

GEO-CRADLE networking event in <u>Chişinău</u>, Moldova Tuesday 3 January 2017, 11:00-13:00



Organised by the National Observatory of Athens, GEO-CRADLE Project Coordinator

Kindly hosted by the State Hydrometeorological Service of the Republic of Moldova







GEO-CRADLE:

Fostering regional cooperation and

roadmap for GEO

implementation in

and Copernicus

Middle East and

North Africa,

Balkans

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

GEO-CRADLE networking event in Chişinău, Moldova Tuesday 3 January 2017, 11:00-13:00

AGENDA

11:00-11:10 Welcome by Mr Valerii Cazac, Chief of the Department of Hydrology

11:10-11:30 Presentation of the State Hydrometeorological Service of Moldova and its three departments: Meteorology, Hydrology, Environment Quality Monitoring, by *Ms Violeta Balan, First Deputy Director of the State Hydrometeorological Service*

11:30-12:00 GEO-CRADLE contribution towards inventorying of capacities and user needs, gap analysis, maturity indicators and priorities, addressing regional challenges (in the fields of adaptation to climate change, improved food security and water extremes management, better access to raw materials and energy) and implementing GEOSS & Copernicus, *by Ms Alexia Tsouni, GEO-CRADLE Project Coordination Team*

12:00-12:20 Q&A

12:20-12:30 Presentation of the GEO-CRADLE survey of the regional Earth Observation (EO) capacities, by Ms Alexia Tsouni, GEO-CRADLE Project Coordination Team

12:30-12:45 Registration of capacities on the GEO-CRADLE survey in terms of space/air-borne/in-situ EO monitoring networks and infrastructure, as well as modelling and EO data exploitation facilities and skills

12:45-13:00 Open discussion







FUNDING: 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 €

Starting date: 01/02/2016

Duration in months: 30









The GEO-CRADLE consortium brings together **19 organisations** as *full partners*, including *4 international organisations* (EURISY, EARSC, EGS, CEDARE) and **5 organisations** as *"third-party" partners*, and **1 organisation** from a *collaborating country*. This allows covering the complete EO value chain, ensuring sufficient representation of the most important players in the Region of Interest (**20 countries**).



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





ID	Participant Organisation Name	Country	Logo
1	National Observatory of Athens (NOA) - Coordinator	Greece	
2	Interbalkan Environment Center (IBEC)	Greece	LBEC
3	Center for Environment and development for the Arab Region and Europe (CEDARE)	Egypt	Ð
4	Research and Studies Telecommunications Centre (CERT)	Tunisia	GERT
5	Tel Aviv University (TAU)	Israel	HAR AND
6	Cyprus University of Technology (CUT)	Cyprus	
7	TUBITAK UZAY Space Technologies Research Institute (UZAY)	Turkey	V ITAT
8	Space research and technology institute (SRTI)	Bulgaria	WKNT
9	National Institute of R&D for Optoelectronics (INOE)	Romania	Cines
10	University of Ss Cyril and Methodius (USCM)	FYROM	Ô
11	Institute for Nature Conservation in Albania (INCA)	Albania	
12	Institute of Physics Belgrade (IPB)	Serbia	3
13	CIMA Research Foundation (CIMA)	Italy	climit
14	Academy of Athens (AOA)	Greece	QUREAN
15	INOSENS (INS)	Serbia	5
16	European Association of Remote Sensing Companies (EARSC)	EU	EARST :
17	EURISY	EU	eurisy
18	EuroGeoSurveys (EGS)	EU	
19	World Radiation Center (PMOD/WRC)*	Switzerland	pmod wrc





Seeks to identify common needs, create synergies (regional cooperation), and integrate capacities (monitoring capabilities and networks, as well as scientific skills);

Proposes/sets up large scale regional initiatives based on the Earth Observation (space based and in-situ) for addressing societal priorities in different thematic aspects.

- 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

linked with the UN SDGs



GROUP ON

EARTH OBSERVATIONS







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







GEO-CRADLE Portal





Regional Data Hub – **Connection with GEOSS & Regional Portals**

- The GEO CRADLE Regional Data Hub (GC-RDH) is going to provide its users with a transparent discovery and access mechanism of the **GEOSS** portal's resources, and other regional portals.
- This mechanism will heavily rely on the GEO **Discovery and Access Broker (DAB) APIs** which is a middleware component in charge of interconnecting the heterogeneous and distributed capacities contributing to GEOSS; part of the GEOSS **Common Infrastructure (GCI) since** November 2011.





http://geocradle.eu



First Mockups of the Regional Data Hub









5 Types Identified:

- 1. Non-EU Balkan states
 - Albania, FYROM, Serbia
- 2. EU Balkan states

Bulgaria, Romania, Cyprus, Greece

- 3. Low influence of EU in EO dev. Tunisia, Egypt, Turkey
- 4. Advanced EO Ecosystem Israel
- 5. Rapid up-starters

UAE and Saudi Arabia











Albania, FYROM & Serbia

- Only basic space-borne capacities
- Dominated by public sector
- In-situ networks need further development
- Large structural gaps, sharing depends on personal relationships
- INSPIRE is being implemented (Infrastructure for Spatial Information in the European Community)
- Structural and capacity gaps aggravated by budget tightening
- EU funds support capacity building and equipment







Bulgaria, Romania, Cyprus, Greece

- All have space-capacities & formal ties to ESA
- INSPIRE is being implemented (Infrastructure for Spatial Information in the European Community); structural gaps are still large in Romania and Bulgaria
- End-users have more specific data needs than Albania, FYROM & Serbia
- Capacity gaps aggravated by budget tightening and hiring freeze in public sector
- Private sector in Romania and Greece diversified from only servicing the public sector











Tunisia, Egypt and Turkey

- All have space strategies, Egypt & Turkey have launched own EO satellites
- Public sector dominant
- Turkey EO sector has very advanced capacities
- Very large structural gaps in Egypt and Tunisia, data sharing is very limited
- Capacity gaps in Egypt and Tunisia (insufficient personnel and expertise), aggravated by budget cuts
- Observational gap identified in Tunisia: in-situ networks operate mostly at the local level and are not integrated









- Highly developed EO capacities
- Design, launch and operate EO satellites
- Advanced EO application in public and private sector
- Specialize in micro/nanosatellites niche for global market













UAE and Saudi Arabia

- Rapid EO development through high funding and prioritization; recently funding cut following fiscal consolidation
- Space agencies
- Dominated by public sector
- Low data sharing due to high bureaucratic barriers, depends on personal relationships
- Saudi Arabia
 - Burdensome bureaucratic and import procedures complicate sourcing of equipment
- UAE
 - Plan to launch satellite to study Mars atmosphere by 2020
 - Depend on foreign experts, problem of retention







T3.2 MATURITY INDICATORS

Defining maturity indicators

Parameters by which the maturity of the country related to **Earth Observation and geo-information capabilities** is measured and monitored.

Help to understand where the capabilities of the country are, and which way is the country going (projection and prospects).

Grouped by:

- <u>Capacities</u> (including national or regional capacities)
- <u>Cooperation</u> (including international cooperation)
- <u>Uptake</u> (including national uptake and awareness)

For each indicator a table has been produced:

description, parameters, constrains, gap analysis, comments









Country

Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicator S	indicators	level
CAPACITY	Infrastructure		COOPERATION	Impact GEO		UPTAKE	events	
	eo reserach		1	impact Copernicus			dissemination	
	industry base			international			policy	
	space authority			funding			penetration	
	capacity building							

Detail assessment

capacity	indicator	level	cooperation	indicator	leve
infrastructure	space borne		Impact GEO	participation GEO	
	access 3rd party missions			designated GEO office	
	ground based/ in-situ			actions on SBA's	
	modelling & computing			provision data to GEOSS	
	eo data exploitation		impact Copernicus	projects	
eo research	n. public organizations			organizations involved	
	univ. courses offered		international	ESA	
	diversity/maturity courses			meteorological	
	n. researchers			CEOS	
	papers published			INSPIRE	
industry base	n. companies			Int. agreements	
	scale companies		funding	R&D participation	
	employment				
	resellers, partnership		uptake	Indicator	leve
	clusters		events	networking	
space authority	space organization			thematic workshops	
capacity building	national R&D		dissemination	networking	
	eo focus actions			data portals	
			policy	policy implementation	
				budget	
			penetration	USA	

LEGEND eo maturity card

O initial **b** basic **•** intermediate **9** advanced **•** optimized



- identifying the content's relative maturity of indicator per country;
- providing a framework to semi-objectively classify each of the indicators and ensure metrics usage to be comparable in country regions but also over time;
- aiming to assign each of the information provided by country partners into a set of boundaries, to ensure comparison with other countries.

initial	basic	intermediate	advanced	optimized
Ad hoc	definied	managed	prospects	consolidated



http://geocradle.eu



Maturity card



T3.3 PRIORITIES IN RELATION TO REGIONAL CHALLENGES

Priority Definition Methodology











• 30 project proposals were collected from country partners









Priority framework

Priority Criteria	Sub-criteria	Description
	Scope	- Is the project within the scope of the thematic areas treated by GEO-CRADLE project?
RELEVANCE	End-user requirements matching	- Does the project meet specific end user requirements that have been promoted as common in the region according to the results of T2.4?
POLITICAL INTEREST	Visibility	- Has the project any chances to become visible and by this attract the strong interest of the decision makers, and/or receive the strong political interest in some of the countries it runs?
	Coverage	 Does the project create methodological standards and generate qualified and comparable information which can be extended to cover larger areas at regional level? What is the magnitude of the project's impact on addressing the challenge?
IMPACT	Replicability and Scalability	- How easy is it to replicate the same pilot project and how easy can it be scaled to a national level?
INFACT	Speed	- How long will it take for the design, implementation and realization of the project's impact?
	Sustainability	 Will the government(s) and partners be able to maintain the solution over the medium and long term? Does it help enable systemic improvement? Will additional funding be required for the pilot project to continue?
	Adverse effect	- What is the magnitude of negative impact?







Priority framework

Priority Criteria	Sub-criteria	Description
	Governance model	- What are the rule of law, transparency and accountability mechanisms to implement the solution?
FEASIBILITY	Capacity& skills	- Is there adequate capacity and skills to plan, implement, and monitor the solution within the timeframe of GEO-CRADLE project?
	Additional factors	- What are additional factors that may impede the implementation of the solution?
	Synergies between countries/ stakeholders	- Does the project showcase complementary use of capacities and skills from the region and synergies between countries/ stakeholders for achieving its goals?
REGIONAL DIMENSION	Use of regional/worldwide EO monitoring infrastructures	- Does the project make use of regional/worldwide EO monitoring infrastructures (space and/or in-situ)
INVESTMENT & MARKETABII TY	Market uptake	- Does the project showcase the possibility for EO market uptake in the thematic area it treats?
	Investment opportunities	- Could the potential project be a starting point or linked with existing or future investments, towards and beyond the implementation of GEO, GEOSS activities?
SYNERGY WITH	Synergy with GEO and Copernicus	- Does the project make use of existing GEO and Copernicus infrastructures, and data, and/or core products and services?
	Contribution to GEOSS initiative	- How the project is expected to contribute to the advancement of the RDH and the GEOSS portal by making available datasets and relevant metadata?







Regional Priority Action Plan (RePAP)

• The RePAP is built upon the national priorities



- The draft Regional Priority Action Plan (RePAP) is composed of 5 parts:
 - 4 thematic areas (Climate Change, Food Security & Water Extremes Management, Access to Raw Materials, Access to Energy)
 - Cross-cutting areas







Example of the RePAP

Project name	Monitoring of planted forests in semi-arid climate and assess their environmental impact using Sentinel-2.	Type of activity Operational services Capacity building Awareness activities	Operational services and awareness activities
Priority area	Food Security and climate change	Beneficiary	Israel ministry of environmental protection.
Pre-requisite For the realisation of the project	Sentinel-2 images ENVI software	Stakeholders Institutions/ actorsinvolved	Israel ministry of environmental protection. Universities.

Motivation

In the past decades, scientists come to a conclusion that our world is changing due to climate change which is affected by two mainfactors: the amount of greenhouse gasses which is released to the atmosphere (in both natural and anthropogenic processes), and the greenhouse gasses absorption capacity (in this case, forests). Natural forests thrive in tropical. Mediterranean and temperate climates where sufficient rainfall exist for maintaining the forest ecosystem, compare to semi-arid climate zone.

The project will monitor and evaluate the impact of planted forest on the micro (inside the forest) and macro (the entire forest and its surroundines) scales.

Scope of the project - The project will evaluate the impact of planted forest in semi-arid climates and

Summary of Draft Action Plan to for BiH Food Security from 2011

		Description		
	Activities and outputs	Responsible institutions*	Timing	Description Describe the pilot project by providing an answer to the following elements Scope of the project - The project will evaluate the impact of planted f
	Part One Policies to increase agricult	ural production and	improve trade	 Objectives - Evaluating the effect of forests on climate characte
1	Project to identify/confirm constraints and formulate on the basis of regular and continuing research policy analysis and policies and programmes to increase grains production and supply and decrease imports	MOFTER Entity Ministries of Agriculture	September 2011 – December	 Expected outcomes – map of the forest's regional impact on the knowledge among decision-makers. Components (IT band non IT infrastructure) Technologies to be used – Sentinel-2, field spectrometer, field m
0	1.1. Establishment of a Policy Analysis Unit (PAU) working as collective	MOFTER	2011 by end 2011	Action plan
	expert for Government Ministries responsible for agricultural production and trade	Entity Ministries of Agriculture		 Sketch out a preliminary project schedule (phase, actions, milestones, deliverables January 2017 – June 2017: data collection, field measurements. June 2017 – November 2017: Data analysis

 Objectives - Evaluating the effect of forests on climate characteristic. Expected outcomes - map of the forest's regional impact on the climate and Integration of knowledge among decision-makers. Components (IT band non IT infrastructure) Technologies to be used – Sentinel-2, field spectrometer, field measurements. Action plan -Sketch out a preliminary project schedule (phase, actions, milestones, deliverables, ...) January 2017 - June 2017: data collection, field measurements. June 2017 - November 2017: Data analysis The project will monitor and Risks What are the factors that may Impacts impede implementation of the What will be the impact of evaluate the impact of planted project (governance, the project ?and how to forest on the micro (inside the measure it? forest) and macro (the entire forest and its surroundings)







Validation of the RePAP & Future steps

- Consider new proposals from non country partners.
- Perform the mapping exercice between the gap analysis and the RePAP.
- Ensure the alignment of the RePAP with the existing national/regional EO policies.
- Validate the RePAP by decision makers.
- Refine and update the RePAP.







^{O related intiatives} The ACC Pilot (Adaptation to Climate Change)



T4.1

The ACC pilot will pave the ground for the holistic monitoring and forecasting of region-specific atmospheric components, Essential Climate Variables 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 services
- 3.Air quality services

Gap Analysis of the Regional Climate related Capacities



IAASARS



End-User Awareness on Copernicus and GEO



The September 2015 Middle East dust-storm results in dramatic **reduction of visibility** in Limassol *Mamouri et al., 2016, ACP*





8 September ~local noon







160 m 460 m



http://geocradle.eu

ACC – Desert dust services

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









B



ACC – Desert dust services

Dust effects on **aviation safety** (AirFrance 2009 accident)



Dust concentration; Cross at 30W; 5S-15N 03UTC 24 July 1 Jun 2009



IAASARS

http://geocradle.eu

Optimization of the ACC dust forecast with satellite data







ACC – Regional climate change services

Establishing a pilot regional climate change web application tool to retrieve climate variables and climate indices from high resolution regional climate projections in support of end-users and decision makers on climate change mitigation and adaptation policies.

- A need for reliable open access to weather and climate data is expressed by all countries of the Rol.
- For ACC is essential the use of future climate data from high resolution model projections for the RoI based on Regional Climate Models (RCMs).
- Need for uncertainty estimates in future projections based on ensemble versus individual RCM simulations.
- Plenty of open access data in databases but there is limited usability from non-experts.
- Need for establishing a user friendly climate change web application tool for regional climate data download in support of intermediary and end users.







ACC – Regional climate change services

Indicative list of Climate variables and indices

Clima	ite Indices	Relevance
CI1	Mean near surface temperature	Fundamental
CI2	Precipitation rate	Fundamental
CI3	Maximum near surface temperature	Fundamental, extremes
CI4	Minimum near surface temperature	Fundamental, extremes
CI5	Wind speed at 10m, 50m, 100m and 200m	Fundamental, Energy, natural disaste
CI6	Surface absorbed solar radiation	Fundamental, Energy, Tourism, Agriculture
C17	95th percentile of rain day amounts	Extremes, natural disasters
C18	95th percentile of wind speed at 10 m	Extremes, natural disasters
CI9	Annual greatest 5-day total rainfall	Extremes, natural disasters
C10	Fraction % of total rainfall from events> long-term P90	Extremes, natural disasters
C11	Number of events > long-term 90th percentile of rain days	Extremes, natural disasters
CI 12	Number of frostdays Tmin < 0 degC	Extremes
CI 13	Heat Wave Duration Index	Agriculture, Tourism
CI 14	Standardized Precipitation Index (SPI)	Agriculture, Water resources
CI 15	Potential evaporation	Agriculture
CI 16	Growing season duration (GSD)	Agriculture
CI 17	Tourism Climate Index (TCI)	Tourism
CI 18	Snow depth (SnowD)	Tourism
CI 19	Heating Degree Day (HDD)	Energy
CI20	Cooling Degree Day (CDD)	Energy
		PTIETIETIETIETIETIETIETIETIETIETIETIETIET

Make use of high resolution RCM data (0.11°) for a number of climate variables from various RCMs and emission scenarios 1950-2100. (data source: EURO-CORDEX: http://www.euro-



TerFull Period Future 11 (Lon: 32.898, Lat: 34.57, Alt: 2.9m)



Time (Years)











A thorough evaluation of specific CAMS forecasts will be exploiting an intensive ACC pilot experimental campaign as well as other regional observational platforms







ACC – Regional air quality services

ACC experimental campaign for ACC service evaluation and optimization – April 2017















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







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

Soil Spectral Library (Task 4.2 – IFS)





0.55

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

			· · · · · · · · · · · · · · · · · · ·	ENVIRONMENT CE
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@	$wl_0.739^{\bullet}0.378179 + wl_1.65^{\bullet}0.389602 - wl_0.689^{\bullet}0.184370 + 0.062336$	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*0.034158.	0.739 µm-reflectance slope/chlorophyll 0.722 µm-chlorophyll remaining
roperty	SEC, SEP, SEL	R ²	Prediction equation	Assignments
oil Field Ioisture (SFM)	0.045, 0.14, 0.016 0.027@	0.645 0.847@	$wl_0.739^{\bullet}0.378179 + wl_1.65^{\bullet}0.389602 - \\wl_0.689^{\bullet}0.184370 + 0.062336$	1.65 μ m-reflectance slope 0.688 μ m-reflectance slope
Organic Matter	0.003. 0.015. 0.002	0.827	wl 0.722*0.135211 + wl 2.328*0.034358-	0.739 µm-reflectance slope/chlorophyll 0.722 µm-chlorophyll remaining
			N	
el by p	ixel 🤘			
nap oi	n 🕌	1		
ntinel	-2			
using	g the 💹	TO		

T4.2

IBEC



2085 L0 2085 L-1 2085 L-2 2085 L-2 2085 L-3 2085 L-4





- Generate a Regional Soil Spectral Library
- Resample the models into Sentinel-2 spectral configuration
- Predict soil attributes using spectral based models
- Apply the models on a pixel by pixel basis on Sentinel-2 (reflectance) data to create soil moisture and clay content maps
- Transfer the thematic maps to the DEWETRA platform
- Apply the thematic maps into the flood models
- Assess the added accuracy obtained from the suggested concept







The connection - del











• myDewetra implementation at Regional scale:

Weather forecast model outputs global scale (e.g. GFS), land use/land cover maps, exposed elements (e.g. OpenStreetMap), satellite based rainfall observation (e.g. GPM, TRMM) and global scale flood risk hazard (e.g. GAR2015 hazard maps).

• myDewetra implementation at Basin scale:

- identification basin "test-case" (e.g. DRIN-BUNA basin in Albania)
- selection of the time period for hydrological forecast (e.g. November 2016)
- Ingestion soil moisture and clay content maps into Continuum hydrological model
- run and comparison of results from hydrological modeling with and without soil moisture and clay content maps
- value added evaluation
- publication and sharing of the results by myDewetra and connection to GEO-CRADLE
 Data Hub







Access to Raw Materials T4.3 (ARM)

Establishing a roadmap for long-term monitoring, mapping, and management of mineral deposits in a severely under-explored Rol.





T4.3 answer to the need defined by WP3

- Five proposals on raw materials pilot projects were submitted from Greece (two) and Cyprus (three).
- Selected examples of the pilot studies sites (Greece and Cyprus) present most interesting mining and post-mining areas which are going to be analysed from the point of view applicability of the EO methods.
- The elaborated methodologies will be the main goal of the pilot. The elaborated EO methodologies will be useful for better management of the mining and post-mining areas and reduce their impact on the surrounding areas.
- It is expected that the methodologies elaborated on the examples pilot site will have a universal character and could be applied for other Rol.







T4.3 answer to the need defined by WP3

Greece

Monitoring of Illegal Quarrying

Objective: Roadmap for the use of Earth Observation data & techniques for mapping and monitoring "Quarries"

Environmental Monitoring of Ayios Filippos Abandoned Public Mine of Mixed Sulphide Ores – Kirki Village (North Greece)

Site Information: Ayios Filippos sulphide Pb-Zn deposit

Objective: Creation of a database to include satellite data and other thematic, physical, environmental, geomorphic, geologic, socio-economic information pertaining to factors that affect post-mining restoration activities.











T4.3 answer to the need defined by WP3

Cyprus

Three mines with different characteristics located on the Troodos Ophiolite

Abestos mine (abandoned – under restoration)

Skourriotissa (operating - massive sulfides)

Kokkinopezoula (abandoned -massive sulfides)

Objectives: Roadmap for:

•Use Space born data to assess possible instabilities in waste dumps in order to take the proper remedial measures.

•Use Space born data to map the waste dumps of abandoned mines in order to select locations for borehole drilling for the assessment of the waste dumps for secondary mineral resources.

•Use Space born data to assess the stability of reprofiled waste dumps in under restoration mines and take the necessary measures if needed.

•Use Space born data to record the behavior of the leaching heaps of the operating mine in Skourriotissa and look for instabilities and possible environmental pollution.









SOLar Energy Applications The Solar Energy Nowcasting SystEm (SENSE) pilot T4.4

Access to energy (Sense), Partners: PMOD/WRC, NOA

pmod wrc

Sense: a solar energy now-casting system +

Purpose:

demonstrate ways to maximize value and benefits at the Rol

•Create synergies with public and private sector (solar plants, energy distributors, solar energy related end-users).

Provision of (tailored to end-user):

Now-casting of solar radiation and solar energy

Long term solar energy atlases for various areas with high temporal and spatial detail
Solar radiation related products (real time and forecasts) related with: health (UV Index (melanoma), DNA damage, cataract, Vitamin D efficiency), agriculture (photosynthesis), scientific.

Application: anywhere (Rol)







The Solar Energy Nowcasting SystEm (Sense)





Long term funding: Science towards applications

- Private sector (PV parks, energy solutions apps, ships, health related SMEs)
- Public sector (energy operators, EPAs, public information sectors e.g. weather and meteorology related bodies)
- Government based initiatives (municipalities, touristic destinations)
- EU projects (Scientific development, user oriented products, case studies)
- Copernicus/GEO related calls

Purpose:

- demonstrate ways to maximize value and benefits at the Rol Sense can be implemented anywhere on Rol – tailored products
- create synergies with public and private sector (solar plants, energy distributors, solar energy related end-users).
- Through GEO-Cradle, new projects, conferences to "advertise" the product. Spin-off opportunity.







Energy consumption in North Africa and Middle East



Source: Apricum market model Q4/2015

IAASARS

SERVAT





Identifying gaps at Rol

Solar energy - Greece















Definition of the specific pilot sites

Region	Product	Maturity	User
Greece	Energy Nowcasting + forecasting	high	Independent Energy Operator
Egypt	Nowcasting + solar atlas	Mod	Dep. Of Energy Egypt
Aegean and Adriatic sea	Solar UV Index	Mod	Superfast ferries







Pilot #1: IPTO



> IPTO is the Independent Power Transmission Operator for Greece

Control the energy demands



GROUP ON

EARTH OBSERVATIONS



Solar Energy now-casting





Pilot #2: Ministry of electricity and renewable energy of Egypt



> Optimum locations for CSP & PV installations using solar Atlas energy maps







Pilot #3: Attica Group













TOPIC : Earth observation services for the monitoring of agricultural production in Africa, http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sfs-43-2017.html

TOPIC : Supporting international cooperation activities on agriculture soil contribution to climate change mitigation and adaptation - International cooperation http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/sfs-50-2017.html

TOPIC : Preparation for a European capacity to monitor CO2 anthropogenic emissions - **List of countries and applicable rules for funding:** described in <u>part A of the General Annexes</u> of the General Work Programme. Note also that a number of non-EU/non-Associated Countries that are not automatically eligible for funding have made specific provisions for making funding available for their participants in Horizon 2020 projects. <u>http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/eo-3-2017.html</u>

TOPIC : EO Big Data Shift - List of countries and applicable rules for funding: described in <u>part A of the General</u> <u>Annexes</u> of the General Work Programme. Note also that a number of non-EU/non-Associated Countries that are not automatically eligible for funding have made specific provisions for making funding available for their participants in Horizon 2020 projects.

http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/eo-2-2017.html







EU Funding Opportunities

Teaming: Work Programme Part: <u>Spreading Excellence and Widening Participation</u> Call : <u>H2020-WIDESPREAD-2016-2017</u> https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/widespread-05-2017.html

PRIMA Initiative:

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

The proposal has been named "PRIMA", which stands for "Partnership for Research and Innovation in the Mediterranean Area". The following seven non-EU countries are taking part in PRIMA: Algeria, Egypt, Jordan, Lebanon, Morocco, Tunisia and Turkey. A total of two hundred million euros have been committed for this initiative over a 10 year period starting in 2018. This figure includes the contribution from the Czech Republic and Luxembourg, which joined PRIMA at a later stage







For more information

http://geocradle.eu/



