The Regional Data Hub of GEO-CRADLE and the BEYOND Data Platforms in support to the data exploitation platform concept

Alexia Tsouni
National Observatory of Athens

Bucharest, 11/10/2018

Why data exploitation platforms?

The continuous provision of **useful, accurate and timely information** through coordinated and sustained **Earth Observation** together with INSPIRE data, Copernicus, and GCI information

is a **key enabler**

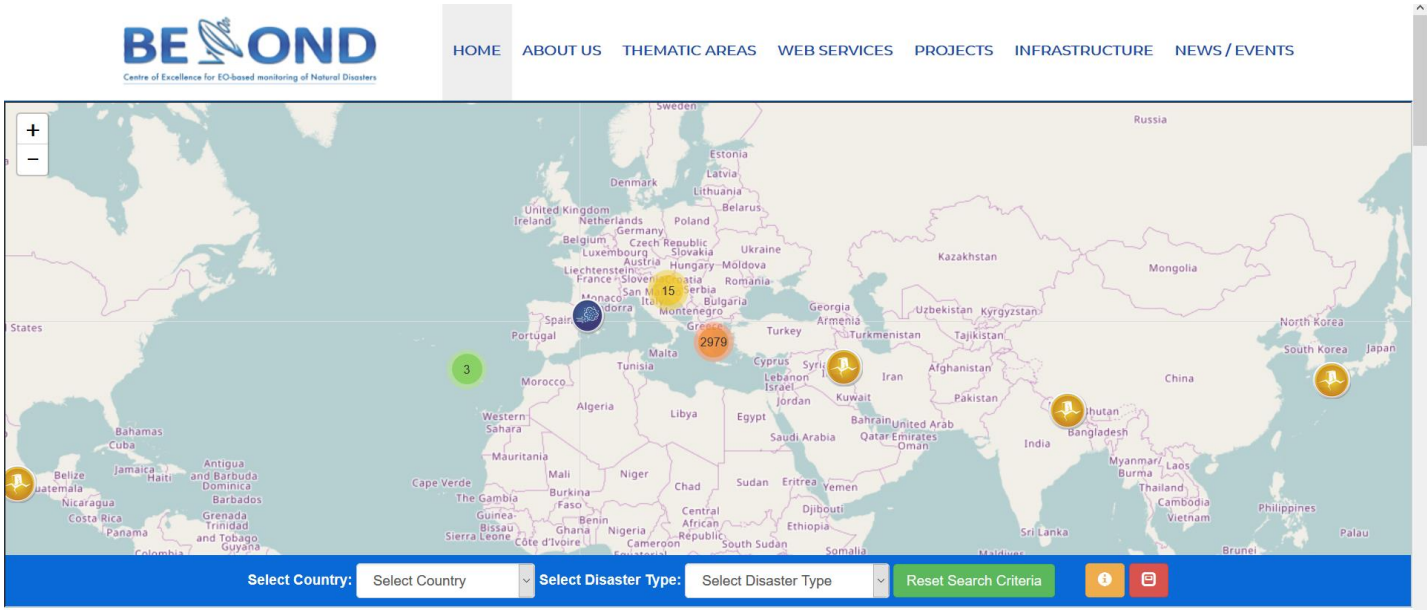
for **informed decision making**, in response to regional challenges and towards the achievement of the **UN SDGs** and the implementation of relevant **EU Directives**.

The BEYOND contribution

http://beyond-eocenter.eu/

COPERNICUS & SPACE APPLICATIONS

11-12 October 2018 | Bucharest, Romania



The BEYOND Center of Excellence develops research and provides EO-based disaster management services addressing priorities and needs from South Eastern Europe to worldwide.

The Center's creation was supported by EU FP7-REGPOT-2012-2013-1 and costed 2,3 Meuros.

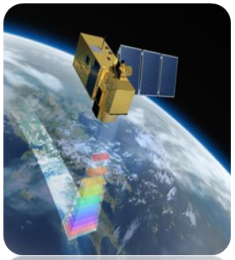
BEYOND

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The BEYOND contribution
State-of-the-art systems

Monitoring Systems

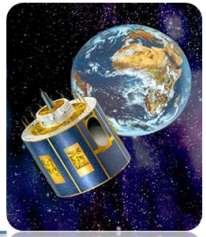


Polar orbit satellites

X-/L-band Station

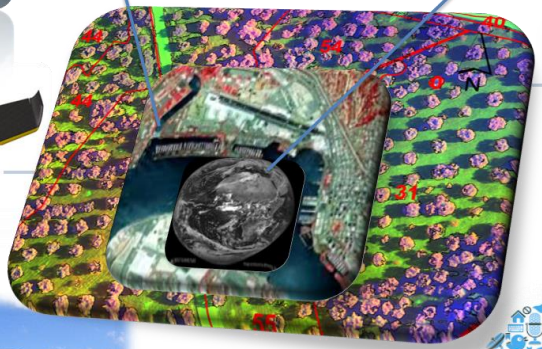
Sentinel Mirror Site

DATA → ANALYSIS → INFORMATION



Geostationary orbit satellites

MSG Seviri



in-situ

In-situ platforms & networks

UAVs

CRADLE

BEYOND

ΕΘΝΙΚΟΝ ΑΣΤΕΡΟΣΚΟΠΕΙΟΝ ΑΘΗΝΩΝ
NATIONAL OBSERVATORY ATHENS

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The BEYOND contribution
State-of-the-art systems

COPERNICUS & SPACE APPLICATIONS

11-12 October 2018 | Bucharest, Romania

BEYOND SATELLITE ACQUISITION FACILITIES 3RD PARTY MISSIONS

Polar orbit satellites, X-/L-band - 300TB Archive, Operation 24/7
EOS AQUA, TERRA, SUOMI NPP, NOAA/AVHRR, METOP, FY.

CRADLE

BEYOND

ΕΘΝΙΚΟΝ ΑΣΤΕΡΟΣΚΟΠΕΙΟΝ ΑΘΗΝΩΝ
NATIONAL OBSERVATORY ATHENS

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The BEYOND contribution
State-of-the-art systems

Operates two **MSG acquisition stations of DVB-S & DVB-S2 systems**

Exploit high throughput provided with the new EUMETCast Europe service, based on using the EUTELSAT 10A

part of EUMETSAT's network

BEYOND GEOSYNCHRONOUS SATELLITE ACQUISITION FACILITIES 3RD PARTY MISSIONS

3 geostationary satellites MSG1-2-3
Data collection per 5 minutes

CRADLE

BEYOND

GROUP ON EARTH OBSERVATIONS

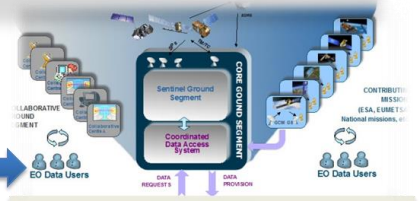
Copernicus

The BEYOND contribution
State-of-the-art systems

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

Hellenic National Sentinel Data Mirror Site / ESA-NOA Agreement

BEYOND SERVES Copernicus
The European Earth Observation Programme



Distributes 150-200 GB/day
Operates non-stop 24/7
Powered by the GRNET/GEANT Network Speed 150-200 Mbps
250 Users in South-East Europe

CRADLE BEYOND NATIONAL OBSERVATORY ATHENS GEO GROUP ON EARTH OBSERVATIONS Copernicus

The BEYOND contribution
State-of-the-art systems

International Sentinel DataHub

COPERNICUS DATA HUB
Operations Center

grnet

serco

Copernicus esa

SENTINELS GREEK HUB

NASA

NOAA

USGS

ARSE

Distributes 55 TB/day
Operates non-stop 24/7/365
Powered by GRNET/GEANT
Network Speed 500-700 Mbps

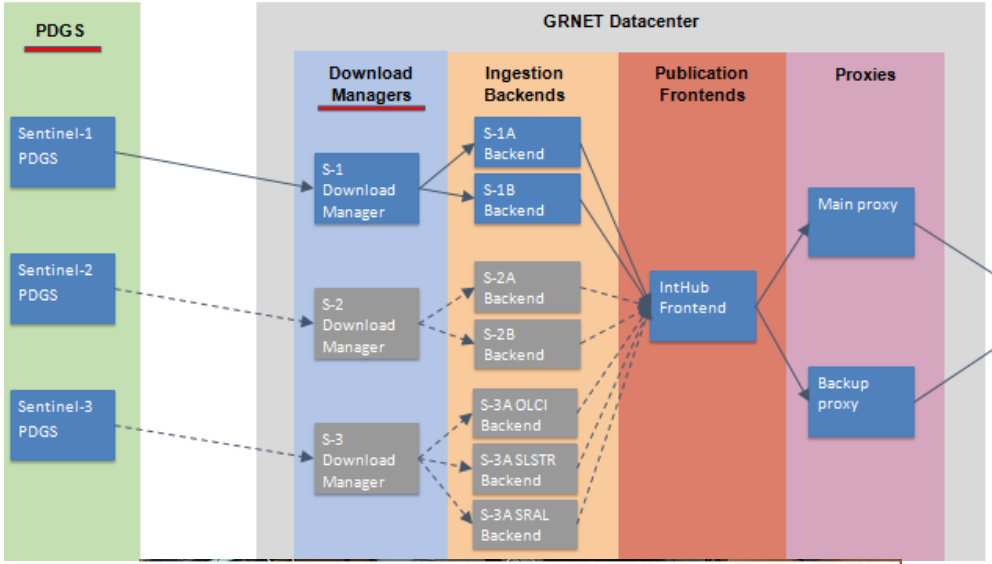
GEO CRADLE

BEYOND

GROUP ON EARTH OBSERVATIONS

Copernicus

The BEYOND contribution
State-of-the-art systems



58 Virtual Machines:

- **~1 TB RAM**
- **~530 virtual CPUs**
- **~4.5 TB disk storage**

A **550 TB** network filesystem for storing > **500 thousand** Sentinel products at any time

- ❑ **INTHUB #1**
- ❑ **COLHUB #3**
- ❑ **DIASHUB #3**
- ❑ **AfricaCastHub**
- ❑ **S-5p PreOps Hub**
- ❑ **S-5p Expert Users Hub**
- ❑ **TMPHUB #1**
- ❑ **HNSDMS**

COPERNICUS DATA HUB Operations Center

grnet serco esa Copernicus

CRADLE BEYOND

GROUP ON EARTH OBSERVATIONS Copernicus

The BEYOND contribution
State-of-the-art services

- InSar based Crust deformation mapping
- Small scale deformation rates - PS SAR Processing
- Landslide modeling
- Earthquake modeling
- Volcanic/Lava modeling
- Soil/Coastal Erosion models

GeoHub Services

FireHub Services

- Fire spread modeling
- Fire risk analysis
- EO Active Fire Mapping
- EO Burn Scar Mapping (Rapid/Seasonal)

AirHub Services

- Dust circulation modeling
- Smoke dispersion modeling
- Toxic gases dispersion modeling (industrial accidents)

FloodHub Services

- EO based Flood Mapping
- Flood Modeling
- Hydraulic Modeling

CRADLE

BEYOND

GROUP ON EARTH OBSERVATIONS

Copernicus

The BEYOND contribution
State-of-the-art services

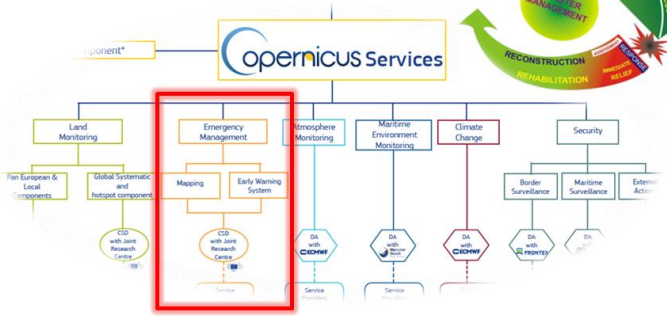
COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

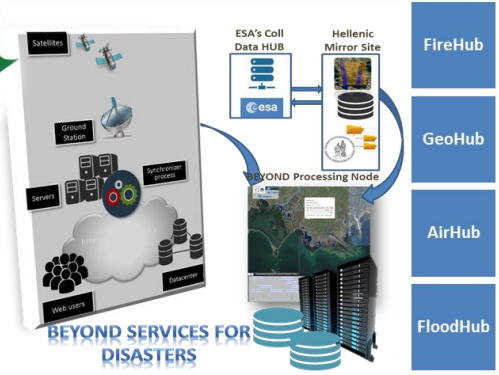
The role of the BEYOND EO Center of Excellence in the European EO Programme Copernicus for emergency management worldwide: Prevention - Preparedness - Risk Assessment - Response - Mitigation

Regulation (EU) No 377/2014 - Copernicus

Copernicus Work Programme

Sendai Framework (UN)
for Disaster Risk Reduction 2015-2030





CRADLE

BEYOND

NATIONAL OBSERVATORY ATHENS

GEO GROUP ON EARTH OBSERVATIONS

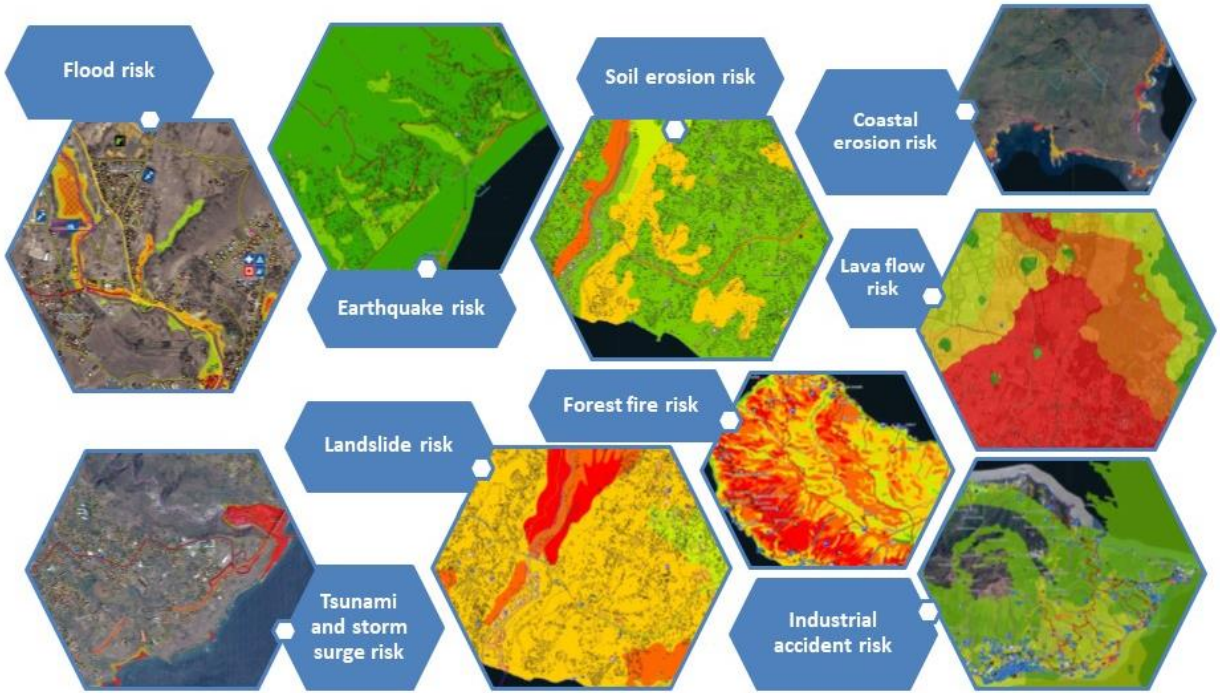
opernicus

The BEYOND contribution
State-of-the-art services

COPERNICUS EMERGENCY MANAGEMENT SERVICE

The BEYOND contribution
State-of-the-art services

COPERNICUS EMERGENCY MANAGEMENT SERVICE



BEYOND

The GEO-CRADLE contribution

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

GEO-CRADLE coordinates and integrates state-of-the-art EO activities in the regions of **North Africa, Middle East, and Balkans** (NAMEBA) and develops links with GEO related initiatives towards GEOSS, contributing amongst others to:

Euro GEOSS

AfriGEOSS

GEO-CRADLE brings together **key players** representing the **entire EO value chain** and promotes the uptake and exploitation of innovative EO activities in NAMEBA through:

- ✓ **Cooperation**
- ✓ **Awareness raising**
- ✓ **Capacity building**
- ✓ **Open data sharing principles**
- ✓ **Interoperability**

http://geocradle.eu

The **GEO-CRADLE** project has received funding from the European Union's **Horizon 2020** research and innovation programme under grant agreement No 690133

GEO CRADLE

BEYOND

ΕΘΝΙΚΟΝ ΑΣΤΕΡΟΣΚΟΠΕΙΟΝ ΑΘΗΝΩΝ · NATIONAL OBSERVATORY ATHENS

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

GEO-CRADLE thematic areas vs

SUSTAINABLE DEVELOPMENT GOALS

Adaptation to Climate Change (ACC)

Improved Food Security – Water Extremes Management (IFS-WEM)

Access to Raw Materials (ARM)

Access to Solar Energy (SENSE)

GEO CRADLE

BEYOND

ΕΘΝΙΚΟΝ ΑΣΤΕΡΟΣΚΟΠΕΙΟΝ ΑΘΗΝΩΝ
NATIONAL OBSERVATORY ATHENS

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE outputs

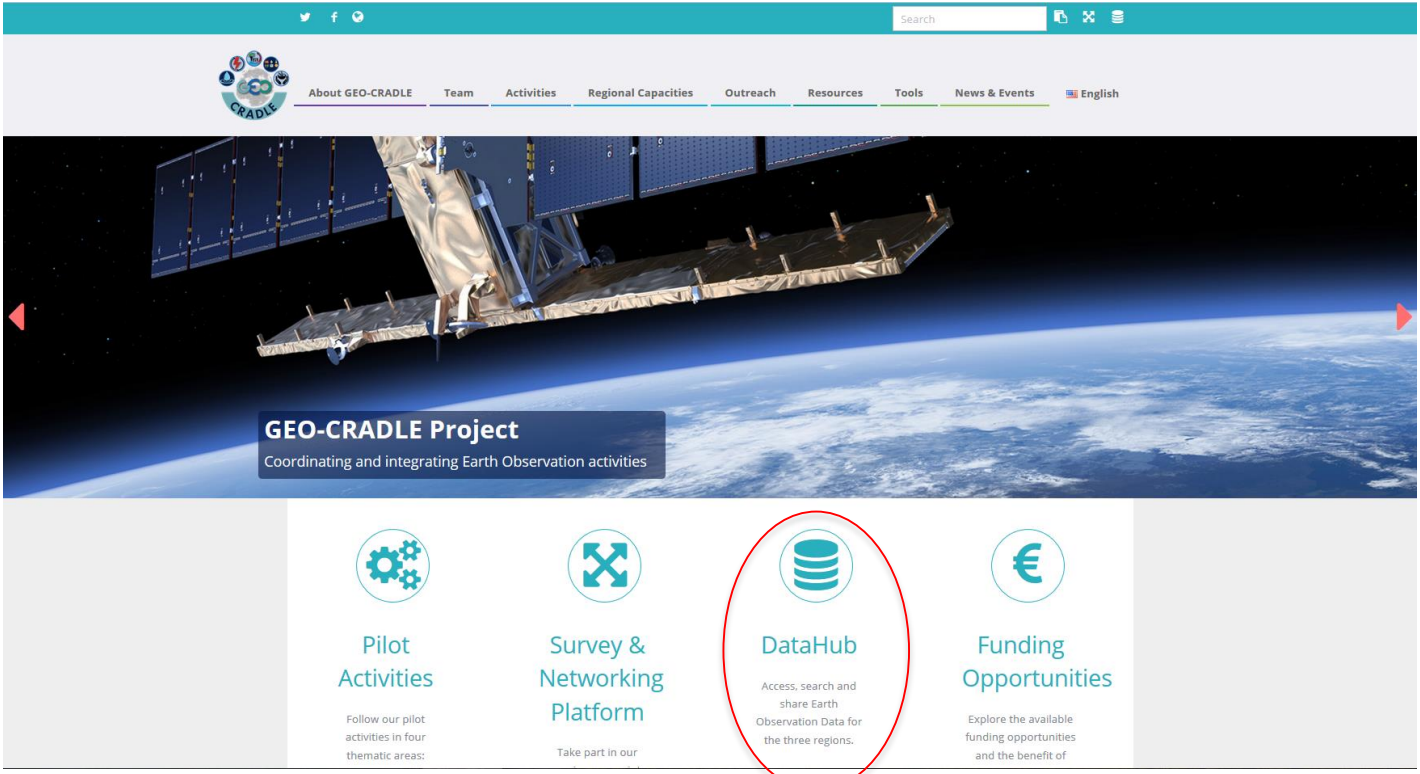
16 regional workshops

Networking platform with >200 stakeholders from 29 countries

CRADLE BEYOND GEO GROUP ON EARTH OBSERVATIONS Copernicus

The GEO-CRADLE portal
http://geocradle.eu

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



BEYOND

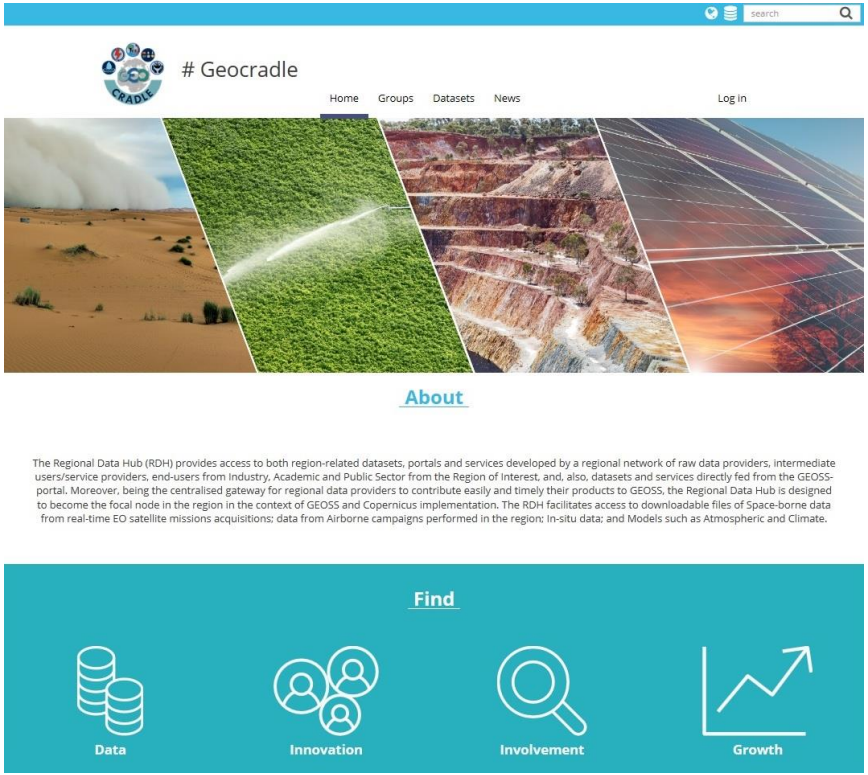
GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub

http://datahub.geocradle.eu/

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

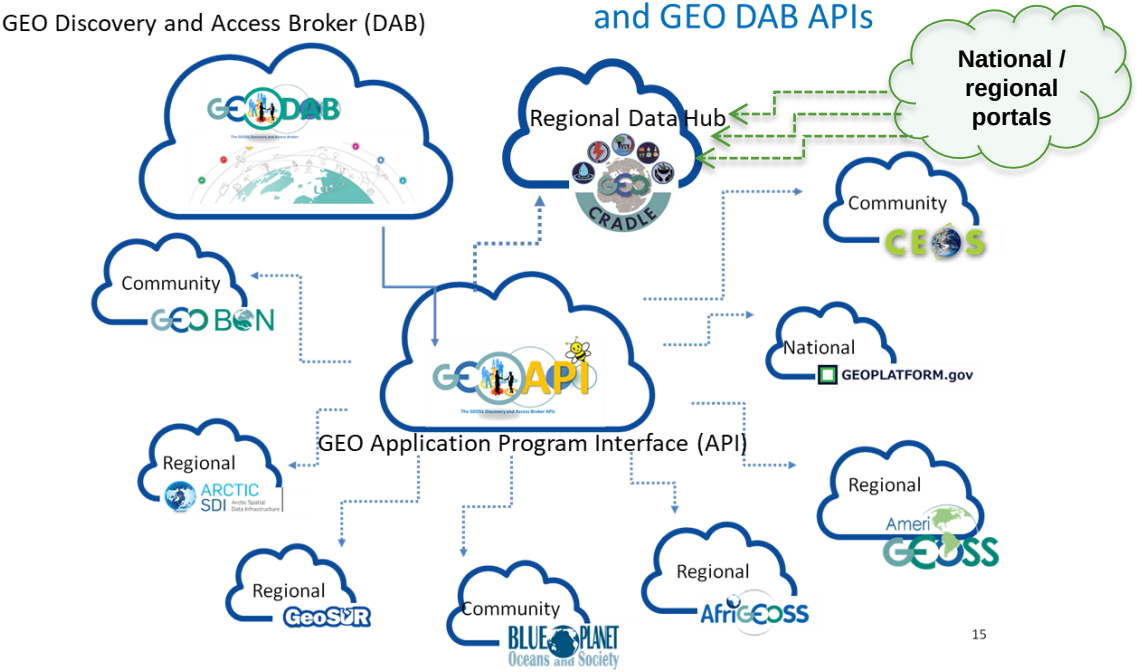


Stable service and full interoperability with GCI and GEO DAB APIs, as well as connection with data available through the project pilots.

The GEO-CRADLE Regional Data Hub Users / GEO Portals

GROUP ON EARTH OBSERVATIONS

National, regional or thematic community portals, leveraging GEOSS Common Infrastructure (GCI) resources and GEO DAB APIs



CRADLE BEYOND GEO GROUP ON EARTH OBSERVATIONS Copernicus

The GEO-CRADLE Regional Data Hub Design and operation

✓ **The GEO-CRADLE RDH is designed and operates as the focal node in the region in the context of GEOSS and Copernicus implementation.**

- It is an open data web management tool / portal (developed using web technologies such as PHP, HTML5, JavaScript, CSS, etc.) that provides access to region-related datasets and services, directly fed from GCI, and at the same time being the central gateway for regional data providers to contribute easily and timely their products to GEOSS.

- It advances the current state of the art by integrating DKAN, which is a complementary implementation of CKAN (Comprehensive Knowledge Archive Network) over Drupal/PHP, with the GEO DAB APIs. DKAN CMS (Content Management System) is an open-source data management platform that treats data as content, facilitating the subsequent publication, management, and maintenance of these, no matter the administration team, its size and level of technical expertise.

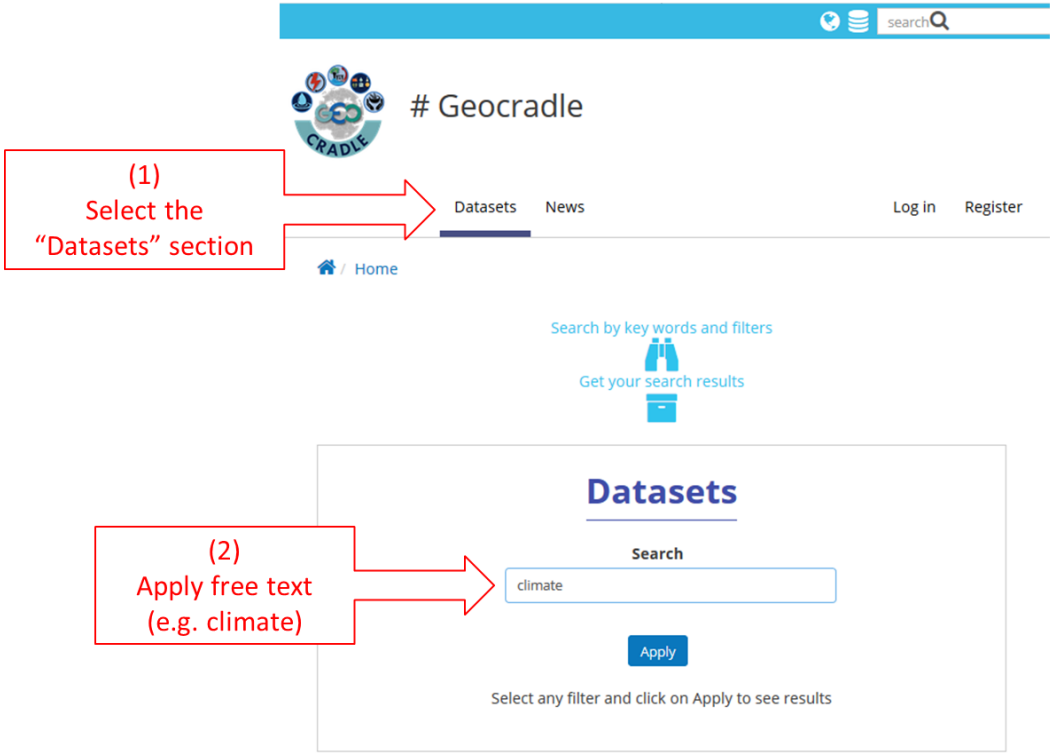
The GEO-CRADLE Regional Data Hub Achievements

✓ Several **achievements** were accomplished for the RDH to be able to provide its users the functionalities described above:

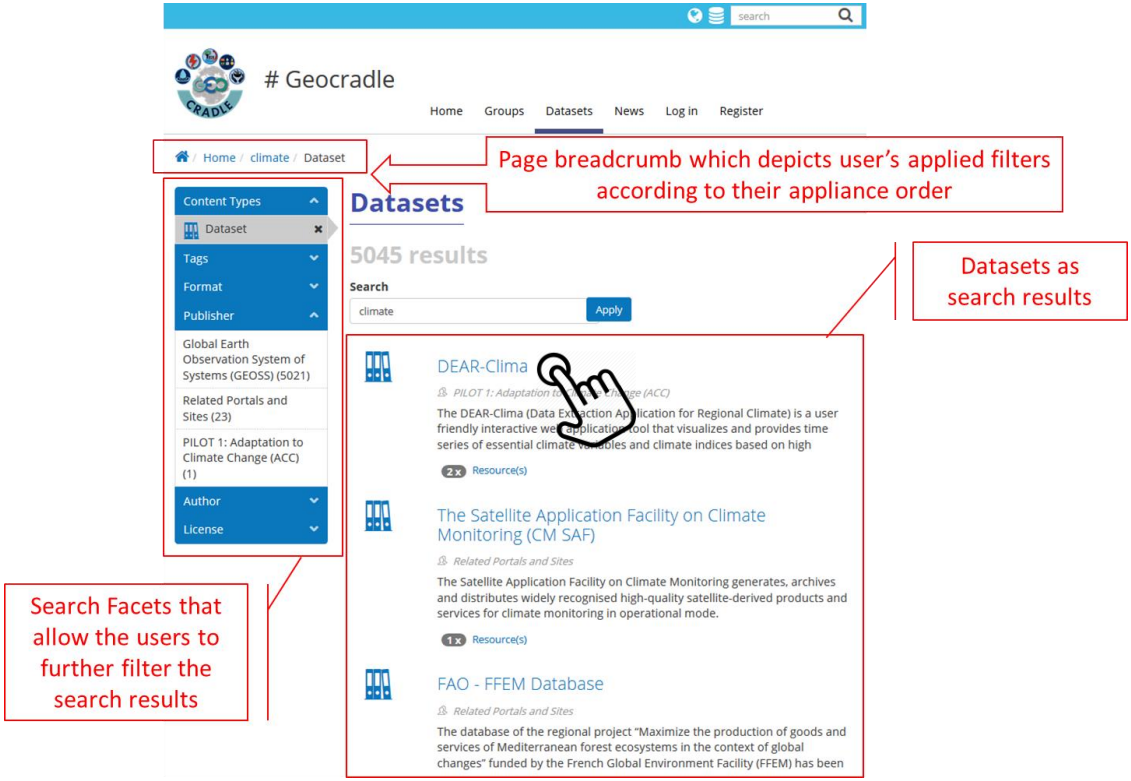
- Search in multiple sources (although by default DKAN looks up for datasets and resources in a single local database).
- Search for datasets in remote resources (integration of the GEO DAB APIs in the DKAN environment).
- Display the remote datasets and resources on-the-fly and with high performance (using a rendering cache mechanism which also implements an Adaptive Time-to-Live consistency mechanism to periodically check the consistency of the cached rendering structures with the original data to assure that users do not receive stale data).
- Cleaning data mechanism (cleans identical or duplicate data, discovers missing information for data, discovers URL that have changed or that are not working anymore, discards data with invalid URL schemes, etc.)
- Preview mechanism (to preview data of various formats and services, such as CSV files, Web Map Services, Zip files, etc.)

An integrated Search and Display mechanism that offers the users unified, centralized and user-friendly interface.

The GEO-CRADLE Regional Data Hub Search examples



The GEO-CRADLE Regional Data Hub Search examples



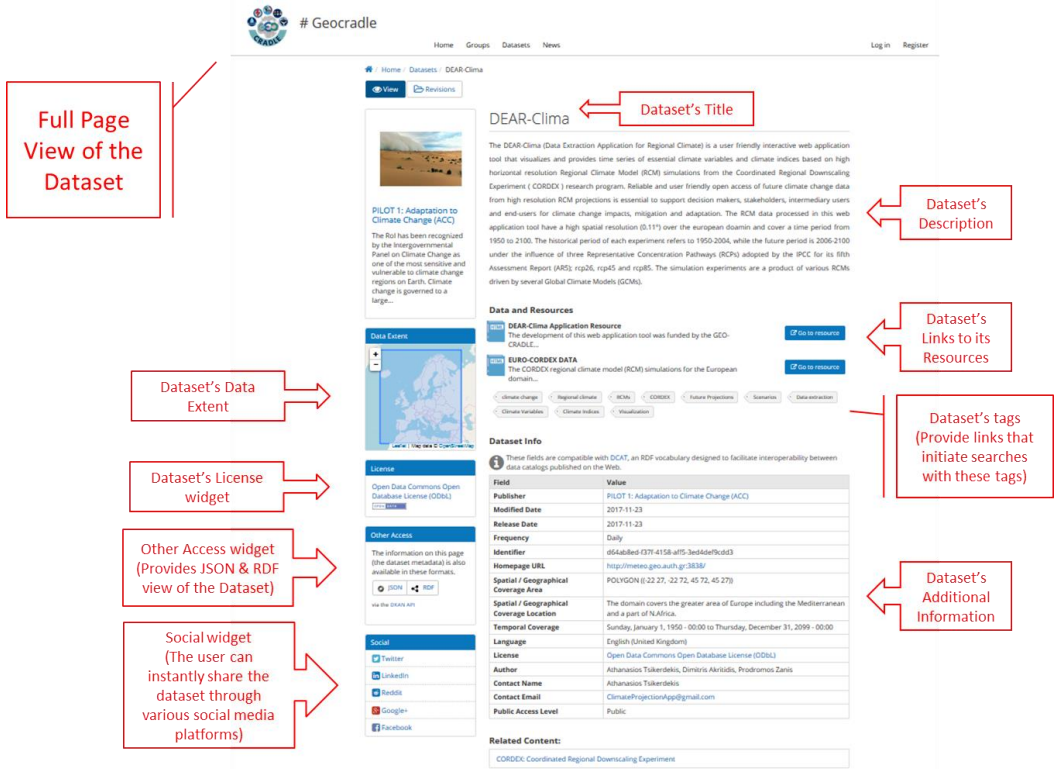
BEYOND

GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub Search examples

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



The GEO-CRADLE Regional Data Hub
Data & Data Providers

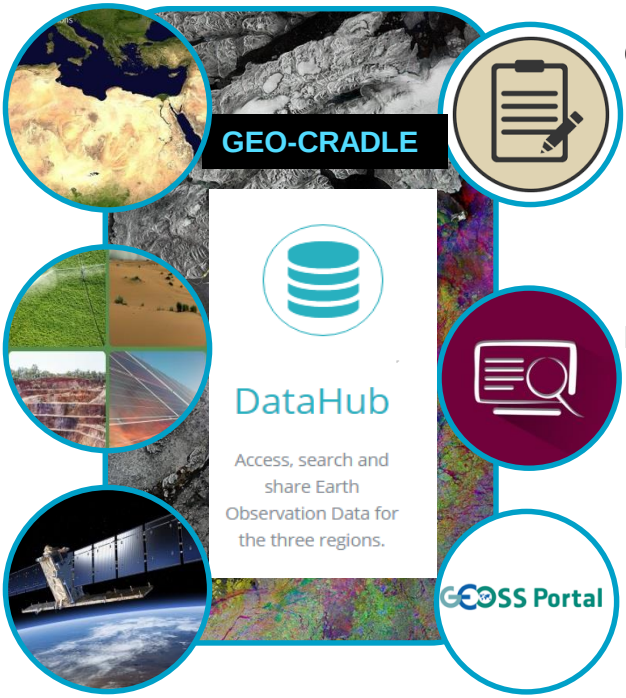
COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

DATA

Regions of Interest
- Balkans
- Middle East
- North Africa

Thematic Areas
- Climate Change
- Food Security & Water Extremes
- Raw Materials
- Energy

EO Data Categories
- Space borne
- Ground based
- Modelling



DATA PROVIDERS

GEO-CRADLE Survey
- 10 national portals and sites

National portals **in total**: 42

Desk Research
- 32 national portals and sites
- 12 continental and global portals and sites

GEOSS Portal
- 25,216,989 datasets

BEYOND
GROUP ON EARTH OBSERVATIONS
Copernicus

The GEO-CRADLE Regional Data Hub
National sites and portals in numbers

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

	Adaptation to Climate Change	Improved Food Security and Water Management	Better access to Raw Materials	Better access to Energy	Total Number of Portals per RoI (unique)
Balkans	16	17	8	3	23
Middle East	6	8	1	2	18
North Africa	0	1	0	0	1
Total Number of Portals per Thematic Area	22	26	9	5	Total number of portals and sites: 42

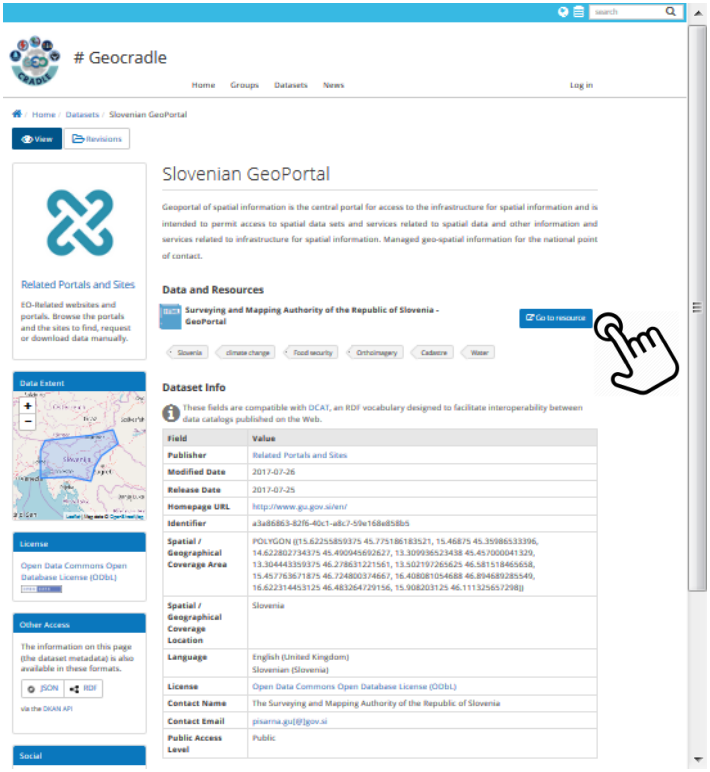
GEO CRADLE | BEYOND | GROUP ON EARTH OBSERVATIONS | Copernicus

The GEO-CRADLE Regional Data Hub Prioritised Portals

a/a	Portals	Brokered by GEOSS
1.	Danube Reference Data and Services Infrastructure (DRDSI)	Done
2.	Eusoils	In progress
3.	Albania - GEOportal	Pending
4.	Montenegro - GEOportal	Pending
5.	Croatia - GEOportal	Pending
6.	Moldova - National geospatial data of Moldova	In progress
7.	FYROM – Soil information system	Pending
8.	Bosnia & Herzegovina - GEOportal	Pending
9.	REP of SRPSKA - GEOportal	Pending
10.	Slovenia- Portal and Forest Data Viewer	Done
11.	Cyprus - Geoportal	In progress
12.	Cyprus - Air quality	In progress
13.	United Arabic Emirates - Abu Dhabi Geospatial Portal and Map Viewer	Pending
14.	Poland - Central geological Db	Pending

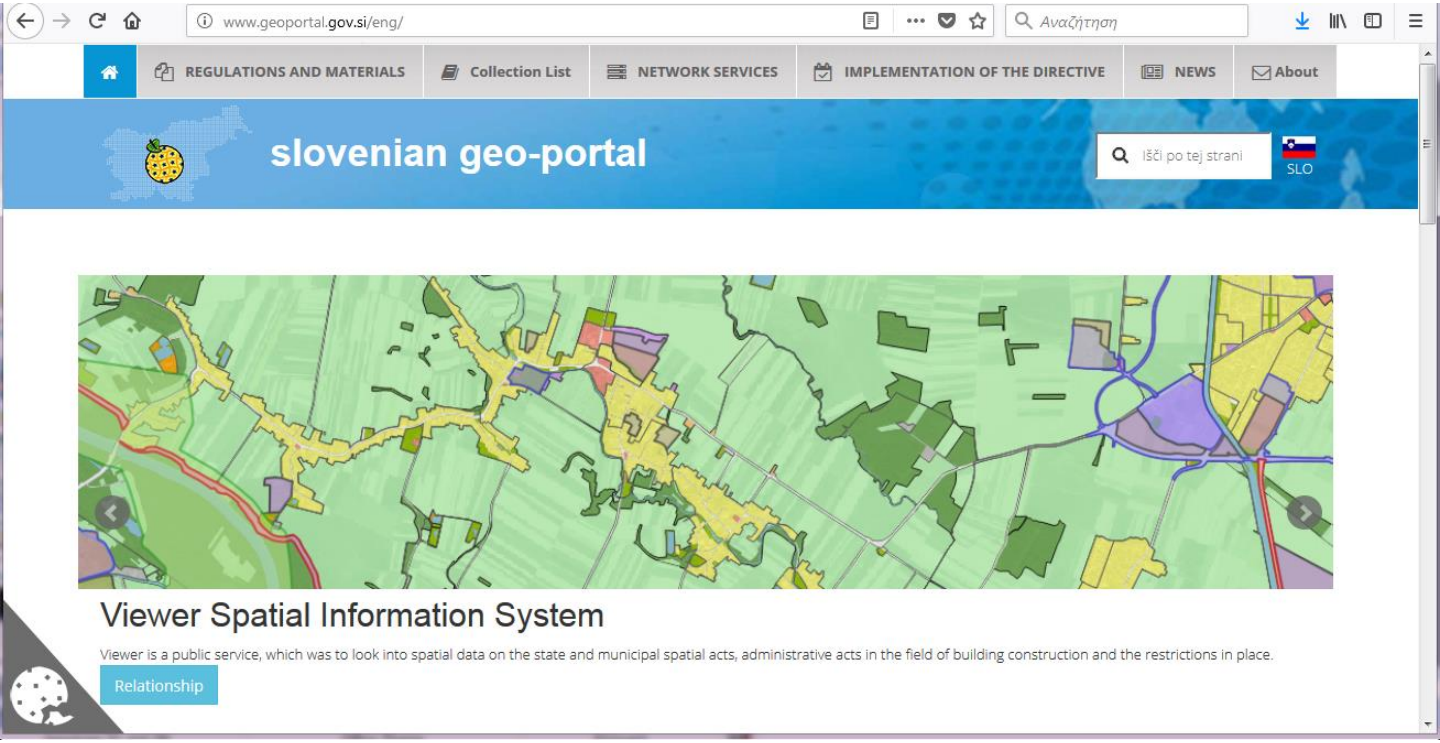
The GEO-CRADLE Regional Data Hub
INSPIRE-compliant example

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



The GEO-CRADLE Regional Data Hub
INSPIRE-compliant example

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

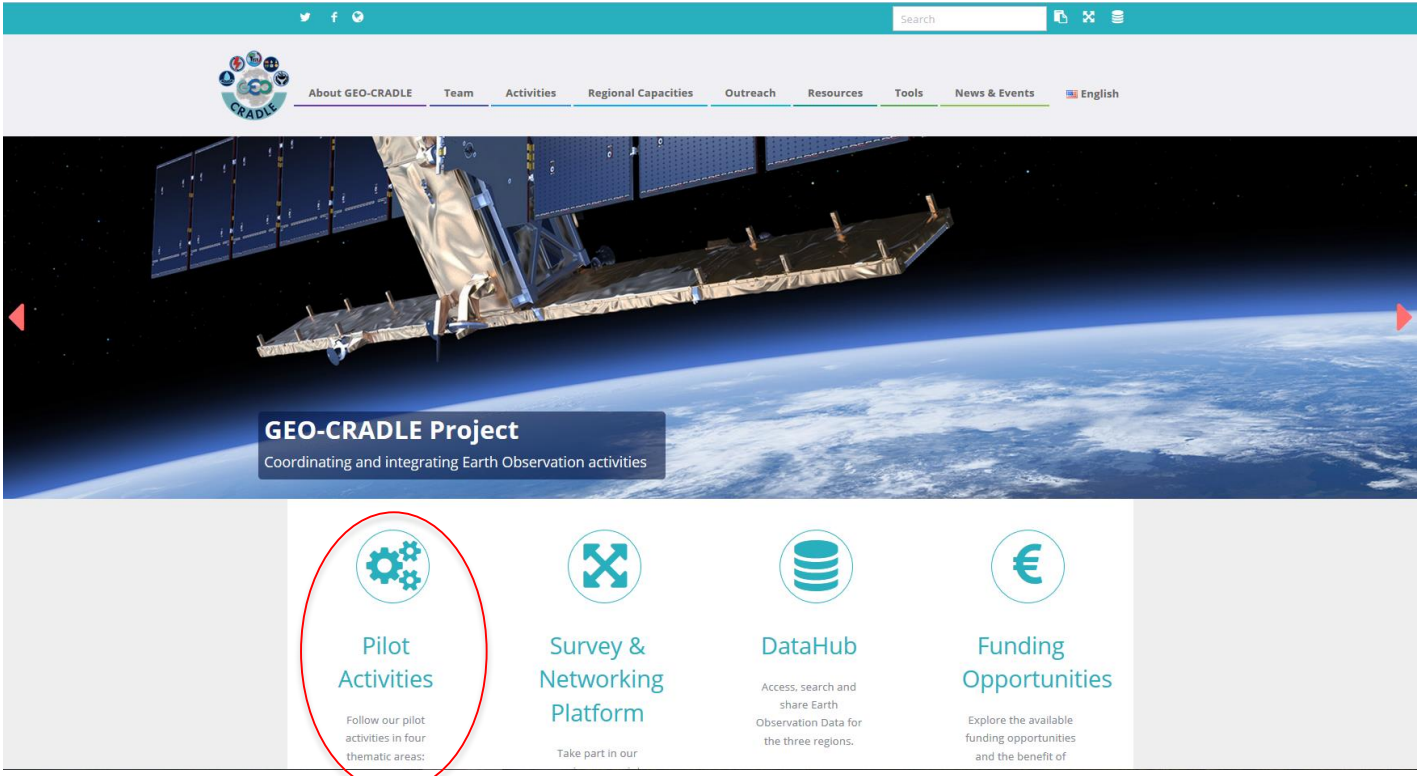


GEO-CRADLE
BEYOND
NATIONAL OBSERVATORY ATHENS
GEO GROUP ON EARTH OBSERVATIONS
Copernicus

The GEO-CRADLE Regional Data Hub Pilot activities

COPERNICUS & SPACE APPLICATIONS

11-12 October 2018 | Bucharest, Romania



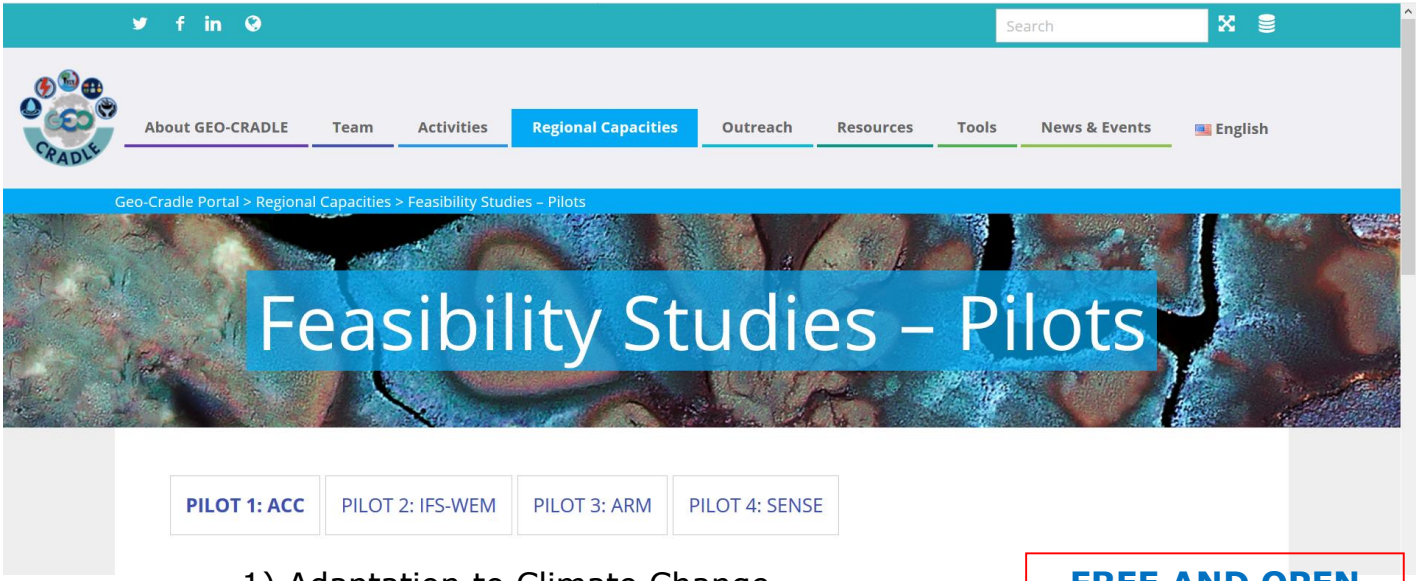
BEYOND

GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub Pilot activities

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



1) Adaptation to Climate Change
2) Improved Food Security – Water Extremes Management
3) Access to Raw Materials
4) Access to Solar Energy

FREE AND OPEN ACCESS TO ALL PILOTS' DATASETS AND SERVICES

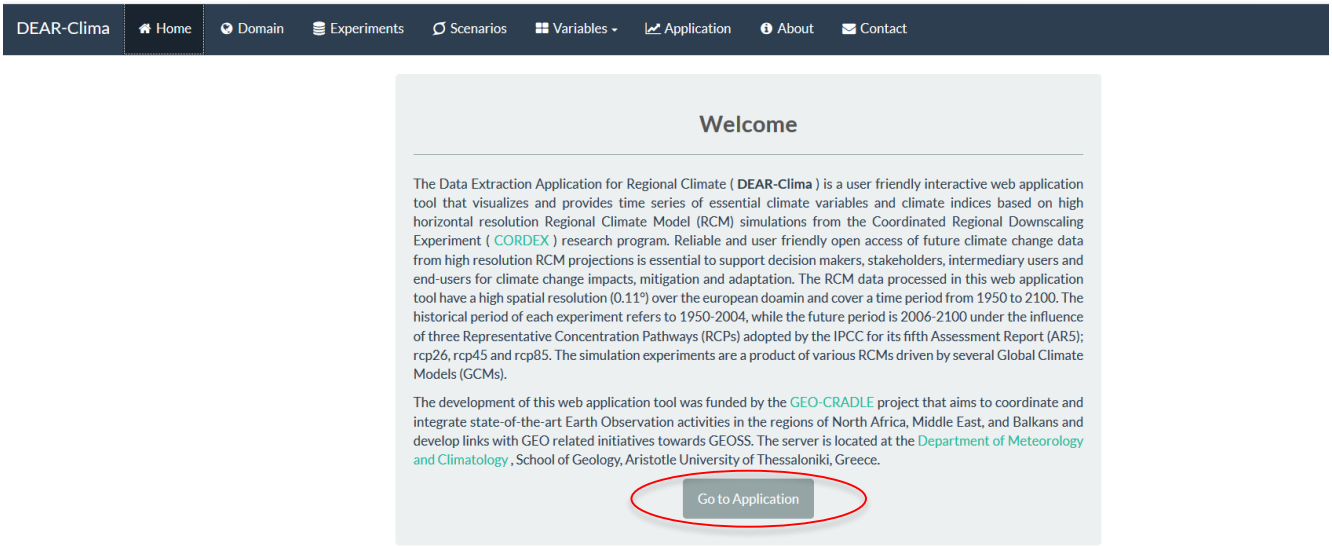
BEYOND

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



http://meteo3.geo.auth.gr:3838

CRADLE

Aristotle University of Thessaloniki

CRADLE

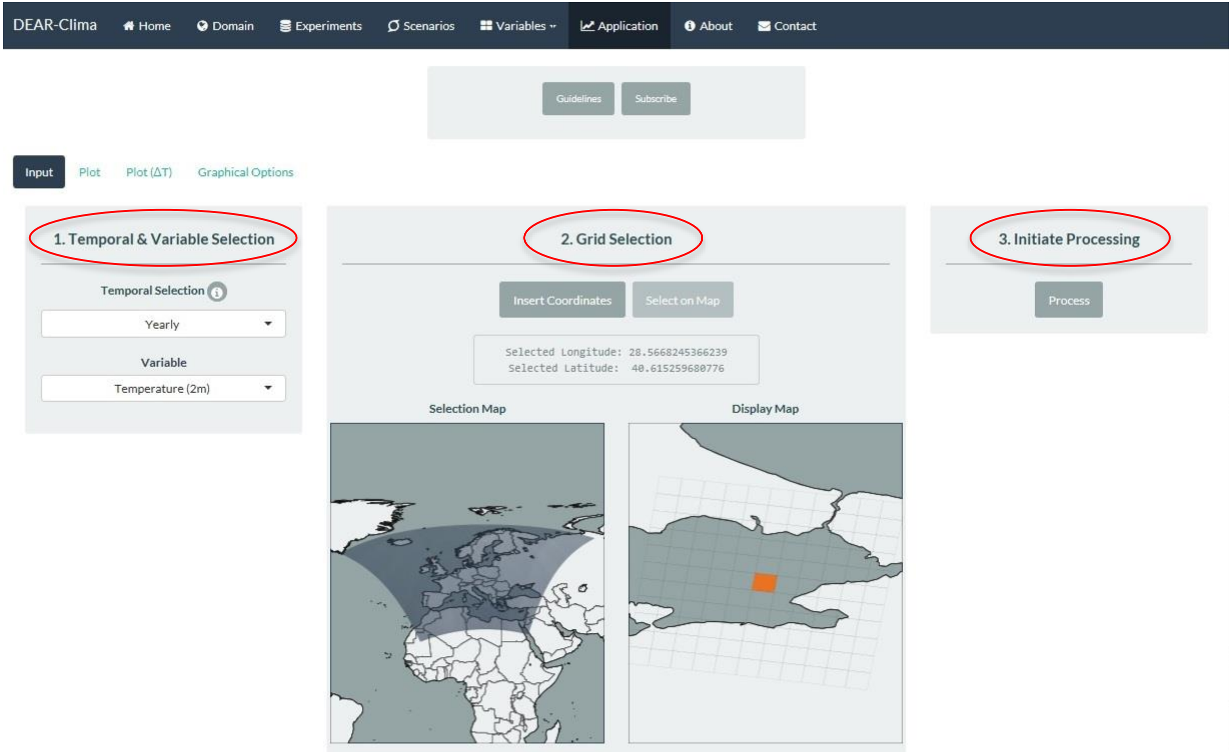
BEYOND

NATIONAL OBSERVATORY ATHENS

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change


DEAR-Clima
Home
Domain
Experiments
Scenarios
Variables
Application
About
Contact
Guidelines
Subscribe
Input
Plot
Plot (ΔT)
Graphical Options
1. Temporal & Variable Selection
Temporal Selection
Yearly
Variable
Temperature (2m)
2. Grid Selection
Insert Coordinates
Select on Map
Selected Longitude: 28.5668245366239
Selected Latitude: 40.615259680776
Selection Map
Display Map
3. Initiate Processing
Process

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

DEAR-Clima | Home | Domain | Experiments | Scenarios | Variables | Application | About | Contact

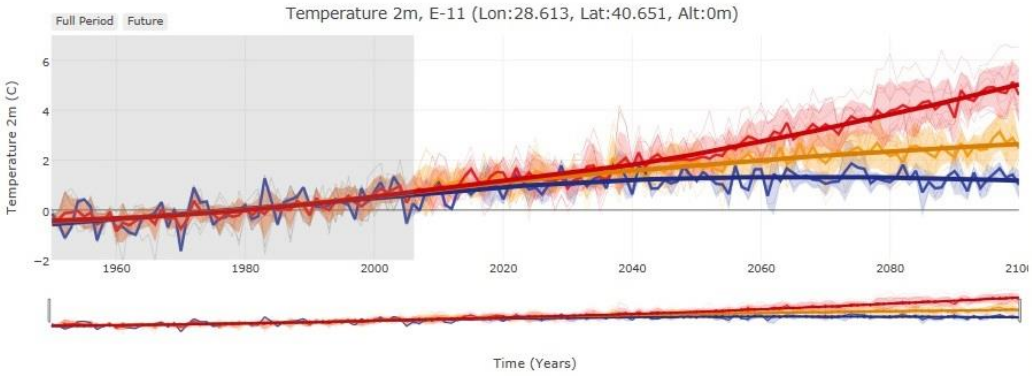
Guidelines | Subscribe

Input | Plot | Plot (ΔT) | Graphical Options

Download

.csv (ΔT)

Hints: Drag-and-drop to zoom into a specific period. Return back to the initial stage by double clicking anywhere in the plot area. Change the displayed features using the **Graphical Options** panel. The ΔT plot is calculated by subtracking the mean value of the historical period 1960-1990 from all the values of the historical, rcp26, rcp45 and rcp85 experiments.



GEO CRADLE | BEYOND | National Observatory of Athens | GEO Group on Earth Observations | Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

Organized by the
National Observatory of Athens

The goal

PRE-TECT is an atmospheric experiment organized by the National Observatory of Athens in the framework of the ACTRIS. The experiment will take place from 1st 30th April 2017, aiming to advance desert dust characterization from remote sensing measurements. It will employ advanced inversion techniques developed in the framework of ACTRIS, focusing on aerosol absorption and aiming to fulfil the objectives of the ACTRIS JRA1 activity ("Improving the accuracy of aerosol light absorption determinations"). The specific aim of the campaign is to validate the remote sensing retrievals against surface and airborne in-situ measurements. The campaign is framed by a number of parallel activities. Learn more.

http://pre-tect.space.noa.gr

BEYOND

GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change

COPERNICUS & SPACE APPLICATIONS

11-12 October 2018 | Bucharest, Romania

Select date

17	18	19	20	21	22	23
AERONET	AERONET	AERONET	AERONET	AERONET	CAMS cross-section	AERONET
CAMS cross-section	CAMS cross-section	CAMS cross-section	CAMS cross-section	CAMS cross-section	CAMS maps	CAMS cross-section
CAMS maps	CAMS maps	CAMS maps	CAMS maps	CAMS maps	CAPS PMssa	CAMS maps
CAPS PMssa	CAPS PMssa	CAPS PMssa	CAPS PMssa	CAPS PMssa	Cloud radar	CAPS PMssa
Cloud radar	Cloud radar	Cloud radar	Cloud radar	Cloud radar	Dust forecast	Cloud radar
DREAM-NMM-ECMW	DREAM-NMM-ECMW	DREAM-NMM-ECMW	DREAM-NMM-ECMW	DREAM-NMM-ECMW	Dust forecast (MSG	DREAM-NMM-ECMW
Dust forecast	Dust forecast	Dust forecast	Dust forecast	Dust forecast	Dust forecast at Skin	Dust forecast
Dust forecast (MSG	Dust forecast (MSG	Dust forecast (MSG	Dust forecast (MSG	Dust forecast (MSG	FLEXPART	Dust forecast (MSG
Dust forecast at Skin	Dust forecast at Skin	Dust forecast at Skin	Dust forecast at Skin	Dust forecast at Skin	HALO	Dust forecast at Skin
FLEXPART	FLEXPART	FLEXPART	FLEXPART	FLEXPART	Microwave Radiomet	FLEXPART
HALO	HALO	HALO	HALO	HALO	MSG-Dust	HALO
Microwave Radiomet	Microwave Radiomet	Microwave Radiomet	Microwave Radiomet	Microwave Radiomet	PollyXT	Microwave Radiomet
MSG-Dust	MSG-Dust	MSG-Dust	MSG-Dust	MSG-Dust	PollyXT classification	MSG-Dust
PollyXT	PollyXT	PollyXT	PollyXT	PollyXT	PREDE POM-01	PollyXT
PollyXT classification	PollyXT classification	PollyXT classification	PollyXT classification	PollyXT classification	PSR observations	PollyXT classification
PREDE POM-01	PREDE POM-01	PREDE POM-01	PREDE POM-01	PREDE POM-01	Pyranometer GHI &	PREDE POM-01
PSR observations	PSR observations	PSR observations	PSR observations	PSR observations	Sea salt forecast	PSR observations
Pyranometer GHI &	Pyranometer GHI &	Pyranometer GHI &	Pyranometer GHI &	Pyranometer GHI &	SENSE	Pyranometer GHI &
Sea salt forecast	Sea salt forecast	Sea salt forecast	Sea salt forecast	Sea salt forecast	Smoke forecast	Sea salt forecast
SENSE	SENSE	SENSE	SENSE	SENSE	WRF overview	SENSE
Smoke forecast	Smoke forecast	Smoke forecast	Smoke forecast	Smoke forecast	WRF WIND(...)	Smoke forecast
WRF overview	WRF overview	WRF overview	WRF overview	WRF overview		WRF overview
WRF WIND(...)	WRF WIND(...)	WRF WIND(...)	WRF WIND(...)	WRF WIND(...)		WRF WIND(...)

GEO CRADLE

BEYOND

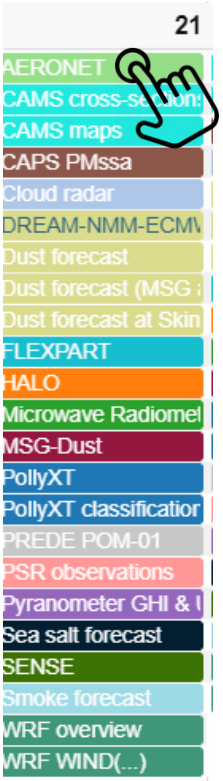
HELLENIC NATIONAL OBSERVATORY ATHENS

GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



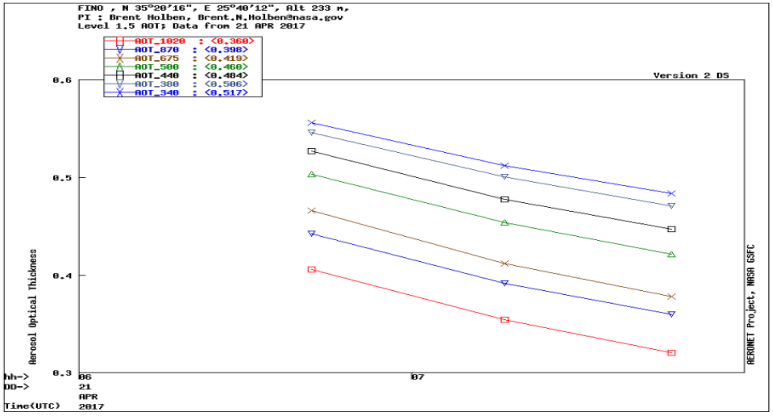
AERONET

Uploaded on 2017-04-21 17:15:28

Start time	April 21, 2017, midnight	**Duration**	1 day
Stop time	April 22, 2017, midnight	**Instrument**	CIMEL sunphotometer

← Previous Next →

Related graphs



Graph 1: Aerosol optical depth

Aerosol optical depth by AERONET sun-photometer

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 I Bucharest, Romania

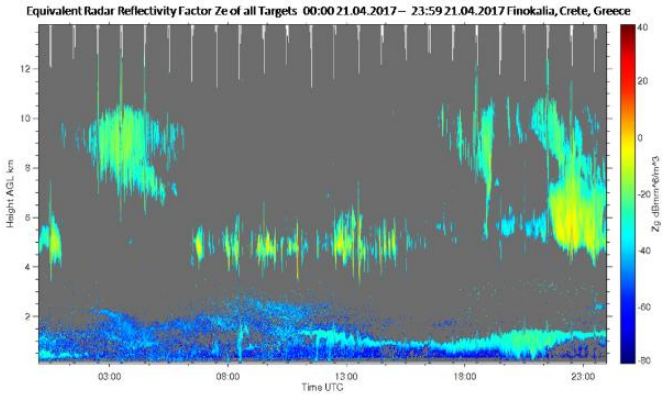
Cloud radar

Uploaded on 2017-04-22 13:11:12

Start time	April 21, 2017, midnight	**Duration**	1 day
Stop time	April 22, 2017, midnight	**Instrument**	Doppler Cloud Radar MIRA-35

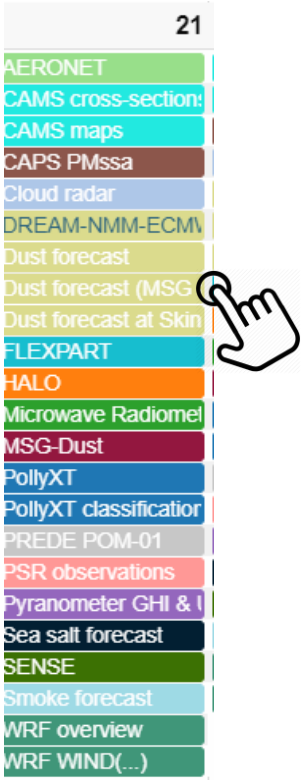
← Previous Next →

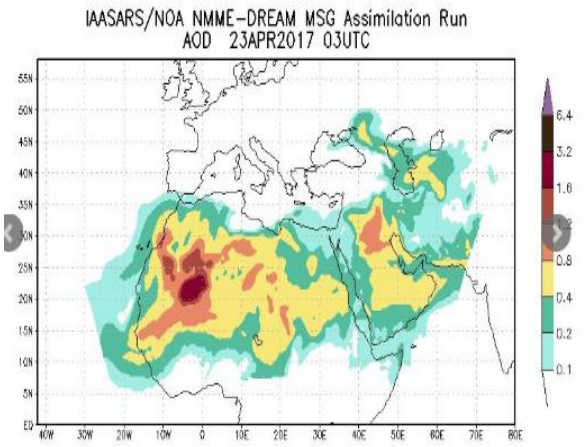
Related graphs

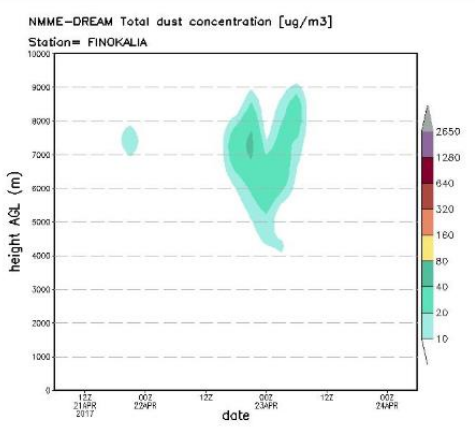


Cloud and aerosol properties

The GEO-CRADLE Regional Data Hub
Pilot 1: Adaptation to Climate Change



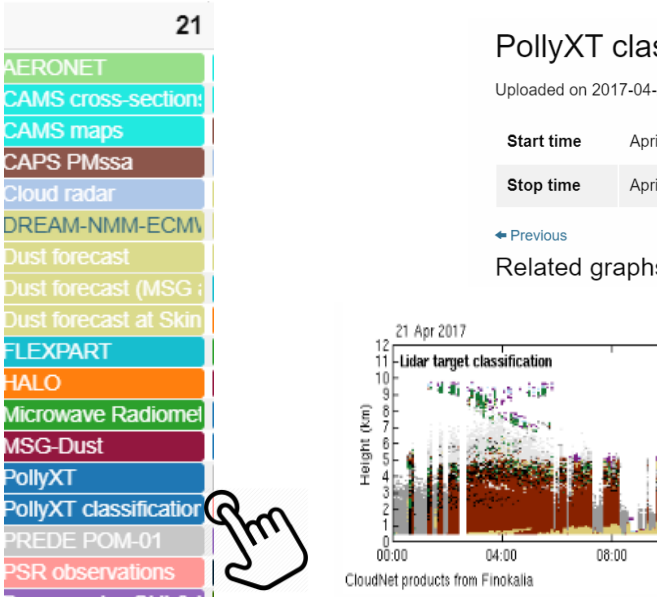




Horizontal and vertical dust forecasts
with satellite assimilation

The GEO-CRADLE Regional Data Hub Pilot a1: Adaptation to Climate Change

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



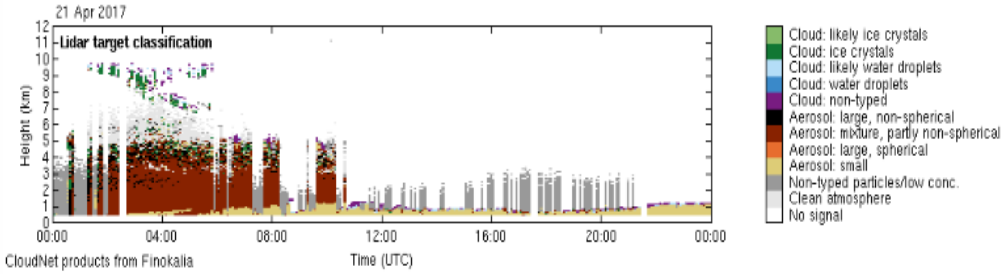
PollyXT classification

Uploaded on 2017-04-24 16:27:56

Start time	April 21, 2017, midnight	**Duration**	1 day
Stop time	April 22, 2017, midnight	**Instrument**	PollyXT lidar

← Previous Next →

Related graphs



Graph 1: Multiwavelength aerosol classification - 2017-04-21

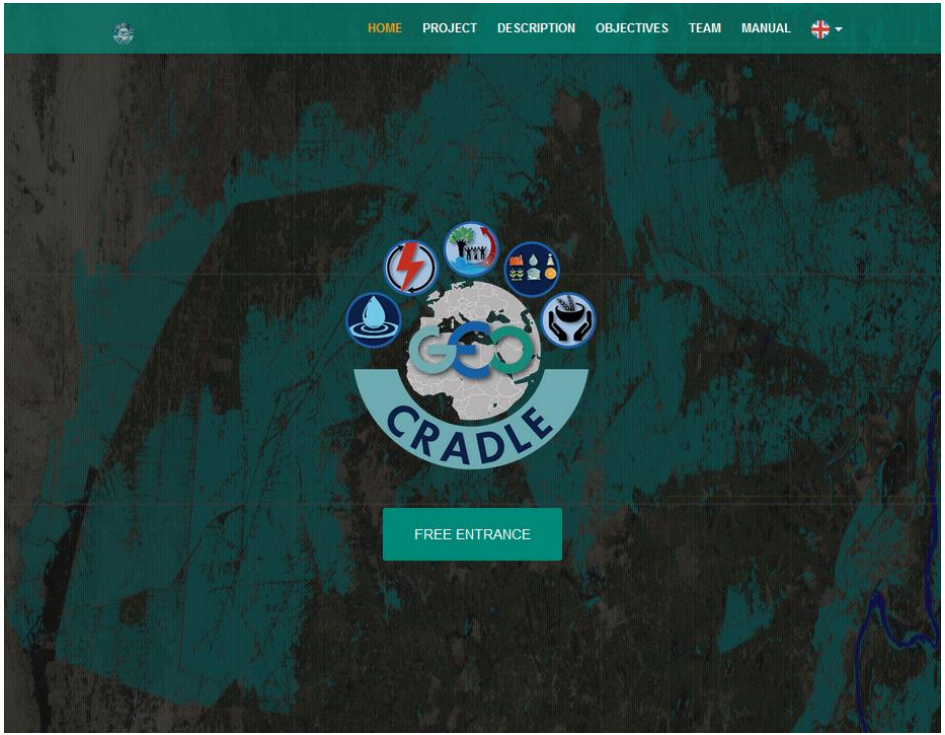
Aerosol Classification by the PollyXT Lidar

The GEO-CRADLE Regional Data Hub

Pilot 2: Improved Food Security-Water Extremes Mgmt

COPERNICUS & SPACE APPLICATIONS

11-12 October 2018 | Bucharest, Romania



Click on
FREE ENTRANCE
and hit Dewetra
on the left pane to
enter the main platform

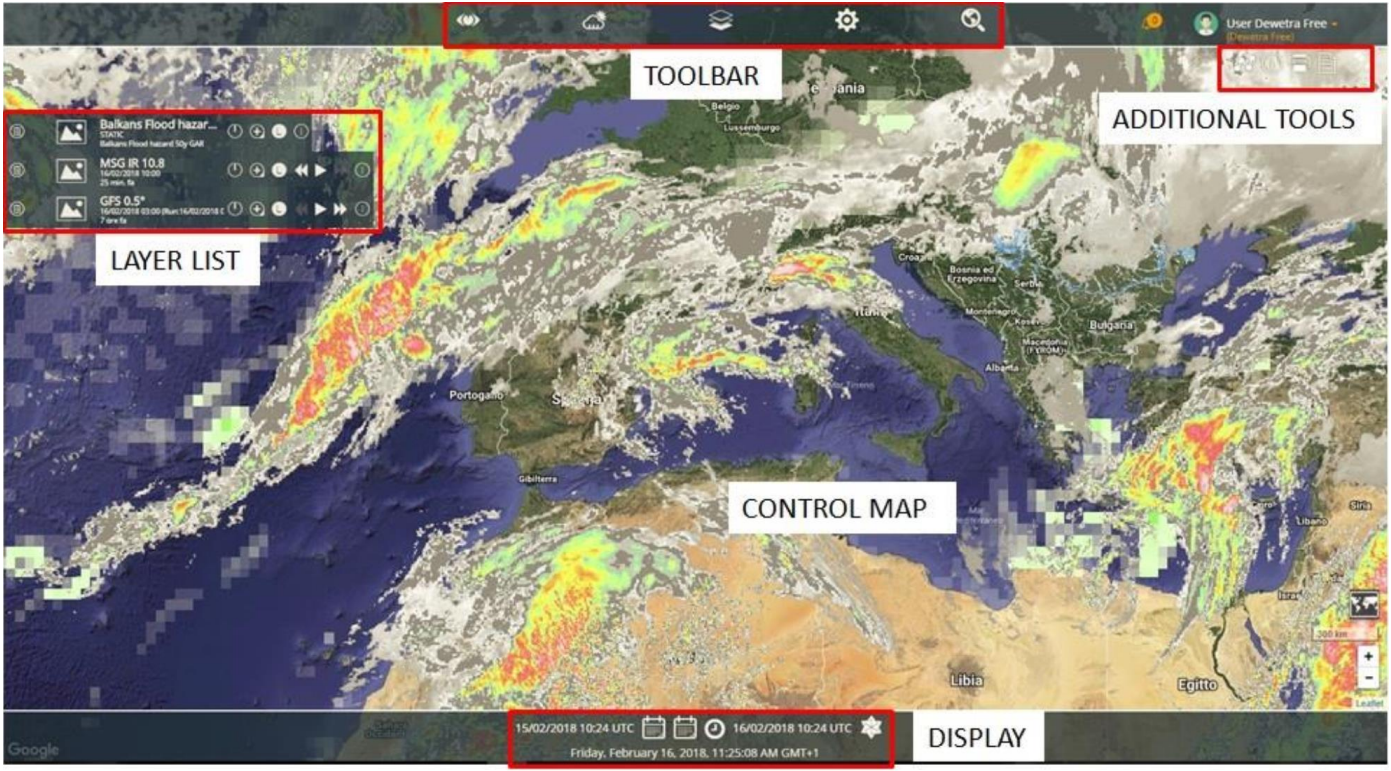
http://geo-cradle.mydewetra.org

The GEO-CRADLE Regional Data Hub

Pilot 2: Improved Food Security-Water Extremes Mgmt

COPERNICUS & SPACE APPLICATIONS

11-12 October 2018 I Bucharest, Romania



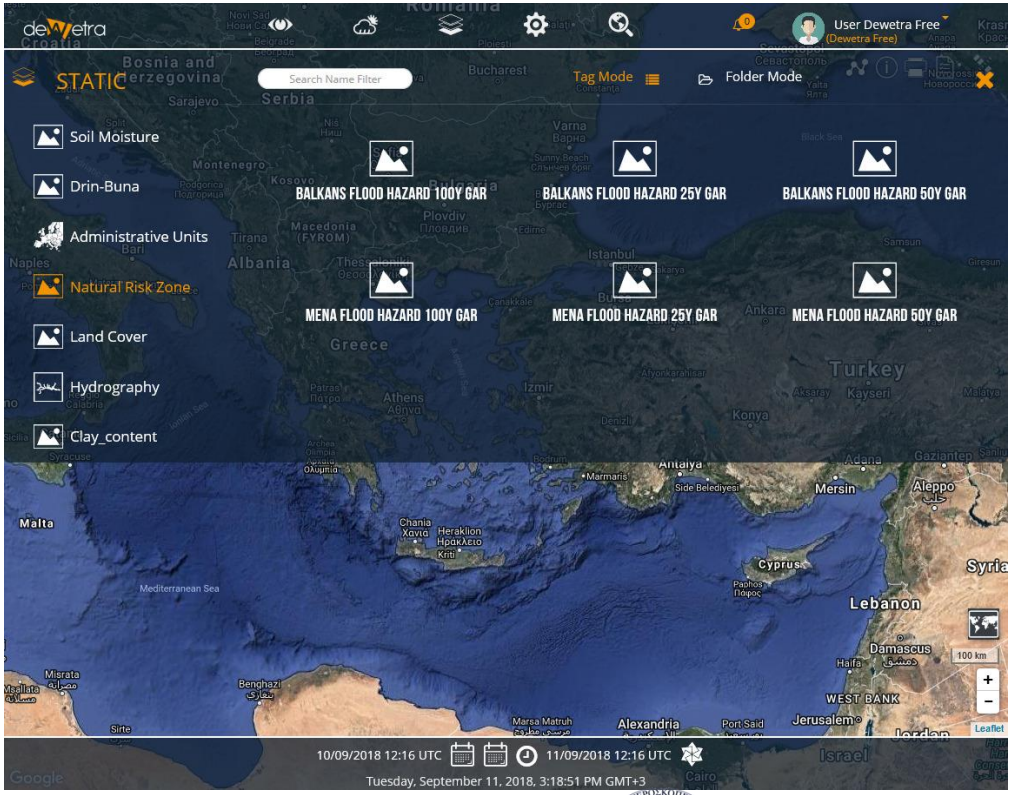
GEO CRADLE | BEYOND | National Observatory of Athens | GEO Group on Earth Observations | Copernicus

The GEO-CRADLE Regional Data Hub

Pilot 2: Improved Food Security-Water Extremes Mgmt

COPERNICUS & SPACE APPLICATIONS

11-12 October 2018 | Bucharest, Romania



STATIC Layer contains data that does not change frequently, needed to design a comprehensive risk scenario such as the exposures or the hazard maps.

GEO CRADLE

BEYOND

NATIONAL OBSERVATORY ATHENS

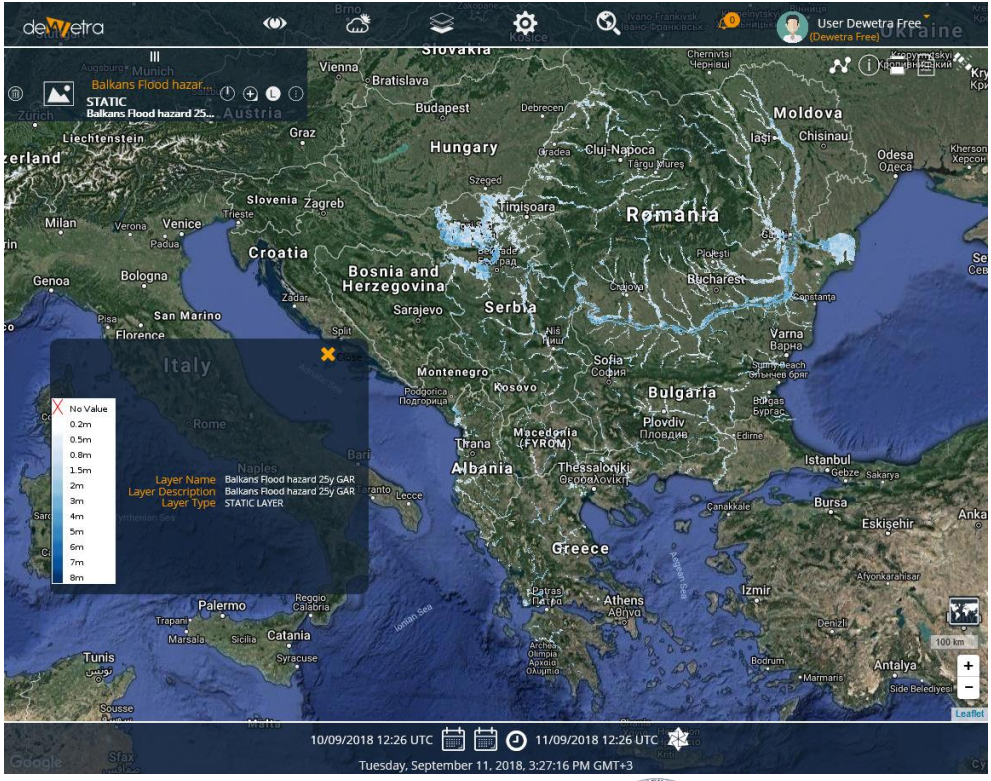
GEO GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub

Pilot 2: Improved Food Security-Water Extremes Mgmt

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

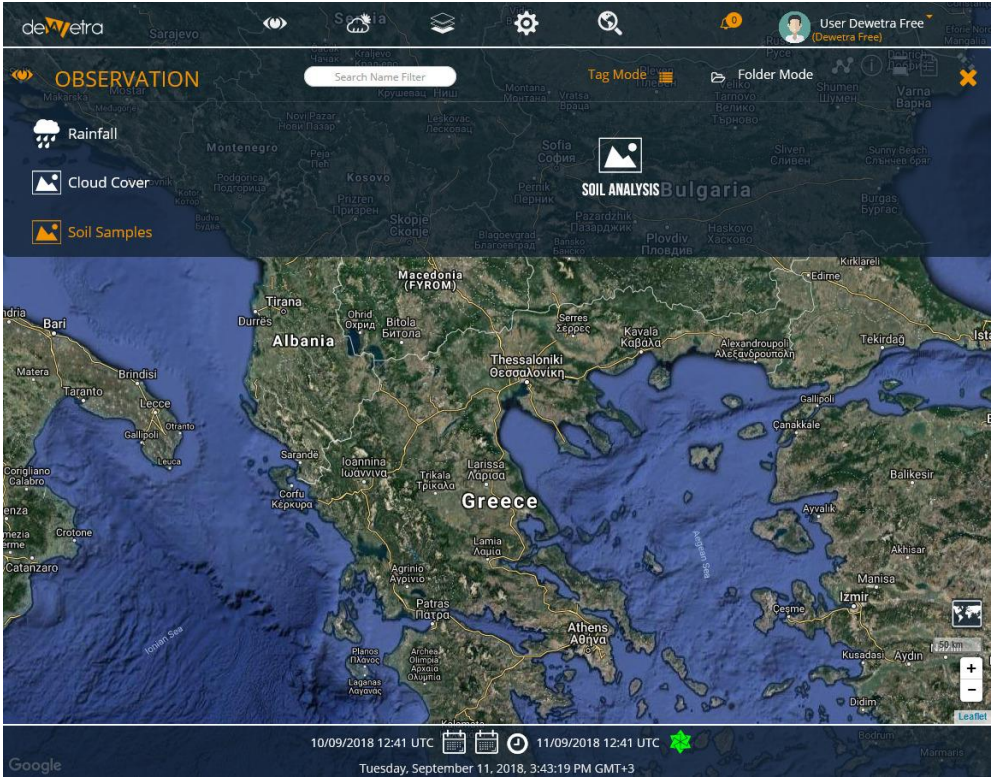


Balkans –
25y Flood Hazard –
Press L to get the legend

The GEO-CRADLE Regional Data Hub

Pilot 2: Improved Food Security-Water Extremes Mgmt

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



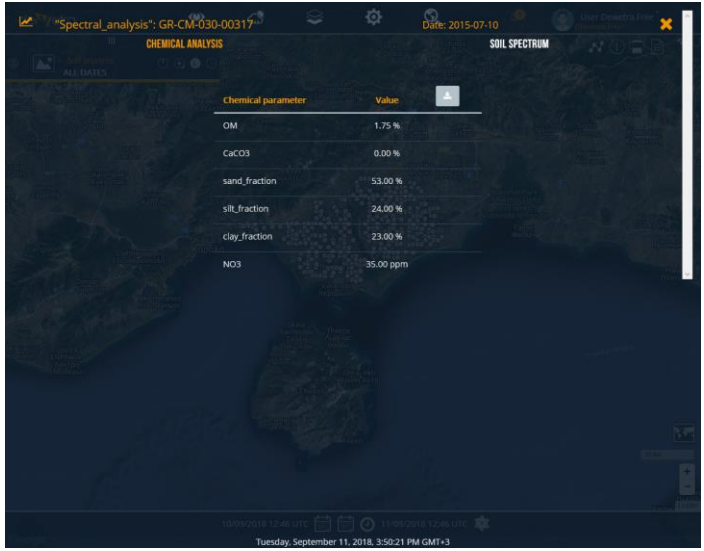
OBSERVATION Layer

Soil Samples

SOIL ANALYSIS

- Click on soil analysis
- Zoom to a region containing soil samples (e.g. North Eastern Greece)

The GEO-CRADLE Regional Data Hub
Pilot 2: Improved Food Security-Water Extremes Mgmt



- Click on a point and visualize the spectrum / chemical results (which can be downloaded)

The GEO-CRADLE Regional Data Hub
Pilot 2: Improved Food Security-Water Extremes Mgmt

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

Home / Datasets / Regional Soil Spectral Library

View | Revisions

PILOT 2: Improved Food Security – Water Extremes Management (IFS)

Food security depends on many aspects such as water abundance and extremes (flooding and drought), vegetation stresses, yield monitoring, soil quality monitoring and sustainability. Plants need...

Data Extent

License

Open Data Commons Open Database License (ODbL)

Other Access

The information on this page (the dataset metadata) is also available in these formats.

Regional Soil Spectral Library

Regional Soil Spectral Library

Part of pilot 2 - Improved Food Security and Water Extremes Management

The importance of soils is ubiquitously recognized; they provide essential services such as food production, prevention of land degradation, water quality, and they act as carbon sinks. It has been thus recognized that a spatio-temporal monitoring of soil quality and soil properties is necessary. One of the most important technologies used to monitor soils is soil spectroscopy which utilizes the spectral information of soil samples to derive their properties. For the successful upscaling (i.e. use of Earth Observation tools) of soil spectroscopy it is important to create detailed soil spectral libraries on the ground, which assist in the validation of the sensors as well as development of soil models.

The Regional Soil Spectral Library

The current dataset contains a regional vis-NIR (350-2500 nm) soil spectral library of the region. It contains metadata regarding the soils sampled, their key properties, and their spectral signature. The spectral signatures were obtained using a standardization protocol. The dataset encompasses the following countries and soil properties:

Country	Samples	SOM	Texture	CaCO3	pH	NO3	EC	CEC
Albania	107	107	107	X	X	X	X	X
Bulgaria	105	105	105	X	105	X	X	105
Cyprus	96	96	94	96	96	X	93	X
Egypt	10	6	X	4	6	X	6	X
FYROM	124	124	124	X	124	X	X	X
Greece	928	928	928	928	X	928	X	X
Israel	221	106	193	150	137	X	141	X
Serbia	63	63	63	63	63	63	X	X
Turkey	100	94	98	100	100	X	100	X
All	1754	1629	1712	1341	631	991	334	105

Form of the datasets

To assist future researchers using this soil spectral library, the datasets are provided in the following formats:

- Per country SSLs in .csv format
- Complete GEO-CRADLE SSL in .csv format

The documentation describing what each column represents may be found in D4.6.

Data and Resources

SSL Albania
This SSL was established by the Institute for Nature Conservation in Albania... — Download

SSL Bulgaria
This SSL was established by the Space Research and Technology Institute (... — Download

SSL Cyprus
This SSL was established by the Cyprus University of Technology (CUT). — Download

SSL Egypt
This SSL was established by the Centre for Environment and Development for... — Download

SSL FYROM
This SSL was established by the Ss. Cyril and Methodius University (USCM).... — Download

SSL Greece
This SSL was established by the inter-Balkan Environment Center (i-BEC). — Download

SSL Israel
This SSL was established by the Tel-Aviv University (TAU). — Download

SSL Serbia
This SSL was established by the Institute of Physics Belgrade (IPB). — Download

SSL Turkey
This SSL was established by the Space Technologies Research Institute (... — Download

SSL GEO-CRADLE
This dataset contains the complete GEO-CRADLE SSL (i.e. all of the countries... — Download

Download All

http://datahub.geocradle.eu/dataset/regional-soil-spectral-library

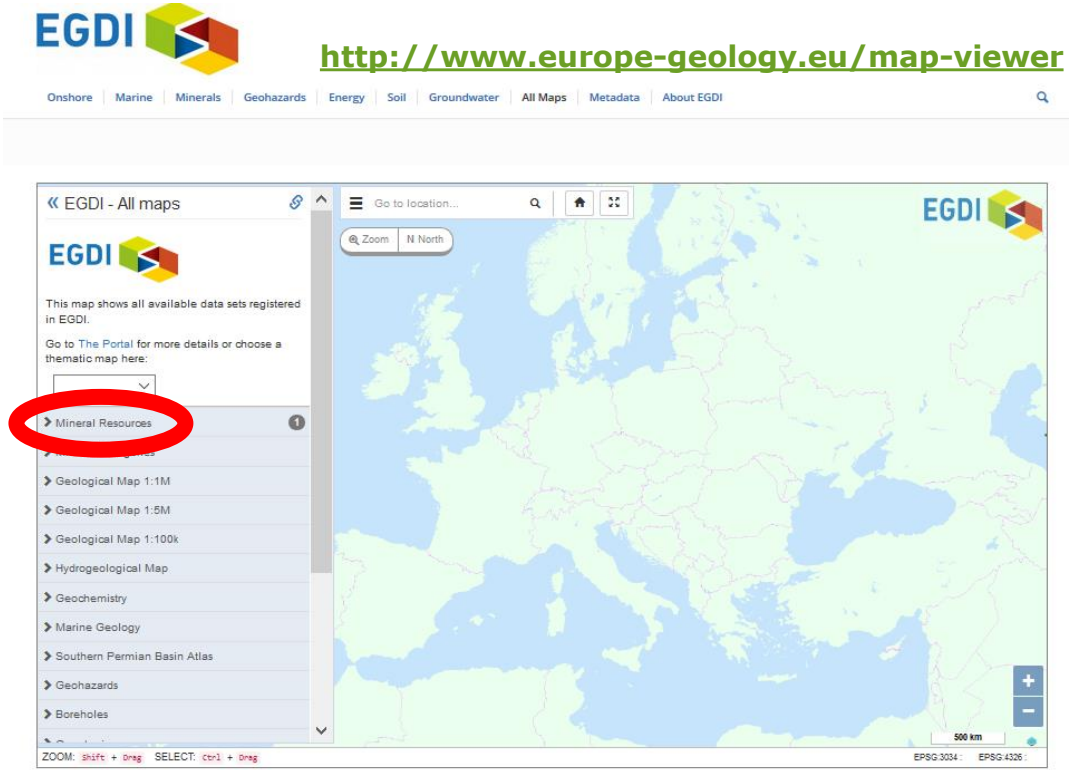
GEO CRADLE | BEYOND | National Observatory of Athens | GEO Group on Earth Observations | Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 3: Access to Raw Materials

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

EGDI

http://www.europe-geology.eu/map-viewer



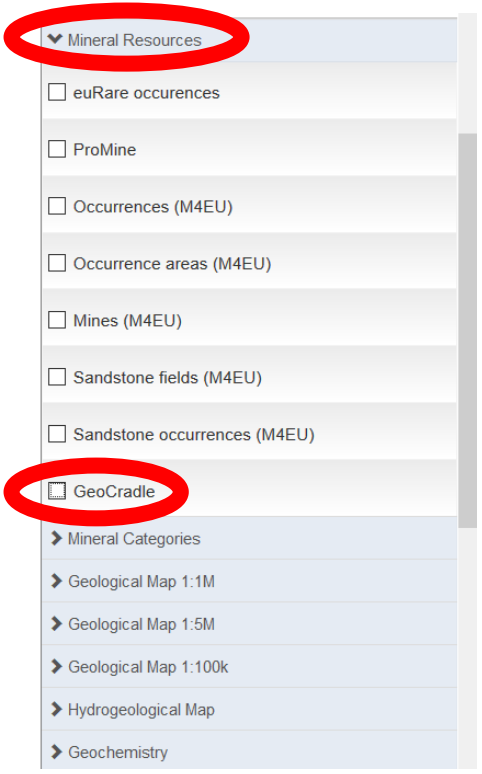
EGDI is EuroGeoSurveys' European Geological Data Infrastructure

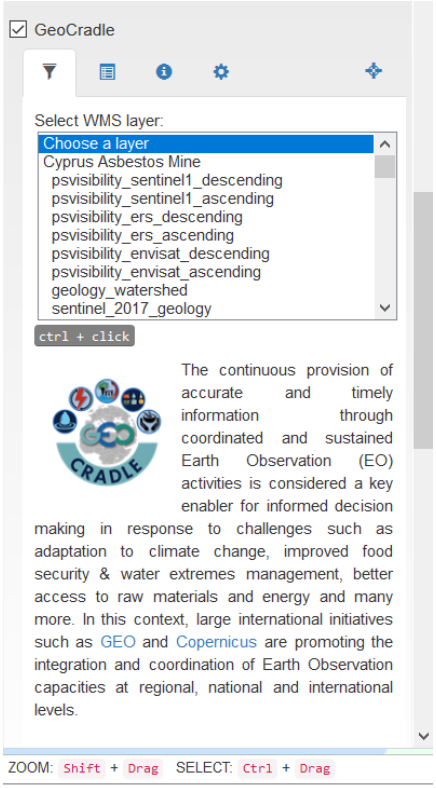
EUROGEOSURVEYS
European Geoscience for Society
The Geological Surveys of Europe

GEO CRADLE
BEYOND
NATIONAL OBSERVATORY ATHENS
GEO GROUP ON EARTH OBSERVATIONS
Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 3: Access to Raw Materials

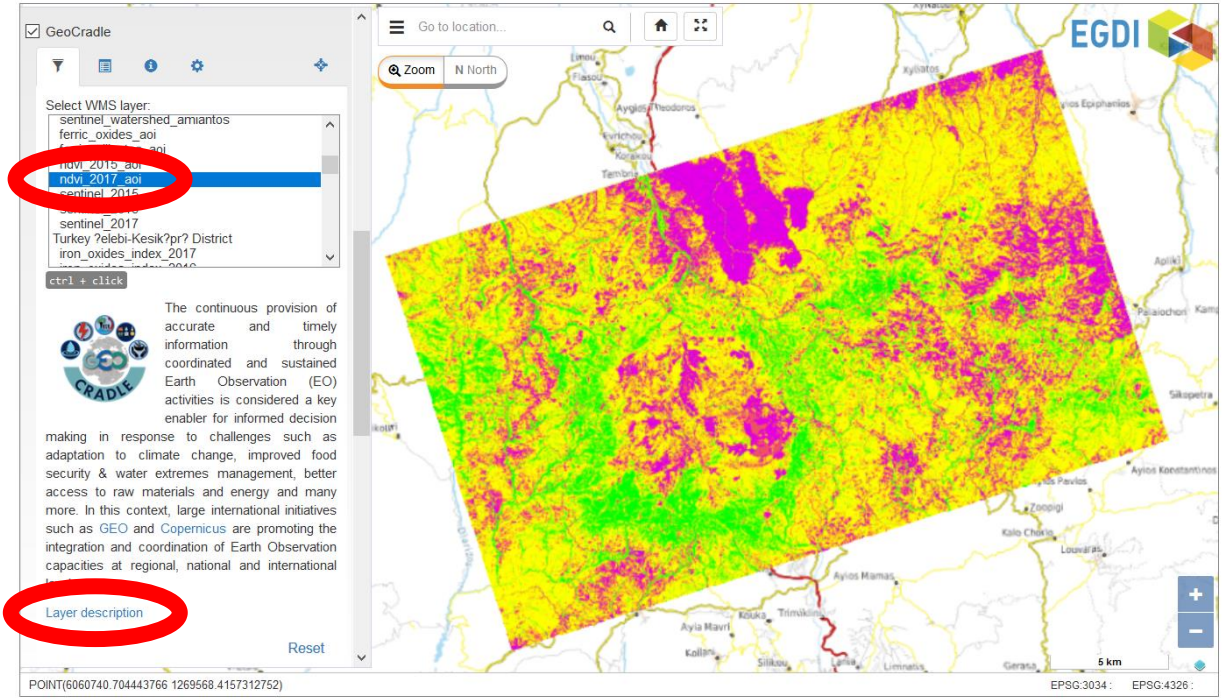
COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania





The GEO-CRADLE Regional Data Hub
Pilot 3: Access to Raw Materials

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



Normalized difference vegetation index (NDVI) calculated from Sentinel-2 image from 2017. The index was calculated based on the formula: ((NIR-RED)/((NIR+RED)), where individual components correspond to the spectral band of the satellite.

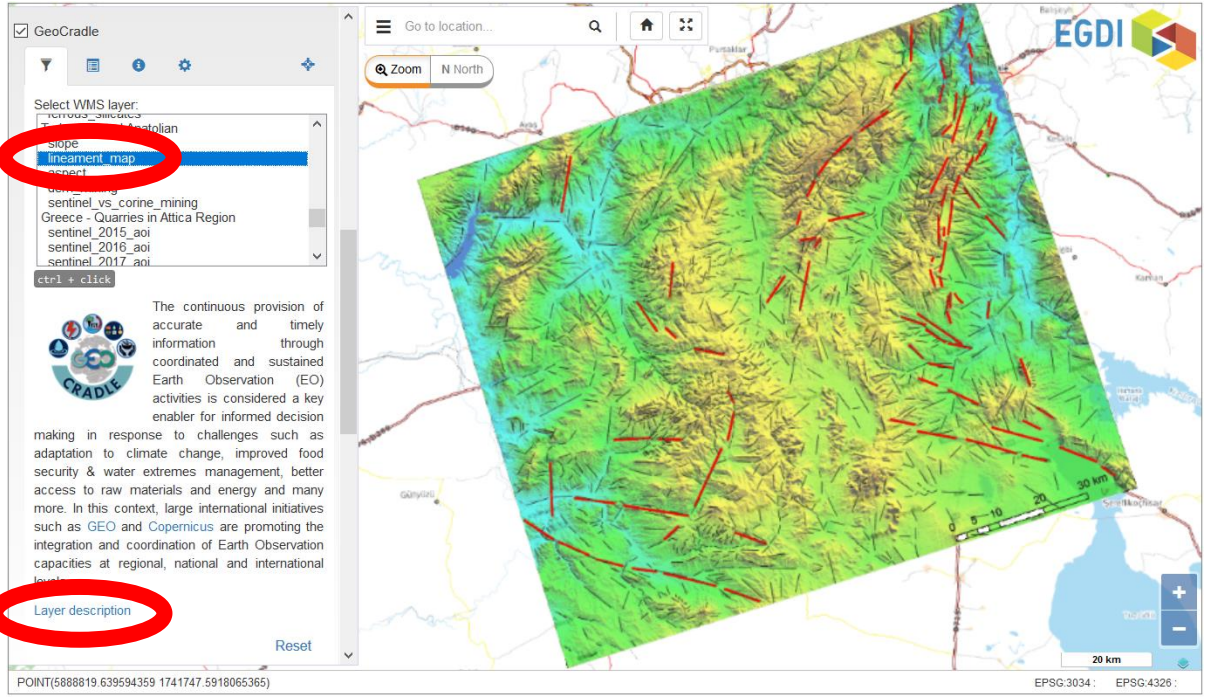
BEYOND

GROUP ON EARTH OBSERVATIONS

Copernicus

The GEO-CRADLE Regional Data Hub
Pilot 3: Access to Raw Materials

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania



Lineament map extracted from 5 different techniques (DEM, Directional Filters, Principal Component Analysis, False Color Composite and Rationing) based on Landsat-8 image and SRTM.

The GEO-CRADLE Regional Data Hub
Pilot 4: Access to Solar Energy

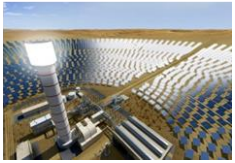
COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

Application developed in support to the Ministry of Electricity & Renewable Energy of Egypt

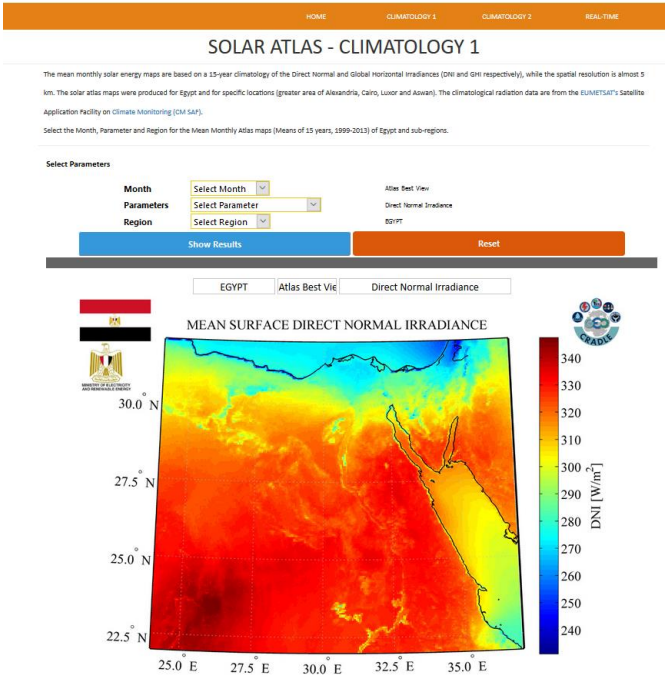
Provides the solar power information in climatological basis for the Global Horizontal irradiance (GHI) and the Direct Normal irradiance (DNI)

GHI applies to PhotoVoltaic (PV) installations

DNI applies to Concentrated Solar Power (CSP) plants



Solar Atlas for Egypt



http://cedarekmp.net/solaratlas/web2

The GEO-CRADLE Regional Data Hub
Pilot 4: Access to Solar Energy

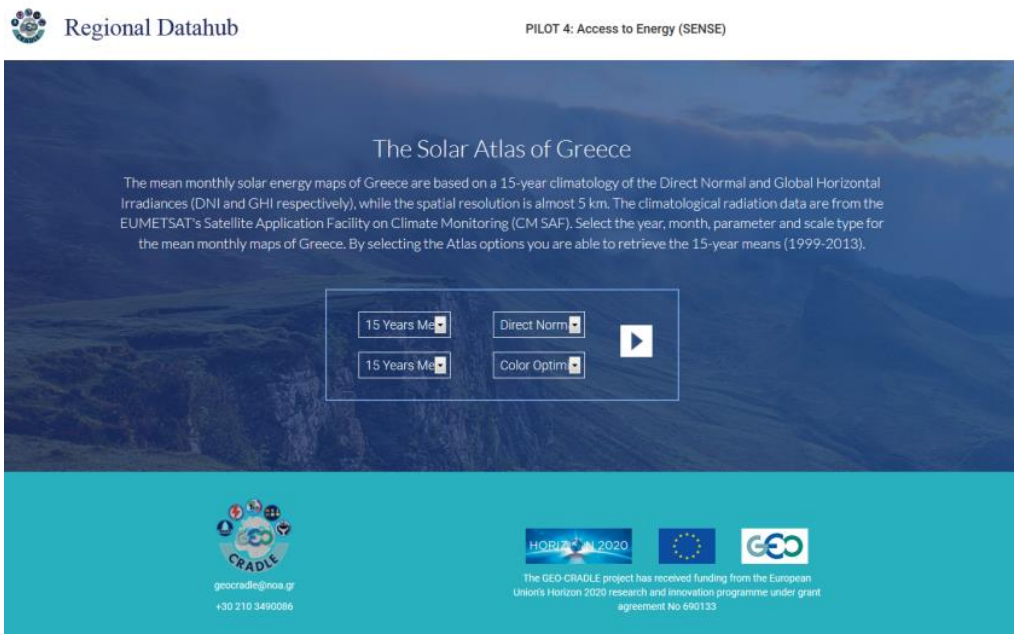
COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

Solar Atlas for Greece

A static applications based on an analytical database of climatological solar energy maps of Greece (GHI, DNI).

The user is able to choose additionally fixed or color optimized scale.

Such applications provided for the first time for Greece through the Geo-Cradle project and are able to provide useful information about the solar energy potential for potential solar farm installations.



http://datahub.geocradle.eu/solar

CRADLE BEYOND NATIONAL OBSERVATORY ATHENS GEO GROUP ON EARTH OBSERVATIONS Copernicus

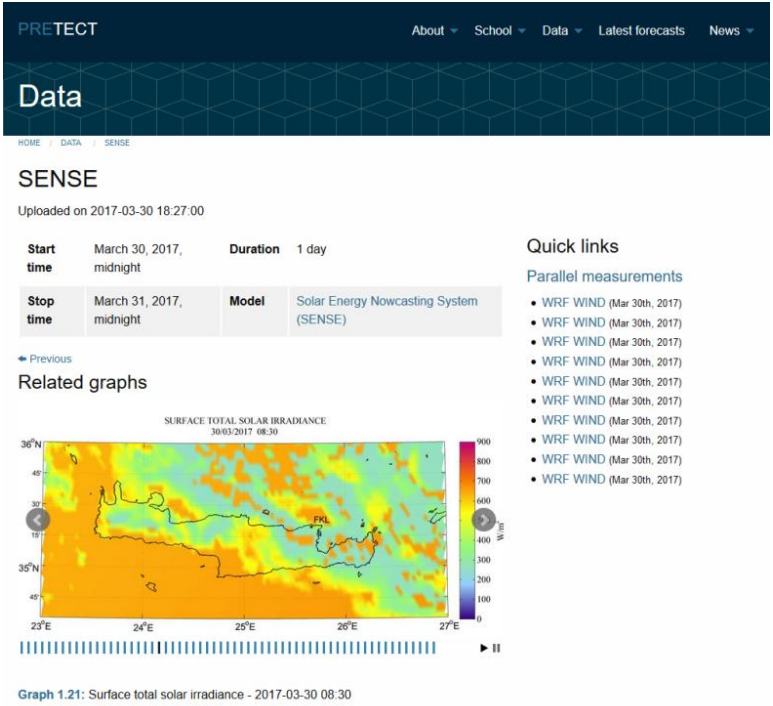
The GEO-CRADLE Regional Data Hub
Pilot 4: Access to Solar Energy

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

The Solar Energy Nowcasting SystEm (SENSE) was applied for a scientific campaign in Crete (PRE-TECT).

Through this portal the user is able to retrieve the produced maps of Crete in high spectral, spatial and temporal resolution (1 nm, 0.05 x 0.05 degrees, 15 min).

The aerosol and cloud impacts were simulated through data input from the Copernicus Atmosphere Monitoring Service (CAMS) and the Meteosat Second Generation (MSG).



http://pre-tect.space.noa.gr/instruments/25

The GEO-CRADLE Regional Data Hub
Pilot 4: Access to Solar Energy

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

Dynamic application with background databases of solar power, energy and Photosynthetically Active Radiation (PAR) for Greece, Cyprus and Egypt.

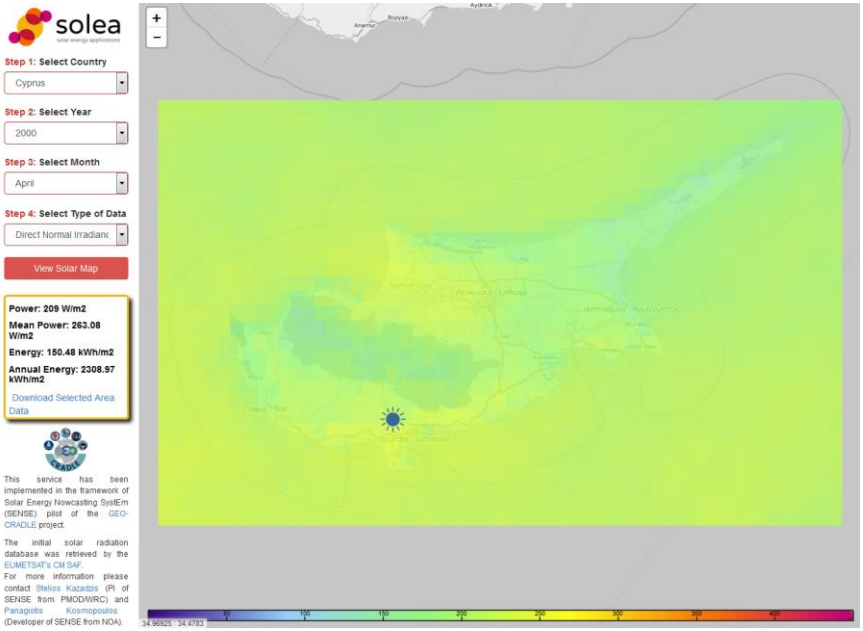
The user is able to download the selected area data in the form of json files.

The solar power describes the "strength" of the irradiance (W/m^2).

The solar energy calculates the potential energy production by a PV or CSP system (kWh/m^2)

The PAR quantifies the energy that supports photosynthesis.

PAR Atlas for Greece, Cyprus, Egypt



http://beyond-eocenter.eu/solarapp

GEO CRADLE
BEYOND
NATIONAL OBSERVATORY ATHENS
GEO GROUP ON EARTH OBSERVATIONS
Copernicus

GEO-CRADLE upgrade in GEO:
Project -> Community Activity -> Initiative

COPERNICUS & SPACE APPLICATIONS
11-12 October 2018 | Bucharest, Romania

GEO Capacity Building in North Africa, Middle East, Balkans, and Black Sea

A **continuation** and **extension** of the work of the **GEO CRADLE** which will capitalise, sustain and scale-up its results, as well as key outcomes of other relevant EU flagship projects and initiatives (e.g. GEOGLAM, NextGEOSS, ERAPLANET, EuroGEOSS, AfriGEOSS, GEO-VENER, EO4SDG), in support of the **3 GEOSS priorities**, namely **CC**, **DRR** and **SDGs**.

Geographic extension

Thematic extension

Operational Maturity

CRADLE

BEYOND

GROUP ON EARTH OBSERVATIONS

Copernicus

thank you!

http://geocradle.eu

FOLLOW OUR ACTIVITIES Twitter @geocradle | Facebook Geo-Cradle | Website geocradle.eu

BEYOND

http://www.beyond-eocenter.eu/