Barrax JECAM Site (Spain)

JECAM/GEOGLAM Science Meeting

Brussels, Belgium

16-17 November, 2015

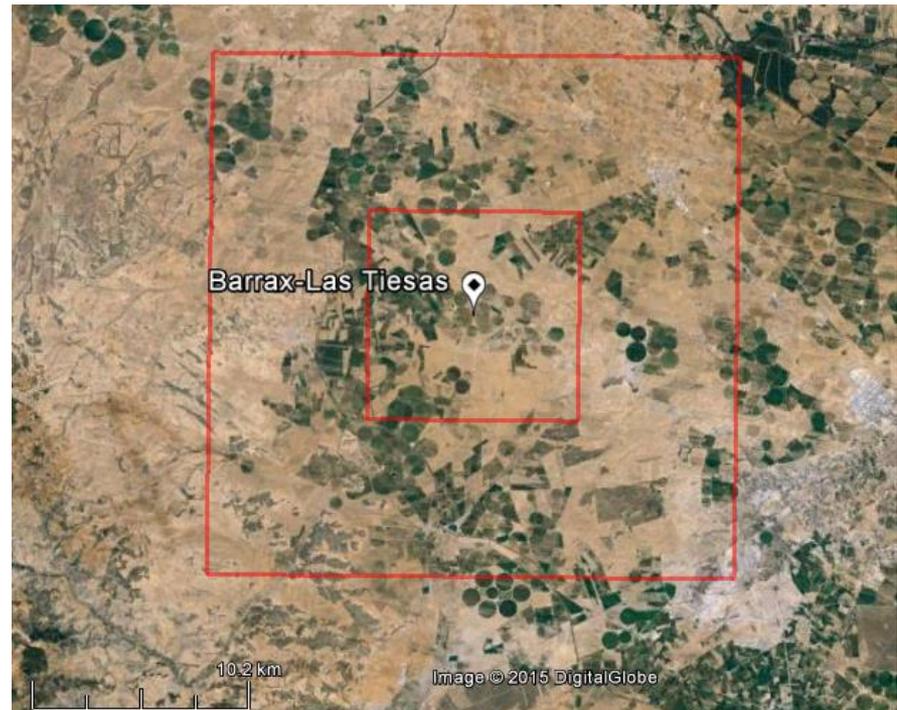**Fernando Camacho**
Consuelo Latorre

Fernando de la Cruz

Site Description

Barrax has been a study area in many ESA cal/val studies (DAISEX, SPARC, SEN2FLEX, SEN3EXP) and irrigation assisted by EO projects(DEMETER, sigAGROasesor, FATIMA)

- ## Location

The study area is located in "*Las Tiesas*" farm (39.074 N, 2.104 W) , managed by the Technical Agronomic Institute of the Province (ITAP) (http://www.itap.es/). It is located near Barrax (Albacete, Spain), in the Castilla-La Mancha plateau : *Don Quijote's land.*

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Site Description

- ## Topography

The area is characterized by a flat morphology and large, uniform irrigated land-use, surrounded by large areas of cereals (~ 10 hc – 100 hc). Differences in elevation range up to 2 m only.

- ## Soils

The soil is classified as Petrocalcic Calcixerepts

with a silty-clayloam texture

(13.4% sand, 48.9% silt, and 37.7% clay)

- ## Drainage class/irrigation

Soils moderately well drained / Sprinklers and pivots

- ## Climate and weather

Temperate Mediterranea climate. Warm but with extreme temperatures in summer and winter.

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Site Description

- **Crop calendar**

Winter and summer crops

- **Typical Crop rotation**

Wheat-Corn-Garlic/Onion

- **Crop Types:**

Wheat, Barley, Camelina, Garlic, Onion,
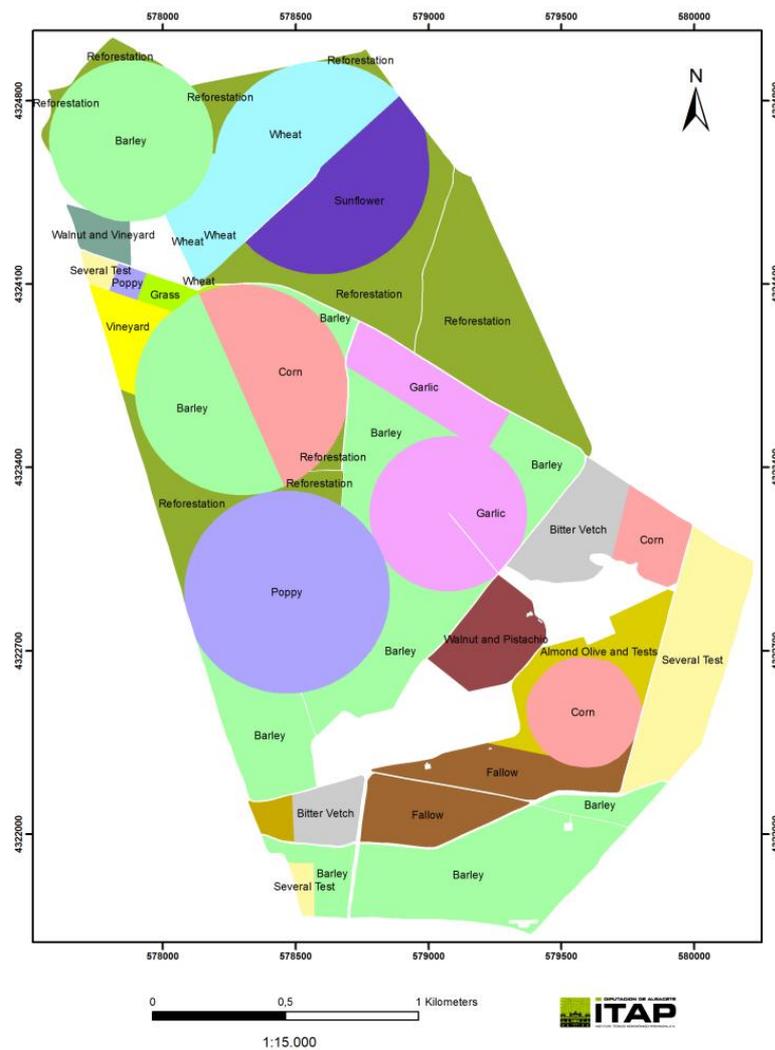Potato, Sunflower, Alfalfa, Pappaver, Sugarbeet..

Garlic

Alfalfa

Papaver Somniferum

Wheat & Barley

Landuse 2014 - 2015. "Las Tiesas" Farm

1:15.000

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Project Objectives

- ## Mapping Agricultural Areas (UCLM, EOLAB)

    Crop type (2 per year) & cropped area

- ## Crop Growing Conditions (ITAP)

    Soil Moisture, Evapotranspiration

- ## Monitoring biophysical variables (EOLAB)

    LAI, FAPAR, Cover fraction

    Canopy Water content, leaf chlorophyll content

    Optimization of indices and empirical relationship for biophysical retrieval

- ## Phenological Events (EOLAB)

    Continuous PAI monitoring with PASTIS

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Earth Observation (EO) Data Received/Used

Landsat OLI sensors:

- UGSS earthexplorer TOA & TOC

- Optical: Red, Green, NIR, SWIR1 are used

- Number of scenes : 6-10 per year, during field campaign experiments.

Landsat-8 METADATA		
Platform / Instrument	Landsat-8 / OLI_TIRS	
Path	199	200
Row	33	
Selected Bands	B3(green) : 0.53-0.59 µm B4(red) : 0.64-0.67 µm B5(NIR) : 0.85-0.88 µm B6(SWIR1) : 1.58-1.65 µm	
	First campaign 26th to 28th May, 2015	**Second campaign** 22nd July, 2015
Acquisition date	2015.06.07 10:42:50	2015.07.16 10:49:21
Illumination Azimuth angle	127.420º	126.763º
Illumination Elevation angle	23.572º	25.659º

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In situ Data

- DHP, Li-COR LAI-2200, Ceptometer AccuPAR LP-80
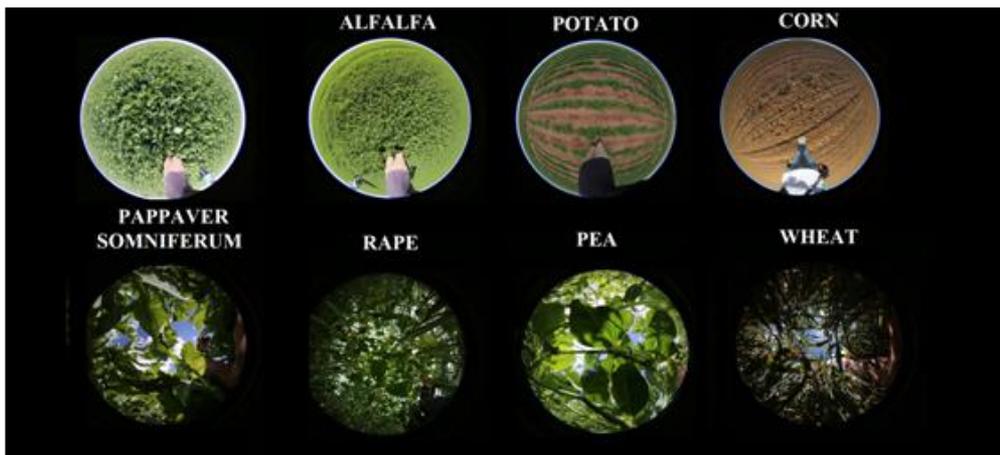
In situ Data

- Sampling according to the FP7 ImagineS field protocol (details later)
  - 30-50 ESUs
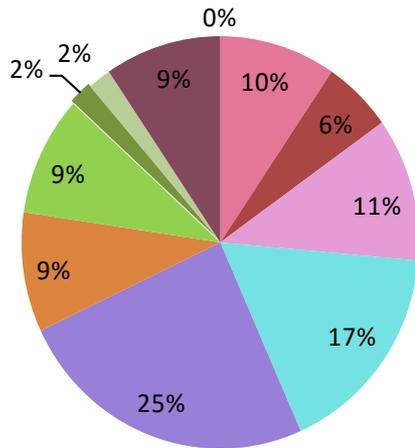 - Visual inspection for bare areas or senescent crops

ESU (DHP & Accupar measurements)
PASTIS - PAR (1 per ESU - 5+1 sensors)
PASTIS - PAR (3 per ESU - 17+1 sensors)

0   0.5   1 km
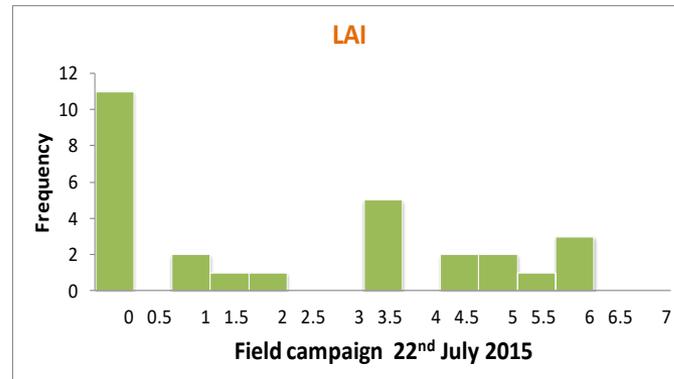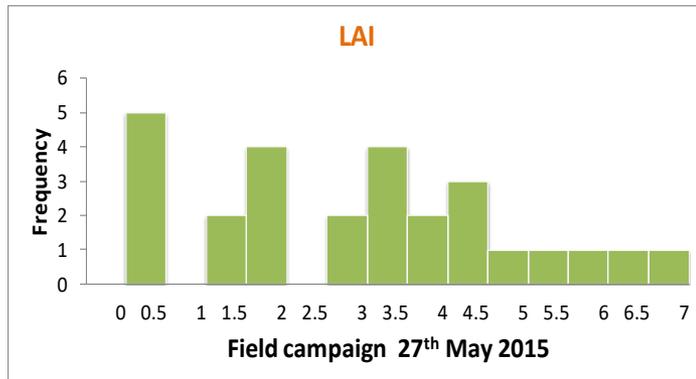
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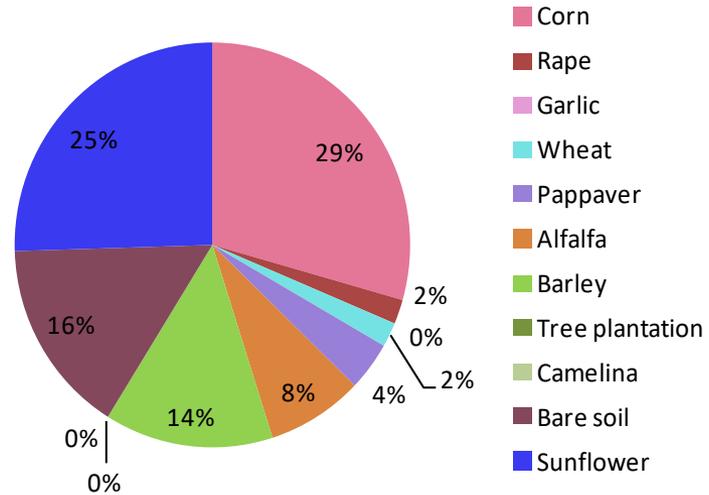
Sampling evaluation

First field campaign - Las Tiesas, Barrax (SPAIN)

Min and Max cum. freq.
Measured cum. freq.
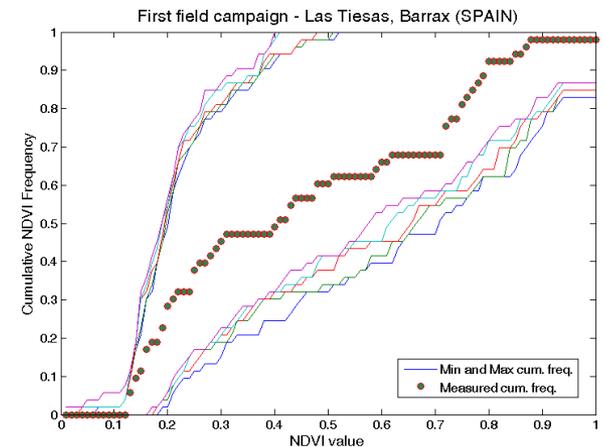
In situ Data

- Summer crop campaigns

27th May 2015

22nd July 2015

Legend:
- Corn
- Rape
- Garlic
- Wheat
- Pappaver
- Alfalfa
- Barley
- Tree plantation
- Camelina
- Bare soil
- Sunflower

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In-situ Data

• Seasonal monitoring, inter-comparison and continuous monitoring of PAI using PASTIS-PAR sensors an instrument capable of acquiring continuous measurements of transmittance (INRA, France) over different crops for winter and summer crops (2015-2016).
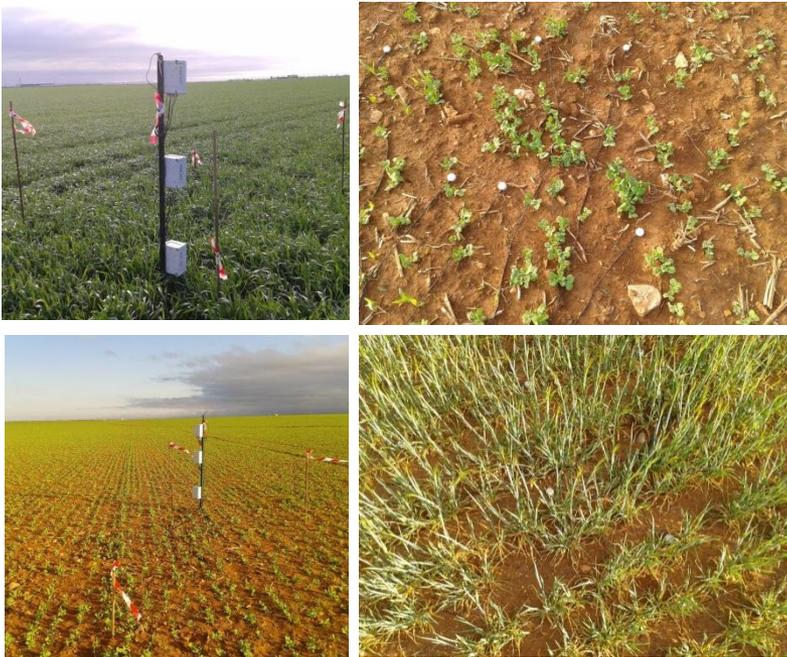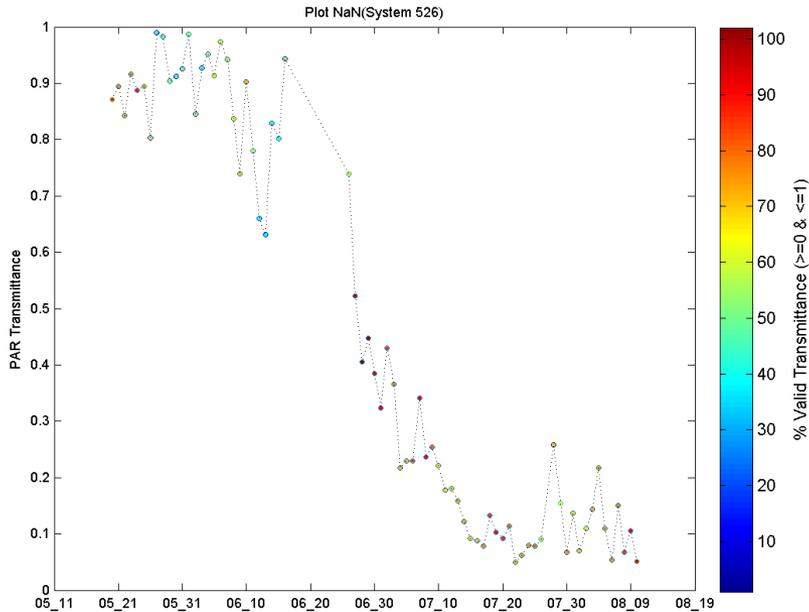

27th May 2015   22nd July 2015   19th September 2015

2015 example

2014 example

PASTIS-PAR sensors

- Results from 2014
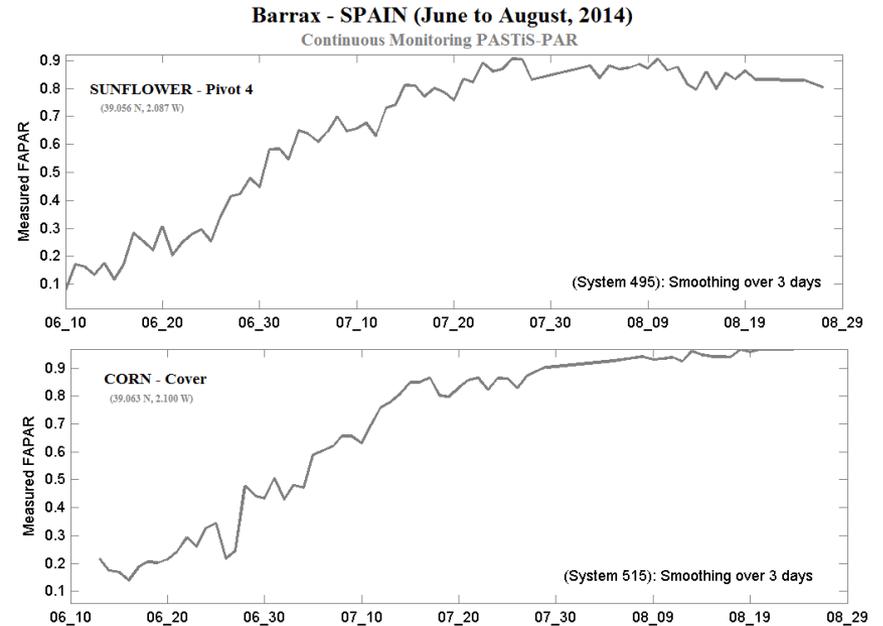
Collaboration

- Biophysical variables collected in other JECAM sites have been used for up-scaling with HR data in support of Copernicus Global Land Validation
  - Ukraine (Pshenichne): supported by FP7 ImagineS project.
  - Capitanata (Italy)
  - Tula (Russia): supported by FPT ImagineS, but data not useful.
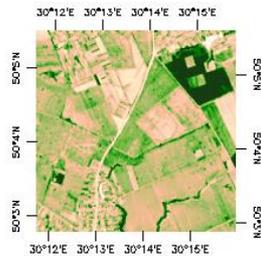 - Guang-dong (China)
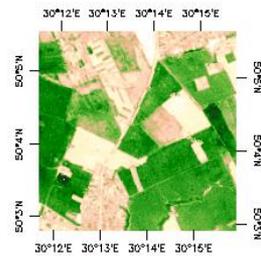- University of Castilla-la Mancha
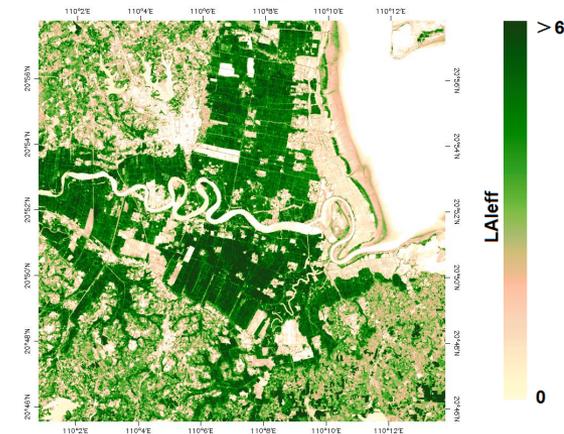 - Crop type mapping
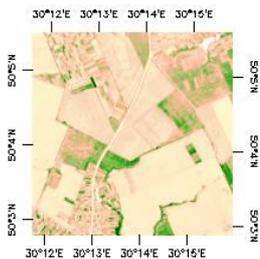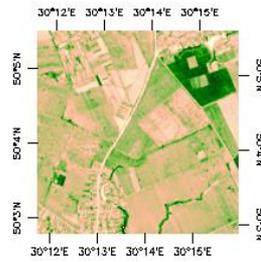
3-06-2015   23-06-2015   7-07-2015   23-07-2015

Guang-dong

Results

- ## Mapping biophysical variables over Barrax

  – Robust regression algorithm (OLS)

27th May, 2015   **22nd July, 2015**   LAI
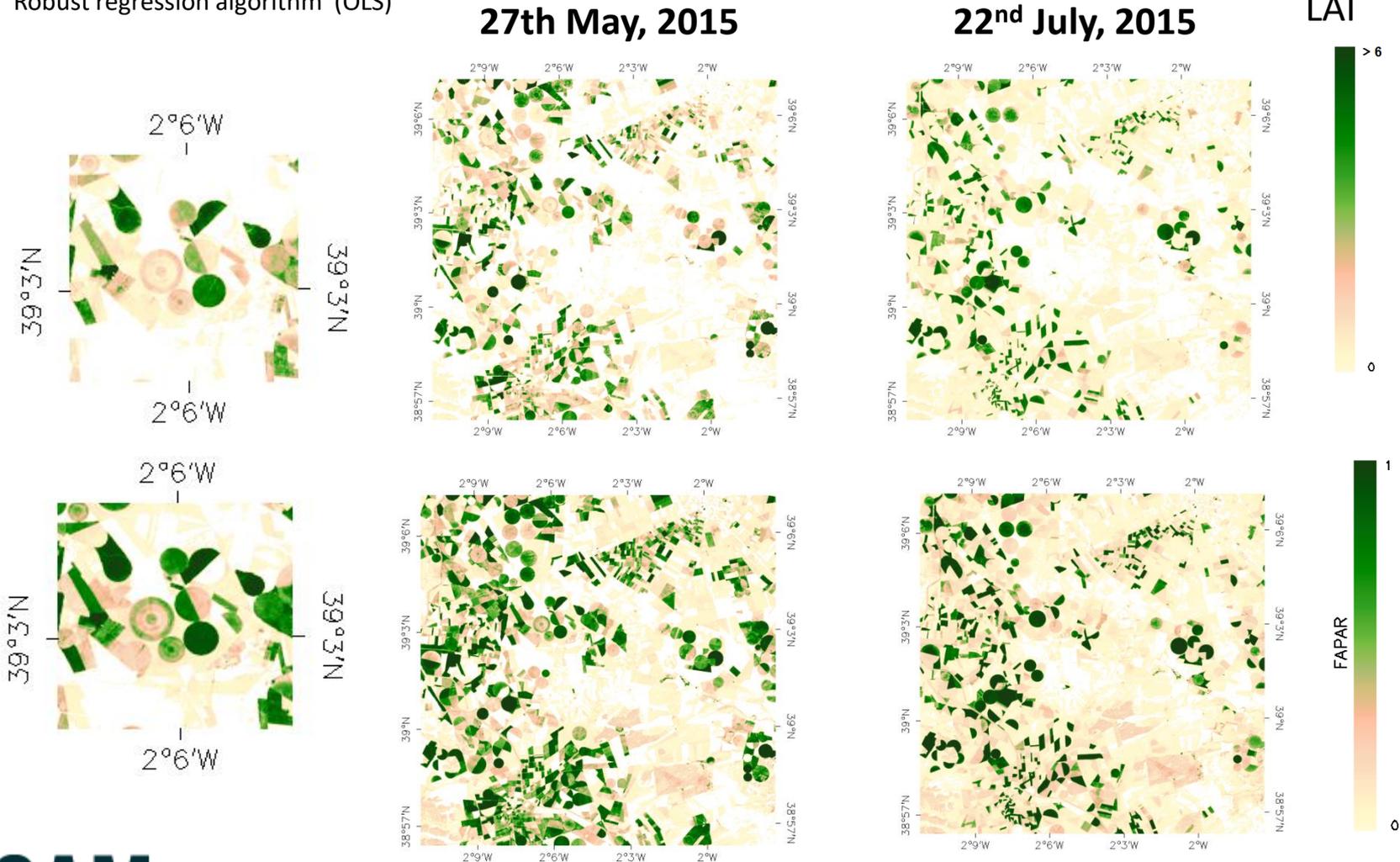
Research Plans for Next Growing Season

- Will you hold the course, or modify the approach?
    - Similar approach for biophysical monitoring (EOLAB).
    - Starting crop type identification – comparisons with UCLM methodology

- Intensive campaign for biophysical monitoring will be done at a monthly frequency (EOLAB)

- Land cover type and crop area mapping
    - Reference map produced by UCLM (two times per year)

- EO data next year?
    - Landsat-8 / Sentinel-2