

Black Sea and Danube Regional Initiative Applications (BSADRI)

**Priority Application Domain B:
Sustainable Natural Resource Management in Agriculture and Forestry**

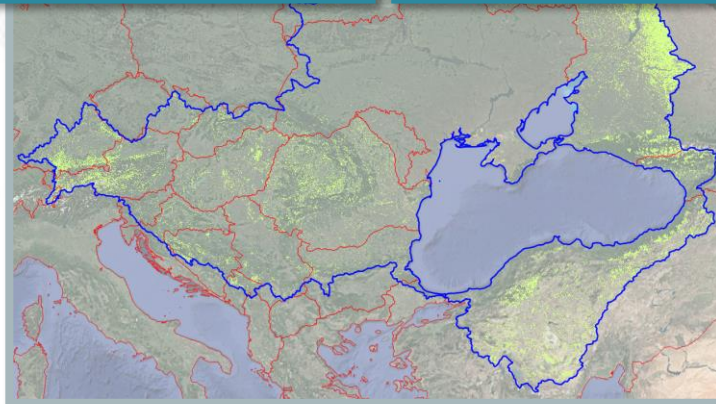
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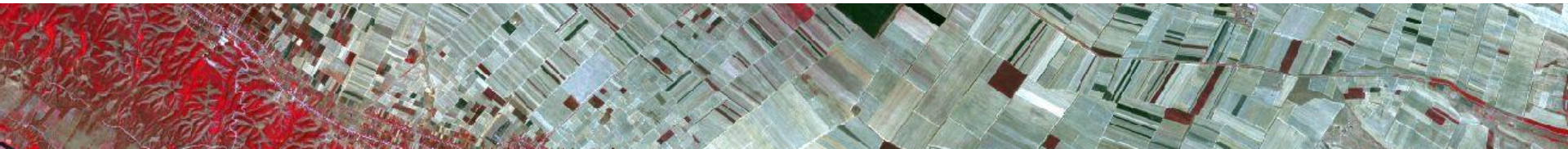
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ESA regional initiatives – Black Sea region

- Activity is part of the EO (Earth Observation) Exploitation Platforms element of ESA's Earth Observation Envelope Programme (EOEP-5,) aiming among others to establish regional information services in selected geographic regions in Europe and neighbouring countries (Alps, Baltic, ...& Black Sea...
- There are three common objectives for all regional initiatives such as:
 - Demonstrate the benefit and utility of EO-derived information to support regional monitoring priorities, and enhance the capabilities to cooperatively address these priorities
 - Achieve measurable progress in embedding EO-derived information into the strategies and cooperation actions within the regions, and
 - Utilise state of the art processing and analysis capabilities within the region and demonstrate added value of using an open, non-monolithic and federated network of platforms, fuelled with European EO assets.



BSADRI - objectives



Precursors & Experience

- Thematic Exploitation Platforms
- Application projects (*EO4SEE /EO4EP*)
- EO based services
(*Sen4CAP, Sen2Agri, DROMAS, Forest Inspector*)

Objectives

- Data tools for EO processing
- Services and applications
- Respond to user needs



Requirements & Expectations

- Use of Cloud infrastructure
- BigData processing
- Link-up to already ongoing developments
- Regional approach to information collection and delivery
- Integrate non-EO data

Context & Regional users

Regional events

Constanta and Sofia
Workshops (2016/18)

Service
providers

EU perspective

CAP, EU Directives



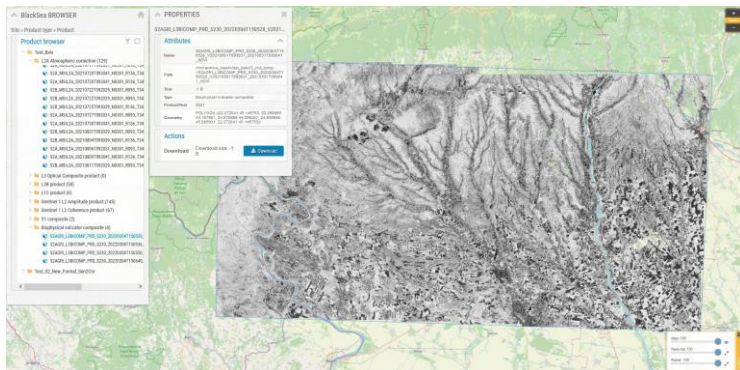
Users

- Authorities
- Research institutes,
- Non-governmental organisations
- International institutions & programs



- ESA regional initiatives
- Infrastructure support (NOR)
- Project office

Tools & Services



Black Sea & Danube Regional Platform

Bringing EO Based Services Closer to the Region

The Black Sea & Danube portal aims to bring EO data closer to the region. It is intended to facilitate EO-based services for better planning across the region providing access to satellite data and value-added thematic services for agriculture and forestry. It endeavors to support more livable communities locally, and a more sustainable region for the benefit of all.

Applications



Access agricultural & forestry services and use case examples

Platform Tools



Find and get the right imagery for your specific needs

Data Sources



Browse other EO resources and find EO-based thematic data

3rd Party



Check 3rd party solutions, EO data processing tools and third services



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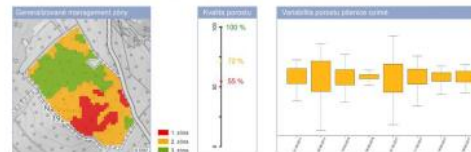
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The Black Sea platform

Zapojenost porostů - 491110708

(rozloha: 59,71 ha; svahovitost: 4,76; převládající půšňi typ: kambazem)



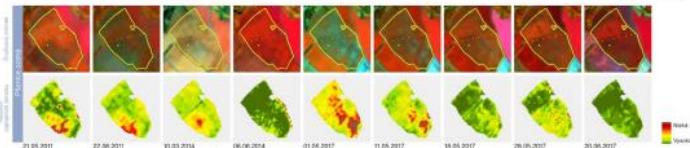
Zapojení porostů je proces uvažující analýzu variabilit zapojení se zaměřením na sledování problematiky plochy na základě družicových dat satelitního rozlišení. Průběh se skládá z následujících kroků:

- analýza zapojení porostů v závislosti na družicových datech (Sentinel, Sentinel)
- definování management zón:
- zóna zapojení - nejvíce zapojení porost
- zóna zapojení - variabilní zapojení porost
- zóna zapojení - méně zapojení porost

Výsledkem analýzy porostů jednotlivých zón ve vztahu k nejvíce citlivé zóně **výsledkem variabilit porostů** přeložené zóně v rozlohu let

Podrobnosti: Popisek výkazu vykazující významnou variabilit porostů

Zpracováno: 9. Dubn 18.07.2019 gisat



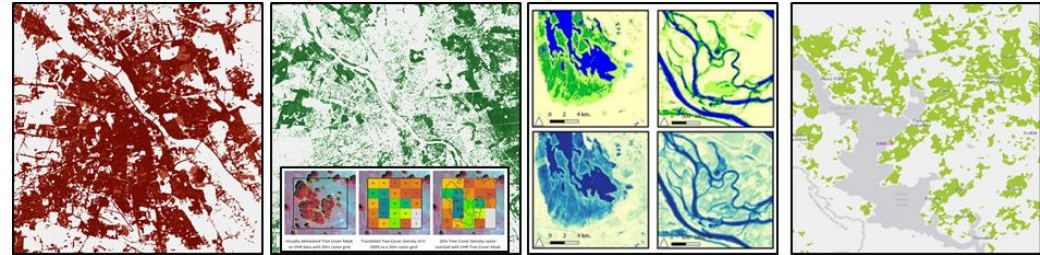
Use case demonstrations

Black Sea – platform

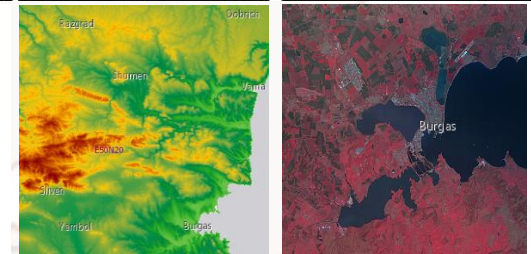
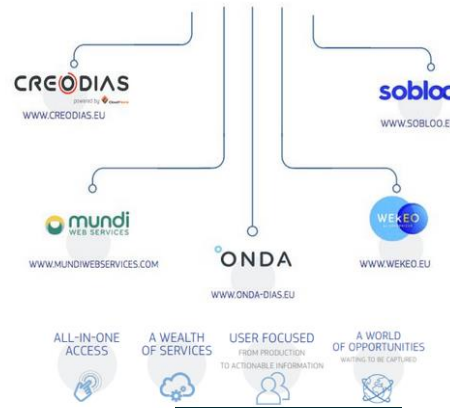


Black Sea – Data & 3rd Party solutions

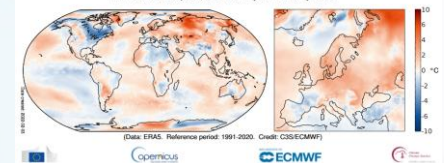
- 01 | Global Copernicus Land Monitoring
- 02 | Pan-European Copernicus (Land Monitoring)
- 03 | High resolution Layers
- 04 | Copernicus Climate Change, Atmosphere...
- 05 | TEP'S - Food, Forestry
- 06 | Sen4Stat, World Cereal, Sen4CAP
- 07 | Data and Information Access Services (DIAS)
- 08 | ESA SCiHub, AWS
- 09 | Sentinel Hub, Land Viewer, Google Earth Engine



THE DIAS & WHERE TO REACH THEM



Surface air temperature anomaly for January 2022




Black Sea – platform tools

Region of interest

Please define your Region(s) of Interest using a GIS layer in ESRI Shapefile (in a zip file including all the components of the layer), GeoJSON or KML format.

No file selected.

Maximum file size: 5 MB



Min Latitude: Max Latitude: Min Longitude: Max Longitude:

Continent: Country: Region:

General

Service Availability Days:

Sensing period

Select the sensing period of the data that will be used. The period can be maximum one year!

From: To: Except Month:

Additional data specifications

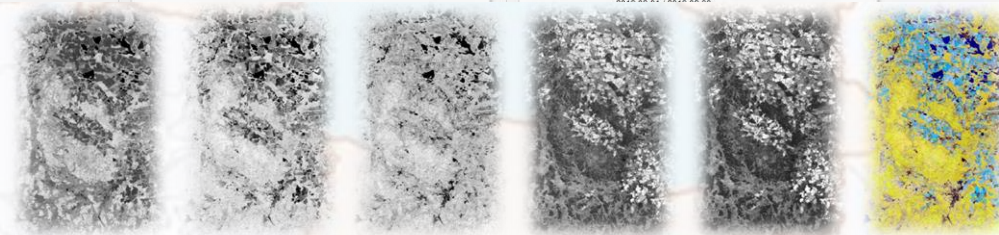
Detail here any other complementary information about the selection of your datasets.

BlackSea

Dashboard

Service user request

<p>Test 2 D</p> <p>Period: 2022-05-01 / 2022-05-11</p> <p>Services: L3B Vegetation Status, L3 S1 Composite, L3 Indicators Composite</p> <p>Status: Unknown</p> <p><input type="button" value="Details"/> <input type="button" value="Cancel processors"/> <input type="button" value="Finalize request"/> <input type="button" value="Get support"/> <input type="button" value="Report incident"/></p>	<p>Test Dd</p> <p>Period: 2022-03-01 / 2022-03-11</p> <p>Services: L3B Vegetation Status, L3 S1 Composite, L3 Indicators Composite</p> <p>Status: Unknown</p> <p><input type="button" value="Details"/> <input type="button" value="Cancel processors"/> <input type="button" value="Finalize request"/> <input type="button" value="Get support"/> <input type="button" value="Report incident"/></p>
<p>Test_1_zi_ro</p> <p>Period: 2022-02-09 / 2022-02-10</p> <p>Services: L3B Vegetation Status</p> <p>Status: Error</p> <p><input type="button" value="Details"/> <input type="button" value="Cancel processors"/> <input type="button" value="Finalize request"/> <input type="button" value="Get support"/> <input type="button" value="Report incident"/></p>	<p>Request_1_zi</p> <p>Period: 2022-02-09 / 2022-02-10</p> <p>Services: L3B Vegetation Status</p> <p>Status: Error</p> <p><input type="button" value="Details"/> <input type="button" value="Cancel processors"/> <input type="button" value="Finalize request"/> <input type="button" value="Get support"/> <input type="button" value="Report incident"/></p>
<p>Test_Bals</p>	<p>Req_oh_1feb</p>



NDVImin

NDVI med

NDVI max

NDVI rng

NDVIstd

NDVIfc

Black Sea – CreoDIAS via NoR

- Large scale demonstration implemented – use of cloud infrastructure inevitable
- Long time-series processed – direct access to Sentinel archives makes it feasible
- High computation requirements – automation, distributed computing and server clustering
- Production tools deployed on the cloud – open-source based, cloud agnostic (docker)
- Innovative EO data processing workflows – AI method, Analysis Ready Data, Big Data

Conclusion:

Cloud computational infrastructures combined with scalable analytical platform capabilities represent a modern viable solution for operational EO data processing and analysis

Applications



Precision
farming

2

Forest
management

4



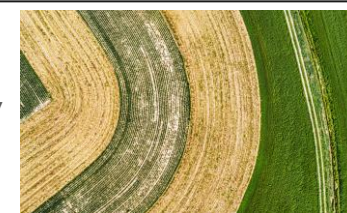
CAP Support

3



Land
Inventory

1





Georgia Long Term Land Use and Land Inventory

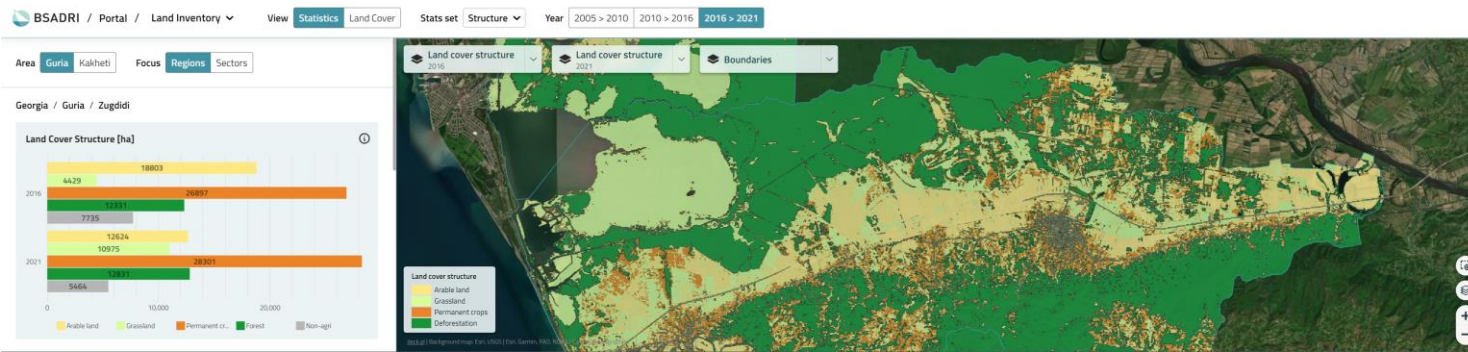
01

- Aims to facilitate land use classification from HR data
- Primary data source S2 and Landsat
- Allows accounting of balance between temporal horizons (5 year)

Institutional reform

...Data gap on agricultural and arable land...

Service extension



Precision Farming

02

- Demonstrate operational agricultural services supporting variable farming management

Products:

Historical time-series analysis of crop spatial and temporal variability, monitoring crop growth in the current season

- Support to soil sampling optimization
- Variable sowing and fertilization
- Pest and disease control
- Smart irrigation



CAP support

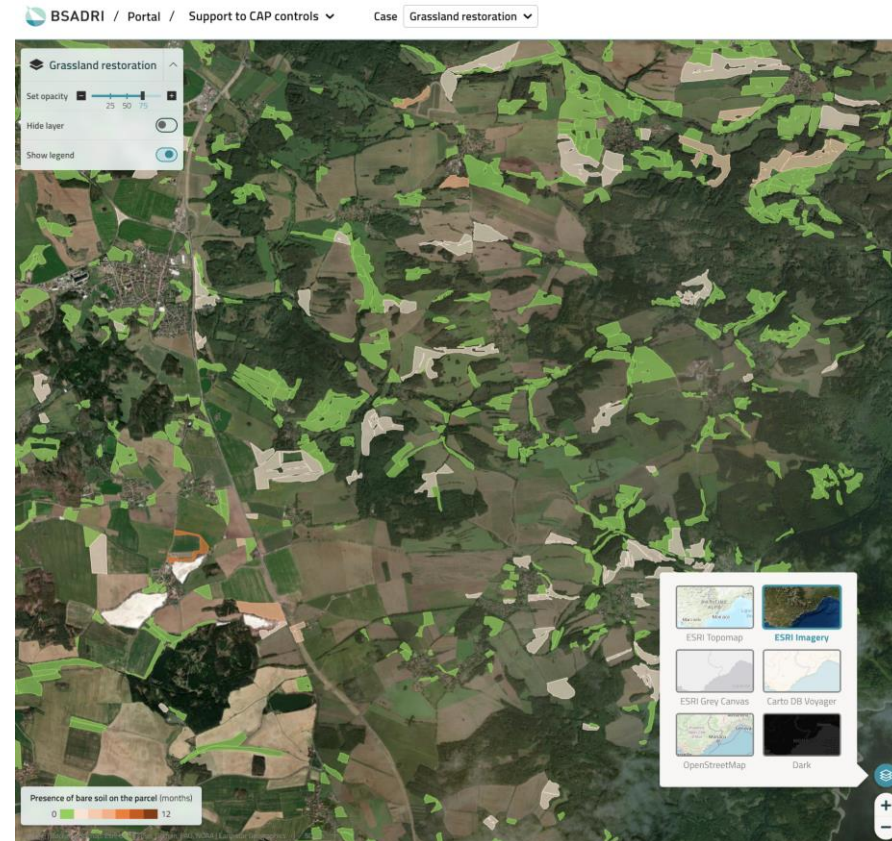
03

- Demonstrate how EO data can be applied to support the compliance checks of CAP subsidy applications

Products:

Monitoring of grassland ploughing, monitoring of crop growing season dynamics to assess the impacts of agricultural drought

- **Implementation of Checks by monitoring**
- **Reducing costs and burden (by automation and limited field visits), increasing fairness (by avoiding sampling)**



Forest management

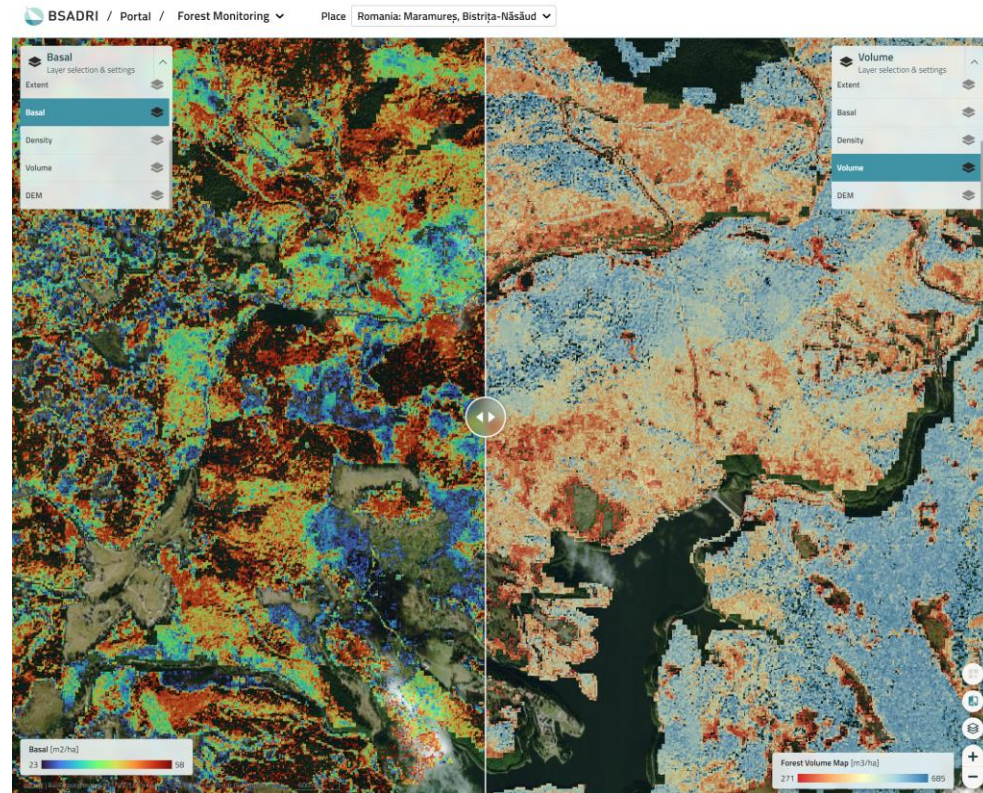
04

- Forest inventory and management from remote sensing Sentinel 2 products for the Carpathian region in Romania

Products:

footprint map, density map, basal area map, volume map

- **Forest inventories**
- **Monitoring** the effect of disturbances
- **Forest operations planning**



Synthesis & Conclusions

- 01 | **Common data basis** – free and open - **Sentinel 1,2** & Landsat
- 02 | Mostly based on operationally available **open source tools**
- 03 | **Data & Services** at one place
- 04 | **Scalability**
- 05 | **Applications** - real operational use cases

- 05 | **Outlook** – portal perspective, additional services, relation to other regional platforms



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