



UNIVERSITY OF
LEICESTER

Global multi-year burned area maps from PROBA-V 333M data

K. Tansey, M. Padilla, P. Arellano (YachayTech, Ec)
A. Bradley (Imperial College, UK), B. Smets (VITO, B),
R. Lacaze (HYGEOS, F), D. Wolfs (VITO, B)

kevin.tansey@le.ac.uk



Objectives

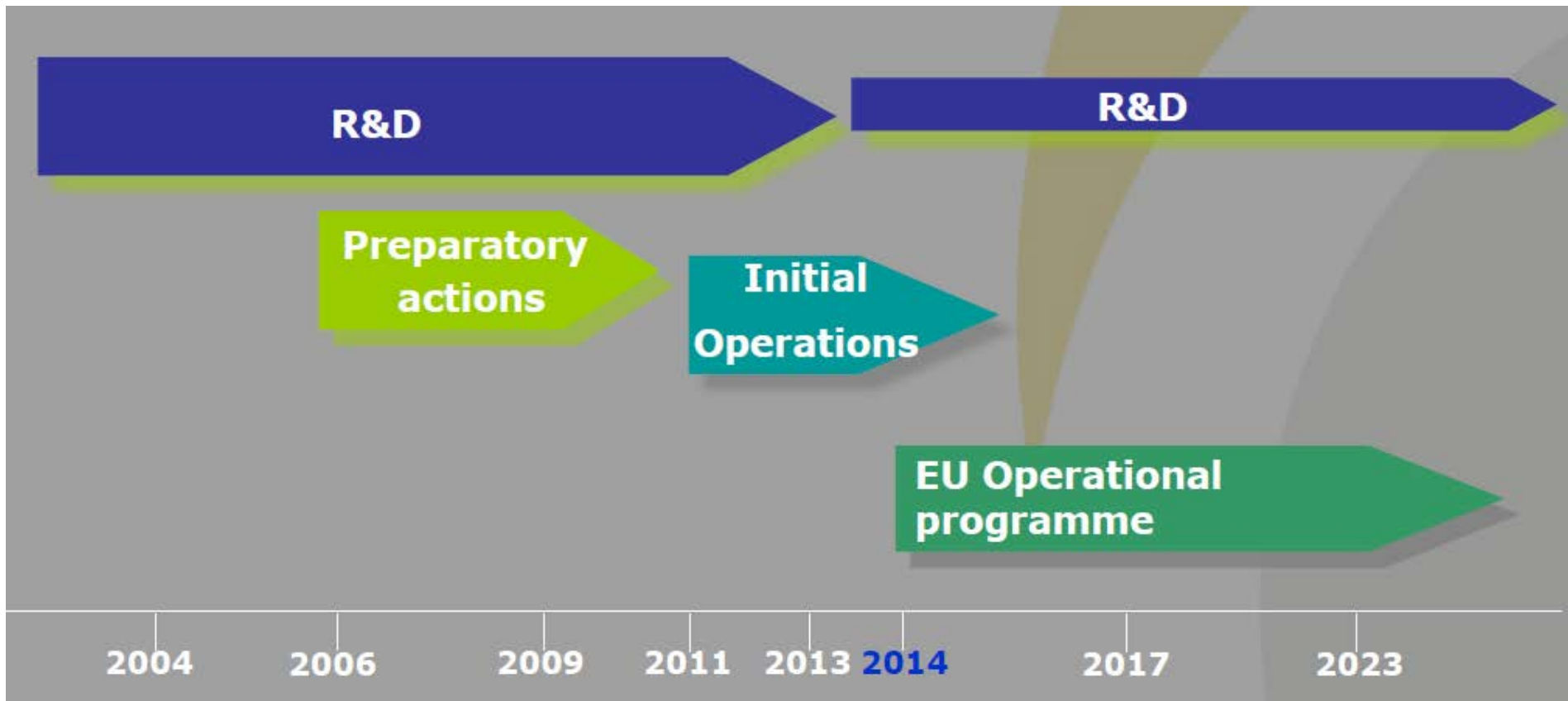
- To offer a multi-year burned area product with an estimate of fire seasonality in near real-time as part of the Copernicus Global Land Service
- Validated and Quality Assured
- Output monitoring indicators
- Flexible algorithm – adapt to new sensors
 - Not reliant on hotspot data



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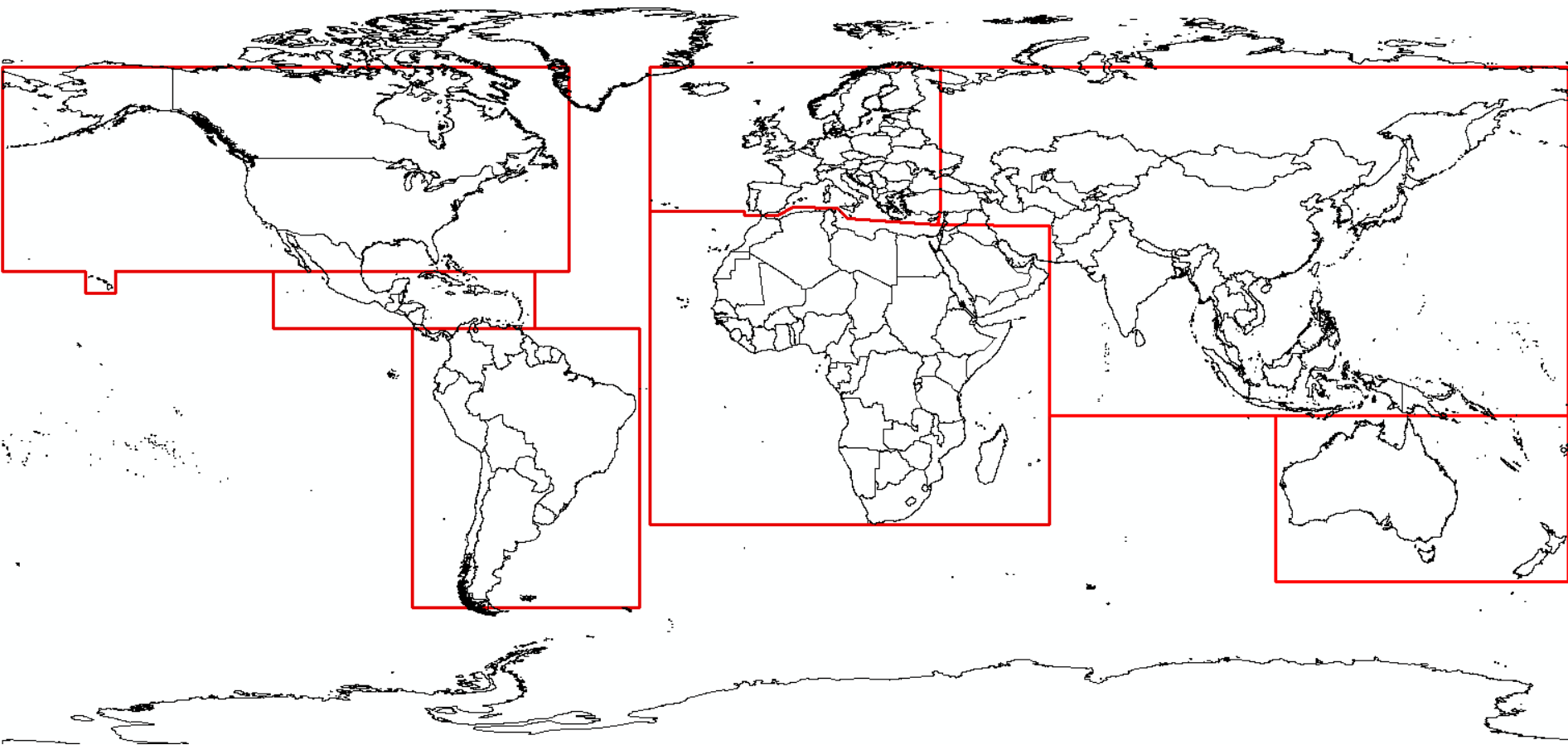
15-year+ global burned area record

- SPOT-VGT until from Q3 in 1999 to end 2013 @ 1km
- PROBA-V 333m from start 2014 to the present day
- Copernicus Global Service Product
- Validation activity supported by ESA CCI Fire + Copernicus



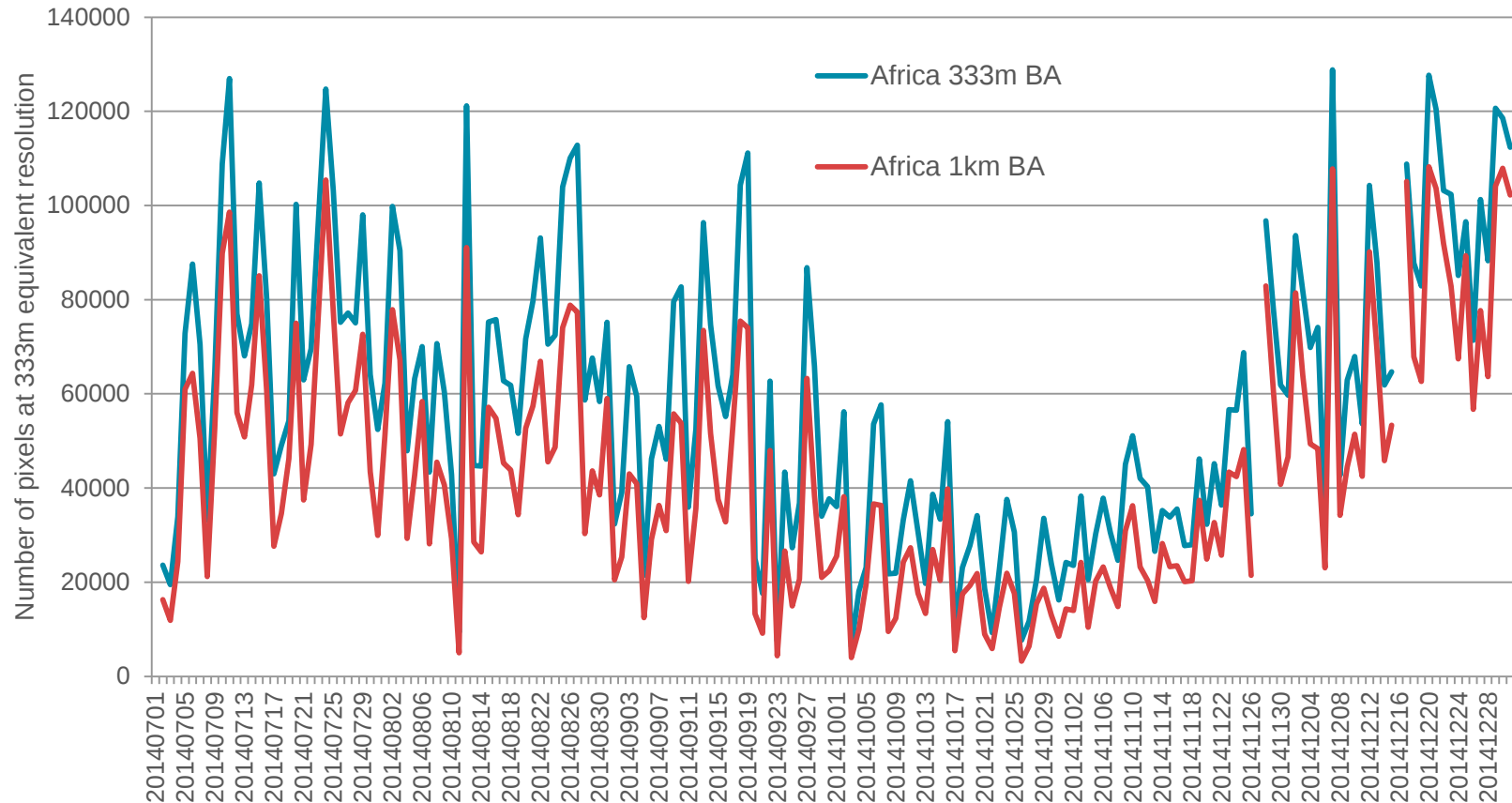
Algorithm Properties – 333m

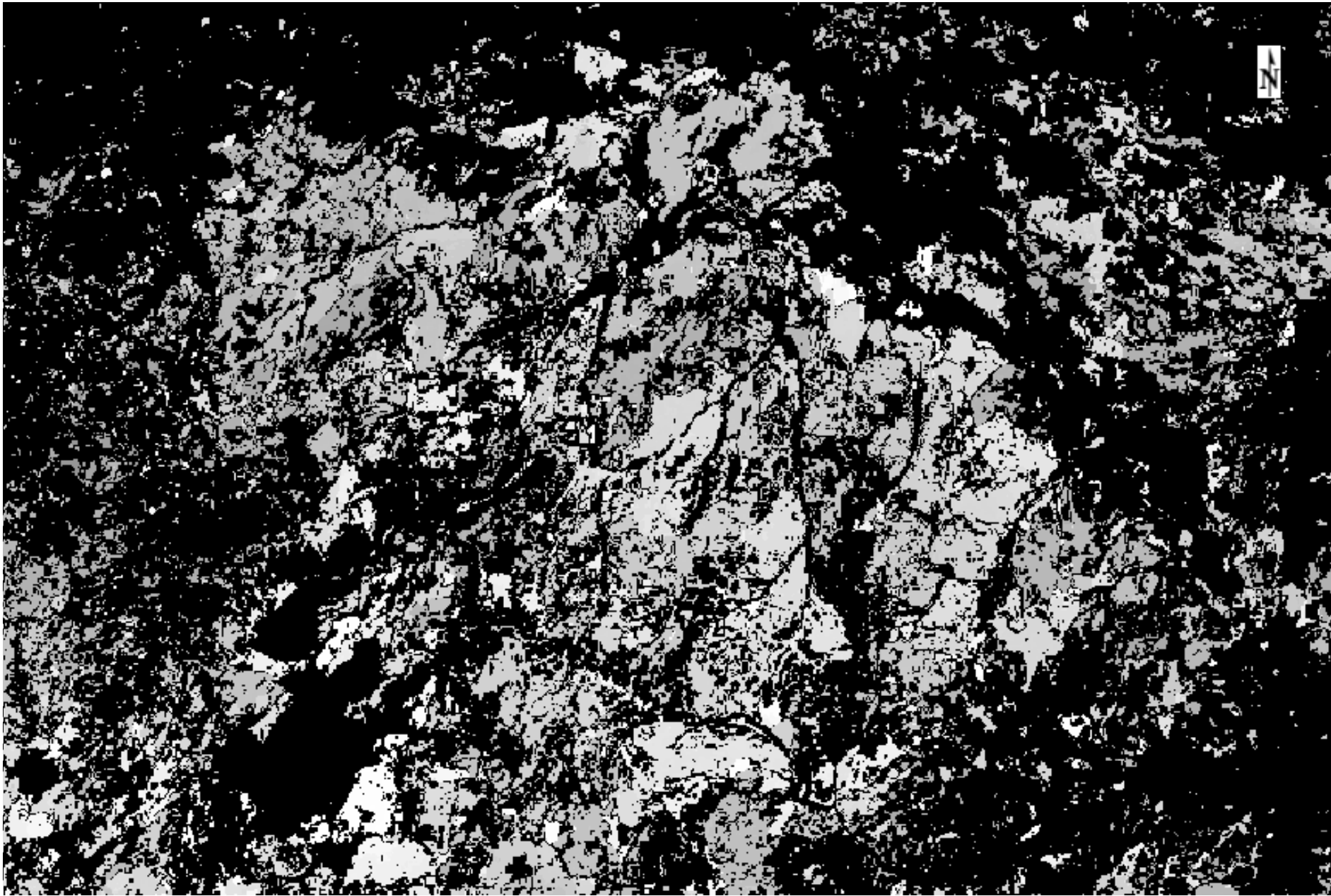
- Evolved from GBA2000 project
- Stringent pre-processing (best cloud detection method), static and dynamic water masking (new), improved DEM
- Removal of those pixels believed to not be vegetated surfaces
- Daily time steps of NIR reflectance evaluated against mean NIR reflectance from time $t-1$
- Threshold checking of the MIR band
- Repeat fire reset after clustering of fire detections in a 1 or 0.5 degree grid call or on the 1st of April.
- Validation in the year 2008 for the 1km product
- Systematic comparison against MODIS, EFFIS and any Copernicus Emergency Service burned area sources

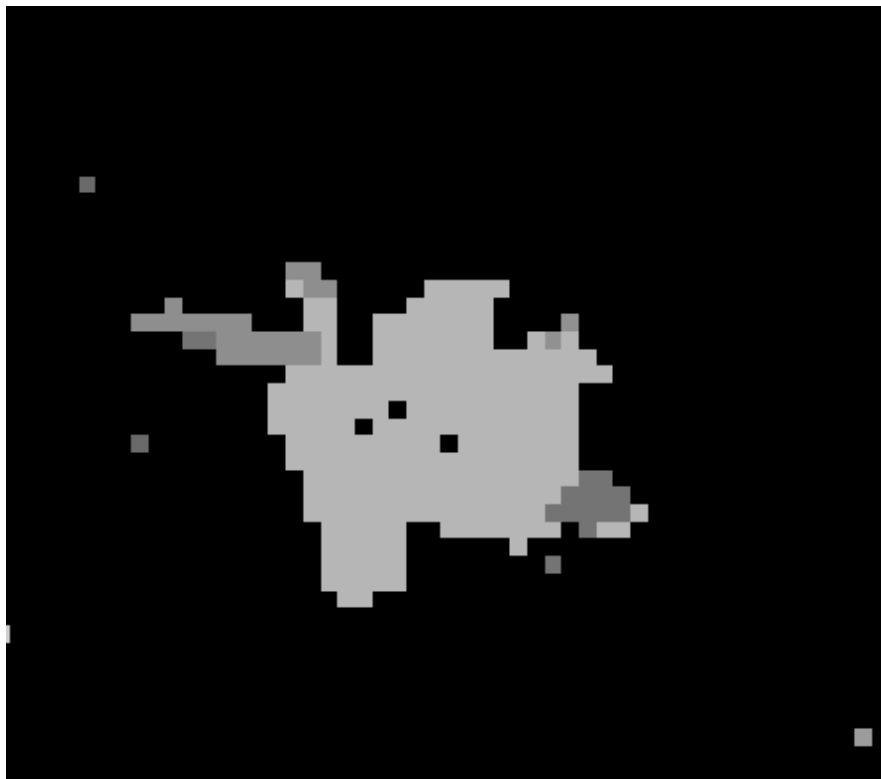


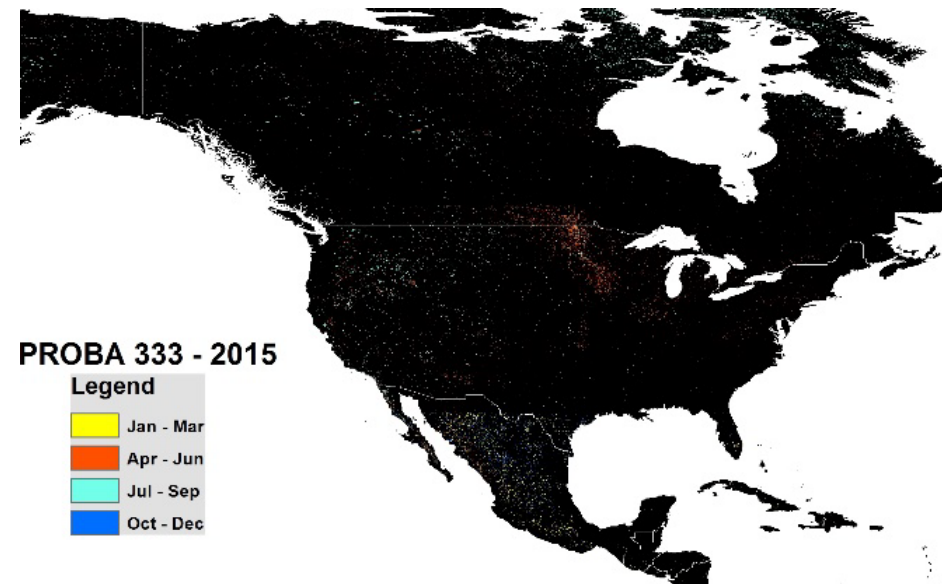
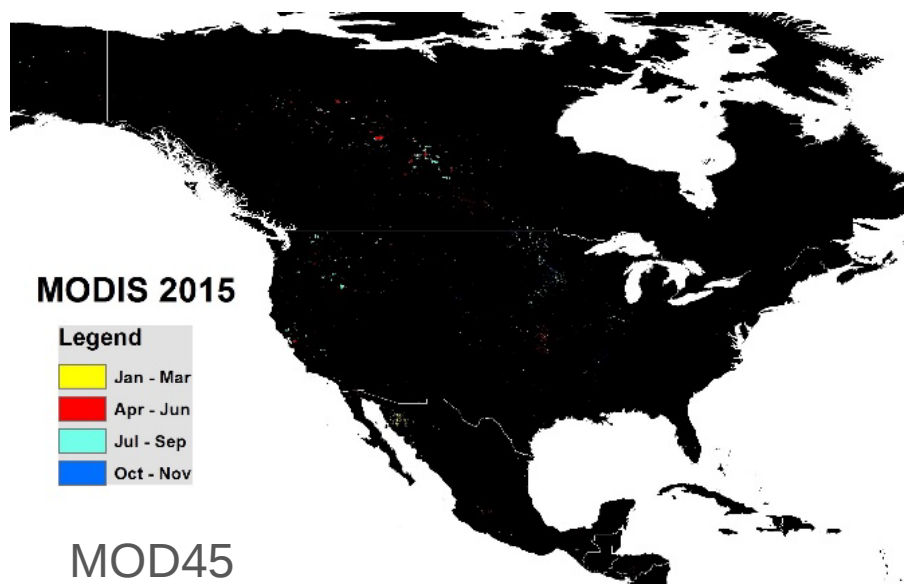
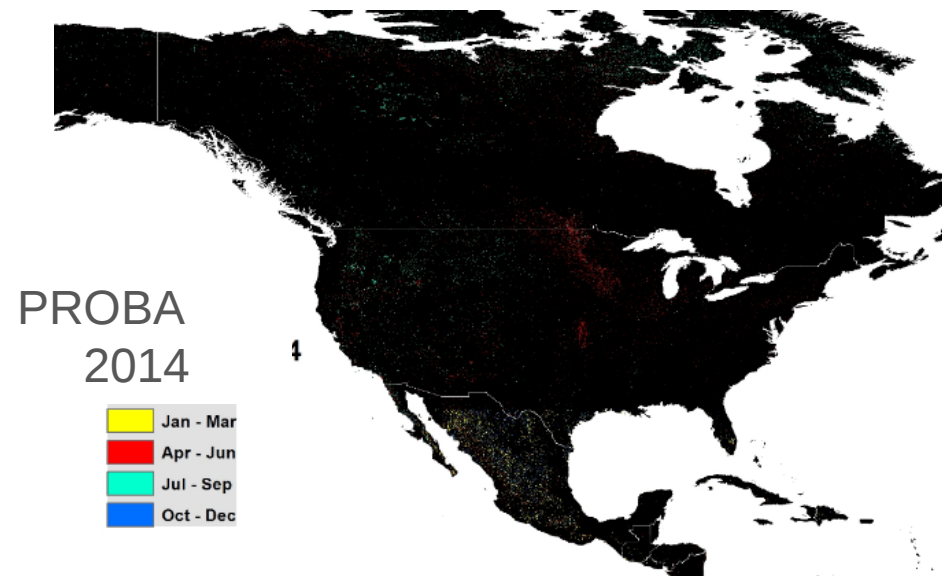
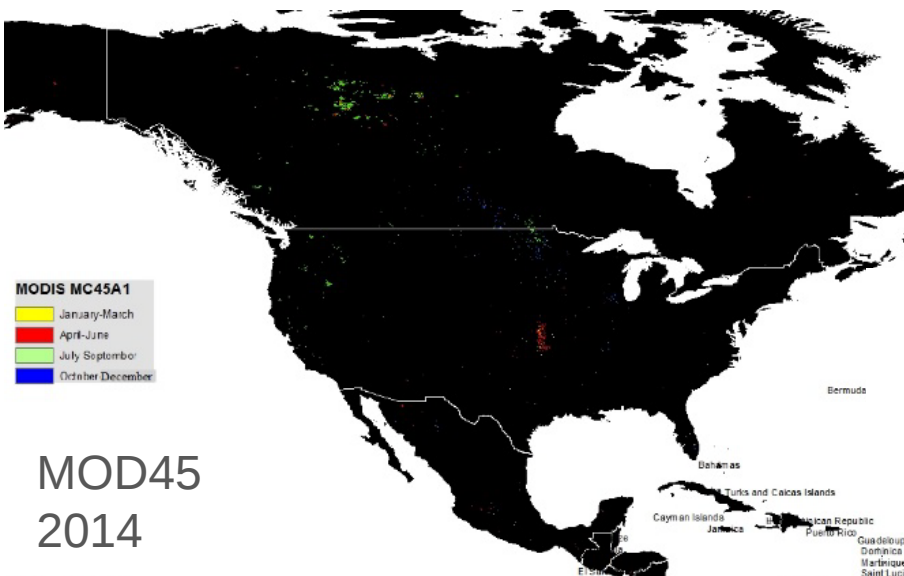
Observations

Increase of burned area from PROBA 333m when compared to 1km

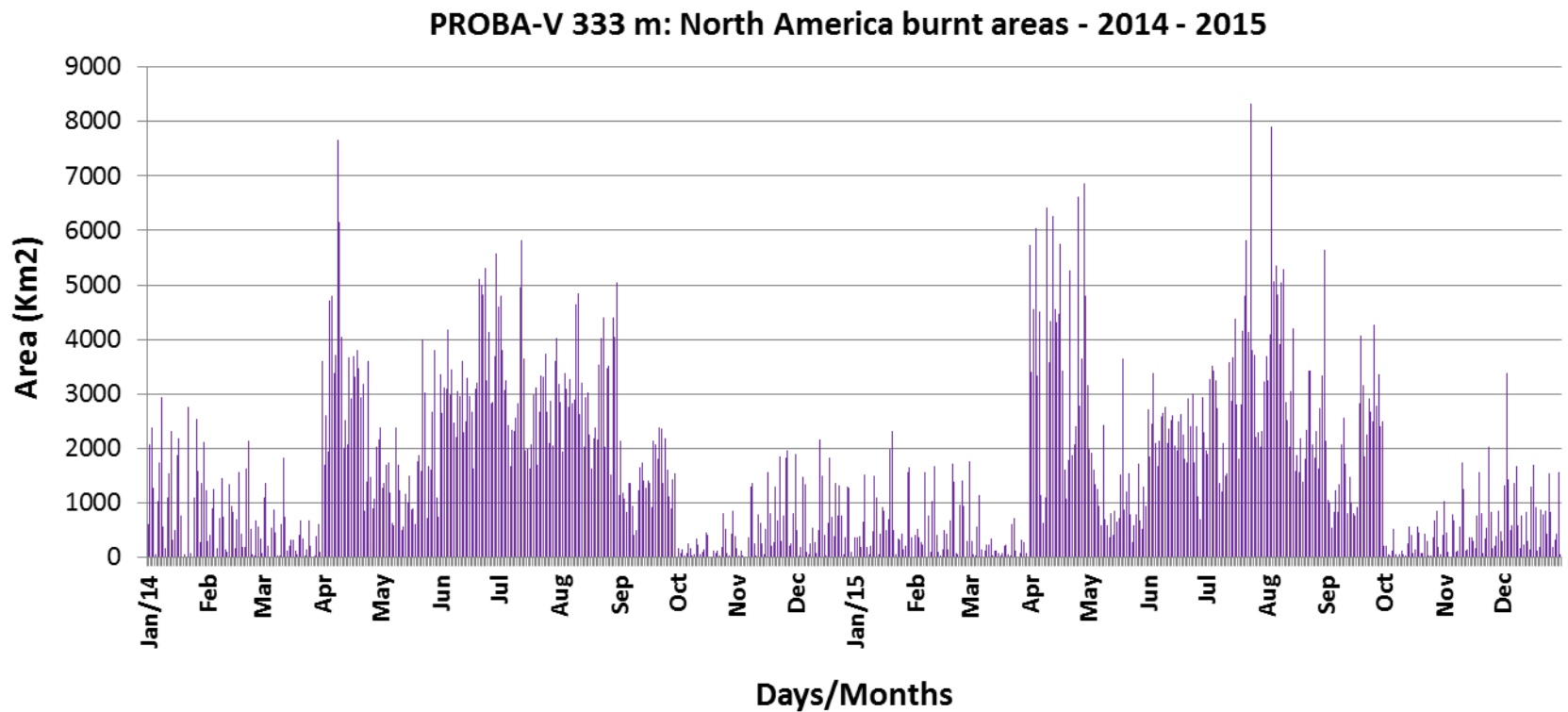
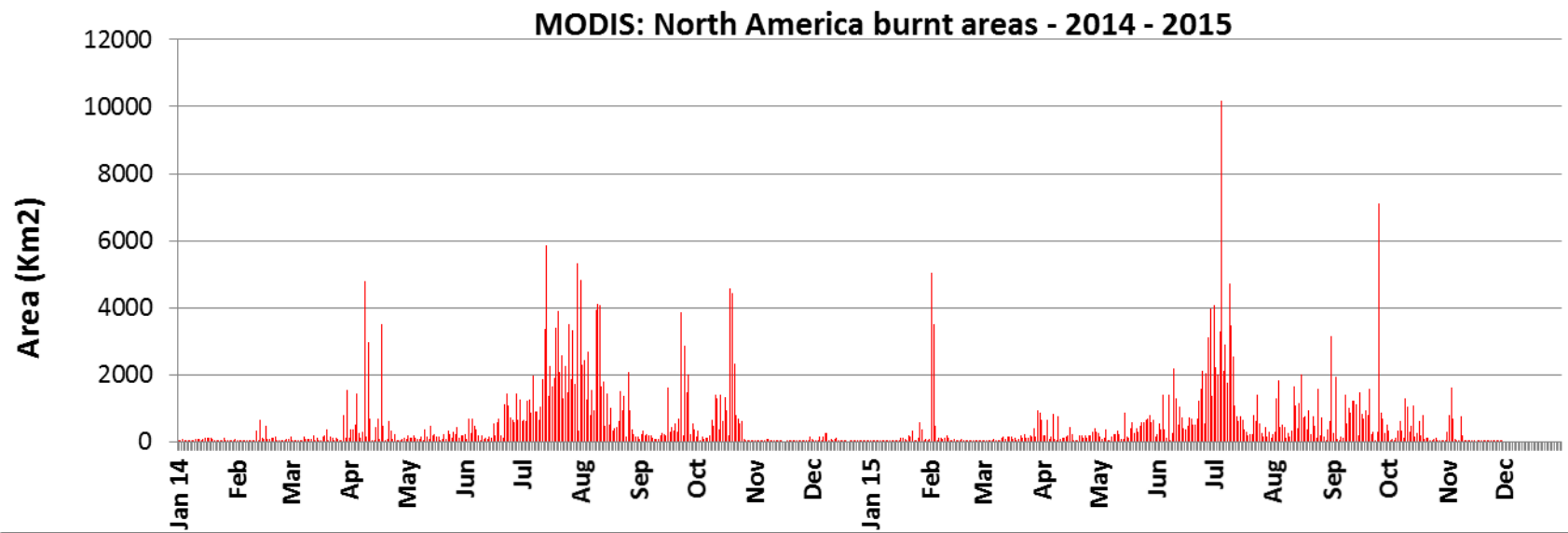


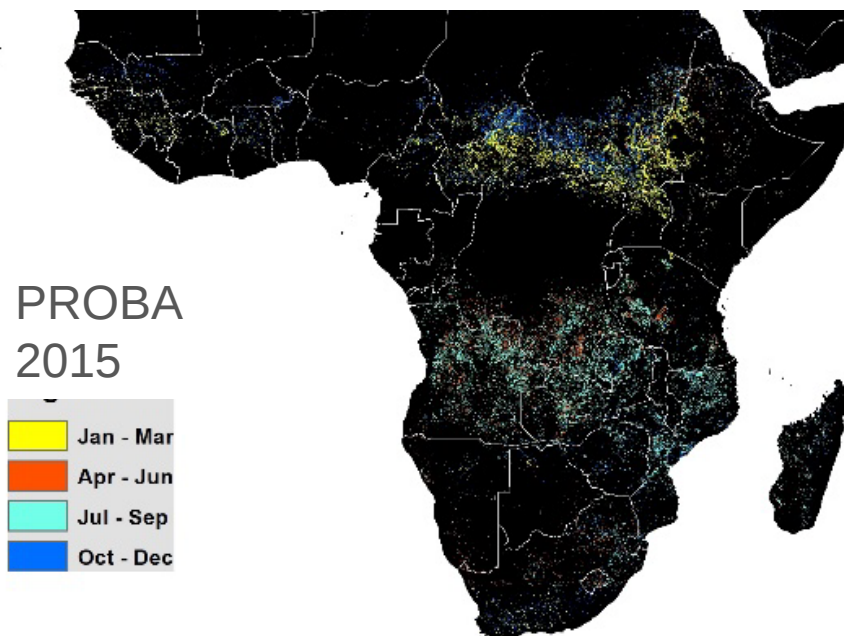
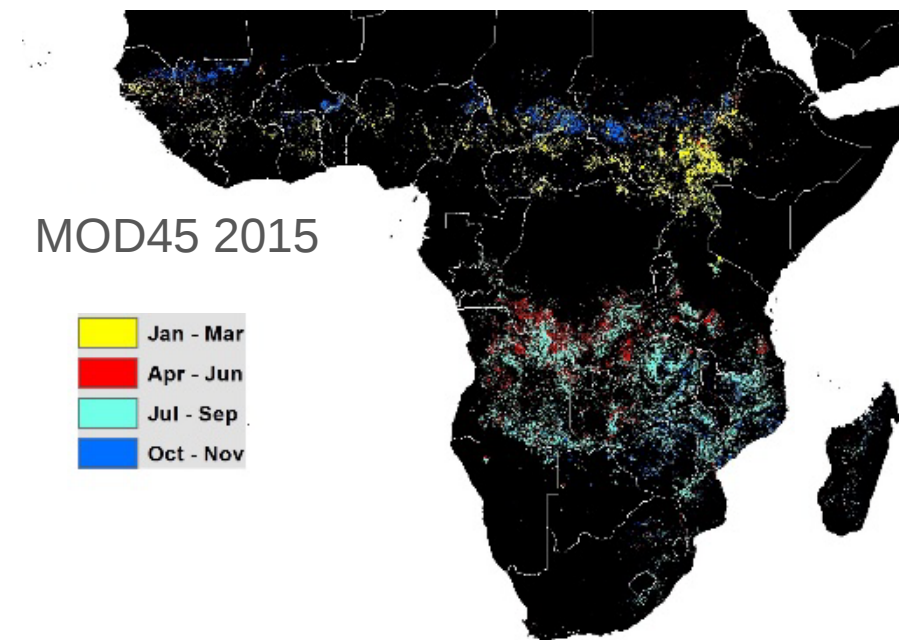
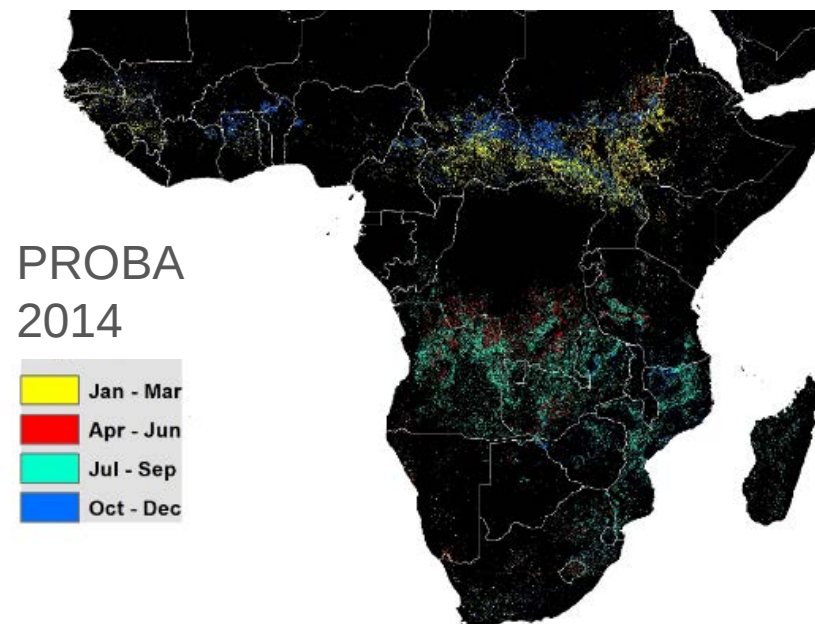
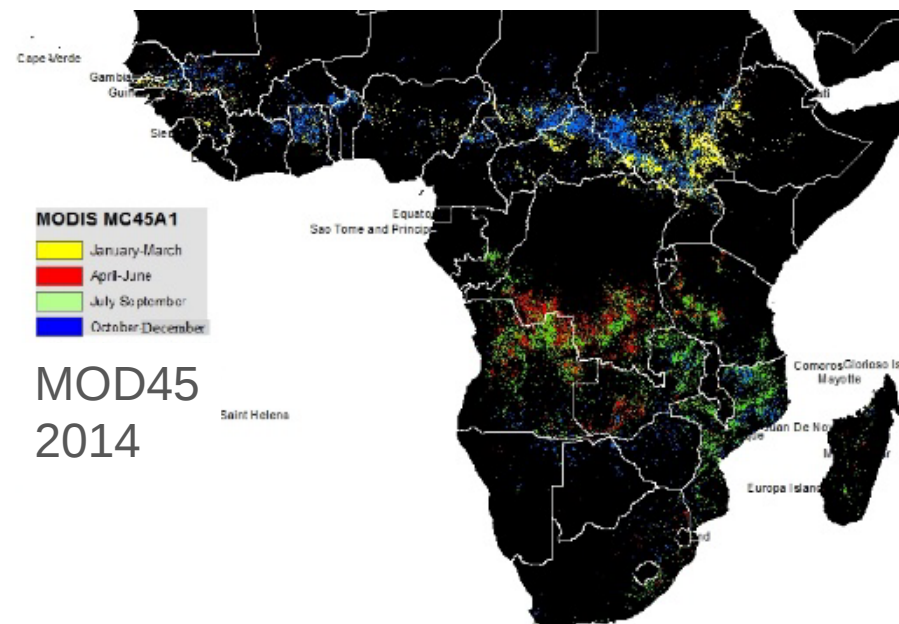




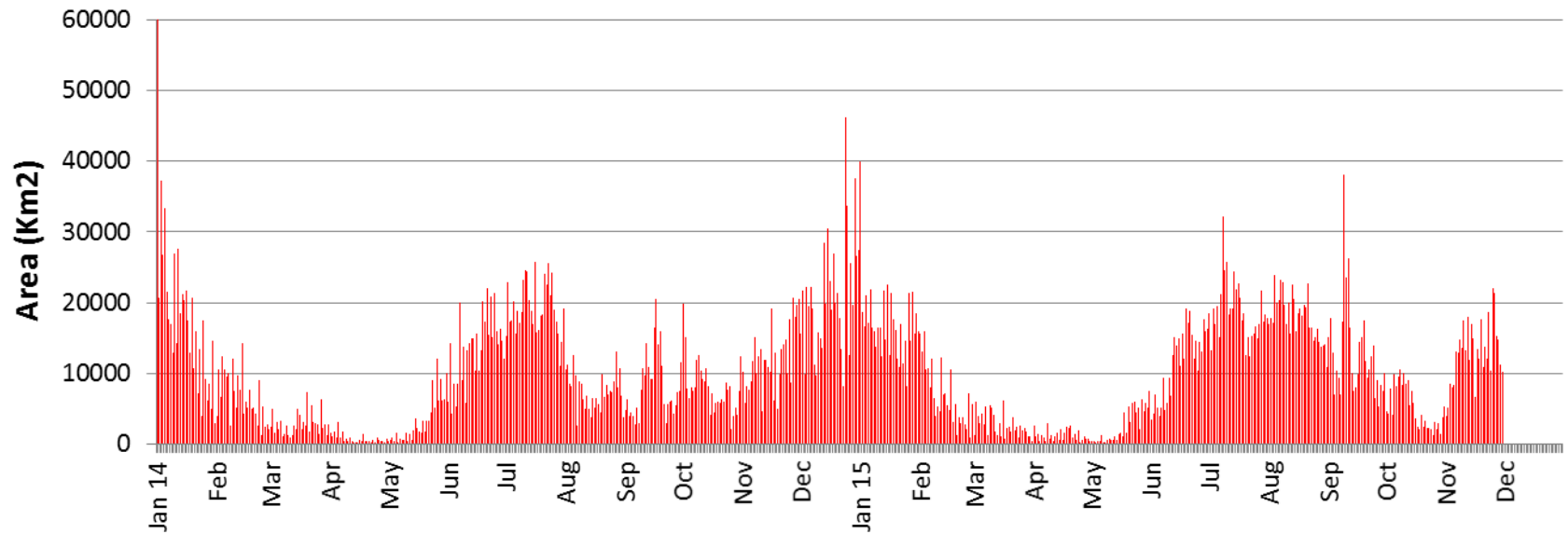


**PROBA
2015**

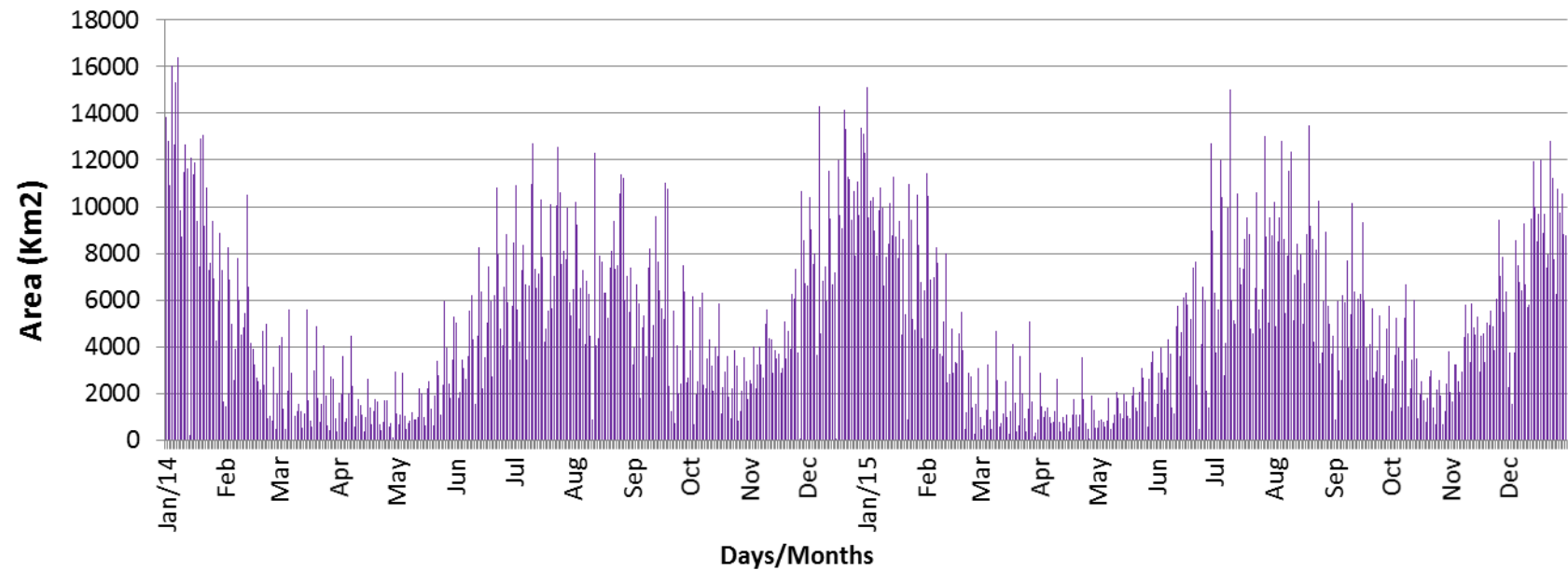




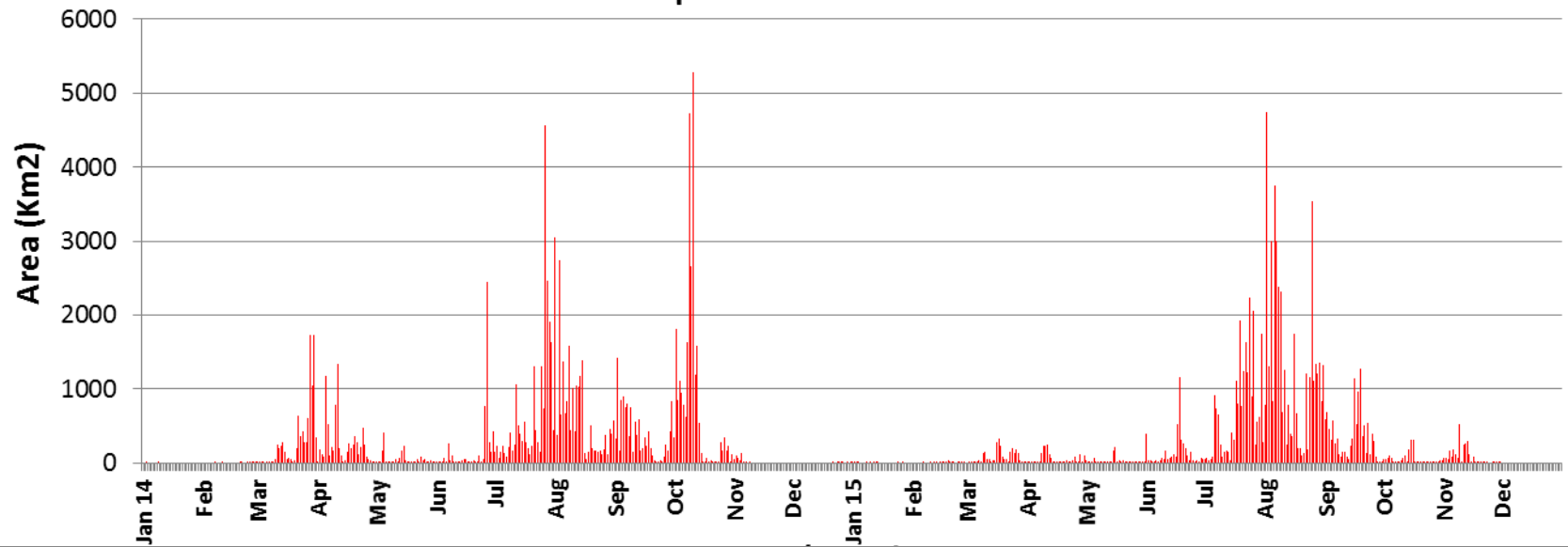
MODIS: Africa & Arabian Peninsula burnt areas - 2014 - 2015



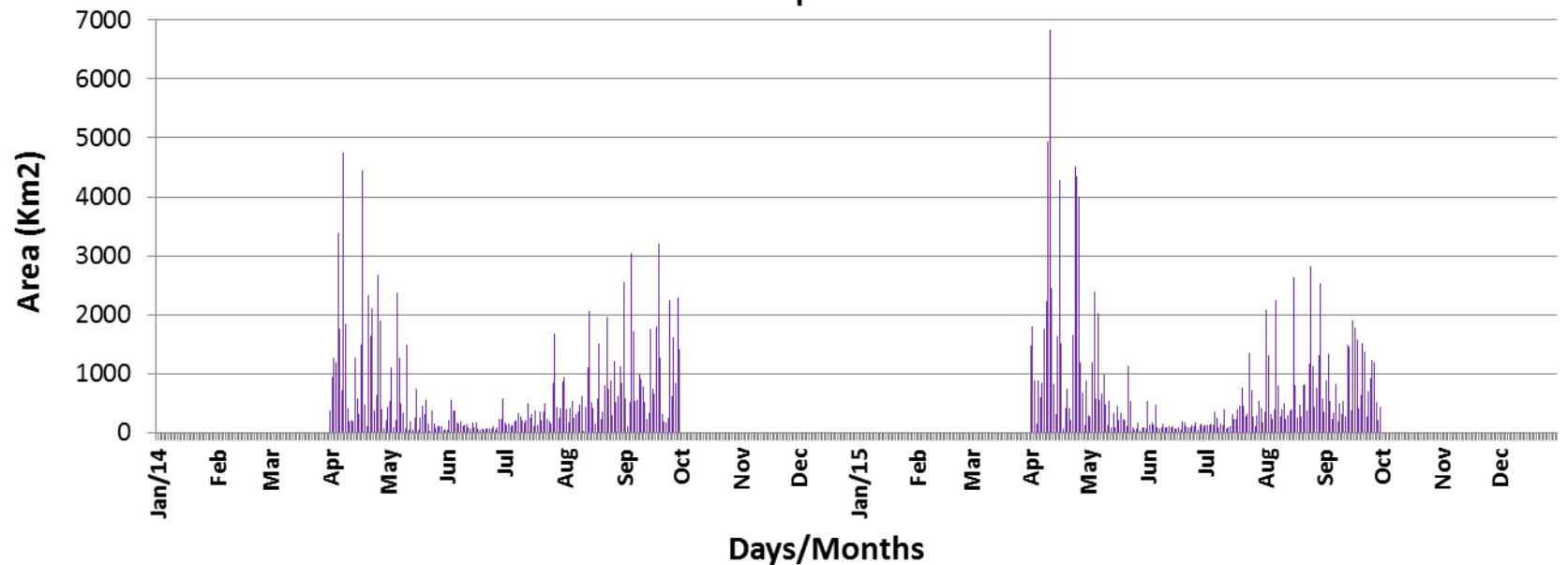
PROBA V 333m: Africa & Arabian Peninsula burnt areas - 2014 - 2015



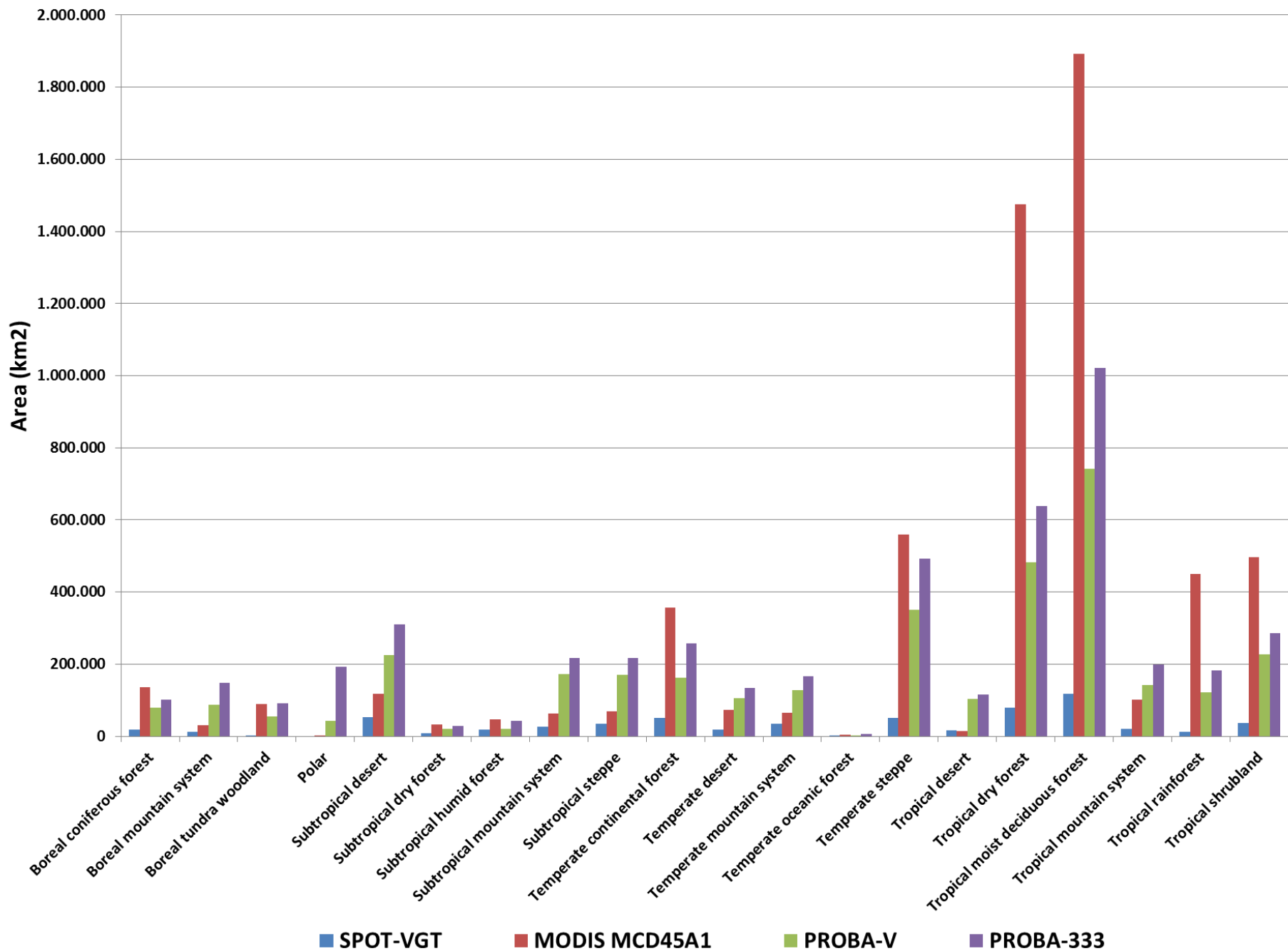
MODIS: Europe burnt areas - 2014 - 2015

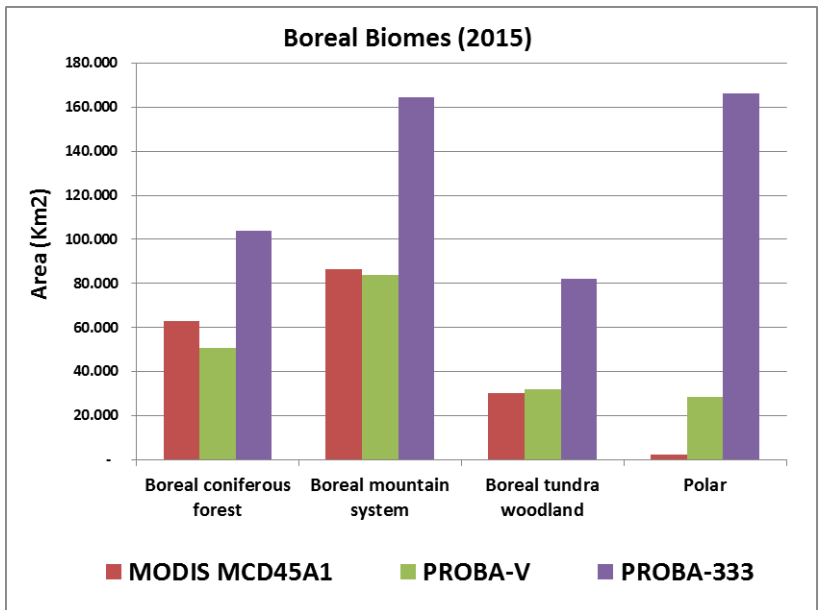
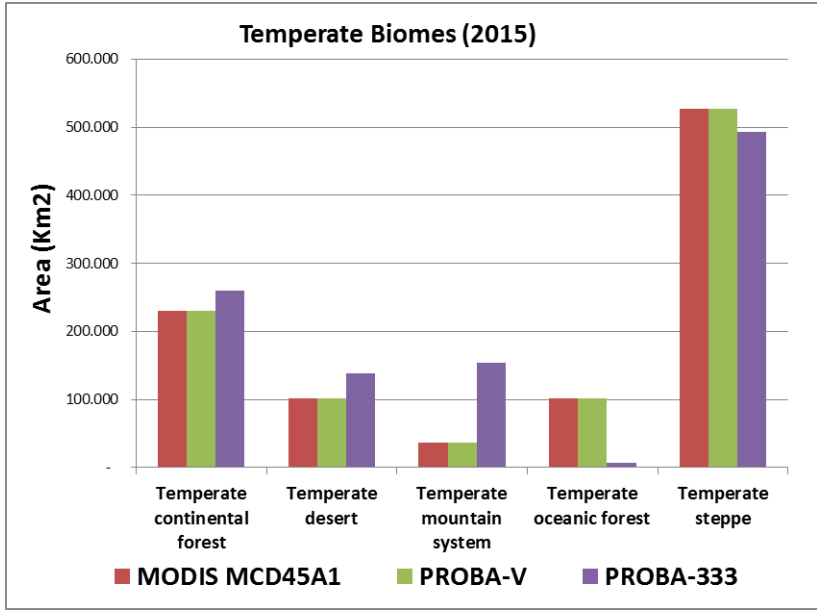
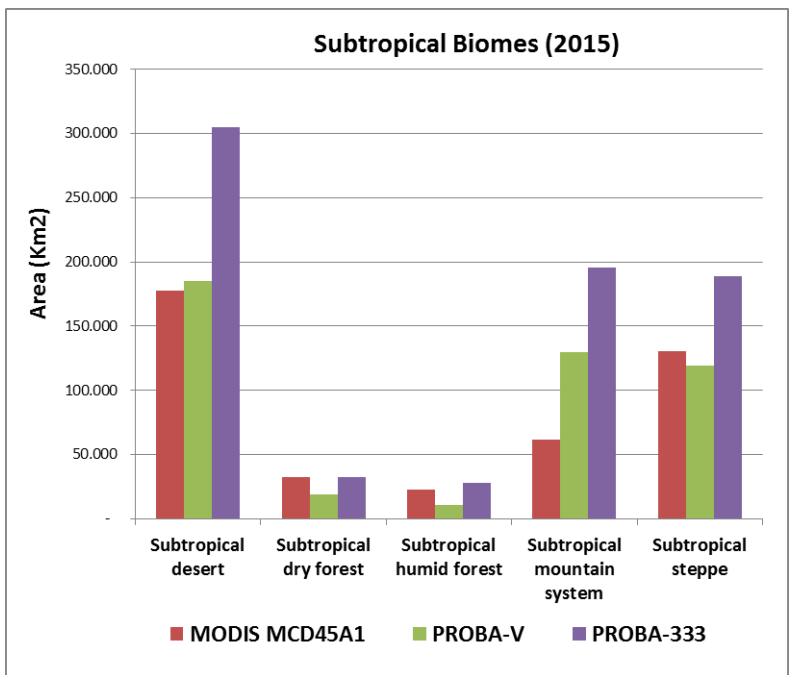
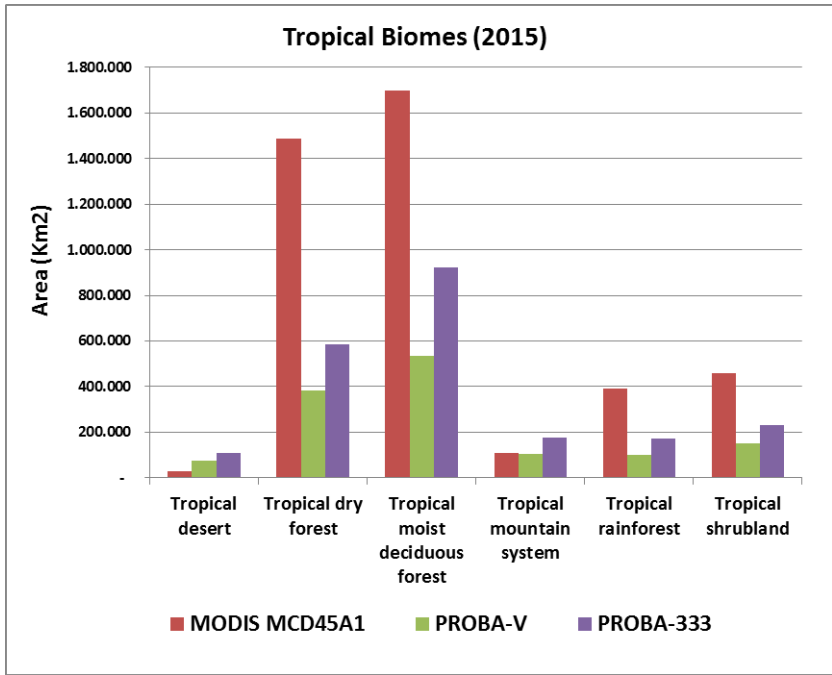


PROBA-V 333m: Europe burnt areas - 2014 2015



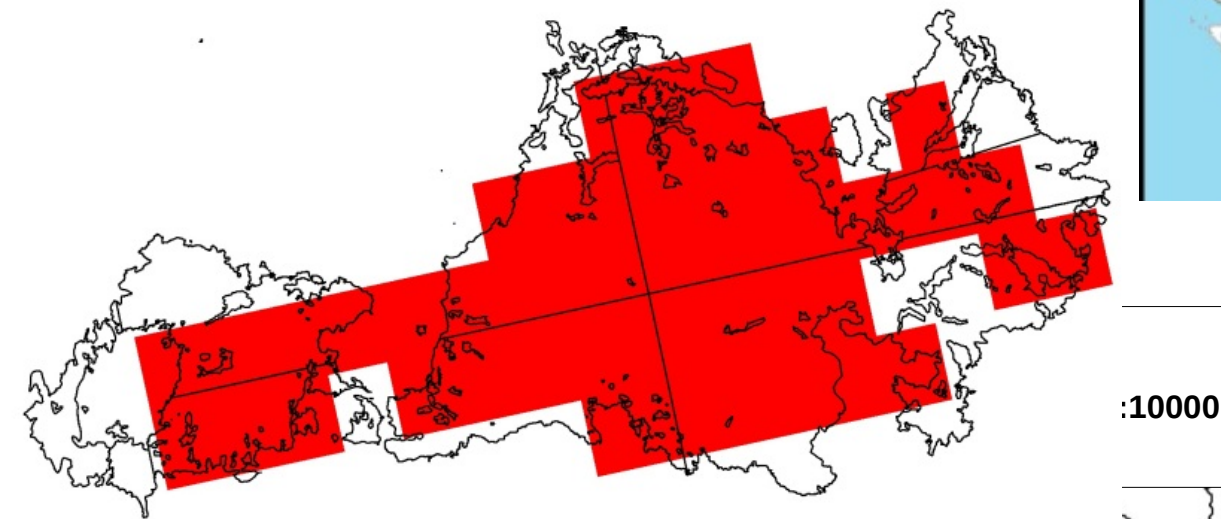
Comparison between all Biomes (2014)





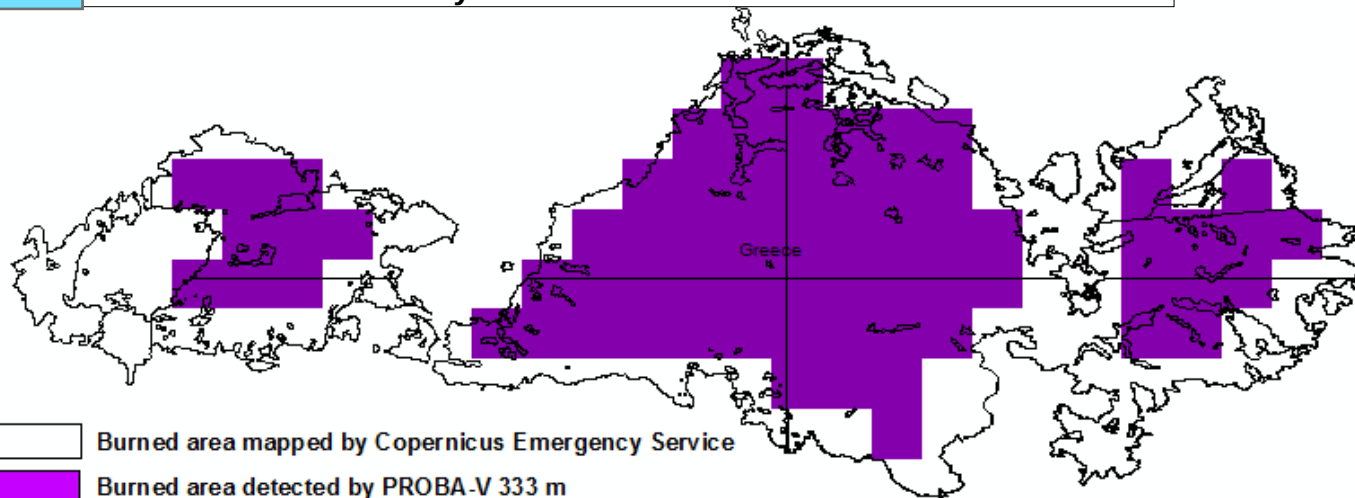
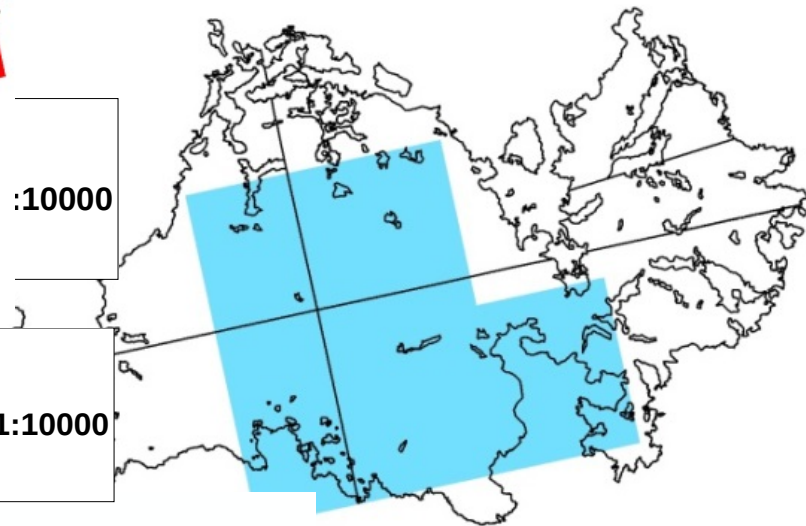
Legend

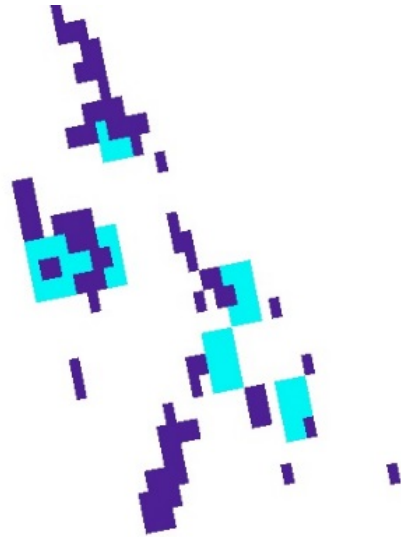
- Burned area mapped by Copernicus Emergency Service. Scale 1:10000
- Burned area detected by MODIS



Legend

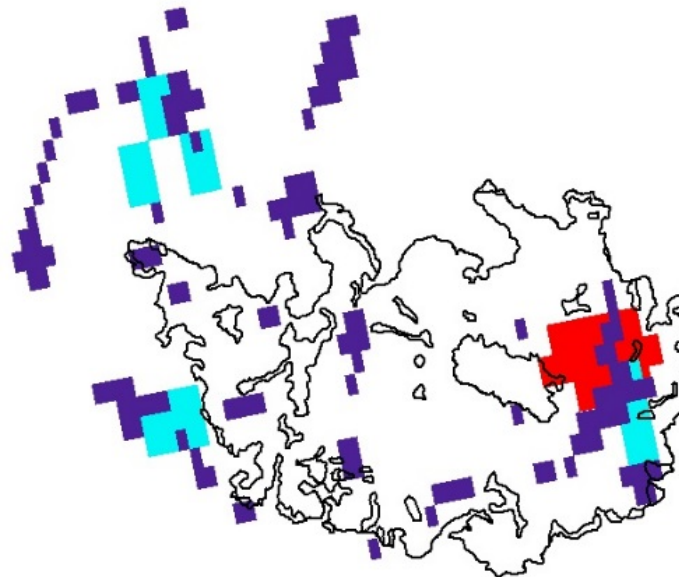
- Burned area mapped by Copernicus Emergency Service. Scale 1:10000
- Burned area detected by PROBA-V





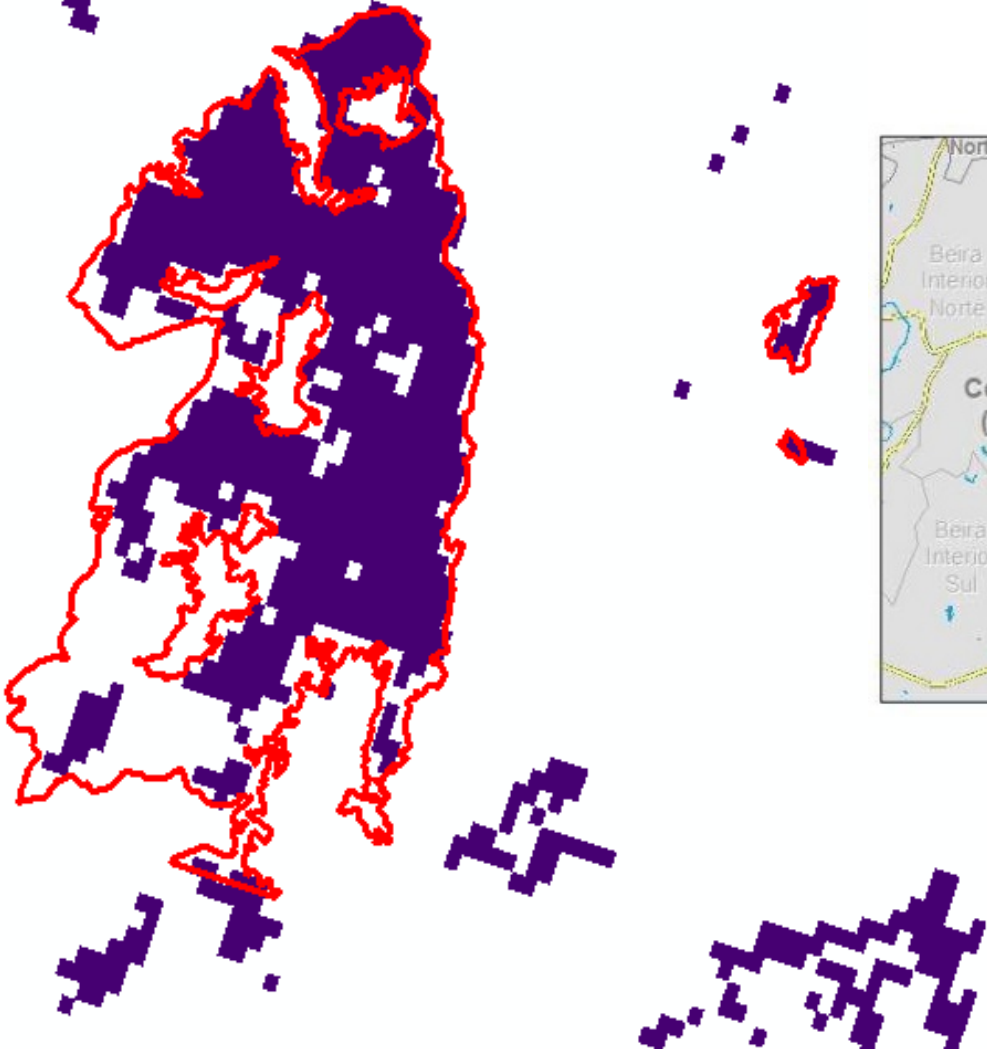
LEGEND

-  Burned area mapped by Copernicus Emergency Service. Scale 1:17500
-  Burned area detected by MODIS
-  Burned area detected PROBA-V
-  Burned area detected by PROBA 333




Fires detected by PROBA-V 333Km

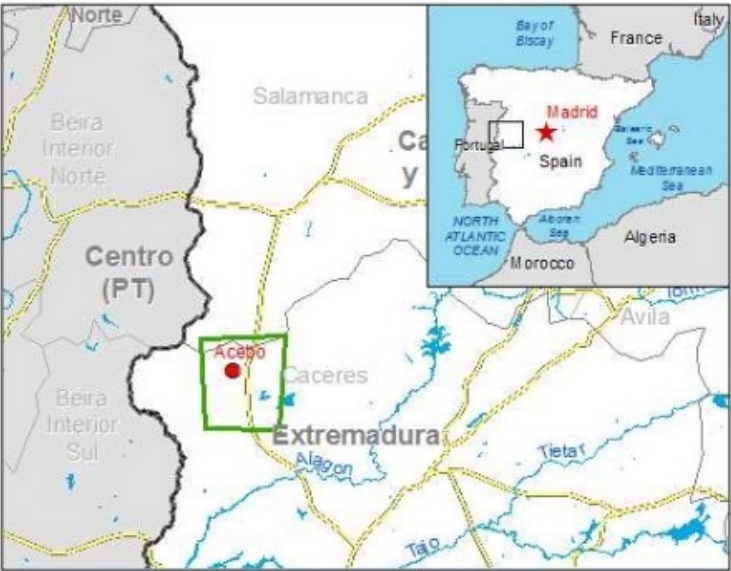

Fires detected by Copernicus Emergency Service (EMS)
Scale 1:11000



Acebo - SPAIN

Fire - 06/08/2015

Grading Map - Monit01





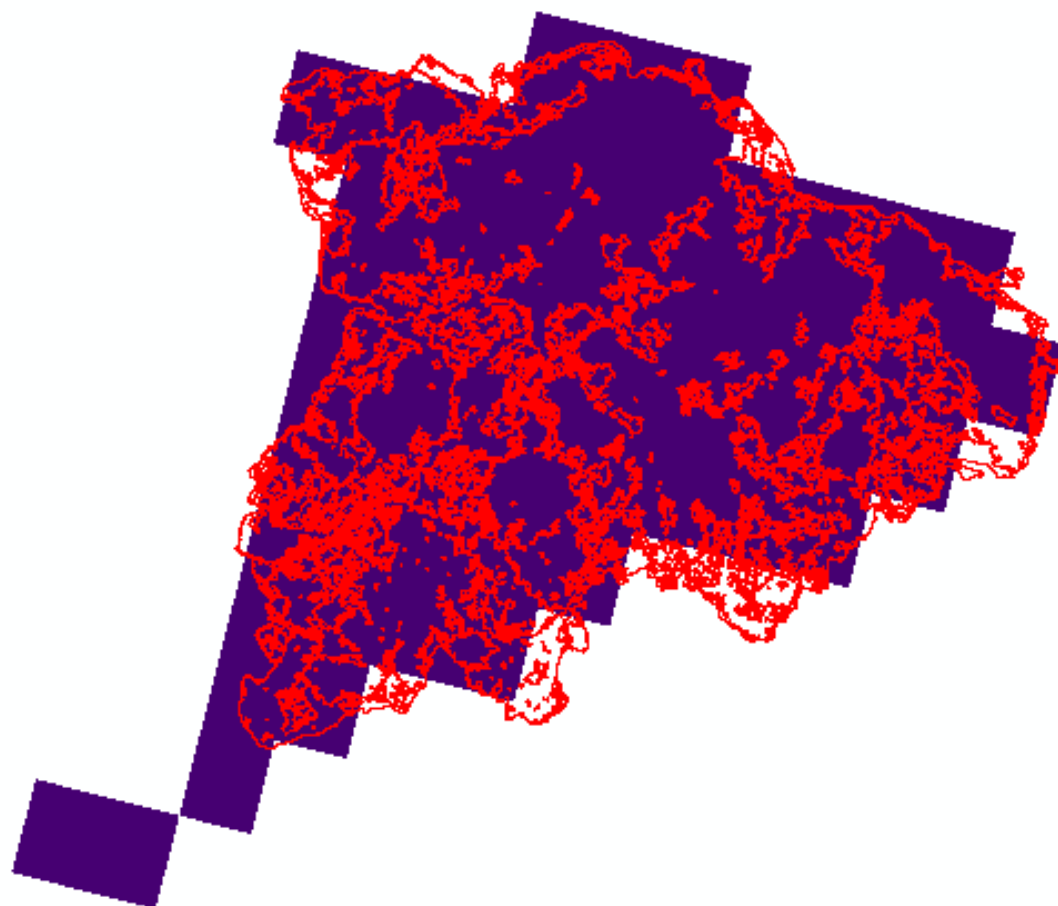
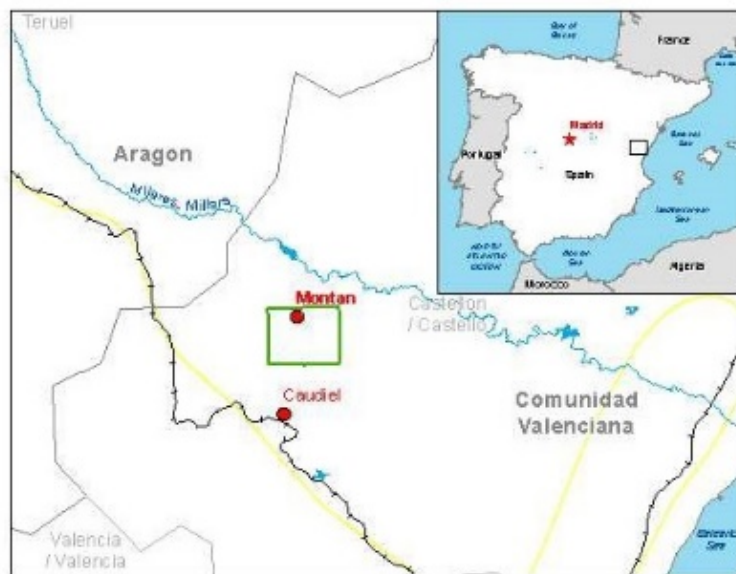
Fires detected by PROBA-V 333m



Fires detected by Copernicus Emergency Service (EMS)
Scale 1:11000

Montan - SPAIN

Fire - 07/07/2015
Grading Map



Overview of the product portfolio

The Copernicus Global Land Service reliably provides a set of global biophysical variables which describe the state and the evolution of the vegetation and soils, the energy budget at the surface, and the water cycle.

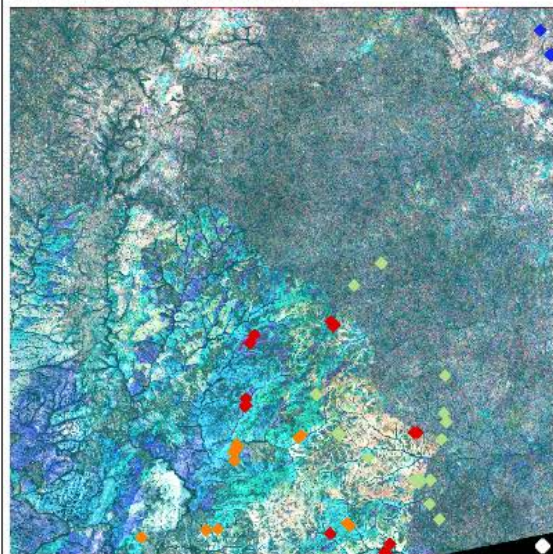
The below table shows the availability of the latest major version, available in near-real time. For more details on the definition, quality, development or version history of the products, as well as the available archive (time series), please visit the individual product pages.

Theme	Near-Real Time Product	Spatial Resolution	
		Coarse ≥1km	Medium 300m
Vegetation	Fraction of photosynthetically active radiation absorbed by the vegetation	In production	In development
	Fraction of green vegetation cover	In production	In development
	Leaf Area index	In production	In development
	Normalized Difference Vegetation Index	In production	In production
	Vegetation Condition Index	In production	N/A
	Vegetation Productivity Index	In production	N/A
	Dry Matter Productivity	In production	In development
	Burnt Area	In production	In production

Summary & Future Tasks

- 15+ years of burned area data available to download
 - <http://land.copernicus.eu/global/>
- 333m product NOW AVAILABLE
- New developments
 - Use of active fire (non-NRT re-analysis product in development at Leicester)
 - Detection of burned areas in cloudy regions with S1
- 2017 will be a Critical Year for Validation
- Better characterisation of fire area at 333m, but still considerable temporal and spatial differences with the MODIS 45 C5 500m product -> New product development

S-1 VV Coherence RGB: Epochs 1-4
with Training Polygons



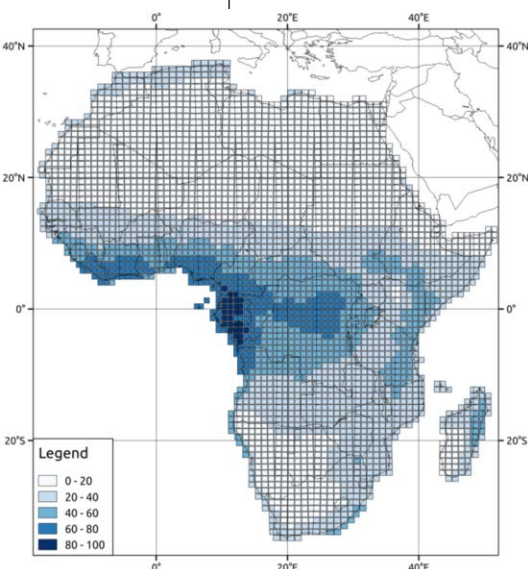
0 10 20 30 40 50 km



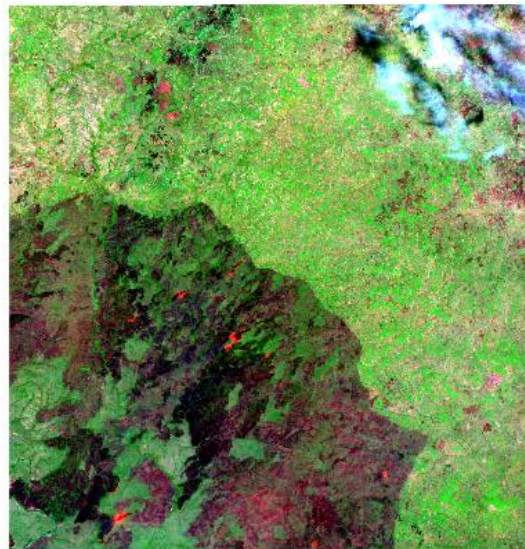
Legend

Training Data

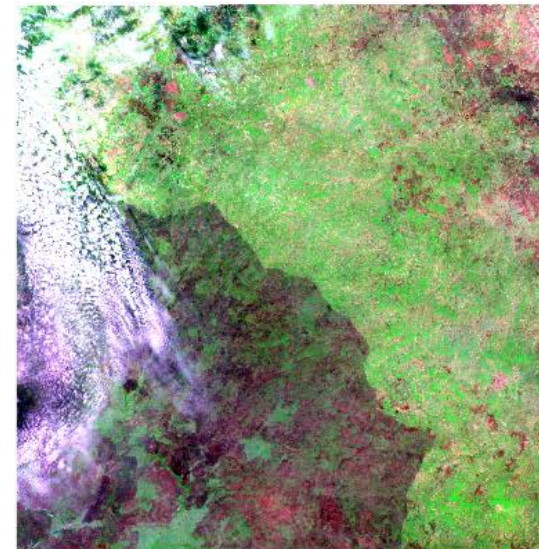
- No_Data
- Epoch_2-3_BA
- Non-BA
- Epoch_1-2_BA
- Water



S-2 Pre-Burn Event RGB: Epoch 2



S-2 Post-Burn Event RGB: Epoch 3

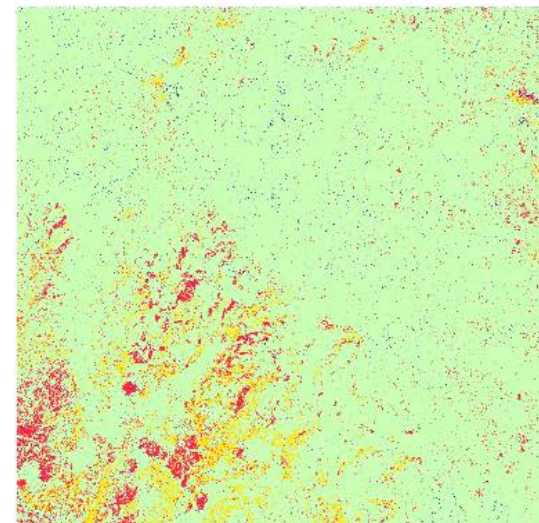


Legend

Classification

- No-Data
- Epoch 2-3 BA
- Non-BA
- Epoch 1-2 BA
- Water

S-1 derived BA classification: Epochs 2-3



Thank You

Kevin.tansey@le.ac.uk