

Funded under H2020 - Climate action, environment, resource efficiency and raw materials

ACTIVITY: Developing Comprehensive and

Sustained Global Environmental

Observation and Information Systems
CALL IDENTIFIER: H2020 SC5-18b-2015
Integrating North African, Middle East and

Balkan Earth Observation capacities in

GEOSS

Project GA number: 690133 Total Budget: 2,910,800.00 €

GEO-CRADLE:

Fostering regional cooperation and roadmap for GEO and Copernicus implementation in North Africa, Middle East and Balkans



http://geocradle.eu/

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Project Coordinator
Research Director NOA









GEO-CRADLE

- ... is a unique EU funded Coordination Action running at regional level;
- ... is looking at the territories of North Africa, Middle East and Balkans;

It seeks to identify common needs, create synergies, and integrate capacities;

Fosters the regional cooperation and integration of monitoring capabilities and networks, as well as scientific skills;

Define and communicate goals that are clear and beneficial from societal and market wise point of view, and also realistic and in line with the domestic priorities and user needs;

Proposes/sets up large scale regional initiatives based on the Earth Observation (space based and insitu) for capacity building and also addressing societal priorities in the thematic areas of the project such as Adaptation to Climate Change, Access to Raw Materials, better exploitation of the renewable Energy resources, and Food Security.

- ✓ Promote the uptake of EO services and data in response to regional needs.
- ✓ Support the effective integration of existing Earth Observation Capacities in the region.
- ✓ Facilitate the engagement of the complete ecosystem of EO stakeholders in the region.
- ✓ Enhance the participation in and contribution to the implementation of GEOSS and Copernicus in North Africa, Middle East and the Balkans.

Objectives









Thematic Areas











Improved
Food Security

- Water
Extremes
Management
(IFS)

2 ZERO
2 HUNGER
12 RESPONSIBLE
AND PRODUCTION

Access to
Raw
Materials
(ARM)

1 NO POVERTY
POVERTY
STATEMENT STAT

Access to Energy (SENSE)

7 AFFORDABLE AND CLEAN ENERGY
9 INDUSTRY, INDUSTRICE

9 AND INFRASTRUCTURE









GEO-CRADLE



- ✓ Promote the uptake of EO services and data in response to regional needs.
- ✓ Support the effective integration of existing Earth Observation Capacities in the region.
- ✓ **Facilitate** the engagement of the complete ecosystem of EO stakeholders in the region.
- ✓ Enhance the participation in and contribution to the implementation of GEOSS and Copernicus in North Africa, Middle East and the Balkans.













25 Partners, 3 Continents, 1 Team 25 Partners, 3 Continents, 1 Team

- ▶ GEO-CRADLE brings together a highly-complementary team combining a strong background in GEO-related coordination activities with proven excellence in the field of Earth Observation:
- Leading research institutes and universities
- Highly-esteemed international associations
- Service Providers with strong regional presence





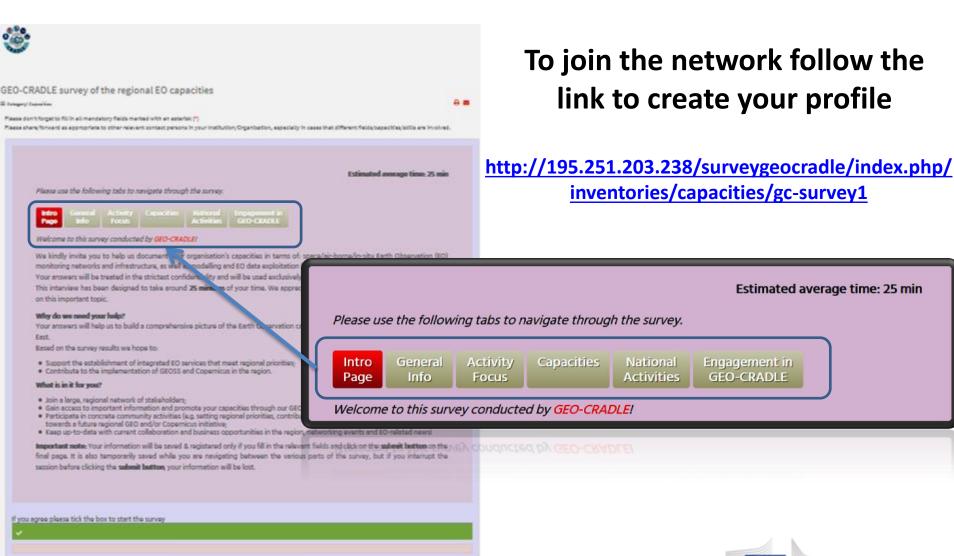
Or Visit: http://195.251.203.238/surveygeocradle/index.php/inventories/capacities/gc-survey1







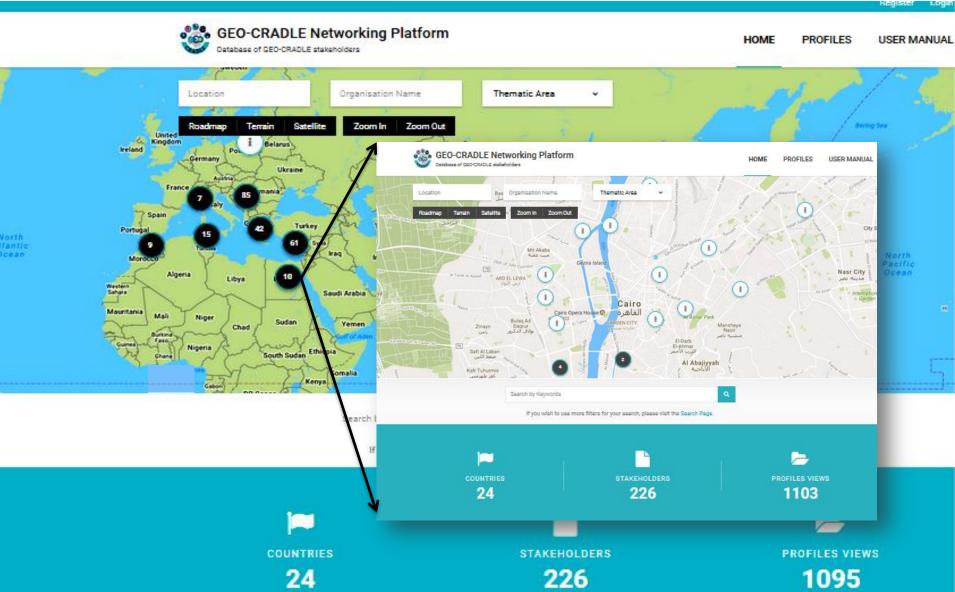






To join& search the network follow the link

http://cpdev.crowdpolicy.com/geo-cradle-stakeholders/



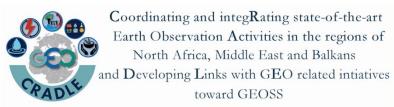


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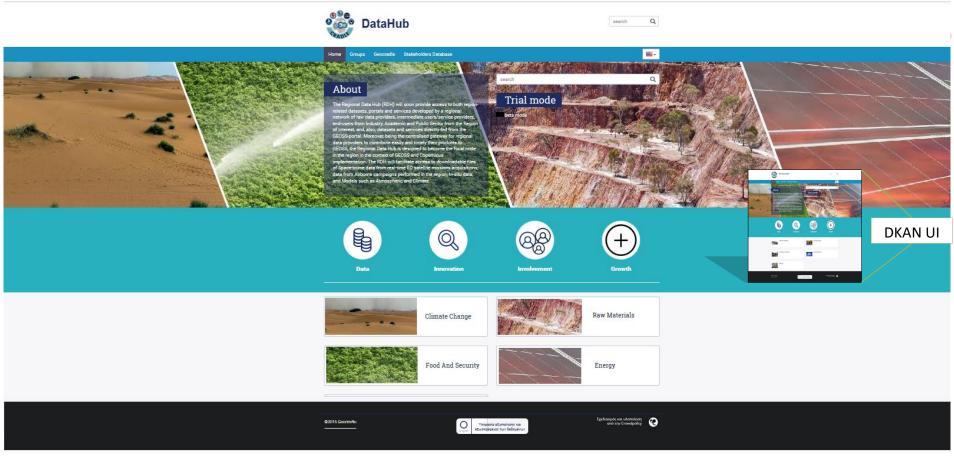






Regional Data Hub –

Connection with GEOSS & Regional Portals









toward GEOSS

Utilizing the GEO DAB

APIs for easy access

and discovery of

regional EO data



Groups



Global Earth Observation System of Systems (GEOSS)

A central part of GEO's Mission is to build the Global Earth Observation System of Systems (GEOSS).

25318292 dataset



PILOT 1: Adaptation to Climate Change (ACC)

The Rol has been recognised by the Intergovernmental Panel on Climate Change as one of the most sensitive and vulnerable to climate change regions



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 gual



PILOT 3: Access to Raw Materials (ARM)

For the first time, GEO-CRADLE will make available in the Rol the roadmap for long-term monitoring, mapping, and management of mineral deposits, al



PILOT 4: Access to Energy (SENSE)

GEO-CRADLE will lead a coordinated effort to support and improve the regional EO infrastructures through the Solar Energy Nowcasting SystEm (SENSE)



toward GEOSS

Home Groups Geocradle Stakeholder Database Datasets

/ Home / climate / Dataset





Mediterranean acidification under the influence of climate change as well as associated economic impacts.

Projections will be based on new observations of chemical conditions as well as new observational and experimental data on the responses of key organisms and ecosystems to acidification, which will be fed into existing ocean models that have been improved to account for the Mediterranean's fine-scale features. These scientific advances will allow us to provide the best advice to policymakers who must develop regional strategies for adaptation and mitigation.

Utilizing the GEO DAB APIs for easy access and discovery of regional EO data

License

License not specified

Other Access

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



via the DKAN API

Social	
☑ Twitter	
in LinkedIn	
■ Reddit	
S Google+	
F Facebook	

Data and Resources

Dataset Info

These fields are compatible with DCAT, an RDF vocabulary designed to facilitate interoperability between data catalogs published on the Web.

Field	Value	
Publisher	Global Earth Observation System of Systems (GEOSS)	
Modified Date	2012-03-02	
Release Date	2012-03-02	
Identifier	C1214598306-SCIOPS	
Spatial / Geographical Coverage Area	POLYGON ((-8 28, 36 28, 36 46, -8 46, -8 28))	
Temporal Coverage	Tuesday, February 1, 2011 - 02:00 to Saturday, February 1, 2014 - 01:59	





The Marine Isotope Stage (MIS) 3 stands out due to its abrupt changes from cold and dry stadials to warm and humid interstadials, the so-called Dansgaard-Oeschger cycles that also affected temperature and painfall in the Black Sea region.

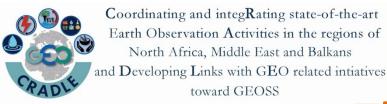












The Regional Priorities

Priority Definition Workflow

Identify recommenda tions

Define the priority framework

Develop the regional action plan

Validate the action plan

- Identify national EO recommendations as perceived from GEO-CRADLE partners.

- Propose a priority framework
- What are the criteria to consider in the definition of priority goals?
- Builds upon the national priorities the regional priorities by looking at the commonalities of national actions with the RoI as well as the specificity of the region.
- Validate the action plan with decision makers.
- How to ensure that the action plan is in adequacy with real needs in the RoI?









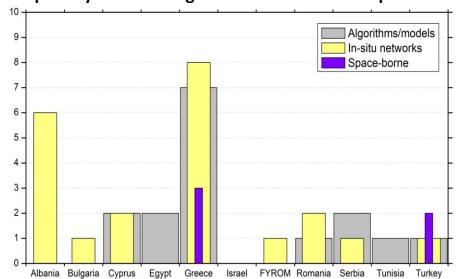
The Regional Priorities Adaptation to Climate Change (ACC)

The ACC pilot will pave the ground for the holistic monitoring and forecasting of region-specific atmospheric components, ECVs and hazards, in line with the standards and vision of GEOSS and Copernicus for information extraction and service delivery regarding the Climate SDG.

Specifically, the GEO-CRADLE ACC will provide 3 services on respective thematic pillars:

- 1. Desert dust services
- 2. Regional climate change projection services
- 3. Air quality services

Gap Analysis of the Regional Climate related Capacities



End-users expressing interest in the ACC pilot

(from the results of end user survey and gap analysis)

- Tourism sector for dust forecasting
- Meteorological agencies for dust forecasting
- Civil aviation for dust forecasting
- Insurance companies for Climate Change services
- Agriculture sector for Climate Change services
- Water river basin agencies for Climate Change services









The Regional Priorities

Adaptation to Climate Change (ACC)

The interactive web application "Climate-Projection" will provide accurate past-present-future climate information using Essential Climate Variables (ECVs) and Climate Indices (CI). These open-access information are especially important for the following sectors:

Energy

Potential solar and power production, as well as estimated energy requirements of households.









Agriculture

Droughts, intense rainfall, frost, evaporation or even growing season periods for plants.



Favorable summer and winter conditions for tourists by combining various Essential Climate Variables.







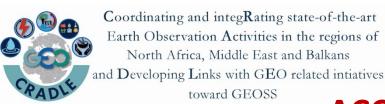


Natural Hazards

Extreme rainfall, intense wind velocity and fires.

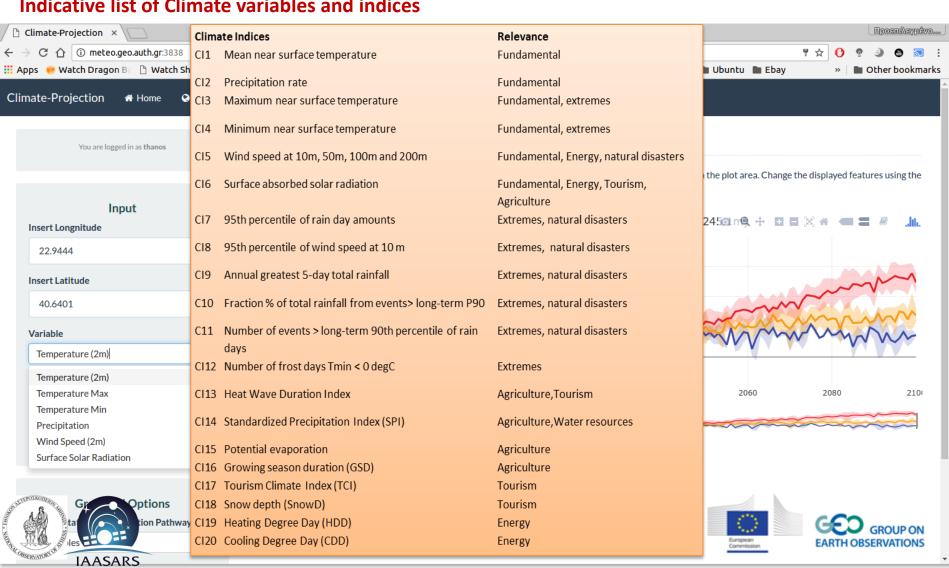






ACC – Regional climate change services

Indicative list of Climate variables and indices



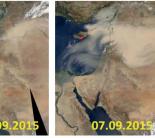


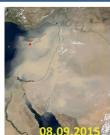
Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East and Balkans and Developing Links with GEO related intiatives toward GEOSS

ACC – Desert dust services

The September 2015 Middle East dust-storm results in dramatic reduction of visibility in Limassol









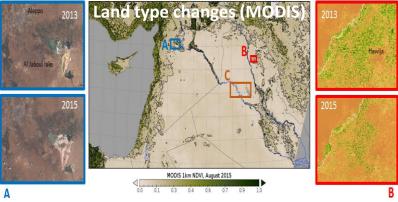


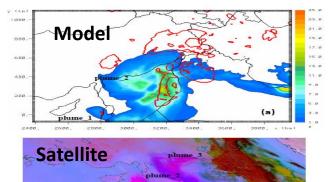


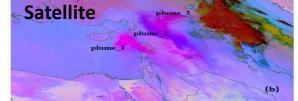




Landuse changes (desertification) and local meteorology increased the severity of this episode Solomos et al., 2016, ACPD









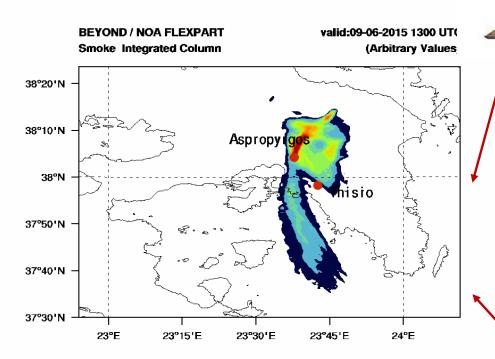








ACC - Regional air quality services





EUFAR

Athens - ACTRIS

Observational platforms



ACTRIS



Finokalia - ACTRIS







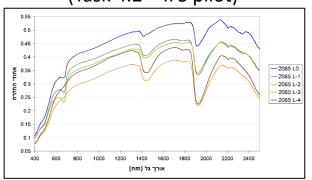




The Regional Priorities Improved Food Security (IFS)

Water Extremes Management (WEM)

Soil Spectral Library (Task 4.2 – IFS pilot)

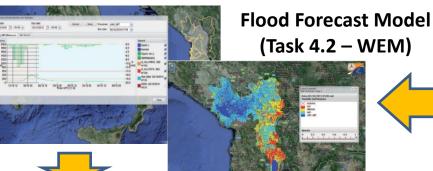


Prediction (spectral based) models of **field moisture and clay content**

SEC, SEP, SEL	R_m^2	Prediction equation	Assignments
0.045, 0.14, 0.016	0.645	wl_0.739*0.378179 + wl_1.65*0.389602-	1.65 µm-reflectance slope
0.027@	0.847@	wl_0.689*0.184370+0.062336	0.688 μm-reflectance slope
0.003, 0.015, 0.002	0.827	wl 0.722*0.135211+wl 2.328*0.034358-	0.739
	0.045, 0.14, 0.016 0.027@	0.045, 0.14, 0.016	0.045, 0.14, 0.016 0.645 wl_0.739*0.378179+wl_1.65*0.389602- 0.027@ wl_0.689*0.184370+0.062336

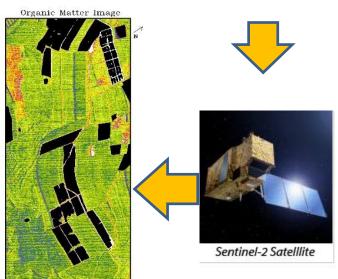


Property	SEC, SEP, SEL	R _m ²	Prediction equation	Assignments
Soil Field Moisture (SFM)	0.045, 0.14, 0.016 0.027@	0.645 0.847@	wl_0.739*0.378179 + wl_1.65*0.389602- wl_0.689*0.184370 + 0.062336	1.65 μm-reflectance slope 0.688 μm-reflectance slope
Organic Matter	0.003, 0.015, 0.002	0.827	wl 0.722*0.135211+wl 2.328*0.034358-	0.739



Pixel by pixel
map on
Sentinel -2
data using the
prediction
models









Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East and Balkans and Developing Links with GEO related intiatives toward GEOSS

The Regional Priorities

and Developing Links with GEO related intiatives Access to Raw Materials (ARM) toward GEOSS

Establishing a roadmap for long-term monitoring, mapping, and management of Quarries, Mineral Deposits in the ROI.









Use of existing regional capacities and skills

Development of protocol for evaluating the level of impact

Mapping of quarries and waste materials in abandoned mines

Monitoring of ground deformation during/after mining



Identification, collection, assessment and use of EO based and in-situ data

Enrichment of the information content of the Regional Data Hub

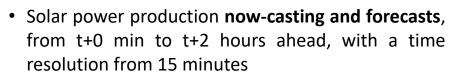


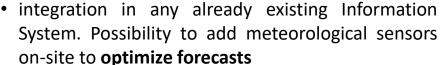


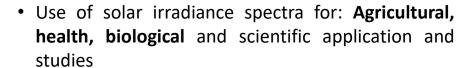


SOLar Energy Applications The Solar Energy Nowcasting SystEm (SENSE) pilot **Geo-Cradle users**

SENSE







Users: Municipalities, private and government based Energy transmission operators, solar renewable energy planning, smart phone apps, health and agricultural sectors, scientific community





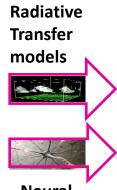




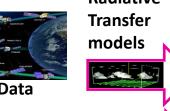
Satellite Data



Copernicus Atmospheric Monitoring Service



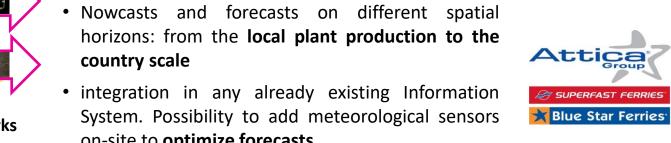






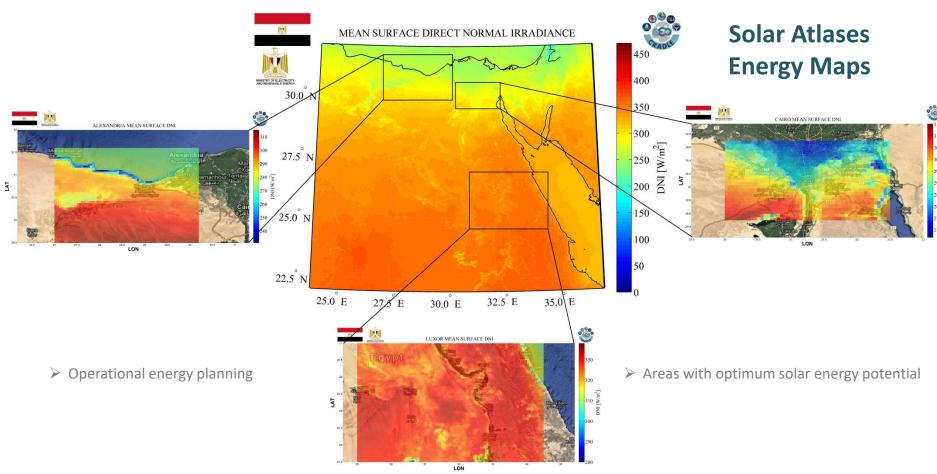
















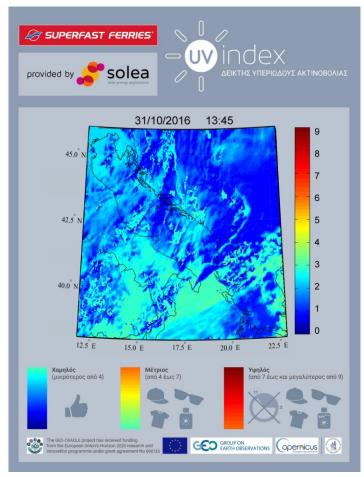


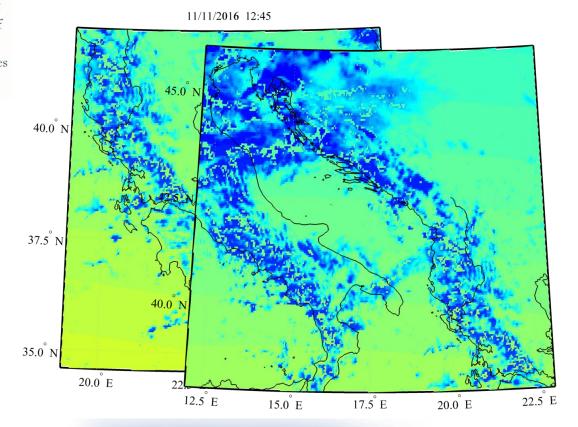




Coordinating and integRating state-of-the-art
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toward GEOSS

Solar radiation related products







UV Index, Aegean and Adriatic sea



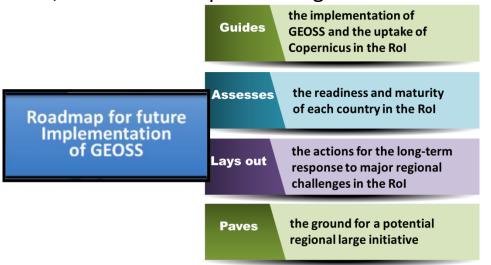






The GEO-CRADLE Contribution

1. Submit to the EC a roadmap with funding priorities in relation to capacity building, filling in gaps (networks, infrastructures, data sharing, skills), training, education, service provision, and business uptake at regional level



2. Engage the countries and regional stakeholders in the data sharing process, the use of open standards, and facilitate the access of the local actors to existing portals, web servers, data repositories, and satellite image archives through big infrastructures such as GEOSS, the European Data Portal, Copernicus data/service portals, and any existing regional Data Hubs (e.g. GEO-CRADLE RDH)









The GEO-CRADLE Contribution

- Generate and sustain a network stakeholders to ensure visibility, and sharing of knowhow, excellence, and skills between the local actors and their counterparts worldwide
- **4. Deliver a prototype methodology and a detailed assessment** on the nations' (market and science) maturity in relation to EO. Compare the regional capacity/state-of-the-art with the ones of developed countries in space, and find the complementary roles where they exist
- 5. Support the EO market uptake and internationalisation by,
 - Understanding the local market, and capacities
 - Mapping existing policies in sectors that may need support from EO
 - Facilitating access to open data
 - Mapping the local competitive landscape
 - Engaging the end-user community
 - Facilitating partnering with international interlocutors (companies, researchers, industries)
 - ❖ Building trust / Overcoming cultural and linguistic issues
- 6. Advance the role of the countries in GEO, and Copernicus by,
 - Setting up local GEO offices, Copernicus Relay Offices, and/or nominating official GEO representations at various levels
 - Strengthening the EO industrial/research dimension by using Copernicus & GEO as key drivers
 - Helping the stakeholders understand how they can benefit from and contribute to GEOSS

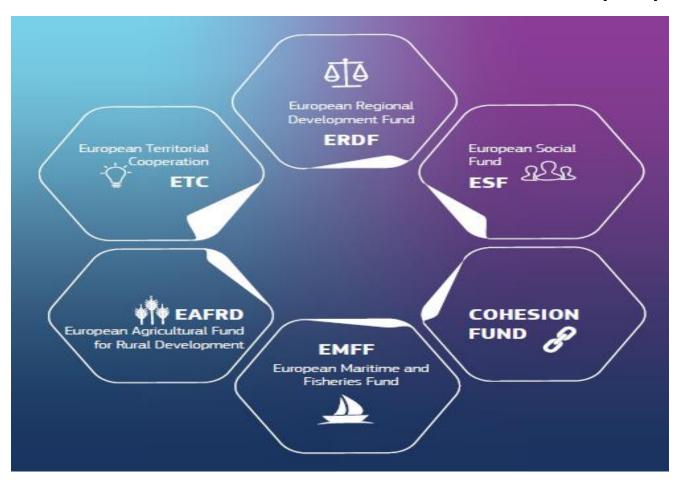


IAASARS





European Structural and Investment Funds (ESIF) 2014-2020



- European Regional Development Fund (ERDF)*
- European Social Fund (ESF)
- 3) Cohesion Fund (CF)
- 4) European Maritime and Fisheries Fund (EMFF)
- 5) European Agricultural Fund for Rural Development (EAFRD)
- * including European Territorial Cooperation (ETC) / INTERREG

https://ec.europa.eu/info/funding-tenders/european-structural-and-investment-funds_en

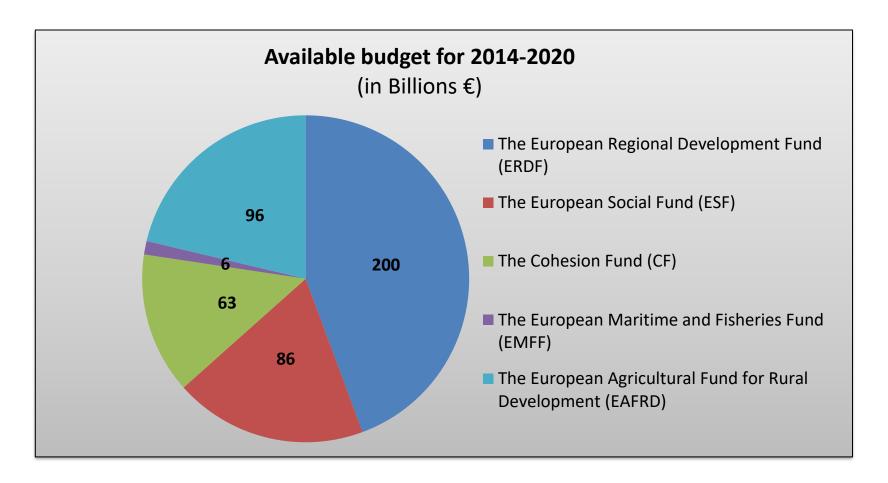








European Structural and Investment Funds (ESIF) 2014-2020





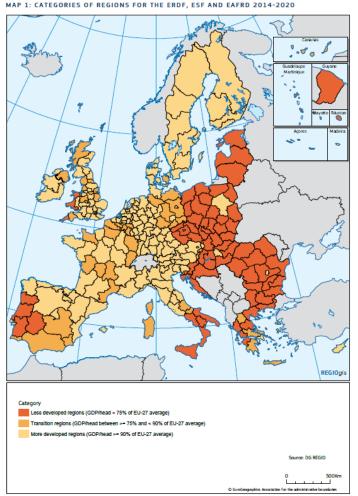


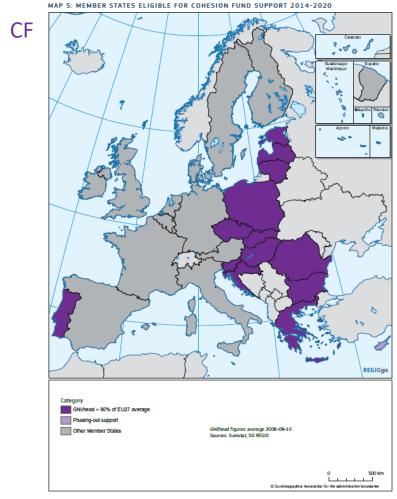




European Structural and Investment Funds (ESIF) 2014-2020

ERDF ESF EAFRD







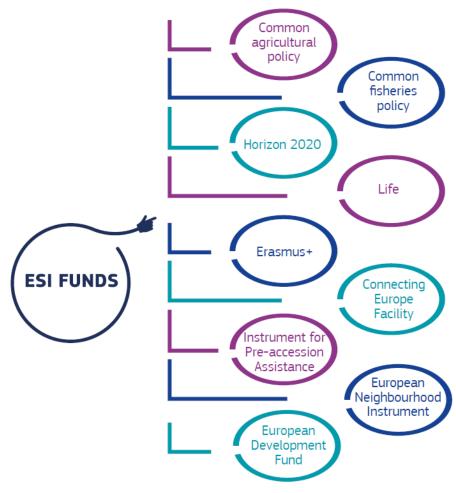






European Structural and Investment Funds (ESIF) 2014-2020

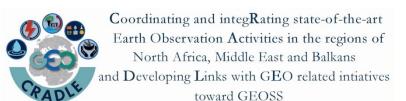
The Common Strategic Framework also sets out practical ways to build synergies between the ESI Funds and other EU policies and instruments:











EU Framework Programme for Research and Innovation (Horizon 2020)

https://ec.europa.eu/programmes/horizon2020/



Highly relevant to

GEO-CRADLE!

Excellent Science H2020 is the

European Research Council

Future and Emerging Technologies Marie Skłodowska-Curie actions

Research Infrastructures, including e-Infrastructures

Industrial Leadership Innovation

biggest EU

Research

and

programme

ever with

over 7 years

(2014 to

2020),

enhancing

EU

Leadership in Enabling and Industrial Technologies

Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing, and Biotechnology

Information and Communication Technologies

Space

nearly €80 Access to risk finance billion of **Innovation in SMEs**

funding **Societal Challenges**

Health, Demographic Change and Wellbeing available

Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy

Secure, Clean and Efficient Energy Smart, Green and Integrated Transport

Climate Action, Environment, Resource Efficiency and Raw Materials Europe in a changing world - Inclusive, innovative and reflective societies

Secure societies – Protecting freedom and security of Europe and its citizens

Spreading Excellence and Widening Participation

international

Science with and for Society

research and **Cross-cutting activities (focus areas)**

Third Fast Track to Innovation Pilot

European Institute of Innovation and Technology (EIT) Country

Euratom participation

Smart Cyber-Physical Systems



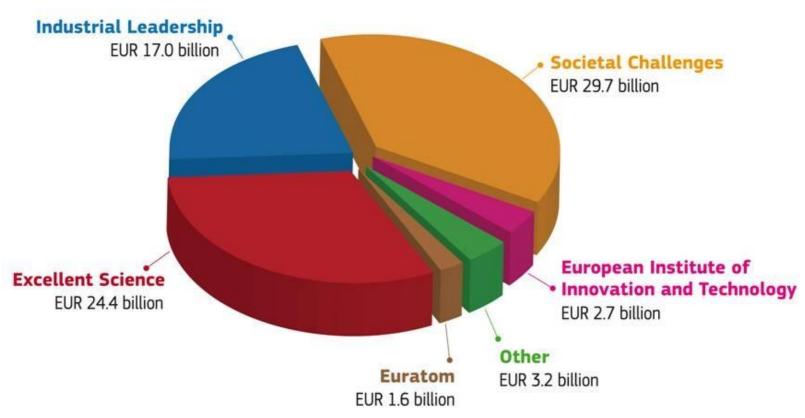






EU Framework Programme for Research and Innovation (Horizon 2020)

HORIZON 2020 BUDGET (EUR 78.6 billion, current prices)











EU Framework Programme for Research and Innovation (Horizon 2020)

The PRIMA initiative

Highly relevant to GEO-CRADLE!

The Commission has agreed on a proposal for a Partnership for Research and Innovation in the Mediterranean Area, PRIMA, which is set to develop much-needed novel solutions for sustainable water management and food production.

Funding for the €400 million partnership will come from the participating countries (currently around €200 million), matched by a €200 million contribution from the EU through its current research framework programme Horizon 2020.

The partnership is scheduled to run for **10 years**, starting in **2018**.

The PRIMA Joint Programme involves 19 countries:

- 11 Member States: Croatia, Cyprus, the Czech Republic, France, Greece, Italy, Luxembourg, Malta, Portugal, Slovenia and Spain;
- 8 third countries: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Tunisia and Turkey.

Of these, 14 countries (Cyprus, the Czech Republic, Egypt, France, Greece, Israel, Italy, Lebanon, Luxembourg, Malta, Morocco, Portugal, Spain and Tunisia) have agreed to jointly undertake the PRIMA initiative.

The participation of **Germany** is currently under negotiation. As the initiative is evolving over time, more participants are expected to follow, both EU and non-EU countries.

http://ec.europa.eu/research/environment/index.cfm?pg=prima









Instrument for Pre-accession Assistance II (IPA)

The IPA provides assistance to countries directly in line to become members of the European Union (candidate countries: Albania, Montenegro, Serbia, the former Yugoslav Republic of Macedonia, and Turkey), as well as the rest Balkan countries (potential candidates: Bosnia-Herzegovina and Kosovo*).



https://ec.europa.eu/neighbourhood-enlargement/instruments/overview_en









Instrument for Pre-accession Assistance II (IPA)

The IPA is the means by which the EU supports reforms in the 'enlargement countries' with financial and technical help. The IPA funds build up the capacities of the countries throughout the accession process, resulting in progressive, positive developments in the region.

Budget of IPA II for 2014-2020: € 11.7 billion.

Country	<u>2016</u>
Albania	89.7
Bosnia & Herzegovina	42.7
The former Yugoslav Republic of Macedonia	91.6
Kosovo*	88.7
Montenegro	37.4
Serbia	207.9
Turkey	630.7
Multi-country	390.0

Pre-accession assistance is an investment in:

- ✓ Public administration reform
- ✓ Rule of law
- Sustainable economy
- ✓ People
- Agriculture and rural development







Highly relevant to GEO-CRADLE!



European Neighbourhood Instrument (ENI)

The ENI funds the European Neighbourhood Policy (ENP) which covers cooperation with EU's 16 Neighbours.

Russia takes part in Cross-Border Cooperation activities under the ENP and is not a part of the ENP as such.

- * SYRIA: EU
 Cooperation with
 Syria is currently
 suspended due to the
 political situation
- ** PALESTINE: This designation does not entail any recognition of Palestine as a state and is without prejudice to positions on the recognition of Palestine as a state.



http://ec.europa.eu/europeaid/funding/european-neighbourhood-and-partnership-instrument-enpi_en









European Neighbourhood Instrument (ENI)

Budget of ENI for 2014-2020: € 15.4 billion.



http://www.enpi-info.eu/files/publications/ENI.pdf









Development Cooperation Instrument (DCI)

The DCI covers all the developing countries except the countries eligible for the Pre-Accession Instrument.
There are 3 specific components covered:

Geographic programmes

Thematic programmes

Pan-African Programme **Geographic programmes** support cooperation with around 47 developing countries in Latin America, South Asia and North and South East Asia, Central Asia, **Middle East** and South Africa. They support actions based on the European Consensus for Development and the following areas:

- ✓ Human rights, democracy and good governance
- ✓ Inclusive and sustainable growth for human development (e.g. health, education, social protection, sustainable agriculture, food and nutrition security...)
- ✓ Migration and asylum
- ✓ The link between humanitarian relief and development cooperation
- ✓ Resilience and disaster risk reduction
- ✓ Development and security, including conflict prevention.







Highly relevant to

GEO-CRADLE!



Development Cooperation Instrument (DCI)

The DCI covers all the developing countries except the countries eligible for the Pre-Accession Instrument.
There are 3 specific components covered:

Geographic programmes

Thematic programmes

Pan-African Programme **Thematic programmes** benefit all developing countries (including those covered by the ENPI and the EDF). These programmes add value, complementarity and coherence to the geographical programmes. There are 2 categories:

- ✓ 'Global public good and challenges': this programme addresses climate change, environment, energy, human development, food security and migration while ensuring coherence with the poverty reduction objective. No less than 27% of this programme is spent on climate change and environment objectives. At least 25% of the programme is used to support social inclusion and human development.
- ✓ 'Civil society organisations and local authorities': this programme provides greater support to civil society and local authorities to encourage them to play a bigger role in development strategies.

 Highly relevant to









Development Cooperation Instrument (DCI)

The DCI covers all the developing countries except the countries eligible for the Pre-Accession Instrument.
There are 3 specific components covered:

Geographic programmes

Thematic programmes

Pan-African Programme The newly established **Pan-African Programme** supports the strategic partnership between the EU and **Africa**. This programme complements other financing instruments which are used in Africa (in particular ENI and EDF) and supports activities of trans-regional, continental or global nature in and with Africa.

Highly relevant to GEO-CRADLE!

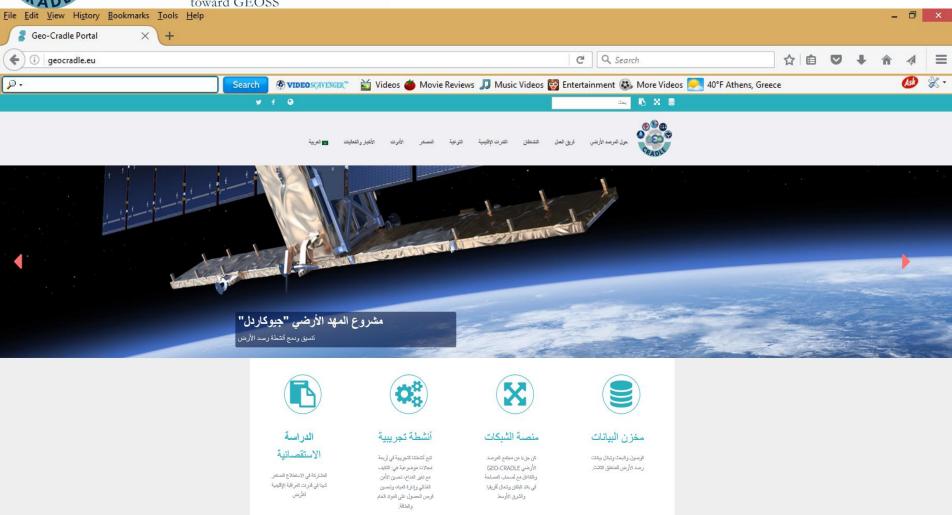






Coordinating and integRating state-of-the-art
Earth Observation Activities in the regions of
North Africa, Middle East and Balkans
and Developing Links with GEO related intiatives
toward GEOSS

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thank you!





