



Global Land Service

Feedbacks on PROBA-V Collection 1

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HYGEOS

on behalf the consortium

"Operations on Vegetation & Energy products"

led by  **vito**
vision on technology

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Copernicus Global Land Service

Portfolio - <http://land.copernicus.eu/global>

Context
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VEGETATION



Leaf Area Index (LAI)
Fraction of Absorbed PAR
Fraction of vegetation cover (FCOVER)
Normalized Difference Vegetation Index (NDVI)
Vegetation Condition Index
Vegetation Productivity Index
Dry Matter Productivity
Burnt Area
Dynamic Land Cover (100m)

ENERGY



Top-of-Canopy reflectance
Surface Albedo
Land Surface Temperature
Soil Water Index
Surface soil moisture
Radiation Fluxes

■ ■ ■ **IN OPERATION**
■ **IN DEVELOPMENT**

WATER



Water Bodies
Lake surface water temperature
Lake and river water level
Lake surface reflectance
Lake turbidity
Lake trophic state

CRYOSPHERE



Snow water extent
Snow water equivalent

Free and Open Access

Portfolio – PROBA-V products

Variable	Temporal coverage	Temporal resolution	Spatial coverage	Spatial resolution	Sensor	Timeliness
LAI/FAPAR/FCover	1999 - present 2014 - present	10 days	Global	1 km 300 m	SPOT/VGT PROBA-V	3 days
NDVI/VCI/VPI	1999 - present 2014 - present	10 days	Global	1 km 300 m	SPOT/VGT PROBA-V	3 days
Dry Matter Productivity	1999* - present 2014 - present	10 days	Global	1 km 300 m*	SPOT/VGT PROBA-V	3 days
Burnt Areas	1999 - present 2014 - present	1 day	Global	1 km 300 m	SPOT/VGT PROBA-V	3 days
TOC Reflectance	2013 - present 2014 - present	10 days	Global	1 km 300 m*	SPOT/VGT PROBA-V*	3 days
Surface Albedo	1999 - present 2014 - present	10 days	Global	1 km 300 m*	SPOT/VGT PROBA-V*	3 days
Land Surface Temperature	2009 - present	1 hour 10 days*	Global	0.05°	ΣGeo	1 day
Soil Water Index	2007 - present 2015 - present	1 day 10 days	Global Europe	0.1° 1 km*	Metop/ASCAT Sentinel-1*	1 day
Water Bodies	1999 - present 2014 - present	10 days	Africa Global	1 km 300 m*	SPOT/VGT PROBA-V	3 days

*In development

Ensure the consistency of time-series across sensors and resolutions

Use of Collection 1

- **Operations of NDVI 1km V2.2**
 - S10 TOC 1km
- **Development of LAI, FAPAR, Fcover 300m V2**
 - S1 TOC 300m, years 2014 - 2015
- **Development of Burn Area 300m V2**
 - S1 TOC 300m, year 2014

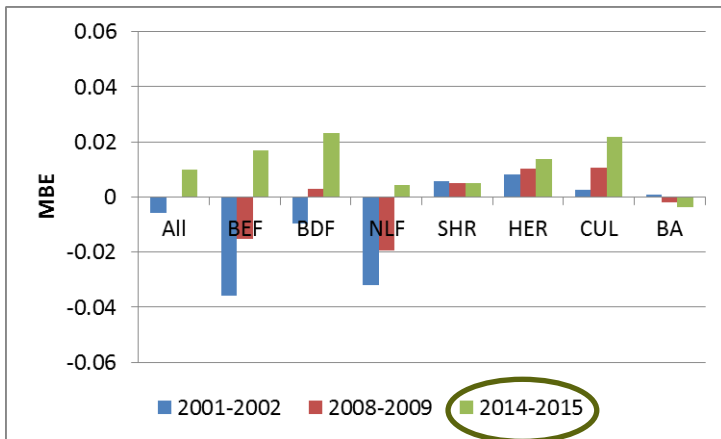
... not an exhaustive list

Feedbacks on Collection 1

- **Improved consistency of time series**
 - comparison with MODIS NDVI

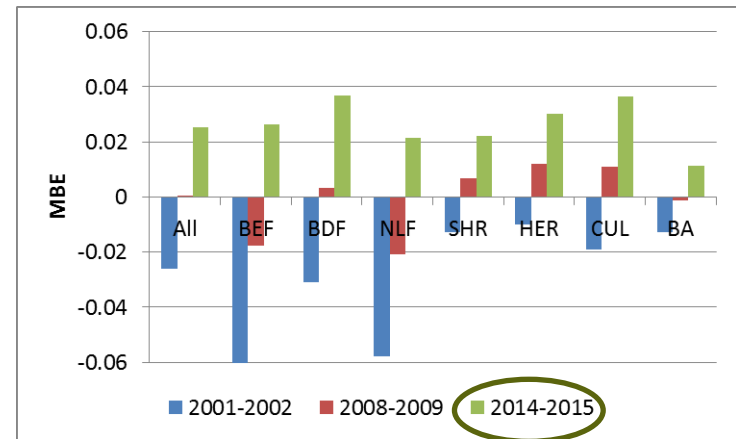
$$MBE = \frac{1}{n} \sum_{i=1}^n (X_i - Y_i)$$

NDVI V2.2 (C1)



PROBA-V C1

NDVI V2.1 (C0)



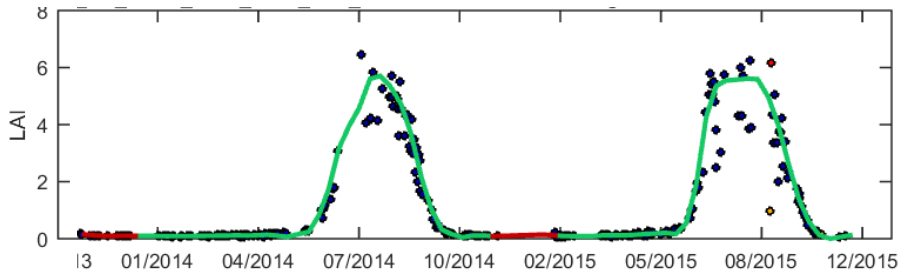
PROBA-V C1

Feedbacks on Collection 1

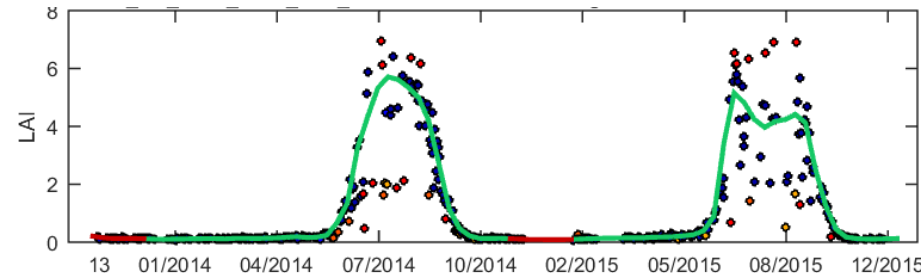
- **Cloud detection**

- improved compared to Collection 0: less noise

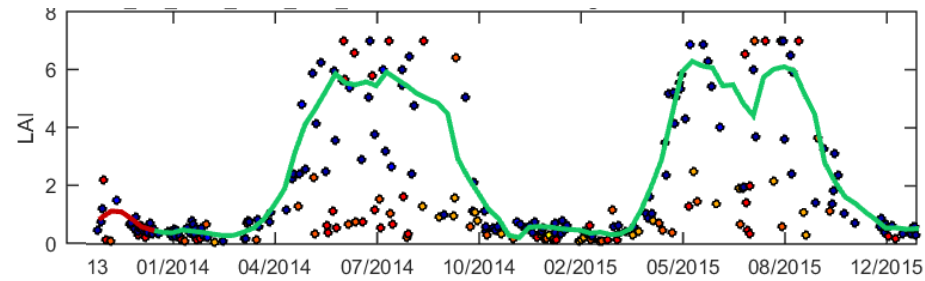
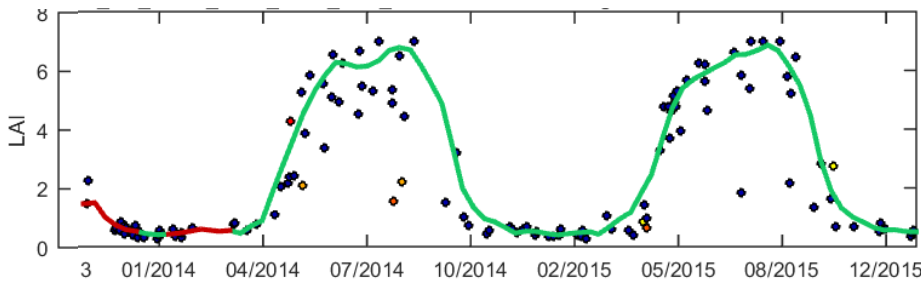
LAI 300m V2 (C1)



LAI 300m V1 (C0)



Crop/grassland Lat= 47.65°N Lon=122.6°E



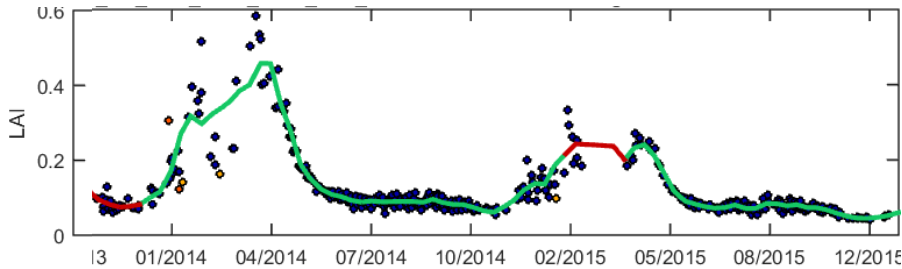
Needleleaf Forest Lat=33.61°N Lon=107.12°E

Feedbacks on Collection 1

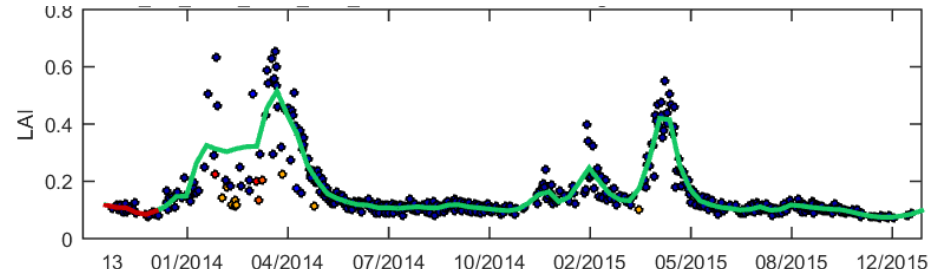
- **Cloud detection**

- But over filter some valid data: more gaps

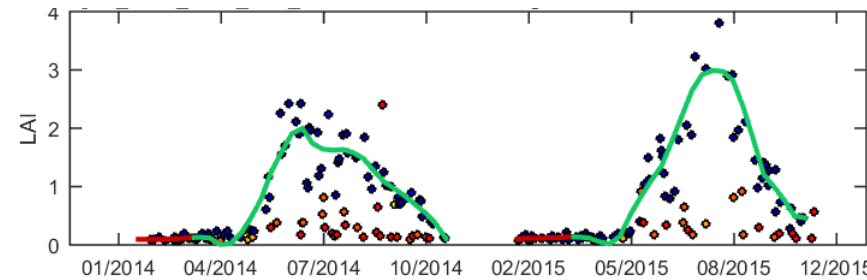
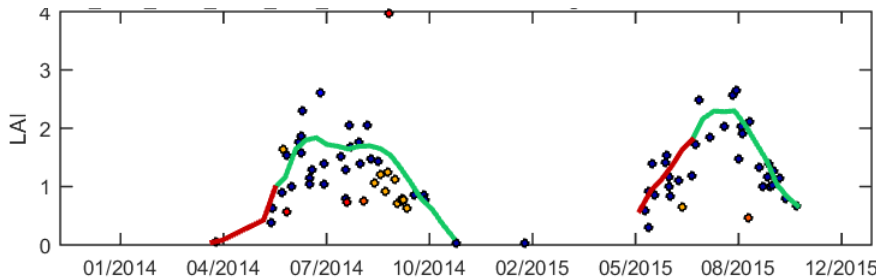
LAI 300m V2 (C1)



LAI 300m V1 (C0)



Crop/grassland Lat=-17.96°N Lon=15.50°E



Needleleaf Forest Lat=50,21°N Lon=-67.51°E

Feedbacks on Collection 1

- **Cloud detection**
 - Remaining haze during many consecutive days

Feedbacks on Collection 1

- **Reflectances=0 found for a block of pixels in Mauritania.**
 - Reason not clear: undetected decompression event?

Conclusion & Recommendations

- **Collection 1 improves the overall consistency of biophysical variables time series but increases the gaps**
 - ⇒ Investigate to decrease the commission error on cloud detection
- **Improve the quality control to avoid unrealistic values in disseminated products**

Conclusion & Recommendations

- **Data access & information:**

- Increase download speed of data or simplify the process to submit jobs at the PROBA-V MEP
 - *spark-submit* quite complicated
 - Single bash command as *qsub*?
- Better if any data available is projected (especially the default ones i.e. HDF5)
 - Geographical information missing when HDF5 displayed in QGIS or when apply *gdalinfo* function
 - A bit complicated to retrieve that information from metadata or html files
- Include example on how to read Status Map with the most popular softwares (including python)

Action: mission extension

- **Global simulated SZA received on early April'17**
- **In the meantime, decision was taken to extend the mission until October 2019**
- **Rough estimate of the impact on biophysical products.**
- **Will be discussed during our F2F meeting next week. (Oct'19 vs Dec'19)**

Contacts

<http://land.copernicus.eu/global>

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Implementation coordination:

copernicuslandproducts@jrc.ec.europa.eu



• Global Land Operations

- Consortium "Production of vegetation & energy products" led by VITO



Coordinator: Bruno Smets – VITO bruno.smets@vito.be
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Helpdesk: helpdeskticket@vgt.vito.be

- Consortium: "Operations on Cryosphere & water products" led by CLS
- Consortium: "Distribution" led by VITO
- Consortium: "Evaluation & User group" led by Spacebel



• Hot Spot Monitoring

- Consortium «Mapping» led by eGEOS
- Consortium «Validation» led by IGT

• Ground-based Observations Collection

- Consortium led by ACRI-ST

• Sentinel-2 Global Mosaic (call closed)



PROBA-V QWG Meeting-5 – Frascati - Italy – 9th - 10th May 2017

