



Towards an operational production and distribution of 300m biophysical variables from PROBA-V sensor data

Contribution to the Copernicus Global Land service

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ImagineS project



- From November 2012 to February 2016
 - 8 partners from 5 EU countries
 - 17 demonstration sites



- **2 objectives:**

1. Support the evolution of the Copernicus Global Land service preparing the use of Sentinels data
 - Improving retrieval methodologies of biophysical variables
 - Developing qualified software able to ingest multi-sensor data
2. Monitor the crop/fodder production, jointly with carbon and water fluxes by assimilation of EO biophysical products in a land surface model



ImagineS portfolio



- **EO products**
 - LAI/FAPAR/Fcover, Albedo, 333m, PROBA-V, global
 - Preparation to PROBA-V + S3
 - FAPAR, 30m, PROBA-V + Landsat8, demonstration sites
 - Preparation to PROBA-V + S3 + S2
 - Crop maps, 30m, PROBA-V + Landsat8 + S1, Russia + South Africa
 - Preparation to S3 + S2 + S1
- **Model outputs**
 - Biomass, drought indicators, carbon fluxes (GPP, RE, NEE) and evapotranspiration
 - 16km global & 8 km over France and Hungary



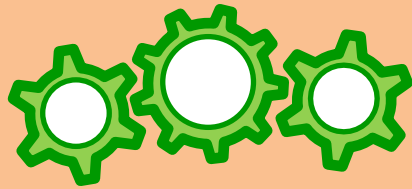
LAI / FAPAR / Fcover retrieval - 1



General principle

STEP A

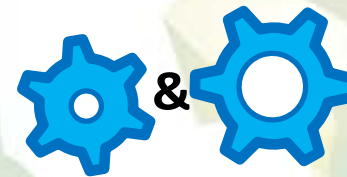
**PROBA_V
Daily
Reflectance**



Neural Networks

**PROBA_V
Daily
Product**

Smoothing



Gap Filling

**PROBA_V
Dekadal
Product**

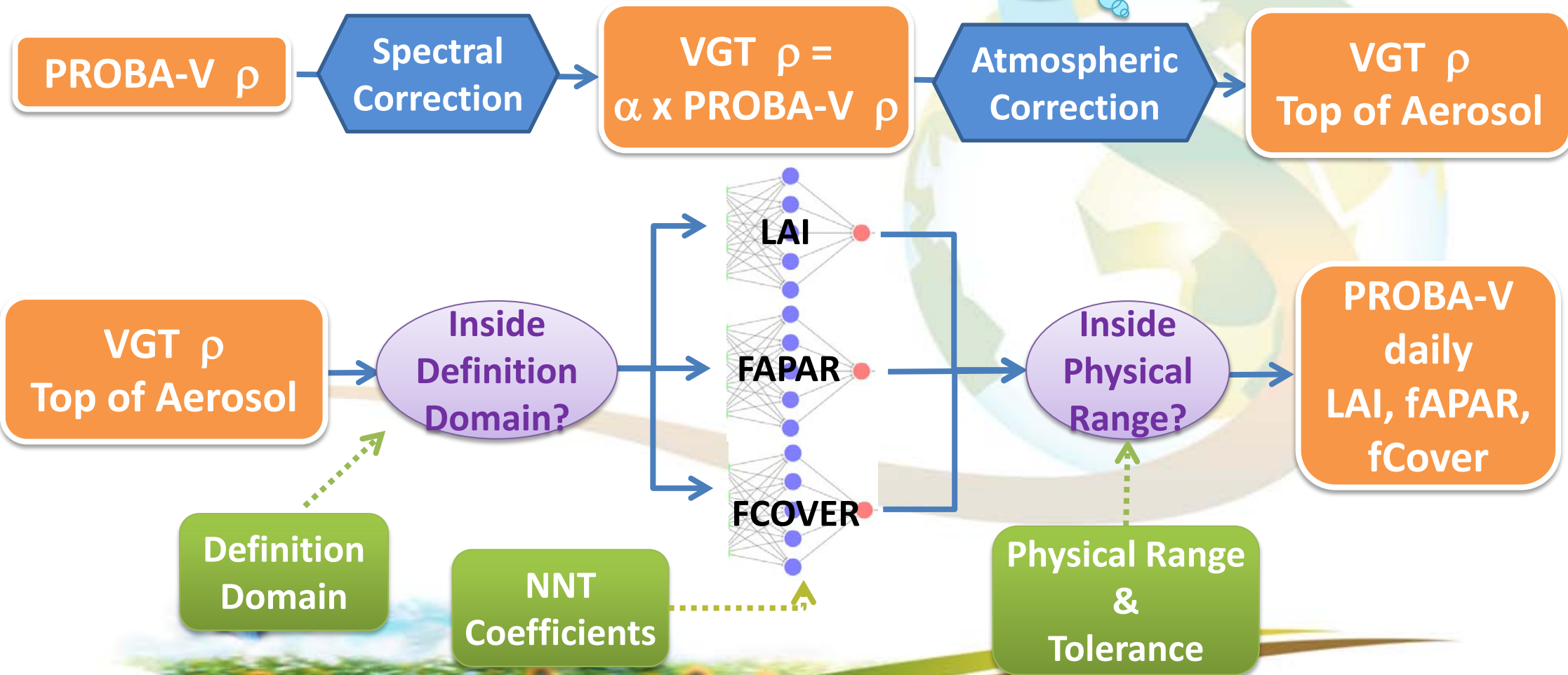


LAI / FAPAR / Fcover retrieval -2



Step A: daily estimates

Ozone, Water Content

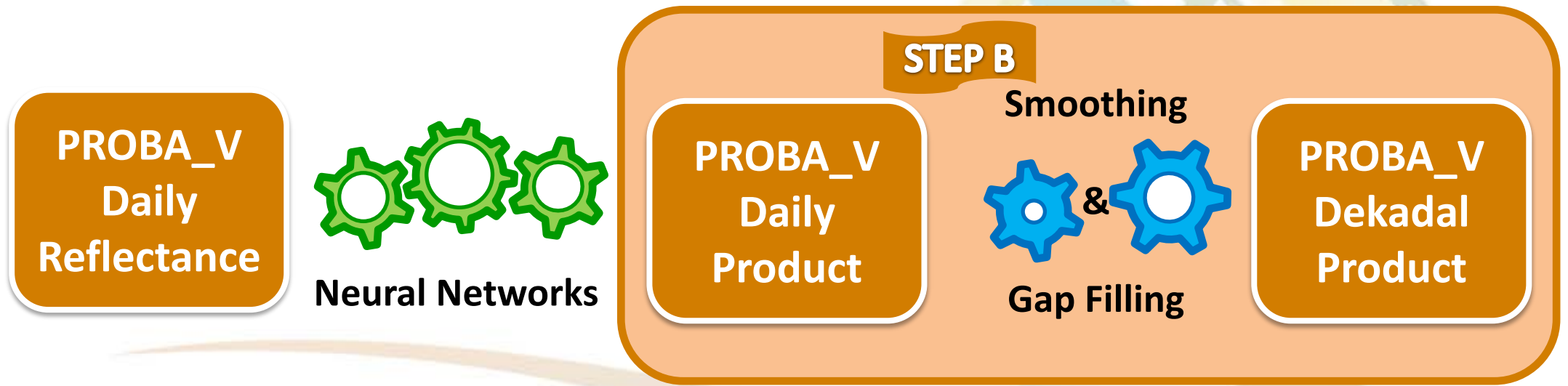




LAI / FAPAR / Fcover retrieval -3



General principle

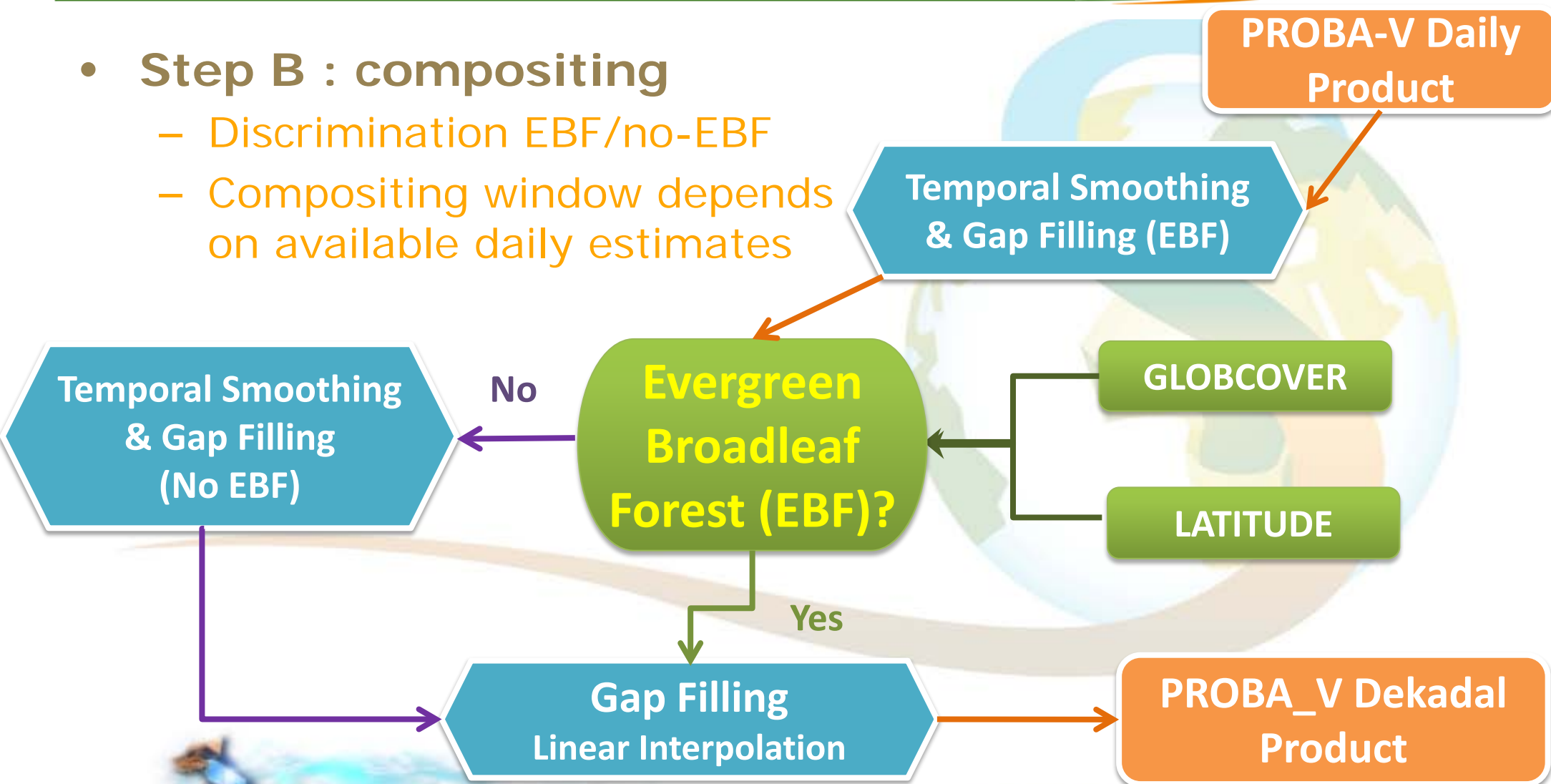




LAI / FAPAR / Fcover retrieval -4



- **Step B : compositing**
 - Discrimination EBF/no-EBF
 - Compositing window depends on available daily estimates





LAI / FAPAR / Fcover retrieval -5



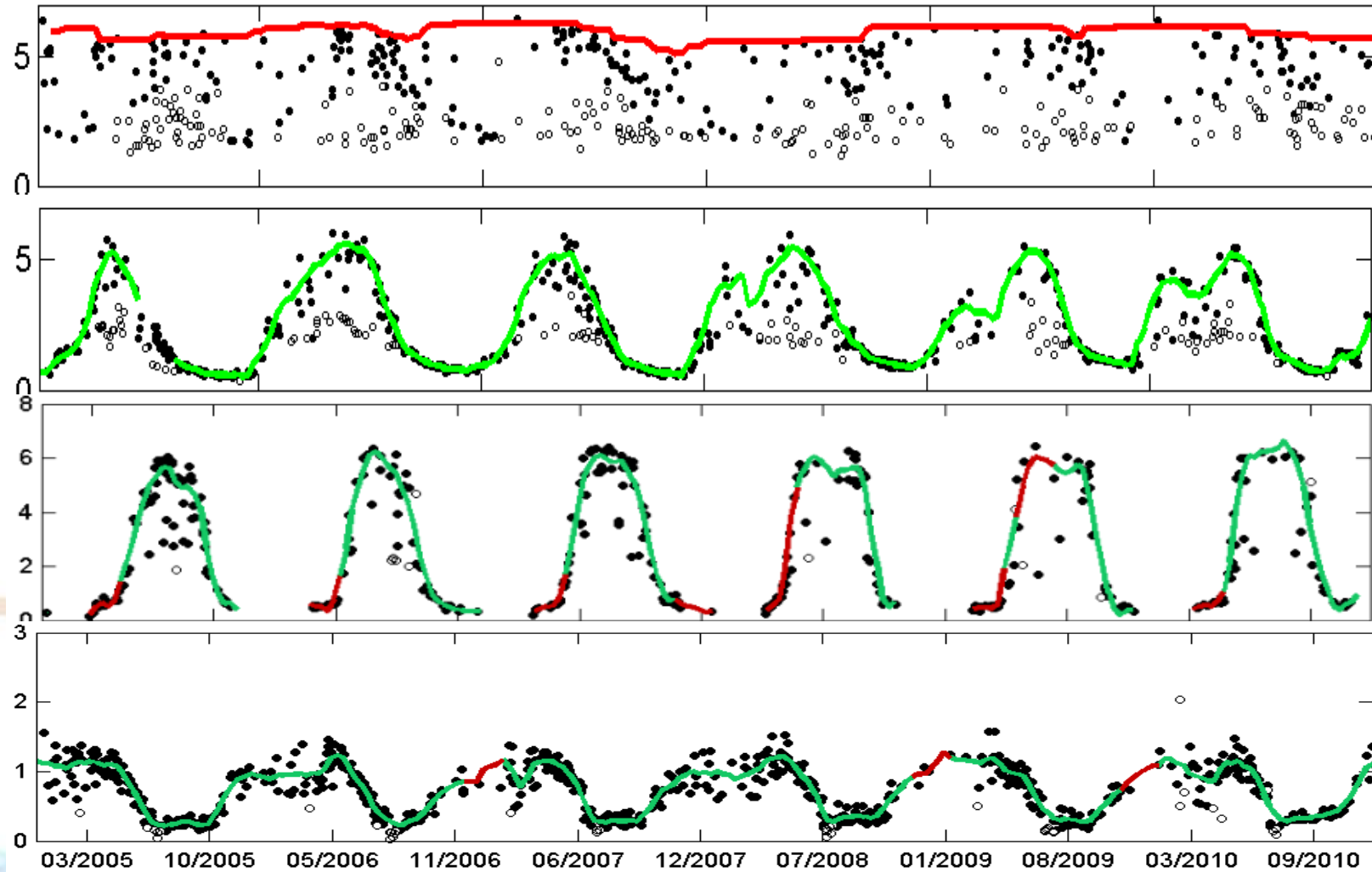
LAI time profiles

EBF case

Non EBF case

Gap filling

Small gaps





Links with the Global Land service



ImagineS

- Variables
 - LAI, FAPAR, Fcover
 - Albedo
 - Crop maps
 - Biomass, C fluxes
- Resolution: 333m & 30m
- Activities: R&D
 - Set-up new algorithms
 - Quality assessment
 - Development of chains

Global Land service

- Variables
 - LAI, FAPAR, FCover, NDVI, DMP, Burnt Areas
 - ToC-R, Albedo, LST
 - Water Bodies, SWI
- Resolution: $\geq 1\text{km}$ & 333m
- Activities: operations
 - NRT production & reprocessing
 - Continuous quality monitoring
 - Dissemination

Integration

Dissemination

- **One entry point**
 - Website: <http://land.copernicus.eu/global>
- **2 data download channels**
 - Internet
 - Access to NRT + full archive
 - Copernicus Global Land portal (discover, order, subscribe)
 - Broadcast (Eumetcast Africa and South-America)
 - NRT only
- **Free and open product access**
 - Anonymous query
 - Simple (automated) registration

Status and Short term prospect

- **Ensure the continuity of 1km production**
 - SPOT/VGT has been replaced by PROBA-V
 - Products degraded from “operational” to “demonstration” until their quality is fully assessed.
- **Introduction of 333m products**
 - LAI, FAPAR, FCover over Europe, first
 - NRT production expected to start in September 2014
 - Prepare the extension to the globe by the end of the year
 - Prepare the introduction of other variables: Albedo, Burnt Areas
- **New dissemination portal with more functionalities**
(customized ROI, format, projection, ...)

Long term: 2015 ...

- **Sustainable global monitoring**
 - at 1km and 300m resolution (Sentinel-3)
 - at 100m ?
- **Add “worldwide” hotspot monitoring**
 - 10m – 100m major protected areas
 - using Sentinel-2 data
- **Benefit of capabilities of new sensors**
 - e.g. soil moisture from Sentinel-1 (launched on April 2014)
- **Integration of new products**
 - e.g. water level, snow extent, ...



Contacts



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Associates

