

Introduction

Brazil's Low Carbon Agriculture (ABC Plan) is one of the initiatives that places the climate in the agricultural agenda towards a more sustainable and adapted agriculture under global changes. The GEOABC Project (Methodologies and Technological Innovation for Satellite Monitoring of Low Carbon Agriculture in Support to Brazil's ABC Plan), aims to develop remote sensing methods to monitor the adoption of the ABC-Plan practices. The practices that will be monitored by satellite are as follows: recovery of degraded pasture, integrated crop-livestock-forestry system and zero tillage systems.

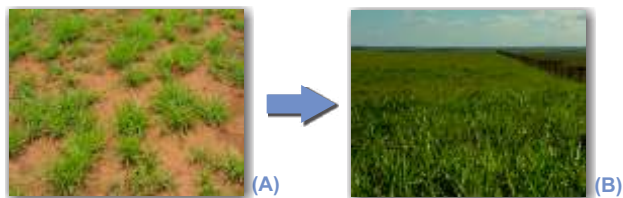


Figure 1. Ferralsol under degraded (A) and under recovered (B) pasture in the neotropical savanna (Cerrado).



Foto: IAPAR

Figure 2. Plowed (A) and zero-tillage (B).

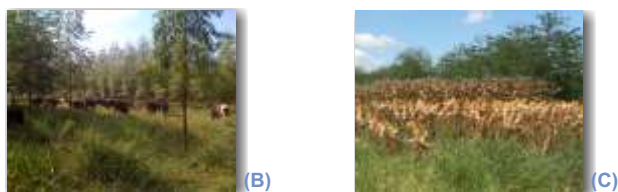


Figure 3 Different ICLF systems: crop-forest (A), livestock-forestry (B), and crop-pasture system (C)

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Methodologies and Technological Innovation for satellite Monitoring of Low Carbon Agriculture in Support to Brazil's ABC Plan – GeoABC Project

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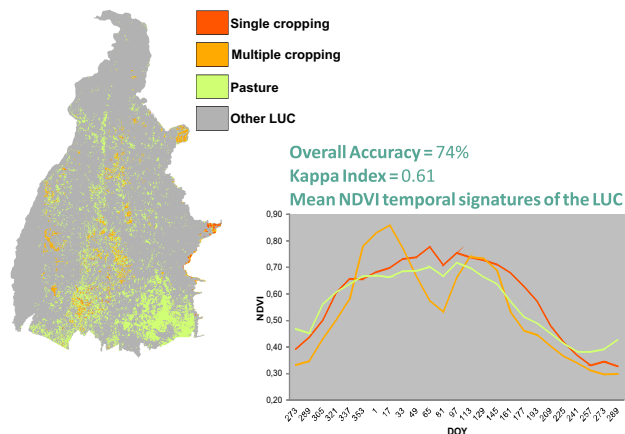
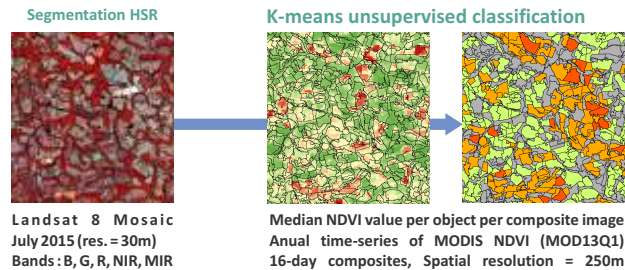
Methods

Different methodological approaches are being developed in the Geo-ABC Project to evaluate how local variables describing the main cropping systems can be up-scaled to be monitored at a regional scale (Bégué et al., 2015). In particular, the developed methodologies focus on the use of spatial, temporal and textural indicators derived from coarse-resolution satellite images to represent cropping systems.

The first results were obtained for the state of Tocantins (277,620.91 km², part of the Brazil's new agriculture frontier, commonly called "MATOPIBA") for the 2015 period.

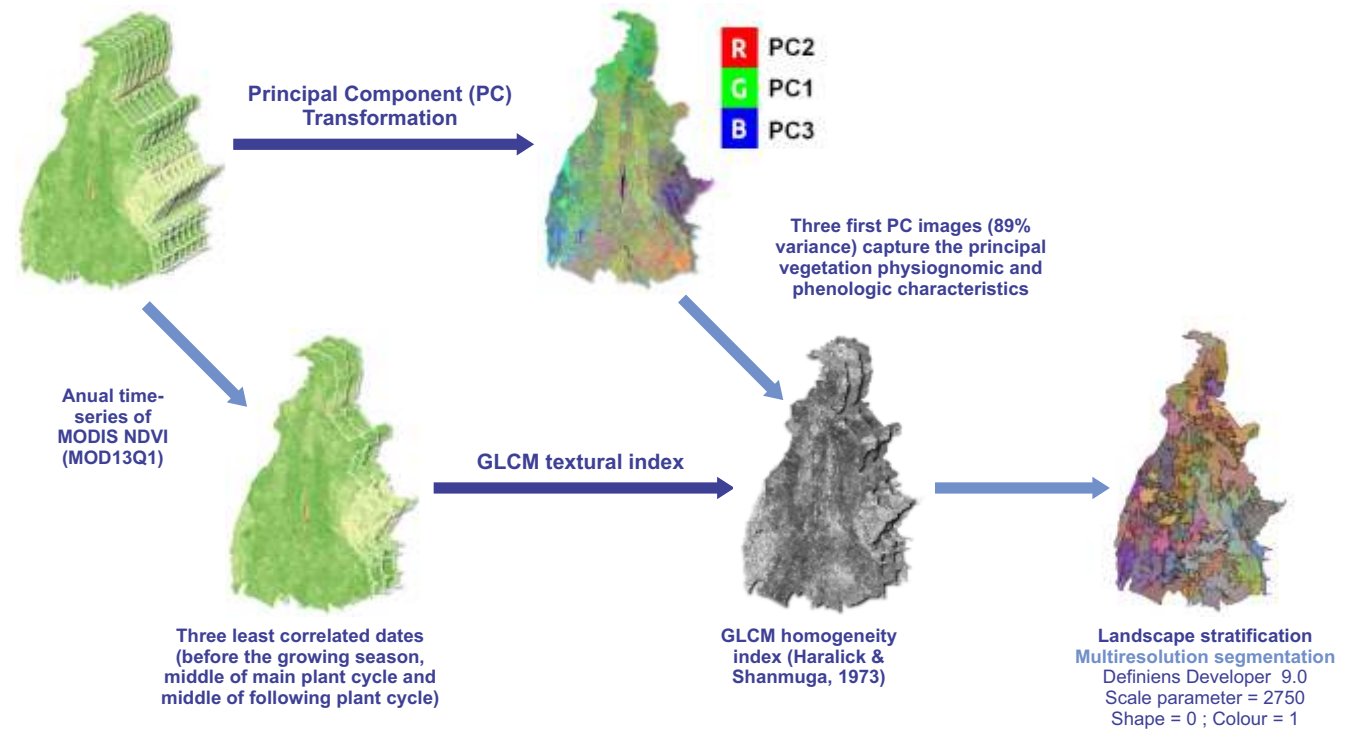
Local level

At the field scale (local scale), object_image analysis (OBIA) was used for the classification of the following Land Use Classes (LUC): pasture, single cropping and multiple cropping (Bellón et al., 2016).



Landscape level

At the state scale (regional scale), a landscape stratification was carried out through segmentation of coarse-resolution satellite derived variables (Bellón et al., 2016).



Conclusions

The results show that through the use of OBIA it was possible to establish : (i) at a landscape level, landscape units with homogeneous land use patterns which were evaluated by local experts; (ii) at the local level, cropping pattern maps.

The second part of the work includes the development of complementary remote sensing derived indicators to further characterise and map the target agricultural systems of the ABC Plan. The complete set of approaches aims to eventually establish methodological protocols to obtain systematic monitoring at multiple levels of the adoption of the ABC-Plan practices.

References

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