SP 9: Landscape-scale land-use analysis and geodata management

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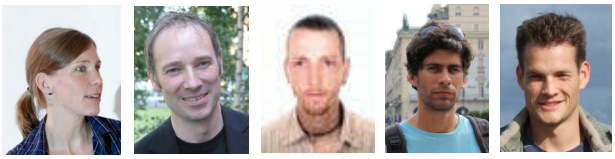

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Objectives

The target is to analyse landscape scale LULCC to support decision-making for an optimized land management. We develop and apply a landscape-wide analysis approach integrating remote sensing and spatial modelling techniques to gain knowledge on how to mitigate existing and prevent future land use conflicts:

Remote Sensing

(1) Development of remote sensing based analysis schemes to derive land use at high resolution with regional coverage over the last 25 years

(2) Development and application of remote sensing based indicators for assessing landscape patterns and its links with carbon sequestration potential at landscape level

LULCC Modelling

(3) Spatially explicit modelling on landscape level to identify drivers and hot spots of change at the landscape scale

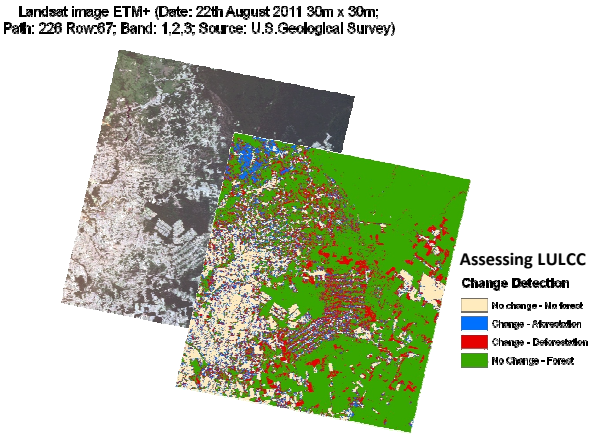
(4) Spatially explicit scenario-building of land use types according to different regional to sub-continental storylines

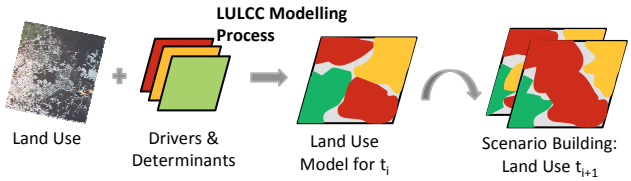
Geodata Management

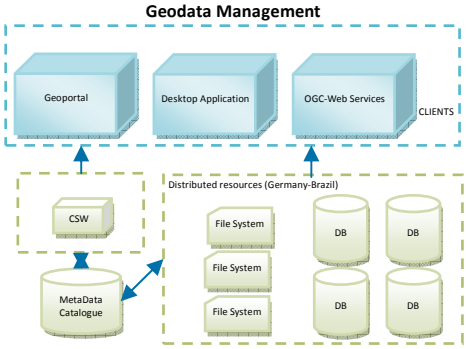
(5) Development of a spatial data infrastructure for the whole carbiocial project including data management and web-based technologies for distributed data access in Germany and Brazil

Methods

- Landsat data analysis in combination with integration of thermal and synthetic aperture radar (SAR) data
- Machine learning algorithms based on support vector machines (SVMs) to cope with the large datasets
- Spatially explicit land-use change model at landscape-scale including machine learning techniques to identify drivers
- Providing distributed and web-based tools to enable distributed data and meta-information access







Expected Results

(1) Up to date land use map covering the study region at landscape scale

(2) Land use change maps and analysis for approx. 25 years, at the landscape scale

(3) Remote sensing based indicators of regional carbon sequestration potential at landscape level

(4) Determination of drivers and resulting hotspots of landscape scale land use change

(5) Scenarios of likely future development based on different storylines

(6) Quantification of impacts on carbon sequestration potential for selected land use scenarios

(7) Open-source spatial database infrastructure for researchers and stakeholders

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