

MATOPIBA - BRAZIL

JECAM/GEOGLAM Science Meeting

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Joint Experiment for Crop Assessment and Monitoring



GROUP ON
EARTH OBSERVATIONS

Tapajos site moved to Tocantins site

Tapajos issues:

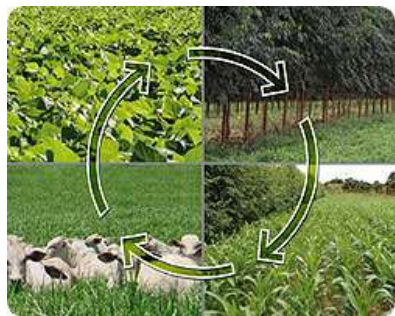
- Limited project environment;
- No Pleiades acquisition for 8 months;
- Access difficult.

Tocantins Facilities:

- Near Embrapa Research Center
- Lots of New Projects going on
- Availability of field data
- Availability of secondary data:

Goals

Develop methodologies for monitoring of land use complex systems to subsidize the Brazilian program of low carbon agriculture program ABC



Brazilian Low Carbon Agriculture Program ABC Program



Crop livestock forest integration



No-tillage systems

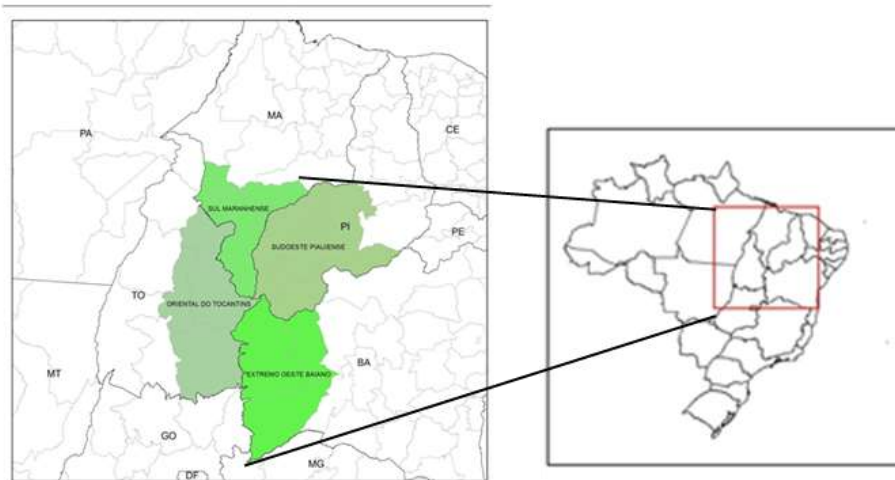


Livestock forest integration

Site Description

Location:

- Guaraí Municipality and surroundings
- Tocantins River basin at State of Tocantins, Center-North Region of Brazil
- Case study of agriculture expansion on MATOPIBA Region



Site Description

Topography:

- Major : Areas with mild relief, slightly undulating with soft slopes (declivity equal or less than 5%) in which, in most soils, the runoff is slow or medium.
- Minor : Areas with sloping surfaces (declivity greater than 5% and equal or less than 10%), usually with undulating relief, in which the runoff, for most soils is medium or fast.

Soils:

- Dominance: Yellowish Red Oxisols
- Entisols (Quartzipsamments)

Note: In accordance with the Soil Taxonomy NRCS/USDA.

Site Description

Drainage class/irrigation

- Yellowish Red Oxisols : Range from strongly to well drained depending on the texture and porosity but can have adequate moisture
- Entisols : Range from of excessively drained to strongly drained depending on topographic position and the level of the water table so can have moisture limitations in drier times

Original Vegetation:

- Dominance: Savannah field (Campo Cerrado)
- Sub dominance: Open mixed forest
- Sub dominance: Submontane Forest

Climate and weather:

- Megathermal wet weather (B1wA'a) (Thormthwaite-Mather (1955);
- Average annual rainfall from 1700 to 1800 mm, with moderate winter water deficit;
- Potential evapotranspiration showing an annual average variation between 1,400 and 1.700 mm and an average of 28% in summer (three consecutive months with higher temperature).

Site Description

Crop calendar:

- Soybean crop: From November to February
- Sugarcane crop: annual cycle (12 months) or longer (15-18 months)

Field size:

will still be set

Agricultural methods used:

- Summer soybean monoculture (mostly no-tillage or minority with conventional tillage), usually with the corn crop at the end of the same season (double crop system); 634 800 hectares for the whole state of Tocantins.
- Sugar cane crop: burning and/or mechanized harvesting -1º planting (cloned material) 2º to 6º regrown crop; 31 150 hectares for the whole state of Tocantins.
- Pasture/livestock: mostly livestock on planted pasture (extensive production); livestock agriculture integrated systems



Tocantins River



Soy crop



Soy crop



Soy crop harvest

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Irrigated corn crop

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Project Objectives

Crop identification and Crop Area Estimation:

The project aims to identify:

- Different agricultural crops
- Different systems of production: no-tillage systems; convention systems
- Intensification/sustainable agriculture systems: crop livestock forest integration; crop rotation; double crop; agroforestry systems; reforestation

Note: To support the Brazilian Low Carbon Agriculture Program (ABC Program)

Crop Condition/Stress:

- not at the moment

Soil Moisture:

- not at the moment

Yield Prediction and Forecasting

- not at the moment

Crop Residue, Tillage and Crop Cover Mapping:

- Different types of soil management as indicators of different cropping systems.

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Earth Observation (EO) Data Received/Used

For each Mission/sensor:

- Space agency or Supplier
- Optical/SAR
- Number of scenes
- Challenges, if any, in ordering and acquiring the data

We're still going to order the satellite images.

Rapid-Eye over all Brazil

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In situ Data

Describe the in situ data collected, with methods and challenges, if any.

The following field data will be collected field data:

- Agricultural calendar and Land use history
- Production systems characterization
- Geo-referencing notable points

Collaboration

Please describe the nature of any collaboration with other JECAM sites or other relevant partners (i.e. who, objective, brief status).

- SIGMA Project

Expected Results

Mapping Agricultural Areas:

- Land Cover
- Cropped Land
- Pasture/Rangeland

Mapping Sustainable Agriculture Practices

- Livestock-crop-Forest Integration
- No-tillage

For Brazilian Low Carbon Agriculture Program (ABC Program)

Research Plans for Next Growing Season

- Will you hold the course, or modify the approach?
- Do you anticipate ordering the same type/quantity of EO data next year? **No**
- If no, how have your needs changed?
 - We are proposing to change the site
 - Main difficult found before: clouds