



# THE BATTLE OF THE AMAZON RAINFOREST

THE LUNGS OF  
THE EARTH

GEO 5329

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Pilcher, H. (2023, July 21)

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# INTRODUCTION

Deforestation in the Amazon Rainforest is driven by several factors including agricultural expansion for cattle ranching, illegal logging, and mining. The consequences include biodiversity loss, soil degradation, climate change, and disruption of indigenous and local communities.



Purdue News Service (2020, December 16)



Butler, R. (2020, September 27)



# PURPOSE STATEMENT

The purpose of this research is to analyze and investigate the primary drivers of deforestation in the Amazon rainforest, collect data on the factors of deforestation on the environment, social, and economic impacts.

Evaluate current mitigation strategies to propose more effective, sustainable solutions for preserving the ecosystem.

# RESEARCH QUESTIONS

- How have technologies such as remote sensing, GIS, and AI improved deforestation detection and the enforcement of protective measures?
- What challenges and barriers prevent the successful implementation of deforestation mitigation plans?
- How do economic and environmental incentives, such as sustainable regenerative agriculture, contribute to reversing deforestation trends?
- Based on current research, what combination of mitigation strategies offers the most promise for reversing deforestation in the Amazon?

# LITERATURE REVIEW

Deforestation in the Amazon rainforest has been a subject of extensive academic and policy research due to its global environmental implications.

The Amazon, often referred to as the "lungs of the Earth," is crucial for biodiversity conservation, carbon sequestration, and climate regulation.



Mongaba (2020, October 21)



Mongabay (2020, October 21)



Satellite Imaging Corp. (2025, April 21)

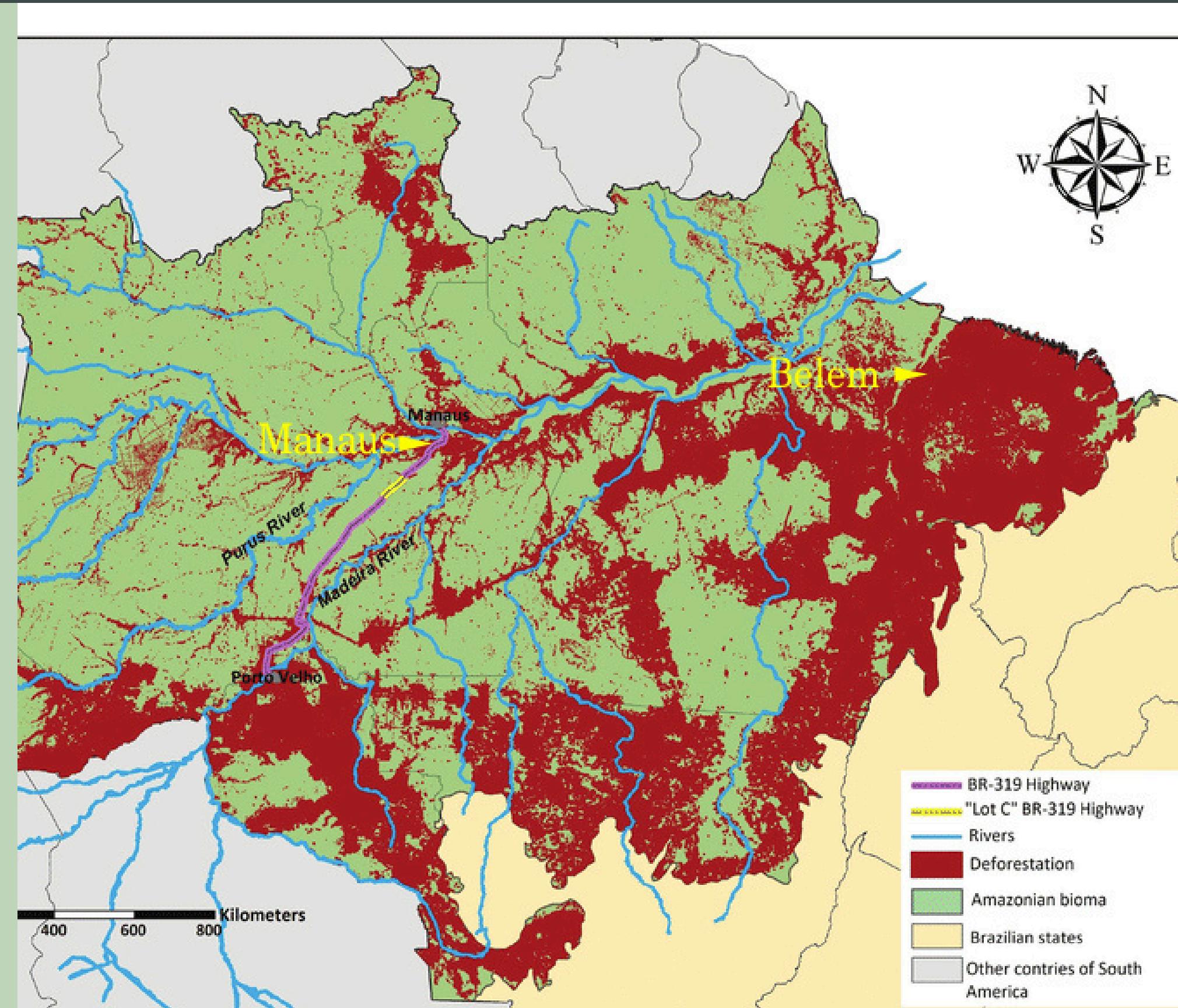
# RESEARCH METHODS

## Data:

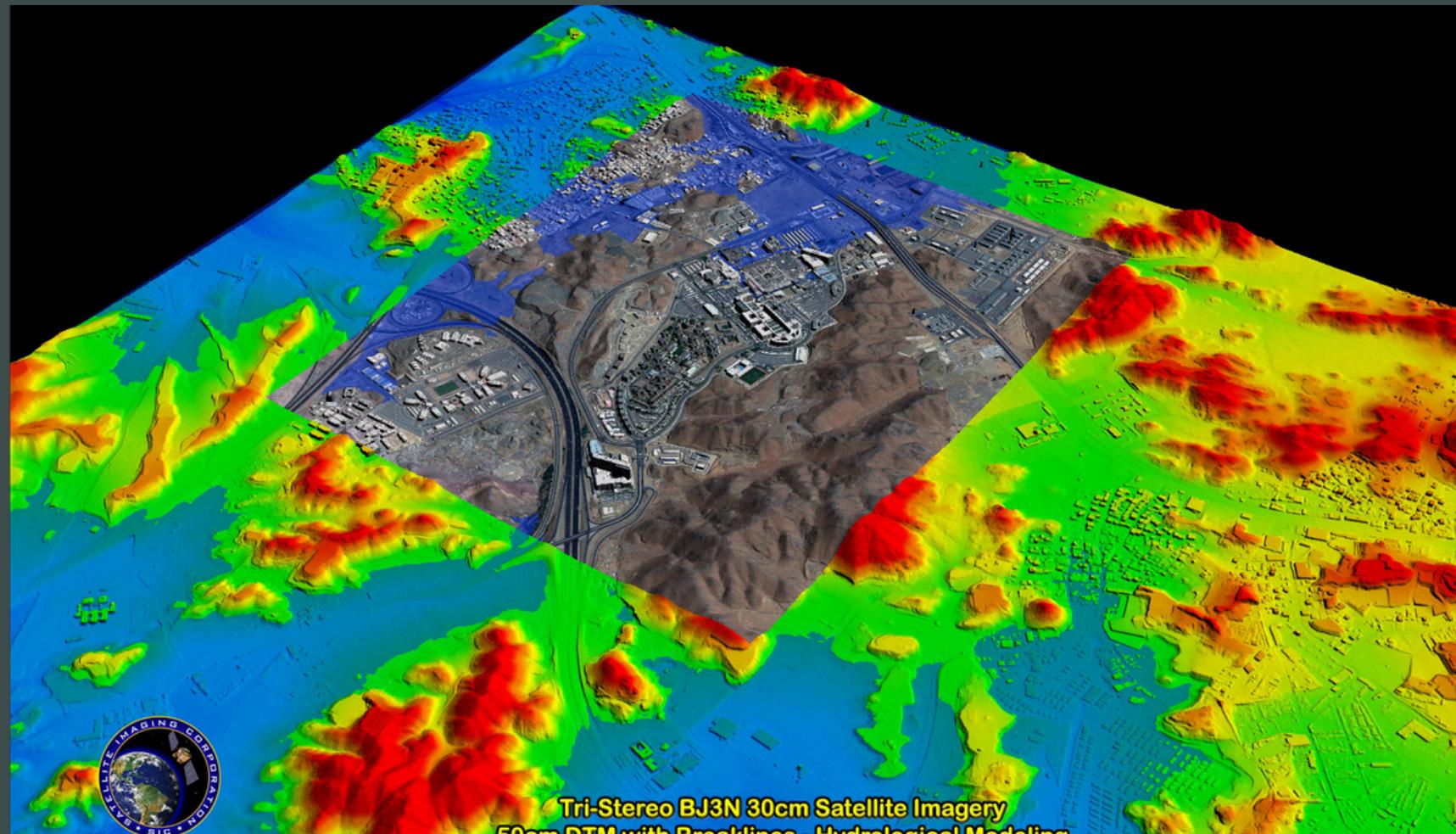
- Remote sensing (Earth Observation Satellites)
- Geographical Information Systems (GIS)
- Artificial intelligence (AI)
- Laws and policies
- Regenerative agriculture

# SITE/SITUATION

Research will be conducted focusing on Manaus and Belém, which are both located in the Brazilian Amazon region. Manaus is the capital of the Amazon state, situated in the heart of the Amazon rainforest, and Belém is the capital of the Pará state, located near the Atlantic Ocean in the Amazon delta.



# DATA INFORMATION



Satellite Imaging Corp. (2025, April 21)



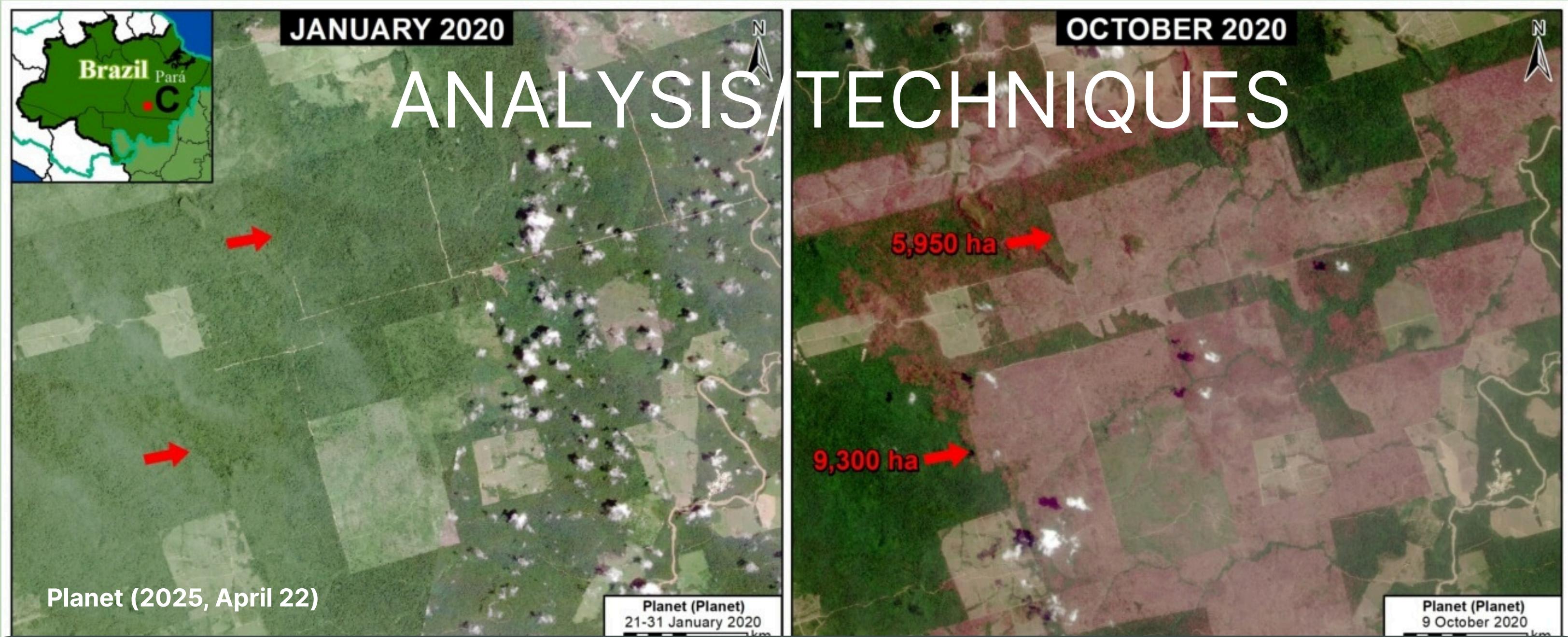
Google Earth (2025, April 20)

Qualitative, quantitative, and technological data methods:

- Data will be collected from a satellite remote sensing company located in Houston
- Conservation and Environmental Organizations
- Science and News Organizations
- Government
- Community

Data:

- Remote sensing (Earth Observation Satellites)
- Geographical Information Systems (GIS)
- Artificial intelligence (AI)
- Unmanned aerial vehicles (UAVs)



Mixed Analysis will be retrieved from various scientific and environmental sources and organizations. Government laws and policies, and community outreach.

# RESULTS/LIMITATIONS

**Results:** AI and Geographic Information Systems (GIS) tools can support forest monitoring and management of deforestation activities by utilizing image data collected by satellites, fix wing aircraft, or unmanned aerial vehicles (UAV). This data is collected and processed to provide NDVI and many other vegetation indices to identify land being cleared legally or illegally.

## **Limitations:**

Economic pressures

Weak governance

Limited Technological and Financial Resources

Global Consumption & Trade

Climate Change & Environmental Factors

Lack of Awareness or Misinformation

<https://www.youtube.com/watch?v=b4eLTYUcj7k>

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