Global Land Component

Land Monitoring

DG JRC – entrusted entity

Michael Cherlet, JRC
Presentation given by Bruno Smets, VITO

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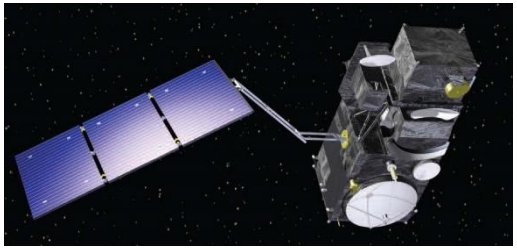
Global Land Objectives (2016-2019):

1. Routine production of Biophysical Variables
2. Ground Based Observations for Validation
3. Hot-Spot Monitoring (land cover change)
4. Sentinel-2 Global Mosaics and thematic products



Land Monitoring

Building on European expertise

50+ industry partners
250+ experts

SYKE · enveo · HYGEOS · IMDC · University of Reading · LEGOS · TU WIEN GEO · ZAMG Zentralanstalt für Meteorologie und Geodynamik · CREAF · ipma · EUMETSAT · TRASYS · eodc · TU WIEN · IIASA · WAGENINGEN UNIVERSITY · JOANNEUM RESEARCH · IGN · ONF International · space 4 environment · GISBOX · EOXPLORE · RMI · EOLAB · METEO FRANCE · University of Leicester · CLS · SPACEBEL · Université de Liège · FINNISH METEOROLOGICAL INSTITUTE · vito · PML Plymouth Marine Laboratory · BROCKMANN CONSULT GMBH · e-geos UNA SOCIETÀ ASI/TELESPAZIO · EXELIS · ISPRA · Telespazio

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Land Monitoring

BIOPHYSICAL PRODUCTS

19 products available at **1km**
8 products available at **300m**

Land cover at **100m**

- ✓ Validated
- ✓ Documented
- ✓ External review
- ✓ Free
- ✓ Continuity ensured

Theme	Variable	Spatial Resolution Moderate 100m
Vegetation	Land Cover	In production

From coarse to medium resolution

Theme	Variable	Spatial Resolution Coarse >=1km	Medium 300m
Vegetation	Fraction of photosynthetically active radiation absorbed by the vegetation	In production	In production
	Fraction of green vegetation cover	In production	In production
	Leaf Area index	In production	In production
	Normalized Difference Vegetation Index	In production	In production
	Vegetation Condition Index	In production	
	Vegetation Productivity Index	In production	
	Dry Matter Productivity	In production	In production
	Burnt Area	In production	In production
	Soil Water Index	In production	
	Surface Soil Moisture	In development	
Energy	Land Surface Temperature	In production	
	Top Of Canopy Reflectance	In production	
	Surface Albedo	In production	
	Downward Short- and Longwave Fluxes at the surface	In development	
Water	Water Bodies	In production	In production
	Lake Surface Water Temperature	In production	
	Lake Water Quality	In production	
Cryosphere	Lake Ice Extent	In production	
	Snow Cover Extent	In production	
	Snow Water Equivalent	In production	

Non-gridded products

Theme	Variable	Rivers and Lakes
Water	Water Level	In production

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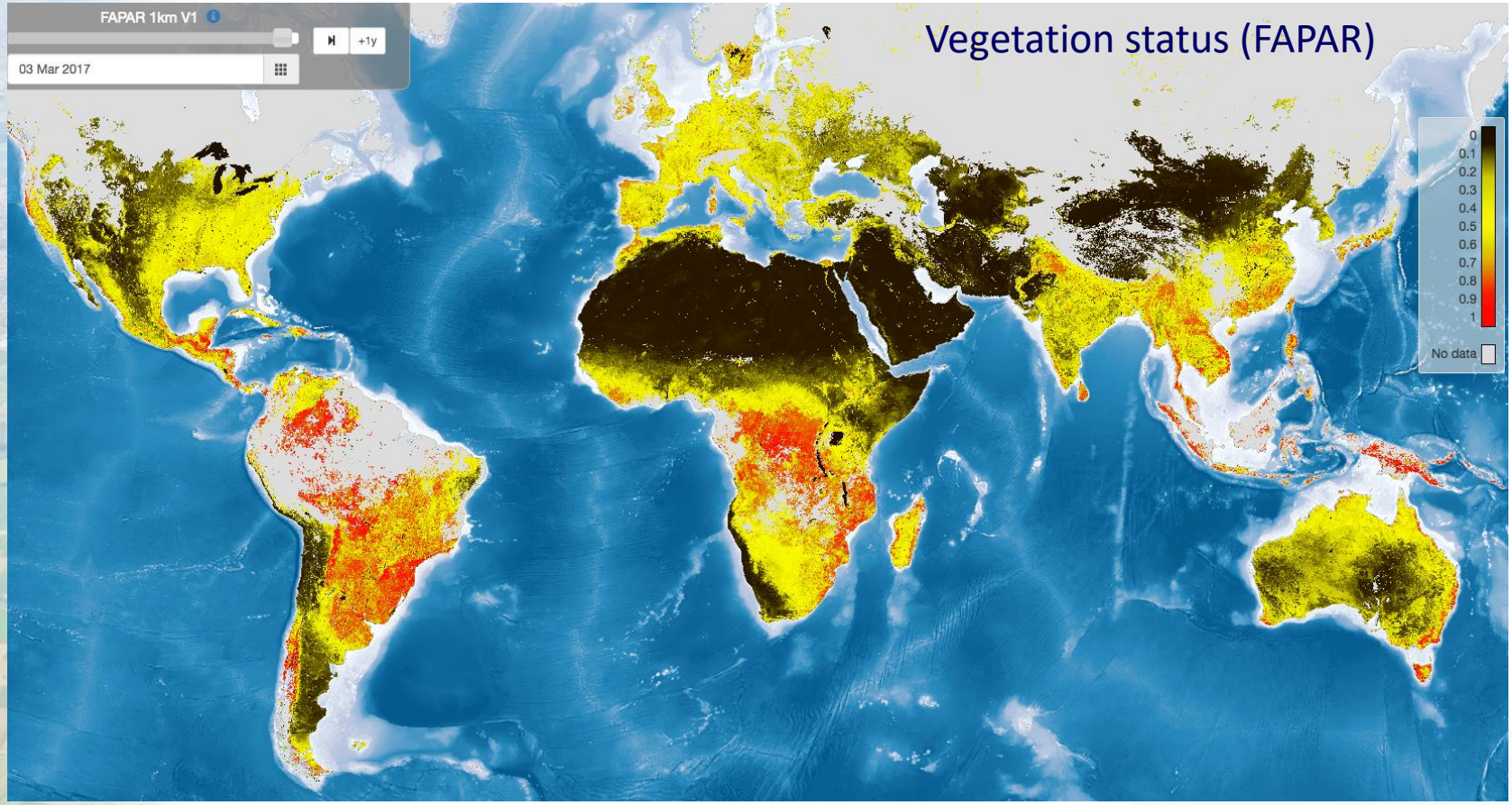

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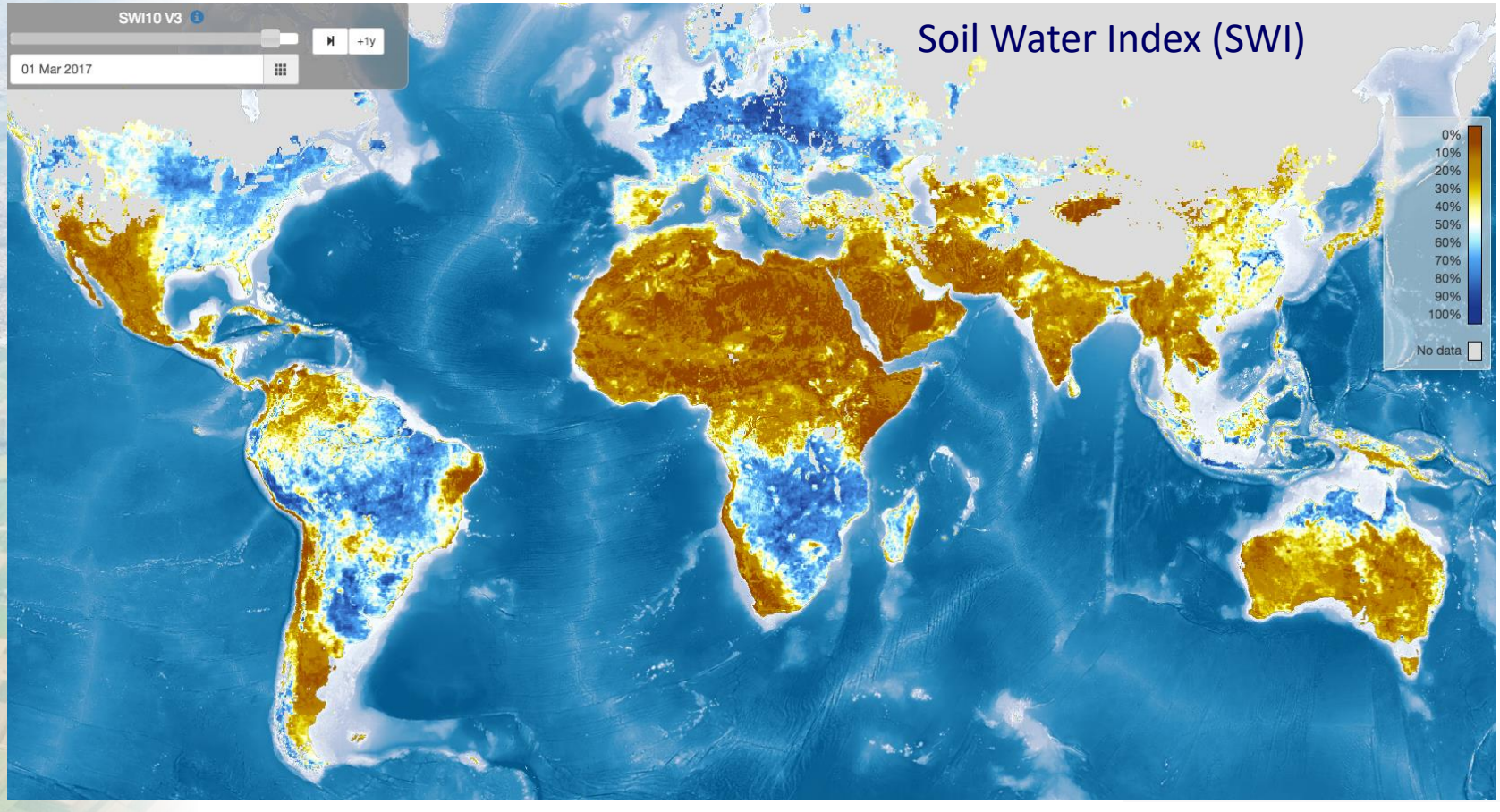
BIOPHYSICAL PRODUCTS



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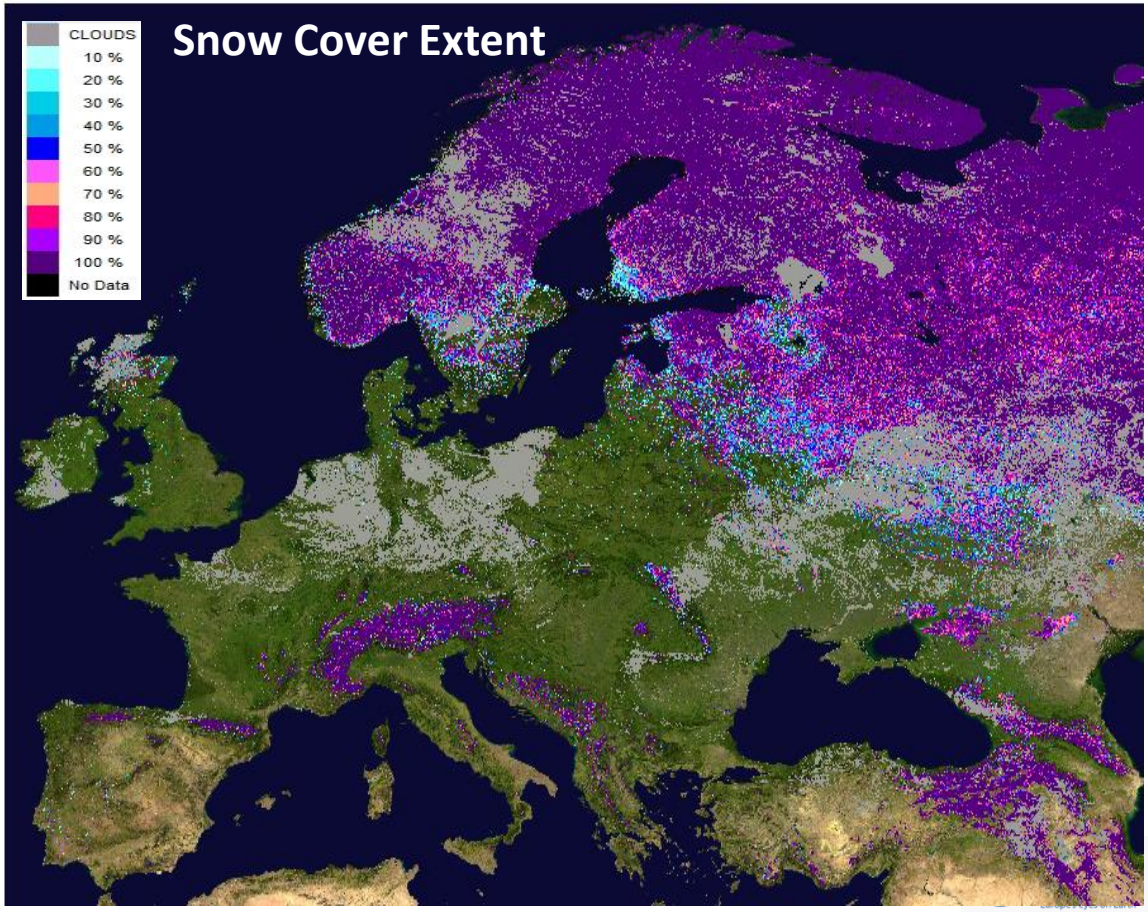
BIOPHYSICAL PRODUCTS



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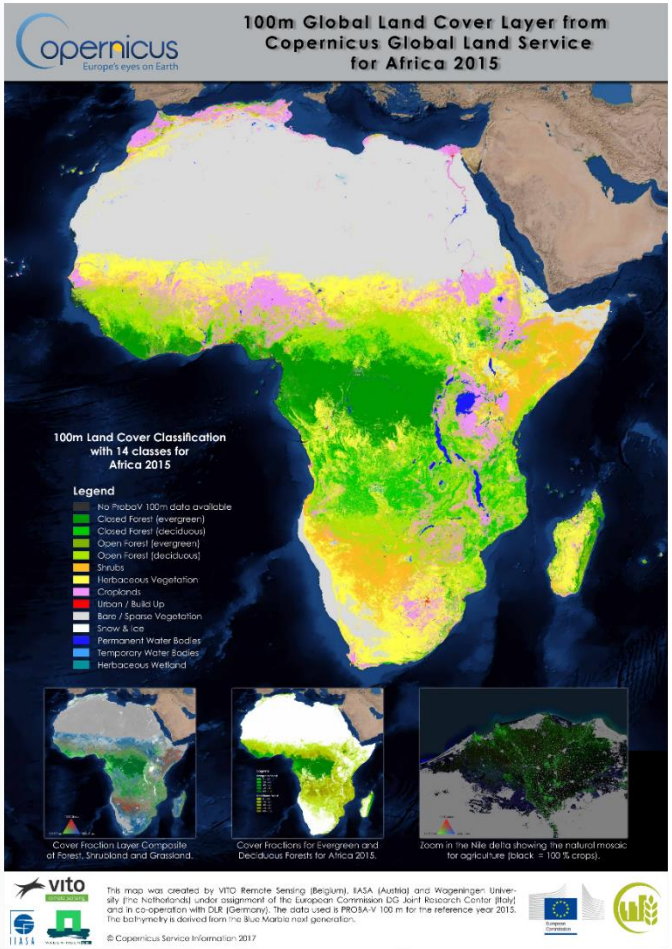
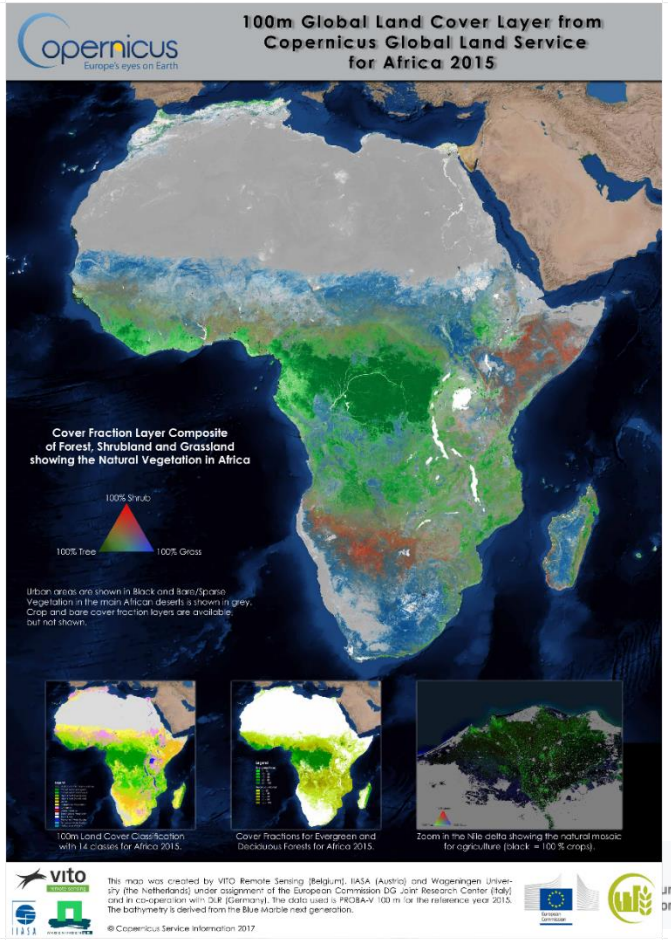
BIOPHYSICAL PRODUCTS





Land Monitoring

PRODUCTION: Ground observations

Ground-Based Observations for Validation (GBOV) of Copernicus Global Land Products

in support of validation of biophysical variables

The GBOV database is being populated with

- reference Measures and
- 'match-ups' for land products

From 52 sites

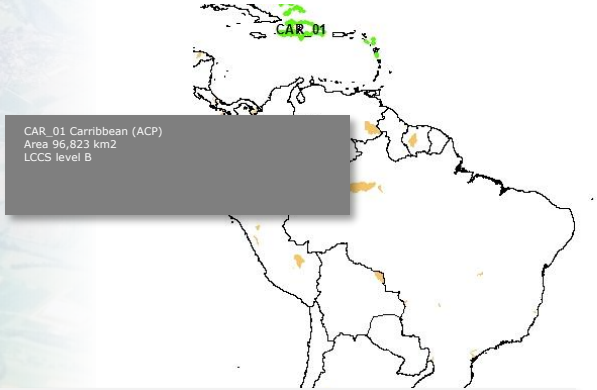
Web dissemination site under development.

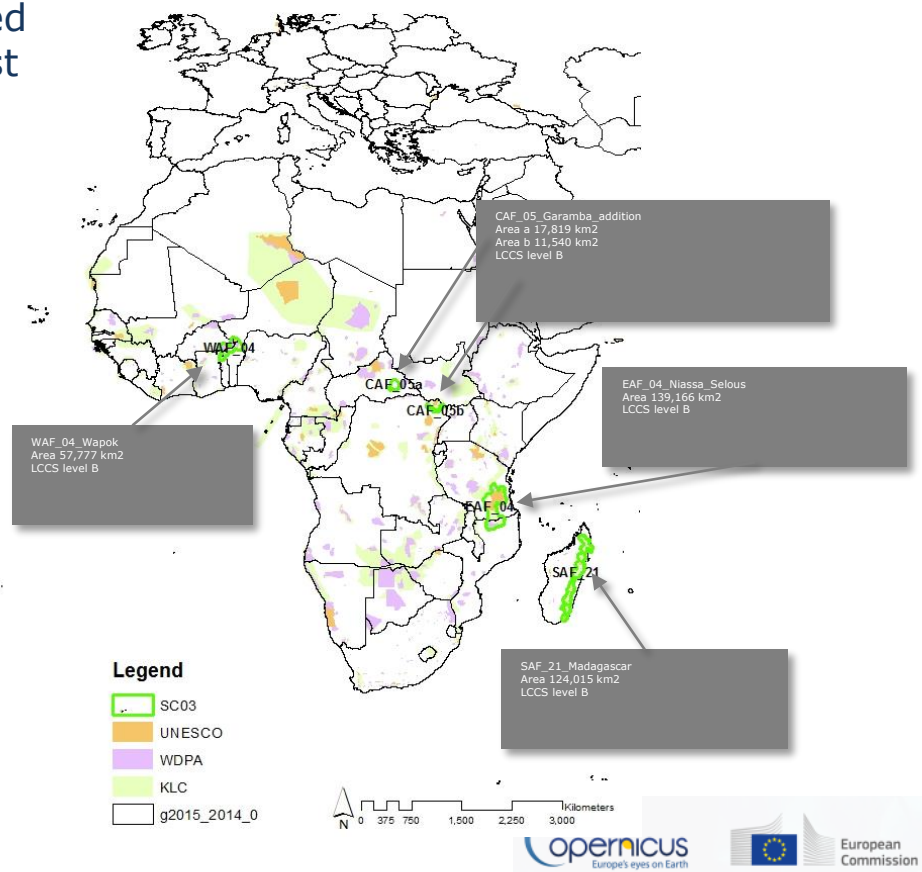
Land Monitoring

HOT SPOT MONITORING

land cover and change maps and related indicators over specific Areas of Interest High resolution

Complements the near real time global monitoring service at low resolution





19 Key Landscape areas, covering a total area of 1.273.350 km2 in process to support Commission Services, delegations and other users for e.g. project/policy planning and evaluation.

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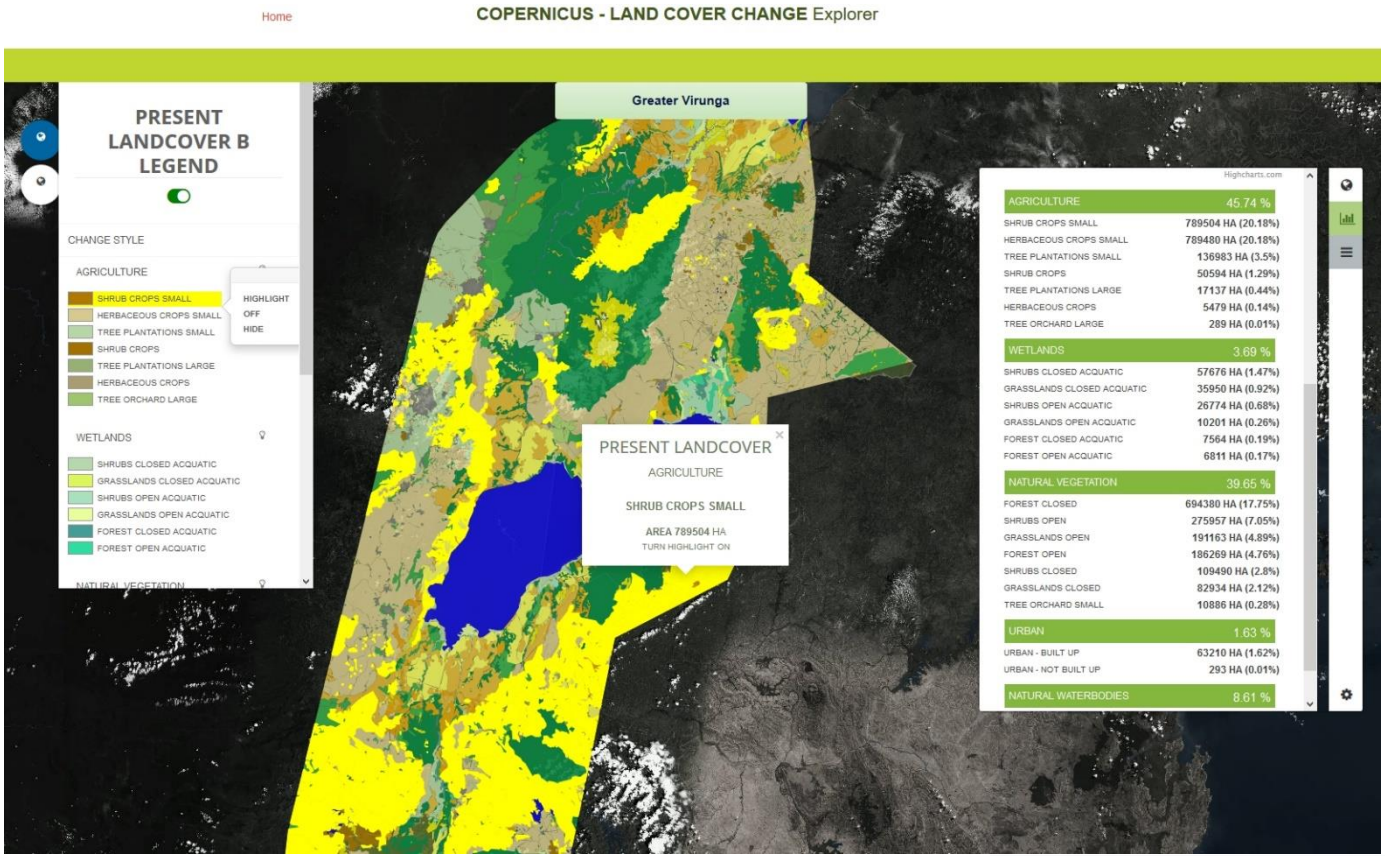
HOT SPOT MONITORING



All data and maps freely available (from late Q3)

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Sentinel-2 global mosaic

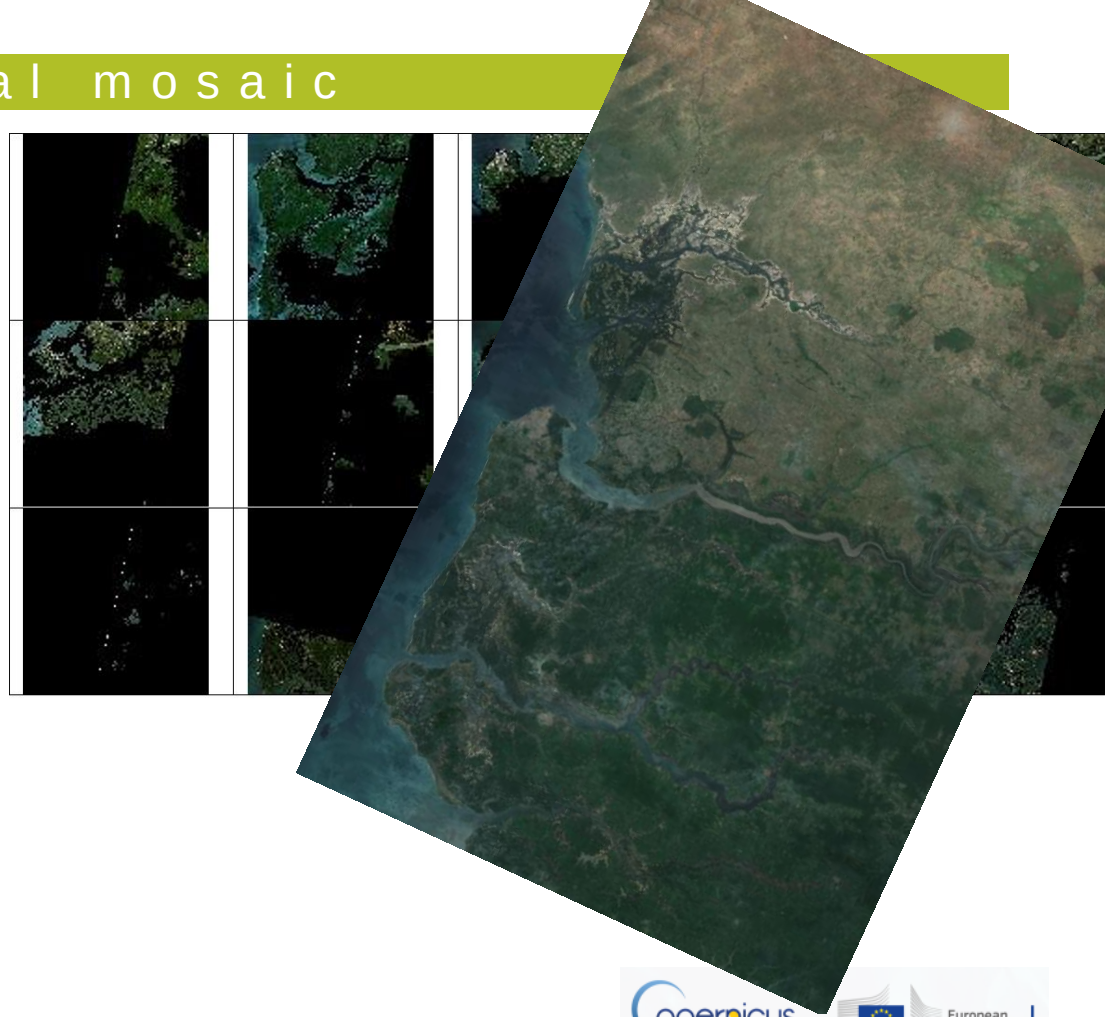
Preparation of Analysis Ready Data

Sentinel 2 Global Mosaics:

Mosaic algorithm processing on 11 European test sites for S2A and S2B data

Dissemination portal to be public in Q3-2018
Global products planned for Q4-2018

Mosaicking algorithms also implemented on ESA Sentinel Application Platforms (SNAP) already now !!



Sentinel 2B (source: ESA)

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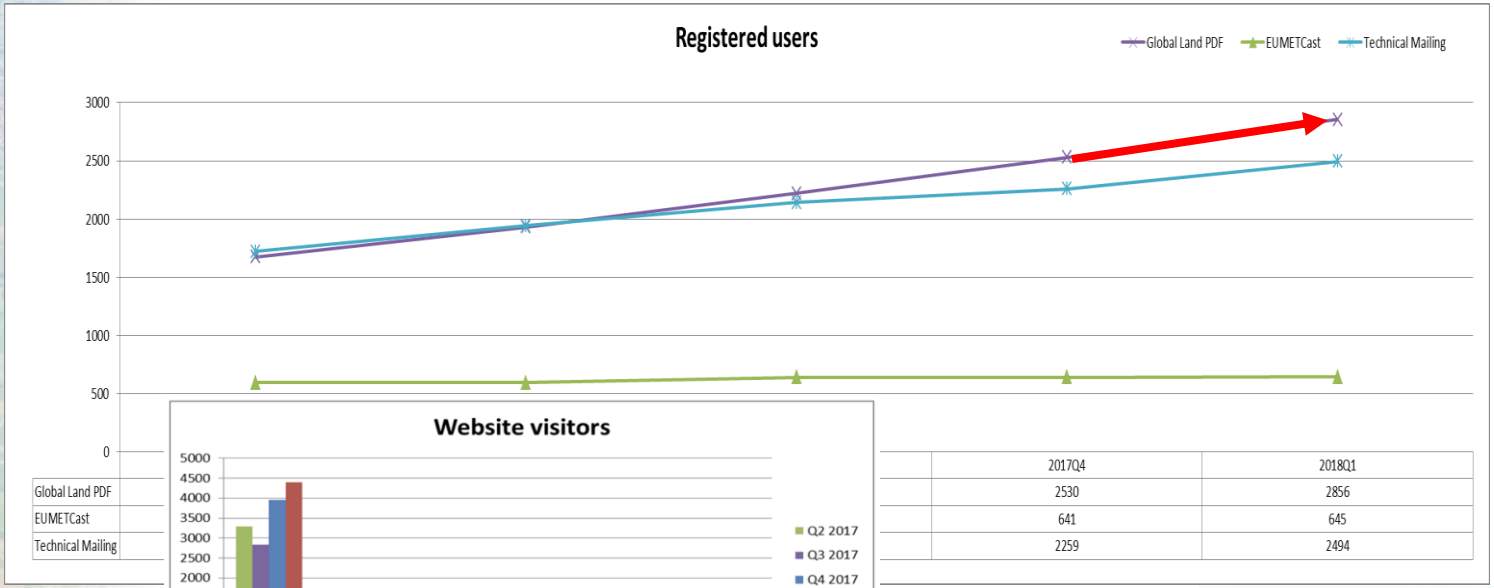
3500+ registered users*



	2017Q4	2018Q1
Global Land PDF	2530	2856
EUMETCast	641	645
Technical Mailing	2259	2494

** Only biophysical products*

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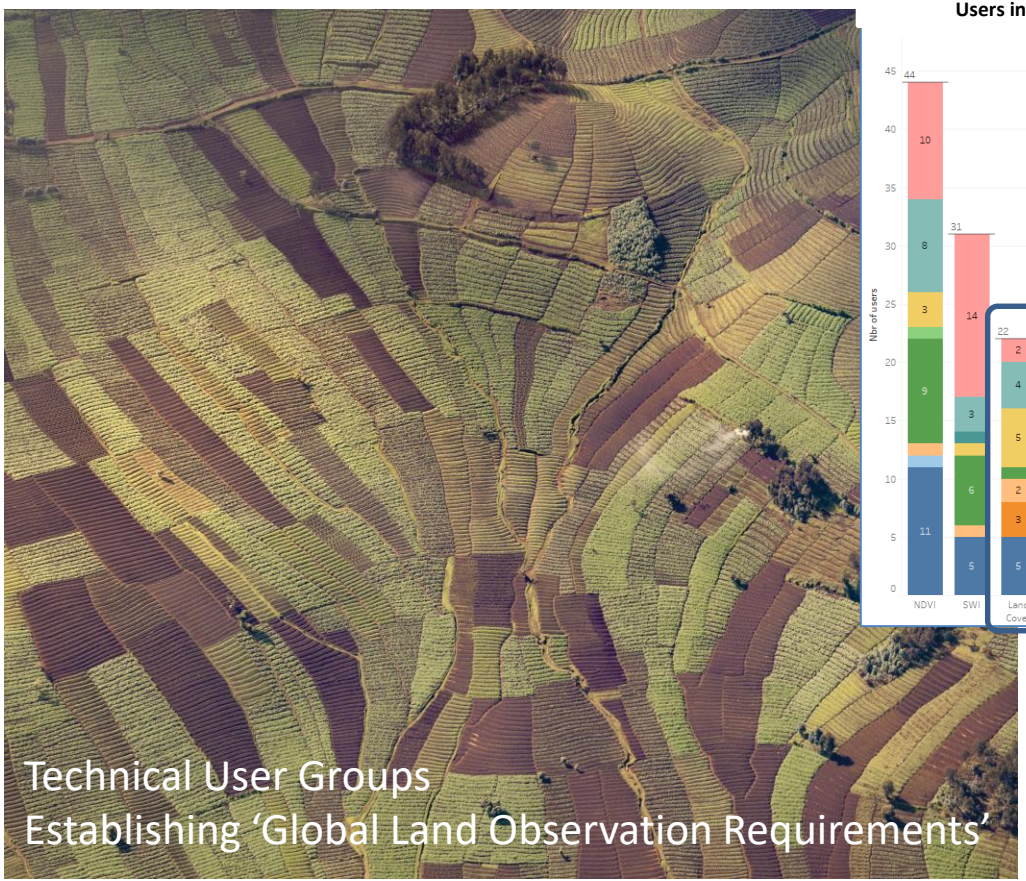
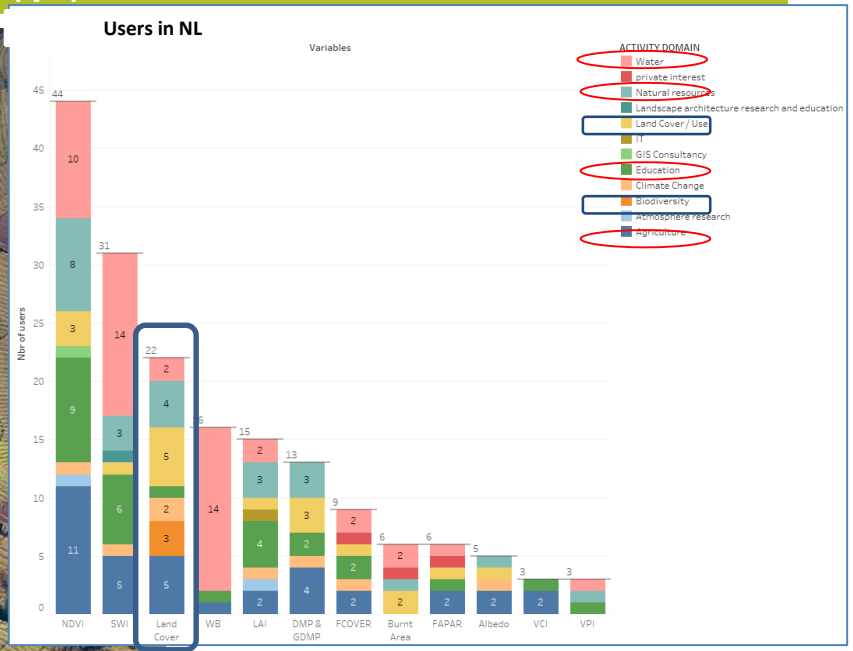
GLOBAL LAND COMPONENT



Technical User Groups
Establishing ‘Global Land Observation Requirements’



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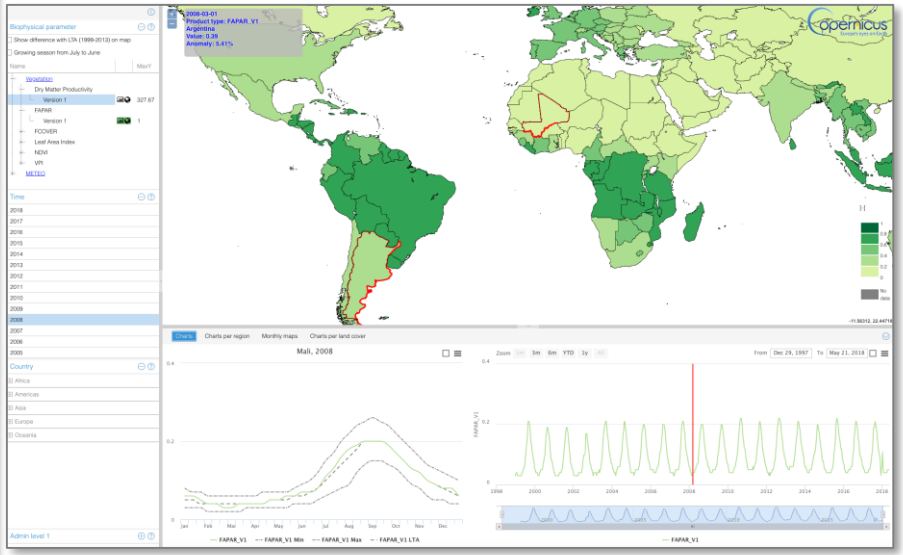
Global Land products provide global background for planning and evaluating of EU policies and projects



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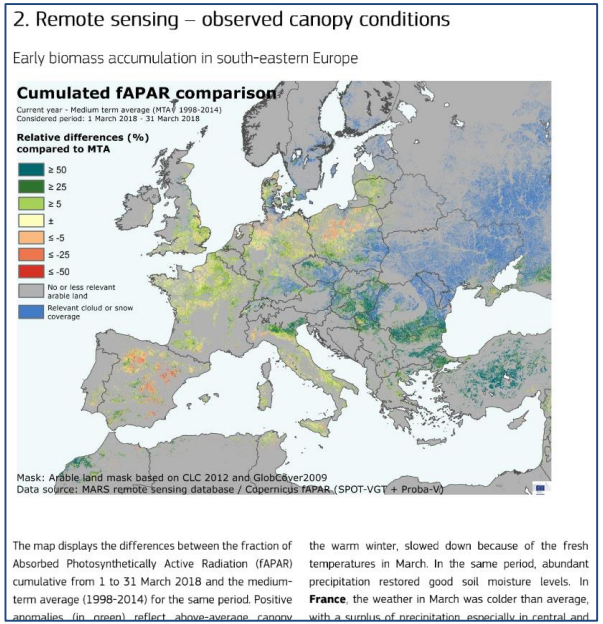
Global Land products used for:

- Further modelling
- Crop monitoring – food security



2. Remote sensing – observed canopy conditions

Early biomass accumulation in south-eastern Europe

Cumulated fAPAR comparison

Current year - Medium term average (MTA) 1998-2014)
Considered period: 1 March 2018 - 31 March 2018

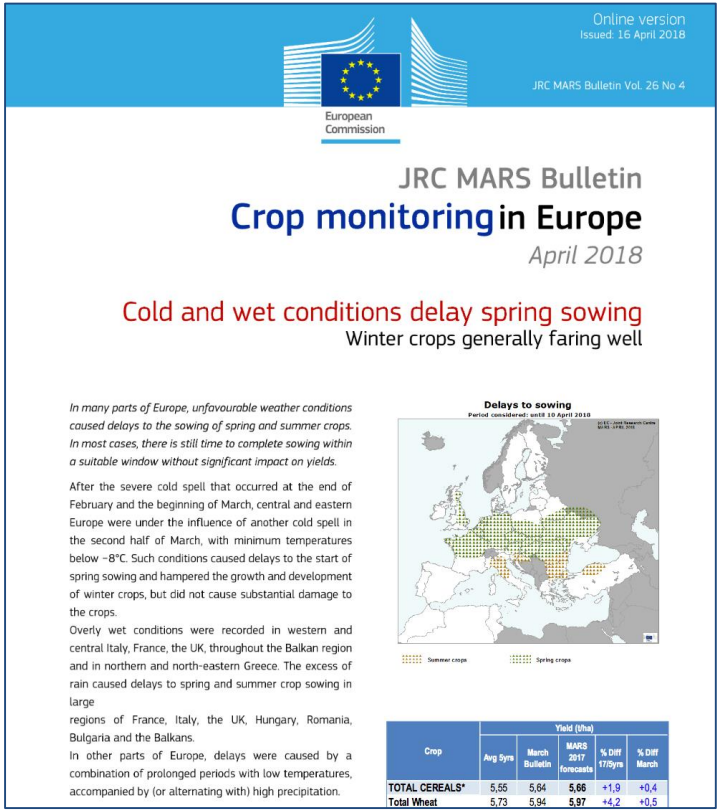
Relative differences (%) compared to MTA

≥ 50
≥ 25
≥ 5
±
≤ -5
≤ -25
≤ -50
No or less relevant arable land
Relevant cloud or snow coverage

Mask: Arable land mask based on CLC 2012 and GlobCover2009
Data source: MARS remote sensing database / Copernicus fAPAR (SPOT-VGT + Proba-V)

The map displays the differences between the fraction of Absorbed Photosynthetically Active Radiation (fAPAR) cumulative from 1 to 31 March 2018 and the medium-term average (1998-2014) for the same period. Positive anomalies (in green) reflect above-average canopy

the warm winter, slowed down because of the fresh temperatures in March. In the same period, abundant precipitation restored good soil moisture levels. In **France**, the weather in March was colder than average, with a surplus of precipitation, especially in central and



Online version
Issued: 16 April 2018

JRC MARS Bulletin Vol. 26 No 4

European Commission

JRC MARS Bulletin

Crop monitoring in Europe

April 2018

Cold and wet conditions delay spring sowing

Winter crops generally faring well

In many parts of Europe, unfavourable weather conditions caused delays to the sowing of spring and summer crops. In most cases, there is still time to complete sowing within a suitable window without significant impact on yields.

After the severe cold spell that occurred at the end of February and the beginning of March, central and eastern Europe were under the influence of another cold spell in the second half of March, with minimum temperatures below −8°C. Such conditions caused delays to the start of spring sowing and hampered the growth and development of winter crops, but did not cause substantial damage to the crops.

Overly wet conditions were recorded in western and central Italy, France, the UK, throughout the Balkan region and in northern and north-eastern Greece. The excess of rain caused delays to spring and summer crop sowing in large regions of France, Italy, the UK, Hungary, Romania, Bulgaria and the Balkans.

In other parts of Europe, delays were caused by a combination of prolonged periods with low temperatures, accompanied by (or alternating with) high precipitation.

Delays to sowing

Period considered: until 10 April 2018

Summer crops
Spring crops

Crop	Yield (t/ha)				
	Avg 5yrs	March Bulletin	MARS 2017 Forecasts	% Diff 17/5yrs	% Diff March
TOTAL CEREALS*	5,55	5,64	5,66	+1,9	+0,4
Total Wheat	5,73	5,94	5,97	+4,2	+0,5

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GLOBAL LAND COMPONENT

Land Monitoring

Global Land products used for:

- Drought monitoring
- ..

Copernicus Global Land Service
Use Case

Drought Surveillance in Sri Lanka

User's reference:
International Water Management Institute (IWMI)

Activity domain: Agriculture, Drought
Geographic area: South Asia, Sri Lanka

Overview

Prolonged drought in Sri Lanka during 2016 and 2017 resulted in serious undermining of farmers' livelihoods and putting the country's rice-based food system under pressure. The low soil moisture levels combined with the exceptionally high temperatures are leading to major disruptions to food systems throughout the country. In order for governments to implement measures and anticipate food shortages, they need ready access to near real-time data on moisture conditions. IWMI developed the South Asia Drought Monitoring System (SADMS) which was further improved by devising the Soil Water Anomaly Drought Index (SWADI) in order to forecast drought impacts on agriculture on a regular basis. Together with other tools, SADMS is able to support contingency planning at national and regional levels.

Soil Water Anomaly Drought Index (SWADI) for all of South Asia from 2007 to the present.

Benefits for the user

- SWI makes it possible to anticipate the impacts of drought on crop production.
- Enhances the ability of SADMS to support contingency planning at the national and regional levels.
- Enhances the resilience of agriculture in the face of multiple water-related risks.
- Governments can take steps to mitigate the impacts of drought, including targeted reinforcement of social safety nets and importation of staple grains

Facts & key numbers

Low rainfall from May to September lead to soil moisture levels at 30-60% below normal in Northern areas.

Rice production estimated as 2.7 million tons in 2017 - almost 40% less compared to 2016, 35% below average of 5 previous years according to UN-FAO assessment.

Data sources used

From the service
- Soil Water Index (Copernicus)

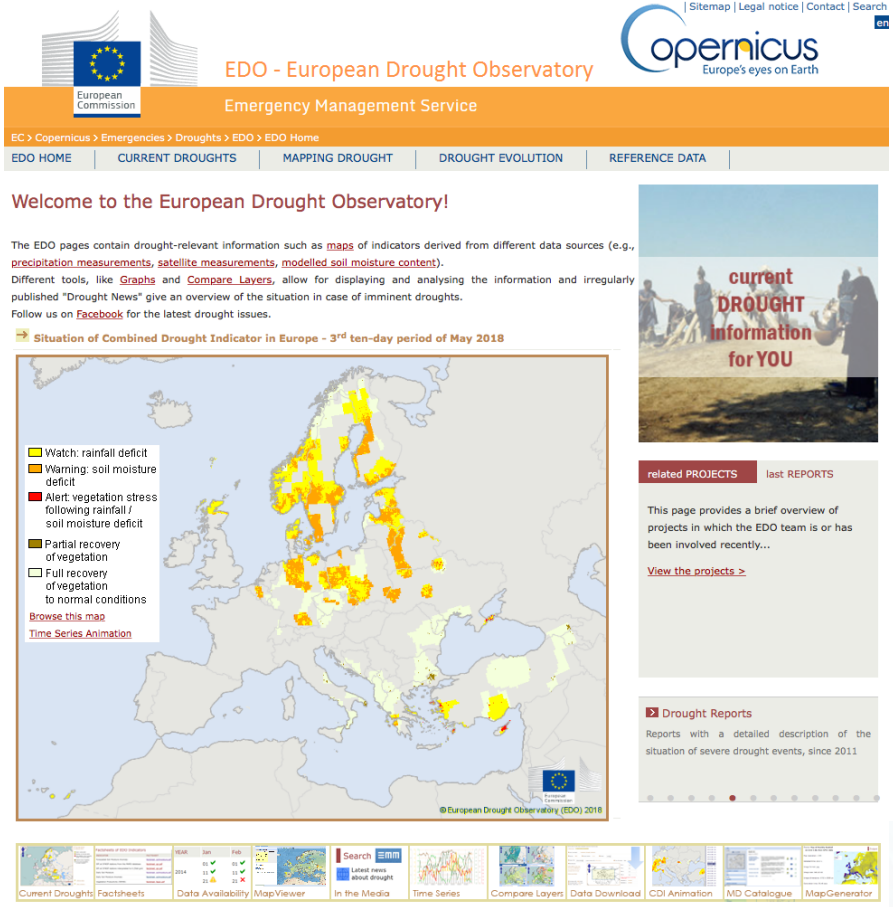
Other sources:
- ASCAT (MetOp EUMETSAT), ...
- NDVI

About the user

Organization type: *Non-profit scientific research organization*
Web site: http://www.iwmi.cgiar.org/
Contact: Giriraj Amarnath

IWMI

land.copernicus.eu/global/ land.copernicus.eu/global/contactpage Published: 2017-12-12



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EDO - European Drought Observatory

Emergency Management Service

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EDO HOME | CURRENT DROUGHTS | MAPPING DROUGHT | DROUGHT EVOLUTION | REFERENCE DATA

Welcome to the European Drought Observatory!

The EDO pages contain drought-relevant information such as maps of indicators derived from different data sources (e.g., precipitation measurements, satellite measurements, modelled soil moisture content).
Different tools, like Graphs and Compare Layers, allow for displaying and analysing the information and irregularly published "Drought News" give an overview of the situation in case of imminent droughts.
Follow us on Facebook for the latest drought issues.

Situation of Combined Drought Indicator in Europe - 3rd ten-day period of May 2018

Watch: rainfall deficit
Warning: soil moisture deficit
Alert: vegetation stress following rainfall / soil moisture deficit
Partial recovery of vegetation
Full recovery of vegetation to normal conditions
Browse this map
Time Series Animation

© European Drought Observatory (EDO) 2018

current DROUGHT information for YOU

related PROJECTS | last REPORTS

This page provides a brief overview of projects in which the EDO team is or has been involved recently...

View the projects >

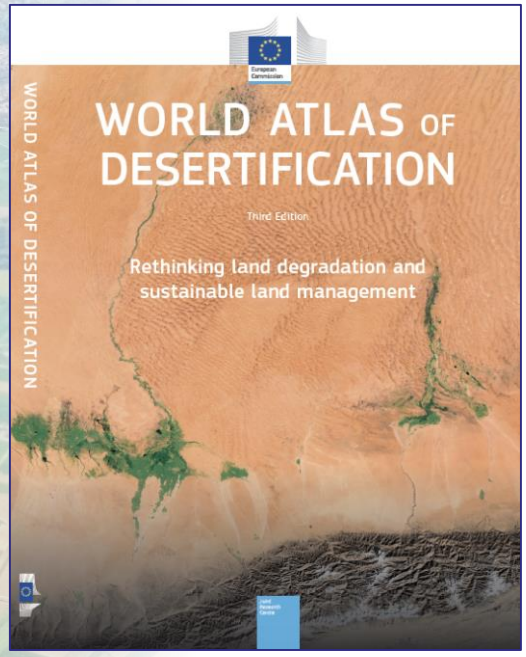
Drought Reports

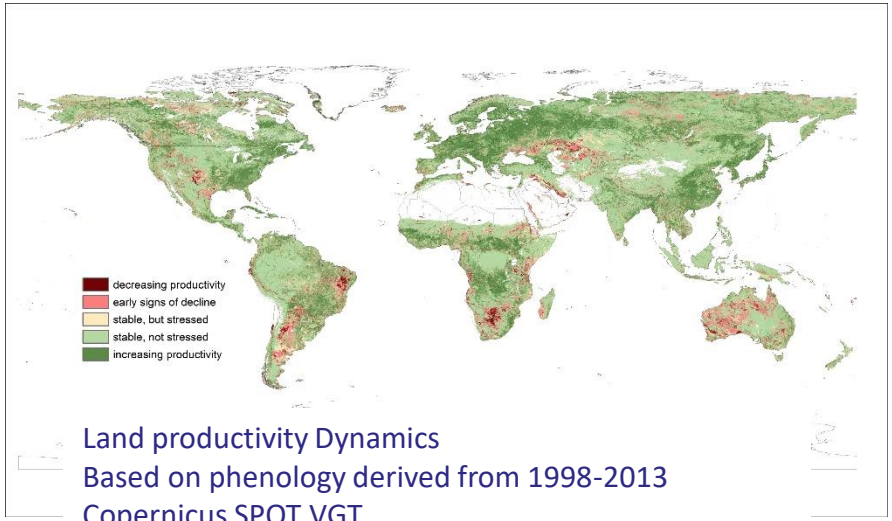
Reports with a detailed description of the situation of severe drought events, since 2011

Current Droughts | Factsheets | Data Availability | MapViewer | In the Media | Time Series | Compare Layers | Data Download | CDI Animation | MD Catalogue | MapGenerator

Global Land products used for:

- Land condition – land degradation monitoring
- ..





Land productivity Dynamics
Based on phenology derived from 1998-2013
Copernicus SPOT VGT
Accepted as SDG 15.3 indicator and UNCCD support

Near future outlook:

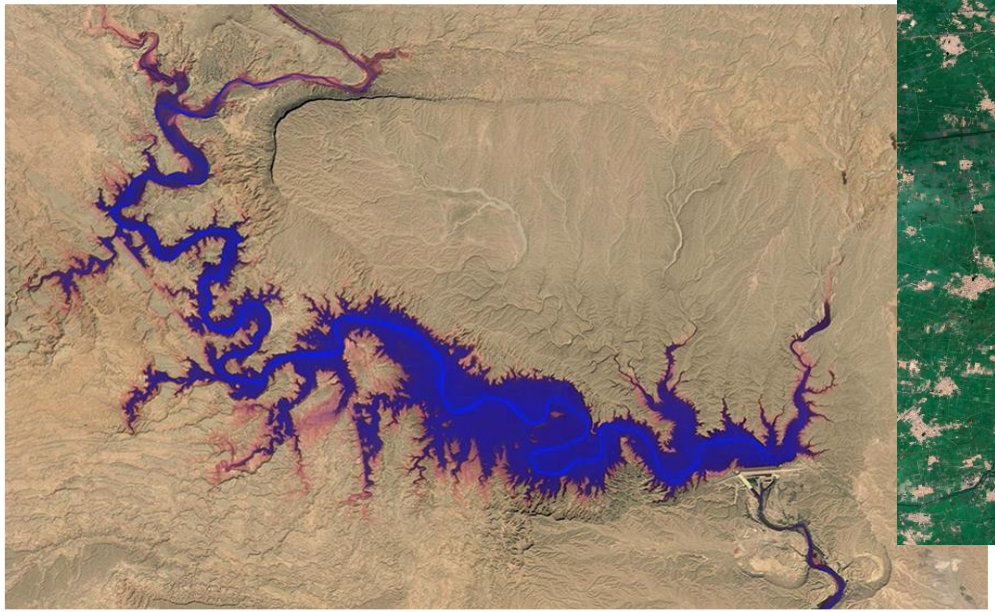
- High resolution land products
- On-the-fly processed products

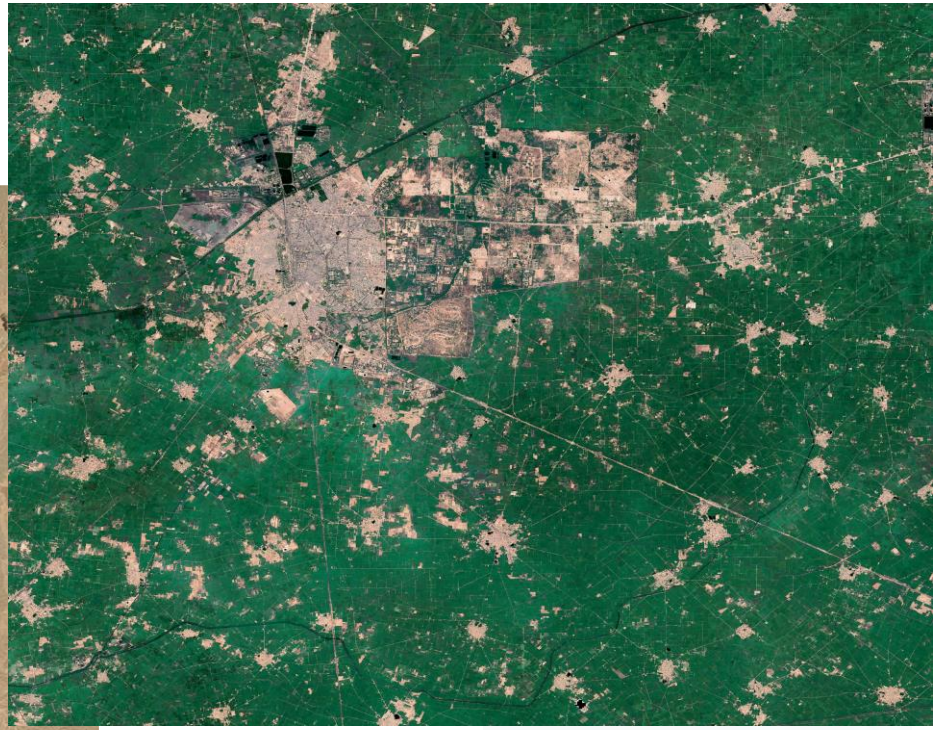
- As base support for addressing Sustainable Development Goals

Land Monitoring

- Supporting specific user communities

Observatories on forest/water/urban/agriculture





https://land.copernicus.eu/global/