



*This document is the draft version of the JECAM minimum data set requirements. It has been prepared based on 20 JECAM site reports, on the discussion at the CEOS-GEOGLAM co-community meeting held in Frascati, Feb. 2014 and on SIGMA and Sen2-Agri projects contribution.*

## I. Objectives

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The JECAM minimum data set requirements aim to build a **common data set of satellite and in situ observations to support research and methods benchmarking activities across JECAM sites**. The JECAM network facilitates data sharing and collaborative research among its partners to develop crop assessment and agricultural monitoring methods for a large variety of agriculture systems.

## II. Definition of a typical JECAM site

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In order to encompass the diversity of regional crop types and crop development, a typical JECAM site will cover **an area of 25 x 25 km (625 sq.km) and be representative of one or several cropping systems** with a core zone **of 10 x 10 km (100 sq. km)** for the most intensive field measurements, including those relating to crop stages and biophysical variables, that are repeated throughout the growing season.

A JECAM site is characterized by regular field observations that are systematically collected from year to year, providing a multi-year data set to be shared with JECAM partners and beyond in the context of a collaborative research effort. In return, satellite time series are provided by space agencies and commercial companies facilitated through CEOS in the context of GEO. Annual reports from the sites and JECAM guidelines are delivered to build best practices and standards for the agriculture remote sensing research community.

## III. Minimum satellite data sets for the JECAM sites

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Three types of satellite data to be acquired and compiled systematically to the active JECAM sites have been identified: (i) time series already freely available, (ii) time series already acquired over some JECAM sites thanks to CEOS efforts, and (iii) time series to be acquired with the support of the CEOS.

Sensor Mission	Specifications of image acquisition	Effective obs. freq. (cloud free)	Space Agency or Providers
<i>Time series already freely available</i>			
Terra/Aqua MODIS	Surface Reflectance Bands 1–7 – 500m (ref. MOD09A1 & MYD09A1 respectively for Terra & Aqua)	daily and 8 days composites	NASA/USGS
PROBA-V	S10 TOC: 333 m Proba-V Level 3 Top Of Canopy (incl. atm. correct.)	daily and 10 days composites	ESA – BELSPO
Landsat 8	15 - 30 m – every possible overpass	biweekly to monthly	USGS
SPOT 4 Take 5 <i>[SPOT 5 Take 5]</i>	20 m – every 5 days	only for 2013 <i>[2015 tbc]</i>	CNES
<i>Time series already acquired but to be extended to all active sites</i>			
Radarsat-2*	fine beam SLC in quad-pol. - asc. with constant large incident angle (from 35 to 45 deg.)	every 10 days (tolerance on angle to improve the revisiting time)	Canadian Space Agency – SOAR
TerraSAR-X*	Mode StripMap dual pol VV-VH - asc. with cst large incident angle (from 35 to 45 deg.)	every 10 days	DLR
Cosmos-Skymed*	Mode Stripmap Ping Pong VV-VH (with cst large incidence angle (form 35 to 45 deg.)	every 10 days	ASI
Rapideye	Ortho product (L3A) – 6.5 m – with similar viewing angles if possible	every 10 days	BlackBridge
Deimos	Ortho product L1T – 22 m	every 10 days	DMC Int. Imaging
<i>Time series to be acquired to all active sites</i>			
Pleiades	2 m multispectral acq./similar viewing angle if possible	1 image per growing season	CNES
Sentinel-1	Stripmap Mode (SM) dual pol (VV-VH) - asc. with cst large incident angle (from 35 to 45 deg.)	every 10 days	ESA
PROBA-V	S1 TOC: 100 m Proba-V Level 3 Top Of Canopy (incl. atm. correct.)	daily	BELSPO (Belgium)
<i>Added-value products to be compiled for all sites for benchmarking purposes</i>			
<i>MODIS products</i>	<i>NRT processing</i>	<i>16-d. to monthly composites</i>	<i>LP DAAC</i>
<i>Copernicus products</i>	<i>NRT processing</i>	<i>10-d. composites</i>	<i>EU-GIO Global Land Component</i>

\* SAR acquisitions are only targeted to a subset of the active JECAM sites with frequent cloud cover.

## IV. Minimum in situ data sets for the JECAM sites

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Three types of *in situ* data have to be systematically collected on the ground and/or possibly by airborne during the main growing season at least. The minimum set of the three types of data are defined as follows:

- (i) *Cropland – non cropland data set*: field observation has to cover the cropland area with more than 100 fields but also includes a set of non cropland samples covering the diversity of the landscape;
- (ii) *Crop type data set*: each main crop type of a given JECAM site should be sampled by 30 field observations well distributed over the site. In addition a minimum sample of n=30 field observations should covered the other crop types;
- (iii) *Vegetation status data set*: the main development stages (e.g. emergence, flowering, maturity, harvest) of the main crops should be described along the growing season for the JECAM site. On the best effort basis, biophysical variables such as LAI, fCover or fAPAR could be also measured for different crops over several fields.