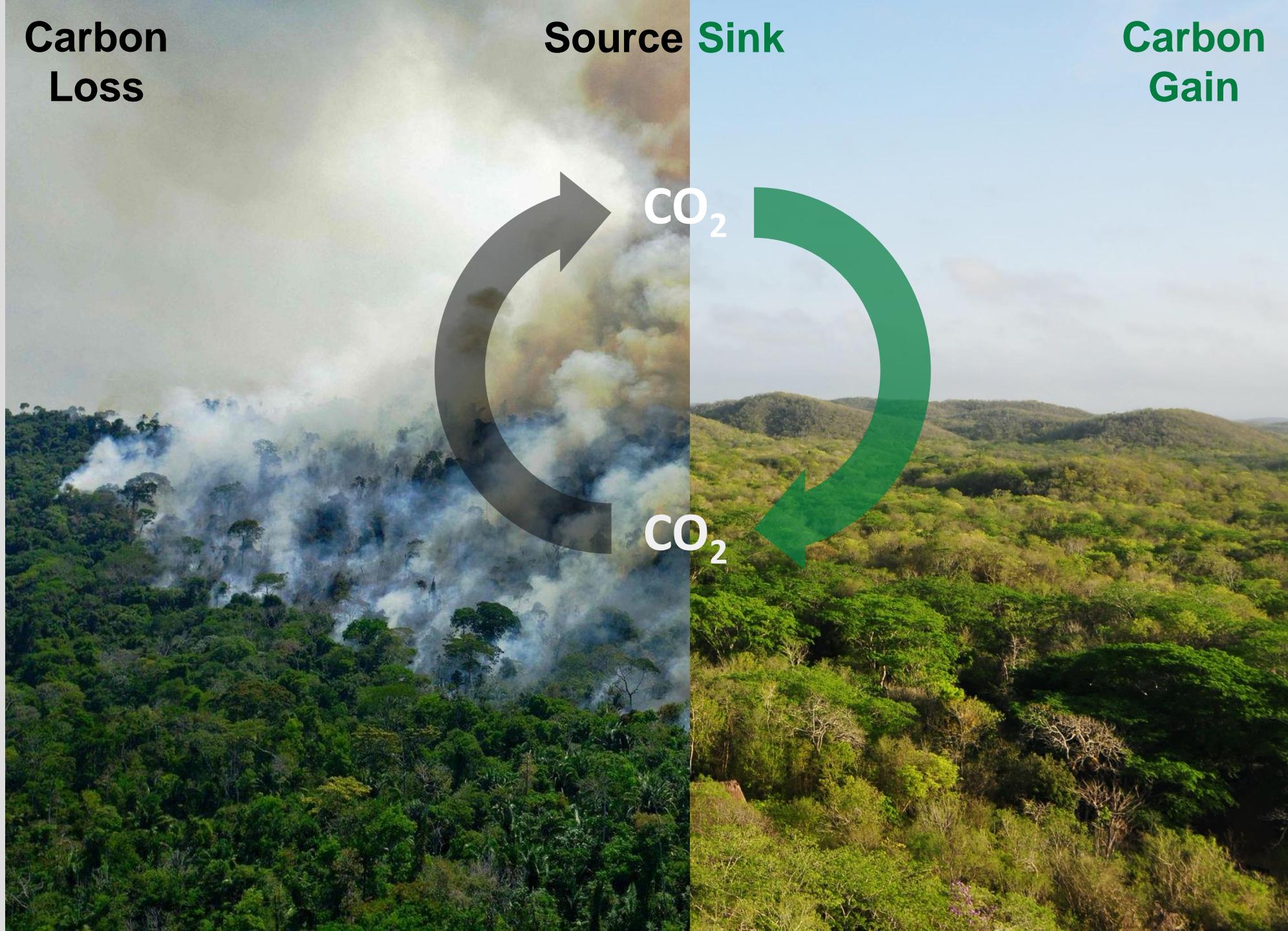
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Net Change

Carbon
Loss

Source Sink

Carbon
Gain

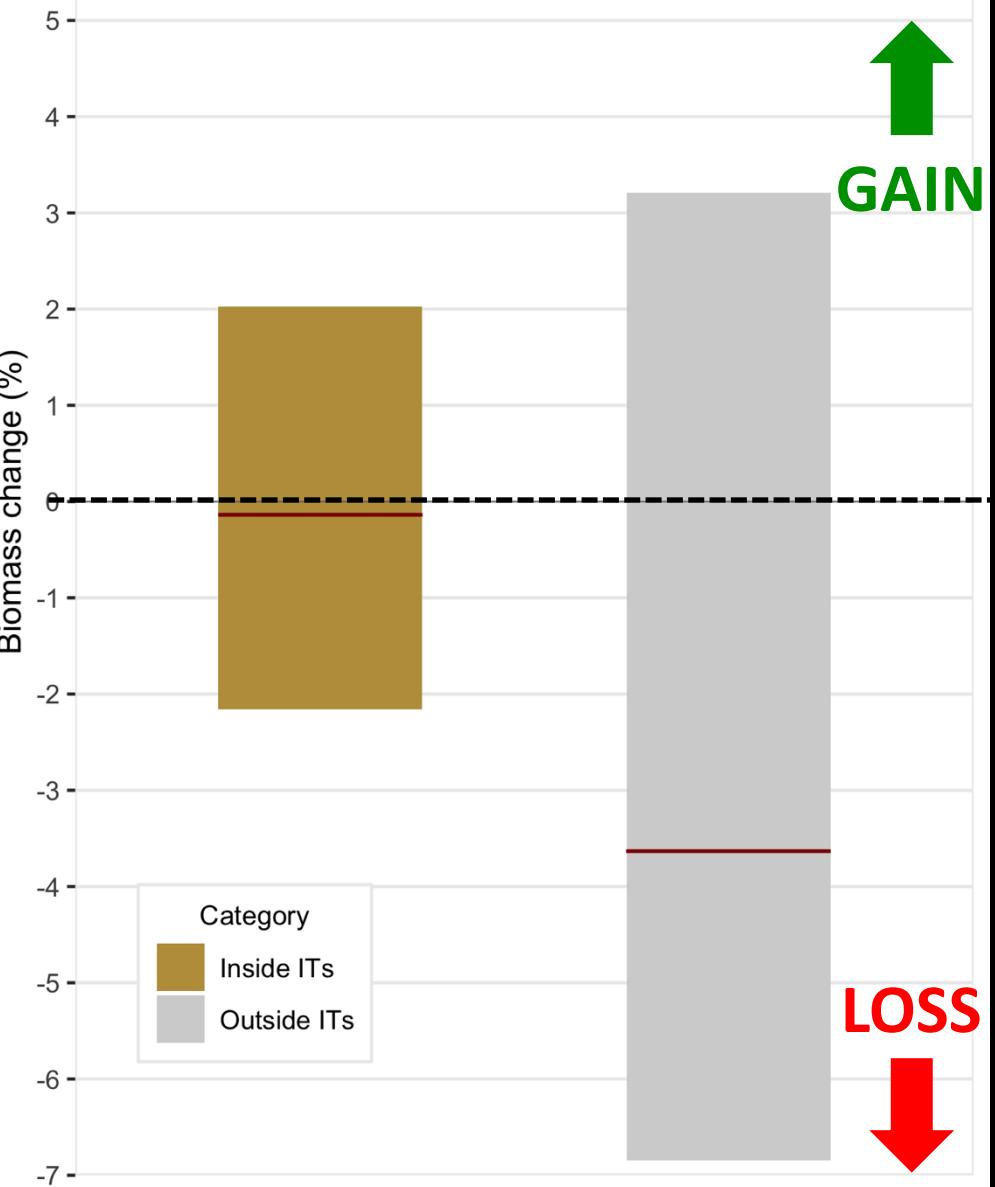




AMAZONIA
Net Change

1.2
Billion Tons

Change in Amazon Carbon Storage Inside vs. outside Indigenous Territories



ITs and PNAs were responsible for just **10%** of the total net change.

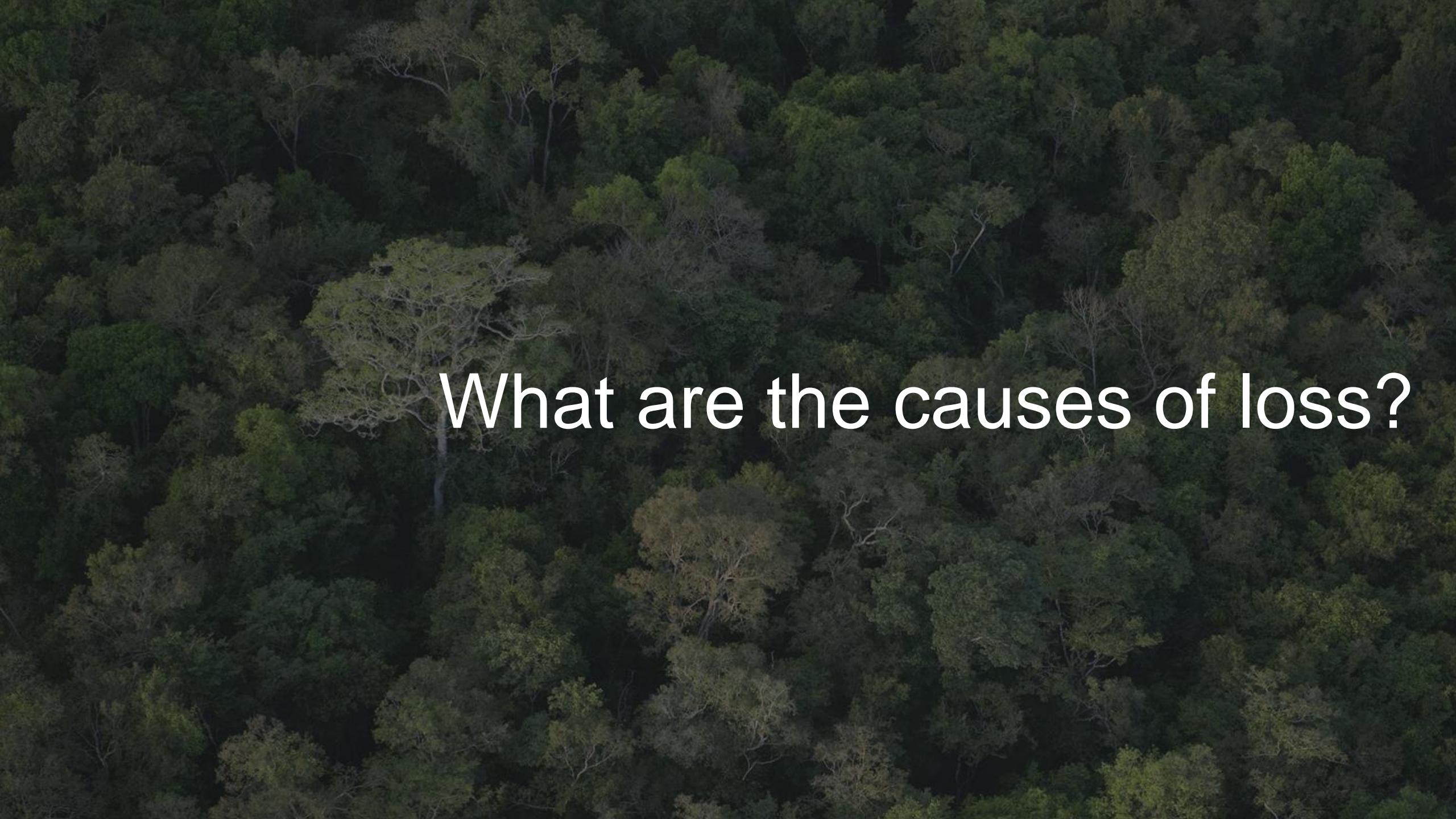
12/2016

Protected lands lost
a billion tons of carbon
from 2003-2016

537 km

Image Landsat / Copernicus

Google Earth

The background of the image is a dense forest of green trees, viewed from an elevated angle. The trees are tightly packed, creating a dark, textured pattern. A few bare branches are visible, suggesting a mix of tree species or perhaps a seasonal change.

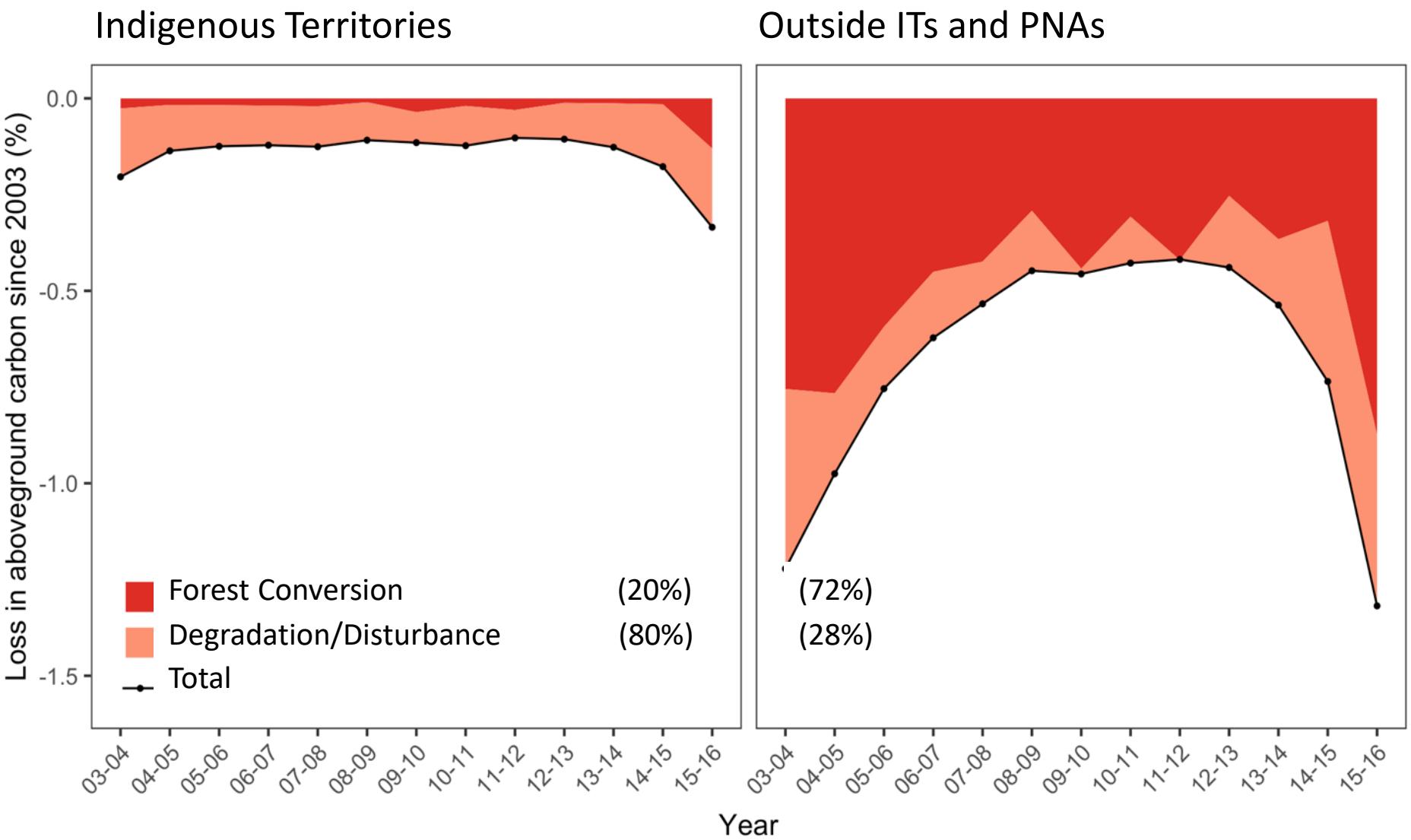
What are the causes of loss?

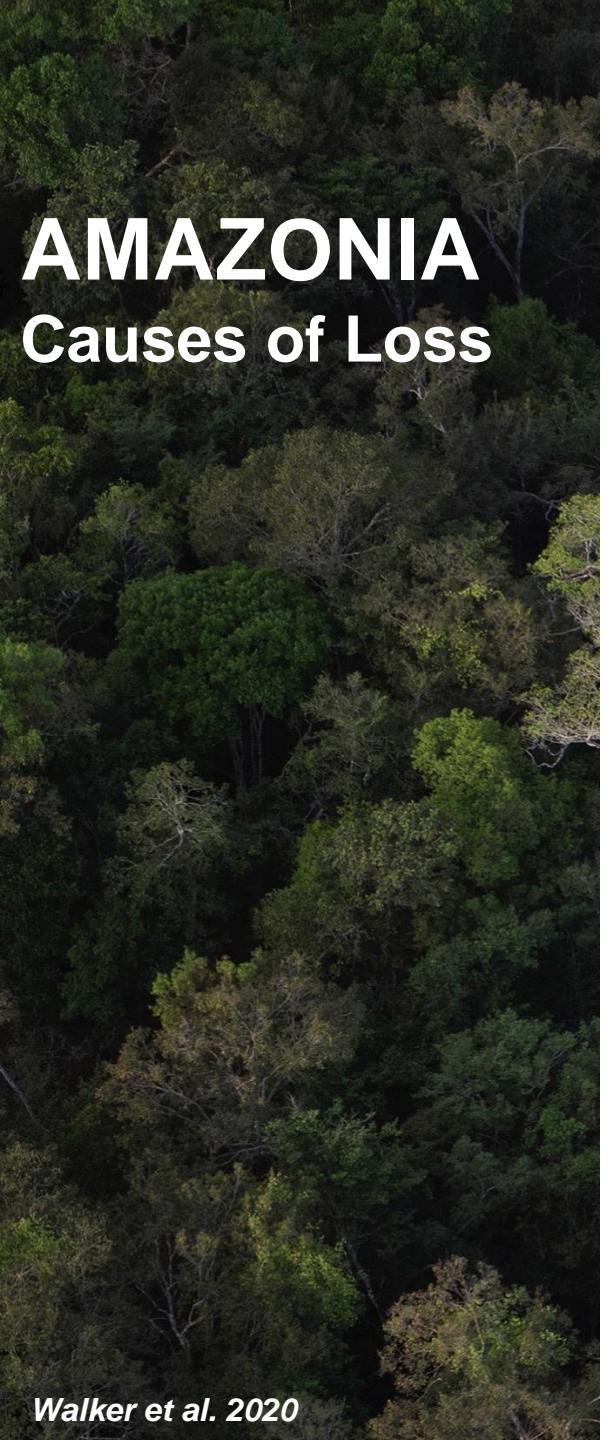
AMAZONIA

Causes of Loss

Degradation and disturbance are the primary causes of loss in protected lands.

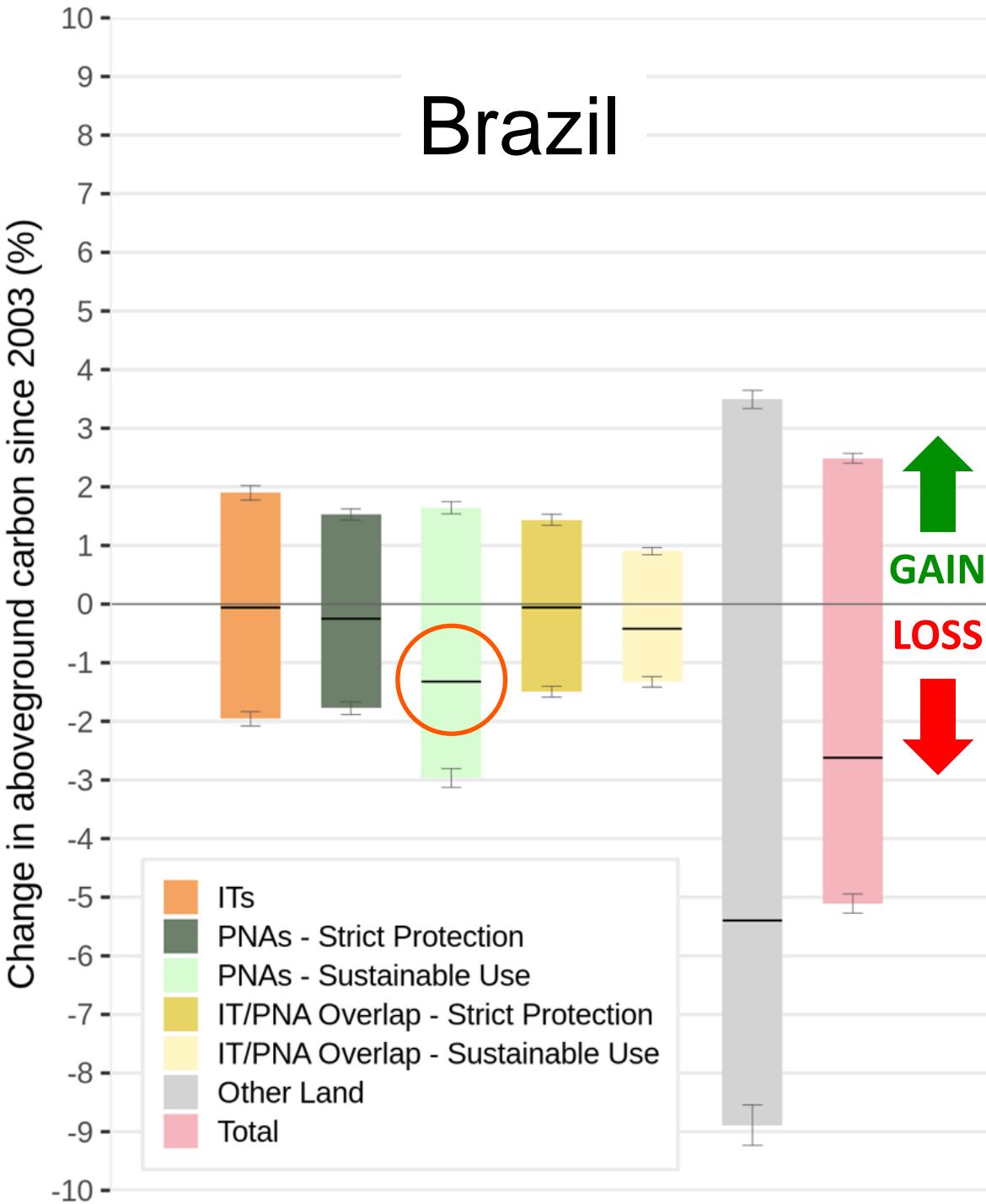
Brazil





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Causes of Loss

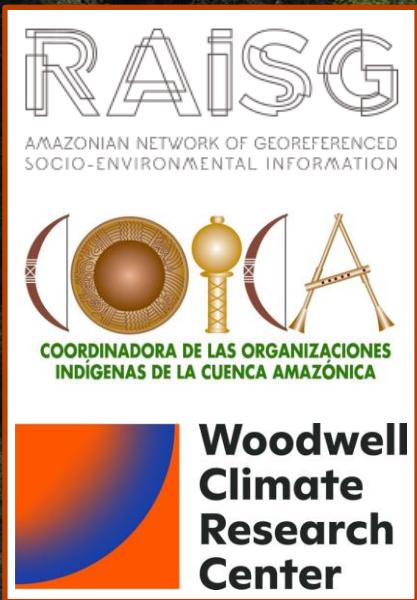


Protected lands are not all the same in terms of management regimes and carbon dynamics.

The background of the image is a dense forest of green trees, viewed from an elevated angle looking down at the canopy. The trees are mostly green, with some bare branches visible. The lighting suggests it might be late afternoon or early morning.

What's next for our collaboration?

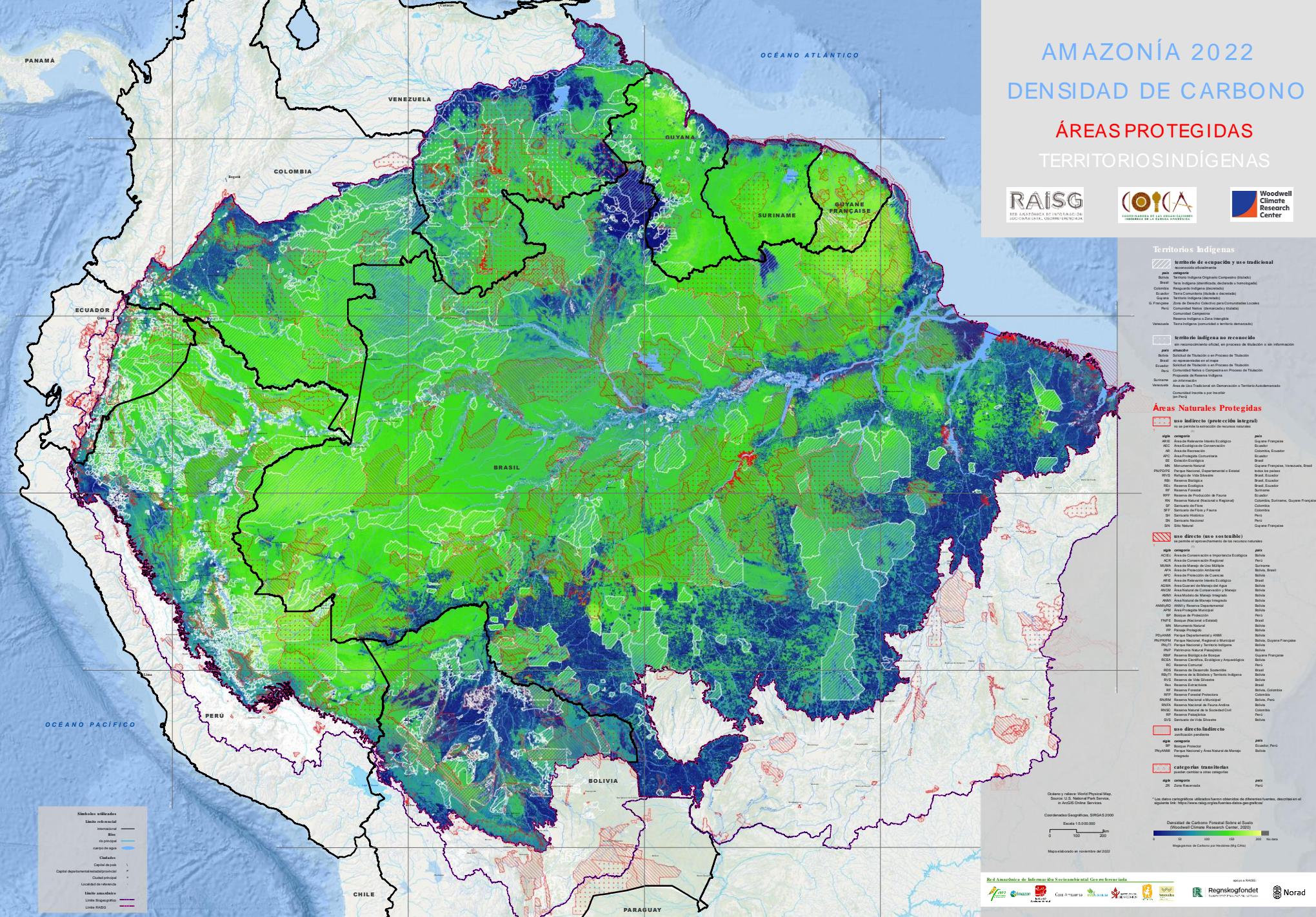
OBJECTIVES 2021-2025



- **Improve detection, tracking, and prediction** of forest carbon losses in Amazon Indigenous Territories (ITs) and Protected Areas (PAs).
- **Identify locally specific strategies** to combat forest carbon emissions in several priority action landscapes.
- **Increase public awareness and inform public opinion** about the role ITs and PAs play in maintaining forest carbon stocks.
- **Improve public policies and legal protections** for ITs and PAs across Amazonia.

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Carbon Storage in ITs and PAs





Gracias!



the David &
Lucile Packard
FOUNDATION



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