MONITORING THE EXPANSION OF EUCALYPTUS PLANTATIONS IN BRAZIL

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Introduction
Classification of specific crops with MODIS or other coarse scale data is useful to assess regionally and annually the land use change.

Area of Eucalyptus plantations in Brazil is continuously increasing: it was 3.5 Mha in 2006 and now reaches almost 5 Mha (ABRAF, 2012).

A precise estimation of recent Eucalyptus expansion and associated land use change is a prerequisite to assess their environmental impact on regional carbon and water cycles, and later on climate.

Validation on a Landsat classification

Validation on Forest Companies data

Validation on GoogleEarth

Validation of the expansion of Eucalyptus plantations

The graphics were produced by the Scientific Visualization Laboratory (LVS) of CIRAD (www.lvs-cirad.fr).

Short-rotation Eucalyptus plantations expansion

In the area covered by our analysis, area of short rotation Eucalyptus plantations has increased by 130% between 2002 and 2009.

Increase of 45% estimated from ABRAF data over Brazil between 2005 and 2009, similar to the 40% expansion estimated in this study. However there is a 30% underestimation.

It is difficult to compare the results quantitatively with other census (IBGE 2006) or companies statistics in the same region (due to cloud mask) and for the same class (only fast-growing Eucalyptus), but work is in progress.

Conclusions and perspectives

- The statistics are correct for classification purposes assessed with 3 types of validation dataset, except in highly fragmented areas.
- A global underestimation of Eucalyptus areas compared to large scales census was observed: effect of MODIS resolution, algorithm, and the fact that only short-rotation plantations are detected.
- Some other time-series classification algorithm have been tested, but the procedure could be improved.
- A transposition of the methodology using higher resolution images (e.g. Landsat) seems necessary to gain accuracy in area estimates.
- Local calibration of UB, LB and T could enhance the classification results.

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