



## INTER-AMERICAN INSTITUTE FOR GLOBAL CHANGE RESEARCH

### The impact of land cover and land use changes on the hydro-climate of the La Plata Basin (CRN2094)

The La Plata basin is key for the economic and social development of Argentina, Bolivia, Brazil, Paraguay and Uruguay. During the last decades, land use and cover have changed significantly as a result of ever expanding agriculture and forestry. Since the end of 2008, this project investigates the impacts of such changes on the regional hydroclimate of the La Plata Basin and their interaction with climate change.

#### Goals

- Develop 25-year datasets that integrate all in-situ and remotely sensed observations on land use and cover; and develop regional models to assess in which way and how much land use changes affect the hydroclimate of the La Plata basin
- Investigate the role of land use and cover changes in the intensity and length of floods and droughts
- Investigate potential changes in the hydrological characteristics of the Basin (soil moisture, infiltration, and runoff)

#### First results

- The project is using 1980-2005 datasets to assess the impact of land use and cover changes on the hydro-climate of the La Plata Basin, and the physical mechanisms by which these impacts take effect.
- These datasets are being used for a regional land surface re-analysis in a Weather Research and Forecast (WRF) modeling system run on continental scale with a nested grid over the La Plata Basin.
- WRF simulations are being prepared for different land cover scenarios, from no agriculture to intensive arable agriculture.
- The project defined a new approach to investigate changes in land cover; the Ecosystem Functional Types (EFTs) and investigated their year-to-year evolution. EFTs replace the current time-fixed land cover types and will be tested in regional models.

#### Principal investigator and lead agency

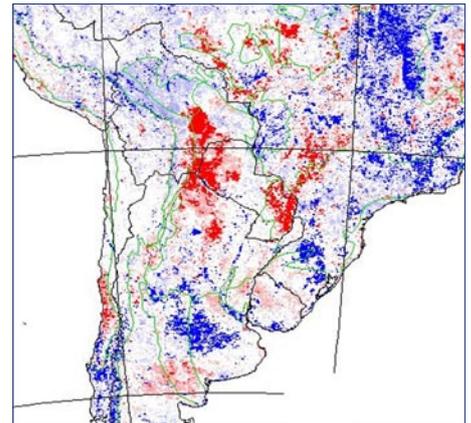
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**Project web page:** <http://www.atmos.umd.edu/~berbery>

**List of publications:** <http://iaibr.liaii.int/bs?publications/CRN2094.pdf>



Changes in the normalized difference vegetation index (NDVI) from 1980 to 2000



Forest to agriculture (NDVI decreases)



Grassland to tree plantation (NDVI increases)

The figures are courtesy of Jose Paruelo and Esteban Jobbágy.

