

Burning Question:

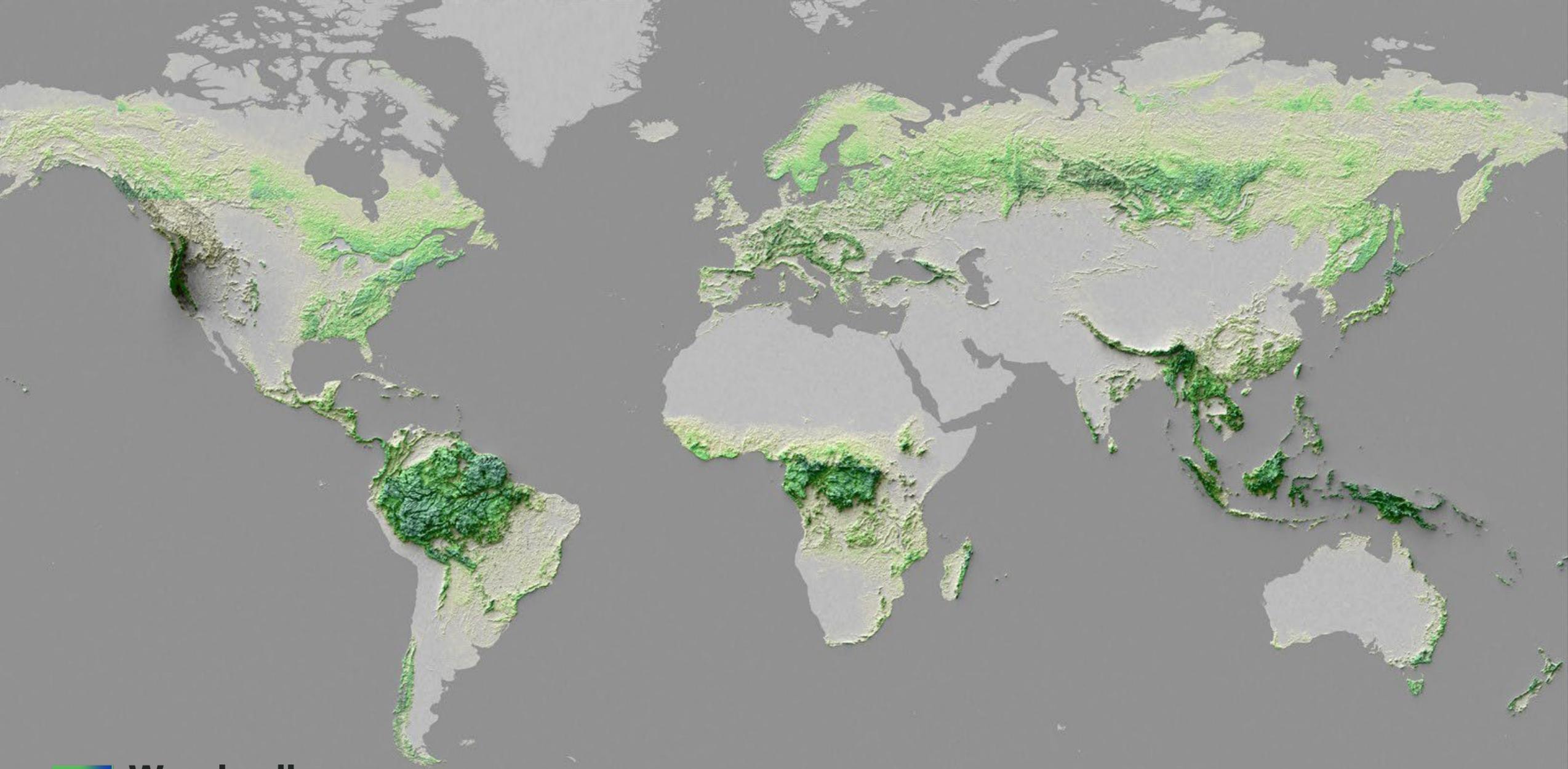
What is the future tropical forests?



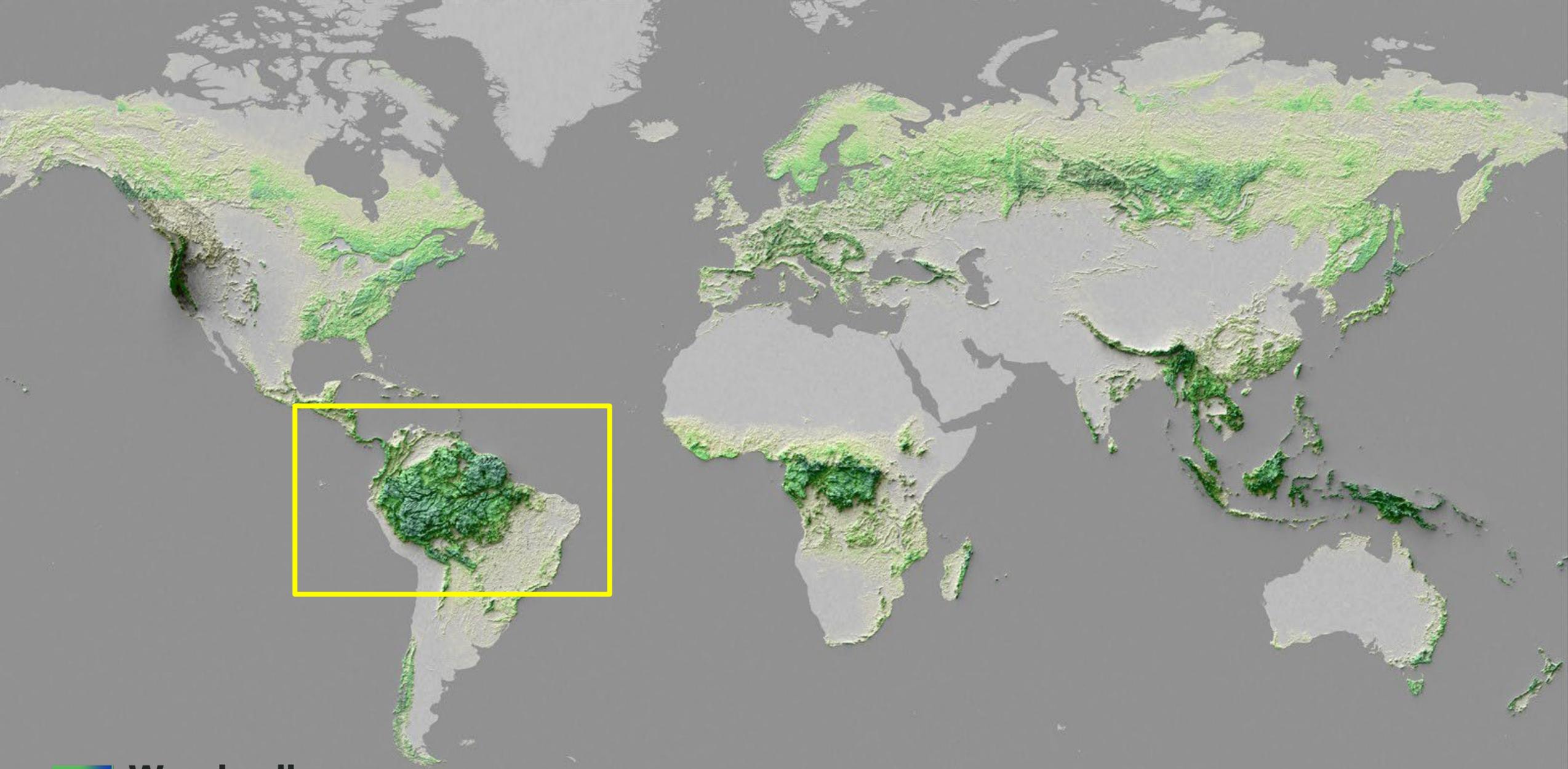
Woodwell
Climate
Research
Center



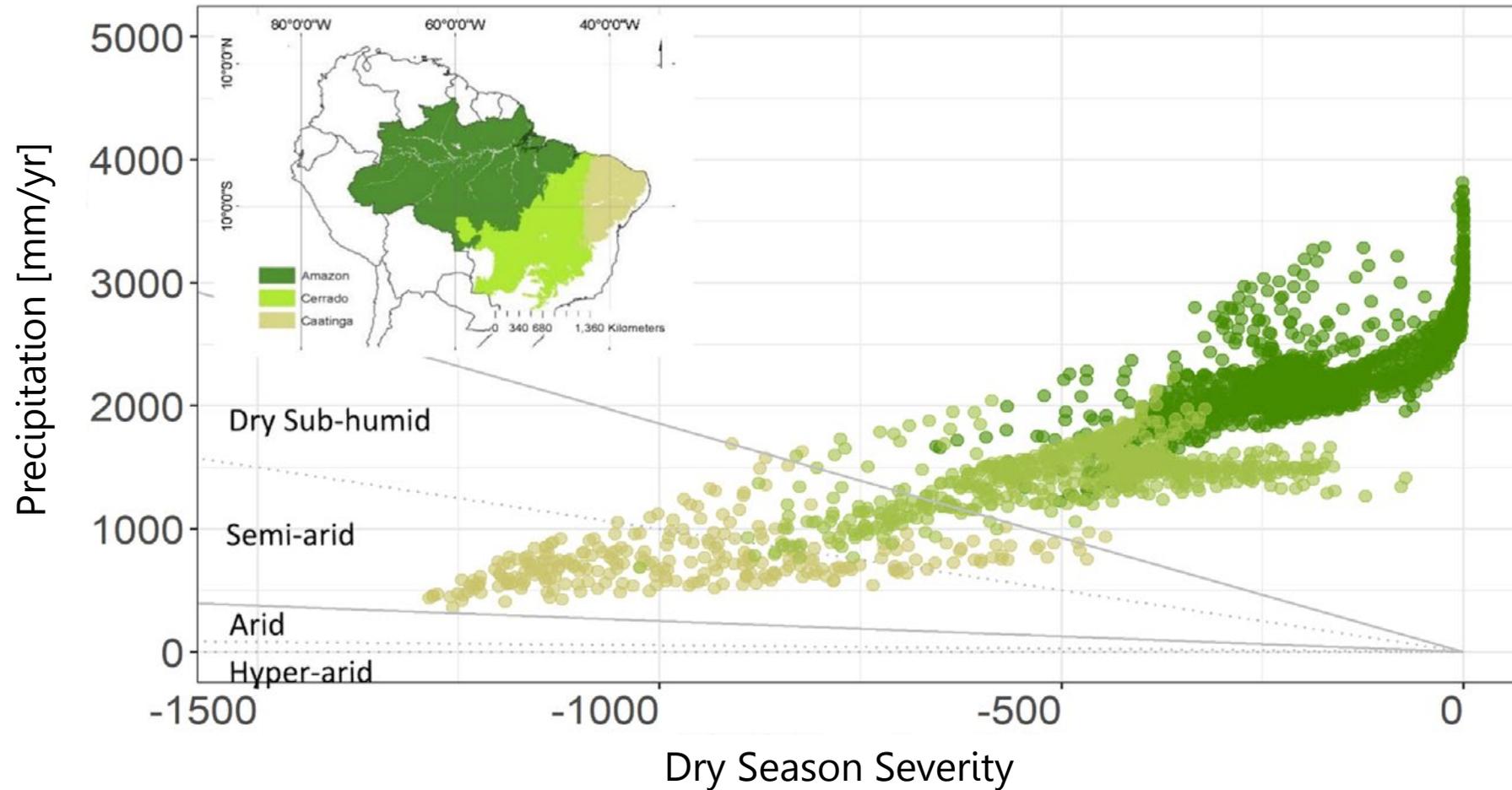
Marcia N. Macedo
September 15, 2023
mmacedo@woodwellclimate.org

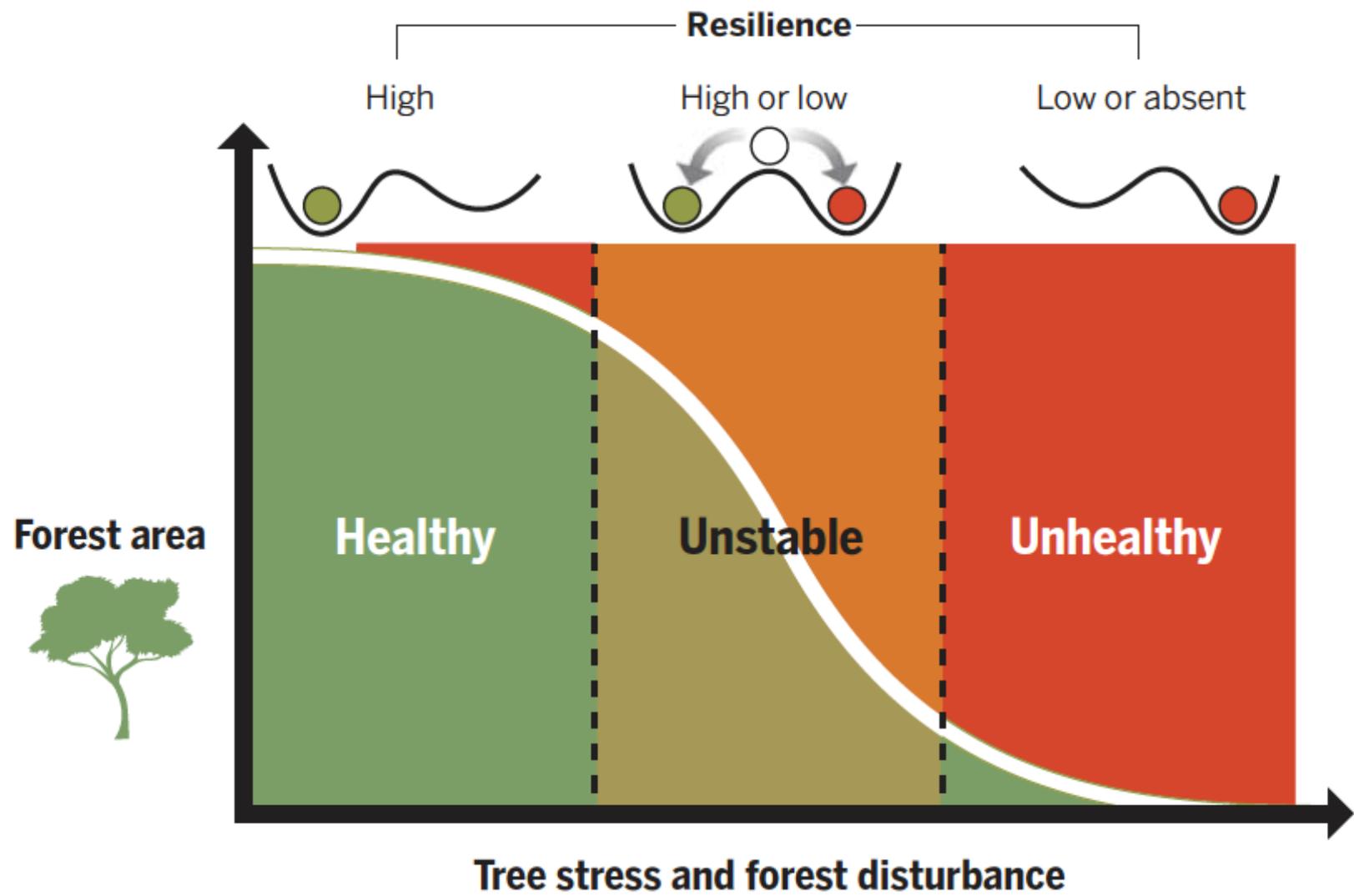


Woodwell
Tropics

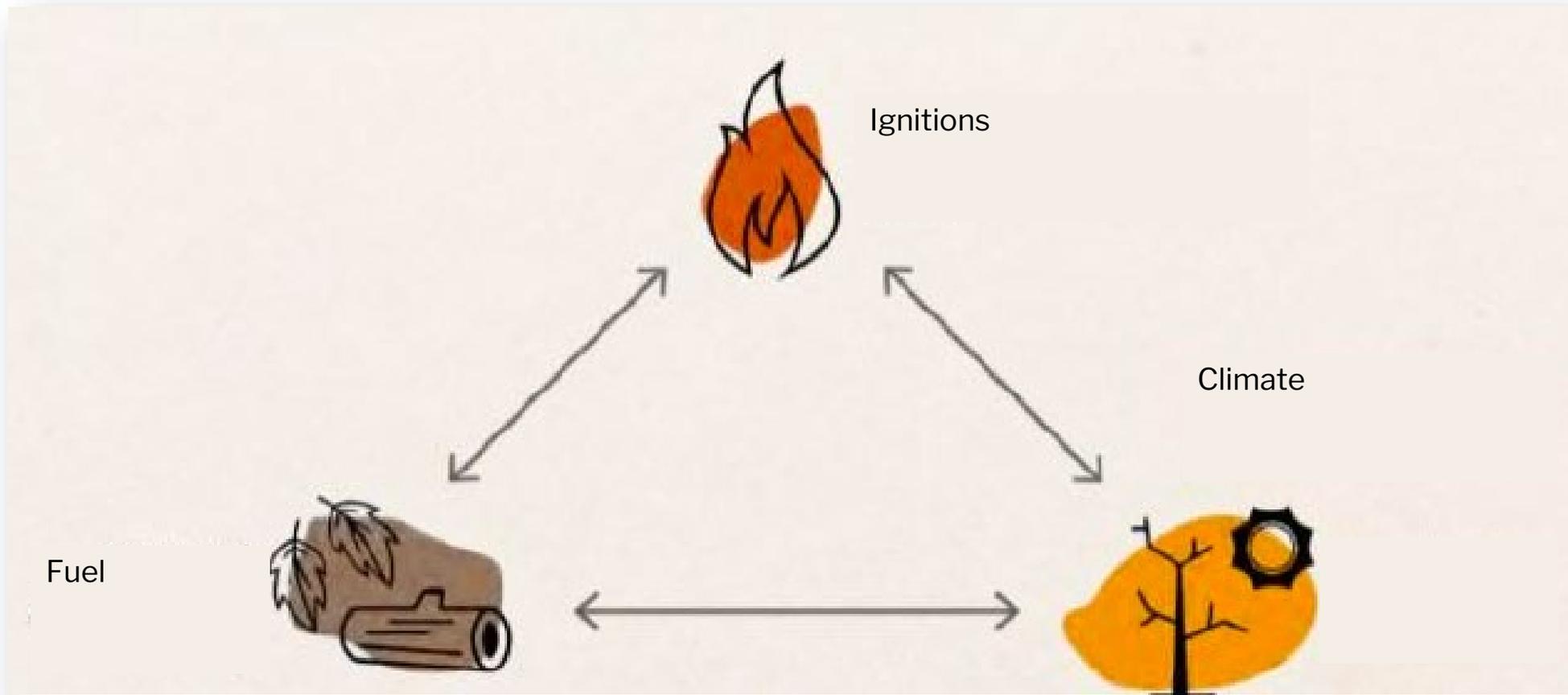


The 'climate space' defines the carbon carrying capacity

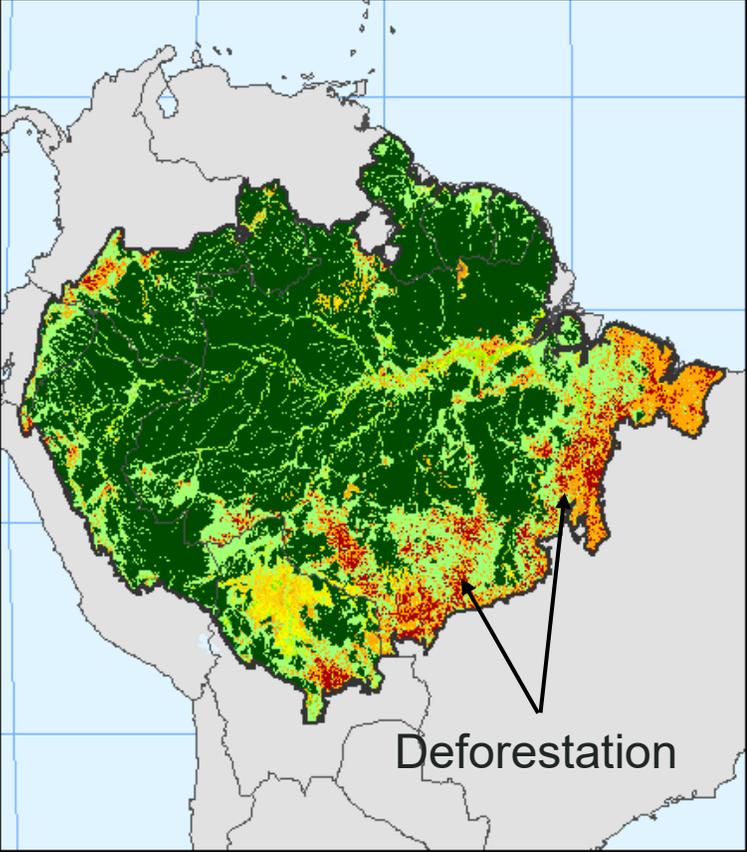




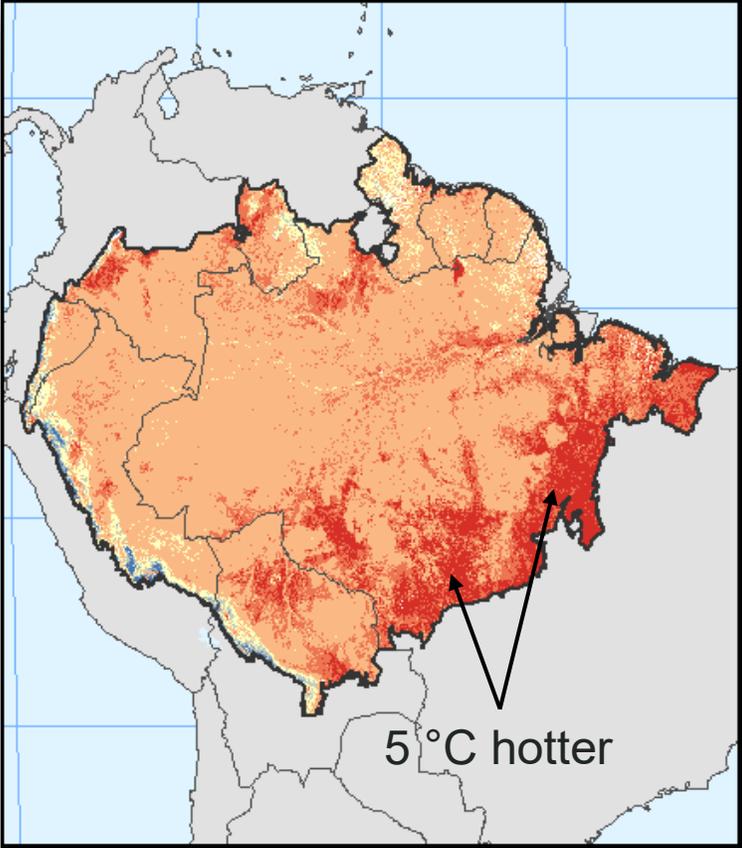
We are changing the three main drivers of fire activity



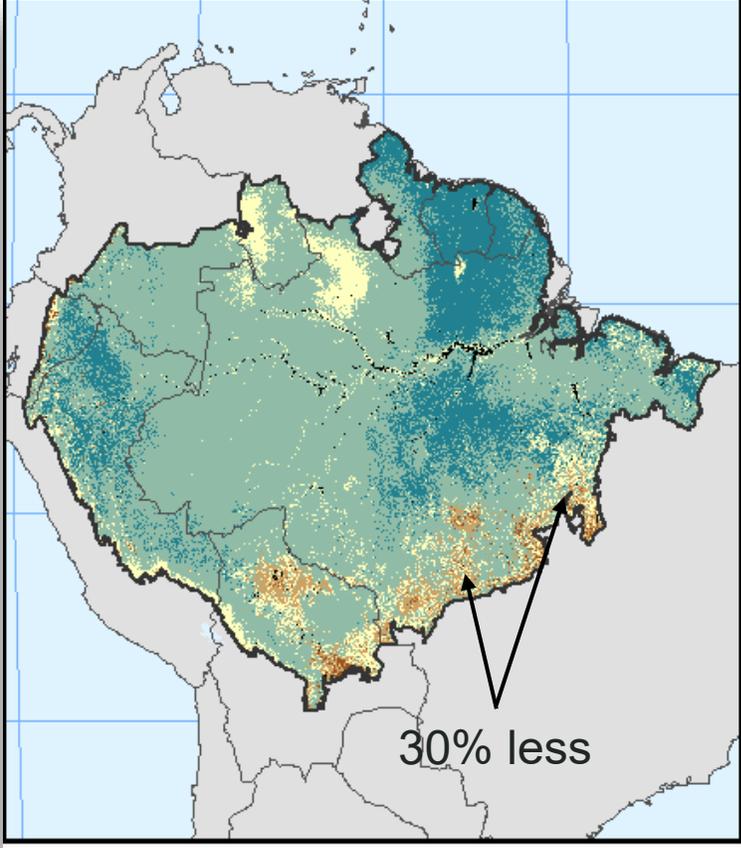
Stopping deforestation is priority number one to reduce fires



Forest status



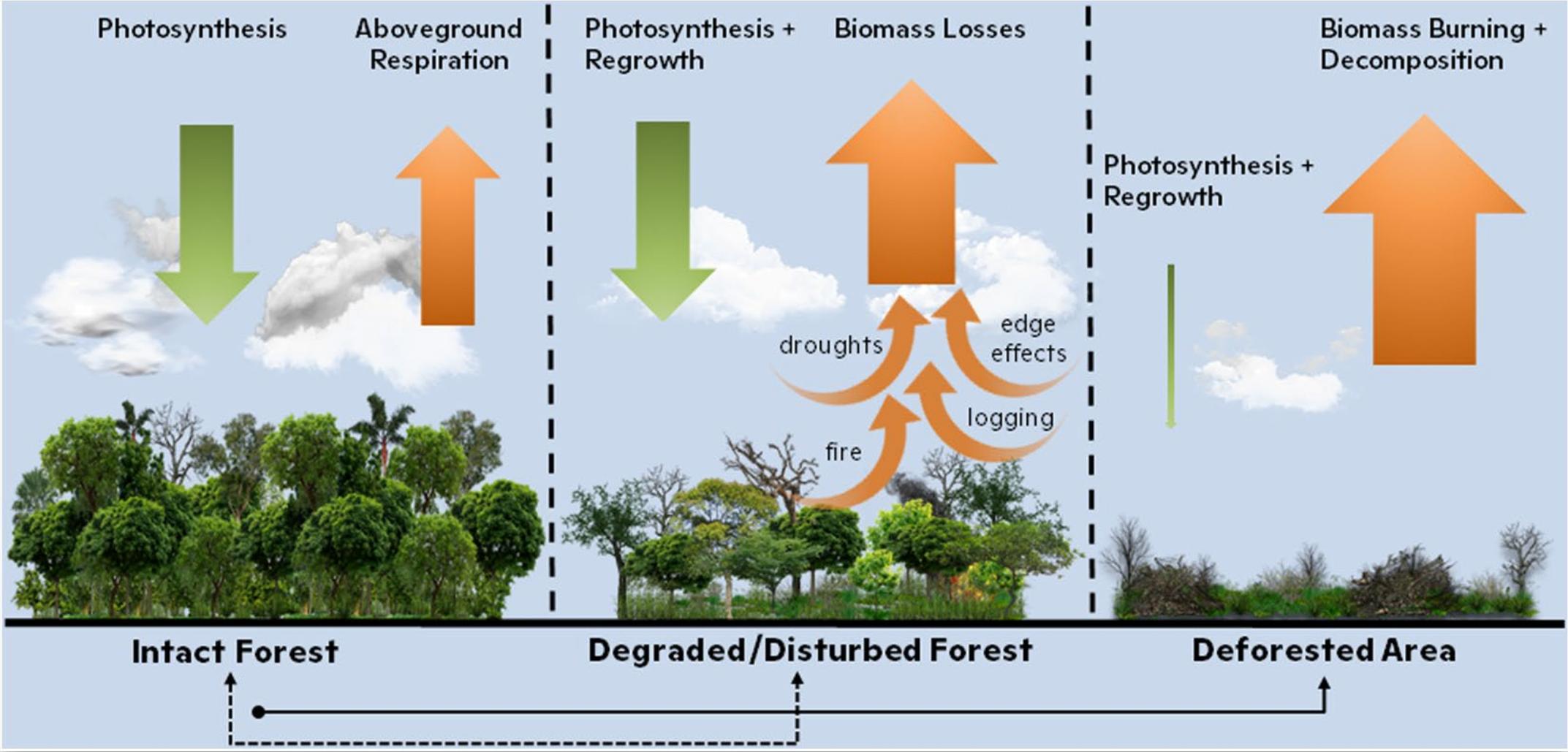
Land surface temperature



Evapotranspiration

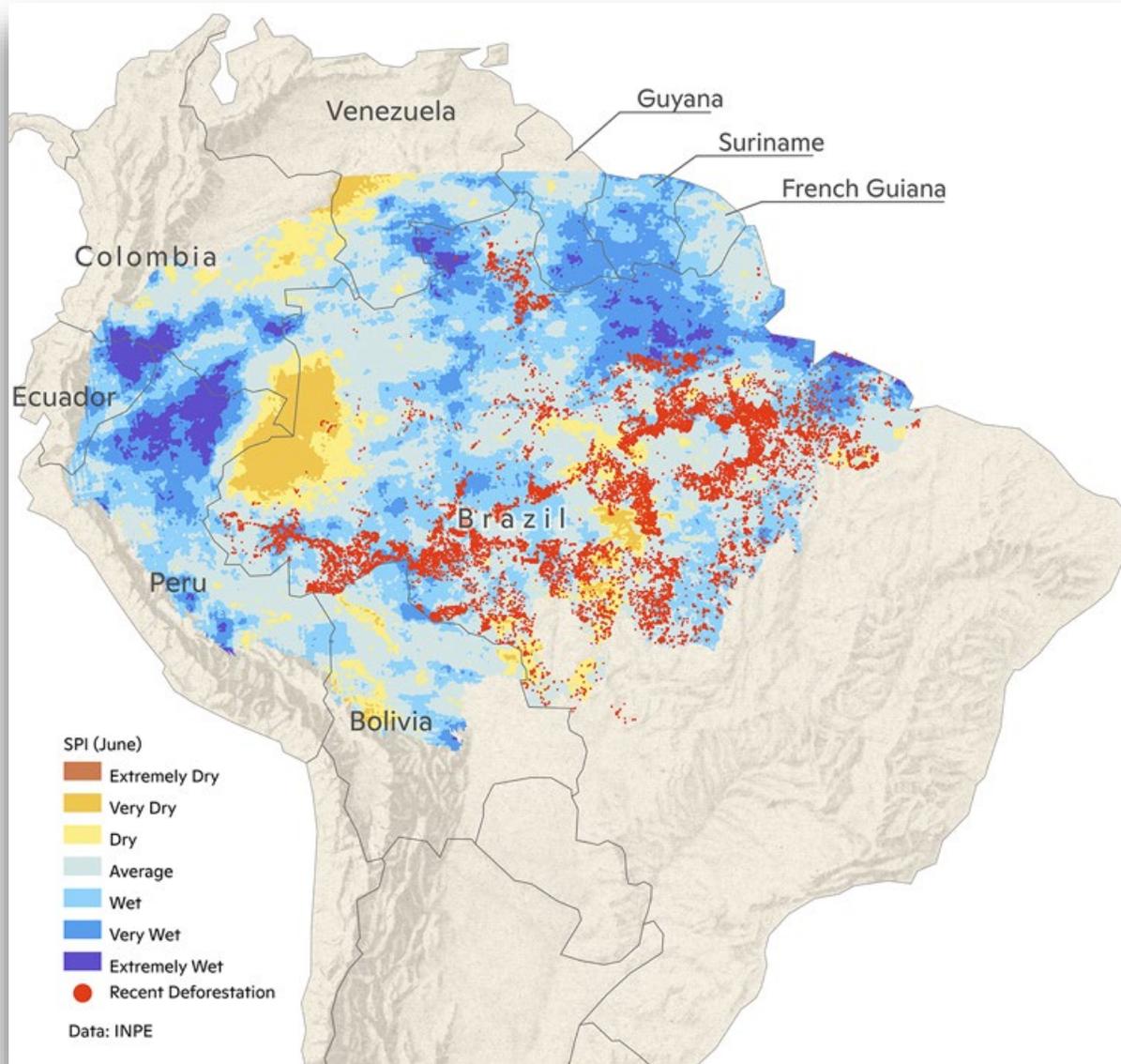
Coe et al. *In Review*

Managing forest degradation is also key for reducing emissions



Kruid et al. 2021, *Frontiers in Forests & Global Change*

We need to improve fire forecasting to enhance fire preparedness

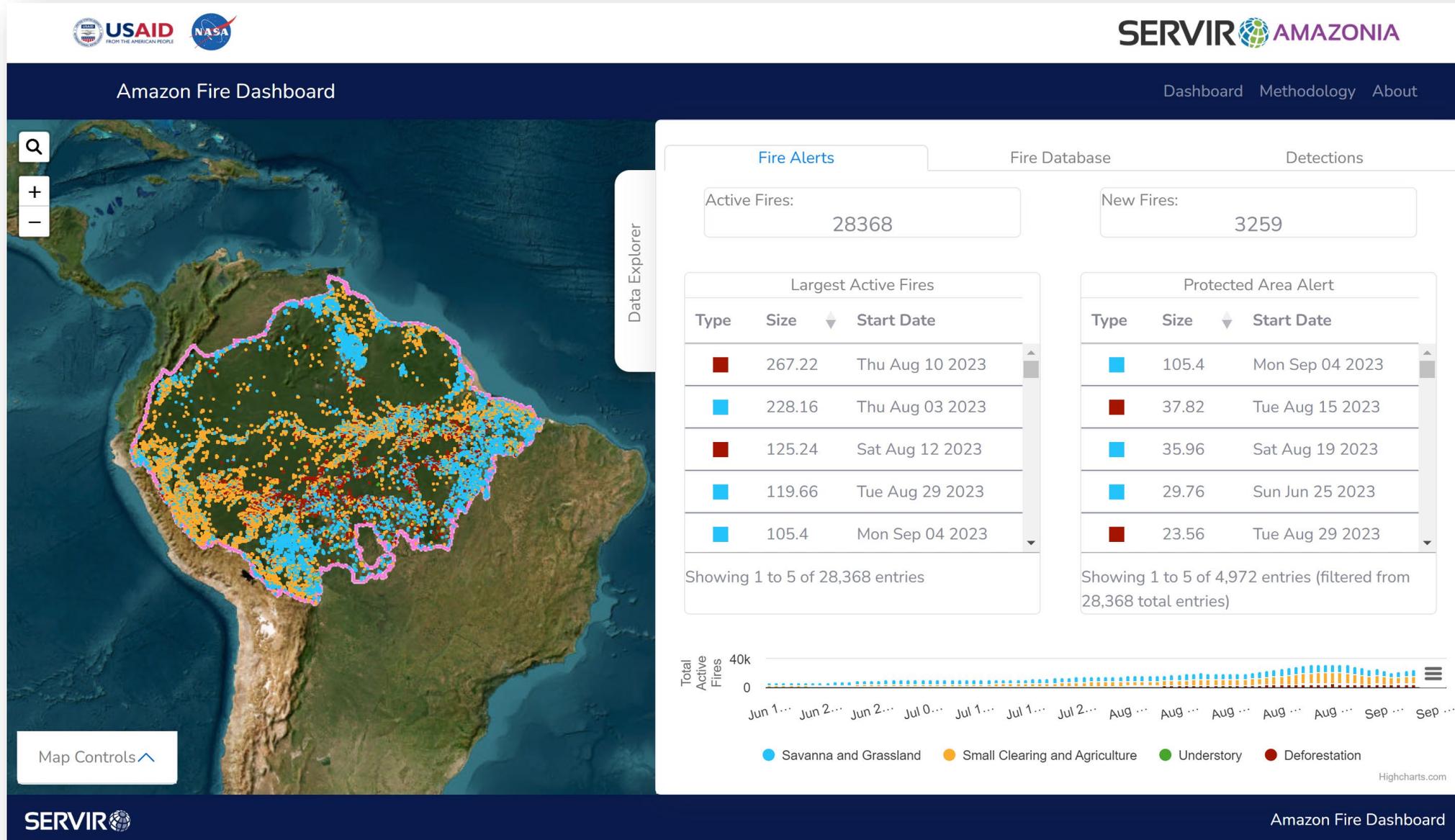


- dryness
- fire type
- land tenure
- governance

Differentiating fire types is key for prevention and suppression



Doug Morton





**Wildland-Ag.
Interfaces
matter too!**





Biodiversity could play a key role in restoring degraded landscapes

PAPER

WILEY **bioTROPICA** ASSOCIATION FOR TROPICAL BIOLOGY AND CONSERVATION

Lowland tapirs facilitate seed dispersal in degraded Amazonian forests

Lucas N. Paolucci^{1,2,*} | Rogério L. Pereira³ | Ludmila Rattis^{1,4} | Divino V. Silvério^{1,3} |
Nubia C. S. Marques^{1,5} | Marcia N. Macedo^{1,4} | Paulo M. Brando^{1,4}



Paolucci et al. 2019, *Biotropica*



Lucas Paolucci

The Economist April 20th 2019

▶ the advantages of being close to a river. That memories of disaster weigh more heavily in this calculation immediately after the flood is not surprising, says Dr Fanta. But that the memory is so short-lived is. He had expected people to heed history's warning for a century at least.

This collective forgetfulness is even more puzzling in light of a central preoccupation of ancient chroniclers, the communication of risk. Writing to preserve their eras for posterity, they recounted harrowing tales of extreme climatic events, fires, famines and plagues. Likewise, there is no shortage of written accounts of Hurricane Betsy or of historical floods in Prague—the maximum heights of many of which are marked along the Vltava's banks.

Such distant secondhand accounts are not enough, Dr Fanta concludes. To be deterred from placing themselves back in danger, people have to hear disaster tales from eye witnesses who can convey the visceral emotion of having lived through them. The group's findings thus suggest that one way of teaching history more effectively might be to bring eye witnesses into the classroom. That approach will not work for ever, of course. Over time, witnesses' own memories fade, and then the witnesses themselves expire.

The forgetting that Dr Fanta sees with respect to historical floods might also explain the recent rise of vaccine hesitancy and right-wing extremism, he suggests, as the survivors of now-preventable infectious diseases and Hitler, respectively, die of old age. Having not experienced those realities, or heard about them first-hand, many people alive today have quite simply forgotten the horror. ■



Just powdering my nose

animals often defecate pips and stones from fruit they have eaten in places distant from where the food were consumed. Much research has therefore been devoted to luring them into damaged areas—sometimes with success. There is a limit, however, to the size of seed that a bat or a bird can carry, and that constrains which plants can be regenerated in this manner.

Lowland tapirs suffer no such constraint. They are the region's biggest herbivores and swallow lots of large seeds. Dr Paolucci thus wondered to what extent tapirs were transporting seeds from pristine to damaged areas. To try to find out he and a team of colleagues set up a study of tapirs' defecatory habits.

The researchers used a mixture of field observations and camera traps to monitor tapirs in three adjacent plots that are part of a larger project to study the effect of fire on Amazonian rainforest. These plots were confirmed at the beginning of the study to be similar in such matters as plant-species richness, the relative abundance of the commonest species, the density and com-

Ecology

Do tapirs defecate in the woods?

It seems they prefer burned-out scrub.

Results provide a glimpse into what is happening in the Xingu Territory



LETTER

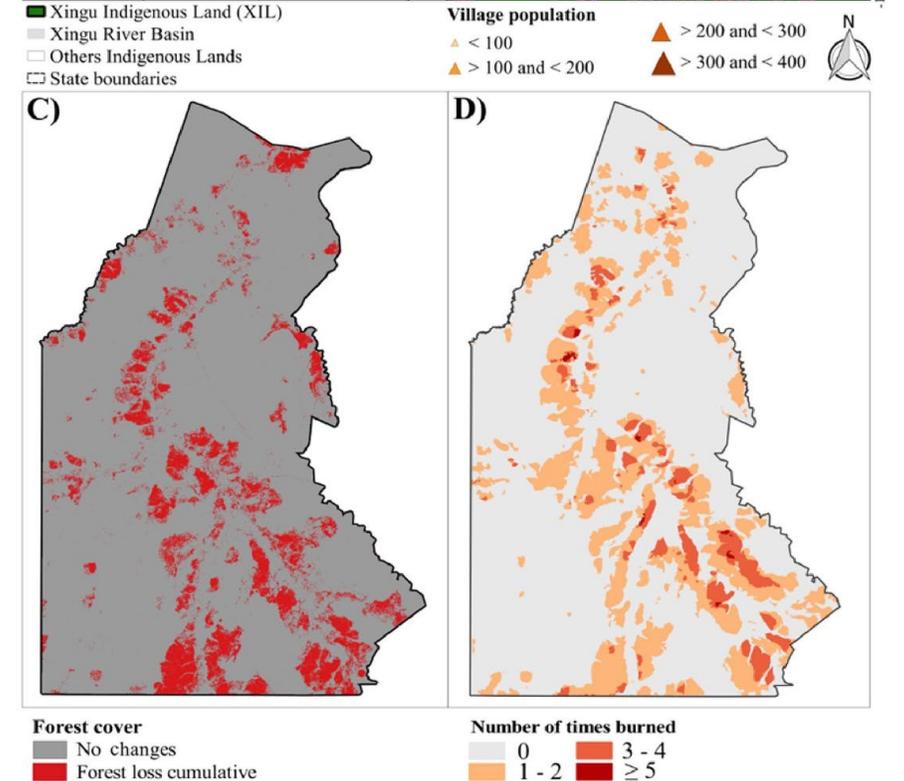
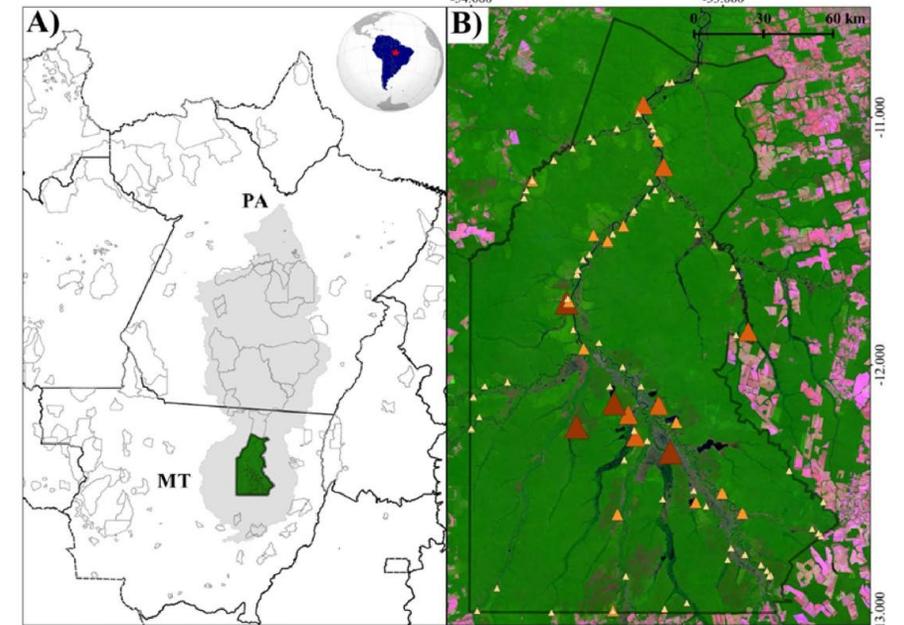
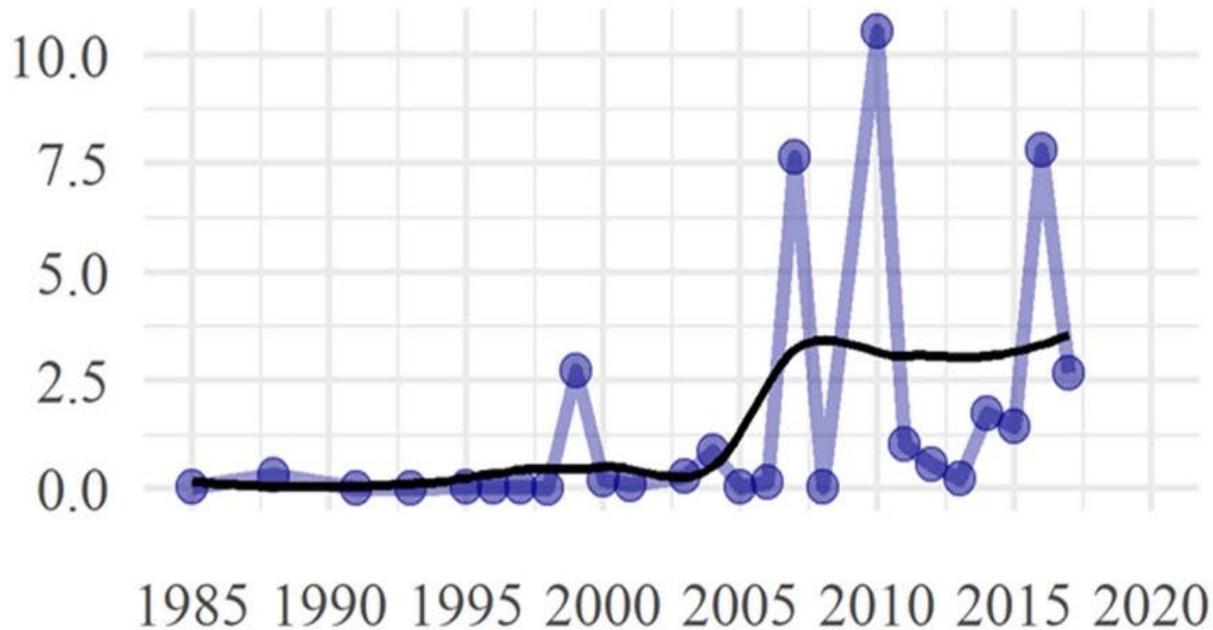
Intensification of fire regimes and forest loss in the Território Indígena do Xingu

Divino V Silvério^{1,2,*} , Robson Santana Oliveira³ , Bernardo Monteiro Flores³ , Paulo M Brando^{2,4,5} , Hellen Kezia Almada² , Marco Túlio Furtado³ , Fabio Garcia Moreira⁶ , Michael Heckenberger⁷, Katia Yukari Ono⁸  and Marcia N Macedo^{5,9} 



Divino Silvério

Burned area (%)



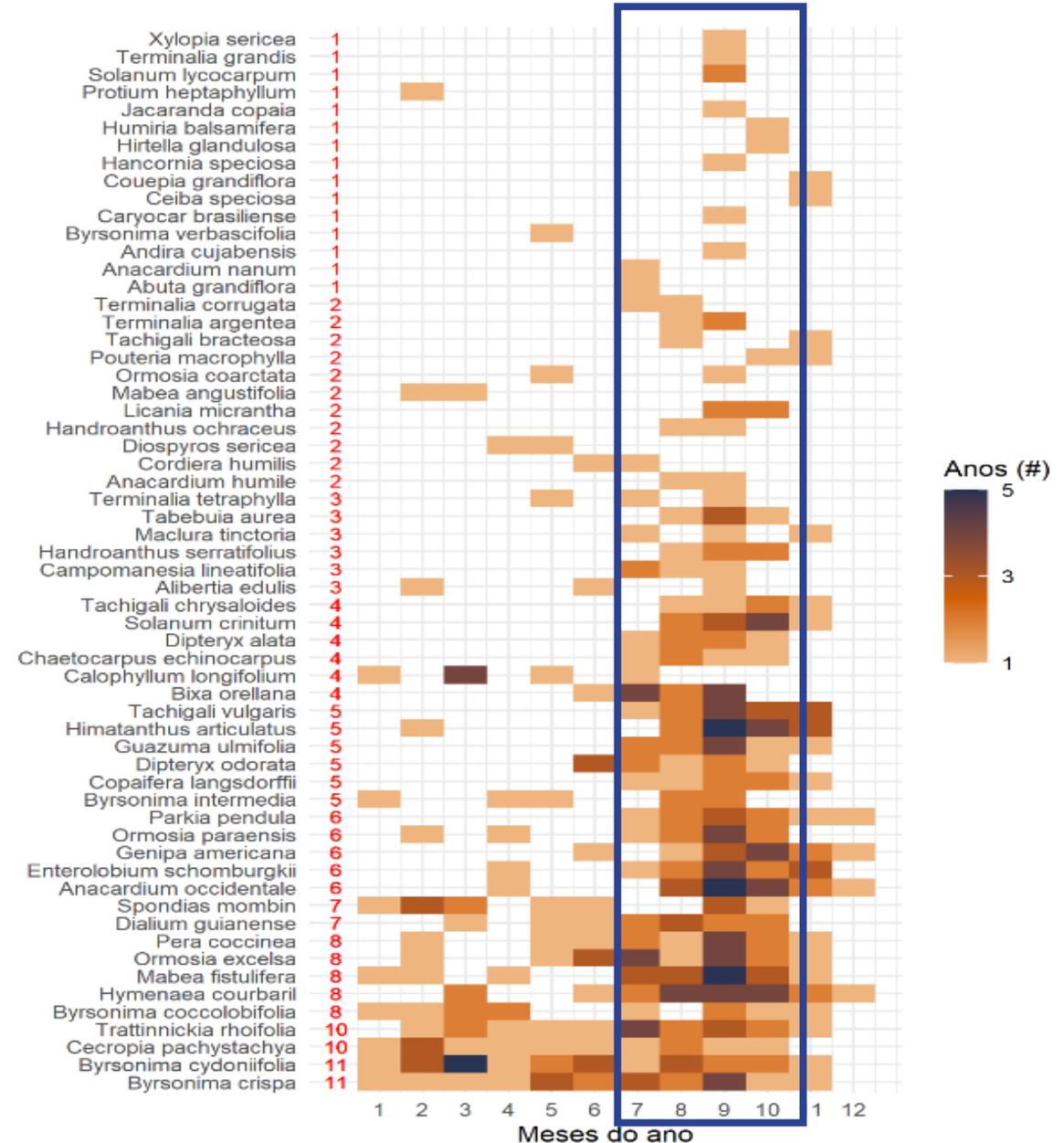
Integrating traditional knowledge about fire use (and impacts) is crucial.



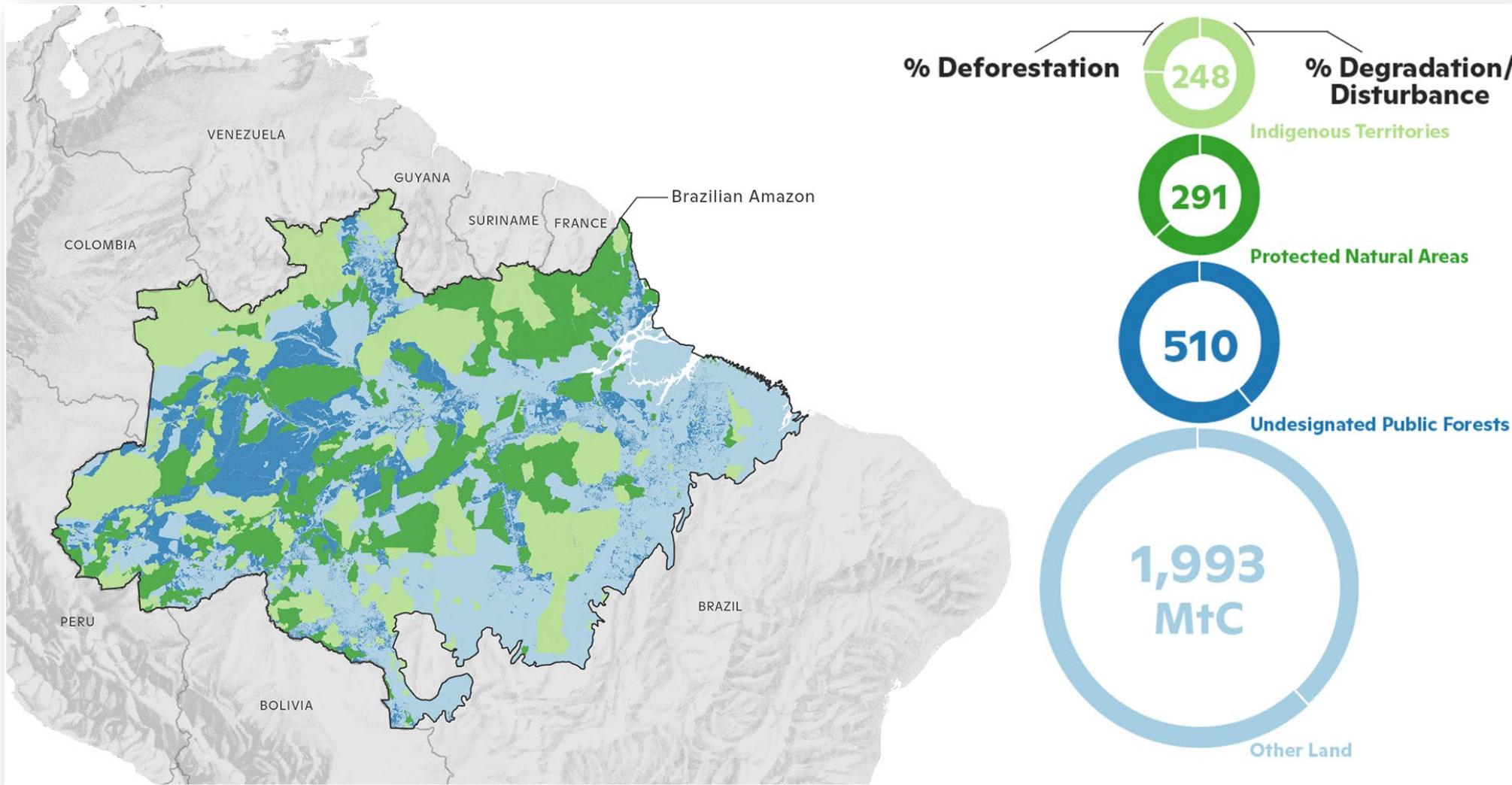
Xingu field team: Aldeia Afukuri, Dec. 2021

Adapting fire management to local realities

- 60 species collected
- Most seeds collected in the late dry season (JASO)
- Half overlap with Rx burn areas



1. Clarify land tenure and protect protected areas



Kruid et al. 2021, *Frontiers in Forests & Global Change*

2. Streamline data flows to support firefighters



Manoela
Machado



3. Build capacity and data tools to support firefighting efforts

The screenshot displays the Google Earth Engine web interface. At the top, the search bar contains "Search places and datasets...". The left sidebar shows a project tree under "Owner (5)", with "users/manoelamachadoeco/Fi..." expanded to show "FireDetection" and "FireDetection_MT". The main editor area is titled "FireDetection_Xerente" and contains a JavaScript script. The script defines a "Layers of Interest" and uses the "ee.FeatureCollection" class to filter data from a specific project. The script also uses "ee.Image().byte()" to process the data. The right sidebar shows the "Inspector", "Console", and "Tasks" panels. The "Console" panel contains the text "Use print(...) to write to this console." The main map area shows a satellite view of a region with a contour overlay. The contour is colored with a gradient from green to red, indicating elevation. The map includes a "Layers" panel, a "Map" button, and a "Satellite" button. The bottom right corner of the map area contains a panel titled "Workflow para detecção de fogo - Xerente" with a description and a list of layers to display.

```
18 ///////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
19 //      Layers of Interest      //
20 ///////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
21
22 // The borders of the Brazilian Amazon { (projects/mapbiomas-workspace/AUXILIAR/biomas-2019 try this, figure out the attribute
23 var BrAmazonBorder = ee.FeatureCollection('users/manoelamachadoeco/GeoPolitical_Regions/amazon_border').filter(ee.Filter.eq('LE
24 var emptyBrAm = ee.Image().byte();
25 var outlineBrAm = emptyBrAm.paint({featureCollection: BrAmazonBorder, color: 1, width: 2}); // 1
26
```

Workflow para detecção de fogo - Xerente

Esta ferramenta tem como objetivo auxiliar os brigadistas na interpretação da situação perante a ocorrência de fogo

Select layers to display.

Bioma

- Amazônia Brasileira - borders
- Cerrado - borders

Divisões e classes

- Brasil
- Estados do Brasil
- Tocantins
- Municípios do Tocantins
- Uso e cobertura do solo - MapBiomas
- Gradientes de elevação
- Curvas de Nivel

4. Support Indigenous land rights and leadership



Valéria Paye

Opinion

We Know How to Stop the Fires

By Marcia Nunes Macedo and Valéria Paye Pereira

Dr. Macedo is an ecologist and climate scientist. Ms. Paye, of the Kaxuyana people, is a policy expert and activist based in Brazil.

Oct. 2, 2020

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<https://www.nytimes.com/2020/10/02/opinion/amazon-rainforest-fire-prevention.html>

