Digitalisation for Agriculture

Webinar 3 – Earth Observation for agriculture and food security policy support

April 21, 2021

Welcome to the participants!

- Who are the trainers?

  → Simone Sala
  → Sjaak Wolfert
  → **Felix Rembold**

- Who are the participants?

  - 21 participants from Delegations different geographic areas, 3 INTPA F3 and F5, 1 JRC

- Practical information: post your questions in the chatbox

Trainer: Felix Rembold

Felix Rembold, Ph.D., currently Food Security team leader at the Joint Research Center of the European Commission, combines an academic background in tropical agriculture with a long research experience in the use of earth observation for agricultural monitoring. Author of numerous publications in the field and actively involved in the conception and development of operational scientific information systems for policy support.

He led the development of the Anomaly hotSpots of Agricultural Production (ASAP) and was one of the initiators of APHLIS (African Postharvest Losses Information System). He has lived in Africa for several years and contributed to numerous international development projects with EU Delegations, local and UN organizations. He is an experienced trainer in the use of EO for agricultural monitoring

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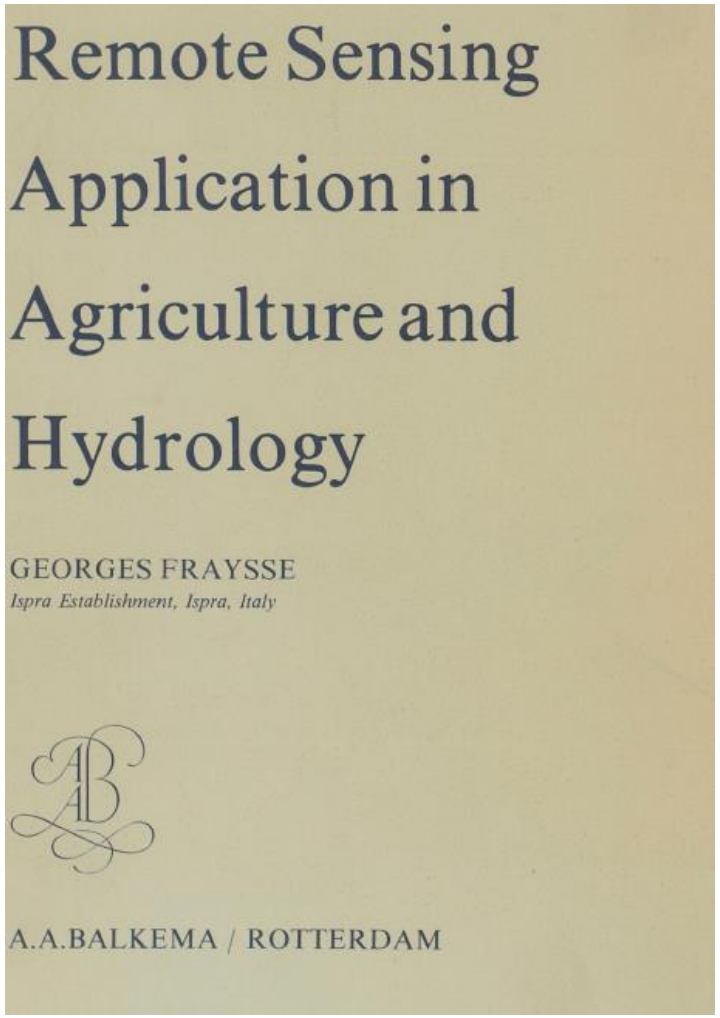

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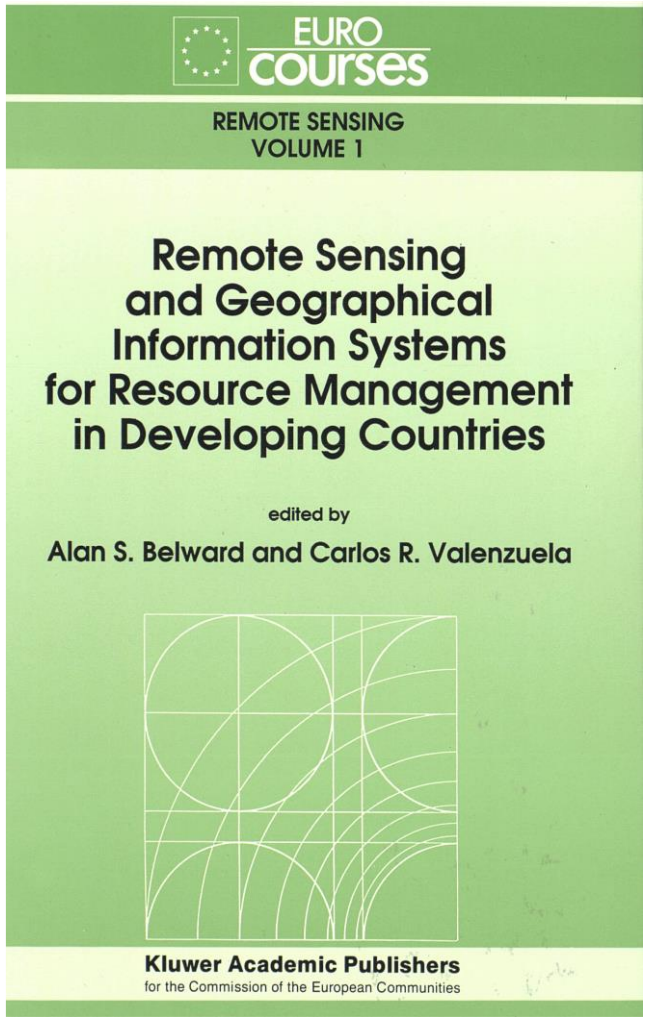

1991

2014

Agenda of the course

1. Key Earth Observation technologies and recent applications in agriculture and food security policy support
2. Key portals to access relevant data and information
3. Earth Observation based services for farmers: from pioneering projects to applications
4. Feedback on recent EO use cases from two EU Delegations (Uganda and Ivory Coast)

5 min

Icebreaker

Quiz: how many satellites are there?

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Key Earth Observation technologies and recent applications in agriculture and food security policy support

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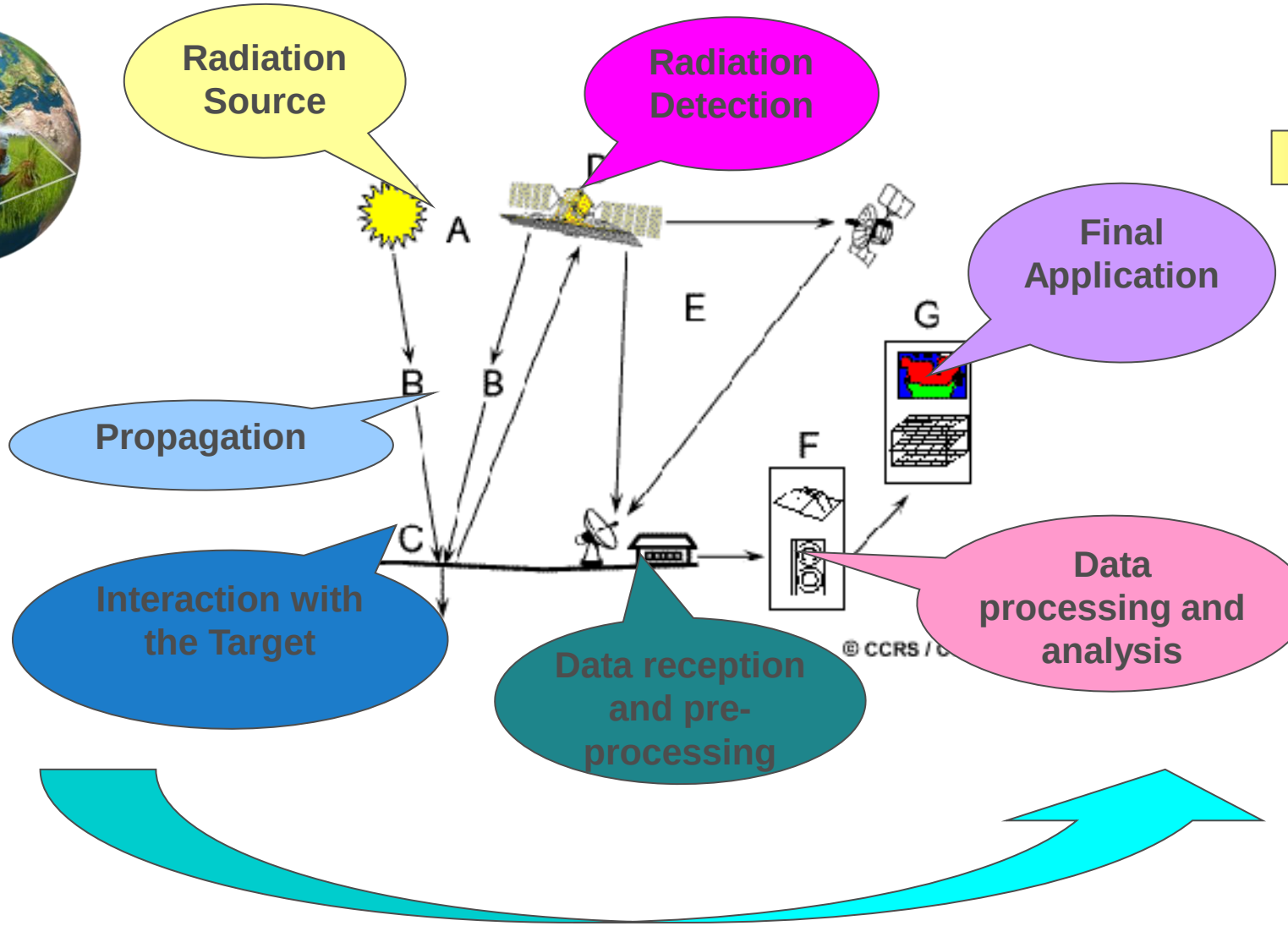
Main contents

- What is Earth Observation?
- Main technologies
- How can it support agriculture and development policies?
- examples related to:
  - Land
  - Water
  - Food Security
  - Risk Management
- Challenges and conclusions

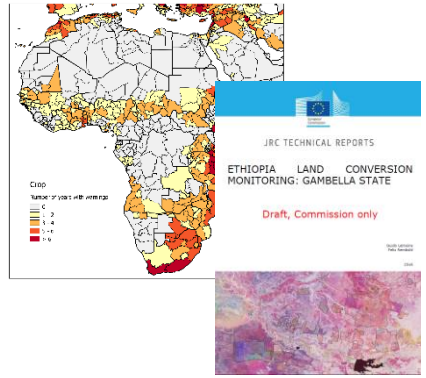
What is Earth Observation?

- EO in practice means digital photography from space
- Some aspects are the same as with digital cameras used every day
- Others are different (distance, spatial resolution, different channels, atmospheric effects…)
- Satellite imagery provides objective evidence for monitoring changes on the earth surface which are relevant for different uses
- With the Corona pandemic information based on EO has become even more relevant than before because monitoring on the ground is restricted

The typical EO scenario



Use specific Information (maps, statistics, reports, web sites…)



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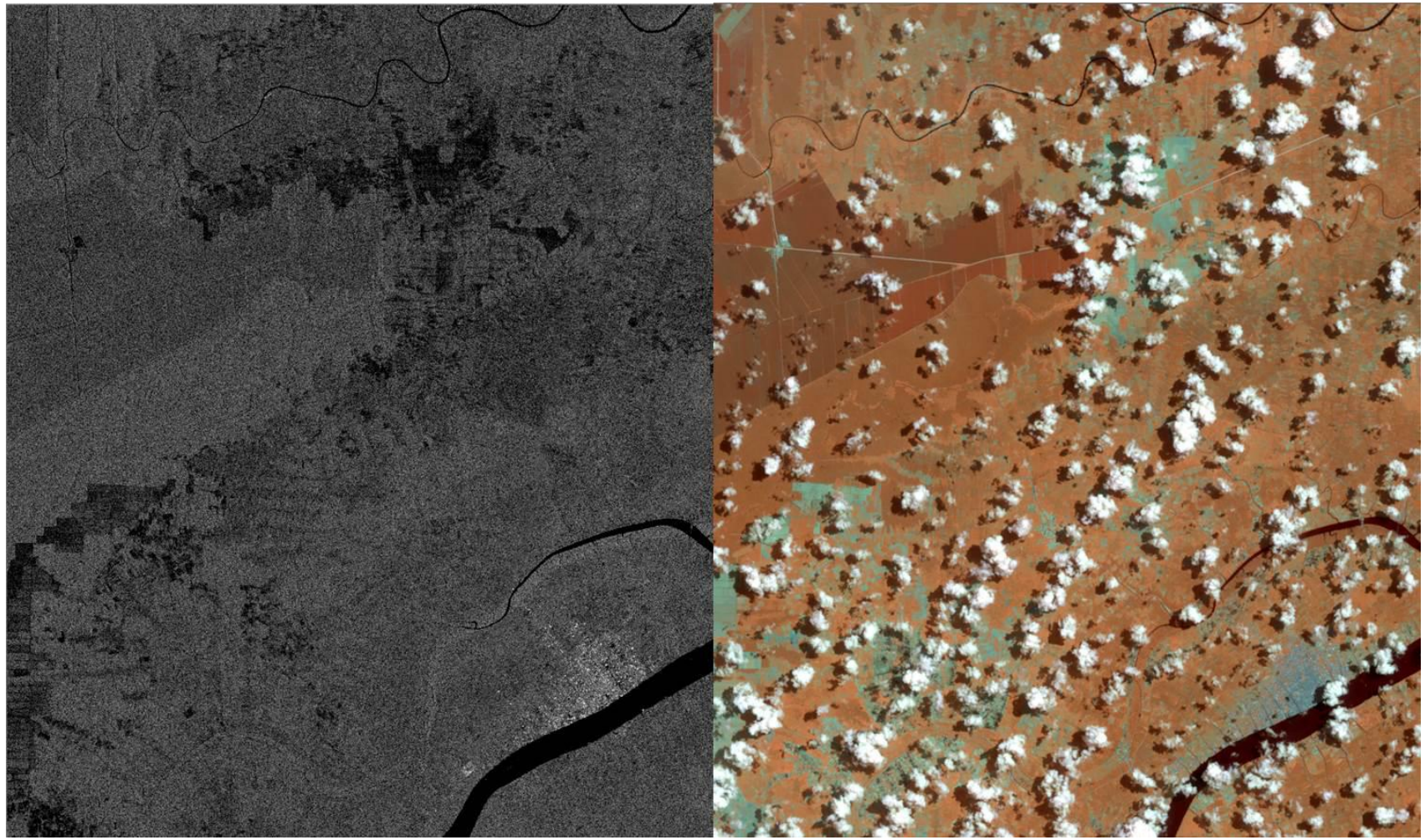
Main technologies

Radar (active)

Optical (passive)



- More complex to process
- Less sensitive to atmospheric effects
- Lower availability

- More immediate use
- More sensitive to atmospheric effects
- Many different products available

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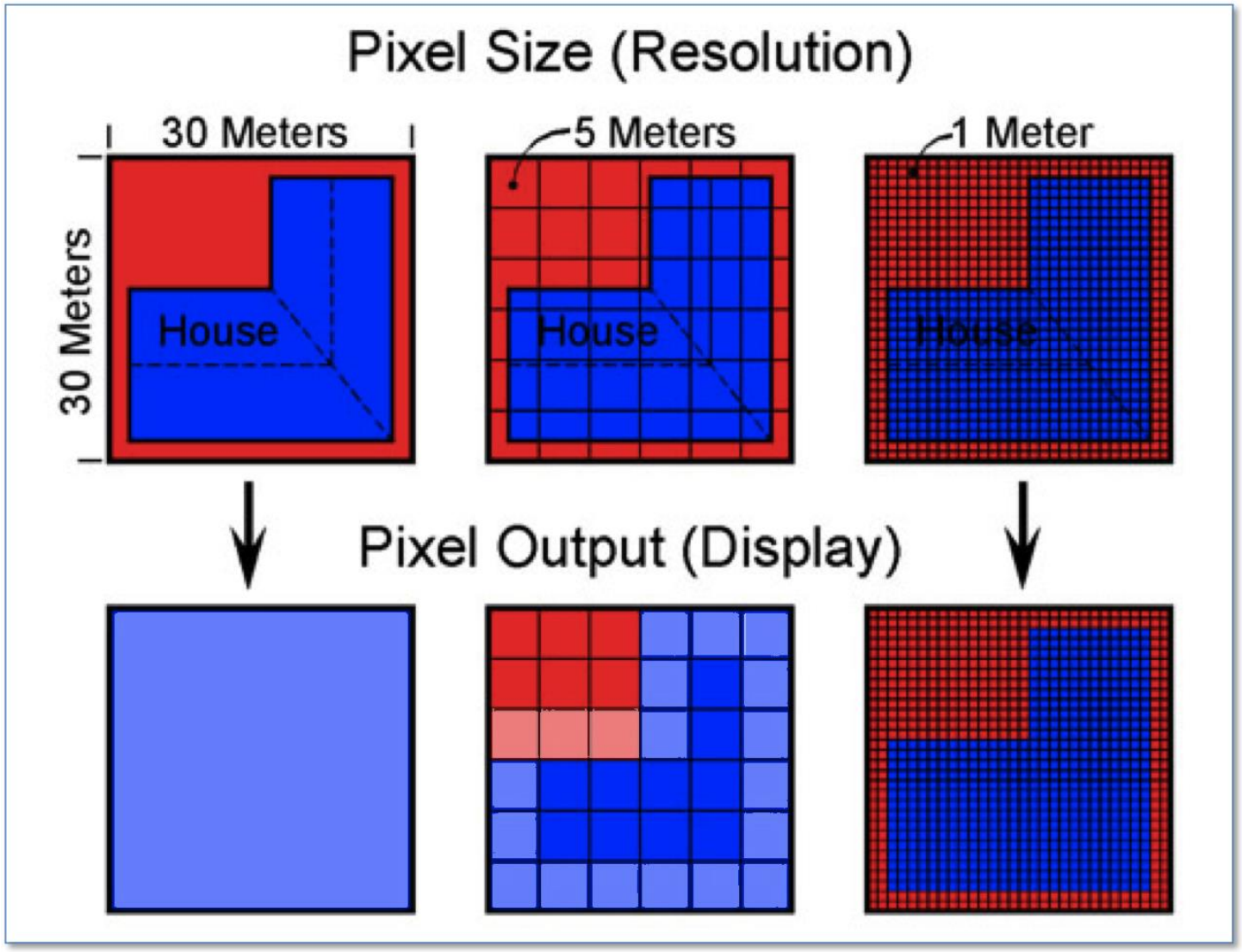
Spatial resolution



- Trade-off between resolution and:
  - Spatial coverage
  - Temporal frequency
- In general very high resolution (>10m) has a price
- Higher resolution means also more data -> need for cloud computing

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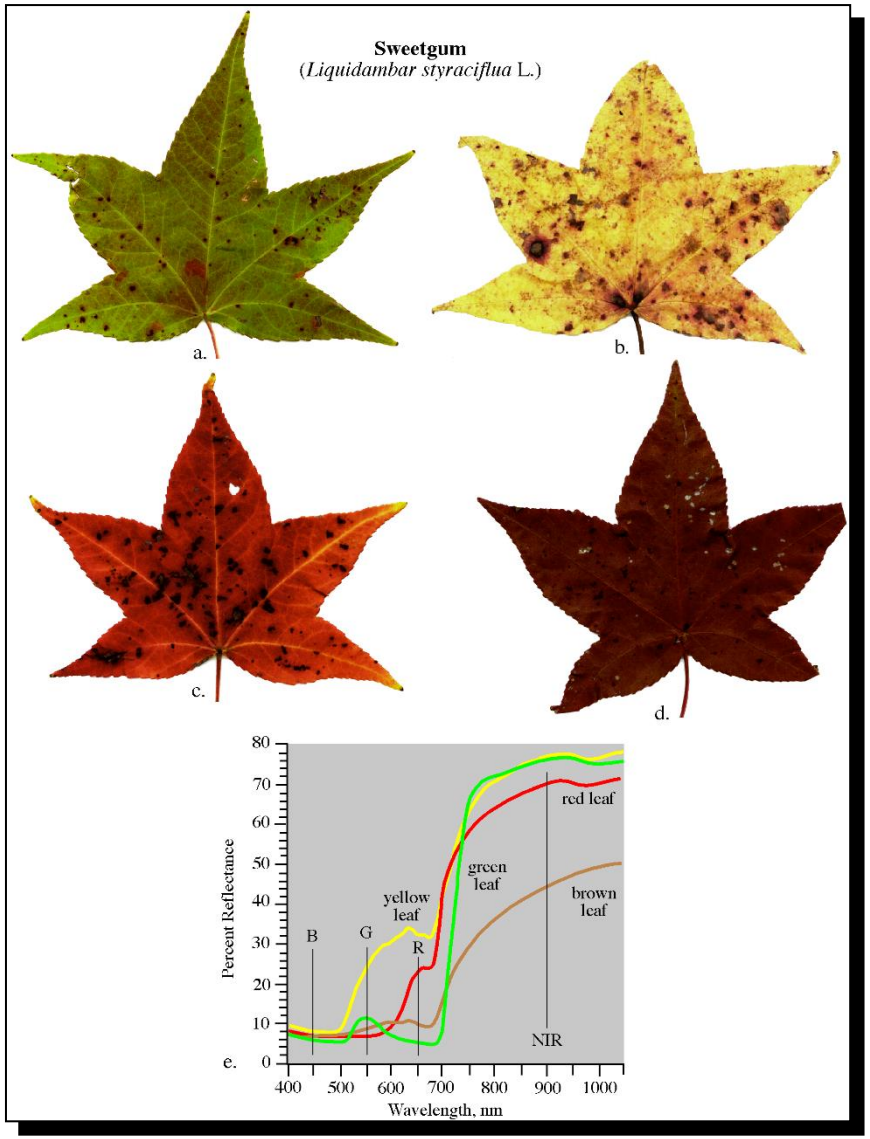
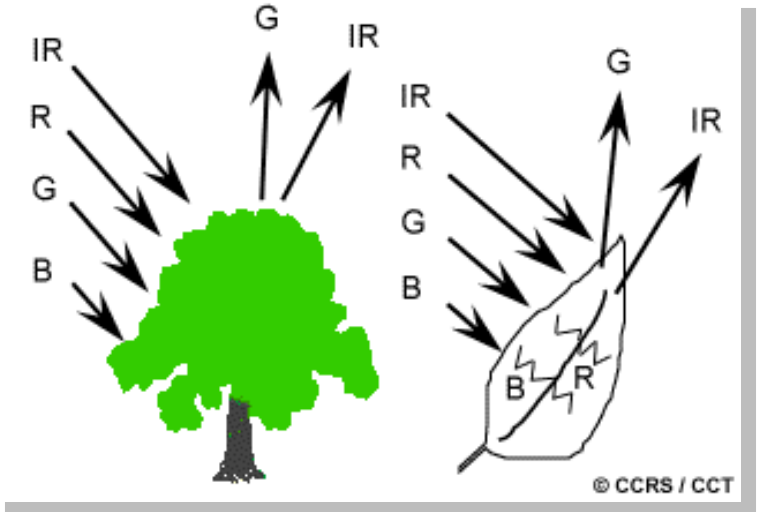
Vegetation reflectance basics



- Leaves: Chlorophyll strongly absorbs radiation in the red and blue wavelengths but reflects green wavelengths.
- Leaves appear "greenest" in the summer, when chlorophyll content is at its maximum.
- In autumn, there is less chlorophyll in the leaves, so there is less absorption and proportionately more reflection of the red wavelengths, making the leaves appear red or yellow .
- The internal structure of healthy leaves act as excellent diffuse reflectors of near-infrared wavelengths.

Vegetation indices (like the NDVI) are band operations that optimize the analysis of the vegetation signal

[More info: Canada Natural resources remose sensing tutorial]

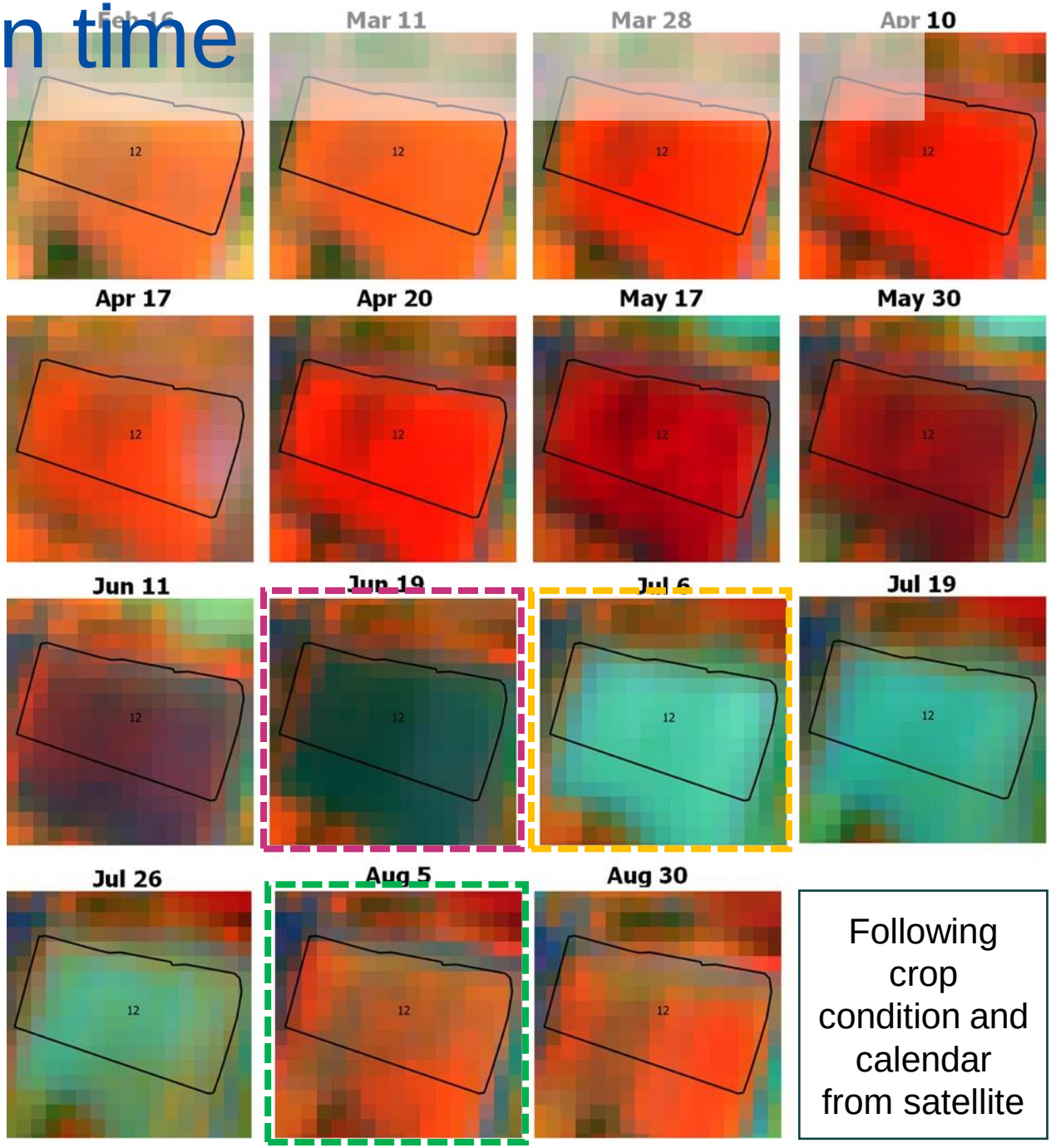


Monitoring vegetation in time

Harvested

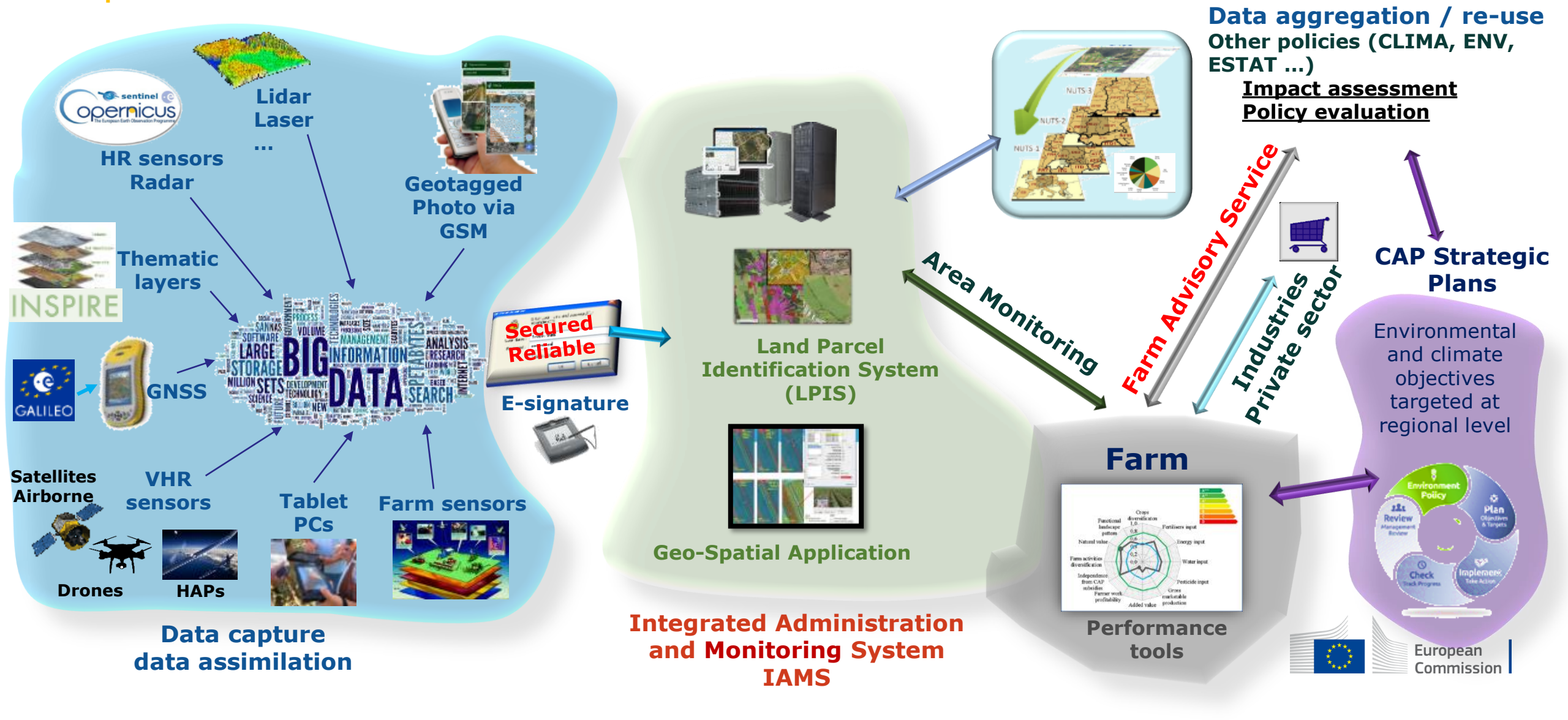
Ploughed

Replanted



Following crop condition and calendar from satellite

The Integrated Administration and Control System's (IACS) digital evolution



How can it support agriculture and FS policies?

EO can:

Provide near real time evidence and contribute to baseline information for many indicators

Support change monitoring (Land use and land use change, GHG emissions, water availability and quality, land degradation…)

Feed into models that help predicting indicators

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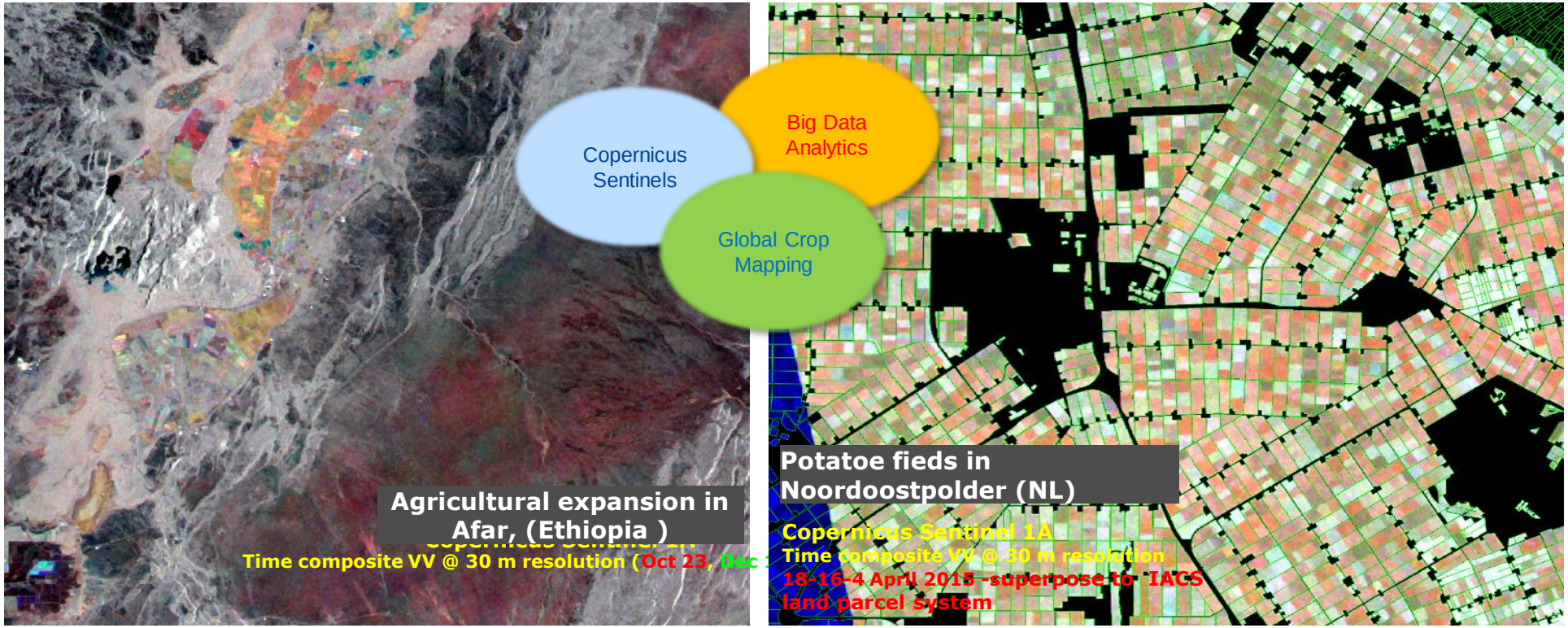
Applications in relation to spatial resolution and temporal frequency

Increasing cost/decreasing coverage

Resolution	Revisit	Application	Limits
low 300 m – 1 km	Daily	Global crop production trends, drought monitoring, pastoral biomass productivity	Not crop specific, difficult to separate area and phenology
high 10-30 m	Weekly	Crop area, crop type, phenology, crop diversity/rotation, land use change Major opportunities!	Free and open Requires massive data processing (Sentinel2 = 1.7Tb daily)
very high 0.5-5 m	On demand	Area measurement, detailed measures, precision farming, impact assessment	Costly, on sample basis only
Aerial photos 5 – 50 cm	On demand	Land tenure, cadastral applications	High costs

New opportunities in the 10/20m resolution domain



- Free and open data of COPERNICUS (Sentinel sensors), 3- 10 days revisit capacity, 10 m spatial resolution range, since 2015
- Towards global crop mapping, area and yield at high resolution – requires big data approach!

COPERNICUS IN BRIEF

- **Copernicus, the Earth Observation flagship programme** of the European Union:
  - **Monitors the Earth,** its environment and ecosystems
  - Prepares for crises, security risks and natural or man-made disasters
  - Contributes to the EU's role as a global "soft" power
- Adopts a **full, free and open data policy**
- Is **a tool for economic development** and a driver for the digital economy

COPERNICUS aims at developing operational services, following the example of meteorology, but for other domains such as:

- emergency management
- air quality monitoring
- land monitoring
- ocean & sea ice monitoring etc …

GMES AND AFRICA

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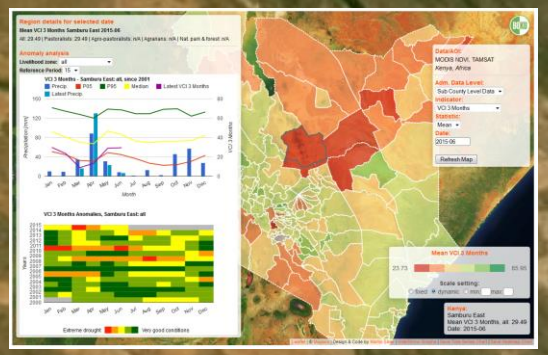
Services supported by COPERNICUS

- **Agriculture and Food Security**
  - Land administration
  - Land register / land tenure support in combination with GALILEO GPS
  - Rural development, Land planning (land cover/use maps)
  - Surface water monitornig, irrigation
  - Land degradation / Soil erosion
  - Drought monitoring, early warning
  - Crop mapping, crop development monitoring and yield forecast
  - Risk management
  - Land grabbing monitoring

- objective supporting evidence
- baseline data
- seasonal monitoring/early warning
- project progress and impact monitoring
- institutional capacity building
- ...



Sentinel-2 mosaic of southern Africa
Christoph Hormann, imagico.de

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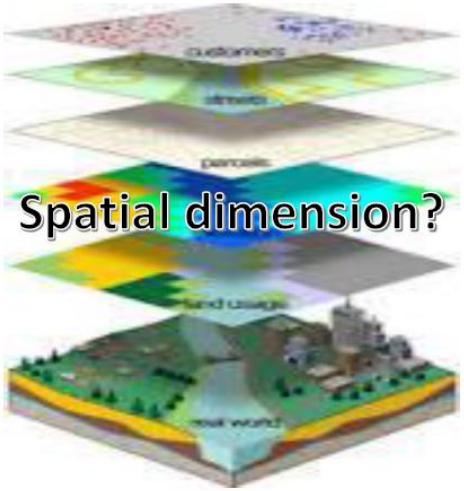
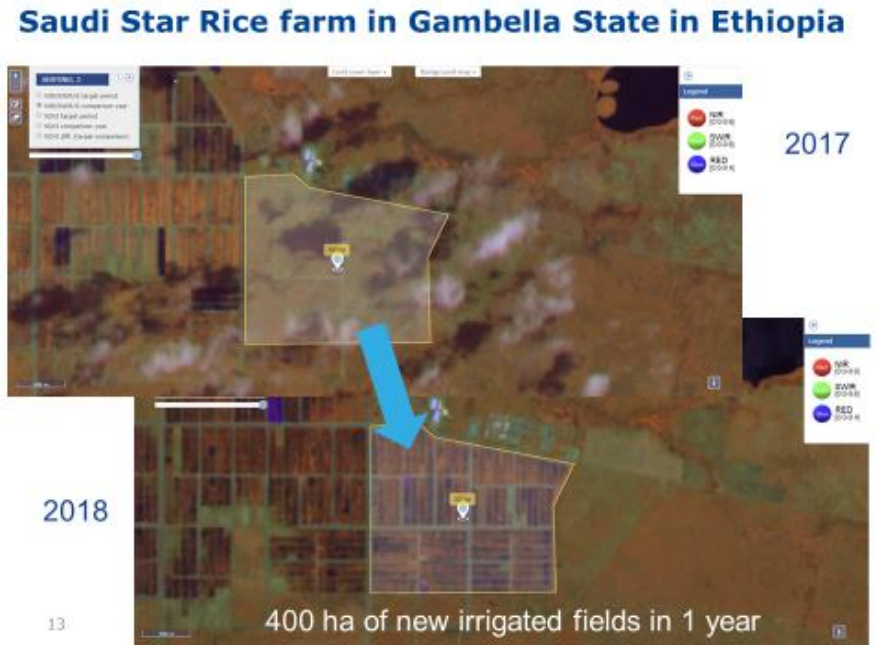
Land: the importance of the spatial dimension





- There is a strong spatial dimension in land governance and land adminstration/management systems need a spatial framework to operate
- EO potential mainly to improve baseline information, land use change monitoring, mapping, evidence for conflict resolution etc… **This applies for example to VGGT support projects, land grabbing, LAND MATRIX**

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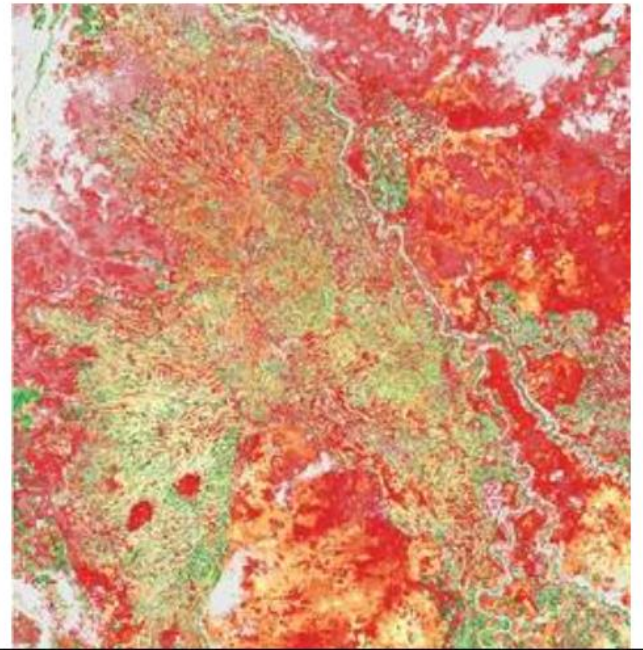
Water: quality and quantity

WaPOR allows measuring water productivity in agriculture

Water productivity is defined as the quantity or value of output in relation to the quantity of water beneficially consumed to produce this output. In agriculture, it can be expressed as the amount of product (biomass or yield) per unit of water consumed by the crop (evapotranspiration).

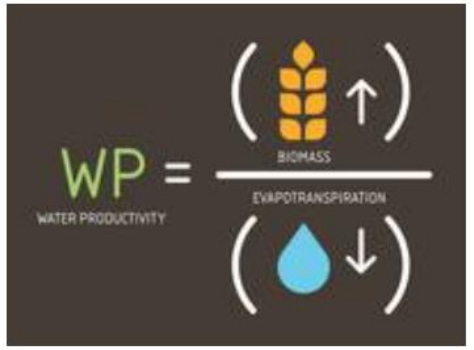
For example, this map (100 m ground resolution) shows the water productivity of the **Gezira scheme in Sudan**:



The **yellow-green** patches in this map are considered to have high water productivity, with low amounts of water consumed per crop produced. Indeed, they represent fields that yield at least 1 kilogram of product for every cubic metre of water consumed (1 m³ = 1000 l).

The **orange-red** fields are comparatively underperforming, as they are considered to have low

What is water productivity?



WaPOR applications catalogue

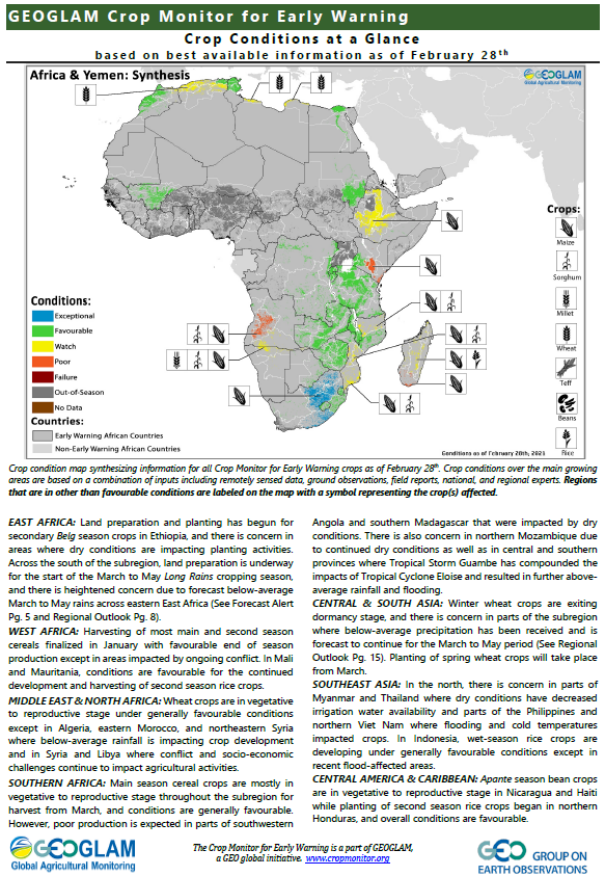
Find out examples of WaPOR applications in the field

Related links

- Estimating water productivity using WaPOR database - Poster, IHE-Delft
- Water productivity technical

Food security: early warning

GEOGLAM crop monitor



Crop condition map synthesizing information for all Crop Monitor for Early Warning crops as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. ***Regions that are in other than favourable conditions are labeled on the map with a symbol representing the crop(s) affected.***

EAST AFRICA: Land preparation and planting has begun for secondary *Belg* season crops in Ethiopia, and there is concern in areas where dry conditions are impacting planting activities. Across the south of the subregion, land preparation is underway for the start of the March to May *Long Rains* cropping season, and there is heightened concern due to forecast below-average March to May rains across eastern East Africa (See Forecast Alert Pg. 5 and Regional Outlook Pg. 8).

WEST AFRICA: Harvesting of most main and second season cereals finalized in January with favourable end of season production except in areas impacted by ongoing conflict. In Mali and Mauritania, conditions are favourable for the continued development and harvesting of second season rice crops.

MIDDLE EAST & NORTH AFRICA: Wheat crops are in vegetative to reproductive stage under generally favourable conditions except in Algeria, eastern Morocco, and northeastern Syria where below-average rainfall is impacting crop development and in Syria and Libya where conflict and socio-economic challenges continue to impact agricultural activities.

SOUTHERN AFRICA: Main season cereal crops are mostly in vegetative to reproductive stage throughout the subregion for harvest from March, and conditions are generally favourable. However, poor production is expected in parts of southwestern Angola and southern Madagascar that were impacted by dry conditions. There is also concern in northern Mozambique due to continued dry conditions as well as in central and southern provinces where Tropical Storm Guambe has compounded the impacts of Tropical Cyclone Eloise and resulted in further above-average rainfall and flooding.

CENTRAL & SOUTH ASIA: Winter wheat crops are exiting dormancy stage, and there is concern in parts of the subregion where below-average precipitation has been received and is forecast to continue for the March to May period (See Regional Outlook Pg. 15). Planting of spring wheat crops will take place from March.

SOUTHEAST ASIA: In the north, there is concern in parts of Myanmar and Thailand where dry conditions have decreased irrigation water availability and parts of the Philippines and northern Viet Nam where flooding and cold temperatures impacted crops. In Indonesia, wet-season rice crops are developing under generally favourable conditions except in recent flood-affected areas.

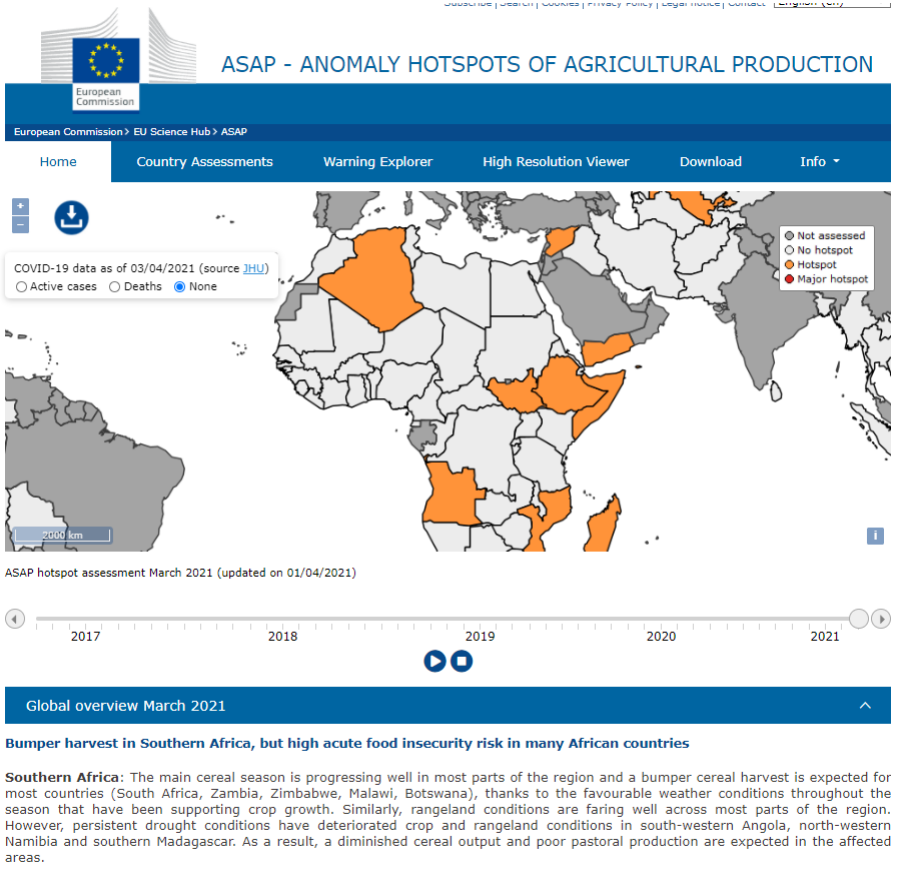
CENTRAL AMERICA & CARIBBEAN: *Apante* season bean crops are in vegetative to reproductive stage in Nicaragua and Haiti while planting of second season rice crops began in northern Honduras, and overall conditions are favourable.

GEOGLAM Global Agricultural Monitoring

The Crop Monitor for Early Warning is a part of GEOGLAM, a GEO global initiative. www.cropmonitor.org

GEO GROUP ON EARTH OBSERVATIONS

Anomaly hotspots of Agricultural production (ASAP)



Bumper harvest in Southern Africa, but high acute food insecurity risk in many African countries

Southern Africa: The main cereal season is progressing well in most parts of the region and a bumper cereal harvest is expected for most countries (South Africa, Zambia, Zimbabwe, Malawi, Botswana), thanks to the favourable weather conditions throughout the season that have been supporting crop growth. Similarly, rangeland conditions are faring well across most parts of the region. However, persistent drought conditions have deteriorated crop and rangeland conditions in south-western Angola, north-western Namibia and southern Madagascar. As a result, a diminished cereal output and poor pastoral production are expected in the affected areas.

Inform food security assessments, IPC (Integrated Phase classification) and Cadre Harmonisé, Global Network against food crises

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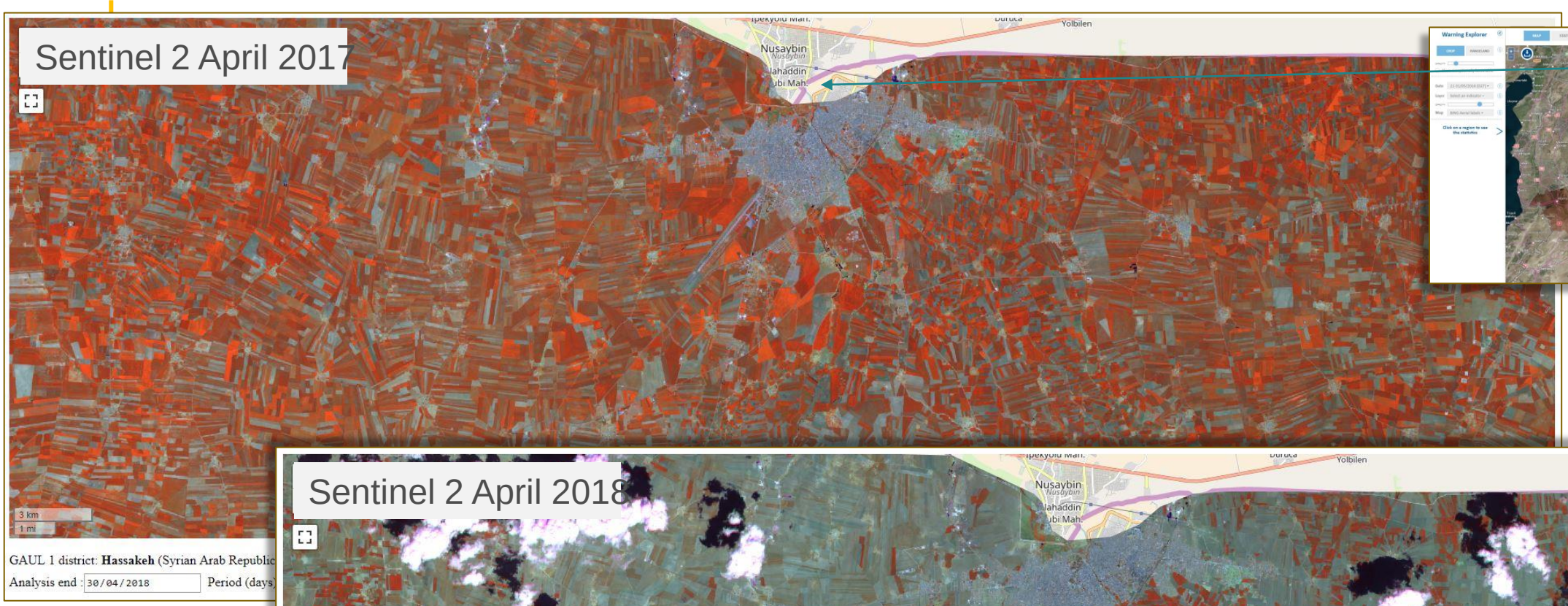
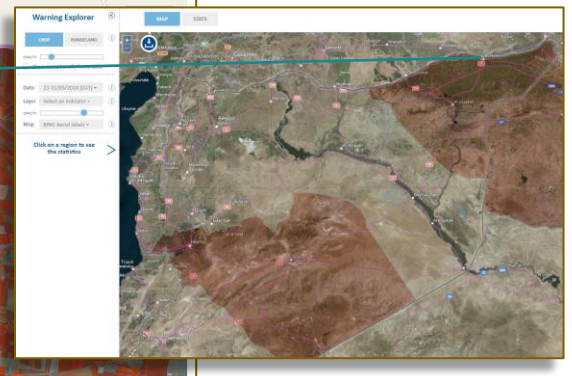
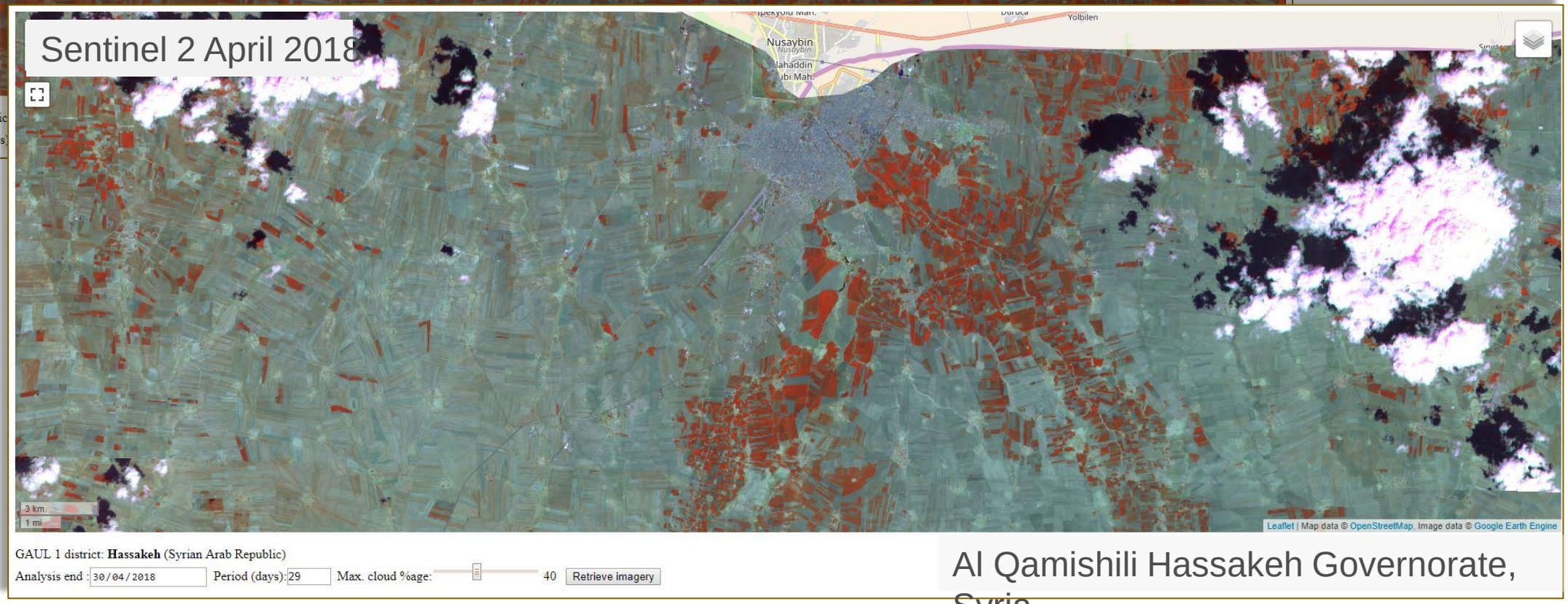




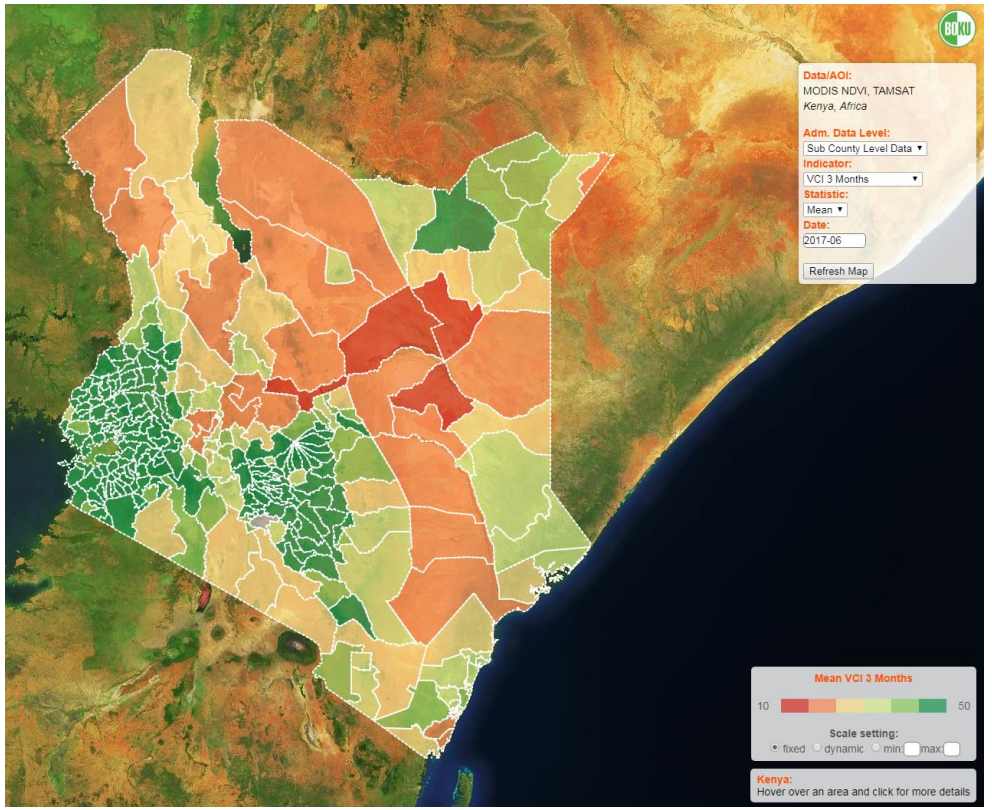


Syria Crop area reduction 2017 - 2018

Al Qamishili Hassakeh Governorate, Syria

Drought risk management systems (early warning component)

- About 74% of the contingency funds disbursed (ca. 8 Mio. Euro) in 2016/2017 was used to mitigate against drought effects on livestock assets
- The pastoralists interviewed felt that the 2016/2017 drought was managed better than any other previous drought.
- The 2016/2017 drought was more severe in terms of rain scarcity (four failed or below normal rain seasons). But basically no livestock losses (as opposed to 2009 and 2011)



NATIONAL DROUGHT MANAGEMENT AUTHORITY (NDMA)

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Challenges

- Data quality, calibration and validation with field data
- Relevance, provide right evidence for policy needs
- Capacity and infrastructure in developing countries
- Knowledge concentration (space industry, big data, artificial intelligence…)
- Intellectual property, copyrights, data access

10 min

Word cloud

Name 3 agriculture and food security challenges where EO can help your work

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Key portals to access relevant data and information for agriculture and food security policy

Digitalisation for Agriculture Training

European Commission

Main contents

- What data do I need?
- Earth observation data, processing services, information products
- Data access portals
- Data processing service portals
- Information and knowledge platforms

What data/information/services do I need?

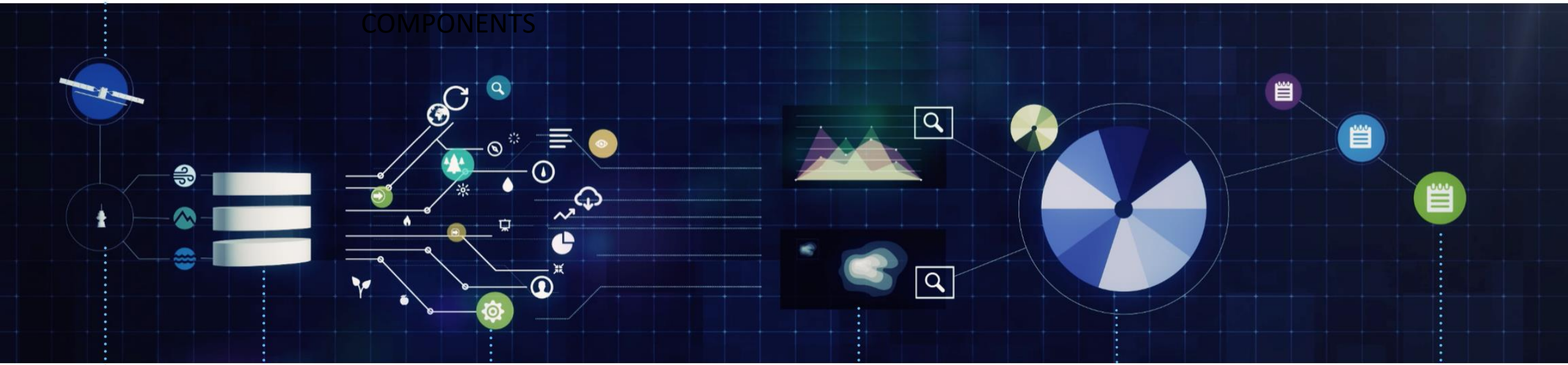
- EO data portals give access to satellite imagery (and in situ data)
  - Give access to the original data that need to be processed
- Cloud computing platforms allow satellite data processing
  - Make available computing space, host the EO data centrally, designed for big data approach
- EO derived information portals make available derived info for specific uses
  - Make available information and specific products to the end users (with limited EO processing background)

COPERNICUS COMPONENTS

FROM GLOBAL EARTH OBSERVATION DATA TO LOCAL INFORMATION AND PRODUCTS

SENTINELS & CONTRIBUTING MISSIONS

COMPONENTS



IN SITU SENSORS **DATA** **SERVICES** **INFORMATION** **TAILORED PROCESSES** **PRODUCTS**

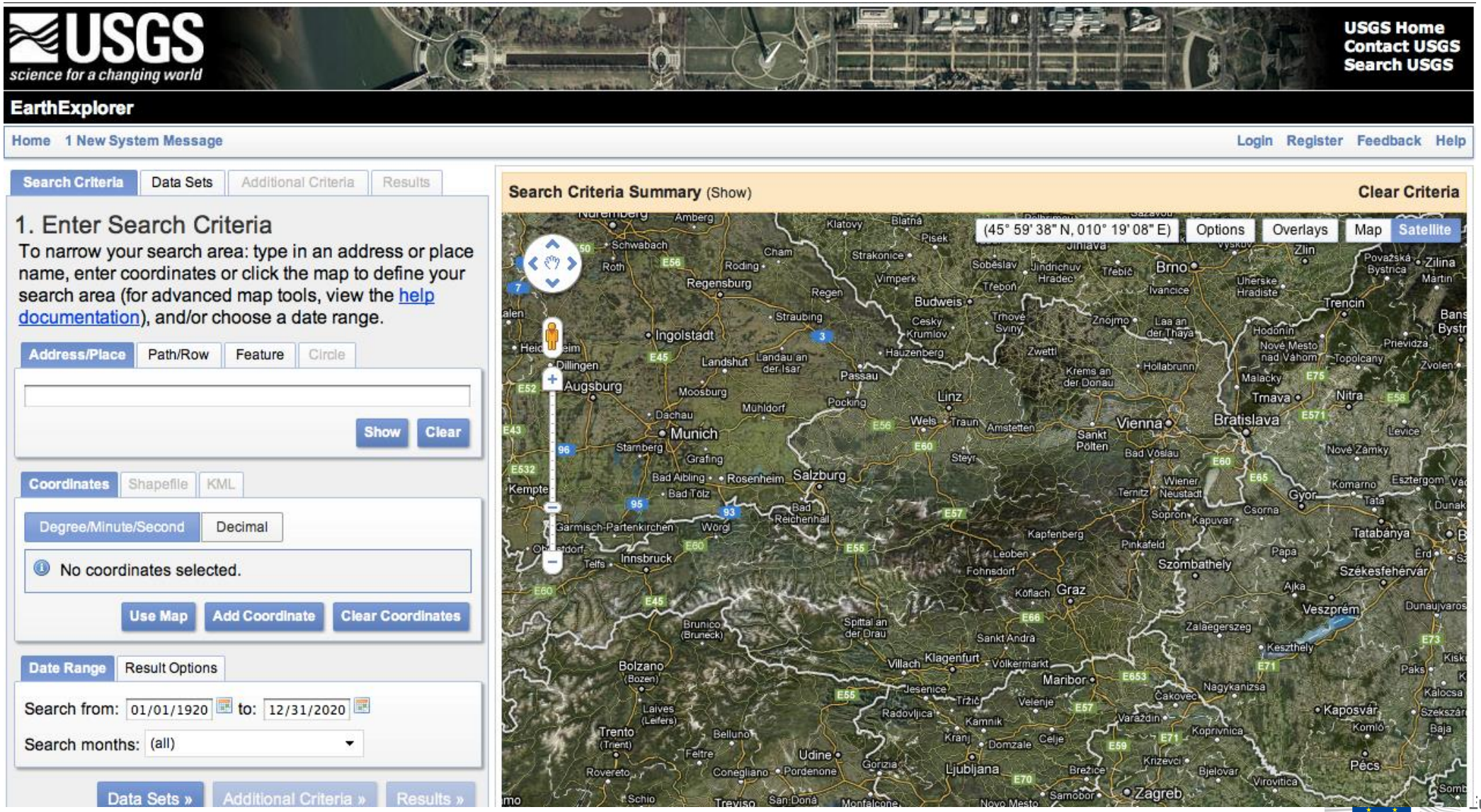
7 COPERNICUS SENTINELS IN ORBIT

	Key Features	Mission	In Orbit
SENTINEL-1A AND -1B	Polar-orbiting, all-weather, day-and-night radar imaging	9-40m resolution, 6 days revisit at equator	✓
SENTINEL-2A AND -2B	Polar-orbiting, multispectral optical, high-res imaging	10-60m resolution, 5 days revisit time	✓
SENTINEL-3A AND -3B	Optical and altimeter mission monitoring sea and land parameters	300-1200m resolution, <2 days revisit	✓
SENTINEL-4 (2022)	Payload for atmosphere chemistry monitoring on MTG-S	8km resolution, 60 min revisit time	
SENTINEL-5P	Mission to reduce data gaps between Envisat, and S-5	7-68km resolution, 1 day revisit	✓
SENTINEL-5 (2021)	Payload for atmosphere chemistry monitoring on MetOp 2ndGen	7.5-50km resolution, 1 day revisit	
SENTINEL-6 (2020)	Radar altimeter to measure sea-surface height globally	10 days revisit time	

Access to data

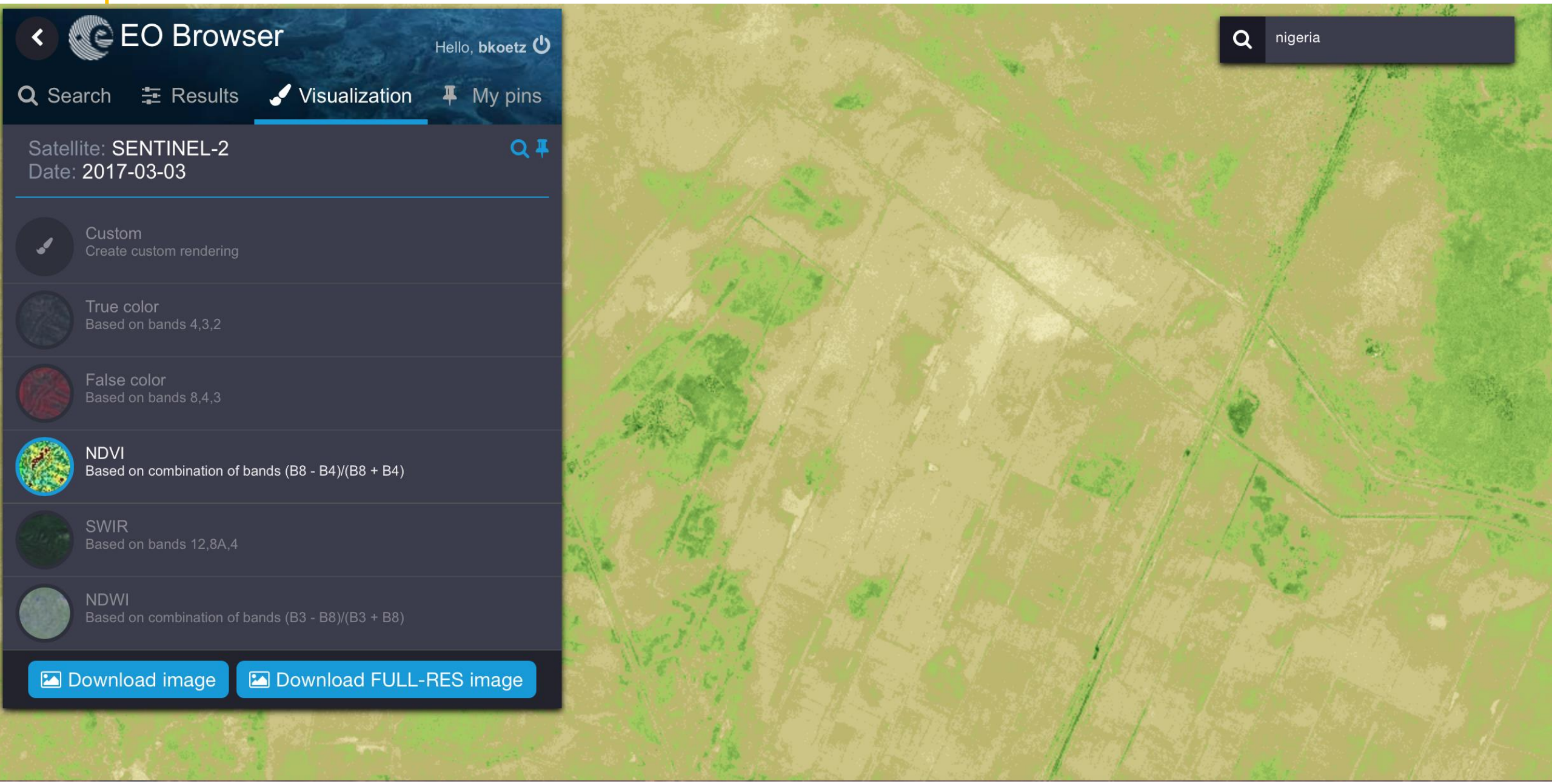
- Data portals provide access to data that can be downloaded manually or automatically
- User needs to identify imagery for his geographic area and time of interest
- Check quality criteria, eg. Cloud cover
- In some cases (commercial data) the user can do tasking (book satellite to record imagery for a certain area at a certain date)

Access to data



Earth explorer http://earthexplorer.usgs.gov/

Access to data



Access to data

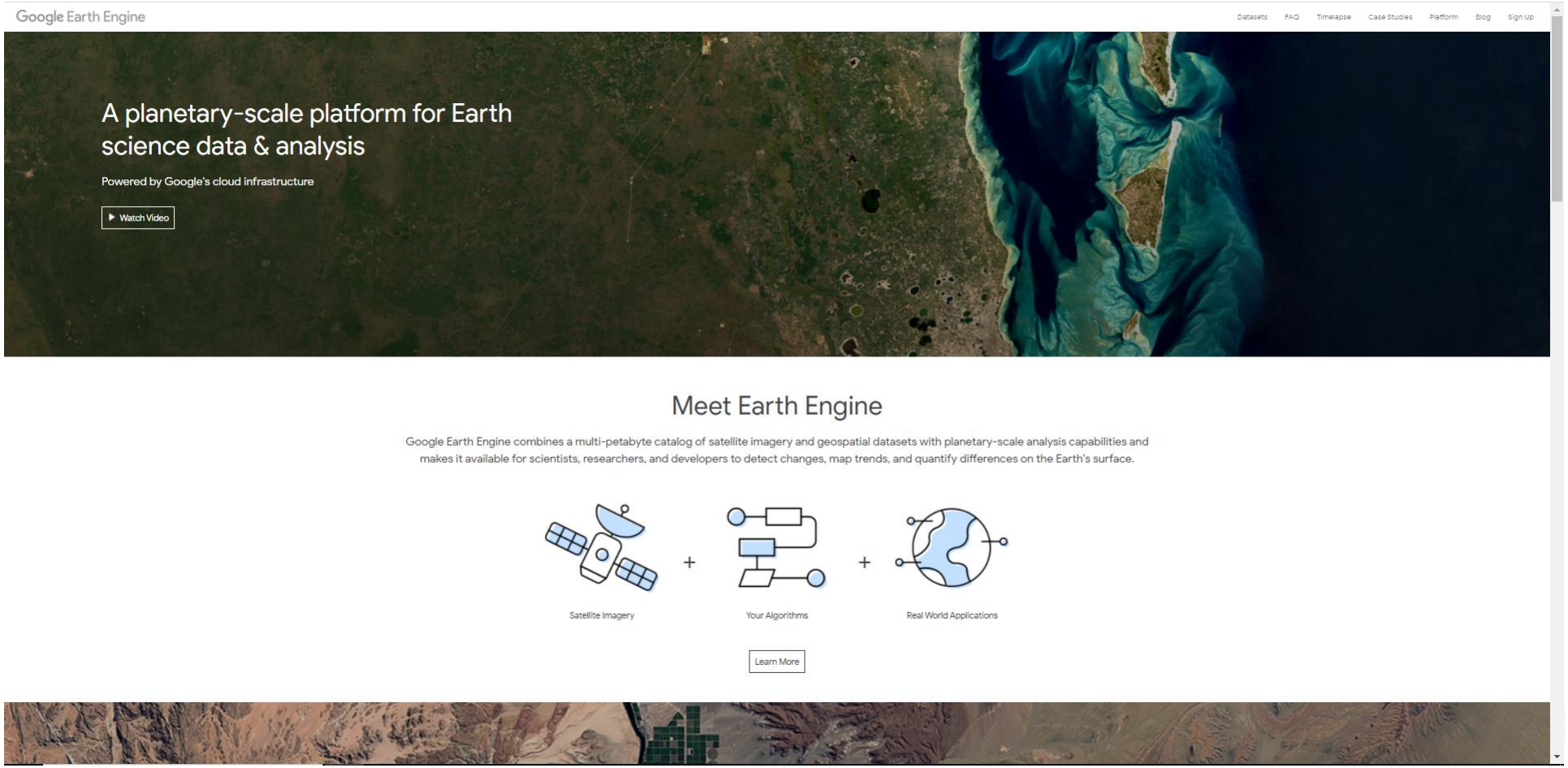
https://scihub.copernicus.eu/

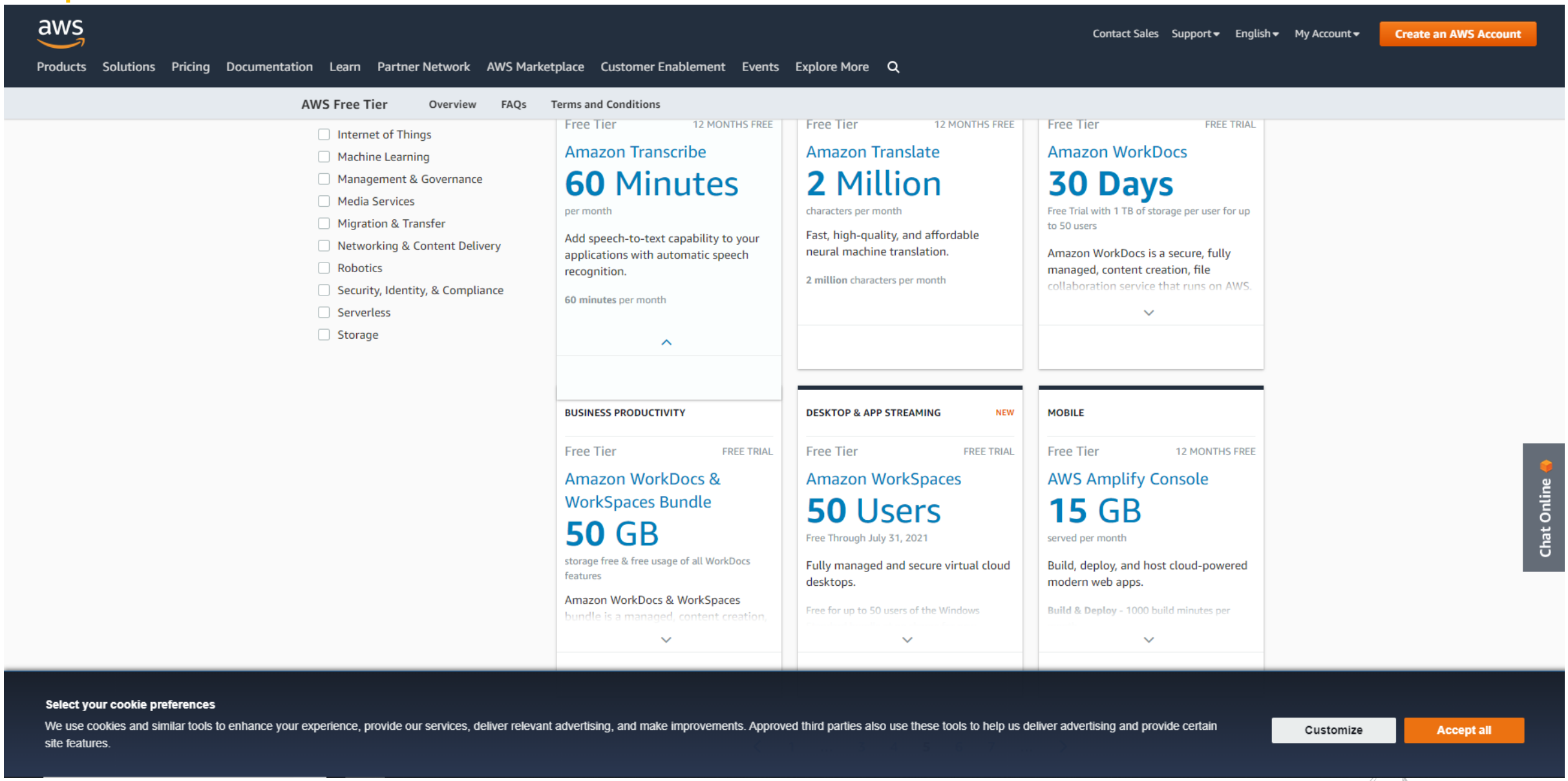
Cloud computing platforms

- Provide large storage and processing capacity on demand
- Free and open EO data already available on the main platforms, user has to add his algorithms or choose from offered tools
- Usually coding
- Only the final results are downloaded or shared online
- Examples of clould computing and analysis platforms that do not need coding

Cloud computing platforms

- Google Earth Engine





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View image information & credits

Data and Information Access Services

Copernicus services catalogue
Conventional Data Access Hubs
Data and Information Access Services

To facilitate and standardise access to data, the European Commission has funded the deployment of five cloud-based platforms.They provide centralised access to Copernicus data and information, as well as to processing tools. These platforms are known as the DIAS, or Data and Information Access Services.

The five DIAS online platforms allow users to discover, manipulate, process and download Copernicus data and information. All DIAS platforms provide access to Copernicus Sentinel data, as well as to the information products from the six operational services of Copernicus, together with cloud-based tools (open source and/or on a pay-per-use basis).

Data cubes

- Technology behind DEA – Digital Earth Africa

Use of cloud computing without coding

http://climateengine.org/

Use of cloud computing without coding

Specific EO based information platforms for

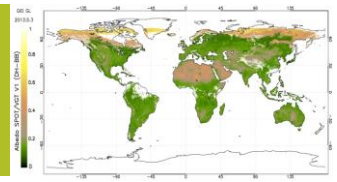
Information based on EO directly available for different uses:

- Natural resources, water, deforestation, land degradation…
- Agricultural early warning, drought monitoring, yield/production forecasts
- Food Security assessment
- Emergency mapping
- Risk Management

Knowledge platforms

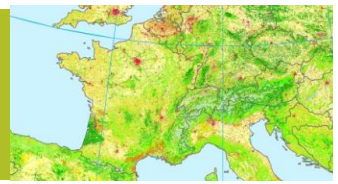
COPERNICUS LAND SERVICE components

Global Systematic Monitoring



Global Hot Spot

Pan-European land cover mapping



EU Local component

SENTINEL 2 Global Mosaic

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

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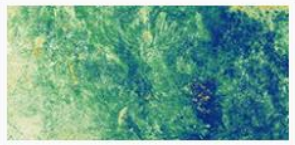
FEWS NET Data Center

FOOD SECURITY CLASSIFICATION DATA

ADMINISTRATIVE BOUNDARIES

LIVELIHOOD ZONES

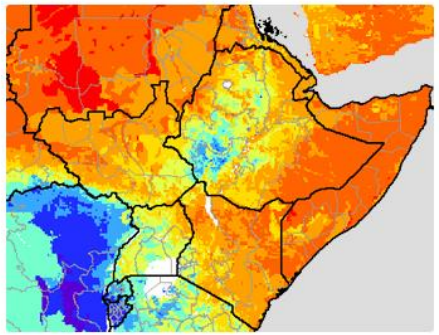


REMOTE SENSING IMAGERY

PRICE AND CROSS-BORDER TRADE

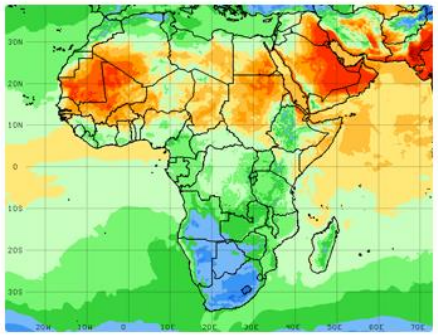
USGS FEWS NET Data Portal

This portal provides access to geo-spatial data, satellite imagery, and satellite-derived data products in support of FEWS NET weather and climate monitoring efforts throughout the world.



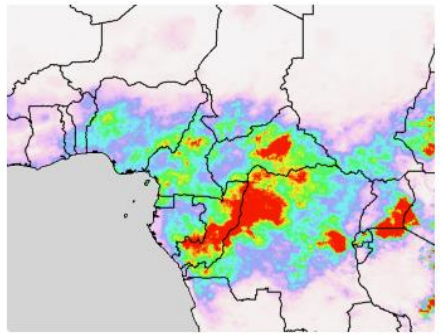
NOAA Climate Prediction Center Data Portal

This portal provides maps for different types of weather monitoring, including temperature, precipitation, and weather hazards, as well as various forecast products.

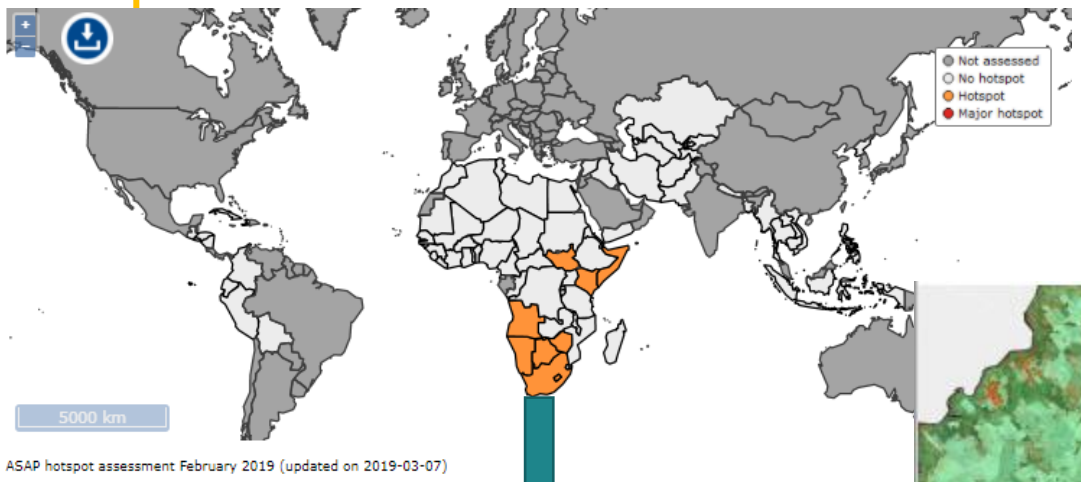


Climate Hazard Group (CHG) Portal

This portal uses a combination of remote sensing data and ground observations as inputs to develop rainfall and other models that reliably predict crop performance in areas vulnerable to crop failure.

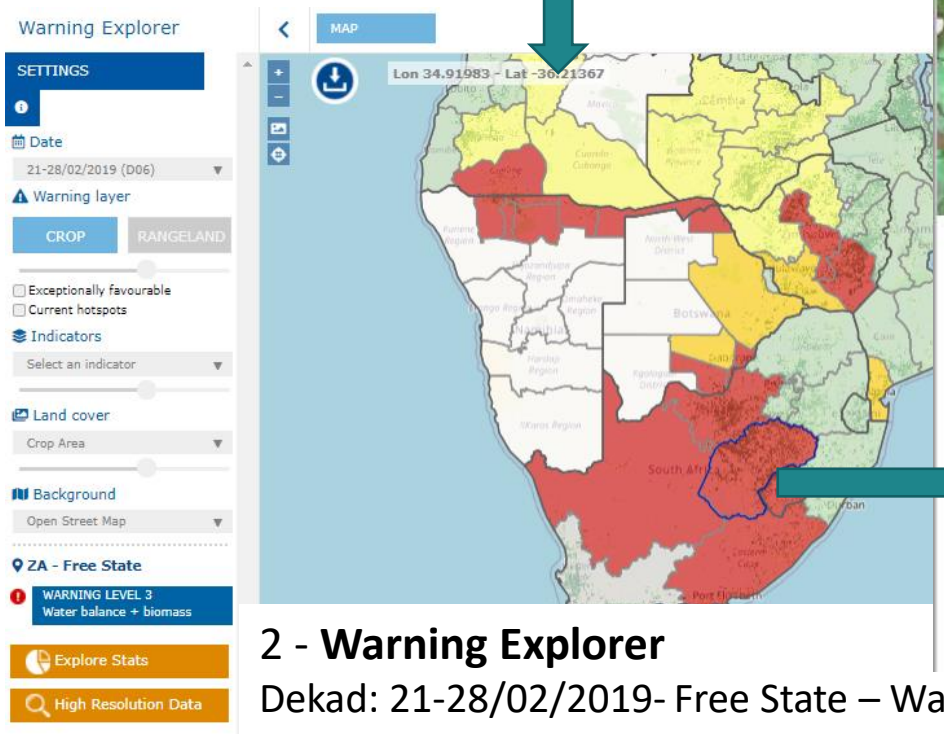


JRC ASAP: Drought detection and monitoring at multiple scales



1 - National level hotspot

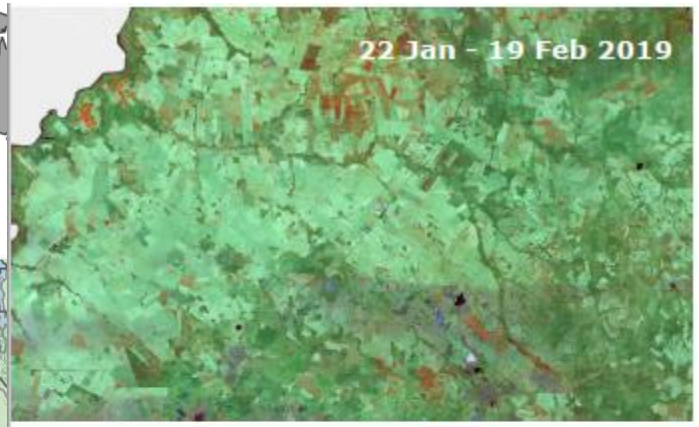
South Africa classified as hotspot -February 2019 assessment

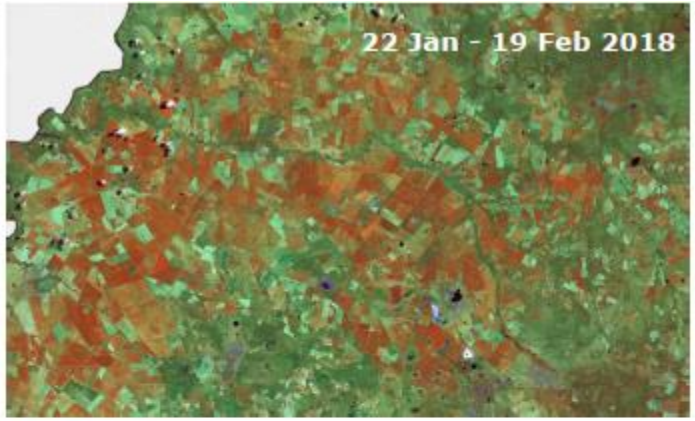


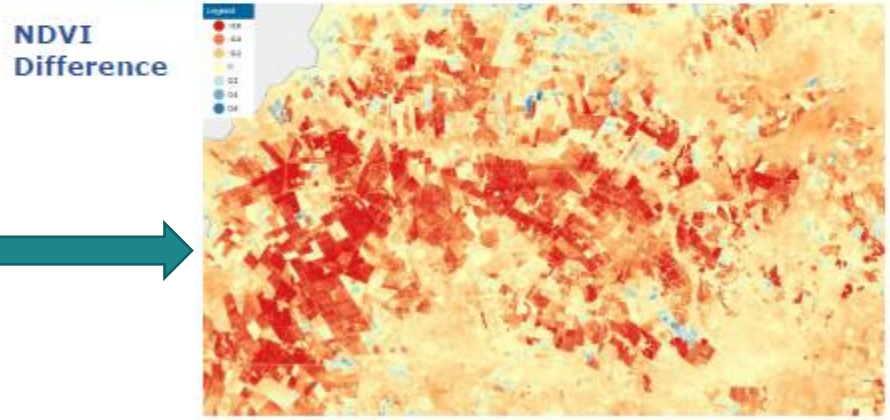
2 - **Warning Explorer**

Dekad: 21-28/02/2019- Free State – Warning 3

3 - High resolution viewer – Free State







Strong negative NDVI anomalies in 2019.
Crop failure and decrease in planted area

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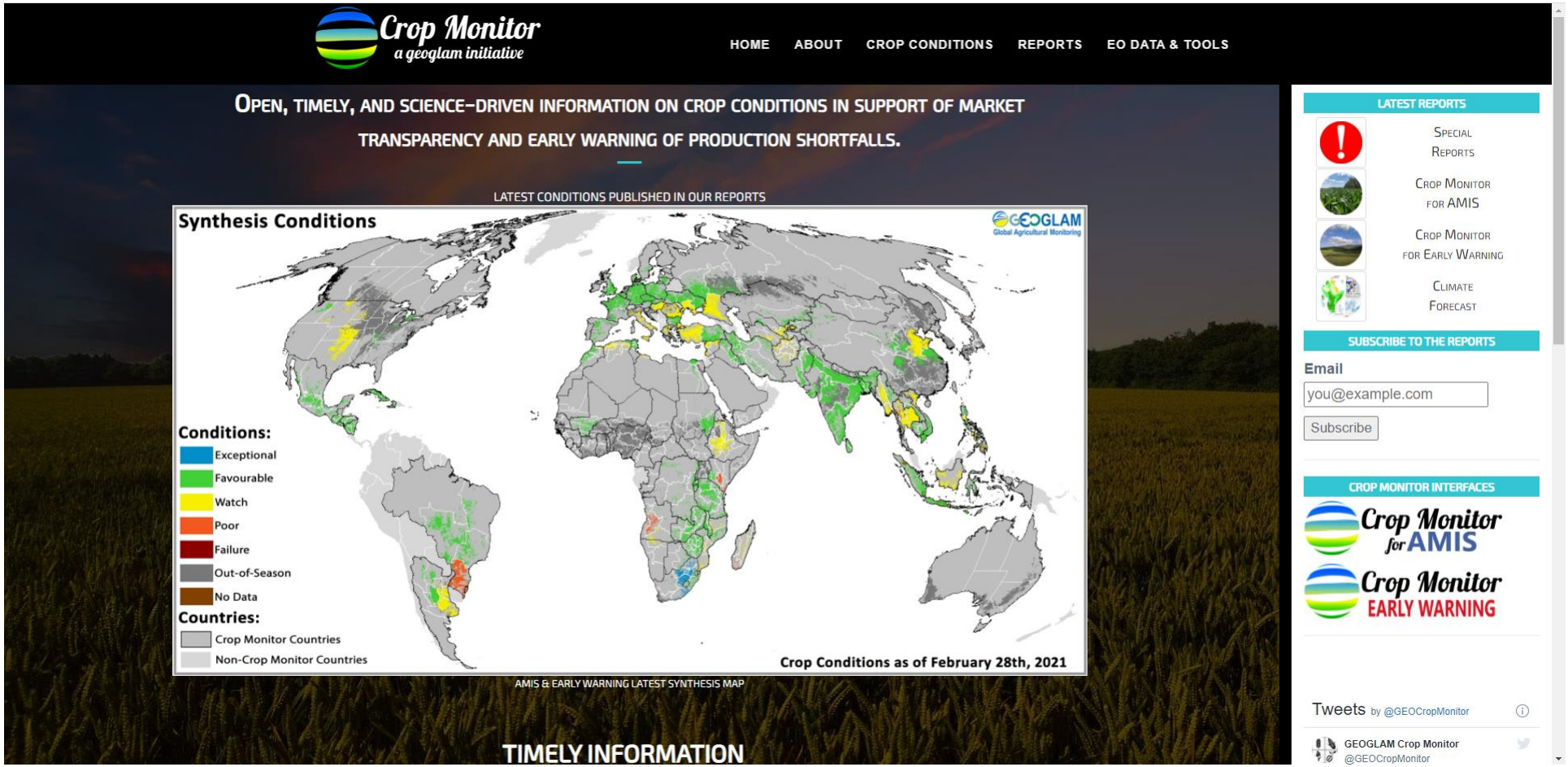
https://mars.jrc.ec.europa.eu/asap/

GEOGLAM crop monitors



https://cropmonitor.org/

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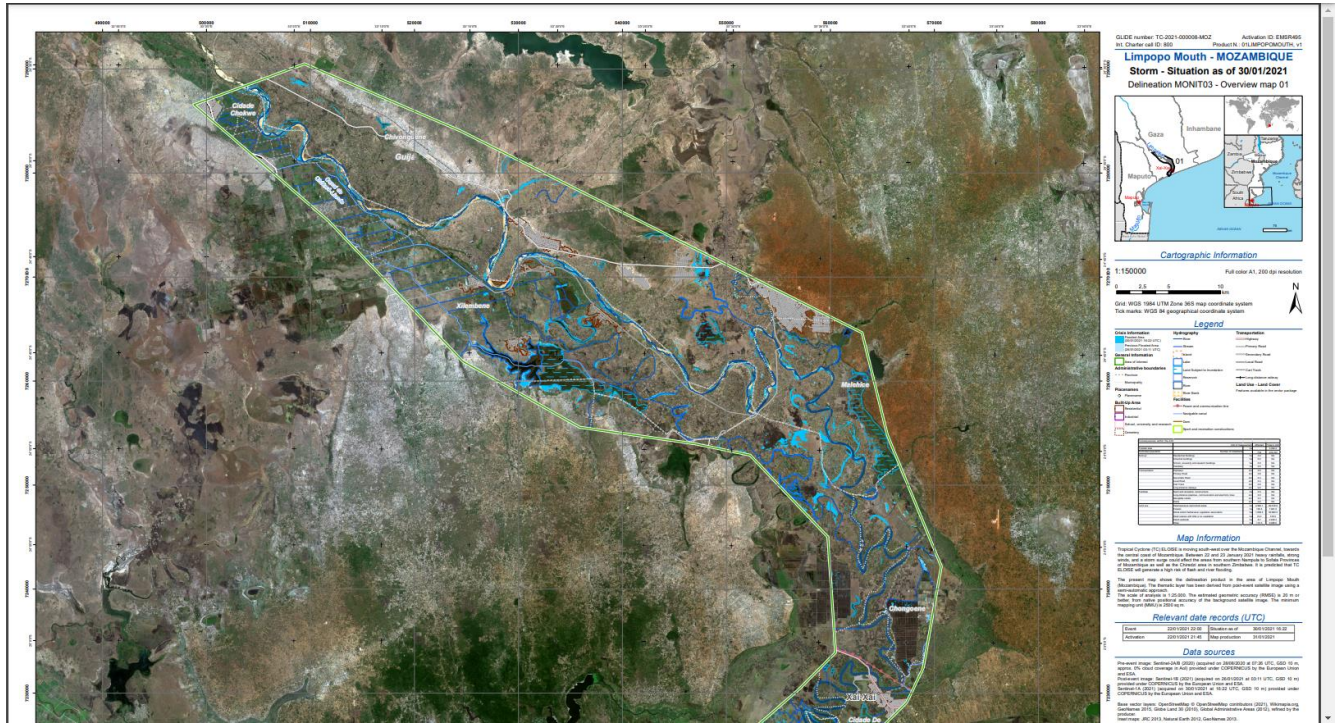
COPERNICUS Emergency mapping

Example Cyclone Eloise, Jan. 2021



https://emergency.copernicus.eu/mapping/ems/service-overview

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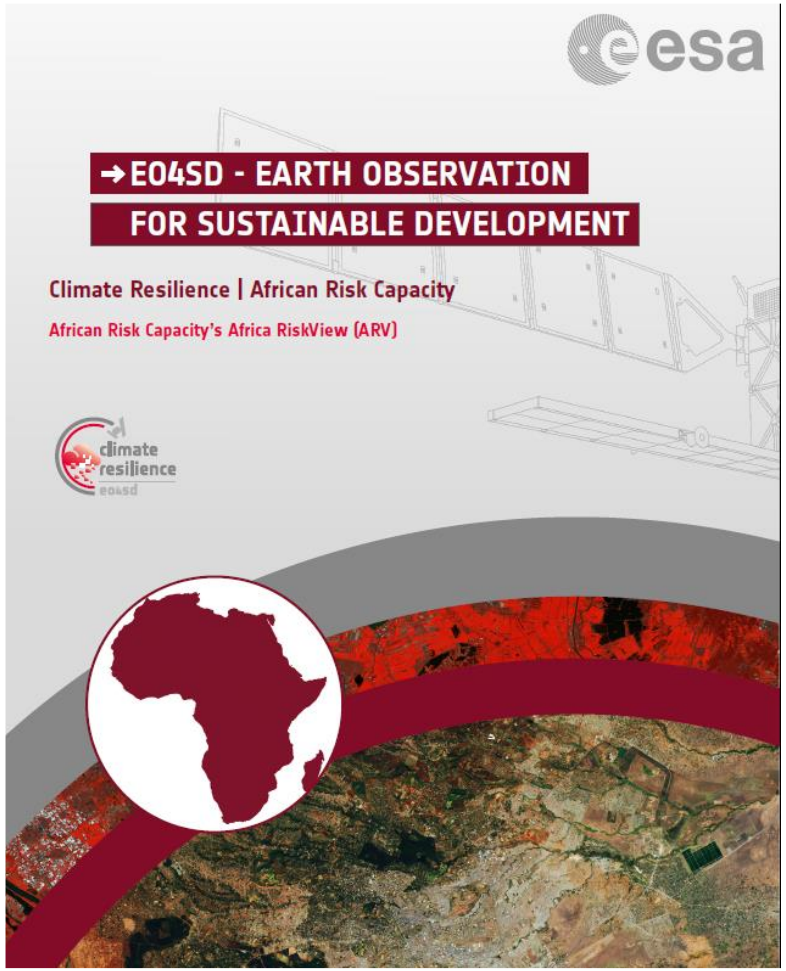
Risk management



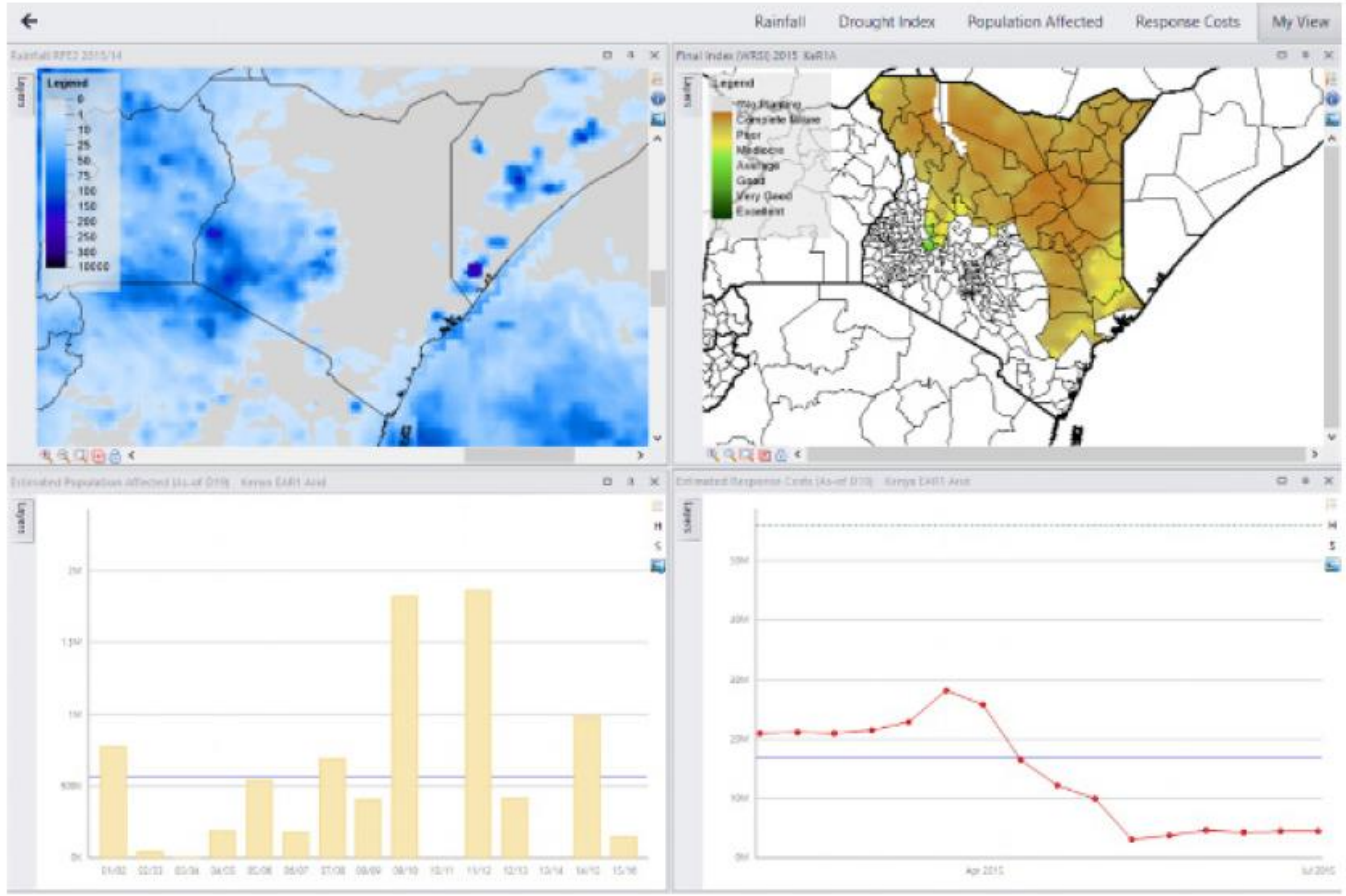
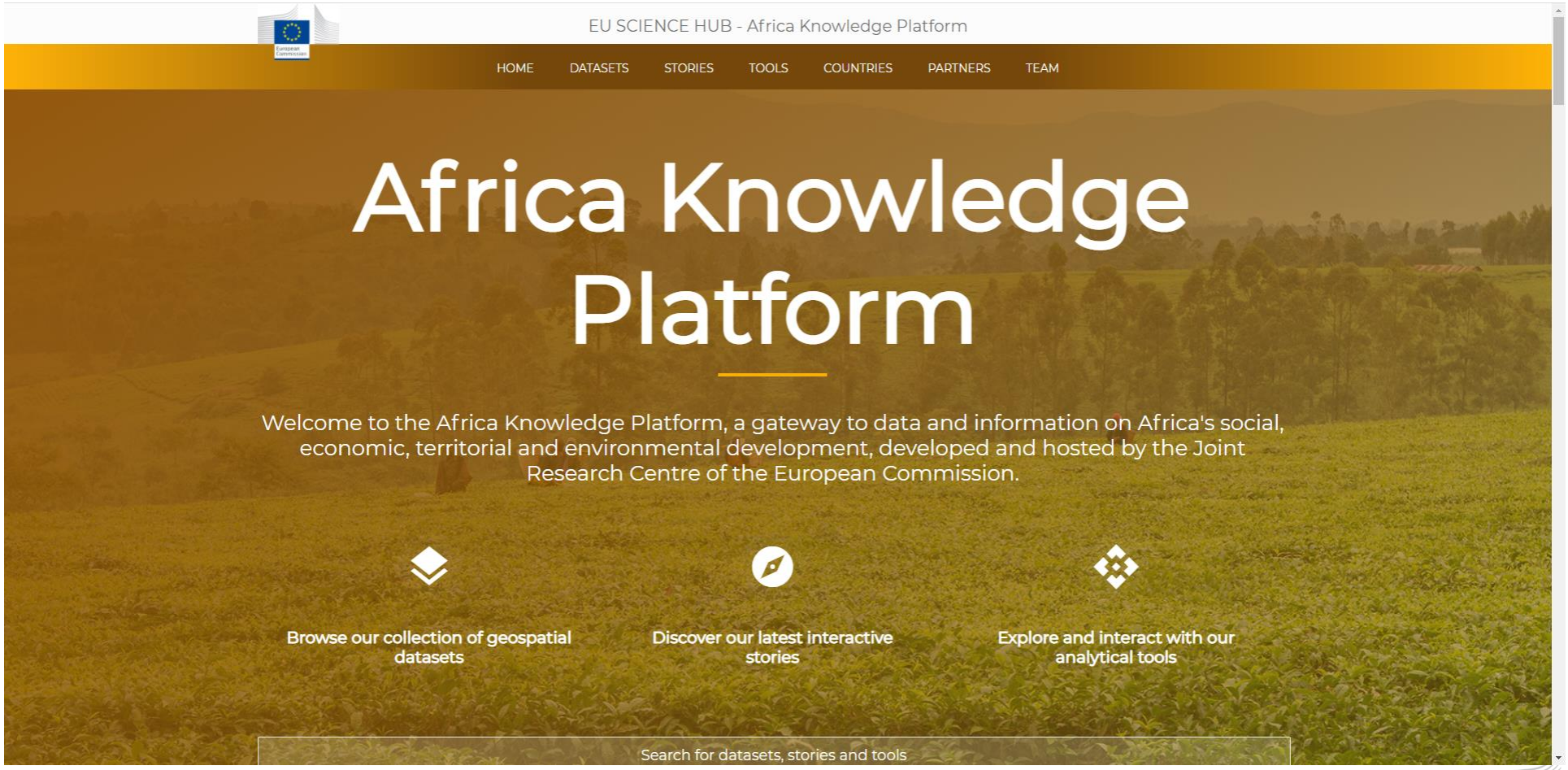


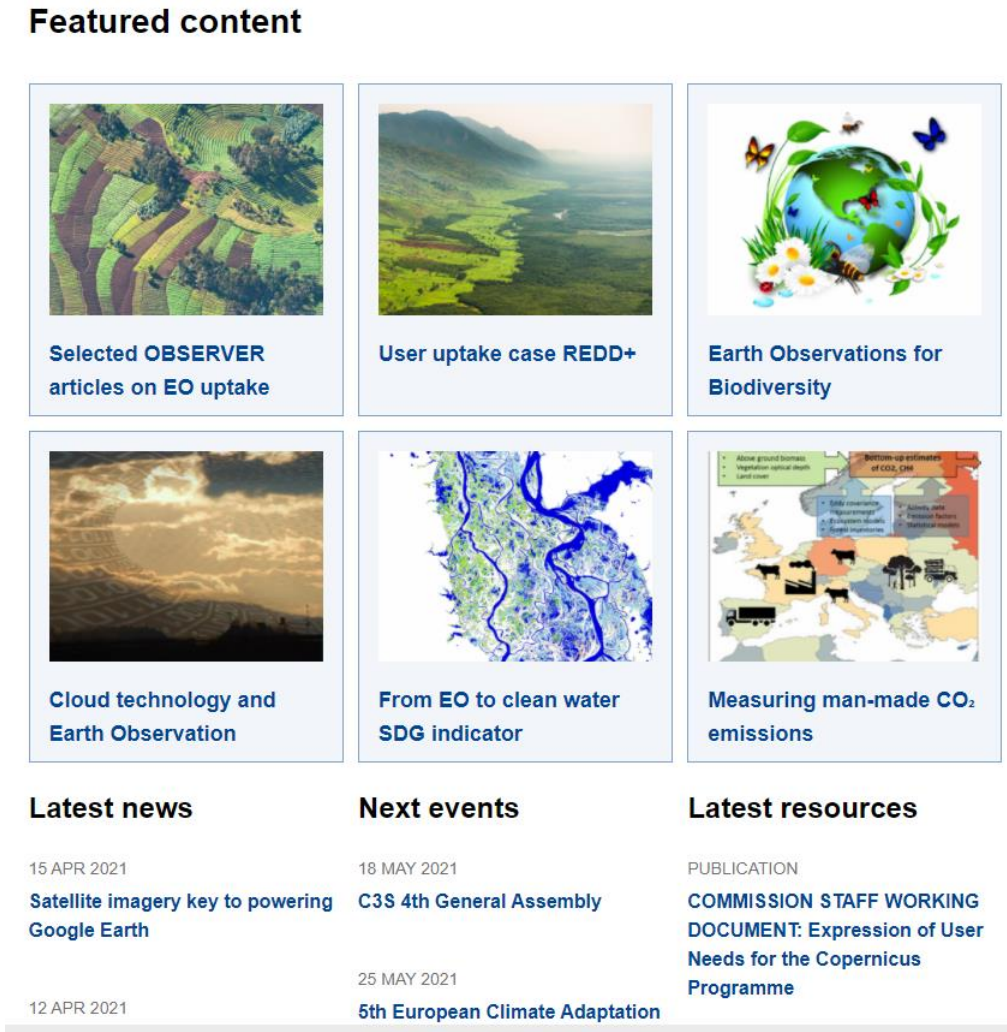
Image 2 Africa RiskView default My View showing Kenya EAR1 Arid (long rains) season. Source: Sistema and Geoville

African Risk Capacity: uses the Africa RiskView tool that estimates population affected by drought based on a water balance model and vegetation indices

Knowledge platforms



EO Knowledge Center



https://knowledge4policy.ec.europa.eu/earthobservation_en

European Commission

Conclusions

- Number of data, computing and information portals rapidly growing
- Important to know what information is needed, what resources are necessary for data download and processing
- Data quality, check sources, reference to validation and accuracy
- Knowlege centers and knowledge platforms can provide guidance and support access to relevant information

10 min

Quiz

Are you a user of EO data or EO derived information?

European Commission

5 min

Break

European Commission

Earth Observation based services for farmers: from pioneering projects to applications

Digitalisation for Agriculture Training

European Commission

Main contents

- Assumptions
- From use of EO for precision farming to services for small scale farmers
- Examples of pioneering projects and emerging applications
- Challenges and conclusions

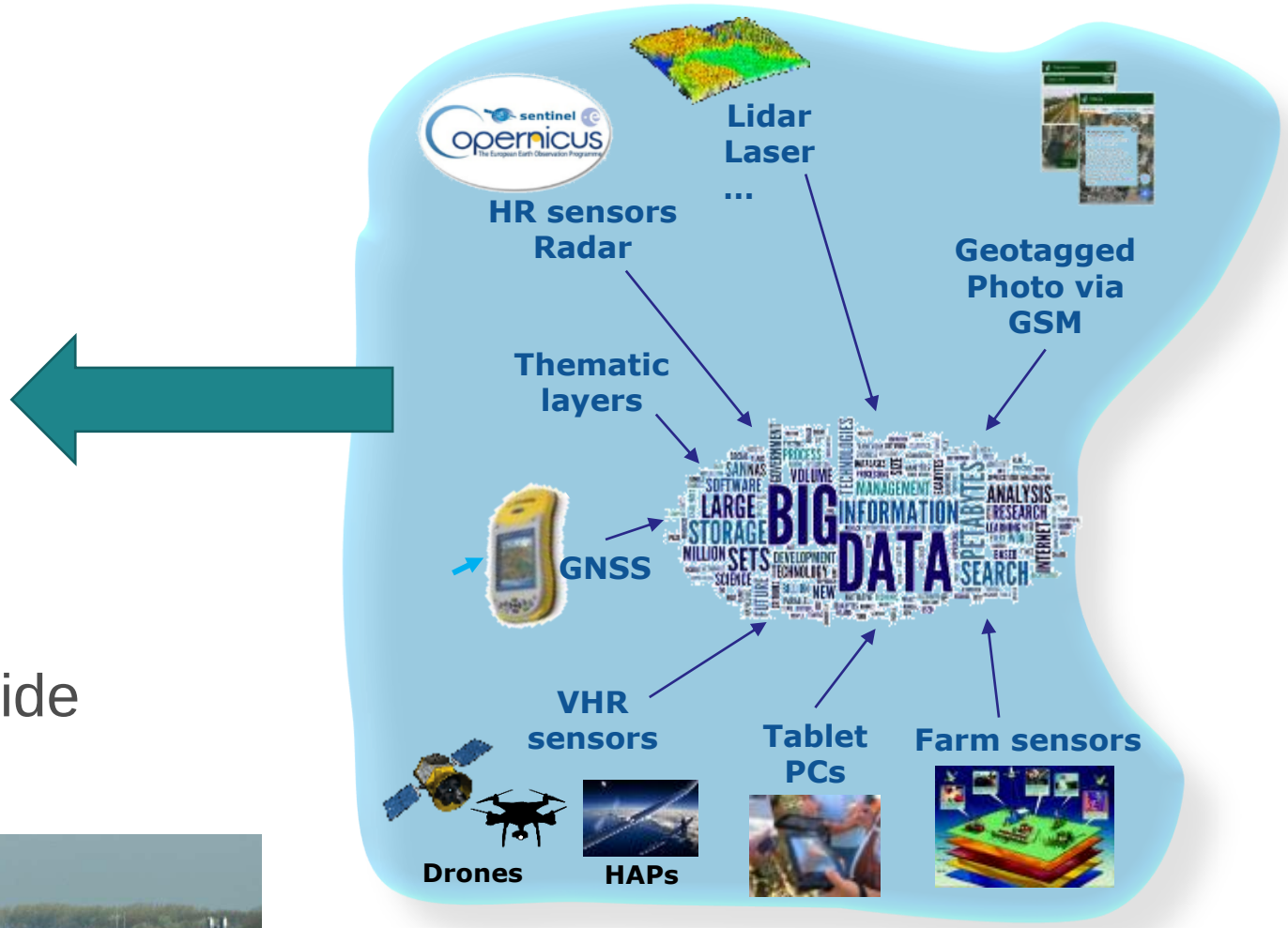
Some assumptions

- Providing digital services to small scale farmers in developing countries can:
  - Improve their access to services which would otherwise be hardly available
  - Digitalization can contribute to agricultural transformation in developing countries
  - **EO information available everywhere and in near real time, provides information complementary to field information, increases transparency**
  - Scale not always adequate for small scale farming
  - Needs policies and regulation for protection of privacy, personal data, reducing ditigal divide...

Main services and technologies

precision farming

- Controlled traffic
- Autoguidance
- Soil mapping
- Yield mapping
- Variable rate fertilizer and pesticide application



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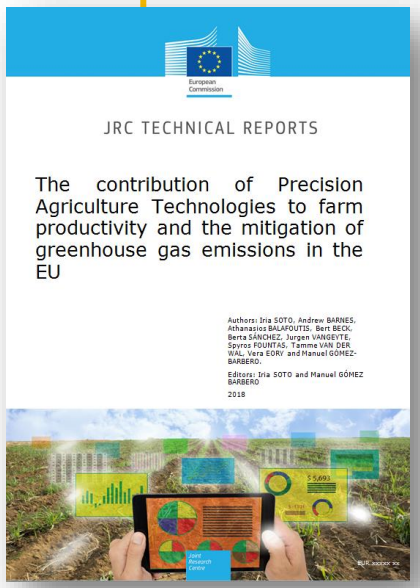
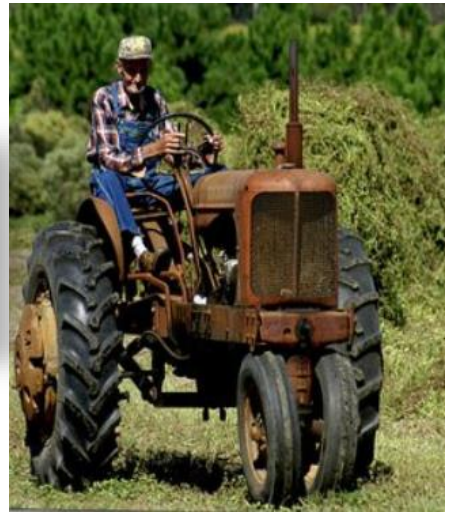
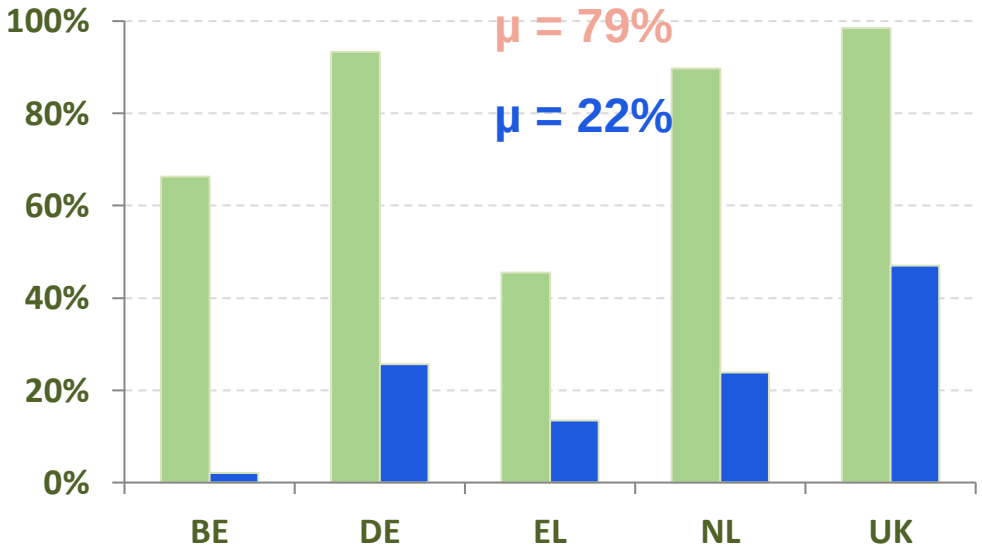
Adoption drivers and barriers

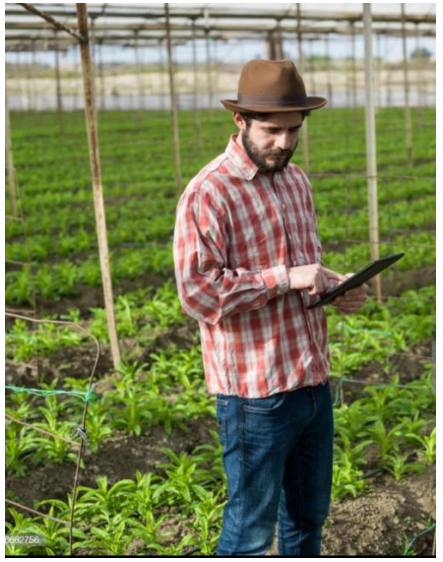


JRC Survey on Precision Agriculture adoption



Farmers awareness vs. adoption of PAT





BARRIERS
Top reasons for NOT adopting PAT

- High costs of the technology
- Uncertainty for recovering the investment
- Size of the farm
- Age
- Lack of unbiased information about benefits

DRIVERS
Top reasons for adopting PAT

- Optimize in the use of agrochemicals
- Reduce costs and increase efficiency
- Increases accuracy of farm management
- Reduction of workload
- Economic capacity / curiosity

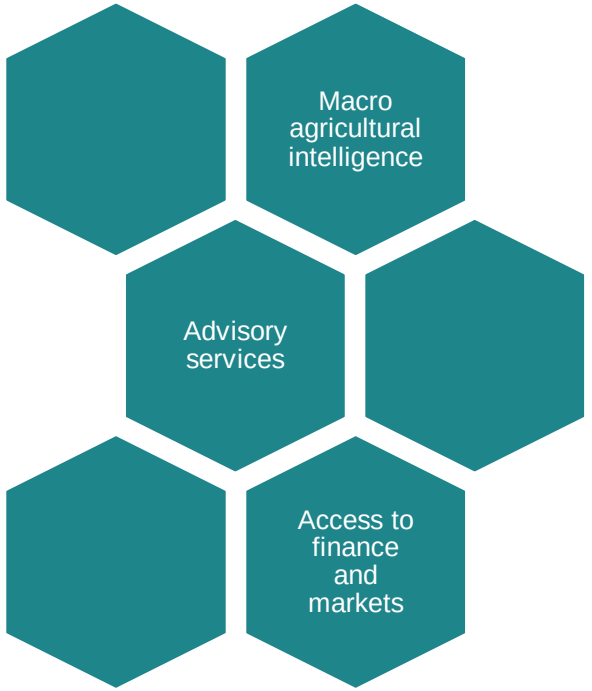
Services for small scale farmers

Services:

- Farm digitization and registry
- Near real time crop monitoring and forecasts
- Advisory services
- Improved access to agri-finance and access to market

Technologies:

- Mobile communication tools
- **GIS, Remote sensing and sensor technology**
- Machine learning



Selected examples of:

Pioneering projects

- **G4AW:** Geodata for Agriculture and Water
- **PICSA**: Participatory Integrated Climate services for Agriculture
- **Sen2Agri**
- **NADiRA:** Nurturing Africa's Digital Revolution for Agriculture

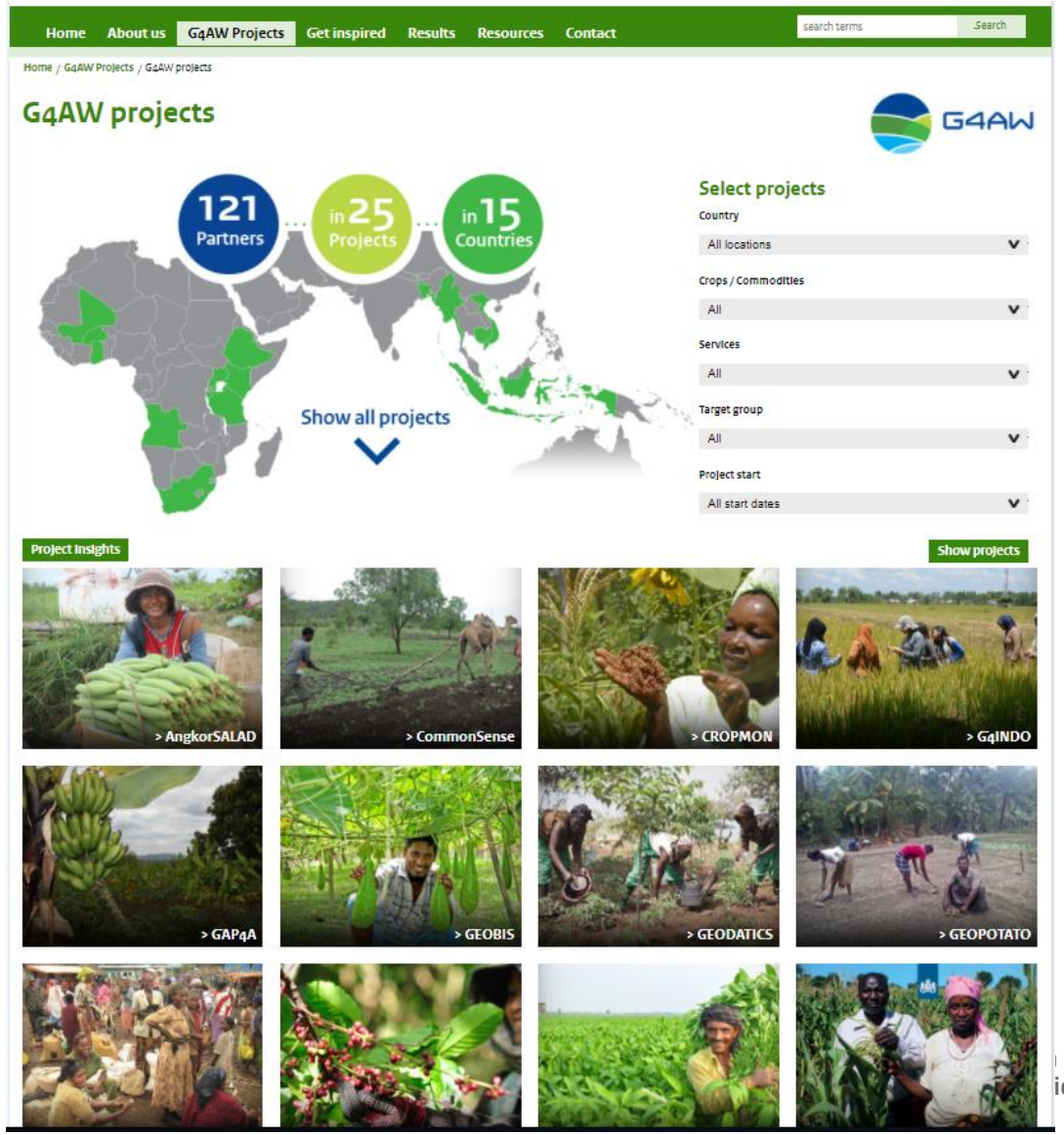
Emerging applications

- **oneSoil**
- **Fieldy**
- **agriBORA**
- **Farmdrive**

NB: these are only examples, not an exhaustive list!

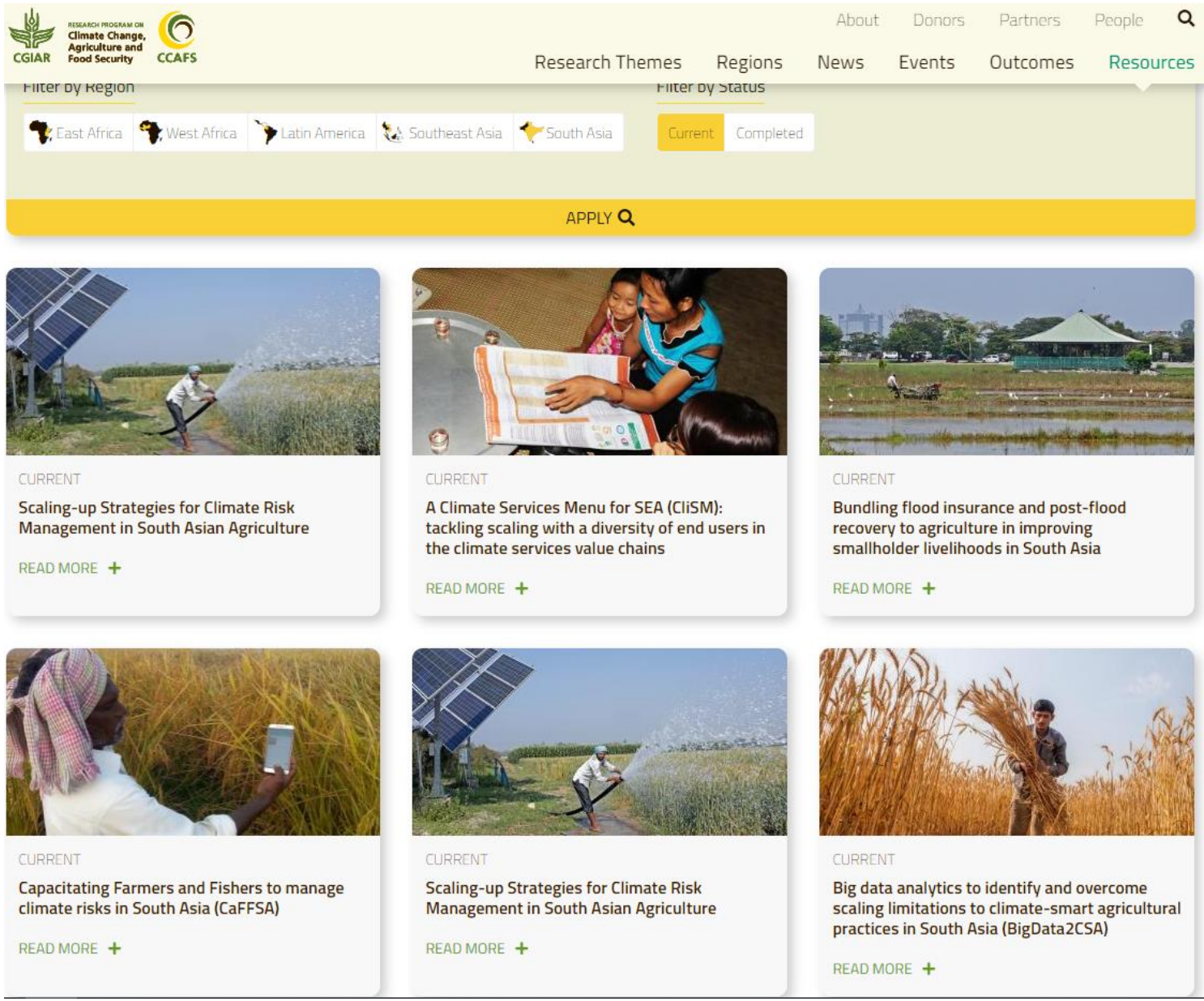
Geodata for Agriculture and Water (G4AW)

- Programme started in 2015 by the Netherlands govt., implemented by the dutch space agency
- Aims at aims to provide the **right information** at the **right time** to the most important actors in the food production chain: farmers, fishermen and pastoralists.
- “Geodata, such as satellite and mobile data, can be converted to relevant information on climate, weather and hazards and even timely agricultural advice”



PICSA

- Improved climate information and decision-making tools enable small scale farmers in the target countries to improve their resilience in the face of erratic rainfall and increasing temperatures.
- Launched by University of Reading as part of the CGIAR CCAFS project works with National Meteo agencies, NGOs and other actors



Sen2agri

- ESA project for exploiting Sentinel imagery and providing services to national level agricultural monitoring
- Developed an open tool for cropland and crop type classification that has become a reference
- Enables agricultural services projects like for example Nadira

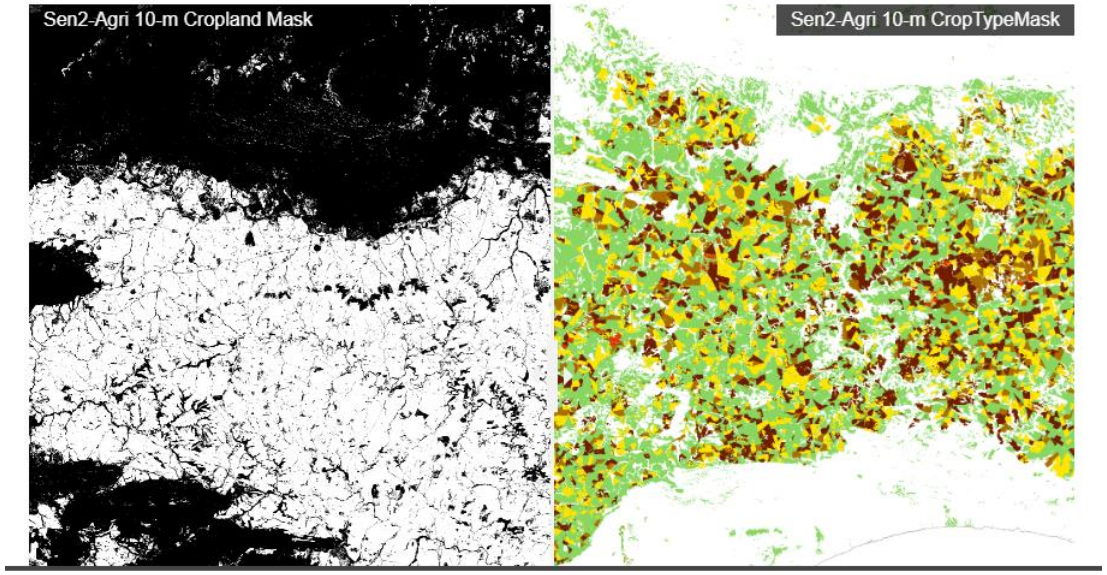
Crop Type Map: mapping crop types using an automated approach

The **Crop Type Map** product is a map of the main crop types or groups in a given region, with a Minimum Mapping Unit of 0,01 ha and provided along with several quality flags.

The **top main 5 crop types** are considered per region. The main crop types are defined as those covering a minimum area of **5 % of the annual cropland** in the region, representing a **cumulated area higher than 75 %** of the latter.

The product is completed by an early Crop Area Indicator, an estimate of the crop type proportion inside a 1 km² pixel, usually derived by a statistically sound approach.

More information is available in the corresponding **product descriptive datasheet**.



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Nadira

NADiRA

HOME CONCEPT PROJECT SERVICES CONSORTIUM NEWS & AGENDA CONTACT

NADiRA will de-risk agriculture further, faster with Earth Observation and IoT

NADiRA is a Horizon 2020 innovation action to industrialize the incorporation of Copernicus, other Earth Observation products and in-situ sensors inside *agCelerant™*. The innovation will reduce investment risk for agro-industrial stakeholders, notably bankers, insurers, input suppliers and food processors.

agCelerant

agCelerant™ is an agricultural value chain orchestration digital platform present in 12 countries and connecting producers with banks, insurers, input providers and agro-industries in smallholder contract farming.

Use data to deliver sustainable information

Through data collected by mobile devices, IoT and satellites, the NADiRA services support better management practices for smallholder farmers and provides reliable information to stakeholders.

CROP TYPE IDENTIFICATION

Increase accuracy and lead time of production.

PARCEL PREPAREDNESS

Improve efficiency in monitoring farm operations that precede the planting period.

CROP STATUS DETERMINATION

Provide information about crop growing conditions and anomalies during the growing season.

HARVEST DATE DETECTION

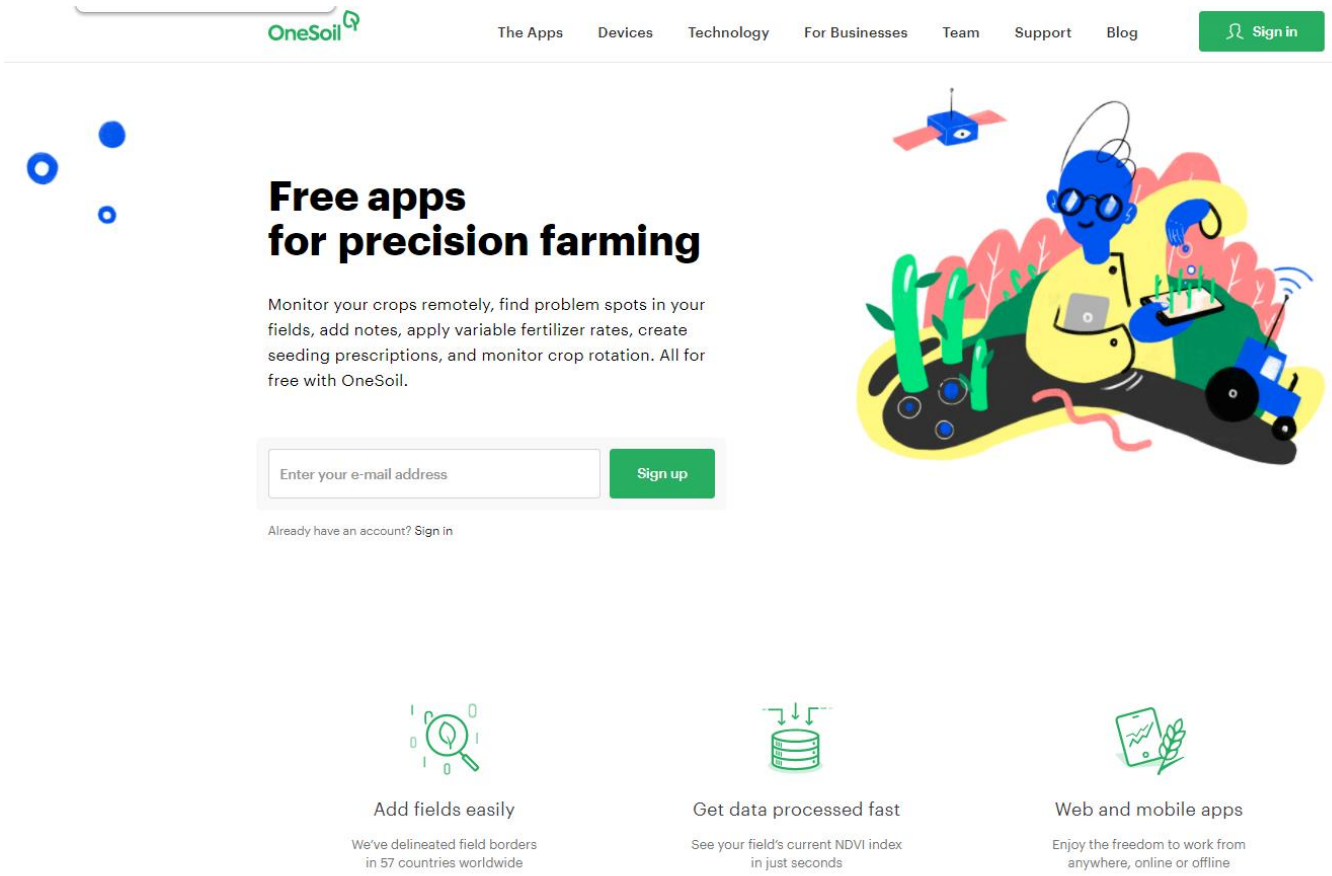
Improve the efficiency and reliability of effective harvest date.

CROP YIELD FORECASTING

Forecast crop yield efficiently and reliably for a large number of parcels.

OneSoil

- Disruptive techonology: automatically detected field boundaries using AI for Europe, US and going global
- Allows monitoring selected fields for crop growth, check weather forecasts, compute nutrients need
- Can be combined with field sensors
- Addressing mainly mechanized and digitalized farmers



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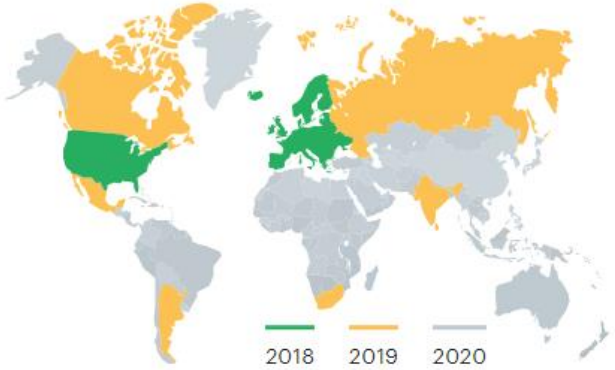
Detecting field boundaries

We manually marked tens of thousands of fields and then trained an ML algorithm to define boundaries automatically. We show what happens with fields at any scale, from a whole region to a specific field plot. As a result, any farmer can get information about the state of their fields in our apps.

IoU 0.85

The accuracy of the automatic field delineation model

49 years is the time one person would need to manually mark these fields



21,603,849

The number of fields marked in the United States

35,923,503

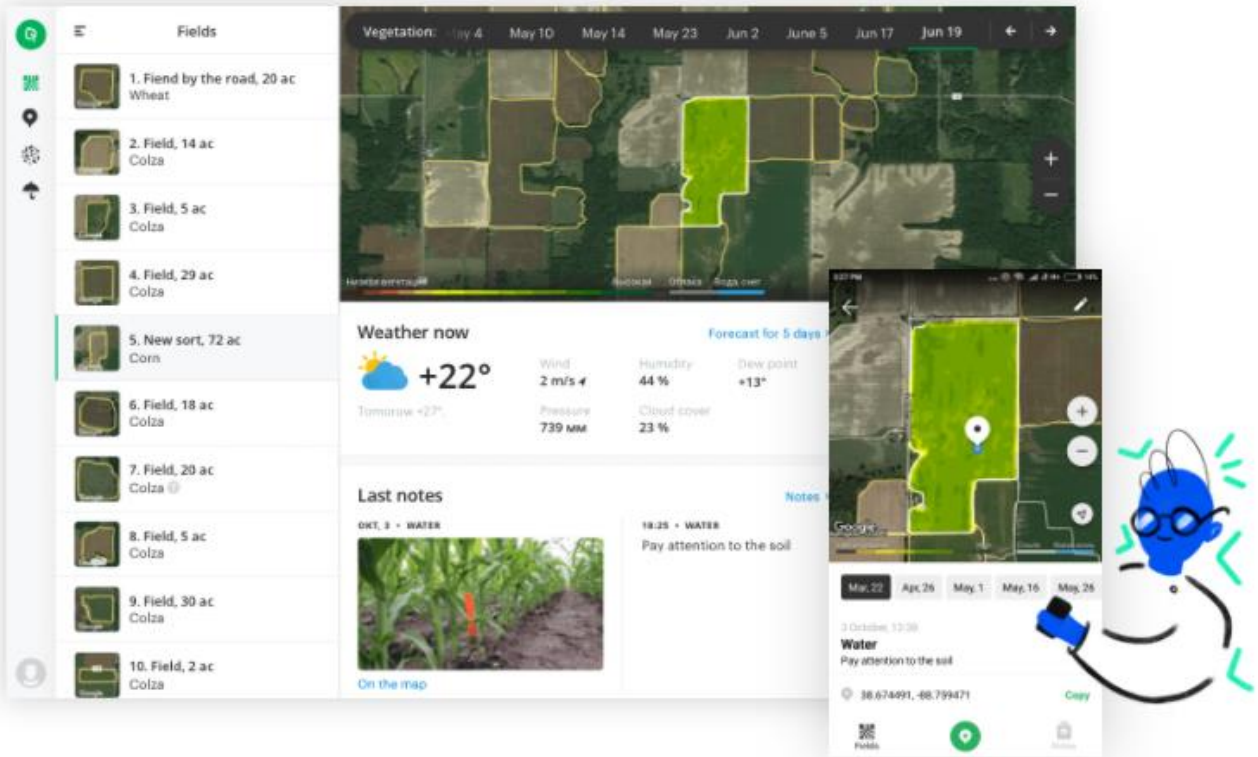
The number of fields marked in Europe

Our algorithms define field boundaries with a 5-meter accuracy

THE APPS

Monitor fields from anywhere

Monitor crops, add notes, check the weather forecast, and calculate nitrogen, phosphorus, and potassium fertilizer rates with OneSoil's free apps. All you need is internet access — we take care of the rest.



Fields

Find your field on the map: we'll define its boundaries and show you how your crops are doing

Scouting and notes

Monitor your plants and add notes for yourself or to share

Fertilizers

Determine variable rates to apply nitrogen, phosphorus, and potassium

Weather

Check the 5-day weather forecast for your field

Sign in

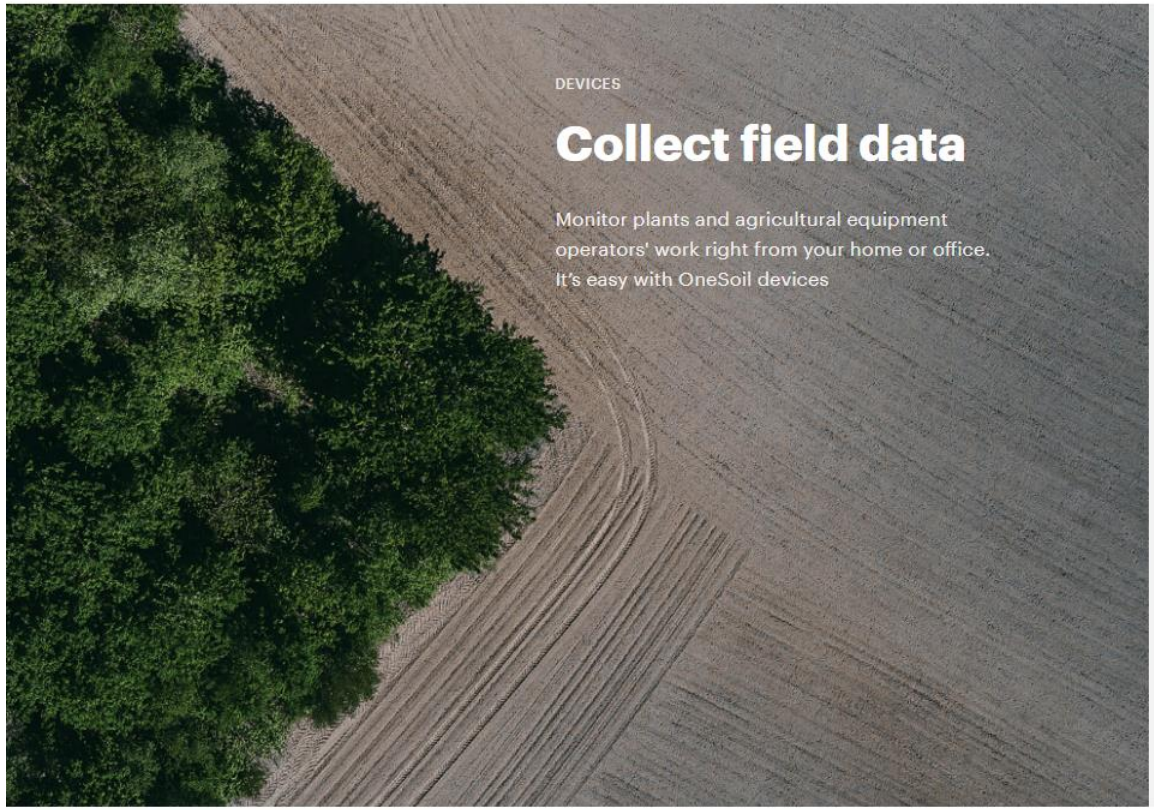
OneSoil for mobile devices

Google Play Download

App Store Download

OneSoil

The Apps Devices Technology For Businesses Team Support Blog Sign in



DEVICES

Collect field data

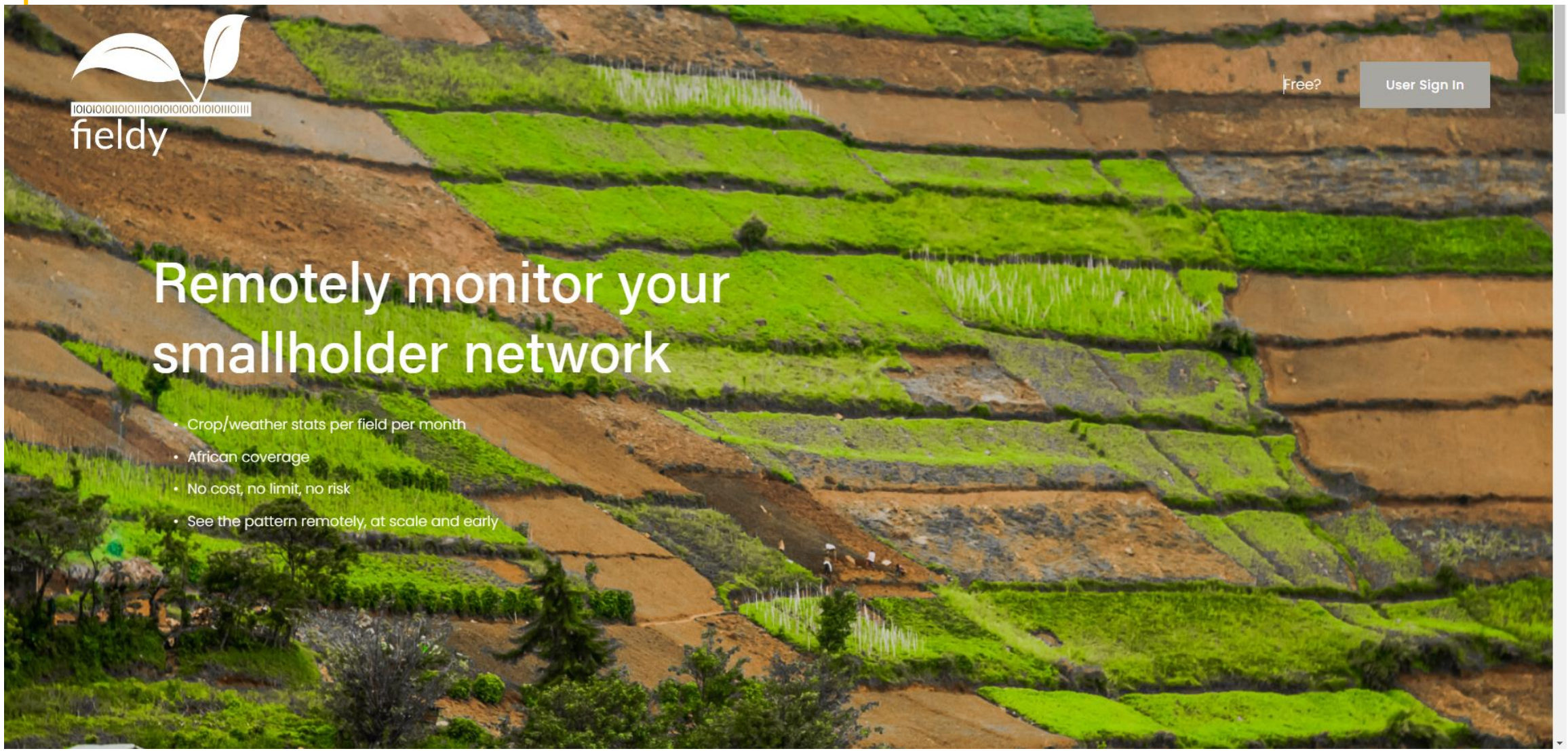
Monitor plants and agricultural equipment operators' work right from your home or office. It's easy with OneSoil devices

Weather sensors

Measure soil moisture and air humidity, soil and air temperatures, and determine the luminance for a specific part of your field with OneSoil weather sensors

Modems

Transfer data easily between agricultural equipment and the OneSoil web app using a mobile network



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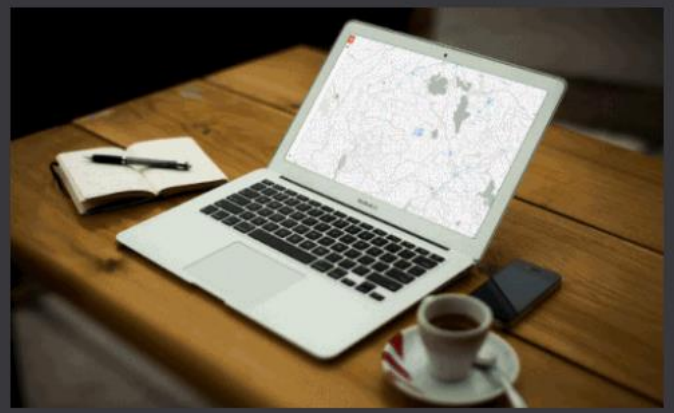
You Provide

- GPS and crop type per field for min 100 fields
- Occasional feedback (we're at beta stage so your experience is vital to the development)

We Provide

- Monthly satellite generated data updates per field for free
- Statistics incl. crop health | soil moist. | ground temp | rainfall | evapo-transipiration
- Access via our web portal or link via API



agriBORA

- Targets linkage between agribusiness and farmers
- Engages small scale farmers via extension services, meteo forecasts etc…
- Uses simple technology, sms
- Provides farm surveys

Use innovative crop growth models to know what is happening on the farm.

Our models incorporate hyper local weather, satellite data and in-situ observations to provide insights on how the crop is performing.

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agroBORA
Data driven agribusiness

HOME ENGAGE MONITOR TRADE CONTACT-US LOG IN REQUEST A DEMO

We *digitize* the value chain making farmers *visible* and partners *trustworthy*

Promoting long-term linkages between farmers, market off-takers and other key market players such as crop aggregators, input and equipment suppliers, logistics and mechanization service providers to financial institutions, insurance providers and fintech companies.

MAKE FARMERS VISIBLE

Enable smallholder farmers to participate in global markets by providing visibility to input and output markets.

MAKE FARMERS BANKABLE

Provide production based risk assessments and real-time monitoring of the crop growth and yields.

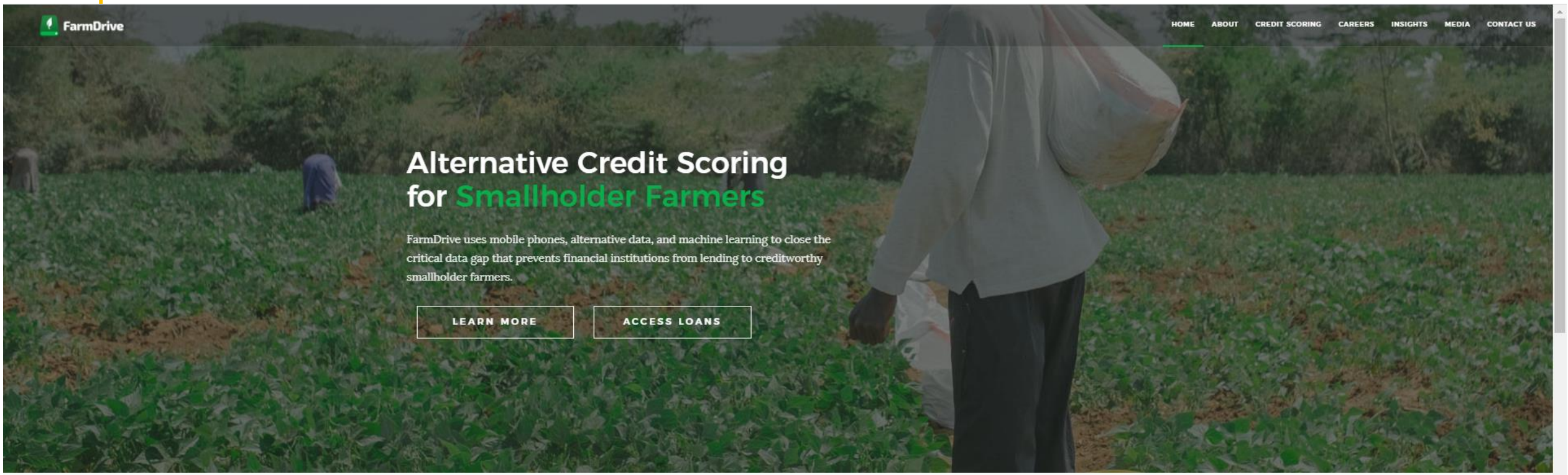
MAKE MARKETS PREDICTABLE

Forecast volumes and plan the harvest schedule based on the yield estimation, crop area and crop calendar insights.

MAKE PAYMENTS DIGITAL

Integrate digital wallets to enhance transparency of transactions and enable faster payments to and from farmers.

European Commission



Unlocking access to credit for smallholder farmers

50 Million Smallholder Farmers

Nearly 50 million smallholder farmers in Africa are struggling to support their families and communities through agri-business because less than 10% have their economic needs met by the financial sector. Without access to credit, they remain unable to purchase quality inputs, make productive investments, and improve their production and harvests.

$450 Billion Financing Gap

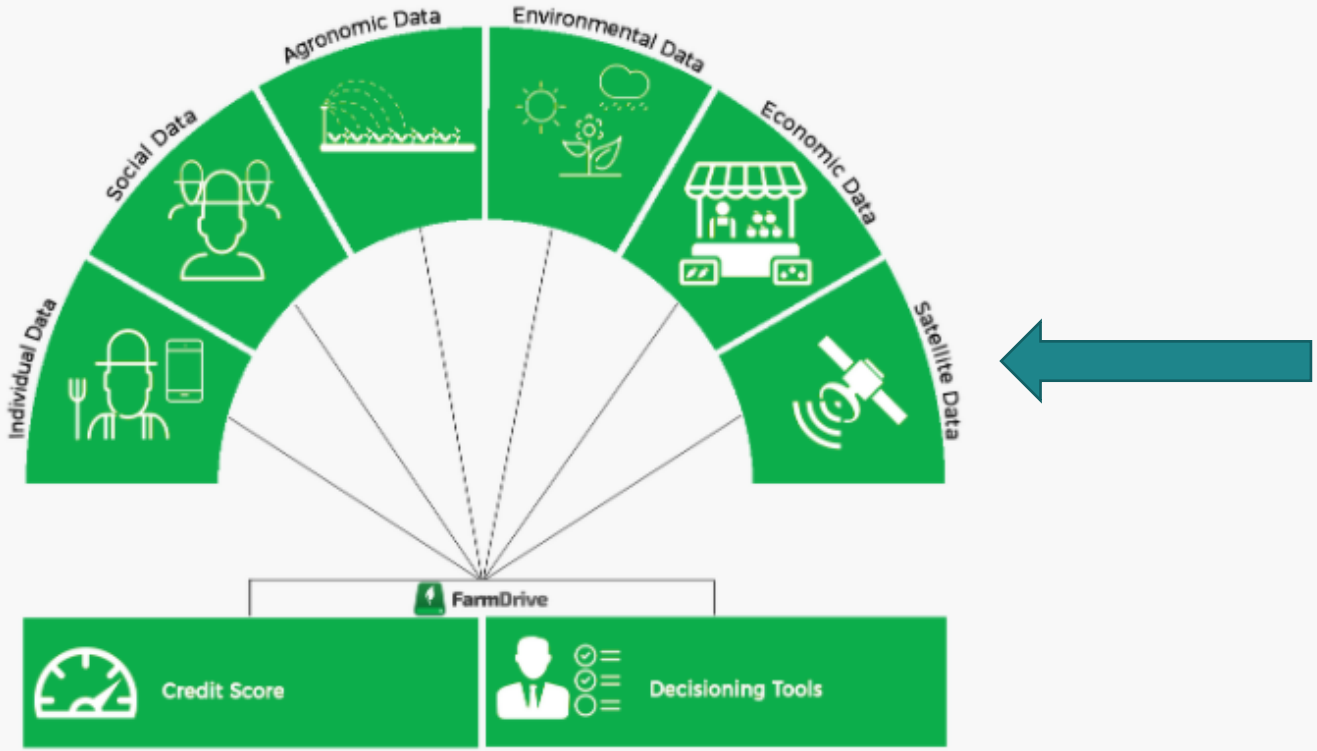
Agriculture employs 65% of Africa's population and makes up 32% of its GDP. However, less than 1% of bank lending in Africa goes to agriculture. In absence of accurate and cost-effective methods for assessing small-scale agricultural lending risk, financial institutions choose not to lend to smallholder farmers, thereby contributing to the $450 billion global agriculture financing gap.

FarmDrive's alternative credit risk assessment model is providing financial institutions with an agriculturally relevant and data-driven model to assess risk and develop loans that fit the needs of smallholder farmers. Not only will this solution unlock millions of dollars of previously

FarmDrive

Credit Scoring

FarmDrive collects and aggregates alternative datasets from multiple sources, in Kenya and around the world, to build credit scores for smallholder farmers in Africa.



The alternative datasets are analyzed by our machine learning algorithm to produce relevant credit scores for smallholder farmers, and decisioning tools that enable financial institutions to develop small-scale agriculture loan products.

Challenges

- Digital divide: Emerging applications and services require connectivity and digital infrastructure
- Digital education
- Privacy and data protection standards
- Need for regulation to favour fair competition

Conclusions

- Classic precision farming technology generally not attractive for small scale farming
- But pioneering projects and recent applications show great potential for specific services for small scale farming
- COVID19 and the recovery phase that will follow make these applications even more relevant
- Need institutional support, infrastructure, capacity building, policy and regulation

10 min

Quiz

Do you think EO based information can be of direct benefit to farmers?

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Feedback on recent EO use cases from two EU Delegations (Uganda and Ivory Coast)

Digitalisation for Agriculture Training

European Commission

15 min

Q&A

- Any questions? Comments? Remarks?

European Commission

Wrap-up

1. Key Earth Observation technologies and recent applications in agriculture and food security policy support
2. Key portals to access relevant data and information
3. Earth Observation based services for farmers: from pioneering projects to applications
4. Feedback on recent EO use cases from two EU Delegations (Uganda and Ivory Coast)

Thank you… and see you tomorrow for our 4th webinar!

Contact: felix.rembold@ec.europa.eu

European Commission