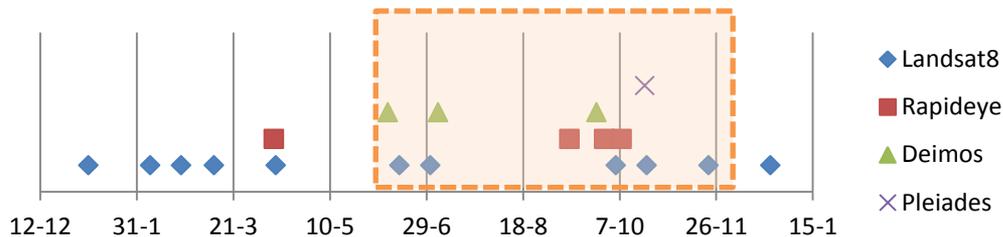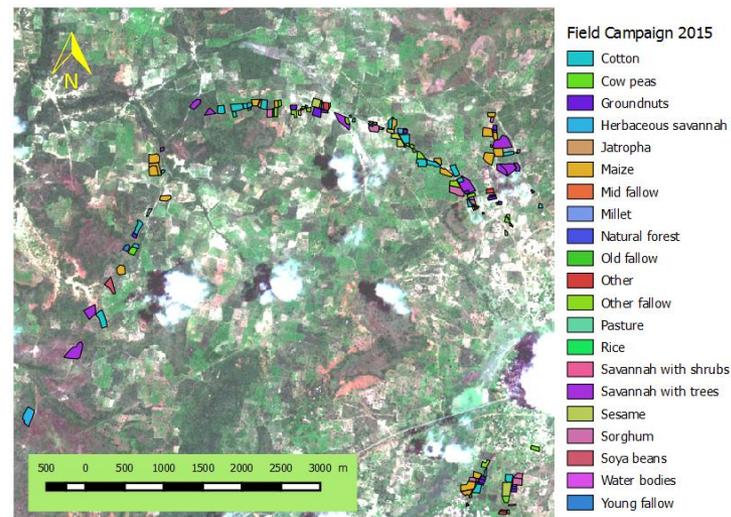# Koumbia (Burkina Faso)

STUDY SITE

- **Topography:** Peneplains with few isolated hills (average altitude around 200m)

- **Soils:** Mostly sandy, somewhere gravelly

- **Crop types: Cotton, maize, sorghum, millet, groundnut,** *niébé* (cowpeas)**, sesame, soja – all rainfed**

- **Crop calendar:** May/June to October/November

- **Climate and weather: Tropical dry** (sudano-sahelian), mostly cloudy in the growing season

- **Agricultural methods used:** Manual or animal-powered tillage / Hoeing / Possible use of fertilizers

- **Main challenging issues:** Lack of valid satellite data during growing season (cloud coverage), small-sized crops, heterogeneity of practices, intra- and inter-plot diversity
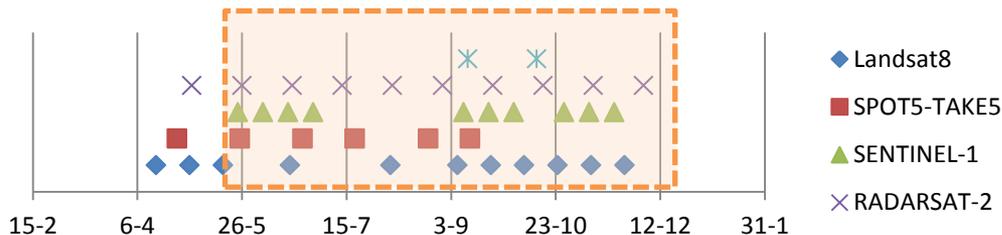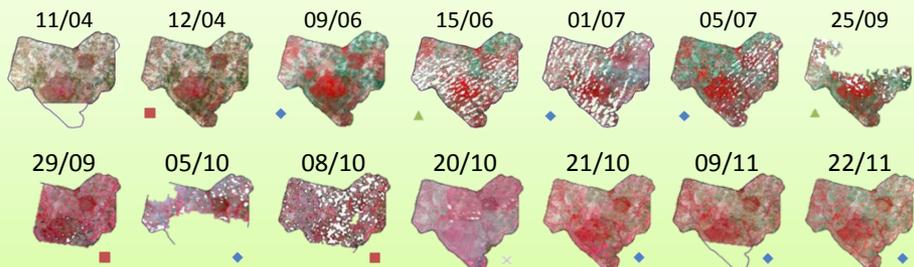
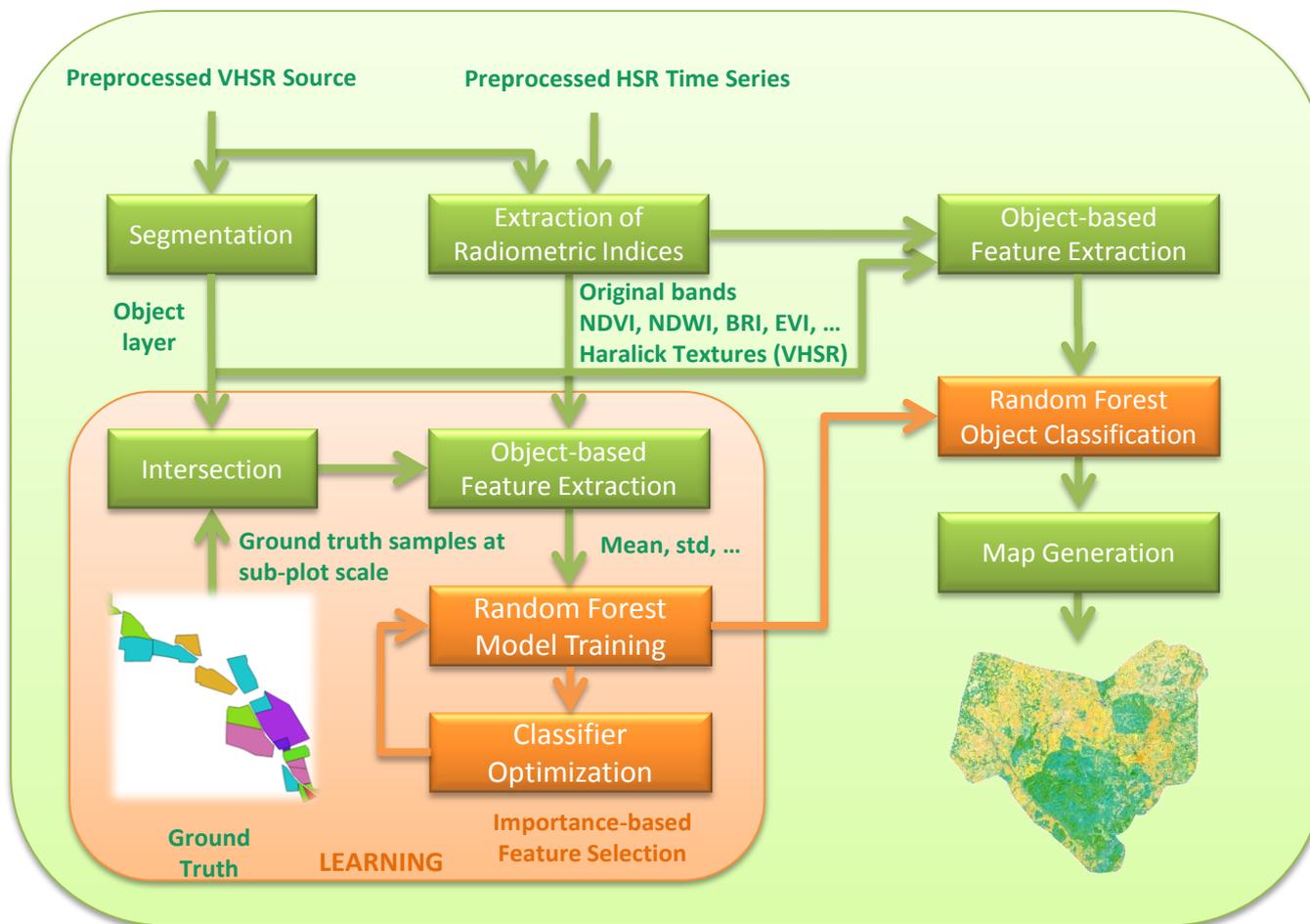# Available Data

Calendar of satellite data for 2014

Legend:
- ◆ Landsat8
- ■ Rapideye
- ▲ Deimos
- ✕ Pleiades

Dates: 12-12, 31-1, 21-3, 10-5, 29-6, 18-8, 7-10, 26-11, 15-1

Calendar of satellite data for 2015

Legend:
- ◆ Landsat8
- ■ SPOT5-TAKE5
- ▲ SENTINEL-1
- ✕ RADARSAT-2

Dates: 15-2, 6-4, 26-5, 15-7, 3-9, 23-10, 12-12, 31-1

Annual field campaigns

Field Campaign 2015
- Cotton
- Cow peas
- Groundnuts
- Herbaceous savannah
- Jatropha
- Maize
- Mid fallow
- Millet
- Natural forest
- Old fallow
- Other
- Other fallow
- Pasture
- Rice
- Savannah with shrubs
- Savannah with trees
- Sesame
- Sorghum
- Soya beans
- Water bodies
- Young fallow

500 0 500 1000 1500 2000 2500 3000 m

Quicklooks of 2014 dataset

11/04   12/04   09/06   15/06   01/07   05/07   25/09
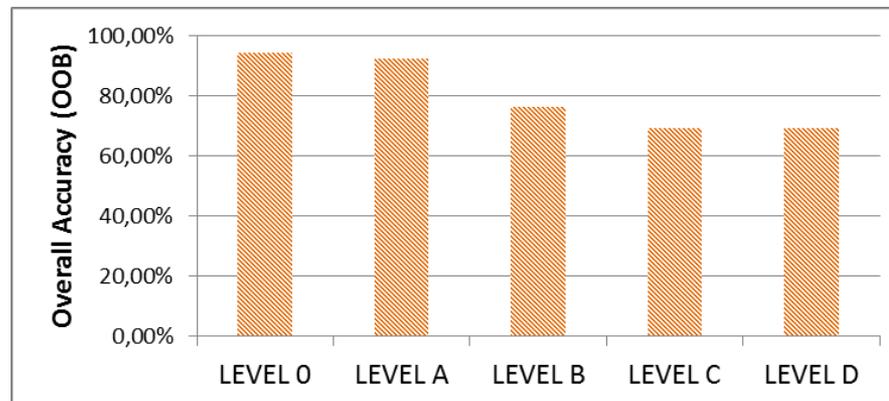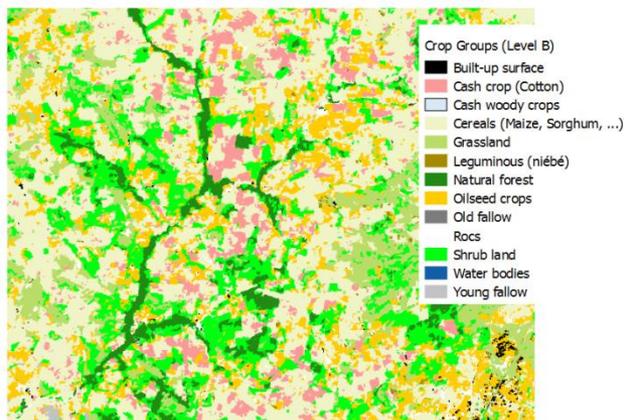
29/09   05/10   08/10   20/10   21/10   09/11   22/11

Overall Methodology

- **OBIA (*Object-Based Image Analysis*) approach** for the fusion of multi-sensor data , **ensemble classifier (Random Forest), multiple classification strategies ("flat", top-down and bottom-up hierarchical)**

Current Results

- Preliminary results are promising, despite **intra-class dissimilarities**, **complexity of landscape** and **cloudy images** (at season peak)

  - **All sources concurr to the achievement of current accuracies**

- **Ongoing improvements** to improve data-fusion strategy

  - Assessing the **potential of Sentinel-1/Radarsat-2 data**
  - Improve **low-level multi-sensor feature extraction**
  - **Optimize object layer extraction** (segmentation)