JECAM Argentina
“San Antonio de Areco”

JECAM/GEOGLAM Science Meeting

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Team Leader and Members:

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JECAM
Joint Experiment for Crop Assessment and Monitoring

GEO GROUP ON EARTH OBSERVATIONS

Site Description

- Location: 100 Km NE from Buenos Aires city
- Topography: Gently rolling (ca. 2%)
- Soils: composed mostly of Mollisols (deep A horizon -30 cm- with high SOC).
- Drainage class/irrigation: Well drained. Irrigation < 5%
- Crop calendar:
  - Maize: October/March
  - Early soybean: November/April
  - Wheat-soybean: June/December - May
- Field size: mean 20 Ha
- Climate and weather: Humid temperate (1000 mm pp)
- Agricultural methods used: No till continuous agriculture

Project Objectives

- Land use / Crop identification
- Yield prediction
- Soil Moisture

Earth Observation (EO) Data Received/Used

Platform	Supplier	Band	Scenes	Observations
MODIS	NASA – REVERB	Optical / SWIR	daily	
LANDSAT 5,8	USGS	Optical / SWIR	116	
DMC-ii	DMC International Imaging Ltd.	Optical / SWIR	18	Clouds / orthorectification
AWIFS	ISRO	Optical / SWIR	15	Not all cloud free
DEIMOS	SIGMA Project	Optical / SWIR	7	
Quickbird	Digitalglobe	Opt. / SWIR / pan	4	
SPOT4	ESA	Optical / SWIR	17	
Rapideye	ESA	Optical / SWIR	24	Cloud mask
RADARSAT-2	CSA	SAR – C band	18	
TerraSAR-X	DLR	SAR – X band	28	
ALOS PALSAR	CONAE	SAR – L band	9	
Cosmo Skymed	CONAE	SAR – X band	31	

In situ Data

Activity	Period	Frequency	Observations
Land use / crop type identification	2010-2014	Several times a year	
Yield	2010-2014	End of season	
Fresh / dry biomass	2010-2013	ca. 30 days	
fCOVER / LAI	2010-2013	ca. 30 days	
fAPAR	2010-2013	ca. 30 days	Depending on atmospheric cond.
Height	2010-2012	ca. 30 days	
Soil moisture	2010-2012	ca. 30 days	Gravimetric. 0-5 cm
Row spacing / orientation / plant density	2010-2013	Once per growing season	

Collaboration

- RADI, CAS, China JECAM site. Prof B. Wu / Ph.D. Zhang Miao. Ongoing collaboration on cross site yield estimation methods / Field campaigns

In addition:

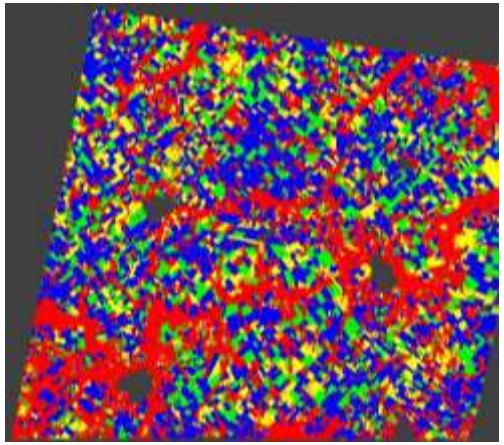
- SIGMA Project partners. Coordination by VITO. Started in November 2013.
- Sentinel-2-Agri project. Coordination: Prof P. Defourny
- University College London – J. Gomes Dans.

Results (slide 1)

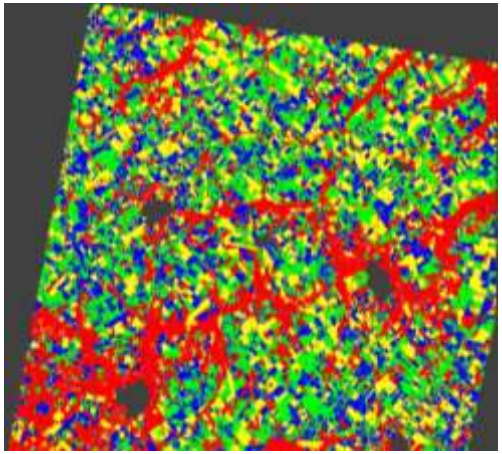
LAND USE / CROP TYPE MAPPING

- Evaluation of land use crop type classification methods, considering temporal and spatial resolution, acquisition timing and frequency (optical / SAR).
- 3 yearly based land use / crop type maps
- Characterization of Crop rotations

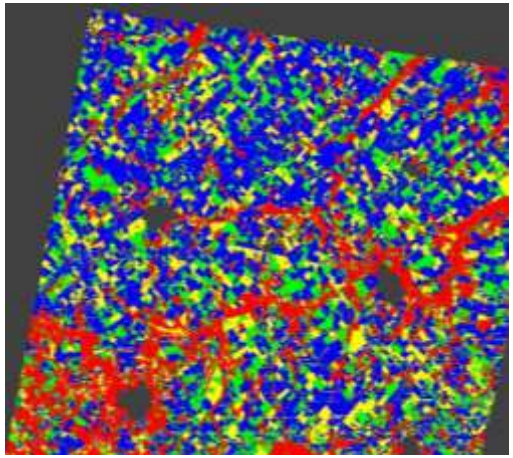
2010-2011



2011-2012



2011-2012



Early soybean
Wheat-soybean
Maize
Forrages

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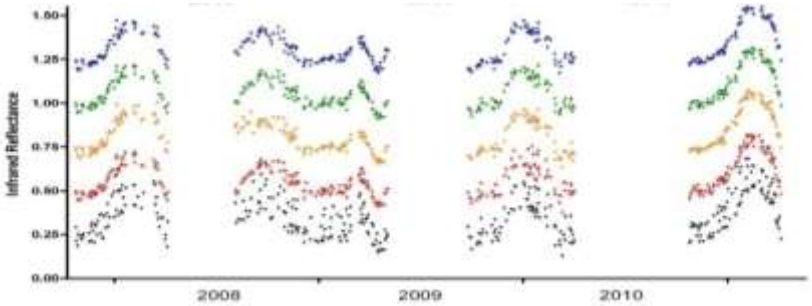
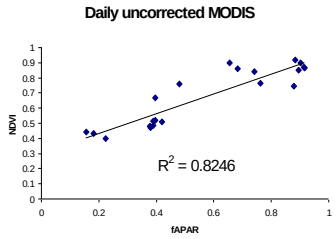
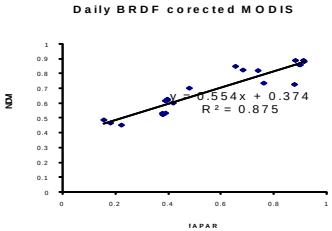
Results (slide 2)

CROP MONITORING

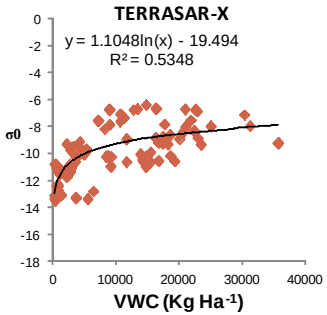
- Generation of BRDF corrected 250 m MODIS reflectance time series

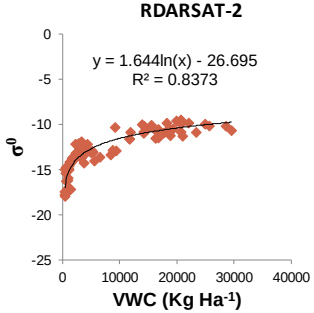


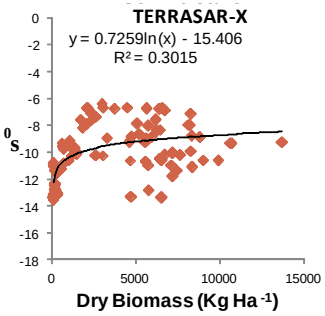


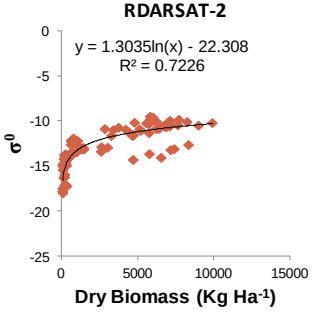


- Estimation of crop biophisical parameters and soil mositure from optical and SAR data (time series / regression analysis).









- Yield estimation method developement from optical remote sensing and wheather data.

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Research Plans for Next Growing Season

- We will deepen our current approach focusing on yield
- 2010-2014 available data and new high spatial resolution yield observations (yield monitor maps).
- Environmental impacts (SIGMA project): Assessment of crop rotation effects (over yields / albedo).
- Test contribution of SAR and time series anlalysis to separate of mixed clases (i.e. early vs. late maize).