



National Collaborative Mapping of Forests and Natural Resources From a Government Initiative - The Rural Environmental Registry (CAR)



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Boston

August 2017



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MEIO AMBIENTE





The **Brazilian Forest Service** is an institution under the Ministry of Environment whose mission is to promote the economic and sustainable use of Brazilian forests with a view to **integrating forest-based development in the country's economic and strategic agenda.**



Research and Forest Information



Forest Concessions



Forest Development



Rural Environmental Registry



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What will be presented?

- Legal Aspects and Characteristics of the Development of CAR
- General Aspects About Brazil's Forest Coverage
- Specificities of Implementation and Architecture of CAR
- Modules, Procedures and Environments for Data Acquisition, Analysis, Monitoring, Consulting and Publishing
- Some Results
- Brief list with the FOSS technologies that were used
- Future Challenges



GENERAL FRAMEWORK BRAZILIAN LAND REGISTRY SYSTEMS

“The implementation of an effective *“Cadastre” (Registry)* in Brazil is a historic challenge. The absence of this instrument means constraints to tenure security, social justice and economic development. Especially in the Amazon, the lack of a Cadastre complicates the management of public lands, regularization of adverse possessions, **encourages irregular exploitation of natural resources**, increases land conflicts, reduces the ability to recognize land rights and limits the sustainable development.

...

many laws created different “cadastres” during Brazil’s history ...there are several institutions aimed to manage the cadastre in Brazil... the way it is today more efforts are required to conceal and integrate the work of different governmental agencies.”*

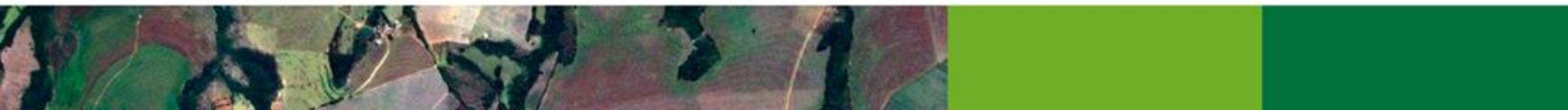
*Brazil towards an effective cadastre with SIGEF

Thiago Marra, Kilder Barbosa, Eduardo Oliveira

Institute of Colonization and Land Reform INCRA, Brazil

Paper prepared for presentation at the “2015 World Bank Conference On Land And Poverty ”

The World Bank - Washington DC, March 23-27, 2015

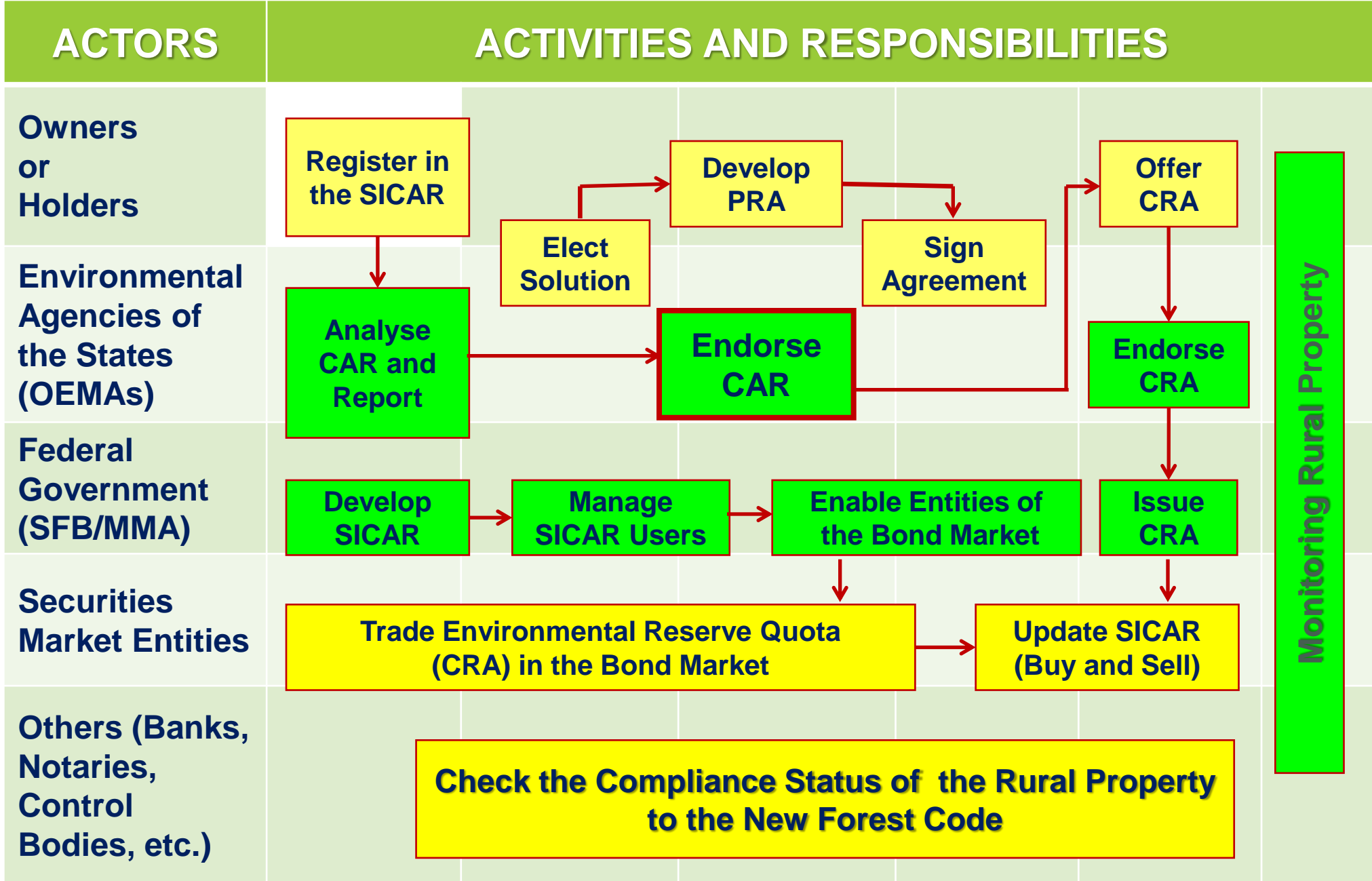


GENERAL FRAMEWORK BRASILIAN LAND REGISTRY SYSTEMS

Main Object	Name	Scope	Urban / Rural	Legal Act	Institution	Purpose
Land tenure	National Cadastre of Rural Land - CNIR	Federal	Rural	Law 10.267/2011	INCRA, RFB (revenue federal agency), Registry	Support taxation, supervision of land social function and knowledge of land distribution
Land tenure	Land Cadastre and Registry System - SICART + Multipurpose Technical Cadastre - CTM	Municipal	Urban	Portaria 511/2009 - Ministry of Cities	Prefeitura, Registry	Creation, establishment and updating of official and systematic territorial inventory of the city (multipurpose by definition)
Land tribute	Cafir / ITR	Federal	Rural	Law 9.393/1996	RFB	Tax application of rural property - ITR
Land tribute	Multipurpose Technical Cadastre - CTM	Municipal	Rural or Urban	Portaria 511/2009 - Ministério das Cidades	Prefeitura	Creation, establishment and updating of official and systematic territorial inventory of the municipality
Land use and occupation	Rural Cadastre National System - SNCR	Federal	Rural or Urban	Law 5.868/1972	INCRA	Promote integration and systematization of data collection, research and treatment of data and information on the use and ownership of land (Decree 72,106 / 73)
Public forests	Public Forests National Cadastre	Federal	Rural	Law 11.284/2006	Brazilian Forest Service SFB / Ministry of Environment MMA	Management of public forests for sustainable production
<i>Land Use</i>	<i>Rural Environmental Registry - CAR</i>	<i>Federal/ State</i>	<i>Rural</i>	<i>Law 12.651/2016</i>	<i>Brazilian Forest Service</i>	<i>Forest development. collect environmental attributes for monitoring and Forest Law enforcement</i>
Federal estate	"Cadastro dos bens dominiais da União"	Federal	Rural or Urban	Law 9.636/1998	Patrimony Secretary SPU	Characterize the federal public assets and keep your registration.

Chart 1 - Cadastral systems in Brazil

Adapted from Marra, Barbosa, Oliveira; 2015

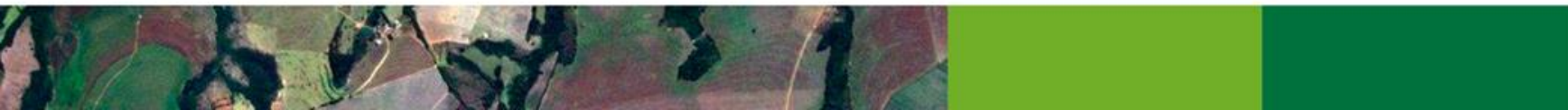


Legal Aspects

Law 12.651/2012 – “New” Forest Code

The Rural Environmental Registry – CAR:

- National level
- Mandatory for all rural properties
- Database for:
 - control and monitoring;
 - environmental and economic planning
 - support to combat deforestation.

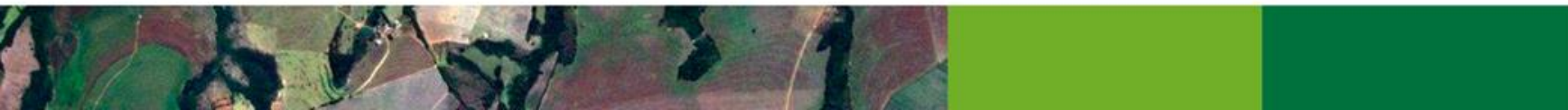


Legal Aspects

- Declaratory nature
- Identification of land owner
- Information about the property including geolocation of:
 - Perimeter of rural property;
 - Areas with remnants of native vegetation;
 - Permanent Protected Areas and Legal Reserve;
 - Converted areas
- Small farmers: Support + special conditions
- SICAR got online: May 2014
- Deadline: December 2017

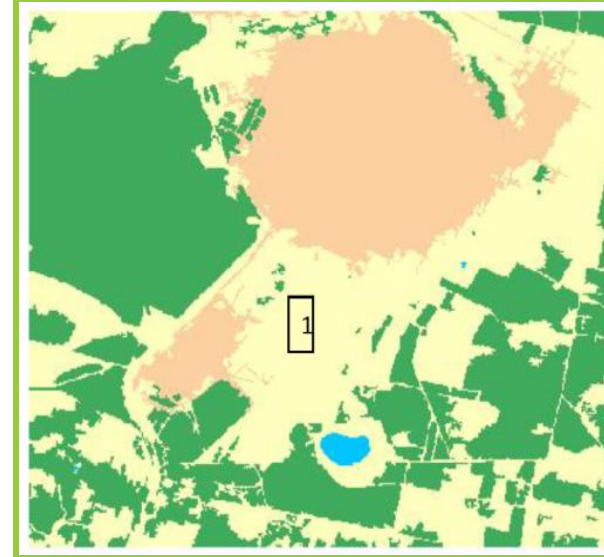
After december 2017

**No funding from the
banking system without
CAR**



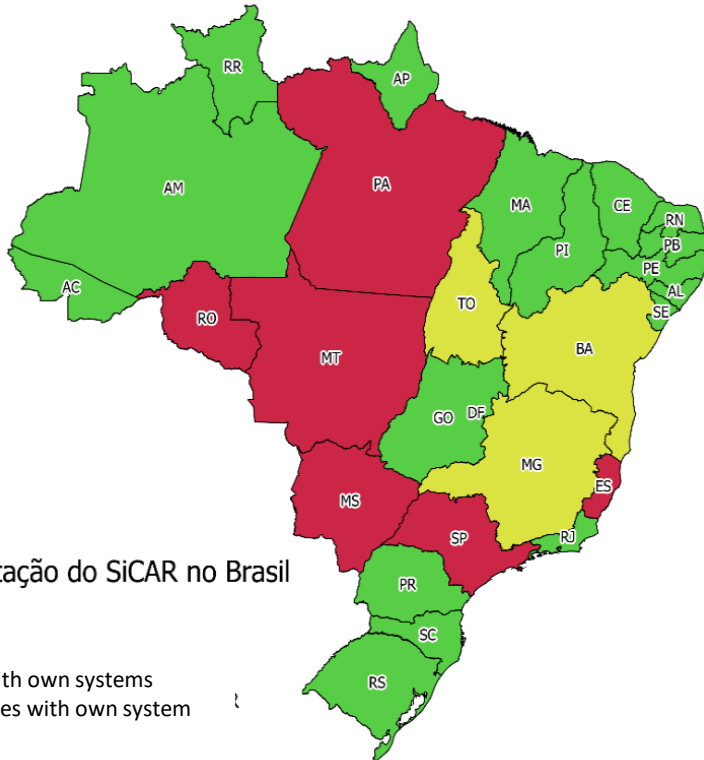
Characteristics of CAR

- Bottom-up (can be made by the landowners themselves).
- 100% FOSS developed by a federal university (Lavras Federal University – UFLA).
- **All data must be analyzed and approved** individually by each state.
- **SICAR** needs to **consume** of and **provide** for services of other systems from federal and states governments at **real time**.
- The **registry's database** needs to be connected to the Central Bank to issue **monetary titles** over the forest cover surplus (Environmental Reserve Quota).
- **Cannot** be used to certify rights of property or possession.
- Automatic filters generate alerts for the land owners.
- Image mosaics from Rapideye (2011) and Landsat 5 (2008) perform with land cover semi-supervised classification.



SICAR implementation in the federal States

2014

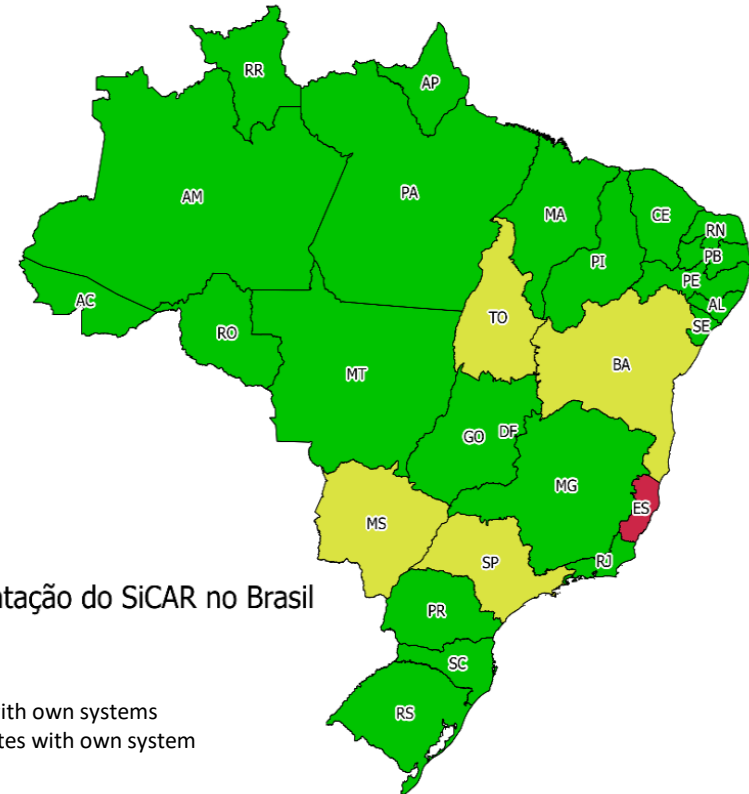


Situação da Implantação do SiCAR no Brasil

05/05/2014

- States with SICAR
- Integrated states with own systems
- Non-integrated states with own system

2016



Situação da Implantação do SiCAR no Brasil

05/05/2016

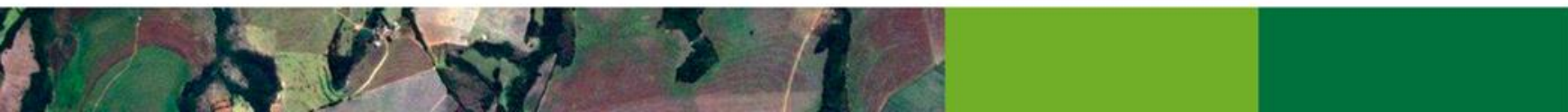
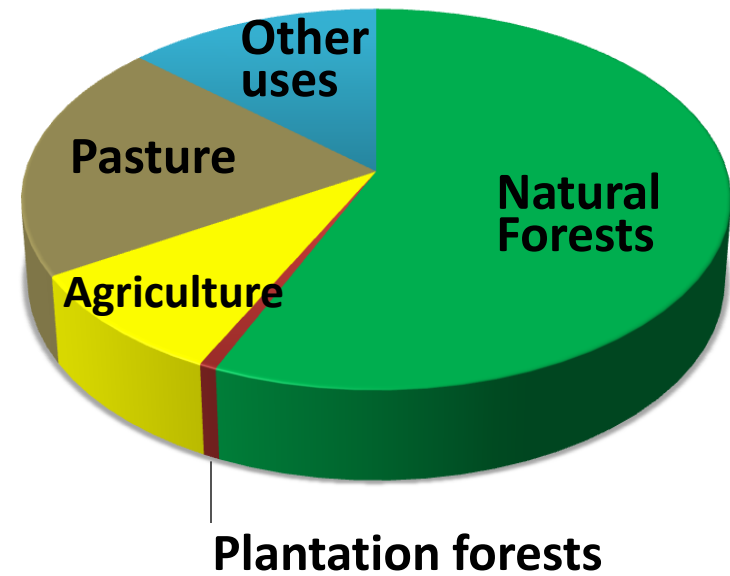
- States with SICAR
- Integrated states with own systems
- Non-integrated states with own system



Forests in Brazil (2016)



Brazilian forests account for 460 million ha (more than 54% of the total area of the country)



National Registry of Public Forests (2016)



Public Forests: 312.6 million hectares
(37% of the territory)

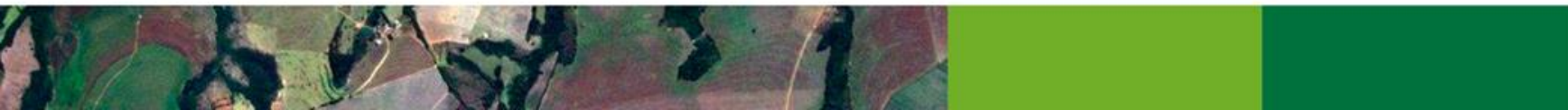
Federal Public Forests: 230 million
hectares

State Public Forests: 82 million hectares

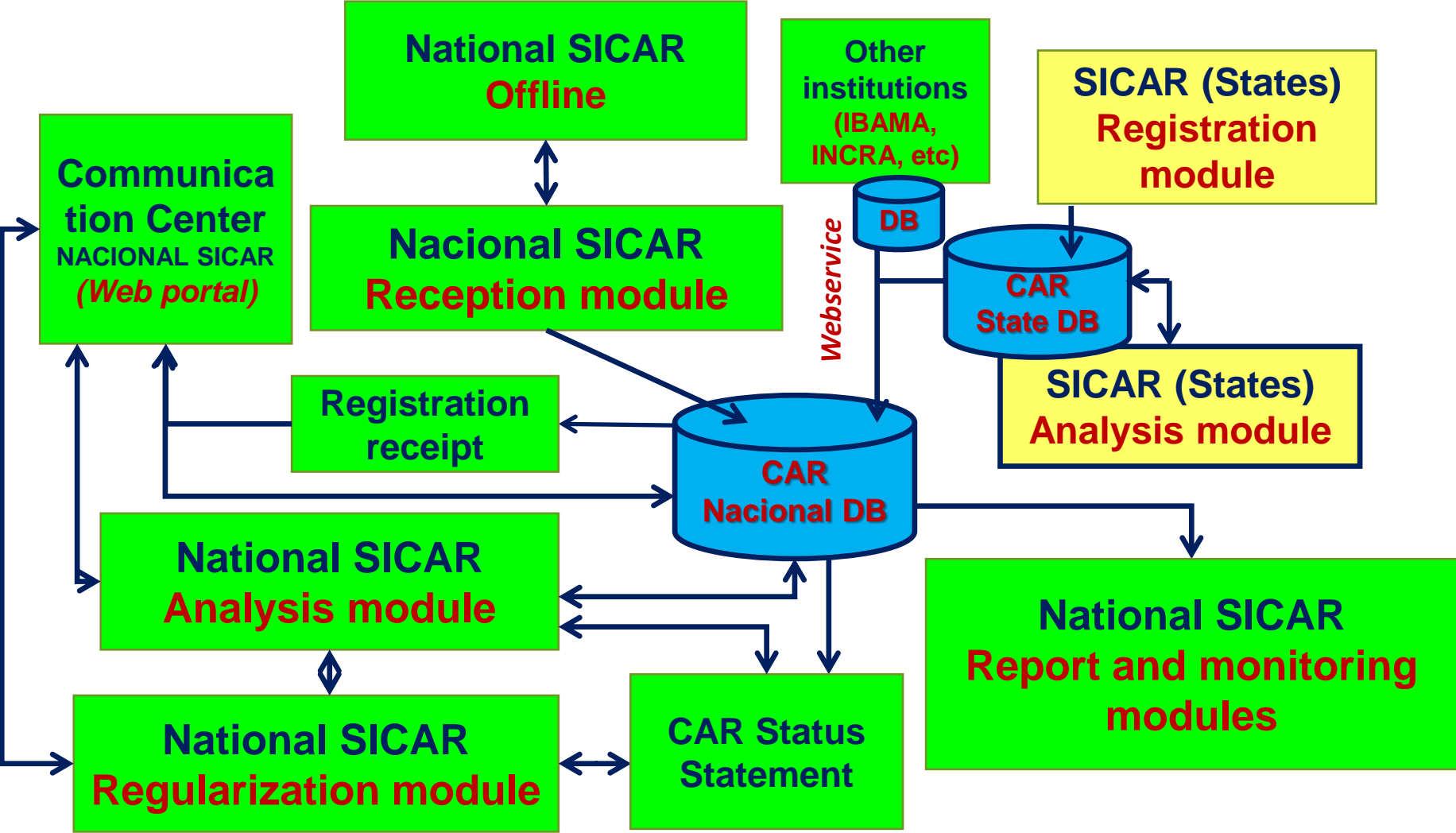
Public Forests concessions: 26 Units
1.2 million hectares (Federal Forests)
0.5 million hectares (State Forests)

THE SYSTEM OF THE RURAL ENVIRONMENTAL REGISTRY - SICAR

Architecture



SICAR - architecture



REGISTRATION MODULE

(Data Acquisition)



Registration module (Offline Desktop App)



Mosaic Download by municipality

Mosaic Download by municipality

Saving to send (".car")

Send ".car"

Registry Rectification

Title and personal information

 Cadastrante Imóvel Domínio **Documentação** Geo Informações

Dados do Documento

Propriedade ou Posse *:
 Propriedade Posse

Nome da Propriedade *: Área (ha) *: Tipo de Documento *:

? Número da Matrícula ou Documento: Data do Documento:  Livro:

Folha: UF do Cartório: Município do Cartório:

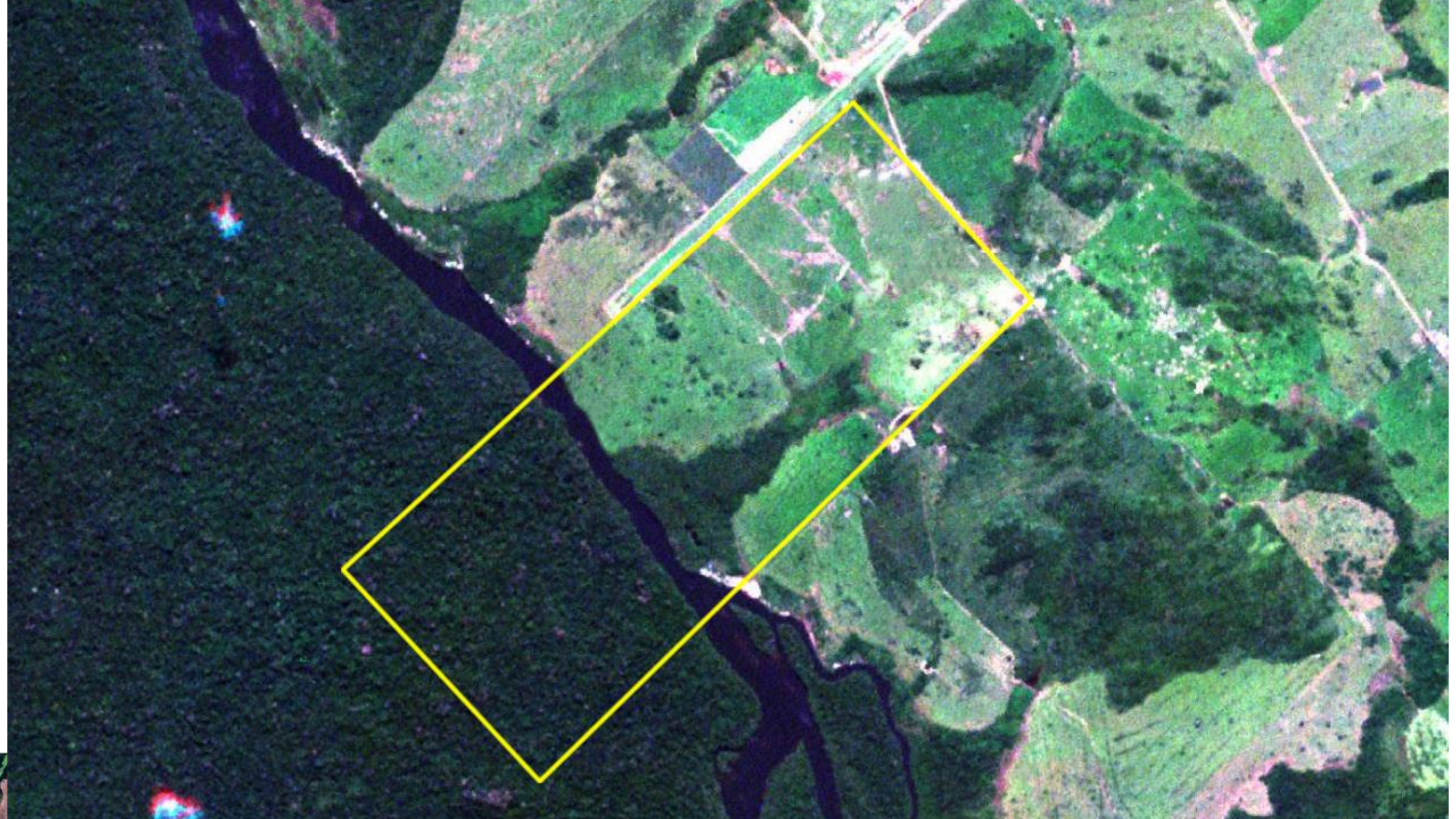
? Código no Sistema Nacional de Cadastro Rural - SNCR: ? Certificação do Imóvel no INCRA:

? NIRF (Número de Inscrição do Imóvel Rural na Secretaria da Receita Federal do Brasil):

Possui Reserva Legal Averbada e/ou Reserva Legal Aprovada e não Averbada?
 Sim Não

**Registry Number of
INCRA or Rural
Revenue Service**





An aerial satellite photograph of a rural landscape. A large, irregularly shaped area is highlighted with a semi-transparent yellow overlay. A white rectangular box with the text 'RURAL LANDHOLDING' is positioned to the left of the highlighted area, with a thin white line connecting the box to a small white circle on the yellow area. The surrounding landscape consists of green fields, a winding river or stream, and some buildings. The image is oriented vertically, with the top of the page at the bottom of the image.

**RURAL
LANDHOLDING**

An aerial photograph showing a landscape with a river on the left and a yellow-outlined area in the center. The area is labeled 'CONVERTED AREAS'. The landscape is a mix of green fields, brown patches, and a dark river. The yellow outline is a large, irregular polygon that encompasses several areas of brown and light green. A white box with the text 'CONVERTED AREAS' is overlaid on the central part of the yellow-outlined area.

CONVERTED AREAS

An aerial photograph of a landscape with a yellow boundary. Inside the boundary, there is a semi-transparent grey area and a solid green area. A white callout box with a downward-pointing arrow contains the text 'NATIVE VEGETATION'. The background shows a mix of green fields, a dark river, and some buildings.

NATIVE VEGETATION

An aerial photograph of a landscape with a yellow-outlined polygon. Inside the polygon, a blue water feature is highlighted. A white box with the text 'HYDROGRAPHY' is overlaid on the polygon. The background shows a mix of green fields, a dark river, and some buildings.

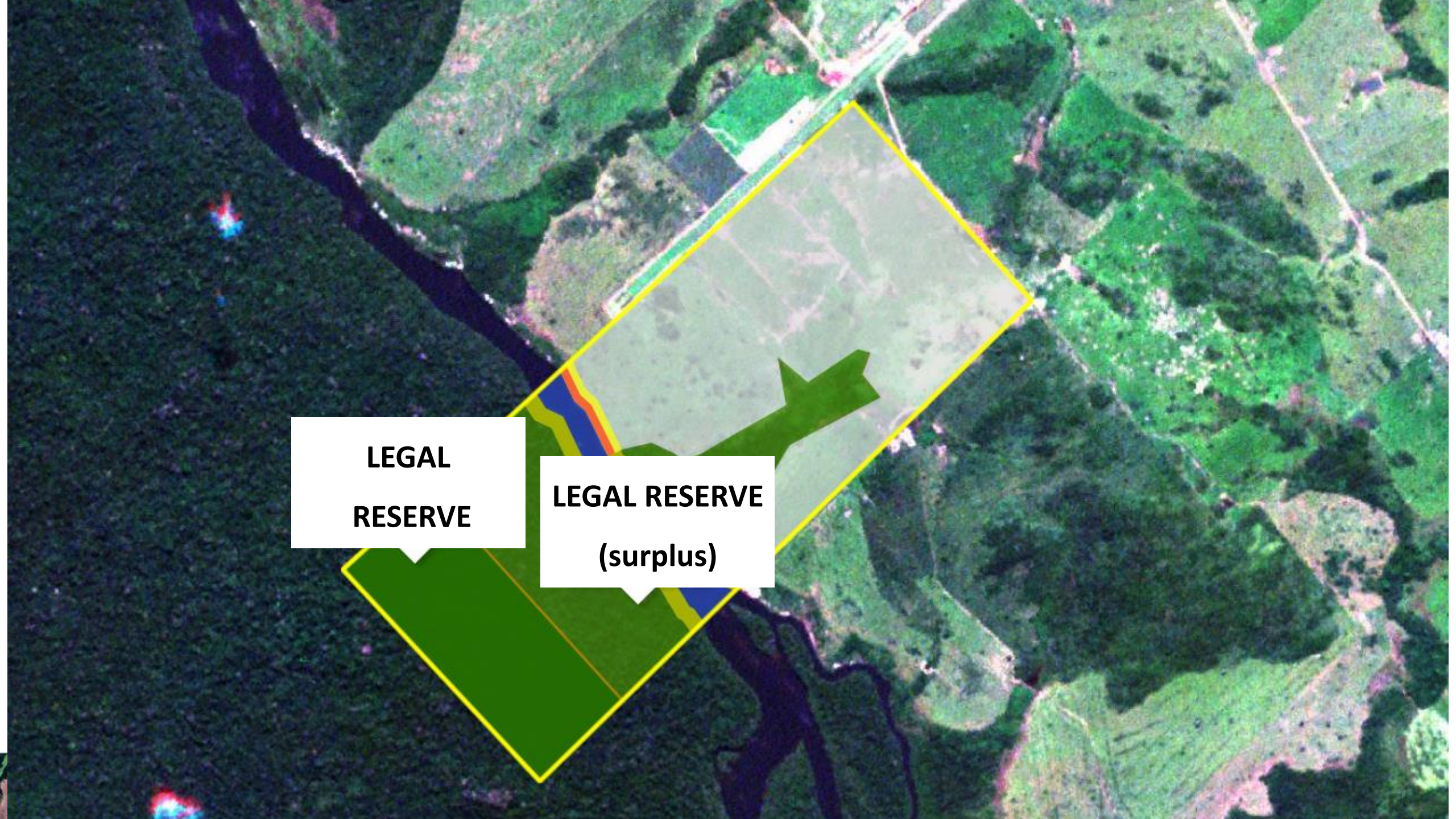
HYDROGRAPHY





PPA (to be restored)

PPA (preserved)



**LEGAL
RESERVE**

**LEGAL RESERVE
(surplus)**

Registration receipt



RECIBO DE INSCRIÇÃO DO IMÓVEL RURAL NO CAR

Registro no CAR: MT-5105150-299998F9B2394F2DA7468A0B695934AF Data de Cadastro: 07/03/2016 23:30:18

RECIBO DE INSCRIÇÃO DO IMÓVEL RURAL NO CAR

Nome do Imóvel Rural: Caso_de_Uso_1_TCC		
Município: Juína		UF: Mato Grosso
Coordenadas Geográficas do Centróide do Imóvel Rural:	Latitude: 11° 21' 35,81" S	Longitude: 59° 10' 46,33" O
Área Total (ha) do Imóvel Rural: 100,1627	Módulos Fiscais: 1,00	
Código do Protocolo: MT-5105150-82592A7B80C524374D8FE2762C26B18A		

ÁREAS DECLARADAS (em hectares)

Imóvel		Imóvel	
Área Total do Imóvel	100,1627	Área Consolidada	46,6527
Área de Servidão Administrativa	0,0000	Remanescente de Vegetação Nativa	53,5100
Área Líquida do Imóvel	100,1627	Reserva Legal	
APP / Uso Restrito		Área de Reserva Legal	53,5100
Área de Preservação Permanente	0,0000		
Área de Uso Restrito	0,0000		

CAR - Cadastro Ambiental Rural

Página 2/3



REPRESENTAÇÃO GRÁFICA



INFORMAÇÕES GERAIS

1. Este documento garante o cumprimento do disposto nos § 2º do art. 14 e § 3º do art. 29 da Lei nº 12.651, de 2012, e se constitui em instrumento suficiente para atender ao disposto no art. 78-A da referida lei;
2. O presente documento representa a confirmação de que foi realizada a declaração do imóvel rural no Cadastro Ambiental Rural-CAR e que está sujeito à validação pelo órgão competente;
3. As informações prestadas no CAR são de caráter declaratório;
4. Os documentos, especialmente os de caráter pessoal ou dominial, são de responsabilidade do proprietário ou possuidor rural declarante, que ficarão sujeitos às penas previstas no art. 299, do Código Penal (Decreto-Lei nº 2.848, de 7 de setembro de 1940) e no art. 69-A da Lei nº 9.605, de 12 de fevereiro de 1998;
5. O demonstrativo da situação das informações declaradas no CAR, relativas às áreas de Preservação Permanente, de uso restrito e de Reserva Legal poderá ser acompanhado no sítio eletrônico www.car.gov.br;

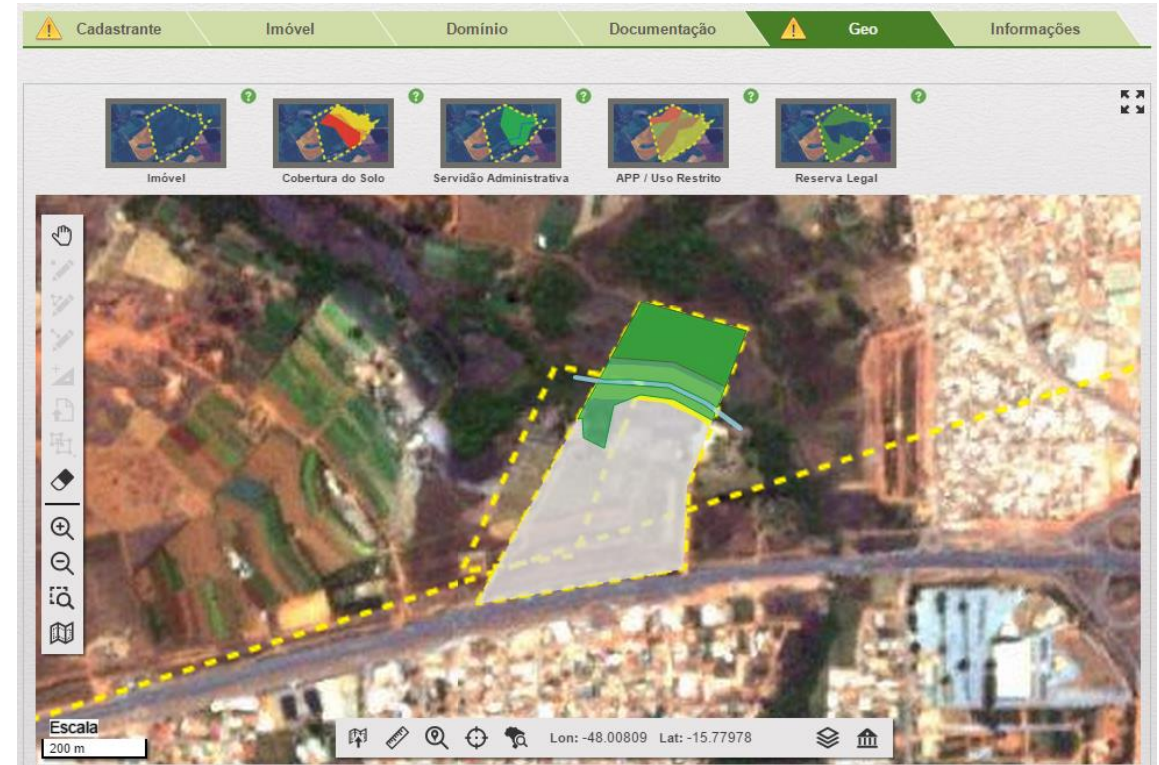


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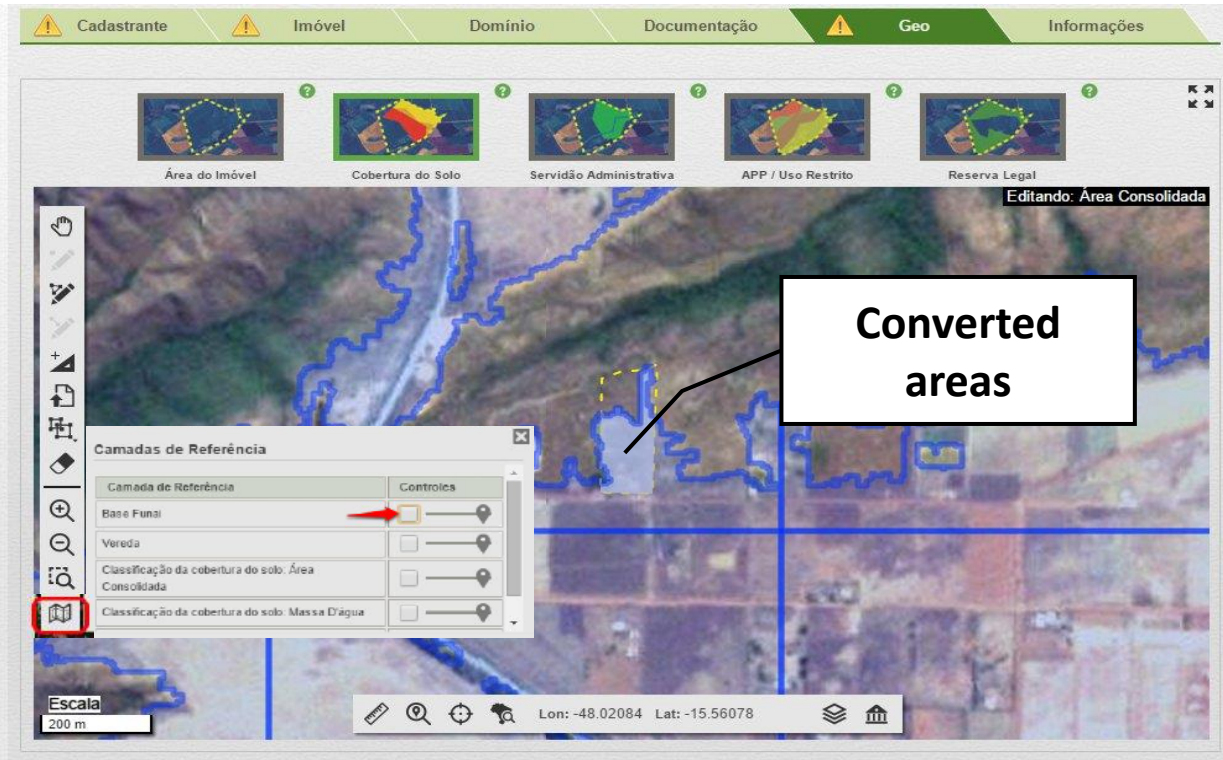


Reference layers for rectification

- Mosaics (Landsat 2008 and Rapideye 2011)
- Protected/restricted areas



- Other registered landholds
- Classified coverages

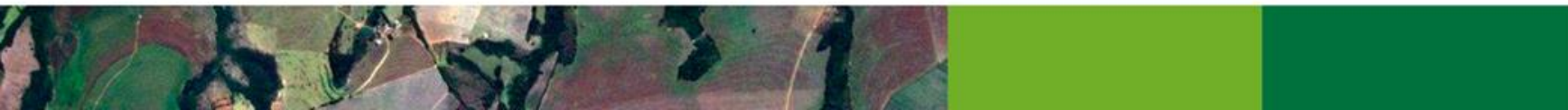


CAR – Declared information

Total area subject to registration (ha)	Total Registered Area (ha)	Registered area (%)
397,836,864	411,001,629	over 100 %
Number of Registered Properties : 4,275,970 (ref. July 2017)		

Increment (July/2017)

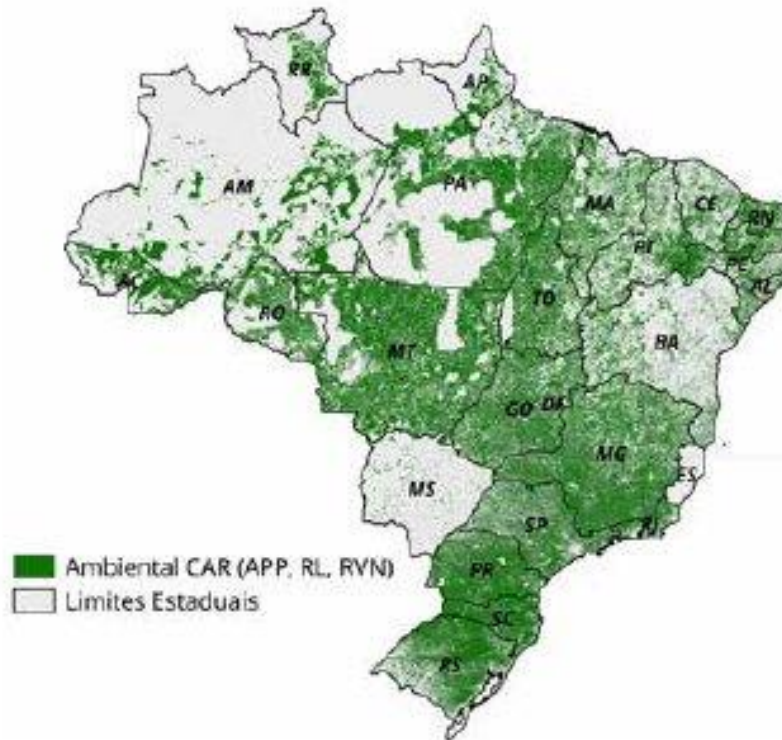
2,410,521 (ha)



Permanent Protected Areas, Legal Reserves and native vegetation (declared: march/2017)



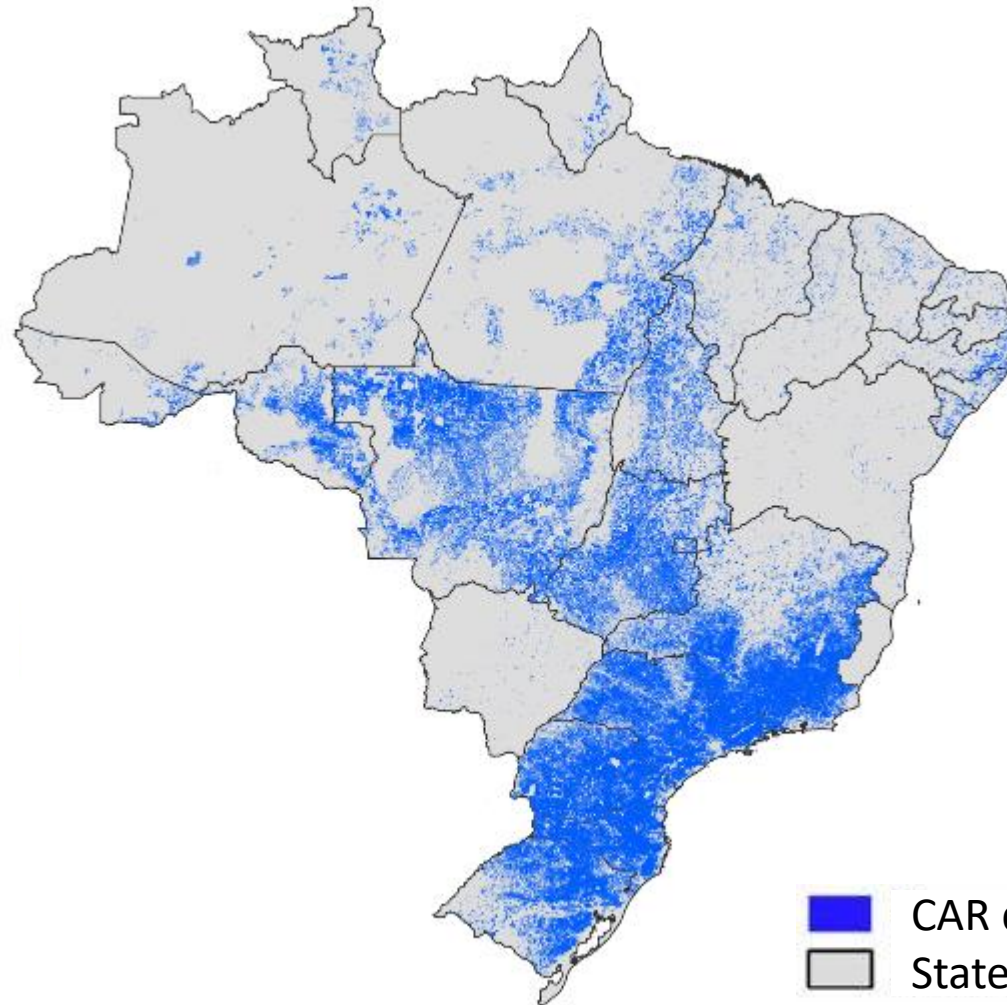
Área de Unidades de Conservação¹:
111,9 milhões ha



Área de RL, APP e Vegetação Nativa:
166 milhões ha

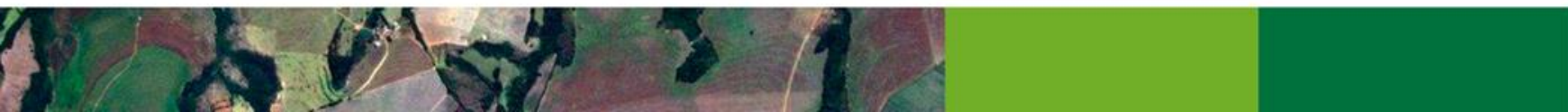


Water Springs (declared – march 2017)



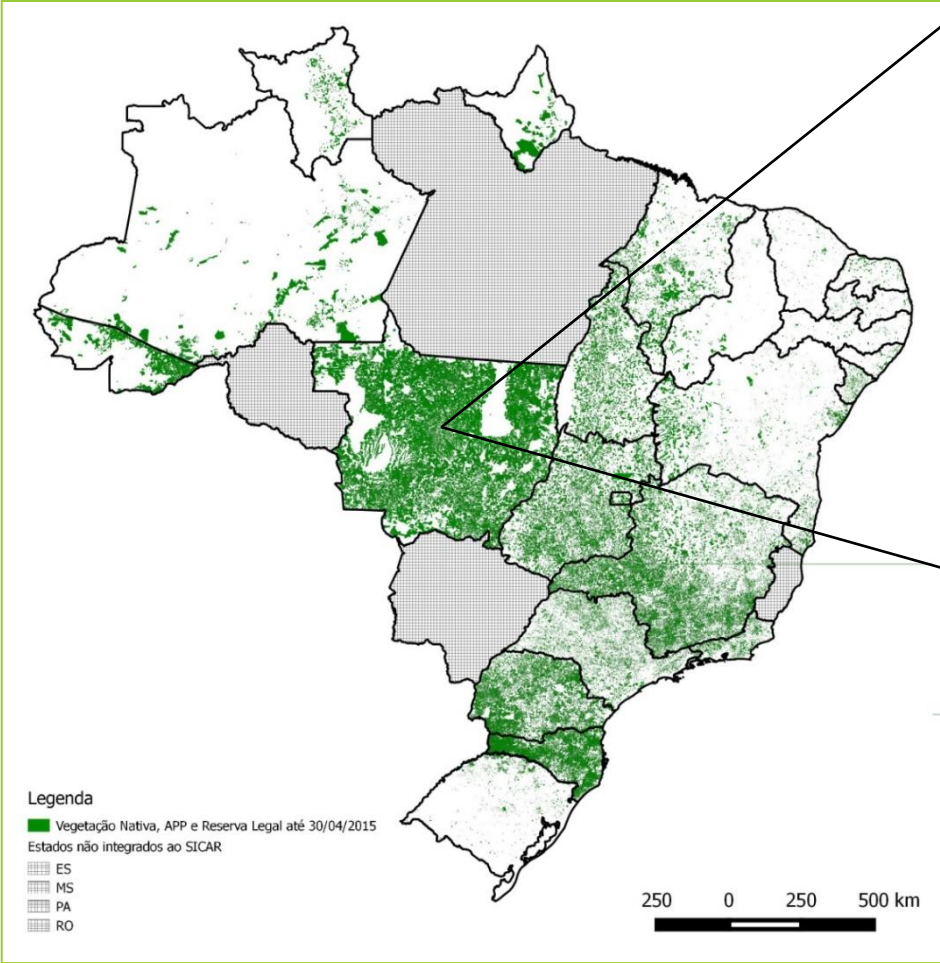
1,456,628 water springs
declared

-  CAR declared water springs
-  State limits



Data Consistency

Remnants of Native Vegetation, Permanent Protected Areas and Legal Reserve



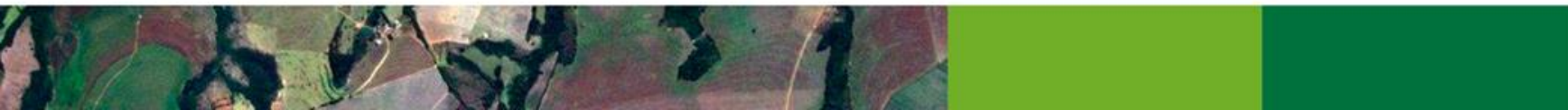
Public consultation platform

CAR status (Decree nº 8.235/2014)

<http://www.car.gov.br/#/consultar>

Information regarding:

- CAR status;
- Analysis status;
- Legal reserve surplus
- pending restoration of Permanent Protected Areas and Legal Reserves;
- Overlap and other restrictions.



[INICIAL](#)[SOBRE](#)[BAIXAR](#)[ENVIAR](#)[RETIFICAR](#)[CONSULTAR](#)
Demonstrativo
do CAR[CONTATOS](#)[ATENDIMENTO](#)[CONSULTA PÚBLICA](#) ▾

Restrições do IR

Origem	Descrição	Processamento	Área de conflito (ha)	Percentual (%)
Áreas Embargadas	Tipo: Embargo/Interdição / Infração: Destruir ou danificar florestas ou demais formas de vegetação, nas áreas de especial preservação pelo Art. 225 da Constituição Federal/1988, (Região da Amazônia Legal) Art. 50 da Lei nº 9.605/98 e art. 37 do Decreto nº 3.179/99.	01/09/2016	3,1256	0,08

Restrictions

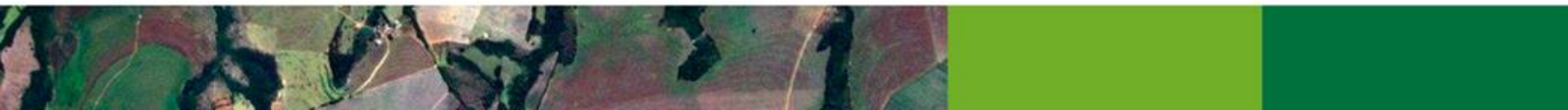
Restrições do IR

Origem	Descrição	Processamento	Área de conflito (ha)	Percentual (%)
Unidade de Conservação	Parque Nacional - Parna do Juruena	01/06/2016	31.635,8491	99,98
Terra Indígena	Apiaká do Pontal e Isolados	01/06/2016	31.635,9043	99,98



ACCESSING CAR PUBLIC DATA

<http://www.car.gov.br/publico/imoveis/index>





IMÓVEIS

REGULARIDADE

RESTRICÇÕES

BASE DE DOWNLOADS



Brasil

total de imóveis:
3.198.327

Área cadastrada:
406.280.957,62 ha



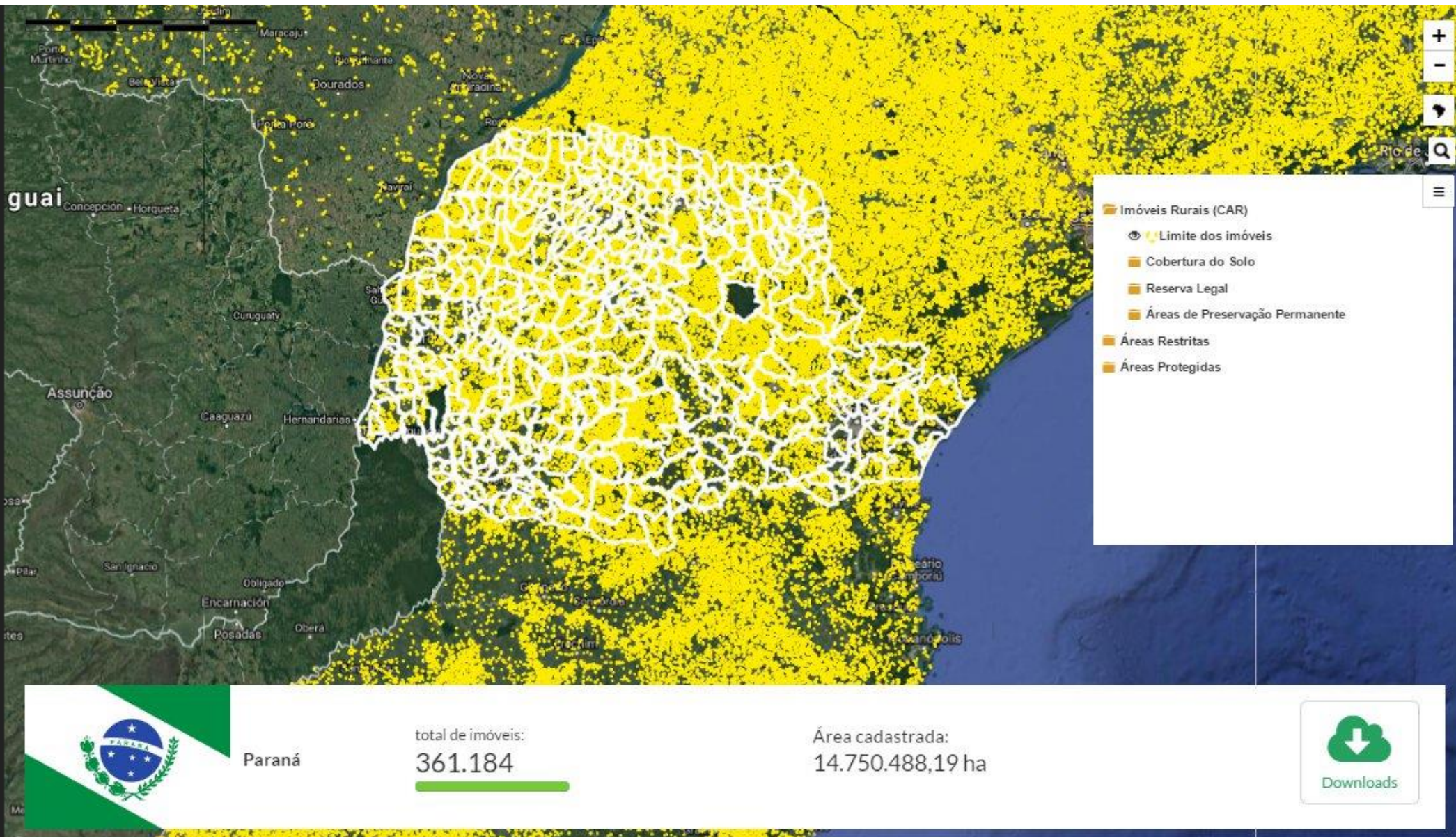
Downloads

Versão 1.0



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Castro

total de imóveis:
3.032

Área cadastrada:
185.128,19 ha



Downloads



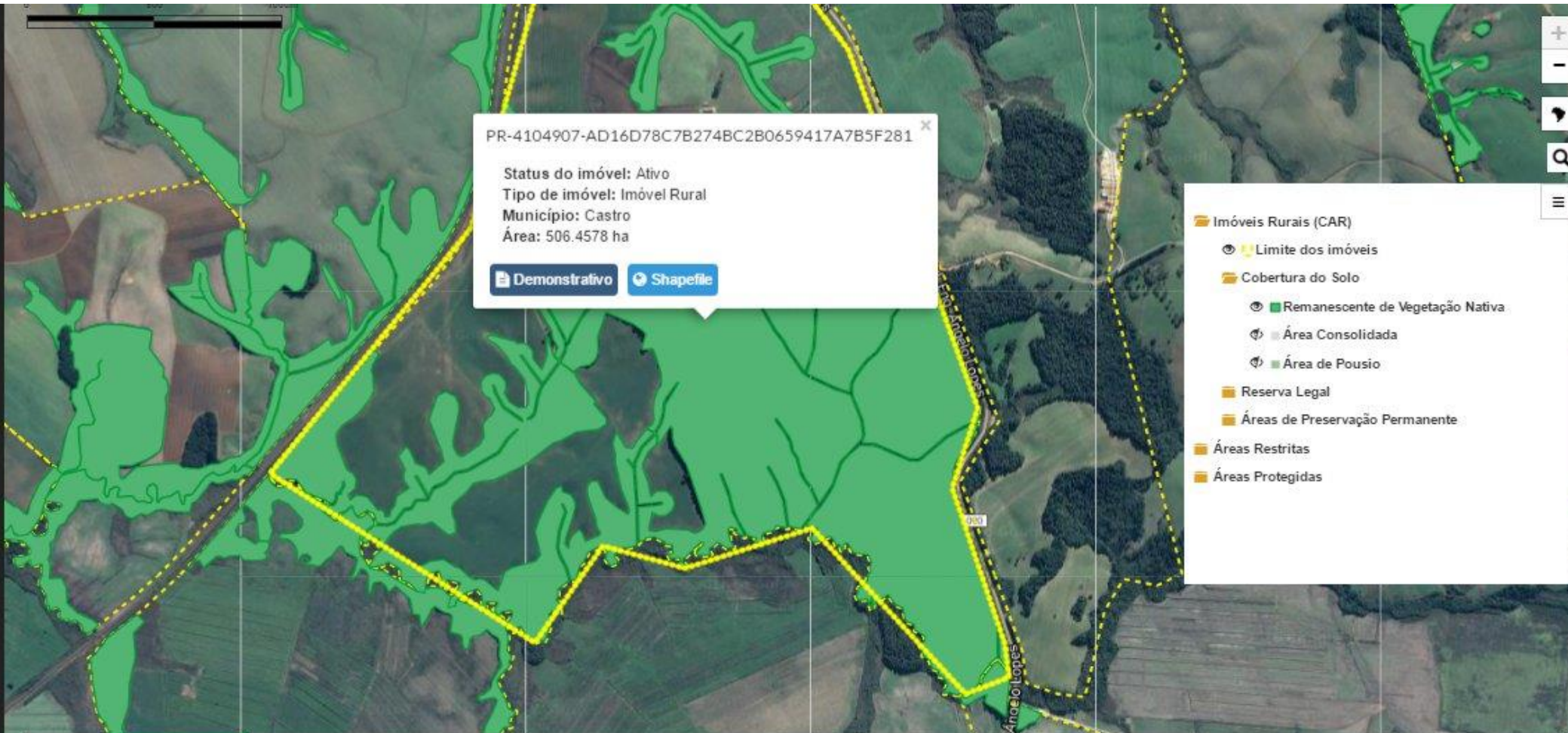
- Imóveis Rurais (CAR)
- Limite dos imóveis
- Cobertura do Solo
 - Remanescente de Vegetação Nativa
 - Área Consolidada
 - Área de Pousio
- Reserva Legal
- Áreas de Preservação Permanente
- Áreas Restritas
- Áreas Protegidas



Castro

total de imóveis:
3.032Área cadastrada:
185.128,19 ha

Downloads



Castro

total de imóveis:
3.032Área cadastrada:
185.128,19 ha

Downloads



Você está visualizando:
ACRE

alterar UF ↻

Filtrar município pelo nome:

Digite o nome do município

Csv and shapefile
download by
municipality

Acrelândia	📄	Assis Brasil	📄
Brasiléia	📄	Bujari	📄
Capixaba	📄	Cruzeiro do Sul	📄
Epitaciolândia	📄	Feijó	📄
Jordão	📄	Mâncio Lima	📄
Manoel Urbano	📄	Marechal Thaumaturgo	📄
Plácido de Castro	📄	Porto Acre	📄
Porto Walter	📄	Rio Branco	📄
Rodrigues Alves	📄	Santa Rosa do Purus	📄
Senador Guimard	📄	Sena Madureira	📄
Tarauacá	📄	Xapuri	📄



COMMUNICATION CENTER

Keeping up with CAR analysis and regularization

395,700

Registered users (April/2017)





Central do Proprietário/Possuidor



CAR - Suporte

Inicial

Seja bem-vindo

Sobre

O que é o CAR

Baixar

Módulo de Cadastro

Enviar/Retificar

Cadastro do Imóvel

Consultar

Situação do CAR

Legislação

Consulte as normas

Suporte

Atendimento e dúvidas

Central do Proprietário/Possuidor:

Já tenho cadastro:

CPF / CNPJ:

CPF / CNPJ

Senha:

Senha

[Recuperar Senha](#)

Acessar

Não tenho cadastro:

Informe o Número do Recibo:

UF-1302405-E6D3.395B.6D27.4F42.AE22.DD56.987C.DD52

Informe o CPF / CNPJ:

CPF / CNPJ

Realize o cadastro e acompanhe as mensagens e notificações relacionadas aos imóveis cadastrados em seu CPF / CNPJ:

Criar Cadastro

Navegadores Compatíveis:



Selecione uma propriedade rural



Informe o nome da propriedade, município ou número do CAR

Propriedades cadastradas

teste07042016 - (Juína/MT) MT-5105150-40ACD53A6E0C43AAB91086C4B2639BD7	Pendente 
teste - (Juína/MT) MT-5105150-94069DE3212E46C18C465D620B89C3C7	Pendente 
teste - (Juína/MT) MT-5105150-B6A66E81BEF54D0E8DD549382065573C	Ativo 
Minaçu - (Minaçu/GO) GO-5213087-24EFD959B9A148F99B76923B78D1DA54	Pendente 

✓ Entrar

Communication Center (landowners)

Página Inicial

Minaçu - (Minaçu/GO)
GO-5213087-24EFD959B9A148F99B76923B78D1DA54

[Alterar Imóvel Selecionado](#)

Baixar o arquivo .CAR **Detalhes do Imóvel** **Recibo de Inscrição**

Demonstrativo

Situação do cadastro: **Pendente**
Condição do cadastro: Em análise

Dados do Imóvel

Data de registro no SiGAR:	11/08/2016	Data da análise do CAR:	-
Área do imóvel:	154,8523 ha		
Módulos fiscais:	3,10		
Município / UF:	Minaçu(GO)		
Coordenadas centroide:	Lat: 13°47'30,16" S		
	Long: 48°16'55,49" O		

Keeping up with analysis results and CAR status



Communication Center (landowners)

Central de Mensagens

Teste2_140216 - (Juína/MT)
MT-5105150-3D7080785F724306A01CA31EE369C9A9
[Alterar Imóvel Selecionado](#)

Baixar o arquivo .CAR **Detalhes do Imóvel** **Recibo de Inscrição**

Mensagens			
	Data	Hora	Assunto
	03/03/2016	14:40:01	Seu imóvel foi analisado
	03/03/2016	14:30:01	Seu cadastro está em análise pela equipe técnica
	14/02/2016	22:54:01	Indício de sobreposição com Terra Indígena
	14/02/2016	22:54:01	Indício de sobreposição entre imóveis rurais

« < 1 > »

Instant messaging and access to documents of the analysis

Communication Center (landowners)

Página Inicial

Teste_07_07_15 - (São Francisco de Paula/RS)
RS-4318200-28197C9999EE244399FD34DCA3FBCF3A2
[Alterar Imóvel Selecionado](#)

Baixar o arquivo .CAR Ficha do Imóvel Recibo de Inscrição

Prazo para atendimento: **109** dias

Retificação do cadastro
Aguardando retificação do cadastro para atendimento da notificação [Atender »](#)

Envio de documentos
Aguardando o envio de 2 documento(s) para atendimento da notificação [Atender »](#)

Demonstrativo

Situação: **Pendente**

Condição: **Analisado com pendências, aguardando retificação e/ou apresentação de documentos**

CAR correction and possibility to send complementary information/ documents



ANALYSIS MODULE

Analysis of overlaps and notification



Analysis of overlaps (detailed for a single CAR)

The screenshot shows the 'Análise Geo' interface for a specific CAR (MT-5105150-299998F9B2394F2DA7468A0B695934AF). The interface includes a sidebar with navigation options like 'Dados Gerais', 'Documentos Enviados', and 'Análise da Ficha do Imóvel'. The main content area features a breadcrumb trail and a menu of analysis categories. Five callout boxes are connected to specific menu items:

- Amongst landholds**: Points to 'Sobreposição com outros IRs'.
- Indigenous lands**: Points to 'Terras Indígenas'.
- Conservation Units (National Parks, etc)**: Points to 'UC'.
- Embargos**: Points to 'Áreas Embargadas'.
- Agrarian reform settlements**: Points to 'Assentamentos'.



ANALYSIS MODULE

Analysis of declared land cover and native vegetation



Land cover analysis

CAR
CADASTRO AMBIENTAL RURAL

SAIR DO MODO TELA CHEIA

- Imóvel Rural analisado
- MT-5105150-D1F9292FB324...
- Áreas vetorizadas pelo cadastra...
- RVN - Remanescente de Veg...
- AA - Área Antropizada não Co...
- + Informações Complementares
- Área classificada do CAR
- AC - Área Consolidada
- RVN - Remanescente de Veg...
- AR - Área em Regeneração
- CD - Corpo d'água
- AA- Área Antropizada não Co...
- Temas Complementares
- Área ... maior que 45 graus

Lng: -59.0965 Lat: -10.9944 1 km Leaflet



Land cover analysis

CAR
CADASTRO AMBIENTAL RURAL

SAIR DO MODO TELA CHEIA

CONVERTED AREAS
CAR (MAPPING)

Imóvel Rural analisado
MT-5105150-D1F9292FB324...

Áreas vetorizadas pelo cadastra...

RVN - Remanescente de Veg...
AA - Área Antropizada não Co...

Informações Complementares

Área classificada do CAR

AC - Área Consolidada
RVN - Remanescente de Veg...
AR - Área em Regeneração
CD - Corpo d'água
AA- Área Antropizada não Co...

Temas Complementares

Área ... maior que 45 graus

Lng: -59.0855 Lat: -11.0367 1 km Leaflet



Land cover analysis

CAR
CADASTRO AMBIENTAL RURAL

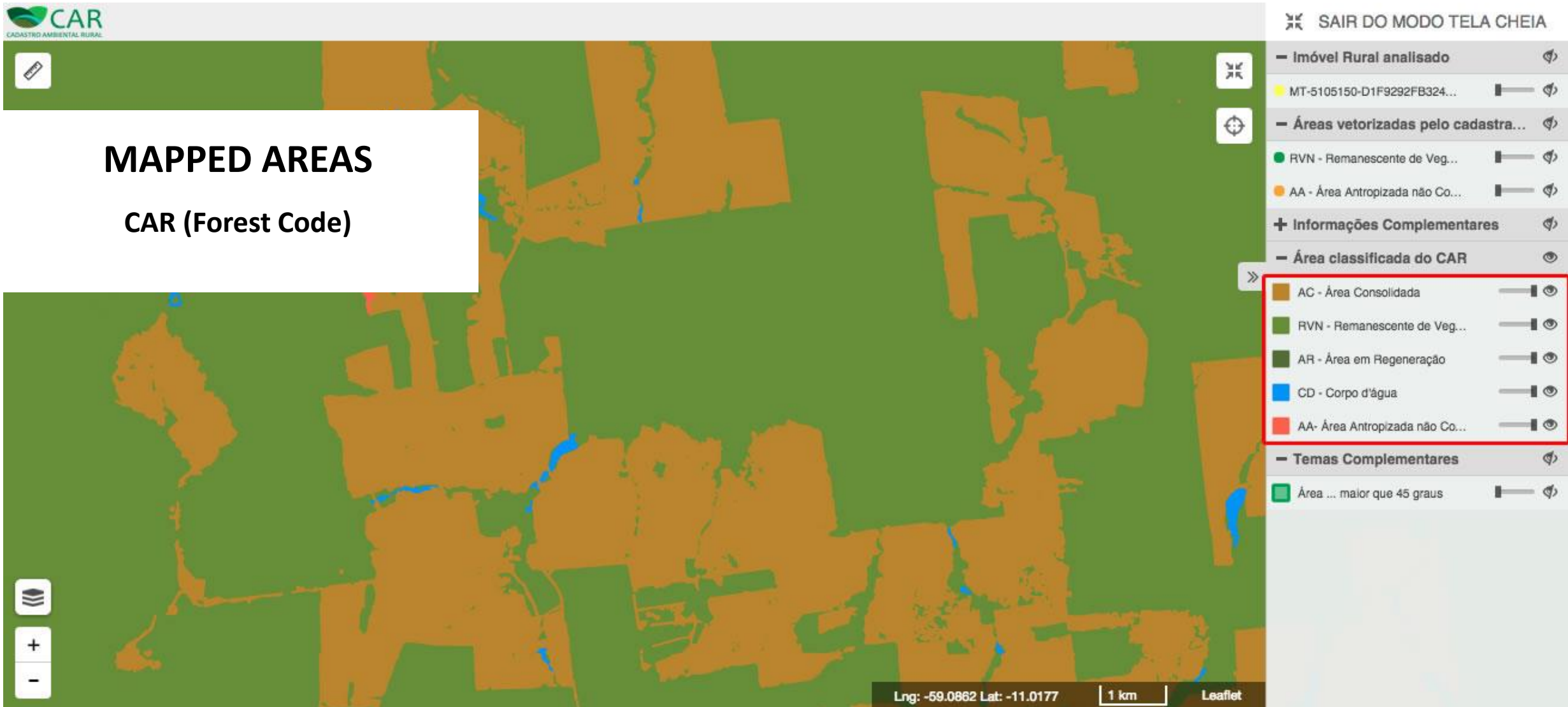
**NATIVE VEGETATION
CAR (MAPPING)**

SAIR DO MODO TELA CHEIA

- Imóvel Rural analisado
 - MT-5105150-D1F9292FB324...
- Áreas vetorizadas pelo cadastra...
 - RVN - Remanescente de Veg...
 - AA - Área Antropizada não Co...
- Informações Complementares
- Área classificada do CAR
 - AC - Área Consolidada
 - RVN - Remanescente de Veg...**
 - AR - Área em Regeneração
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 - AA- Área Antropizada não Co...
- Temas Complementares
 - Área ... maior que 45 graus

Lng: -59.0855 Lat: -11.0367 1 km Leaflet

Land cover analysis



Land cover analysis

CAR
CADASTRO AMBIENTAL RURAL

SAIR DO MODO TELA CHEIA

Imóvel Rural analisado

- MT-5105150-D1F9292FB324...

Áreas vetorizadas pelo cadastra...

- RVN - Remanescente de Veg...
- AA - Área Antropizada não Co...

Informações Complementares

Área classificada do CAR

- AC - Área Consolidada
- RVN - Remanescente de Veg...
- AR - Área em Regeneração
- CD - Corpo d'água
- AA- Área Antropizada não Co...

Temas Complementares

- Área ... maior que 45 graus

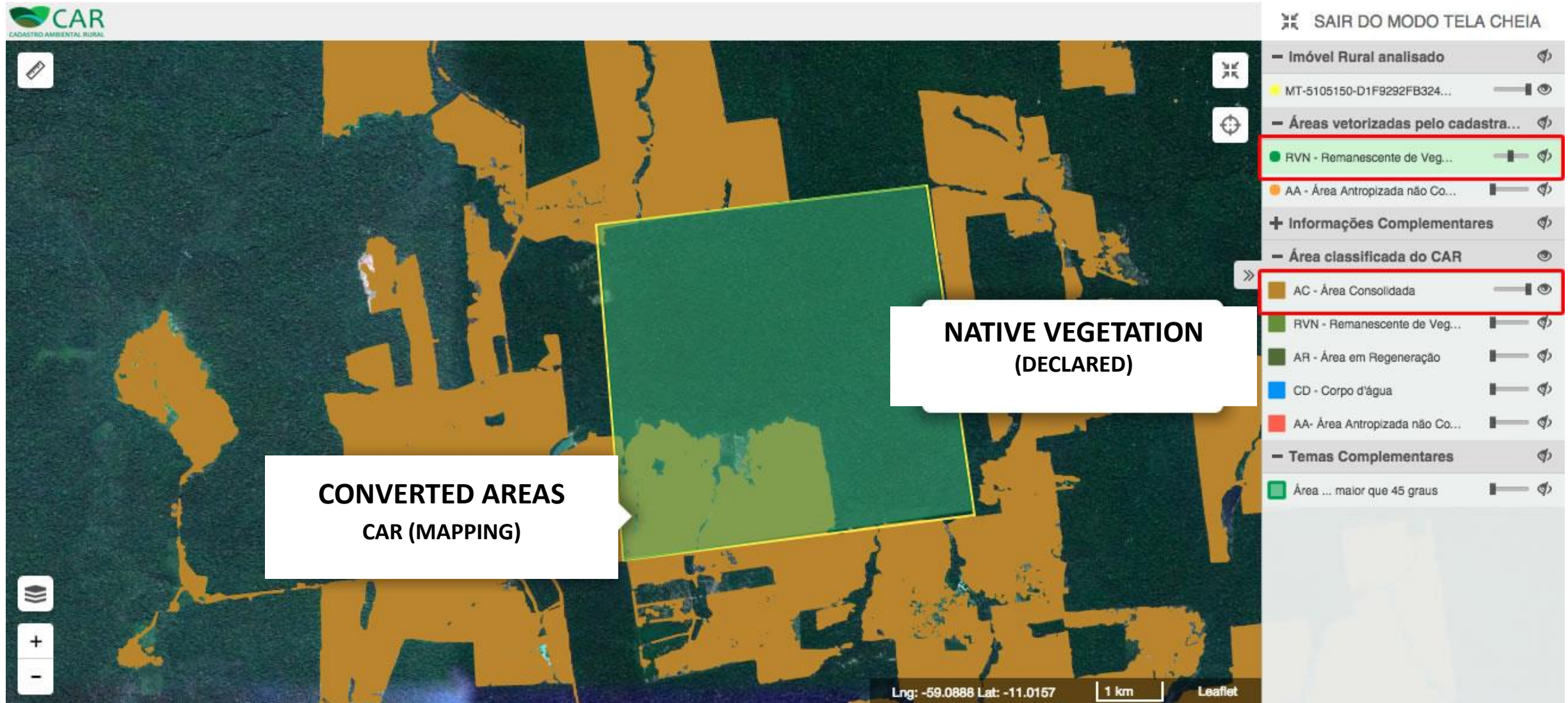
PROPERTY UNDER ANALYSES

Lng: -59.0848 Lat: -10.9904 1 km Leaflet

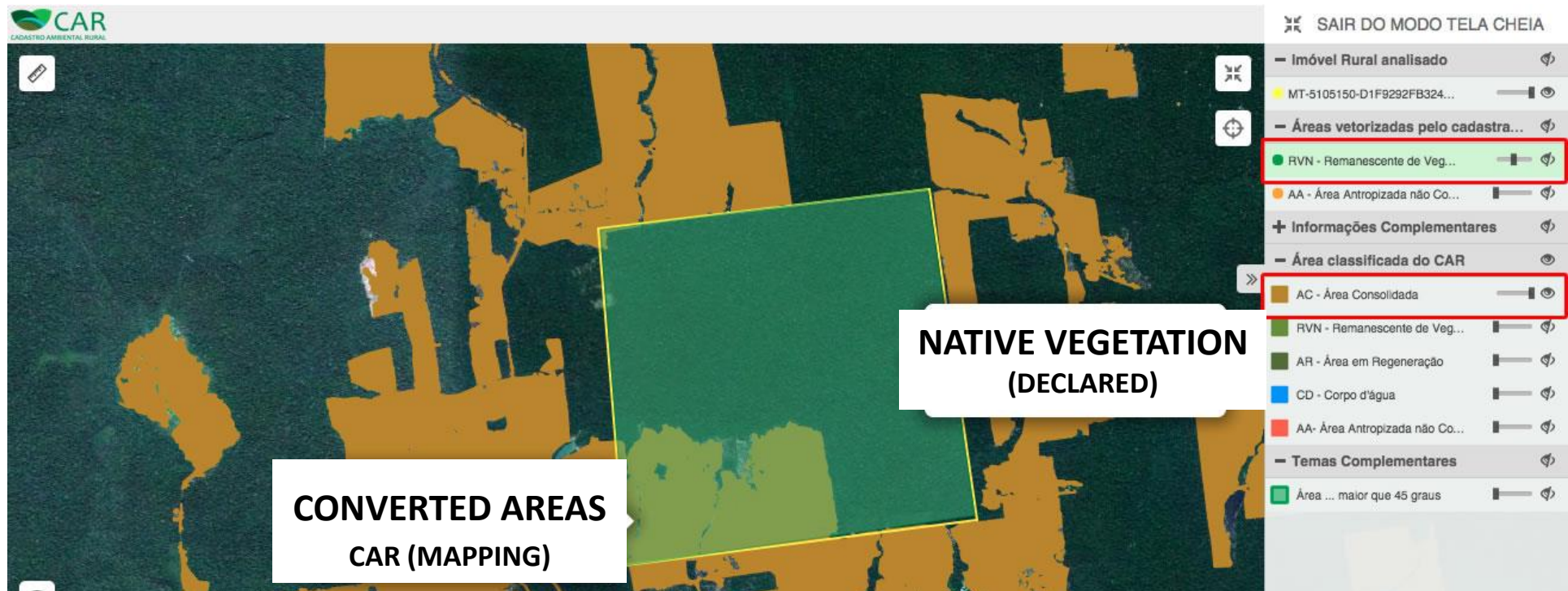
Land cover analysis



Land cover analysis



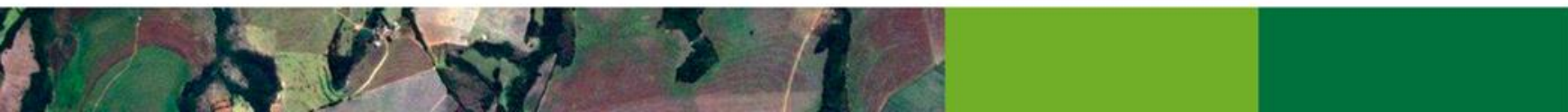
Land cover analysis



▼ Análise da Cobertura do Solo em Remanescente de Vegetação Nativa vetorizada pelo cadastrante

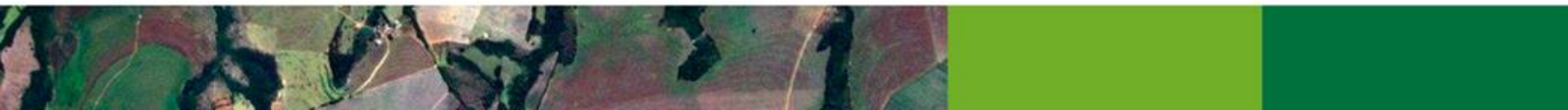
Remanescente de Vegetação Nativa	Área vetorizada pelo cadastrante (ha)	Área de classificação divergente (ha)		
		CAR	Técnico	Sist. Monitoramento
▲ Polígono 1	2.783,3879	534,9114	-	-
✔ Item verificado por Raimundo Deusdará Filho				

Automatic Indication of Inconsistencies



ANALYSIS MODULE

Analysis of the Legal Reserve



Analysis of the legal reserve – deficits and surplus

CADASTRO AMBIENTAL RURAL

Área do Imóvel | Cobertura do Solo | Servidão Administrativa | APP / Uso Restrito | Reserva Legal

COMPENSAÇÃO OU CRA

RLVN

AC

ESCALA 300 m

Lon: -58.97894 Lat: -11.04495

Áreas em Reserva Legal			
Reserva legal	Área total (ha)	Área a recompor (ha)	
Reserva Legal Proposta	91,3204	0,0000	Q
Total	91,3204	0,0000	Q

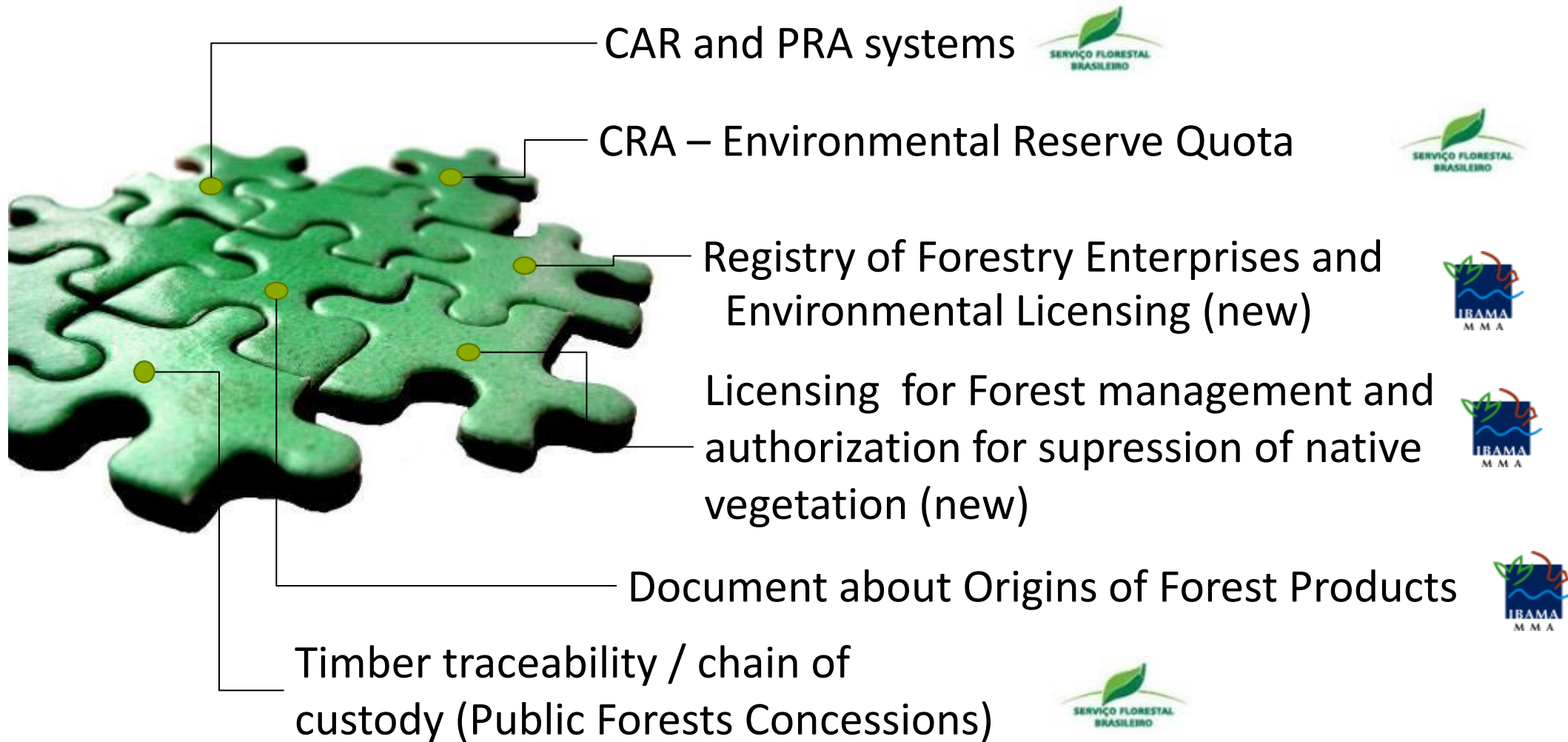
Balanço do passivo ou excedente de Reserva Legal							
Área líquida do IR	MF	RL mínima exigida por lei	Área total de RL vetorizada	Área total compensada no IR	Área total compensada em outro IR	RL excedente /passivo	
100,4232	1,01	80,3385	91,3204	0,0000	0,0000	+10,9819	Q

+ 10,9819

Analysis of the legal reserve – deficits and surplus

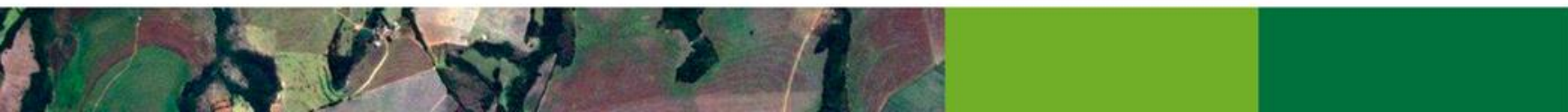
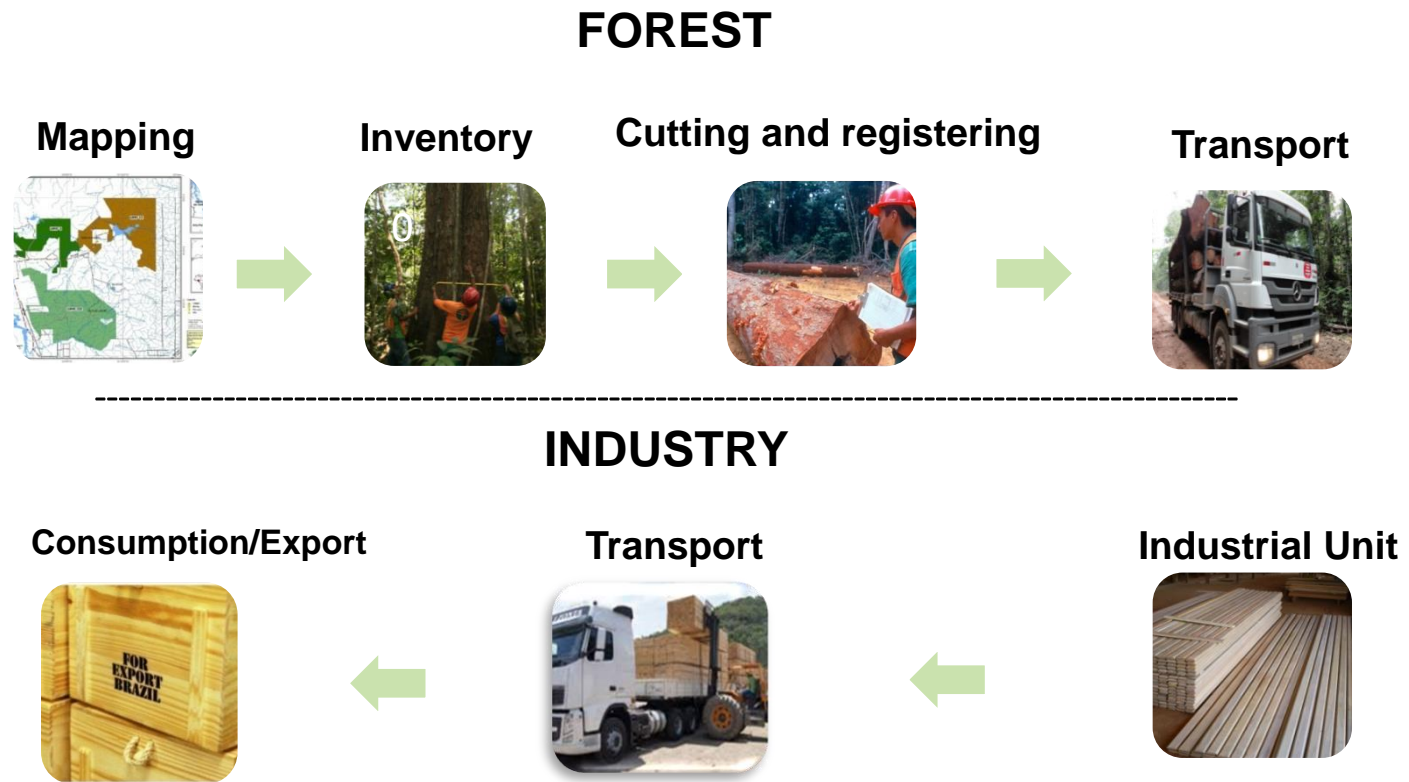


CAR, PRA and other Information Systems on Forests at national level



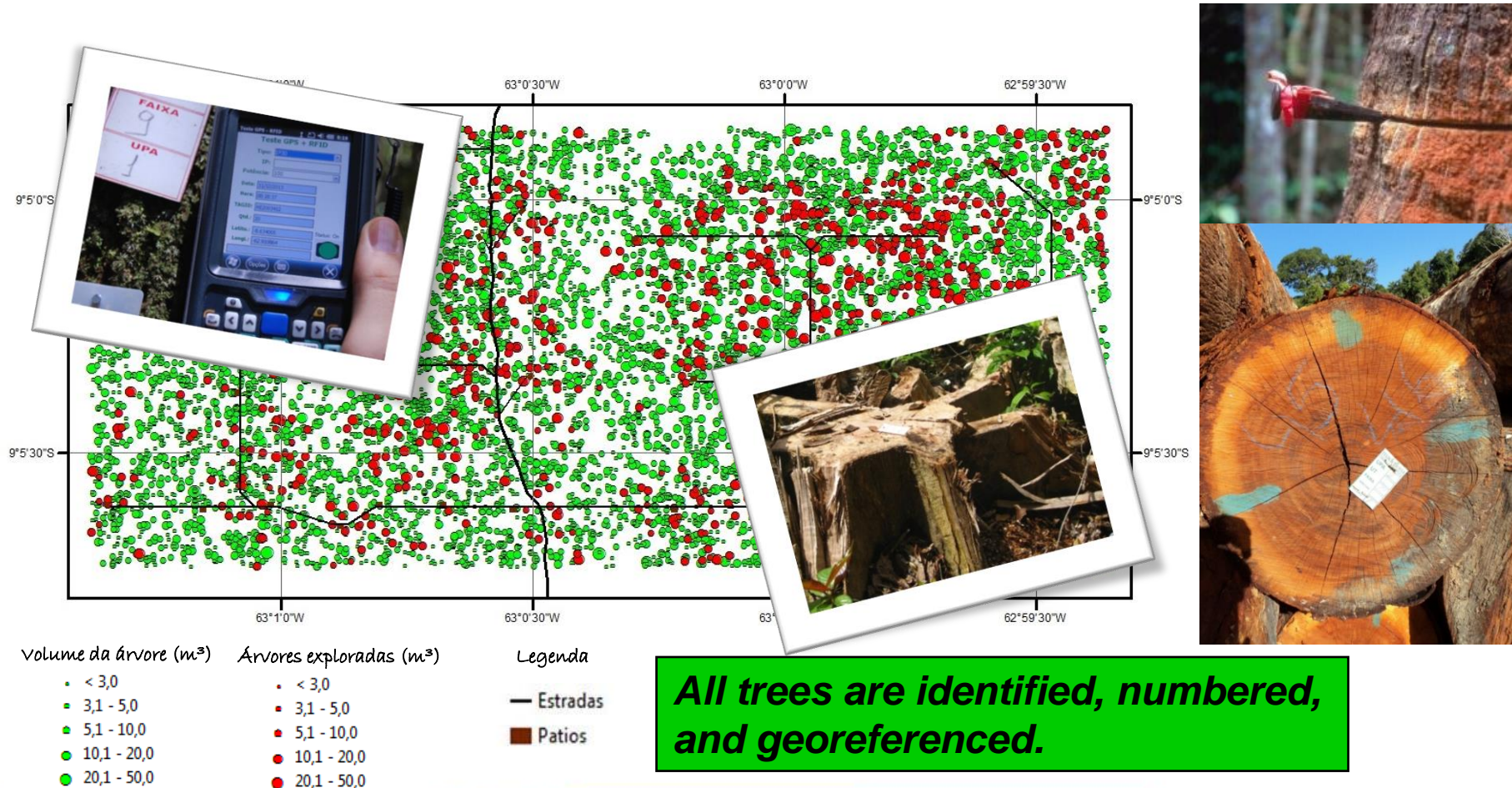
Concessions of Public Forests

Information System for Timber Traceability



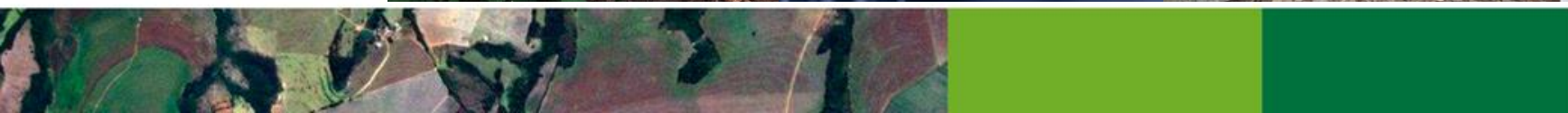
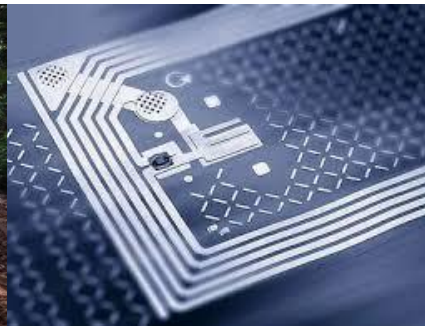
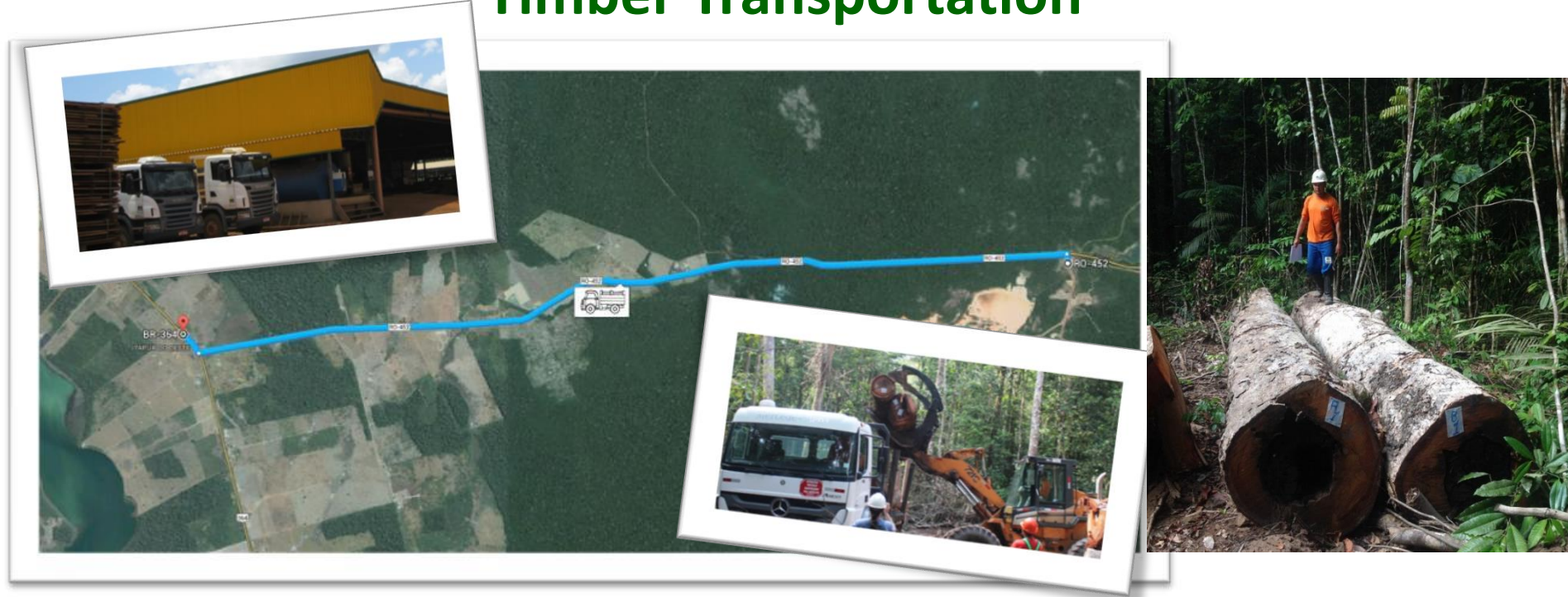
Concessions of Public Forests

Information System for Timber Traceability



Concessions of Public Forests

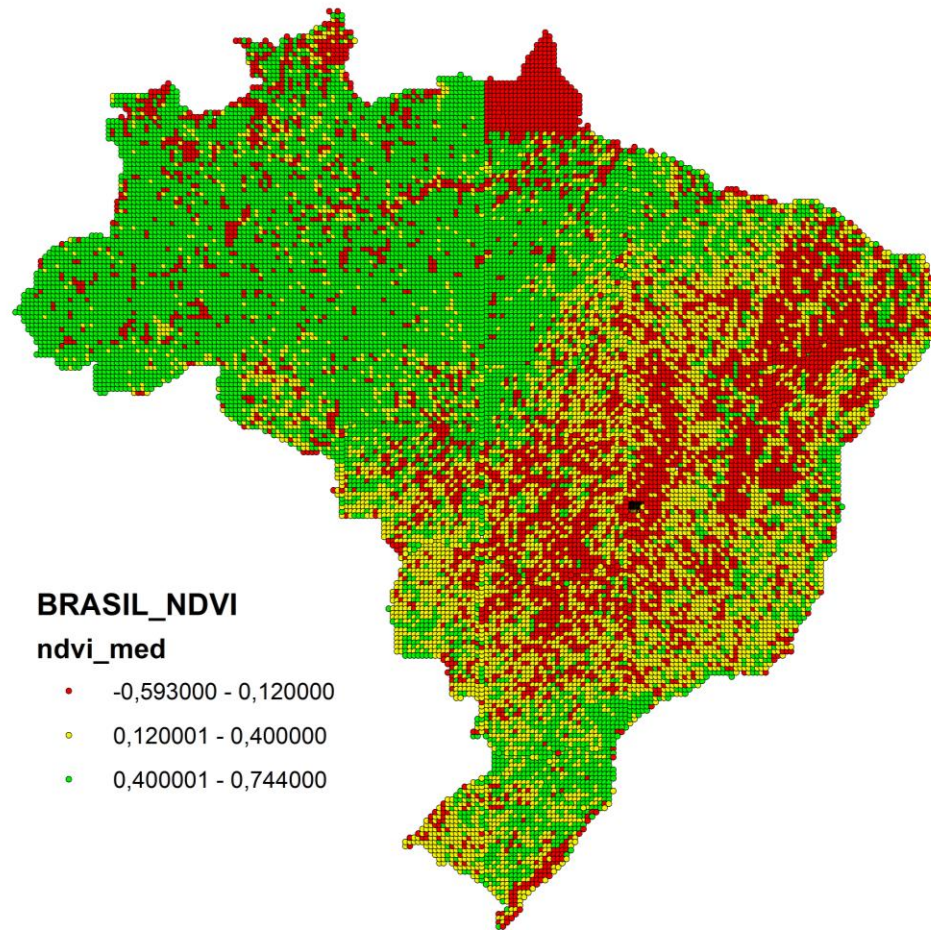
Timber Transportation



MINISTÉRIO DO
MEIO AMBIENTE



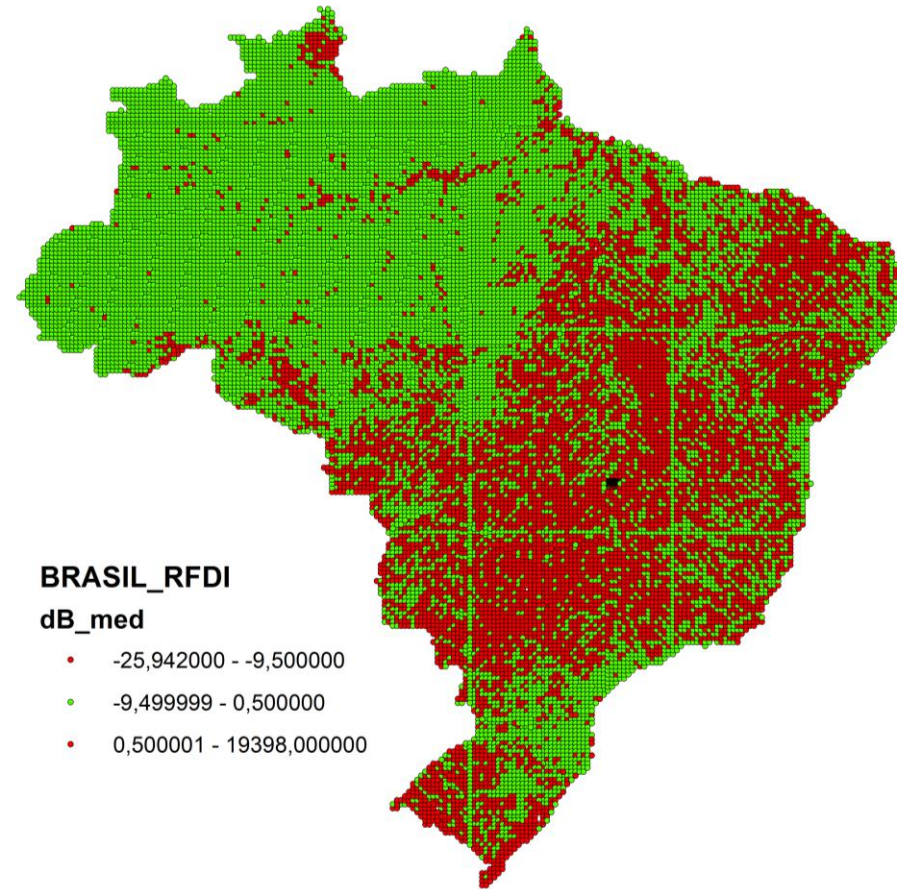
Forest Inventory – Carbon and Biomass Stored in Rural Properties



BRASIL_NDVI

ndvi_med

- -0,593000 - 0,120000
- 0,120001 - 0,400000
- 0,400001 - 0,744000



BRASIL_RFDI

dB_med

- -25,942000 - -9,500000
- -9,499999 - 0,500000
- 0,500001 - 19398,000000



Mobile App – “River Planters”

Connecting spring owners to supporters of increasing water production



Water springs



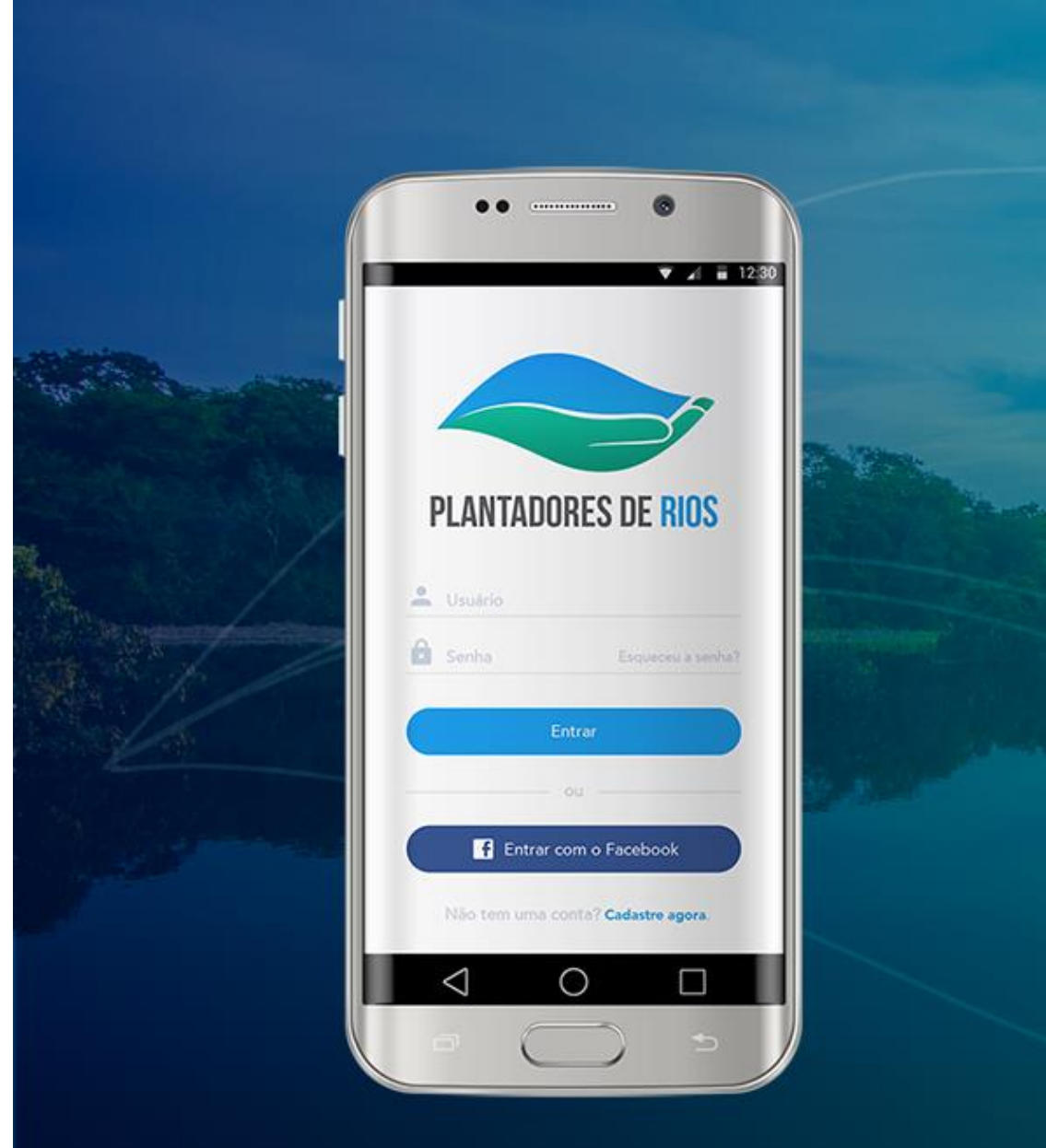
Supporters



Suppliers



Monit
ng



NEXT STEPS

Improving the Information and Data Analyses

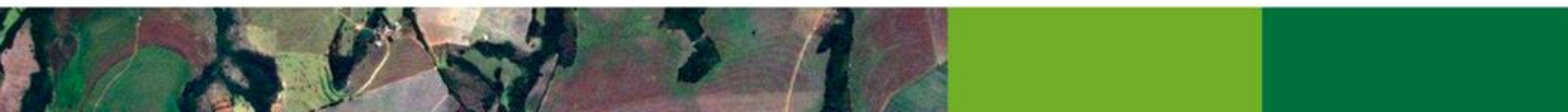
- Implementation of the Analysis Module;
- Evaluation of environmental liability, forest assets and rural properties that comply with environmental regulations;
- Periodic dissemination of information;
- Implementation of images and classification mosaics from Rapideye (2012, 2013, 2014), Landsat 8 (2015) and Sentinel (2016) for monitoring.

Improving Public Policy Formulation and Implementation

- Tracking deforestation;
- Harmonizing agriculture and environment conservation;
- Payment for Environmental Services;
- Establishment of strategies towards conservation: recovering priority areas, ecological corridors, increasing protected areas and integrating with the National Forest Inventory.

Implementing the Program for Environmental Compliance

Regulating the Environmental Compliance Quotas - CRA



Technologies

Registration Module

- NodeJS
- Chromium Embedded Framework (CEF)
- SQLite
- JavaScript
- Jade
- Less
- Grunt
- Leaflet
- Node-Geos

Modules: Receptor + Site + Analysis + Communication Center + Access Management

Backend:

- Java
- Play Framework

Database

- PostgreSQL
- PostGis

Frontend:

- HTML, CSS, Javascript
- Less
- AngularJS
- Jade
- Grunt
- Bower
- Leaflet

BI – Business Intelligence

- MongoDB
- Play Framework
- Java
- jqPlot
- HTML 5 + CSS 3 + JavaScript



Thank You!

Bernardo de Araújo Moraes Trovão

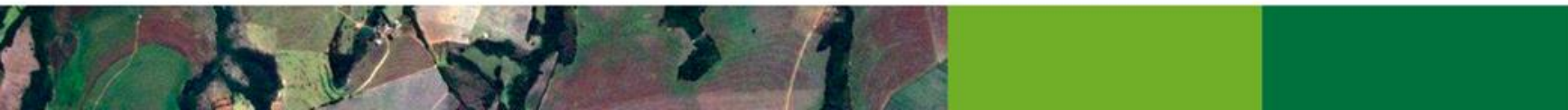
Brazilian Forest Service

Email: bernardo.trovao@florestal.gov.br

<https://github.com/leandromet/Geoprocessamento---Geoprocessing>

www.florestal.gov.br

www.car.gov.br



MINISTÉRIO DO
MEIO AMBIENTE

