

# Spatial metrics and baselines of degradation patterns and provision of ecosystem service by pastures in Brazil



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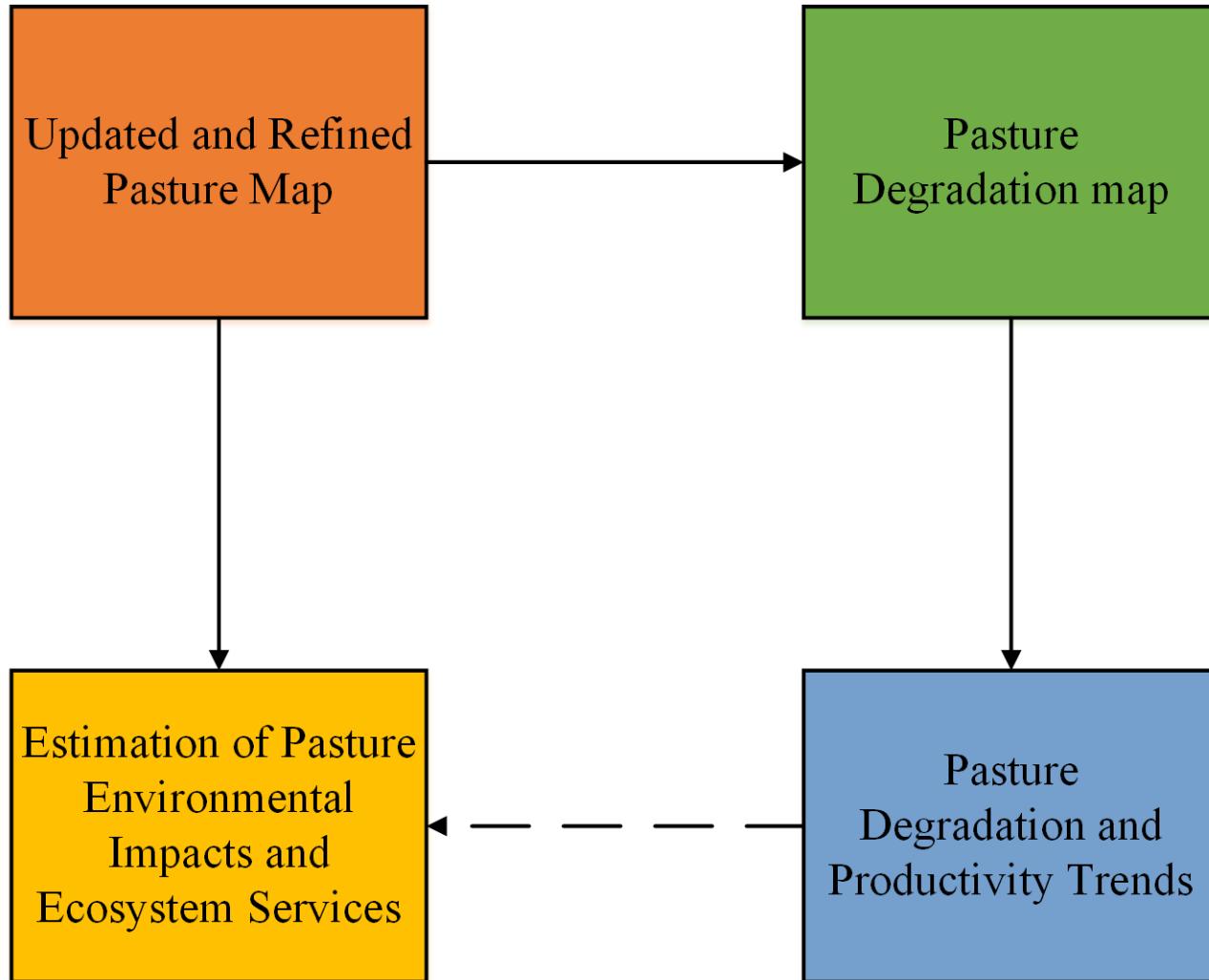
[www.lapig.iesa.ufg.br](http://www.lapig.iesa.ufg.br)

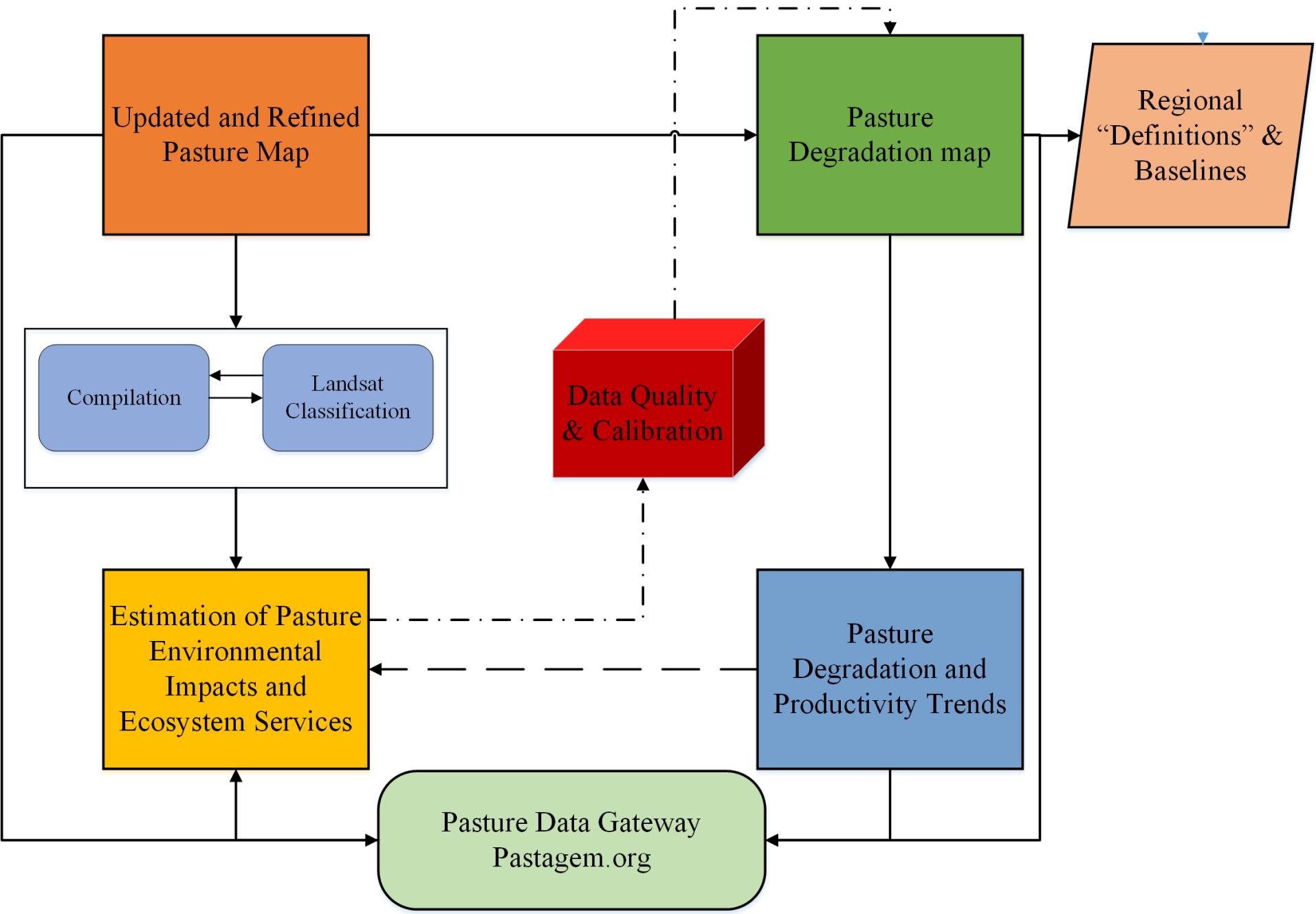
# Goals, Strategies, and Collaborations



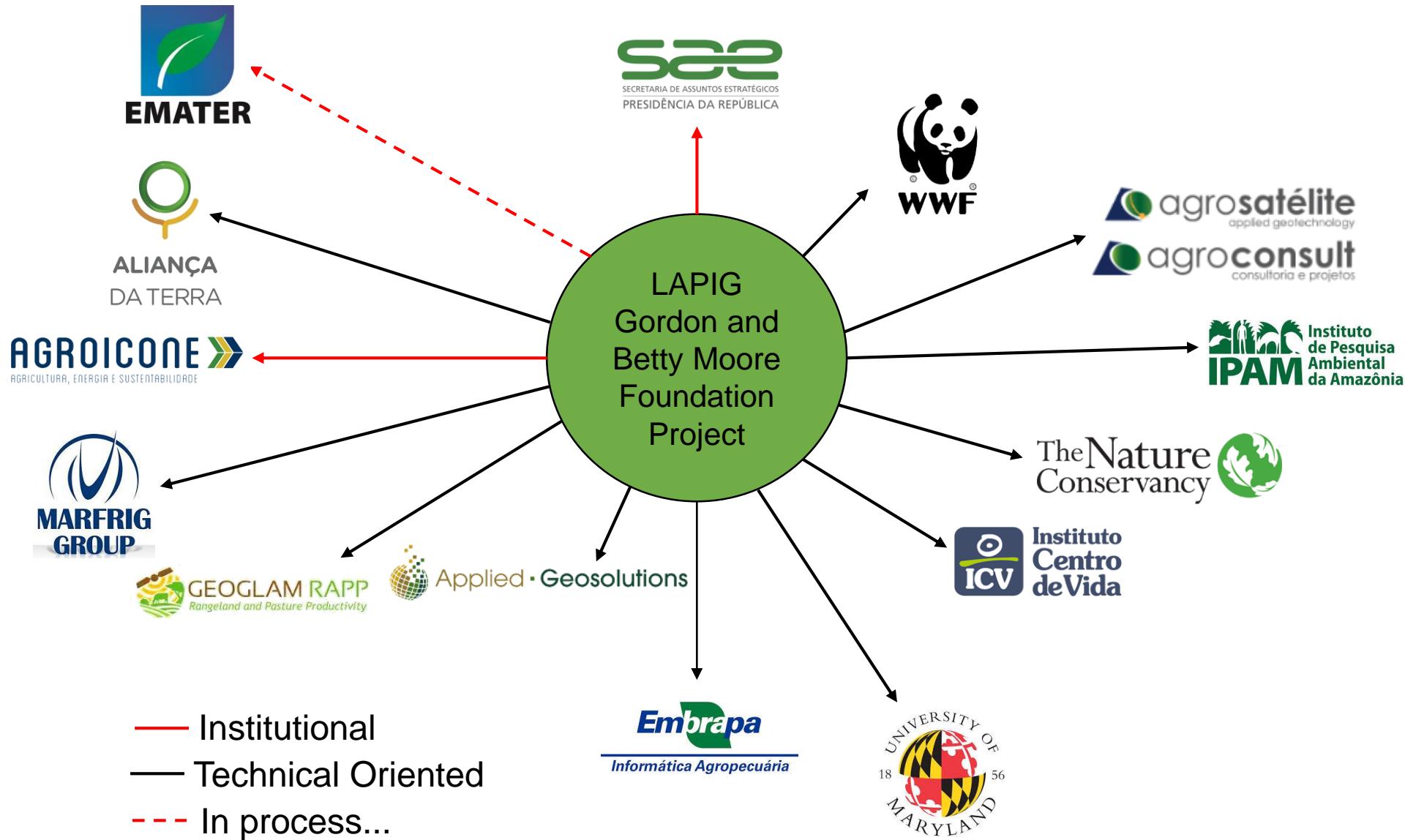
São Felix do Xingu - Pará  
May 2015

# Key Outputs





# Networking...

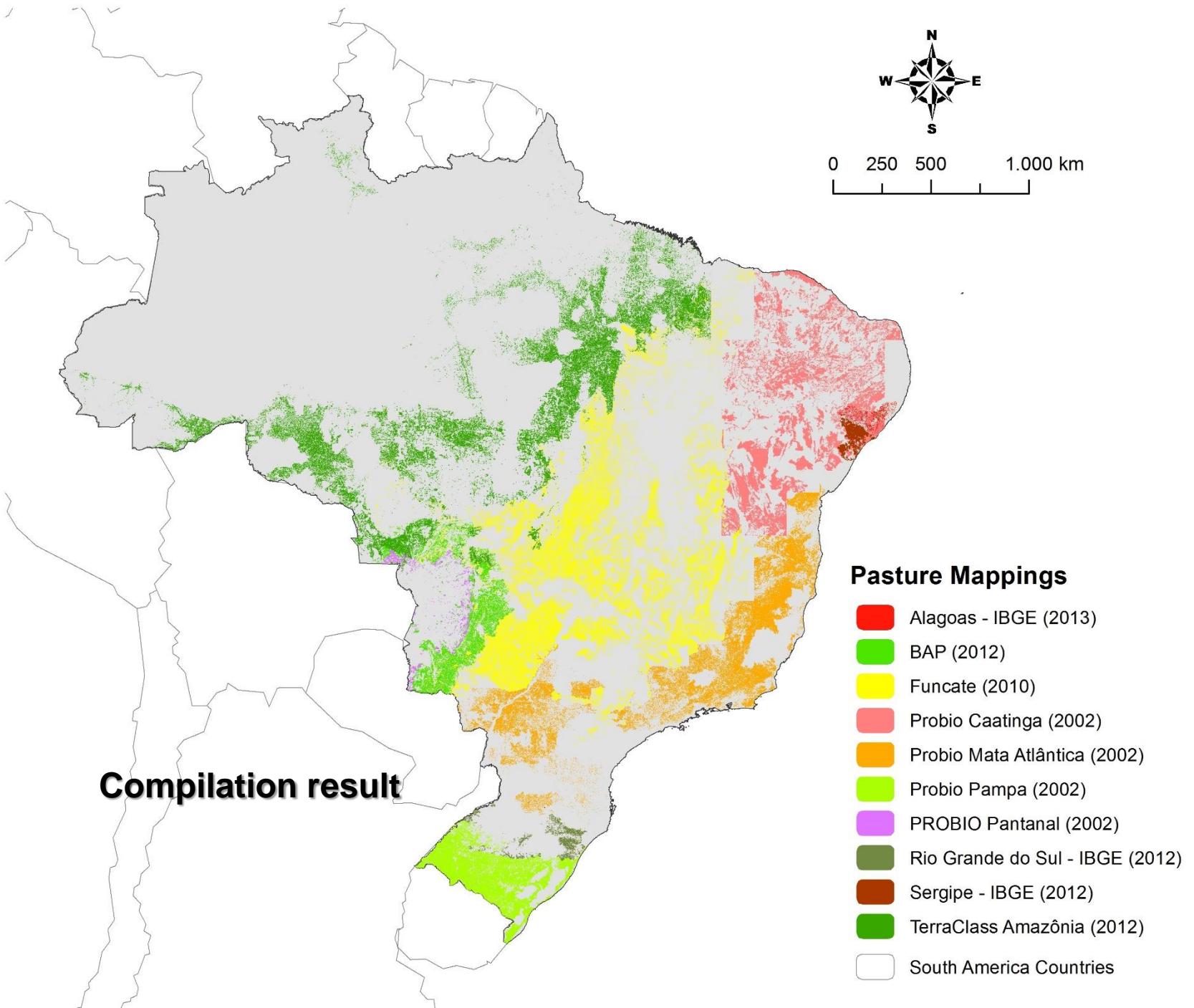


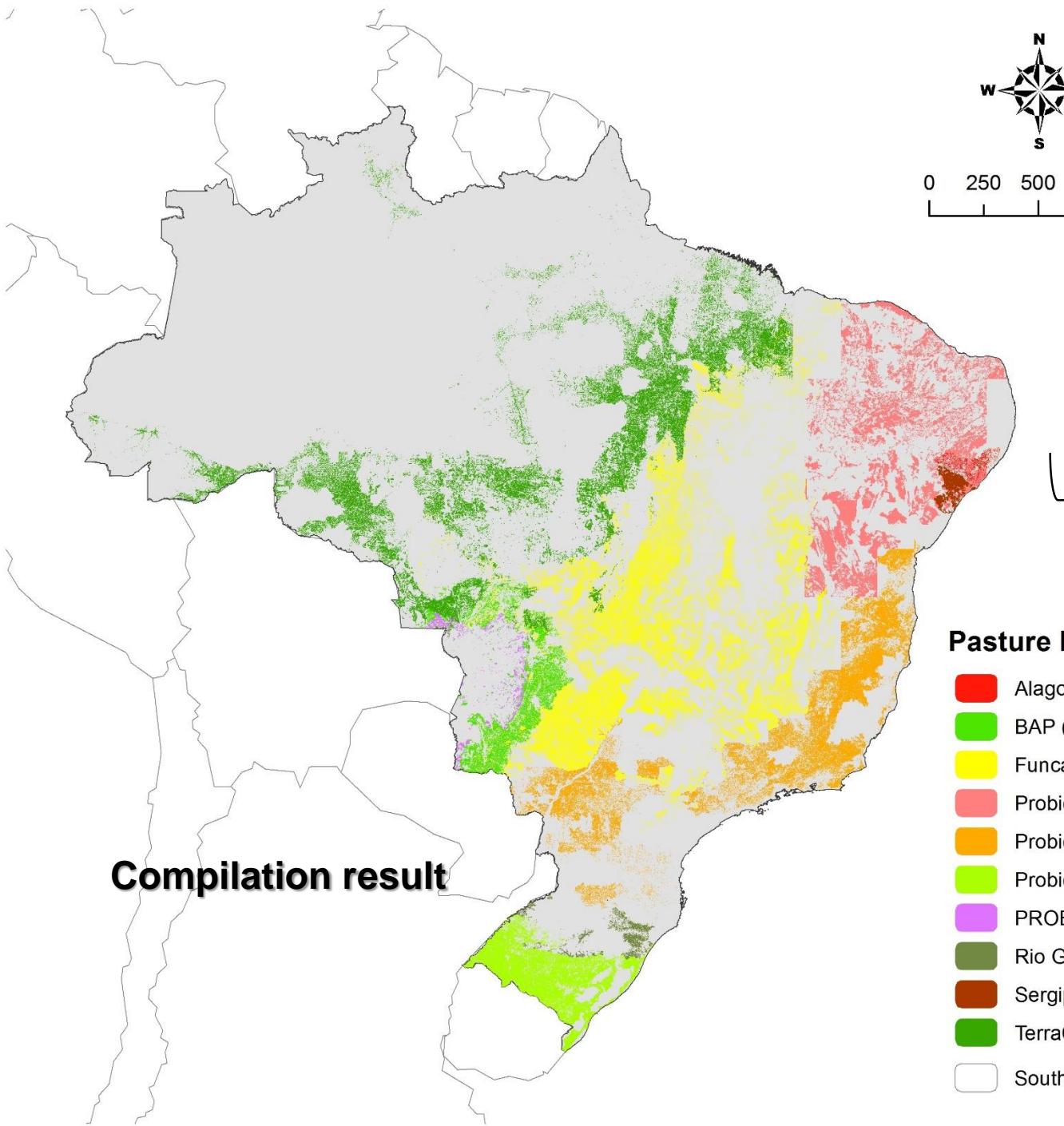
# Pasturelands in Brazil

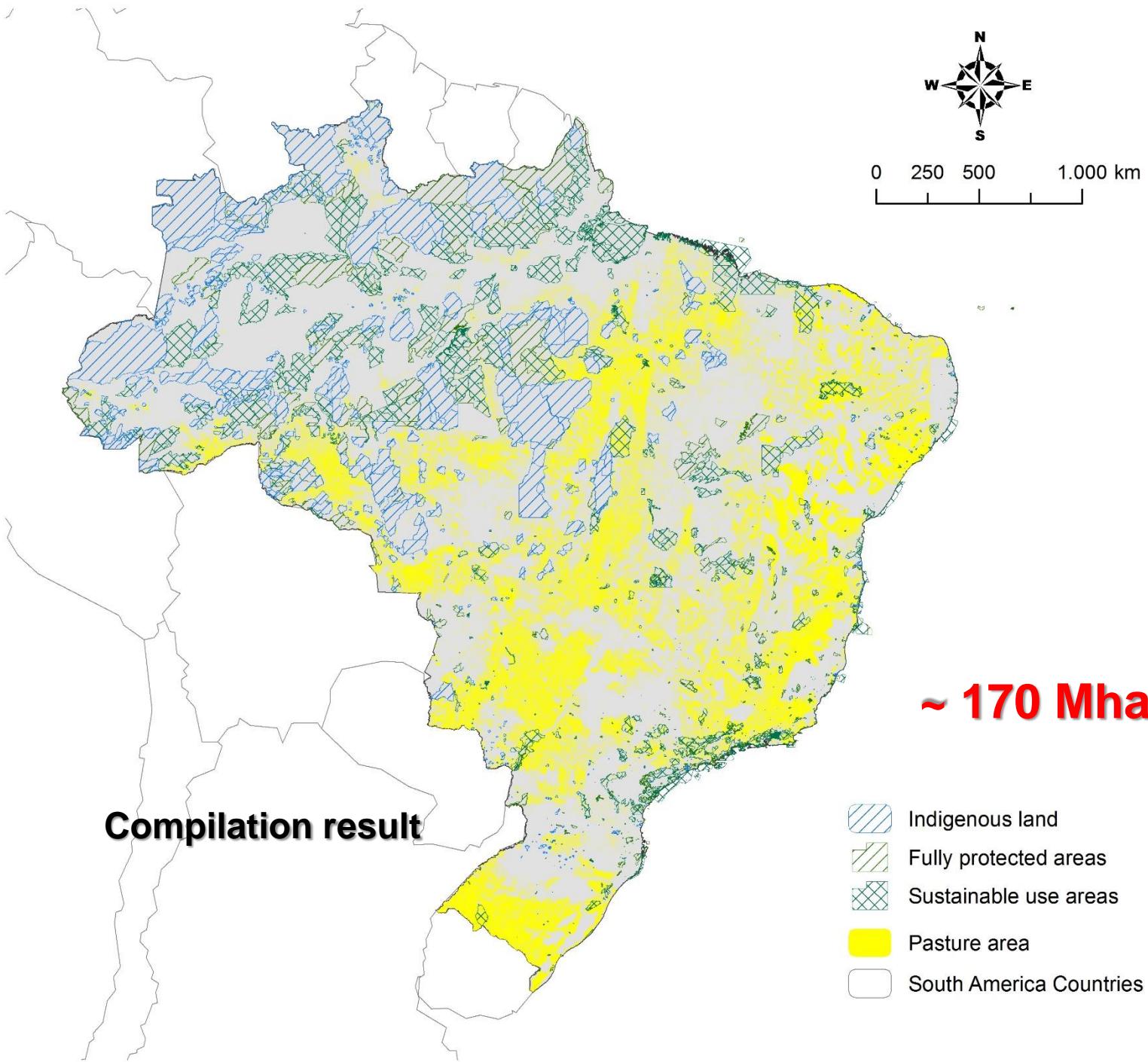
Where are they? What is out there?

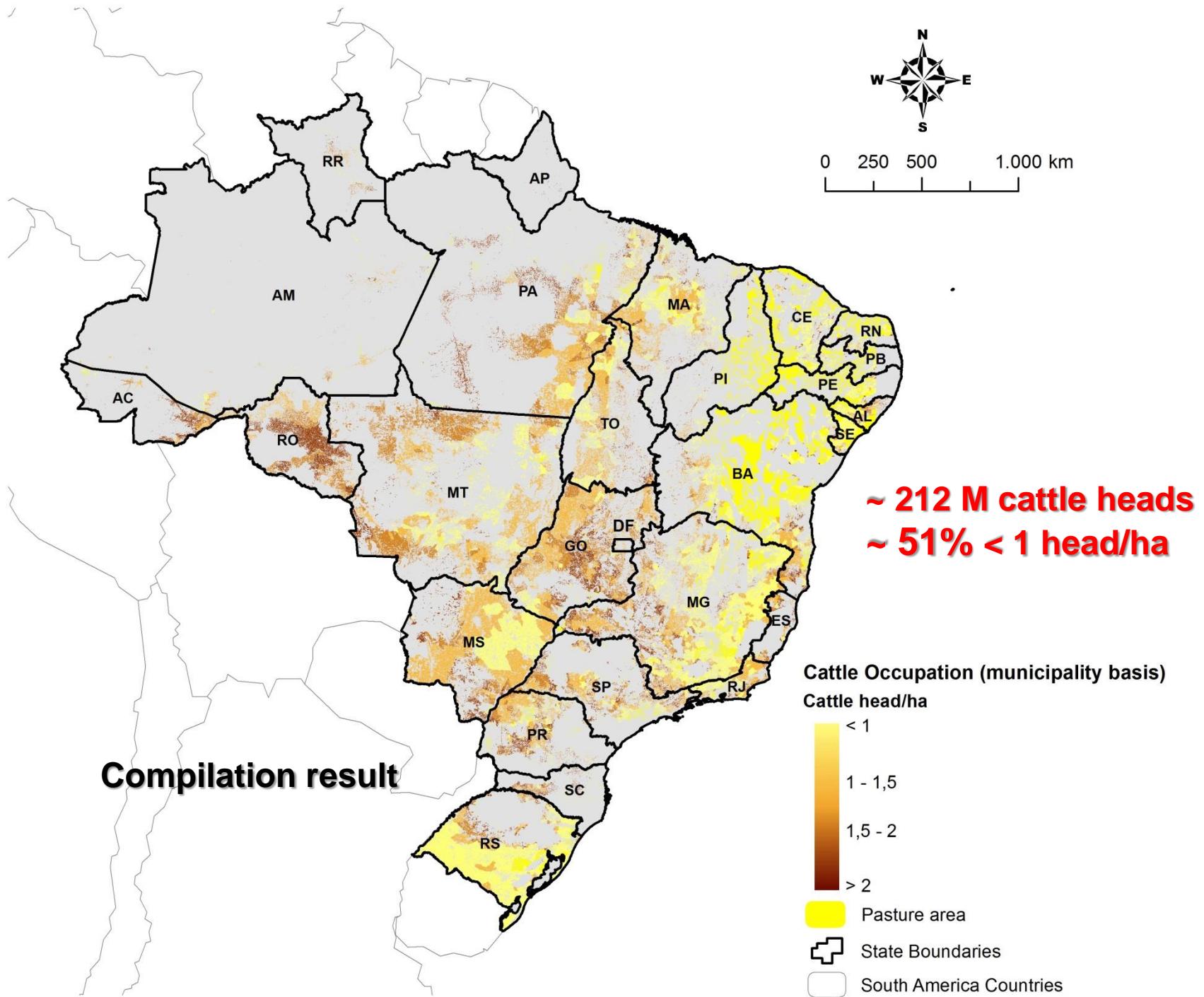


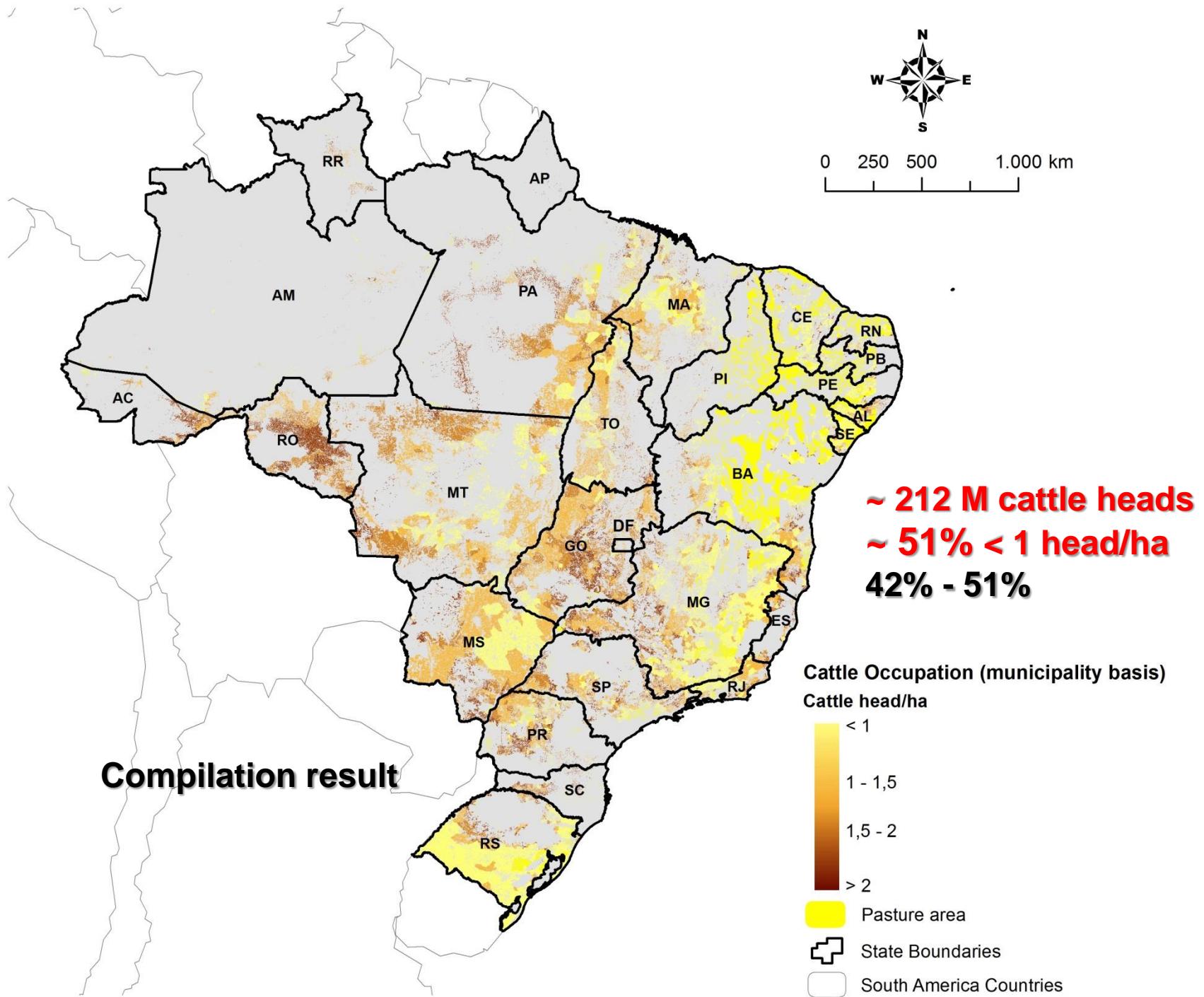
Alta Floresta - Mato Grosso  
February 2015











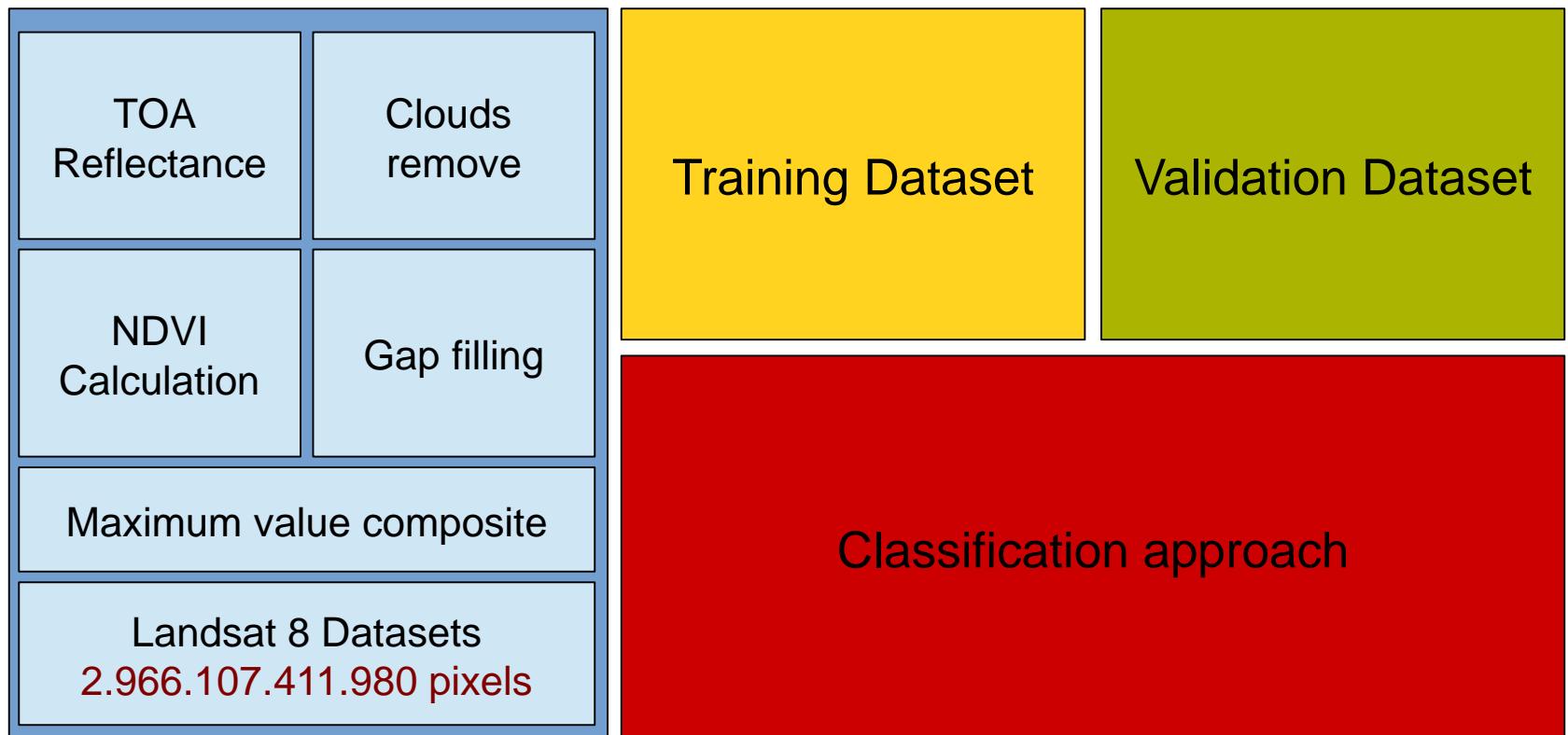
# Pasturelands in Brazil

What does Landsat imagery show?

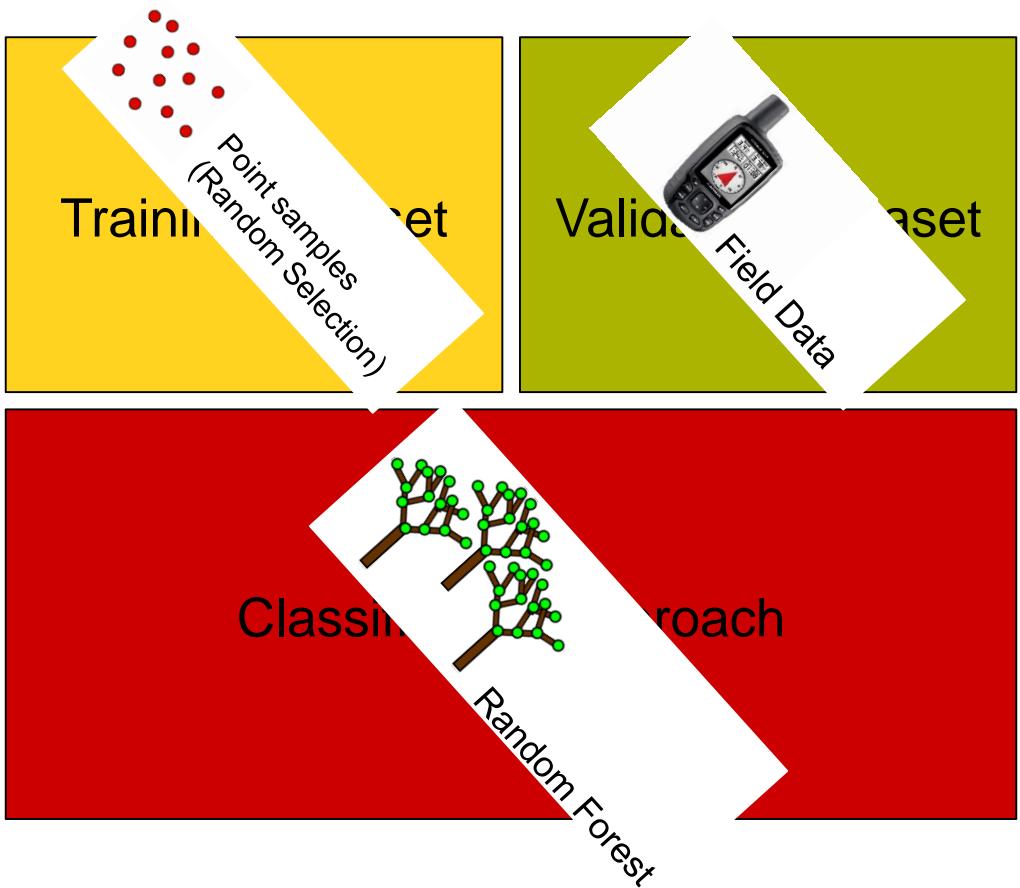
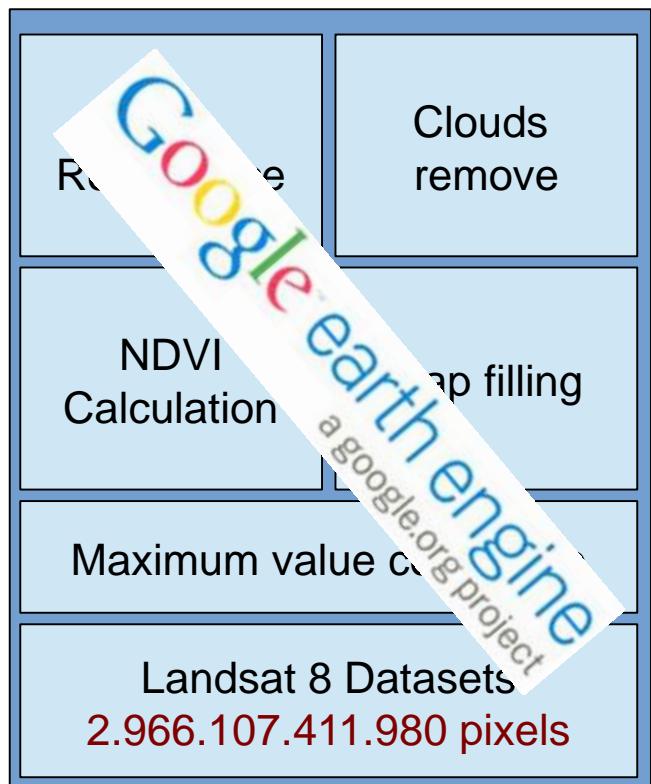


Jussara - Goiás  
April 2015

# Solution blocks



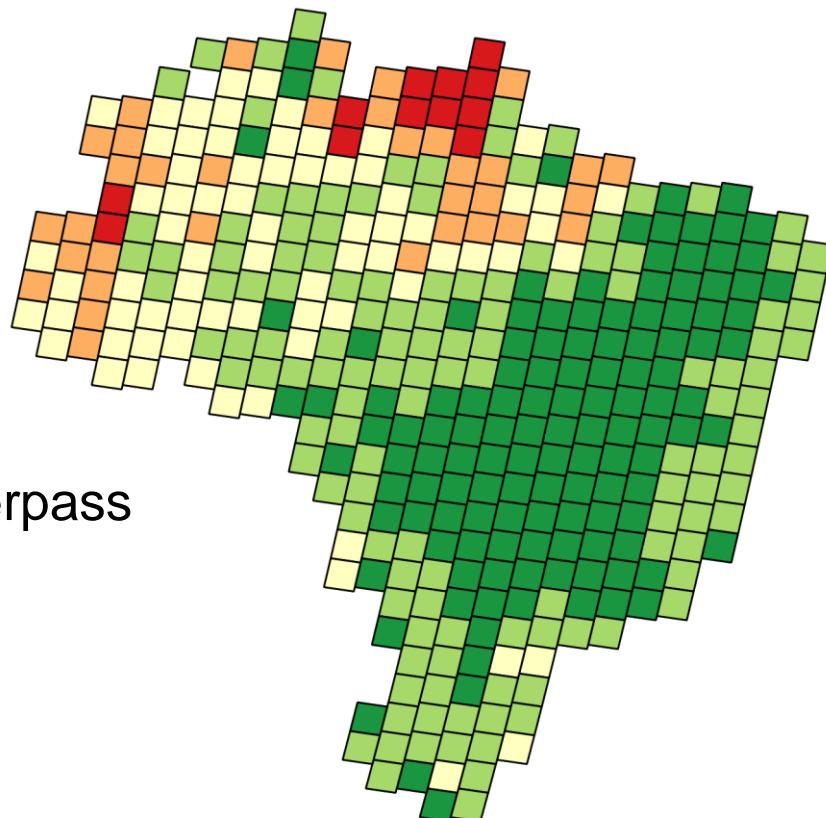
# Solution blocks



# Landsat 8 Datasets

## Landsat 8 - LT1: Available tiles and overpasses for Brazil *Apr,2013 until Mar,2015*

Maximum possible overpasses: 47



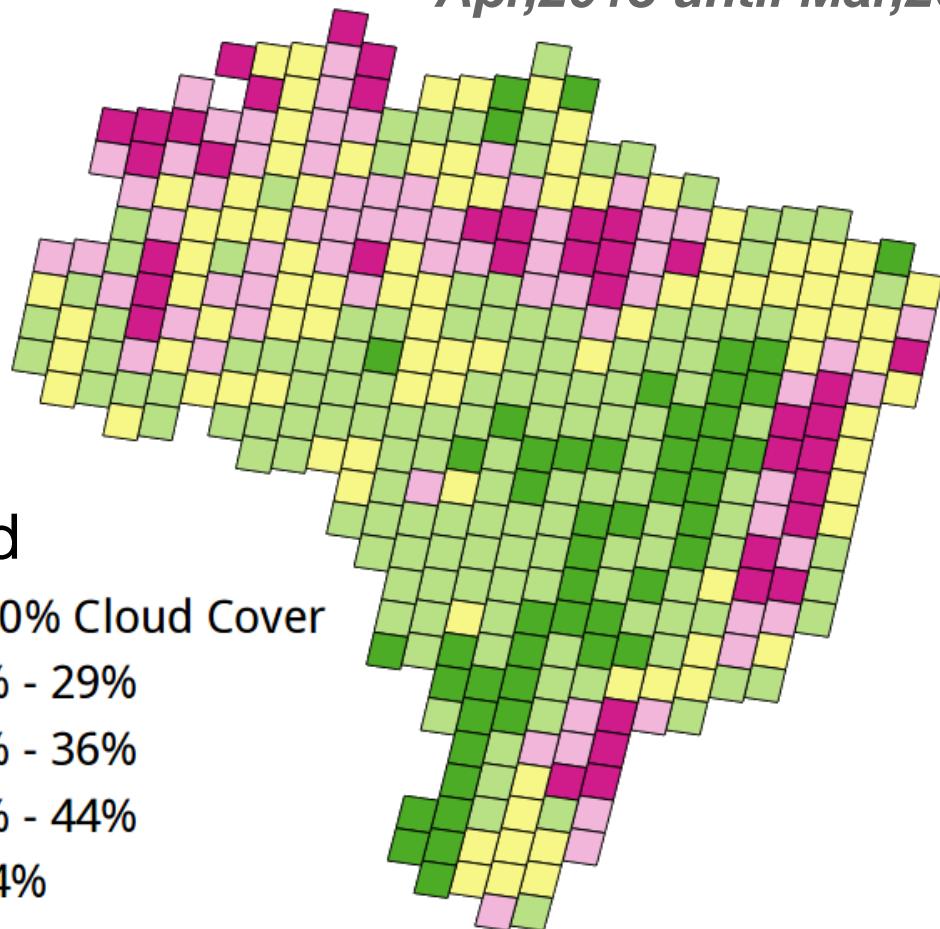
### Legend

- █ <= 10 Overpass
- █ 10 - 21
- █ 21 - 29
- █ 29 - 35
- █ > 35

# Landsat 8 Datasets

## Landsat 8 - L1T: Mean cloud cover (per tile)

*Apr,2013 until Mar,2015*

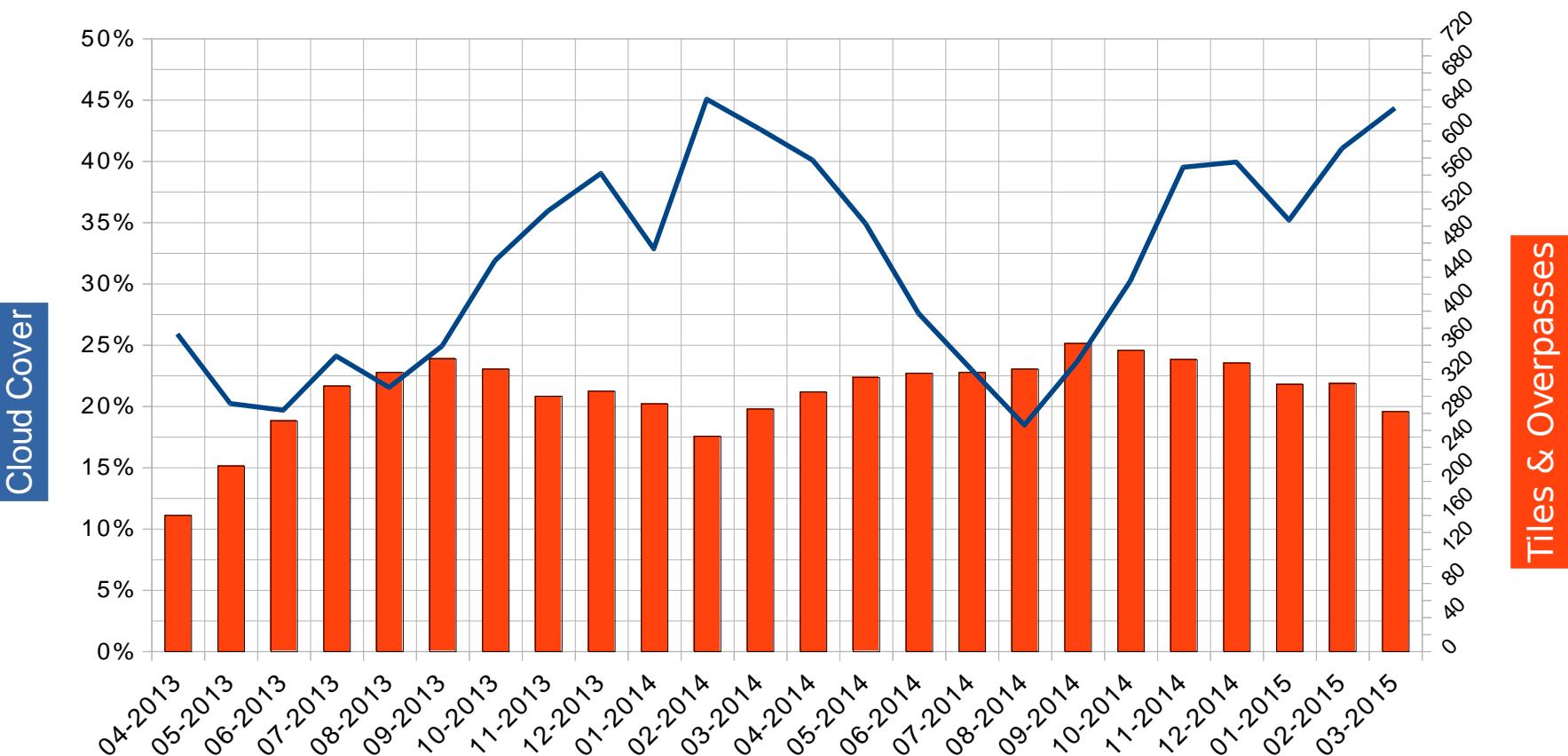


### Legend

- [Dark Green] <= 20% Cloud Cover
- [Light Green] 20% - 29%
- [Yellow] 29% - 36%
- [Pink] 36% - 44%
- [Magenta] > 44%

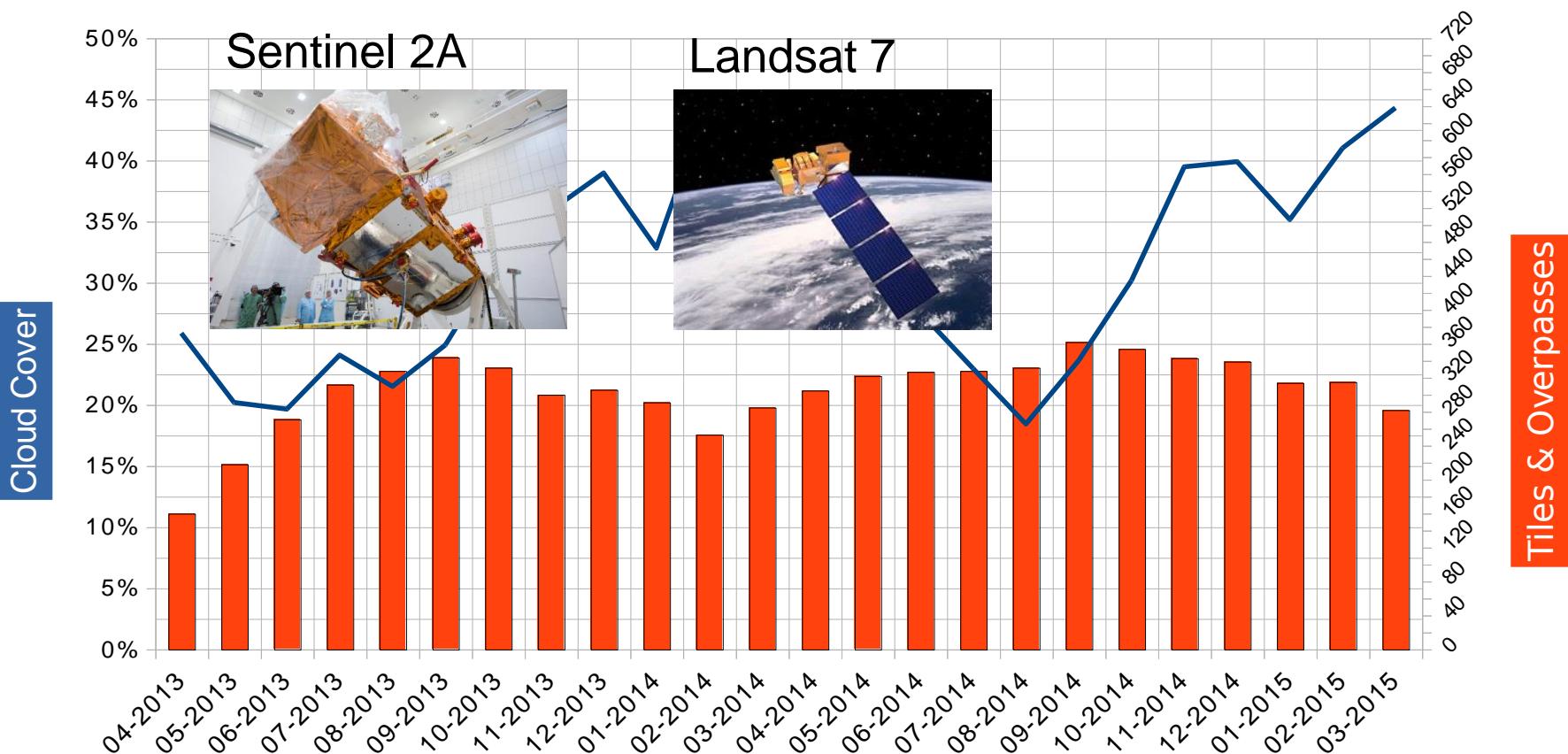
# Landsat 8 Datasets

## Landsat 8 L1T: Mean cloud cover for Brazil *Apr,2013 until Mar,2015*



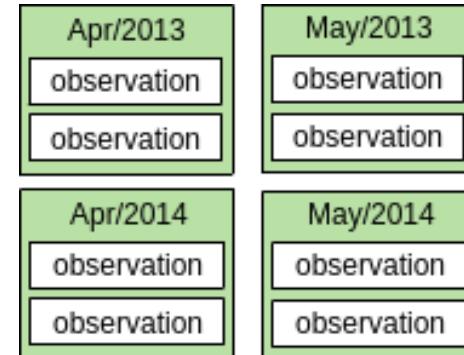
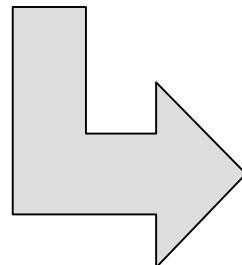
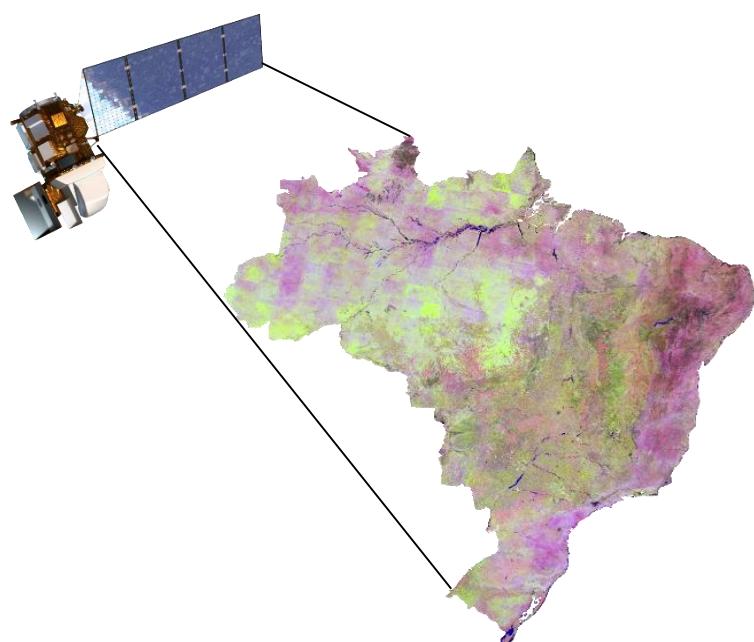
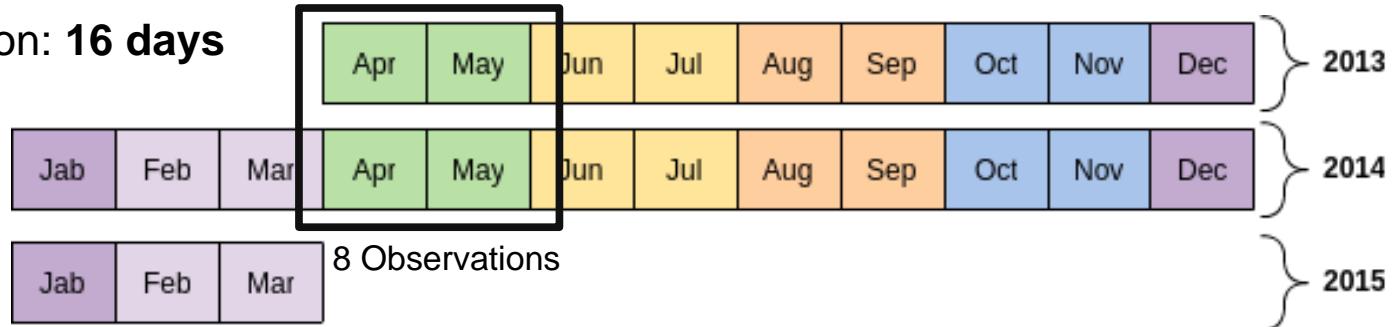
# Landsat 8 Datasets

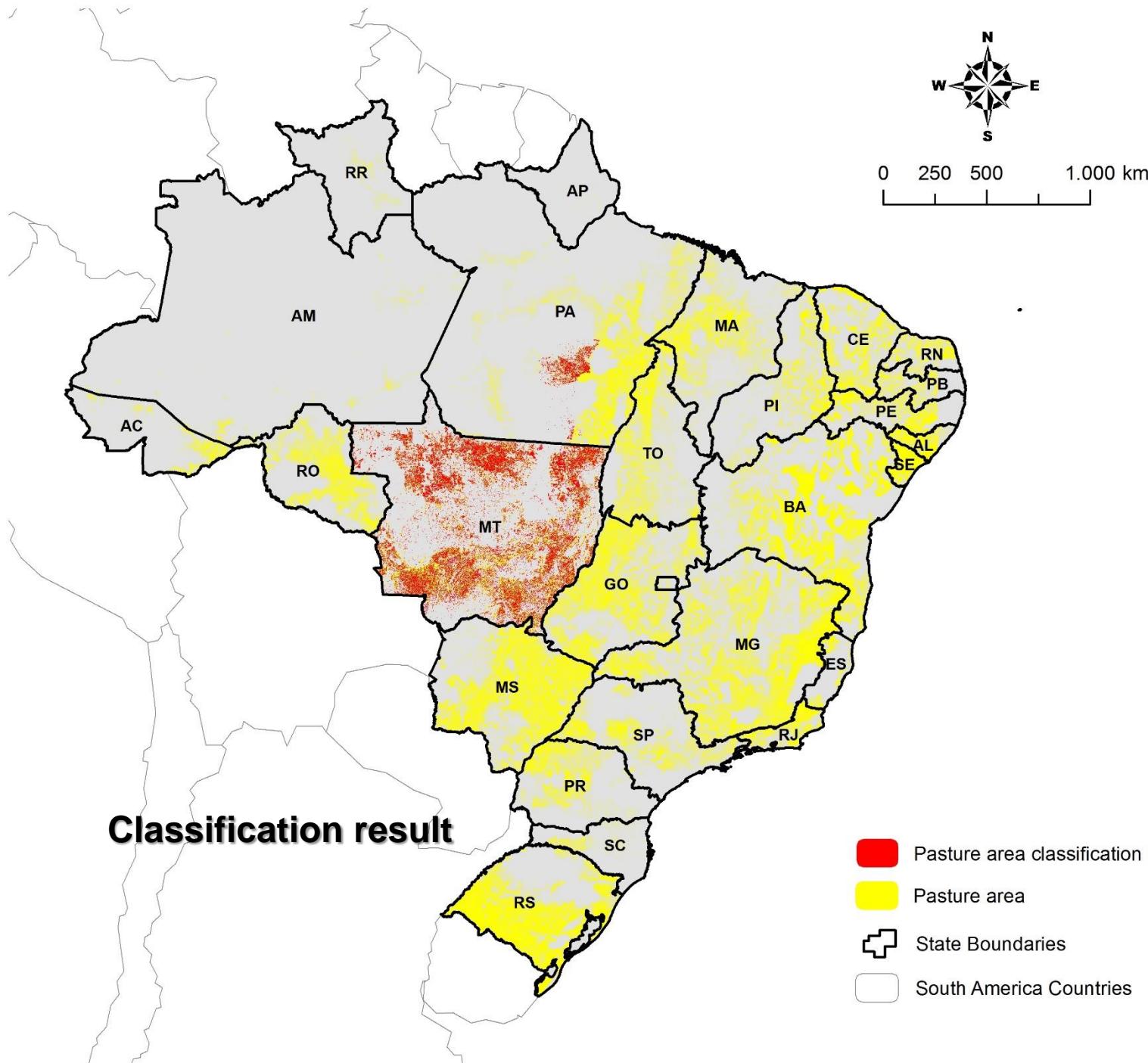
## Landsat 8 L1T: Mean cloud cover for Brazil *Apr,2013 until Mar,2015*



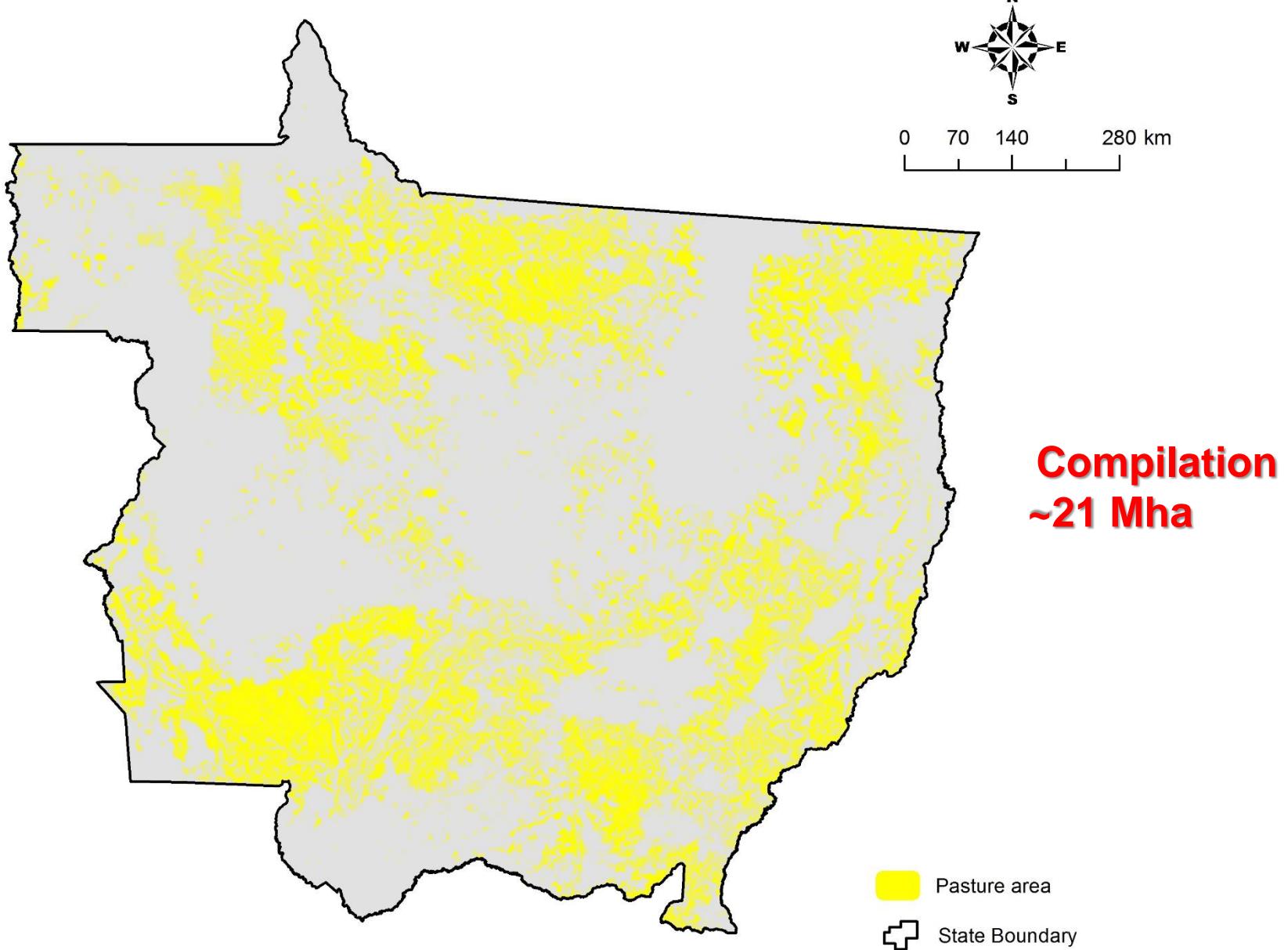
# Maximum Value Composite (NDVI)

Temporal resolution: **16 days**

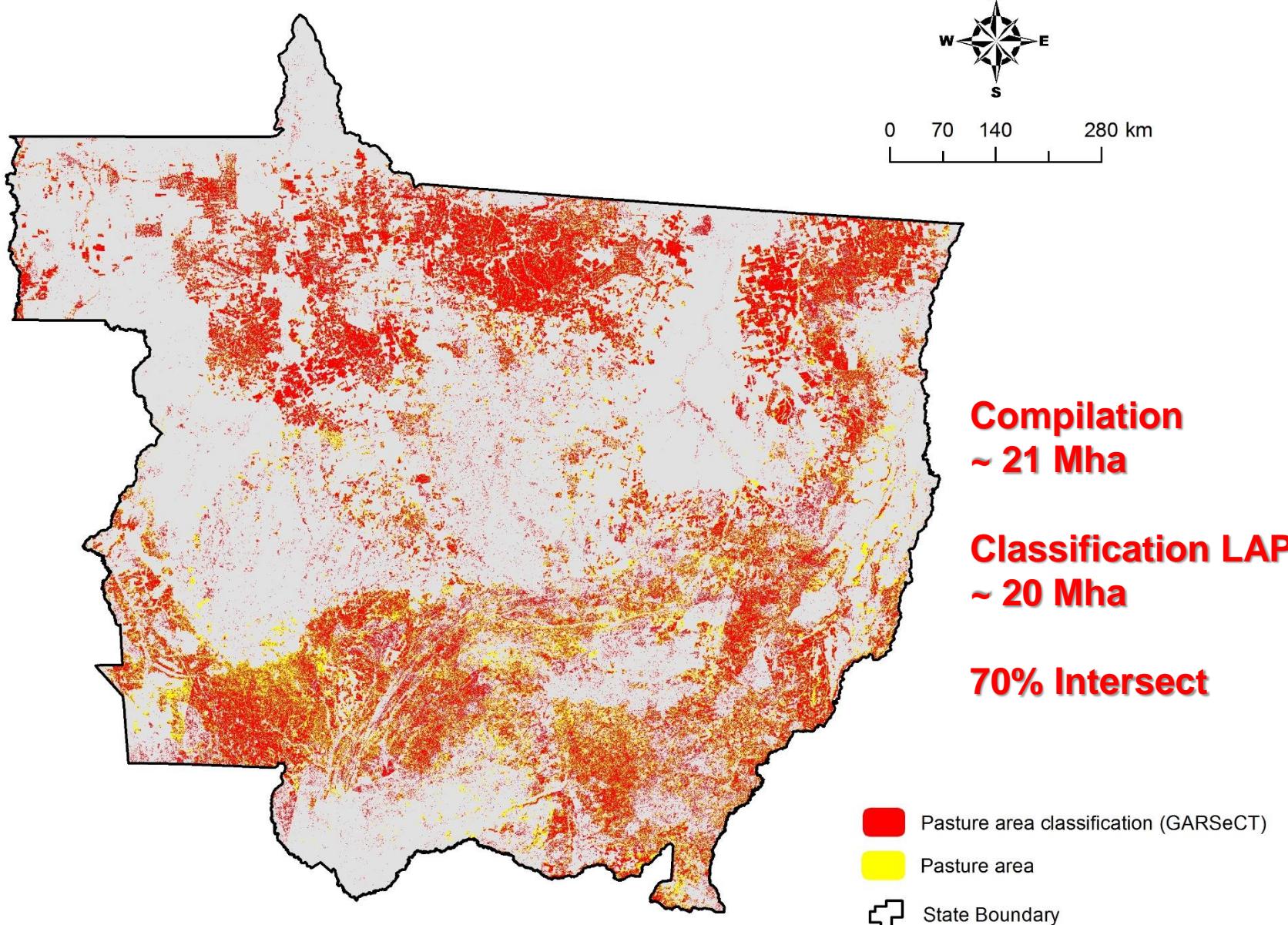




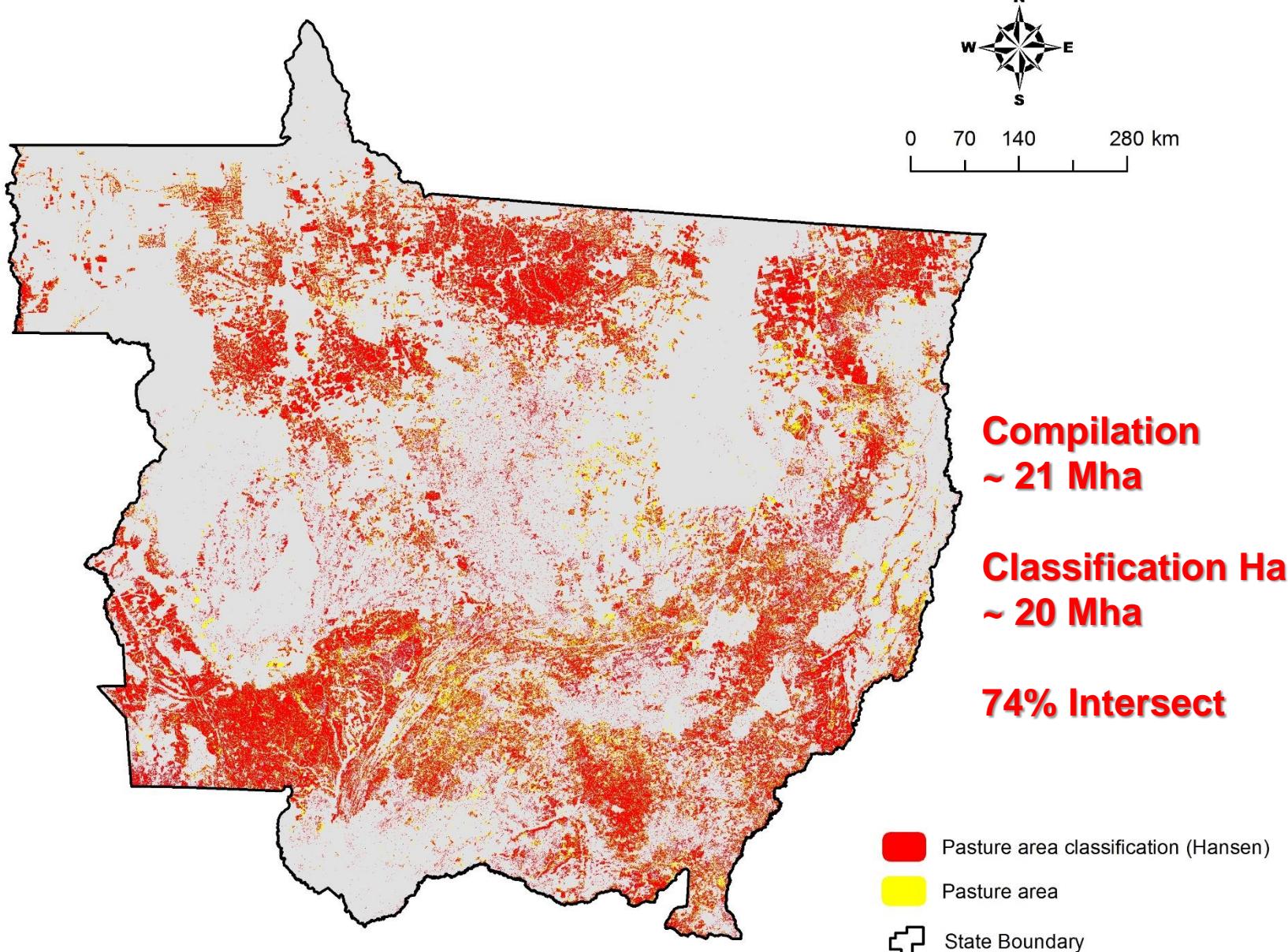
- Pasture area classification (GARSeCT)
- Pasture area
- State Boundaries
- South America Countries



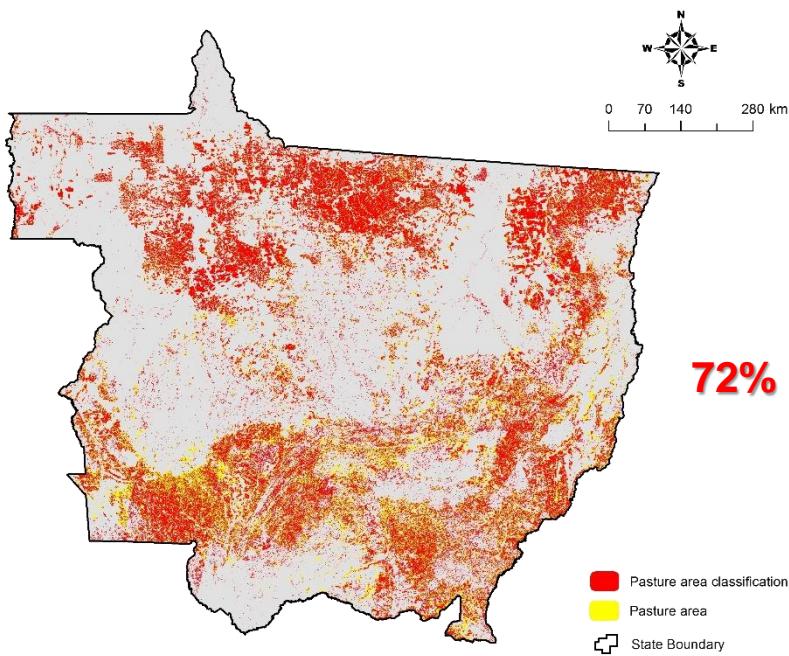
**Compilation result**



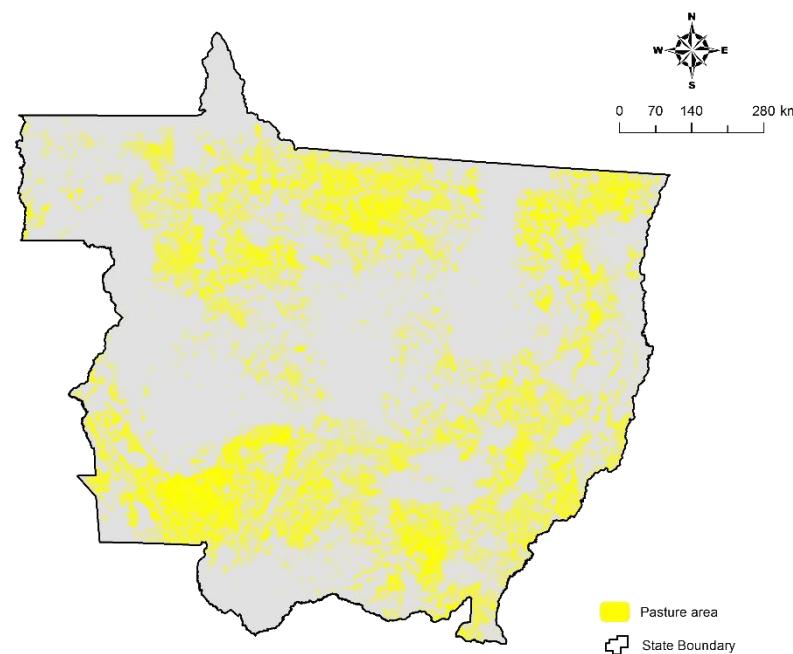
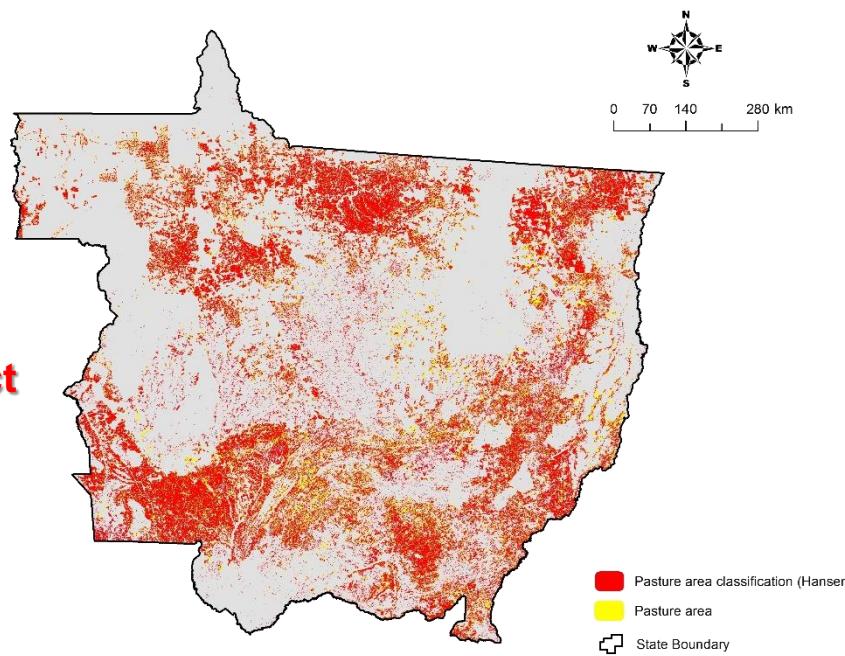
**Classification result (LAPIG)**

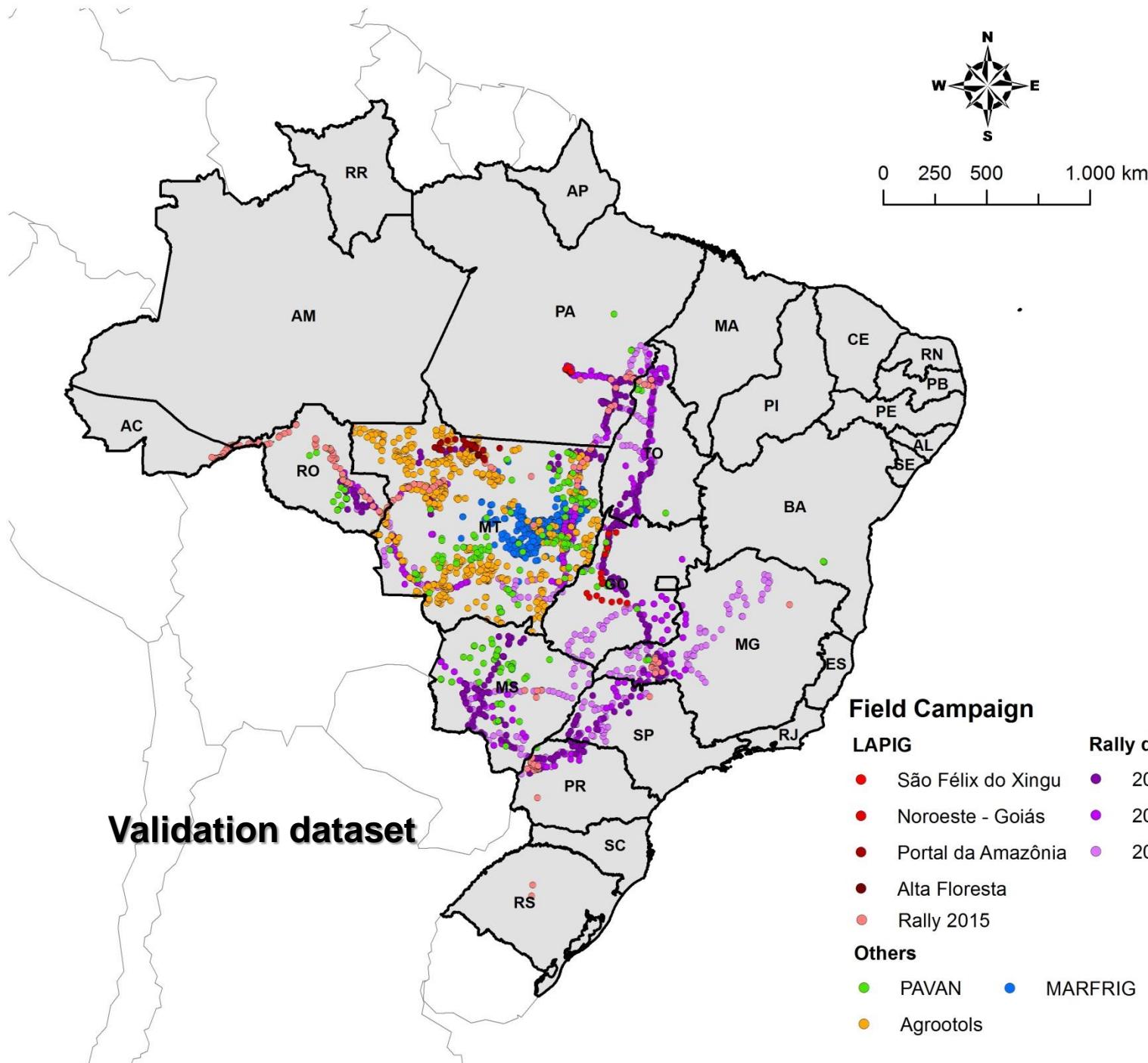


**Classification result (Mathew Hansen - UMD)**



72% Intersect





# Understanding Degradation

How to map and monitor it?



Divinópolis - Tocantins  
June 2015

# What does pasture degradation mean?

Degradation - a **decline to a lower condition, quality or level**

Degradation requires **a previous state or condition in time.**

It varies according to:

## Location



## Forage species



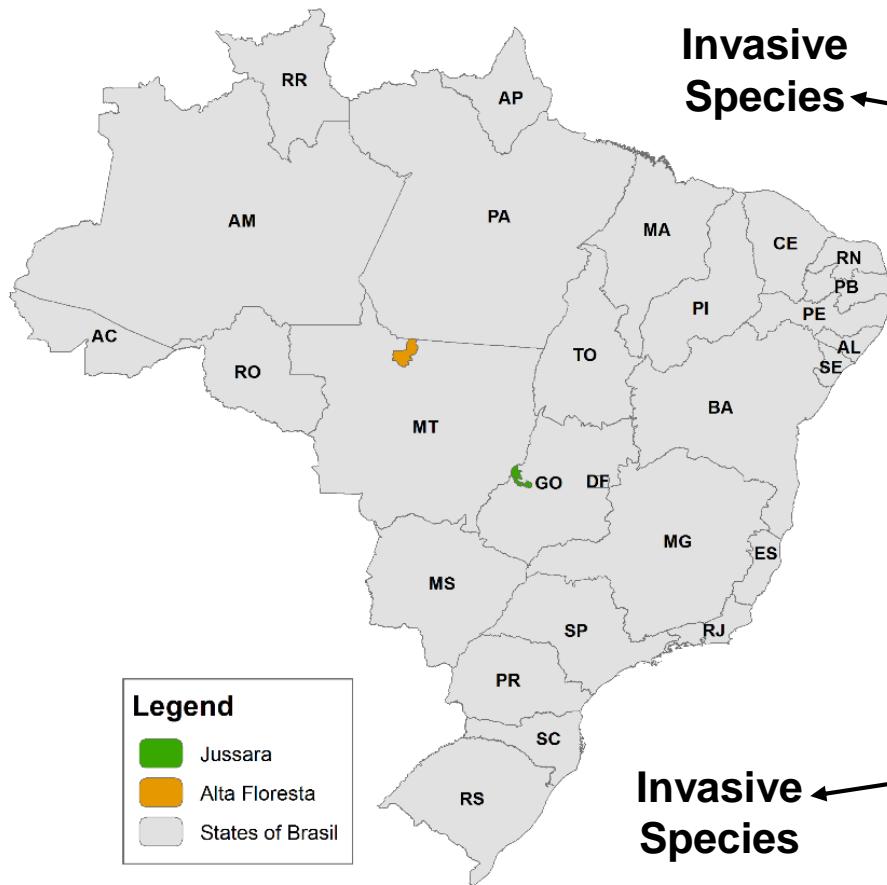
Mombaça



Braquiário

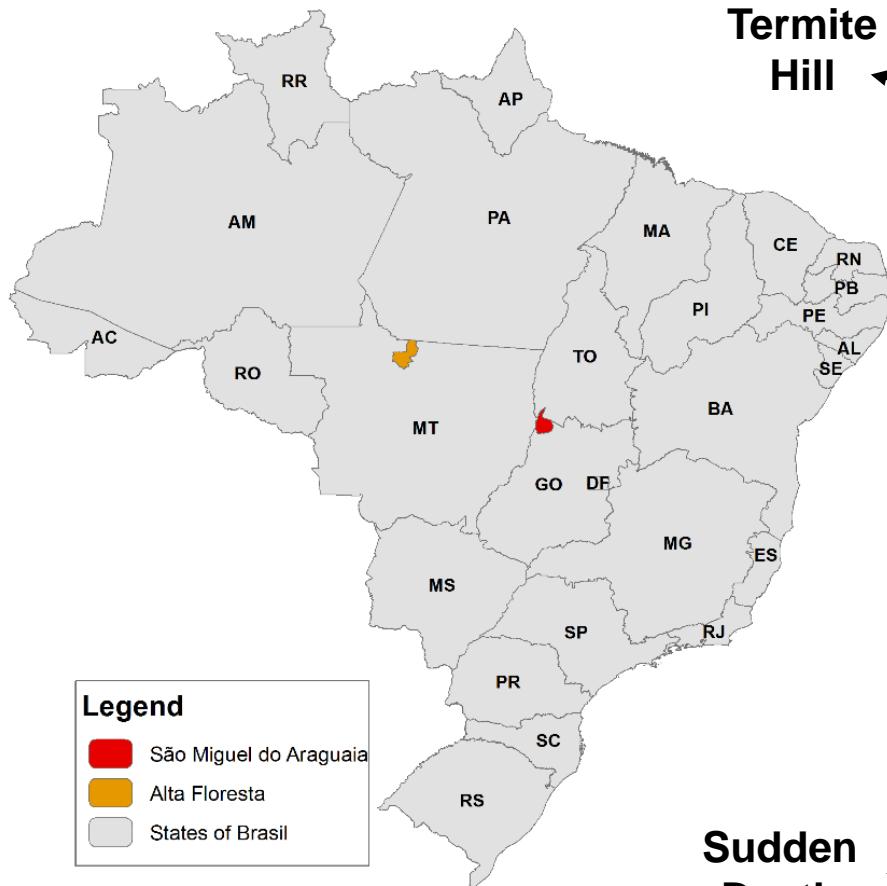
# What does pasture degradation mean?

## “Agronomic Degradation”



# What does pasture degradation mean?

## “Ecological Degradation”

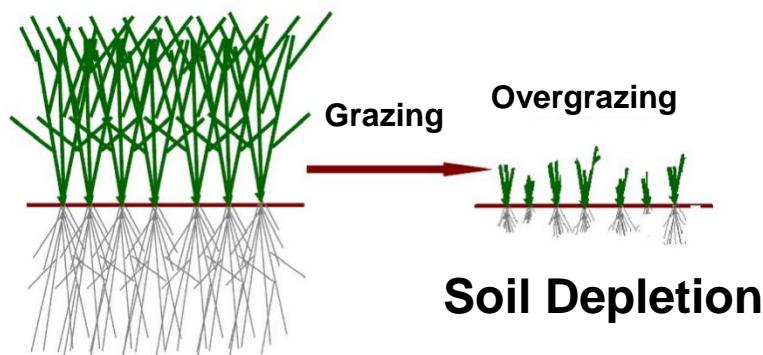
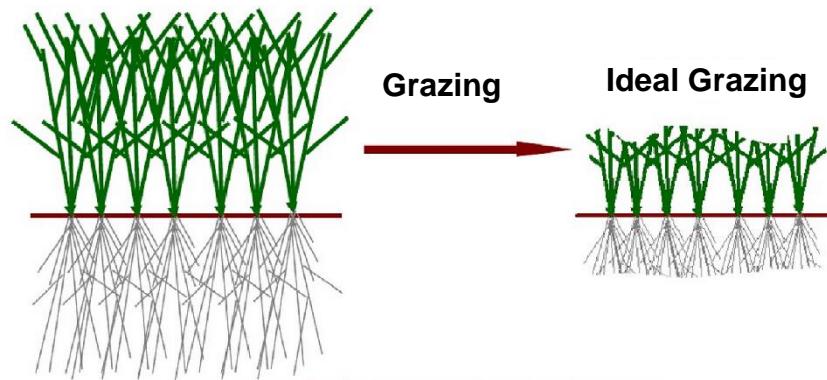


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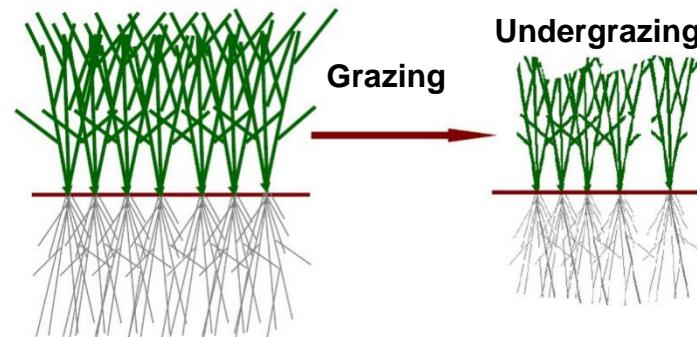
## Pasture Degradation



## Soil Degradation



## Soil Depletion



## Encroachment and Lignin Enhancement

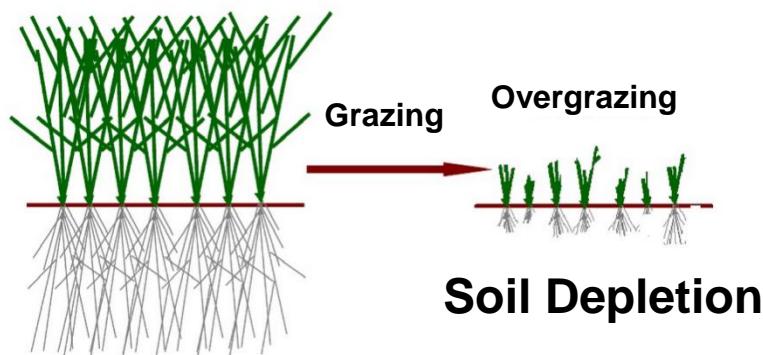
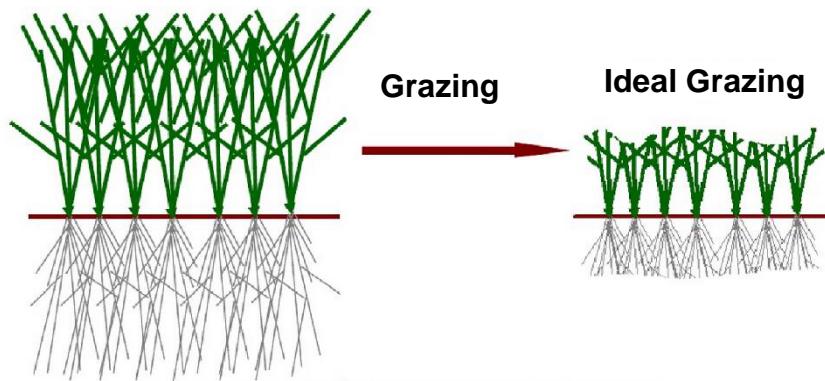
# What does pasture degradation mean?

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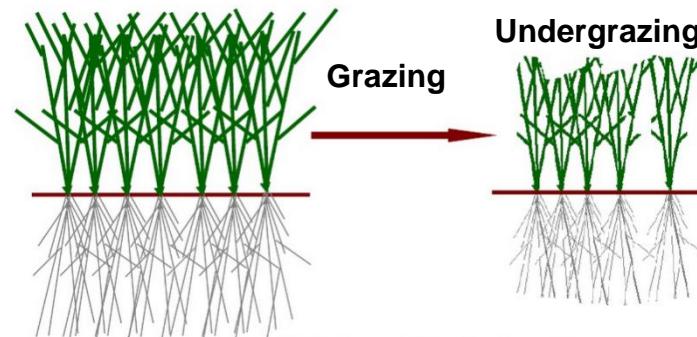


## Soil Degradation

Temporal  
Domain!!

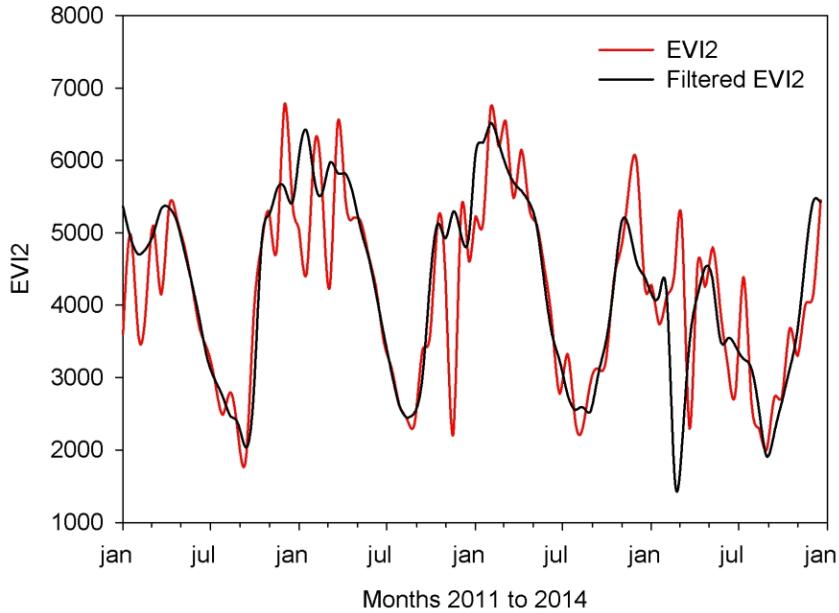


Soil Depletion

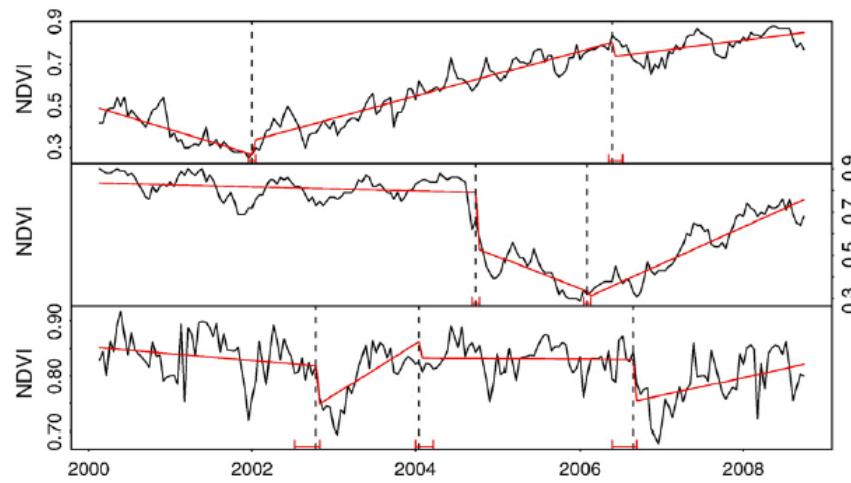
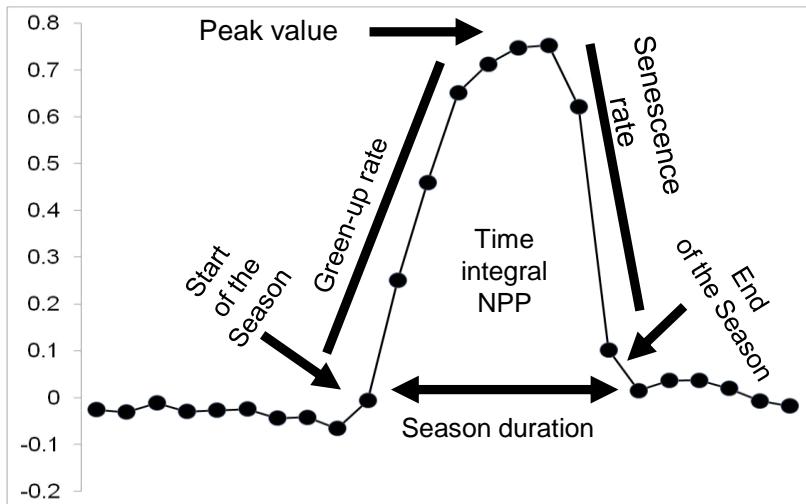


Encroachment and Lignin Enhancement

# Pasture Quality Metrics



Large Seasonal Patterns  
Pasture Quality → “Noise”



# Using forage level as a proxy...

Can optical remote sensing detect pasture degradation?

Douradinho Farm  
31/10/2013

2670 kg / ha / year

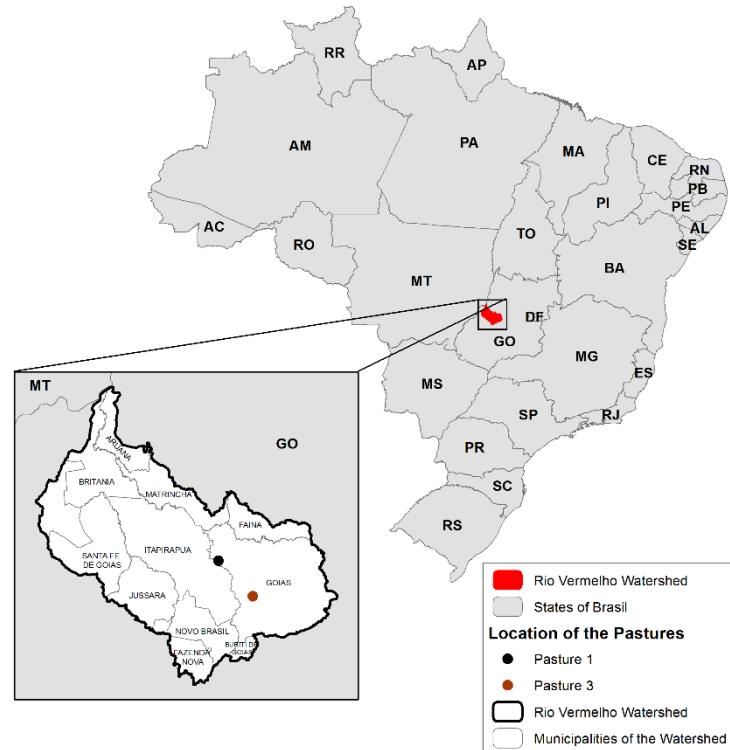
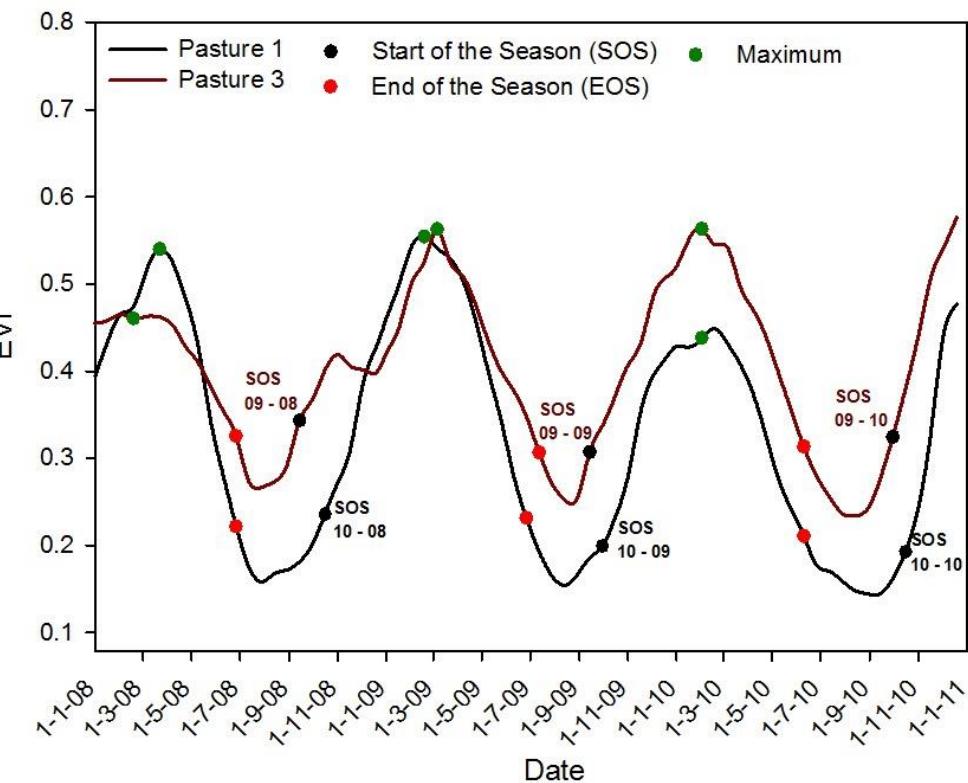


Gloria Farm  
31/10/2013

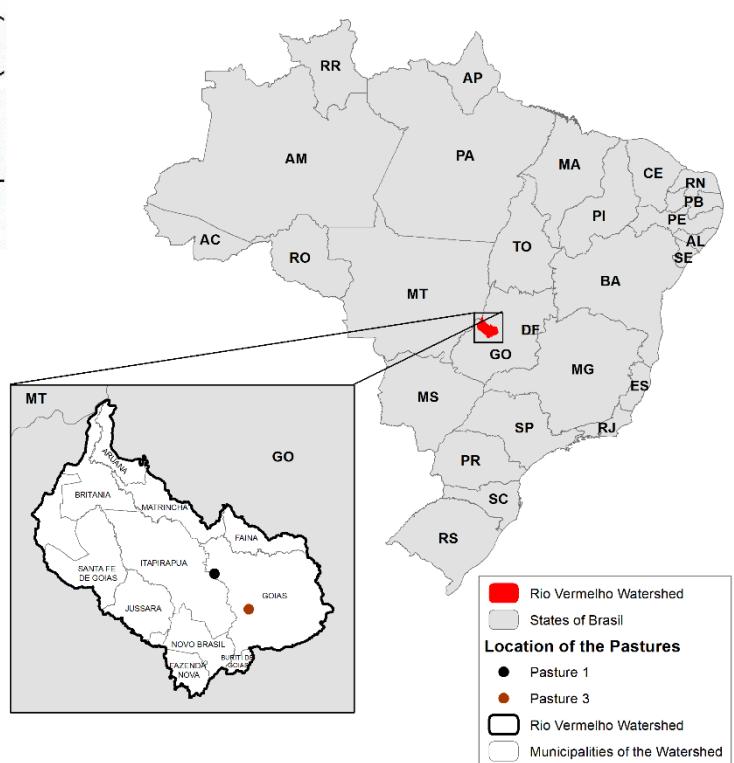
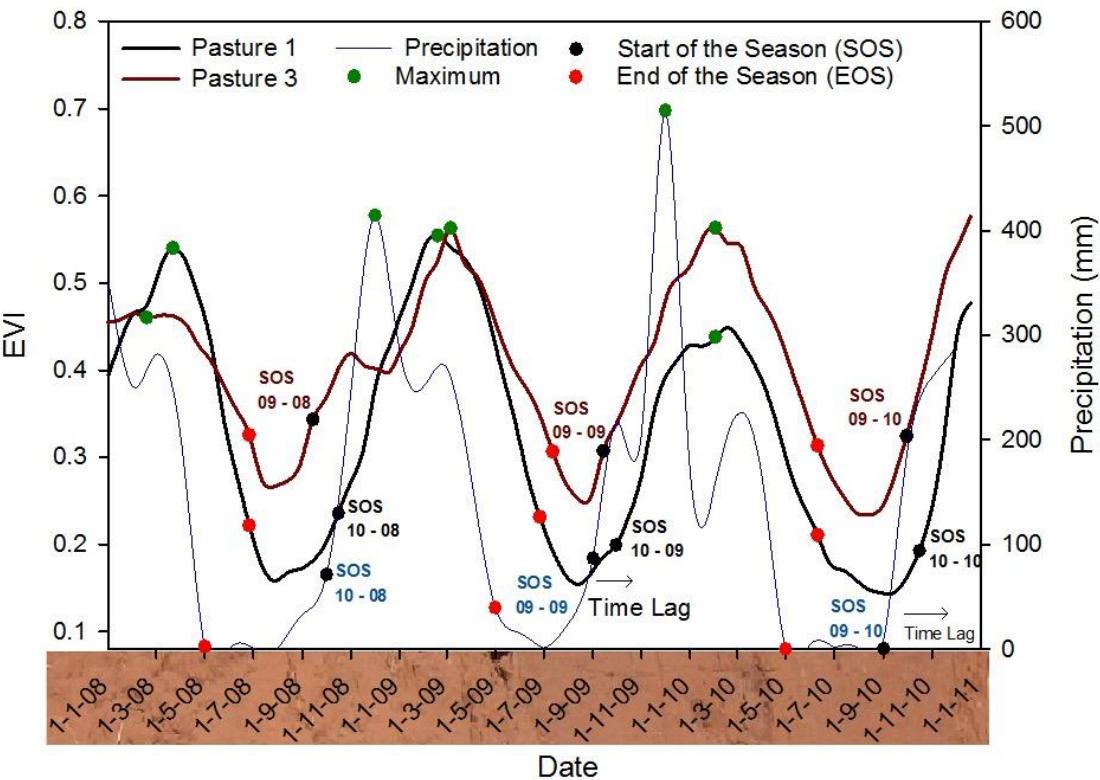
5216 kg / ha / year



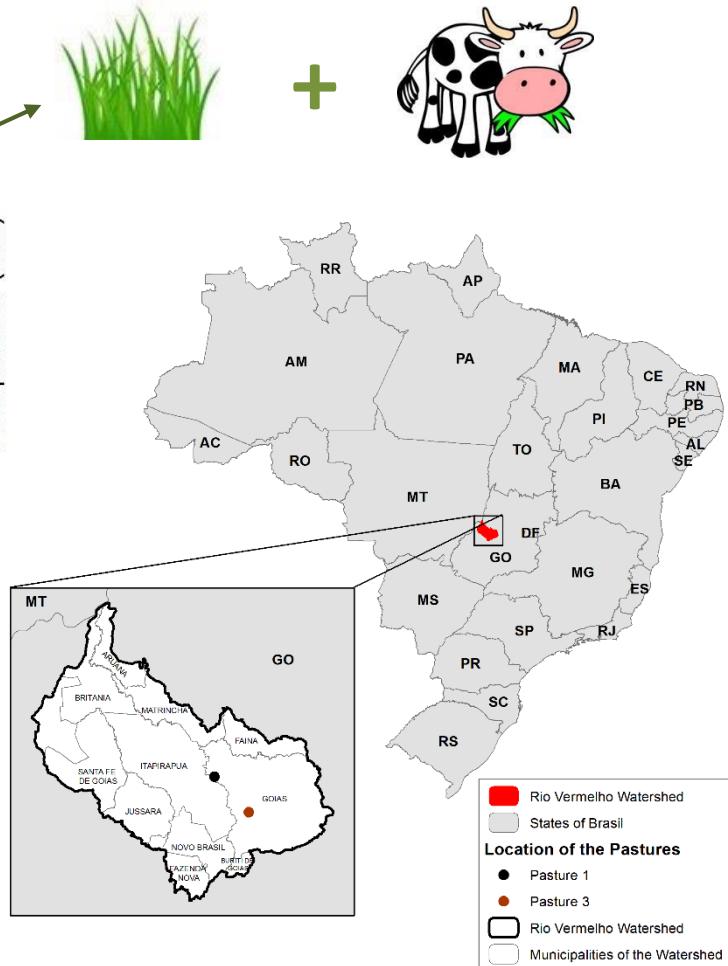
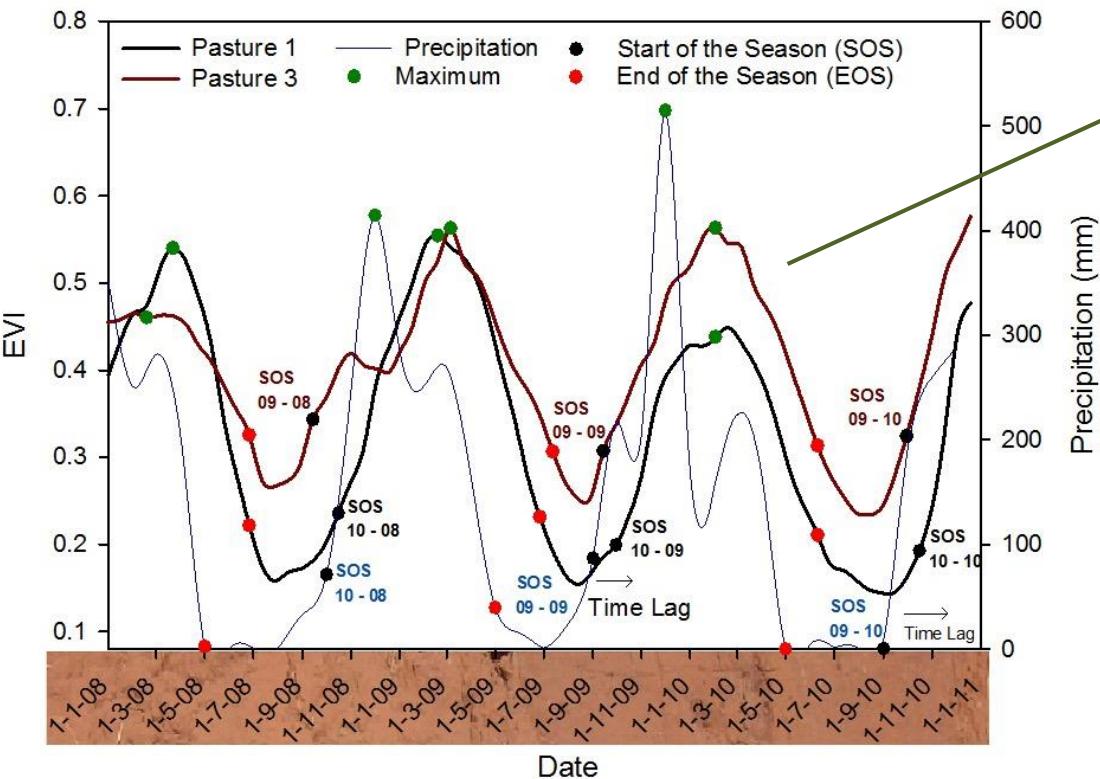
# EVI Responses to Quality / Degradation stages?



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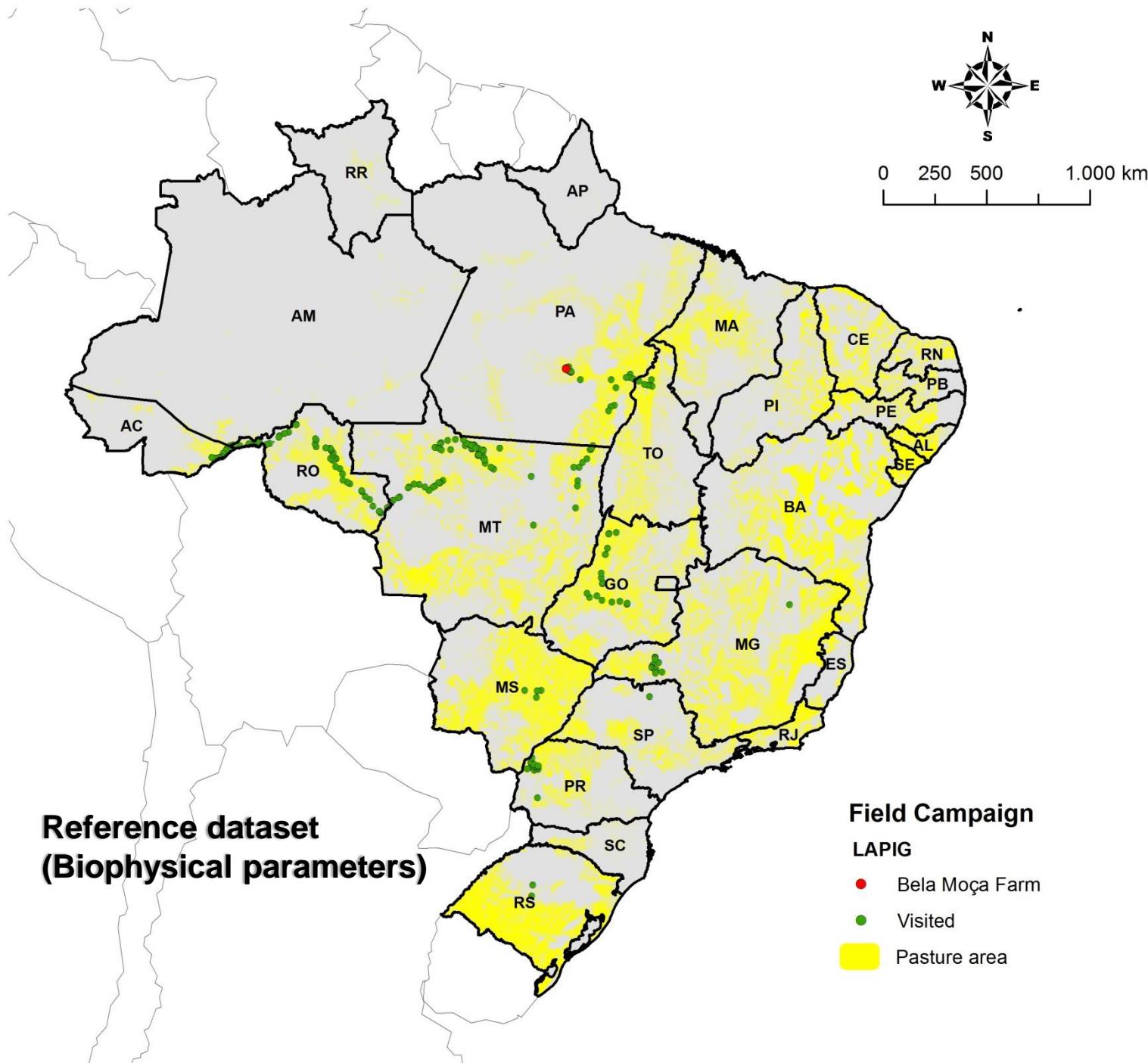
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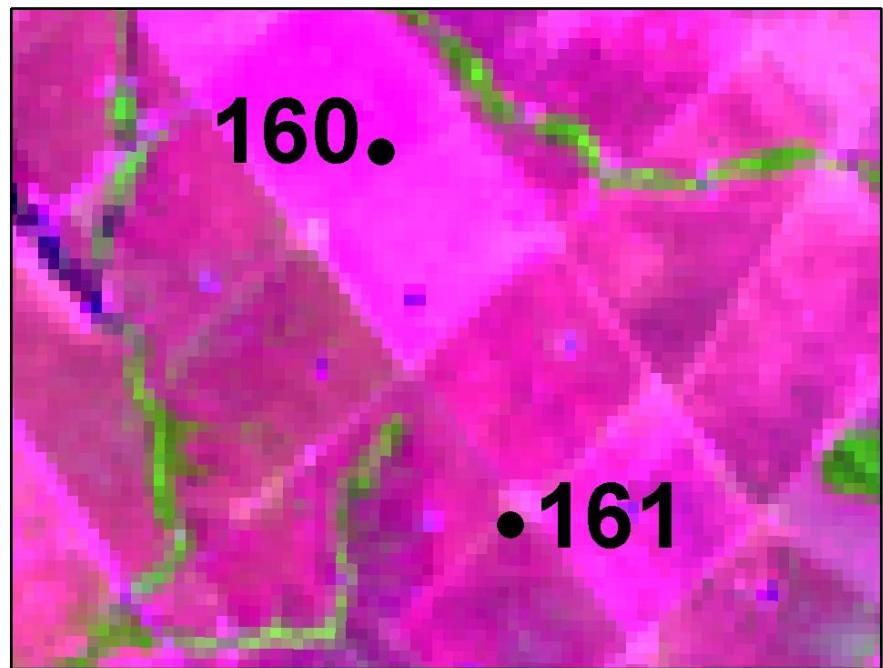
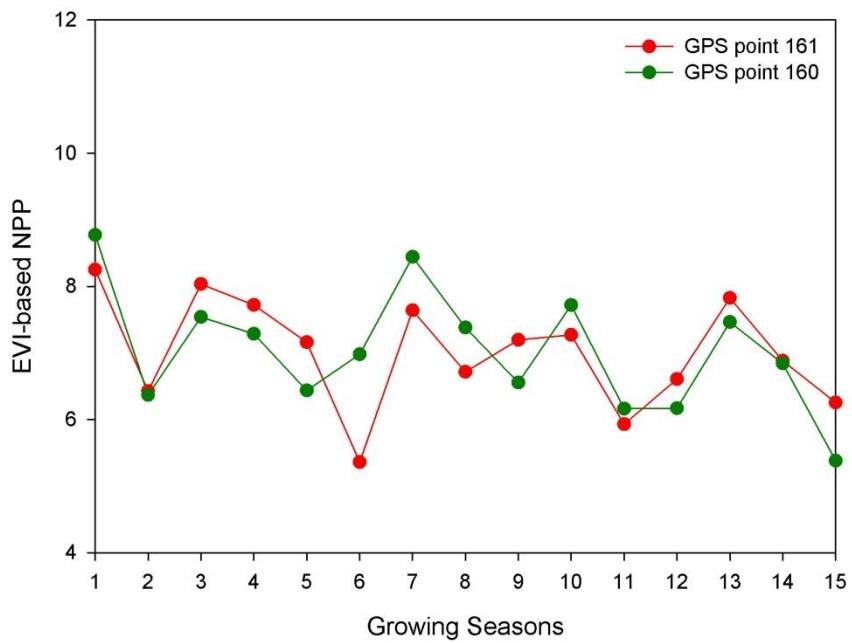


# Pasture Trends

Alta Floresta – Mato Grosso  
February 2015

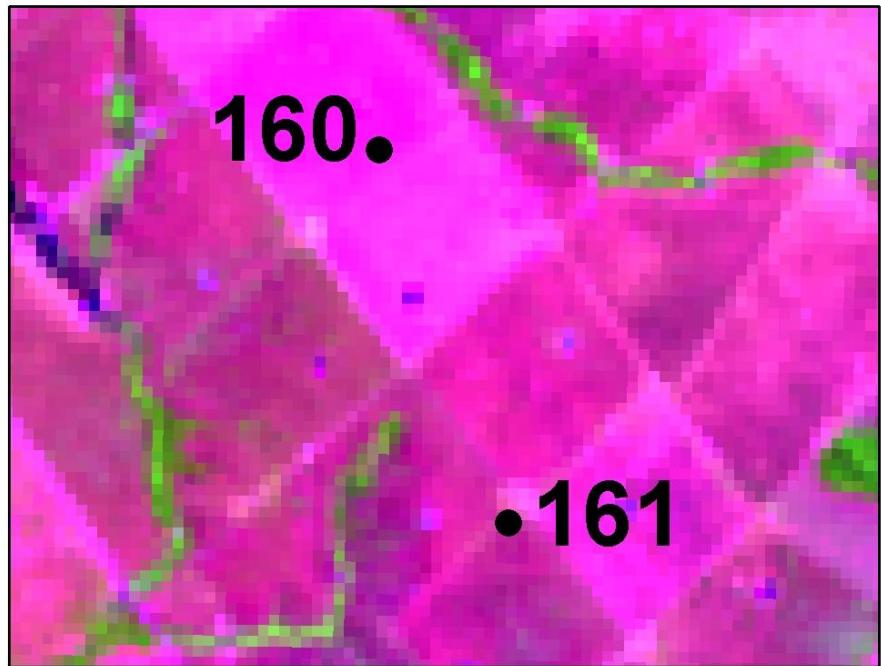
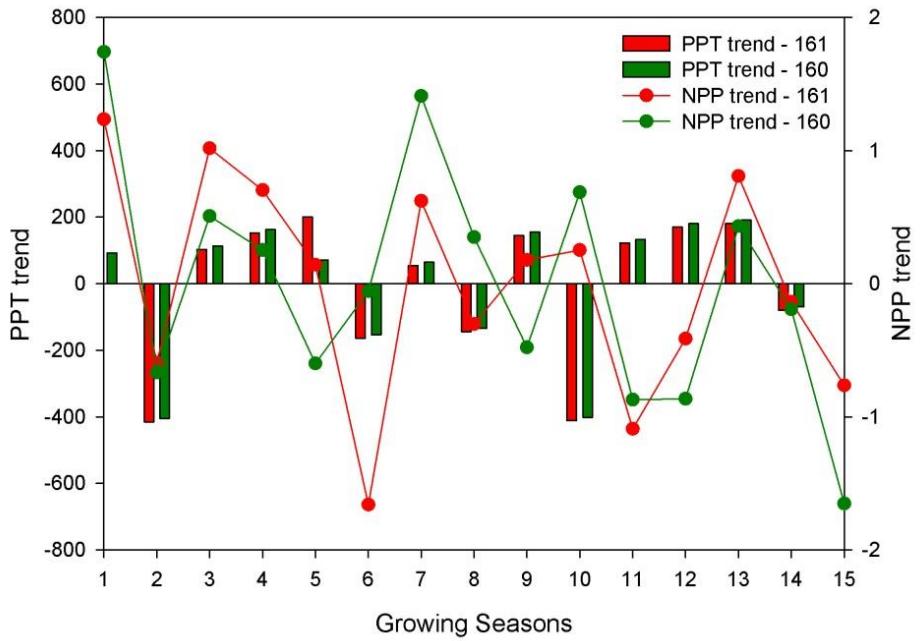


# Bela Moça Farm – São Felix do Xingu Pará



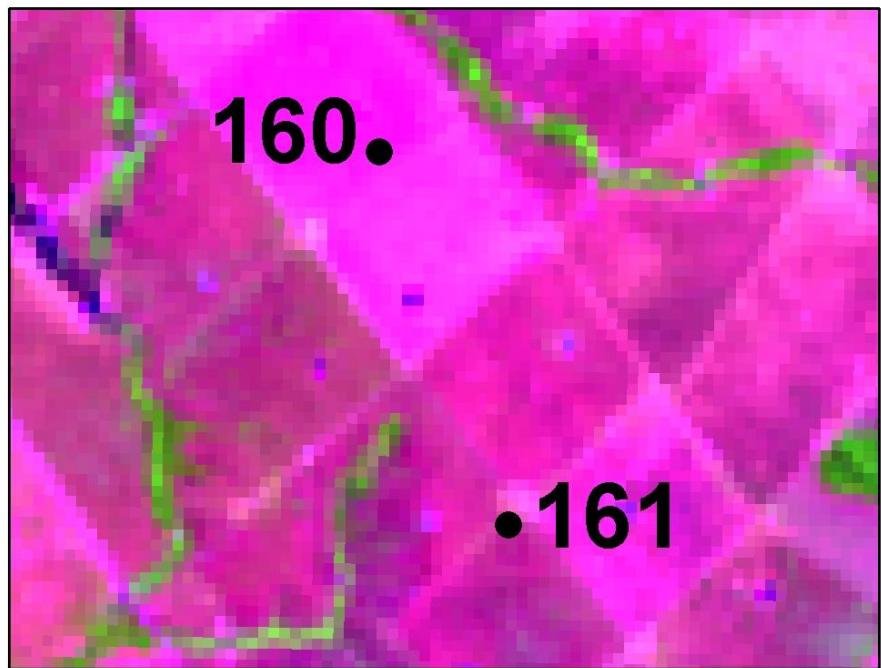
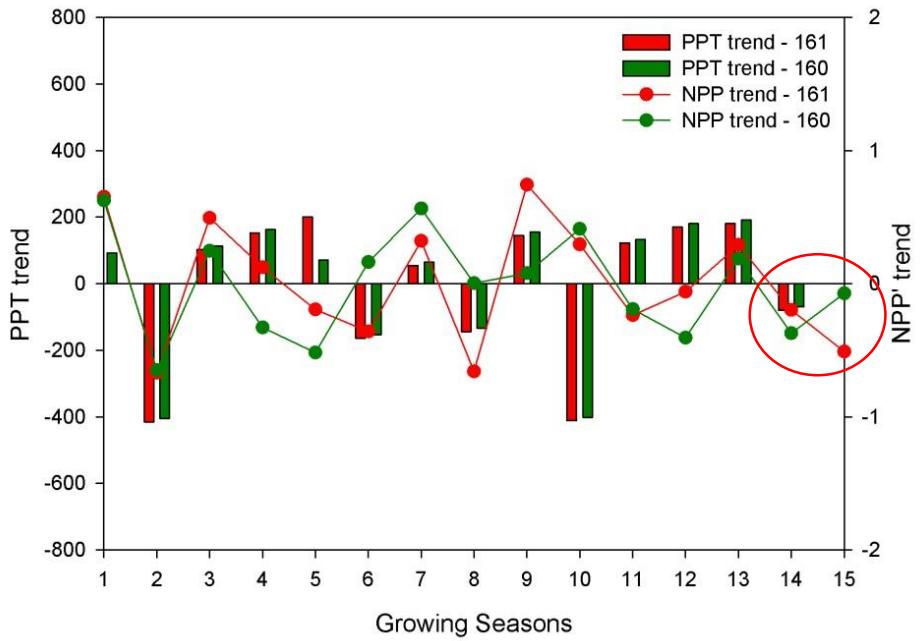
Landsat 8 225/65 – September 14, 2014

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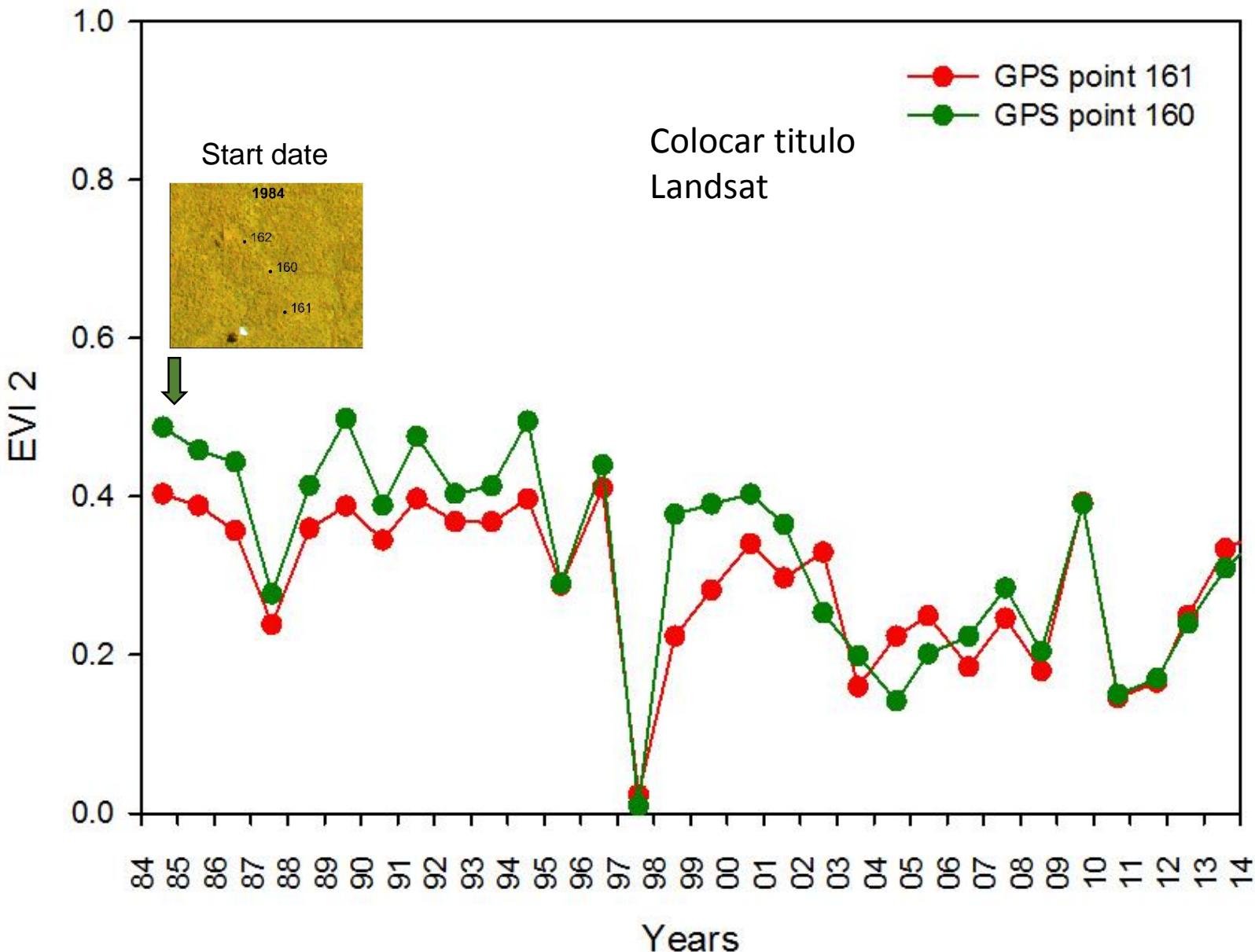
Landsat 8 225/65 – September 14, 2014

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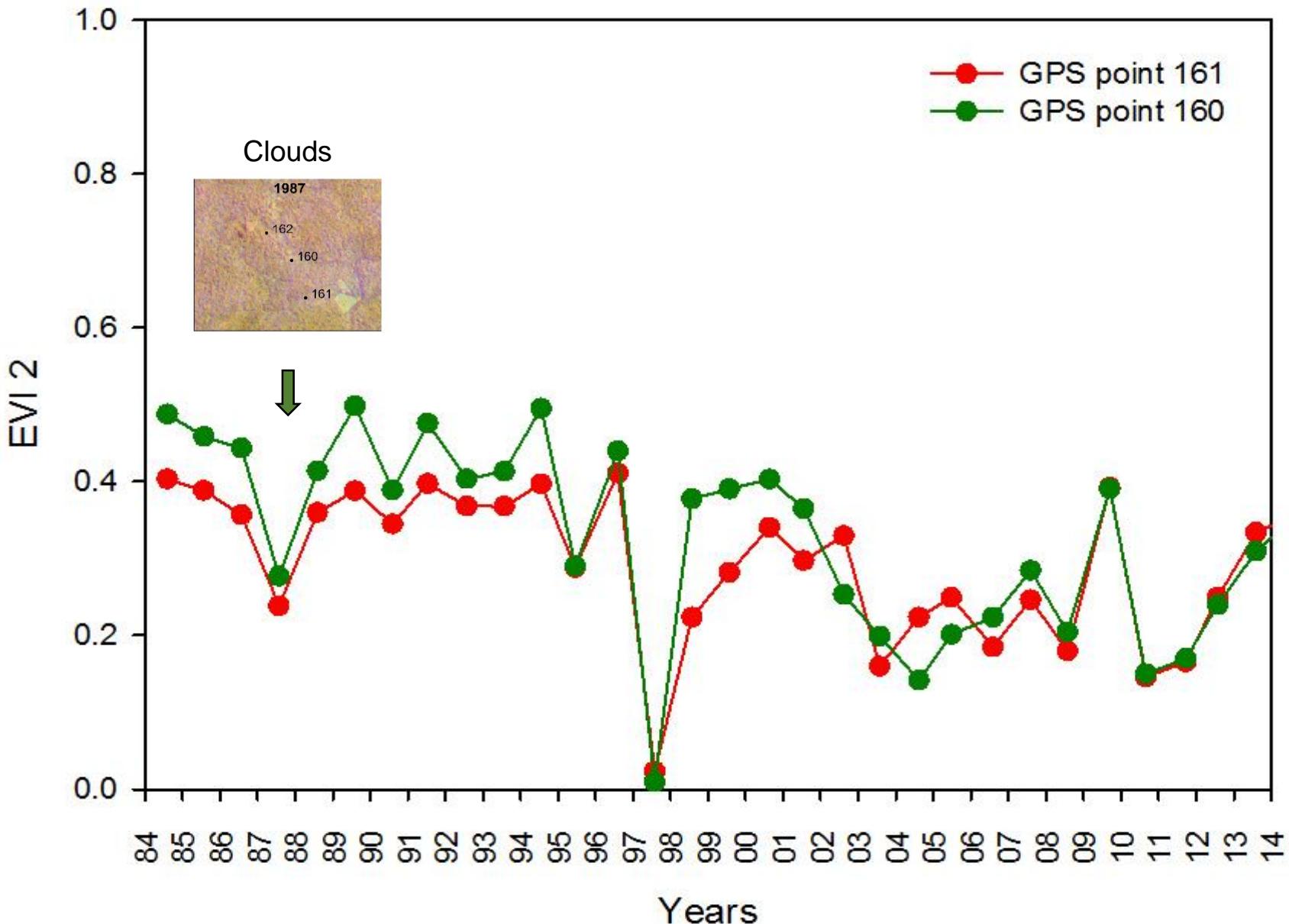


Landsat 8 225/65 – September 14, 2014

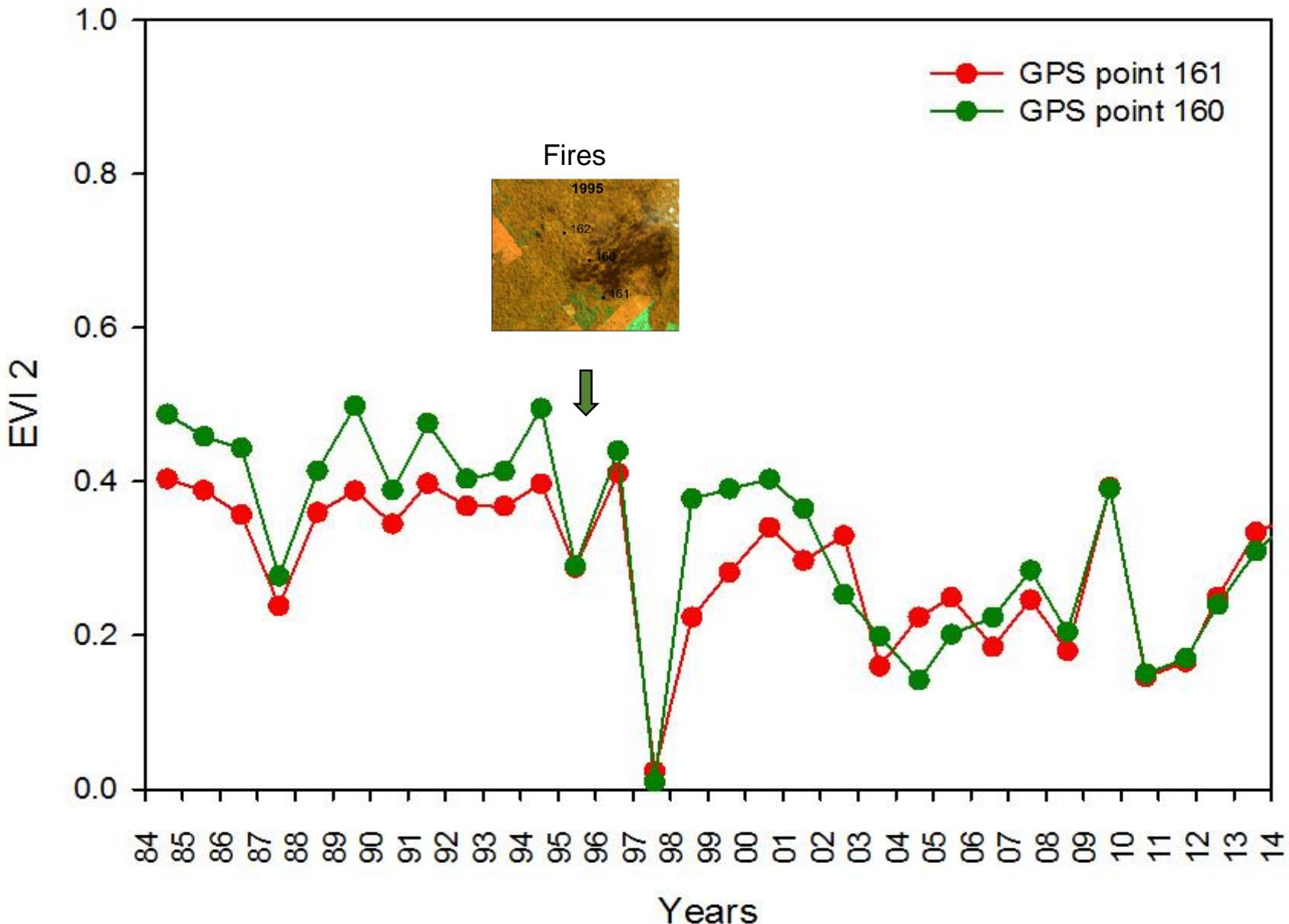
# Bela Moça Farm – Landsat Time Series



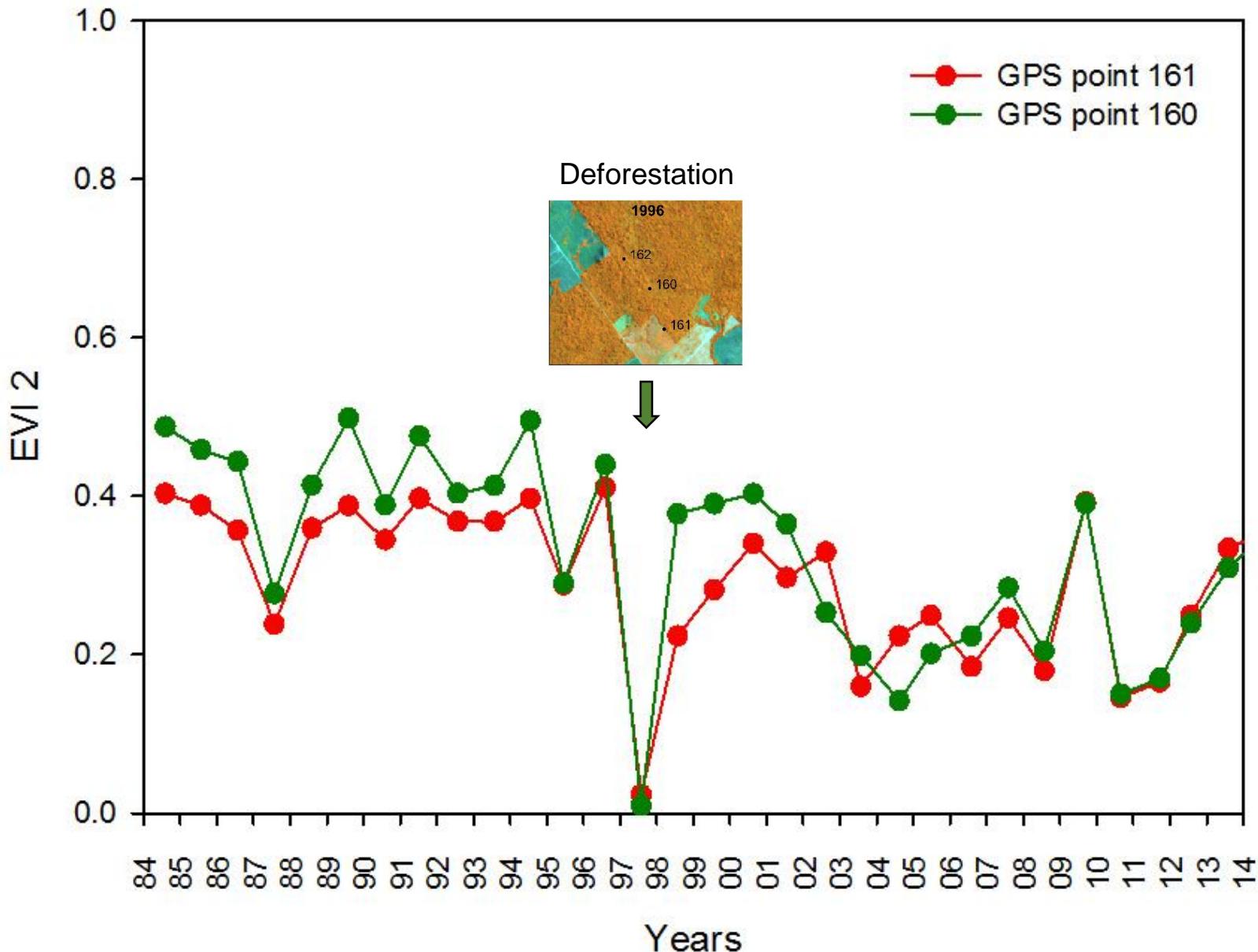
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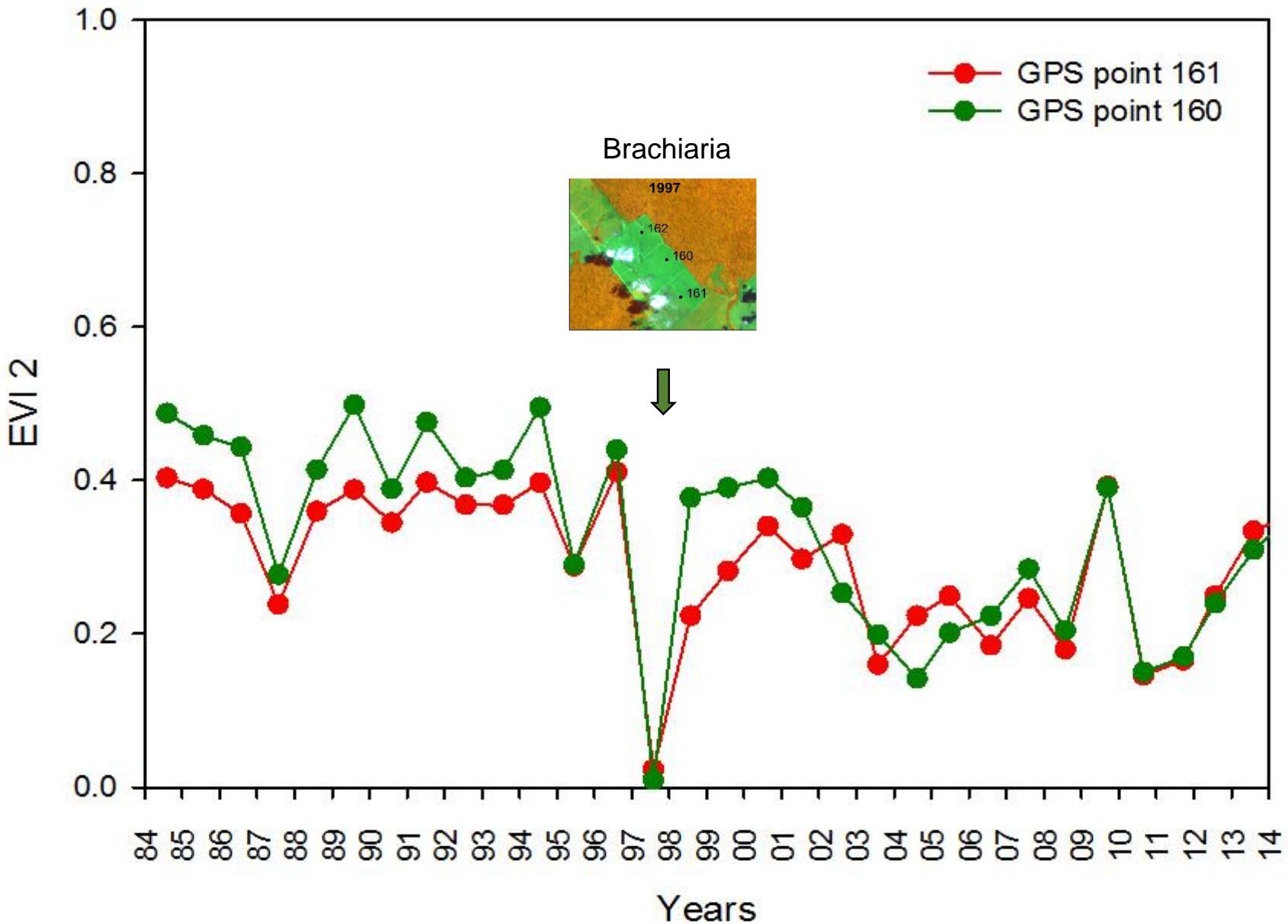
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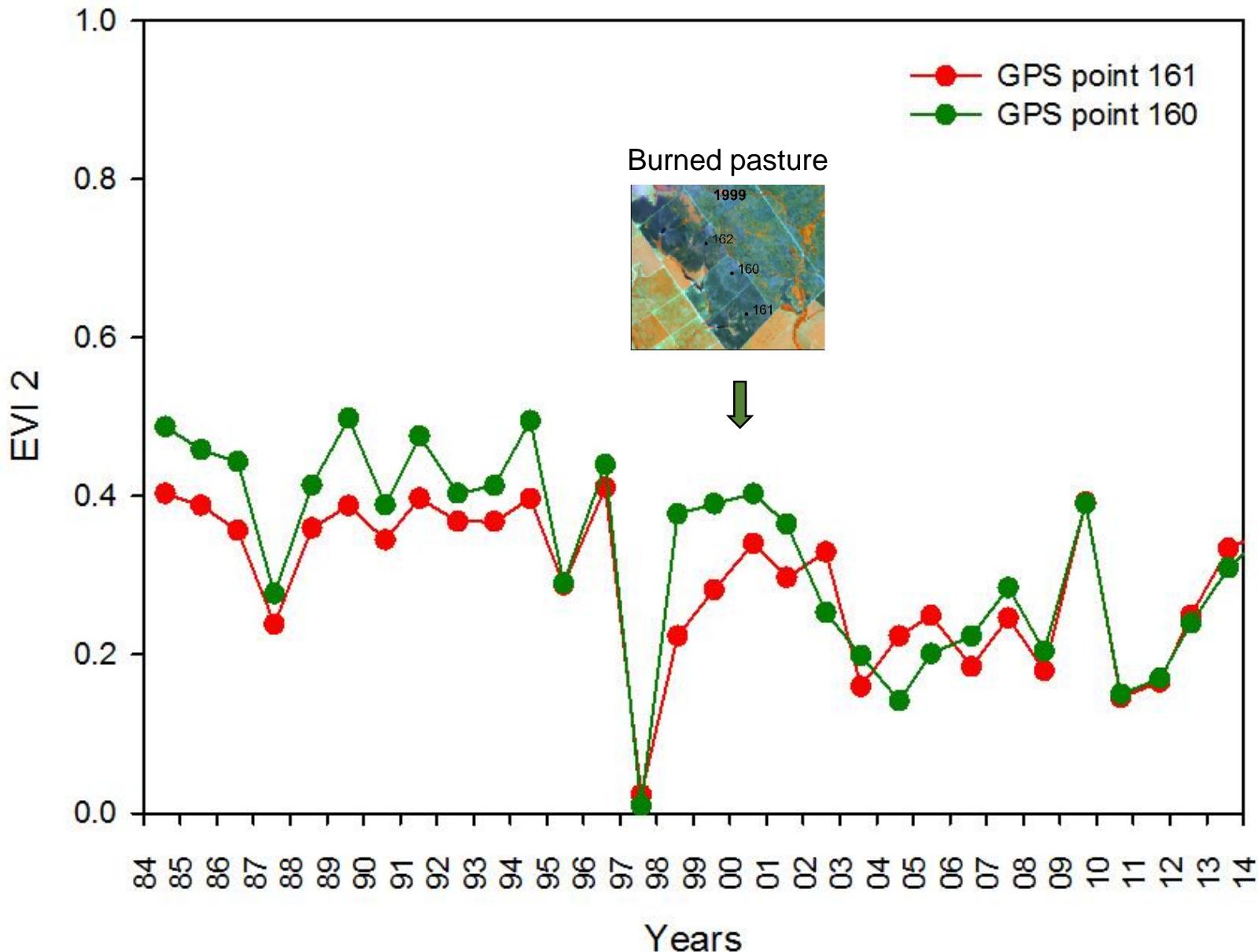
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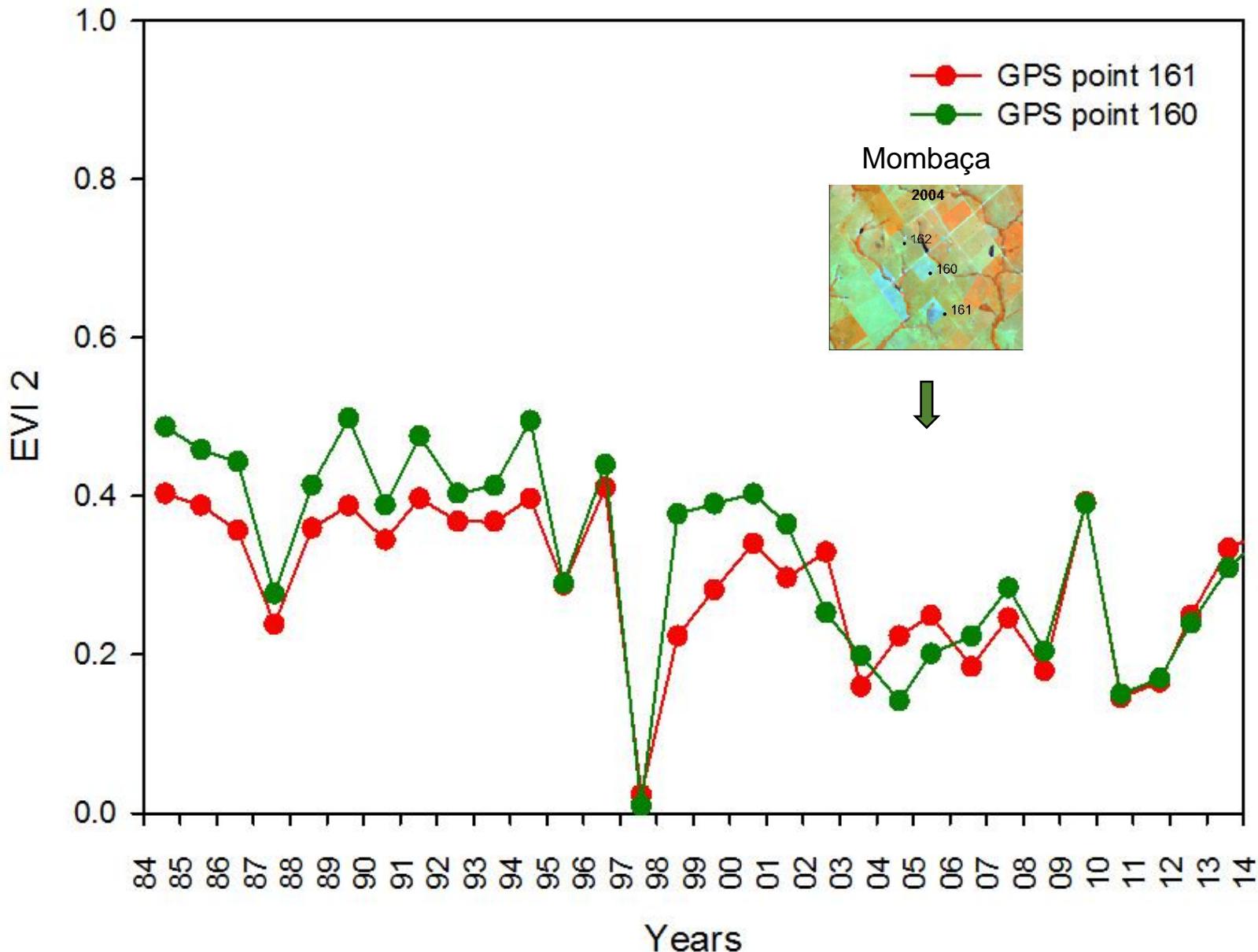
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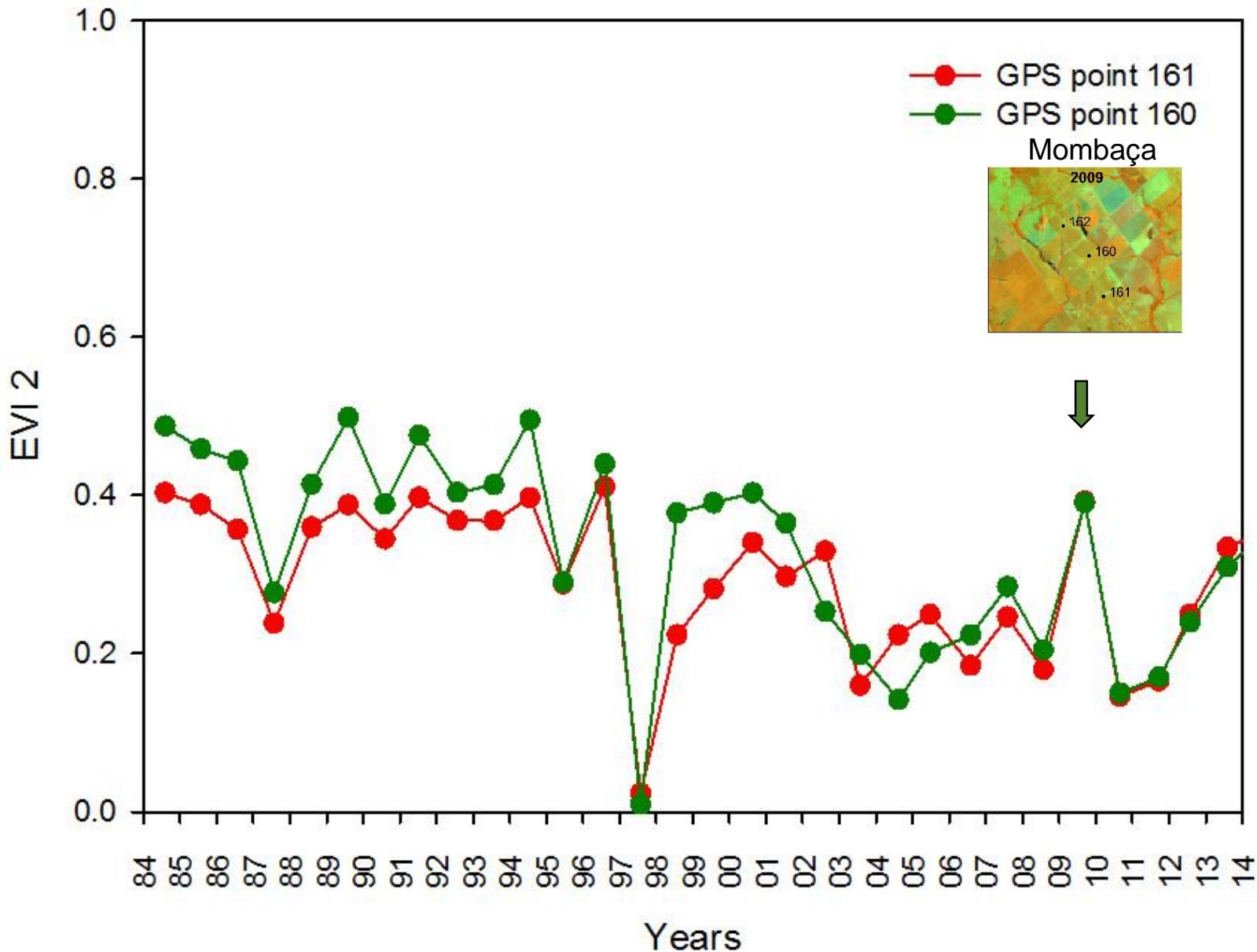
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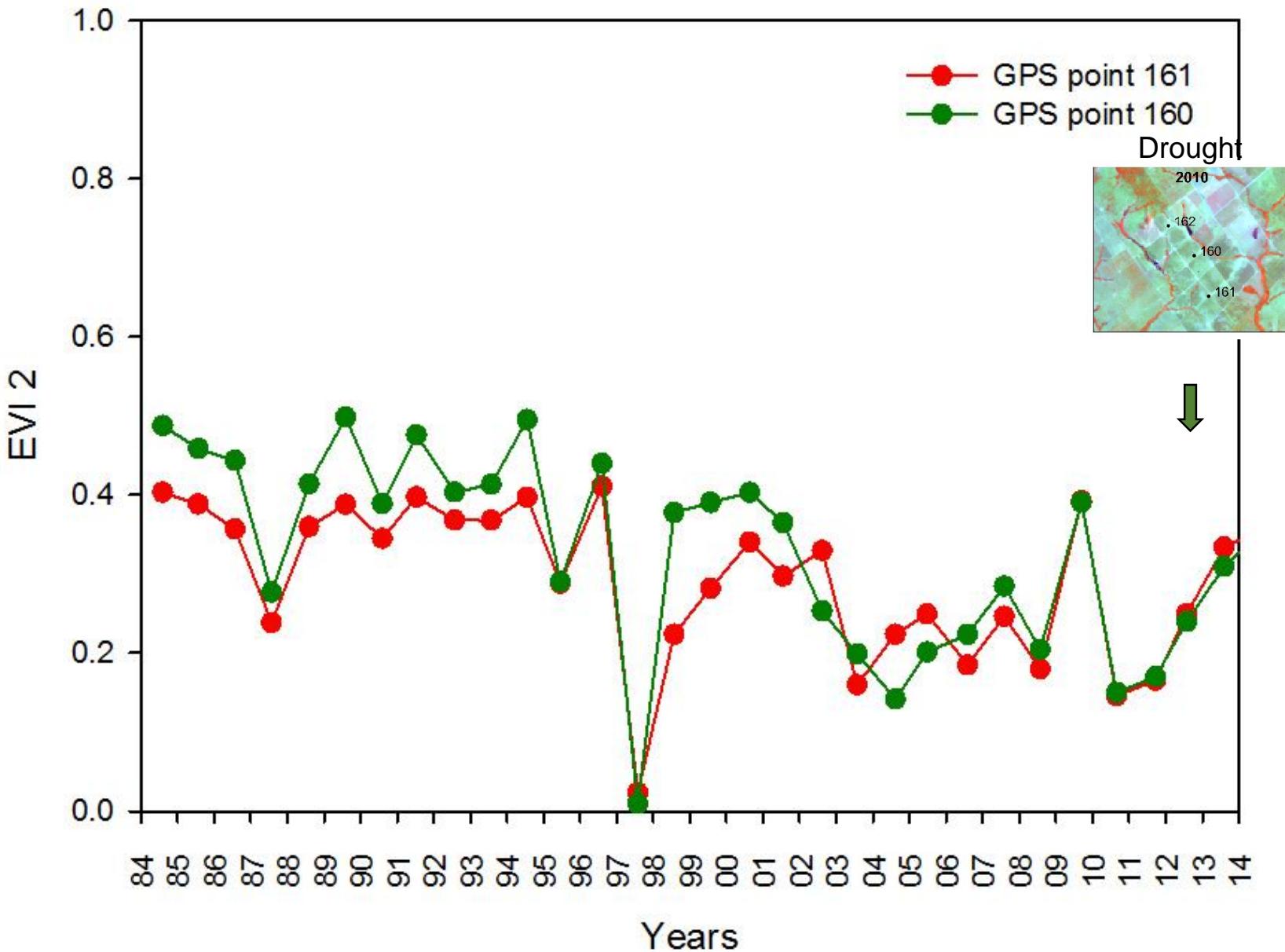
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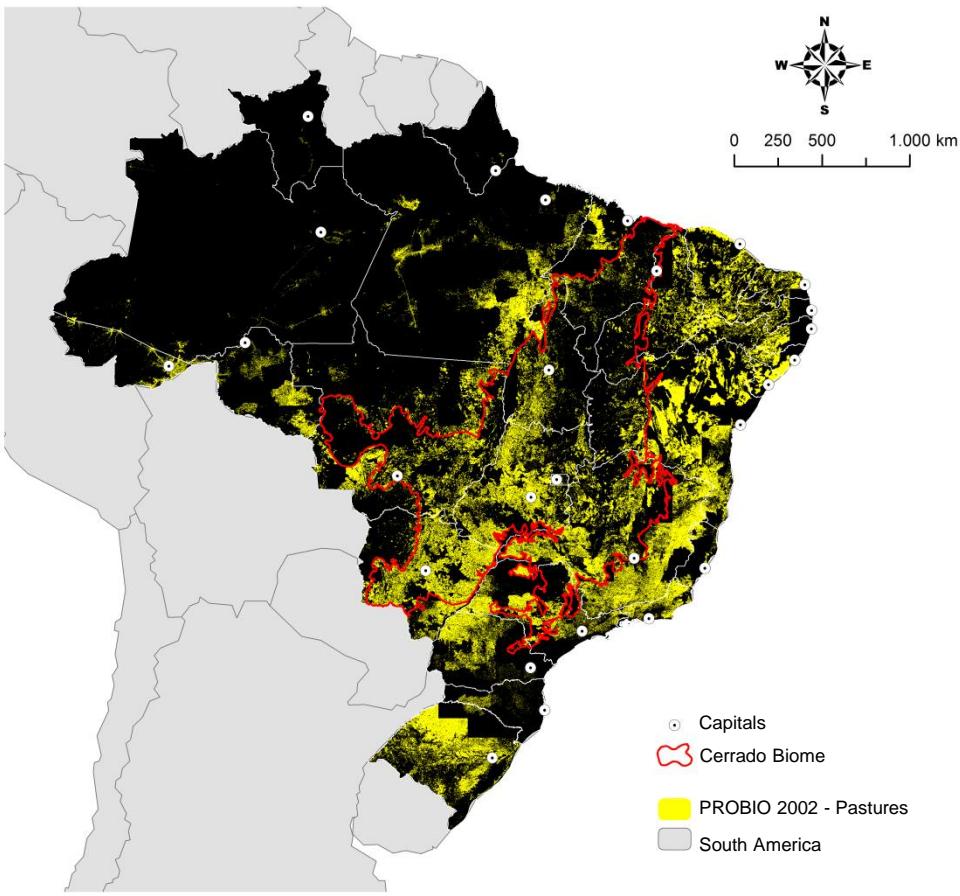


# Pasture & Ecosystem Services

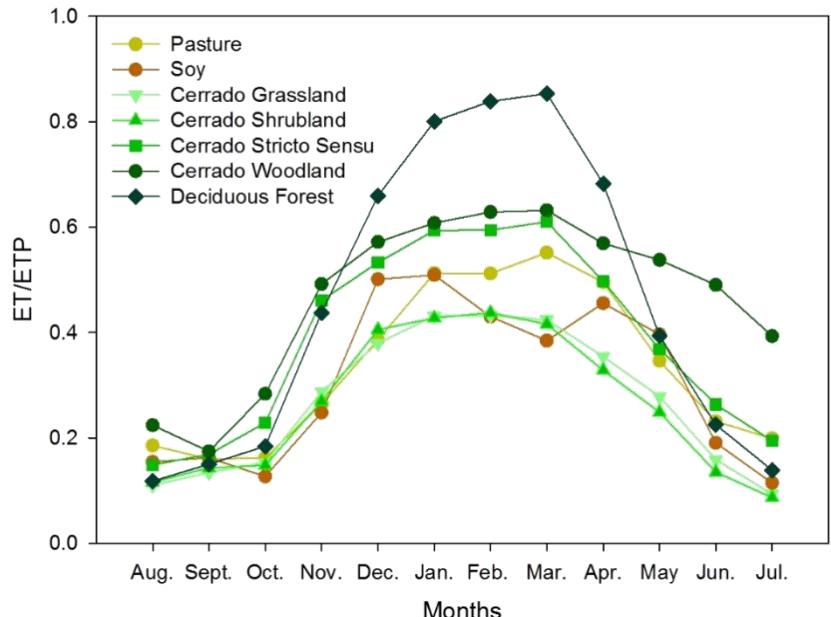
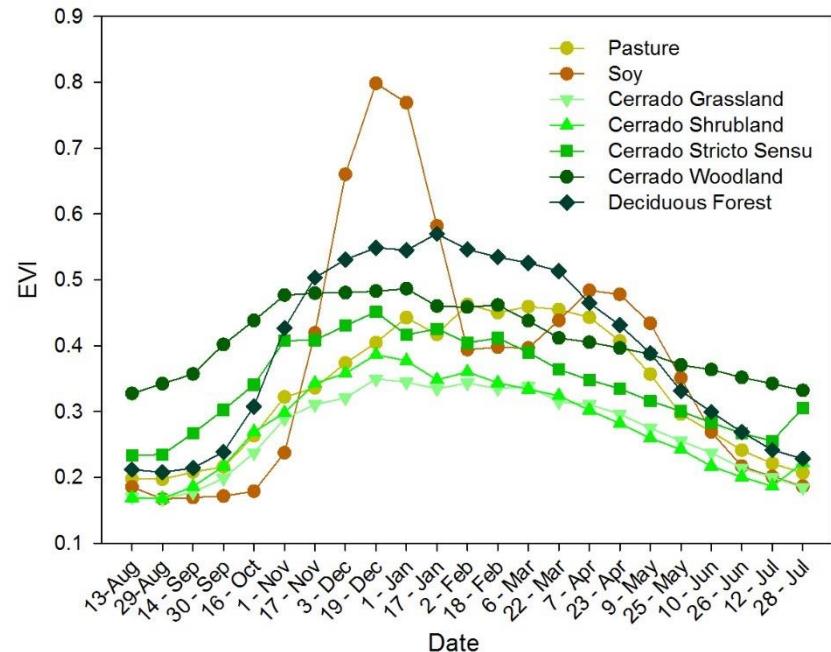


Trindade - Goiás  
April 2015

# Ecosystem Services



Reducing  
Emissions from  
Pasture degradation  
**REPD**



# Approaching Stakeholders

Influencing Public Policies

Rio Vermelho Watershed  
March, 2013



#### Radiografia das Pastagens do Brasil

Saiba mais sobre os resultados, desdobramentos e perspectivas do Projeto.



#### Dados Geográficos

Acesse o mapa interativo para consultar, visualizar e obter dados relacionados a atividade agropecuária brasileira.



#### Desmatamento Zero na Amazônia ?

Veja as novas intervenções na cadeia de fornecimento no setor de carne bovina no Brasil para reduzir o desmatamento.



#### Análise dos Recursos do Programa ABC

Conheça o plano ABC cujo o principal objetivo é minimizar as emissões de gases do efeito estufa.



#### Novo Portal: zerodeforestationcattle.org

Um portal de informações sobre criação de gado na Amazônia com enfoque em desmatamento zero.



25 Junho 2015

Campinas sediará evento internacional sobre Análise de Pastagem  
Nos próximos dias 20 a 22 de Julho acontecerá em Campinas o "Expert Meeting on Pasture Analysis and Remote Sensing", 3º Workshop sobre Monitoramento e Produtividade de Pastagens realizado pela GE...



22 Junho 2015

Mercado de carne bovina: análise aponta queda nas margens da indústria  
Dificuldades no repasse dos custos de matéria-prima explicam a significativa queda na margem bruta da indústria de carne bovina nos primeiros meses de 2015. A atual demanda doméstica enfraquece...



22 Junho 2015

No futuro, análises de mercado pecuário serão via satélite  
O Rally da Pecuária deve ajudar para que o futuro dos produtores fique mais fácil. O evento, que percorre as principais regiões produtoras para troca de experiências, tem recolhido informações...



16 Junho 2015

Brasil receberá nova missão chinesa para avaliação de frigoríficos de aves e suínos  
A Associação Brasileira de Proteína Animal (ABPA) foi informada pela Secretaria de Relações Internacionais do Agronegócio do Ministério da Agricultura que uma missão sanitária emergencial d...



12 Junho 2015

O impacto do aquecimento global na agricultura é tema do SP Pesquisa  
O 12º programa SP Pesquisa, que será exibido pela TV Cultura no sábado (13/06) e pela Univesp TV no domingo (14/06), vai tratar do impacto do aquecimento global na produção agrícola brasileira...



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