Site Description

Barra 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 Barra (Albacete, Spain), in the Castilla-La Mancha plateau: Don Quijote’s land.
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.

JECAM
Joint Experiment for Crop Assessment and Monitoring
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..
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
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.

<table>
<thead>
<tr>
<th>Landsat-8 METADATA</th>
<th>First campaign</th>
<th>Second campaign</th>
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</thead>
<tbody>
<tr>
<td>Platform / Instrument</td>
<td>Landsat-8 / OLI_TIRS</td>
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<tr>
<td>Path</td>
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<tr>
<td>Row</td>
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<tr>
<td>Selected Bands</td>
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<tr>
<td>B3(green)</td>
<td>0.53-0.59 µm</td>
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<tr>
<td>B4(red)</td>
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<td>B5(NIR)</td>
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<tr>
<td>B6(SWIR1)</td>
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<td>2015.07.16</td>
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<td>10:49:21</td>
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<td>Illumination Azimuth angle</td>
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<td>126.763°</td>
</tr>
<tr>
<td>Illumination Elevation angle</td>
<td>23.572°</td>
<td>25.659°</td>
</tr>
</tbody>
</table>
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
In situ Data

- Summer crop campaigns
  - 27\textsuperscript{th} May 2015
  - 22\textsuperscript{nd} July 2015
**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).
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

Results

- Mapping biophysical variables over Barrax
  - Robust regression algorithm (OLS)

27th May, 2015

22nd July, 2015

LAI

FAPAR

JECAM
Joint Experiment for Crop Assessment and Monitoring

GROUP ON EARTH OBSERVATIONS
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