



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 initiatives  
toward GEOSS

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<Project Meeting. November 2016>

## T3.2 – Maturity Indicators

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# EARSC

EARSC is a trade association (non-profit Belgian), founded in 1989, dedicated to helping European companies: *providing services (including consultancy) or supplying equipment in the field of remote sensing.*

Our mission is:

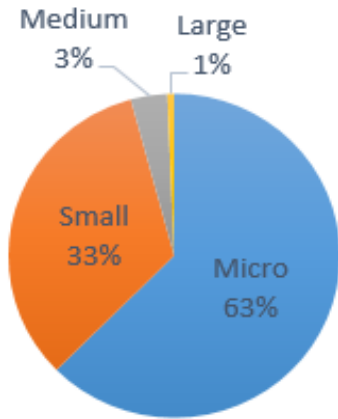
- to foster the development of the European Geo-Information Service Industry
- to represent European geospatial-information providers, creating a sustainable network between industry, decision makers and users

Today: 85 members (75 full and 10 observers) from 22 countries in Europe





# Industry



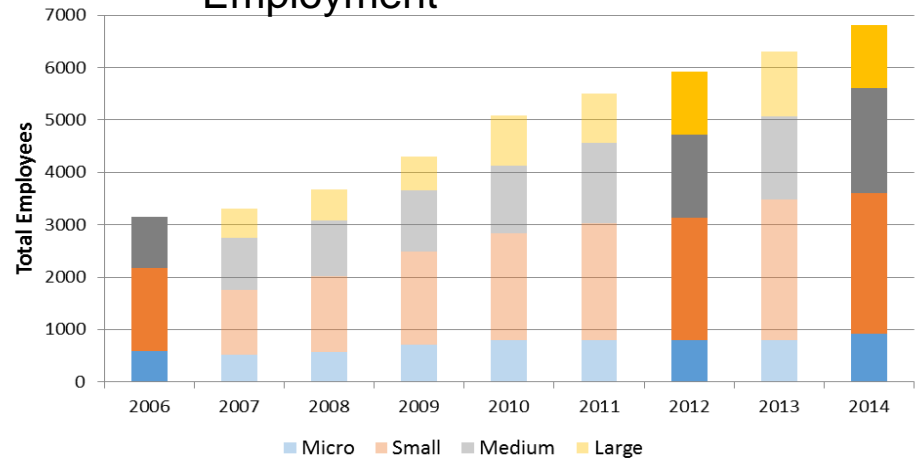
■ Micro ■ Small ■ Medium ■ Large

**>450 companies in Europe**  
**6811 direct employees**  
**€910m revenue**

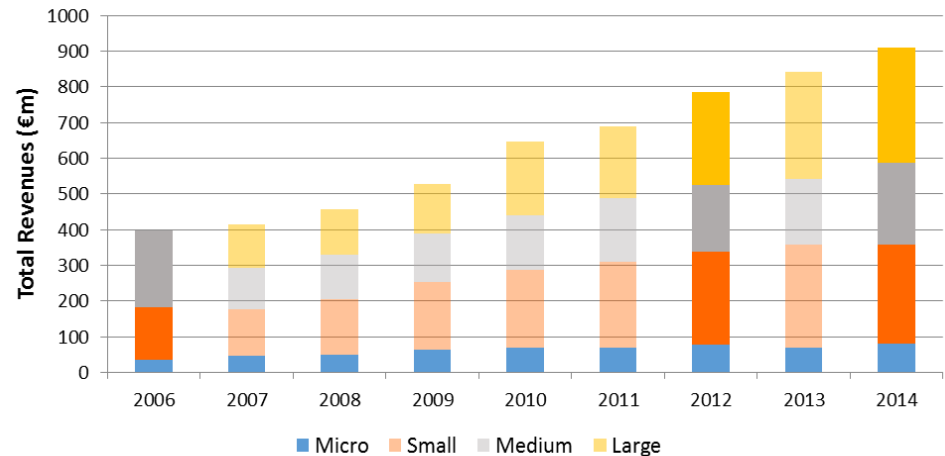
**Growth rate >8% p.a.**

**63% companies < 10 EO employees:**  
**96% companies < 50 employees**

## Employment



## Revenues





# Outline topics

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methodology

Objectives & timeline

Methodology plan

Benefits & Constraints

Definition maturity indicators

- Capacities
- Cooperation
- National uptake & awareness

draft assessment

Maturity card

Maturity level

Indicator ranges

final assessment

Examples

Validation & future



# Objectives

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- Present the Maturity Indicators that will allow to capture the level and measure the progress of each country's involvement in the implementation of GEO and Copernicus vision.

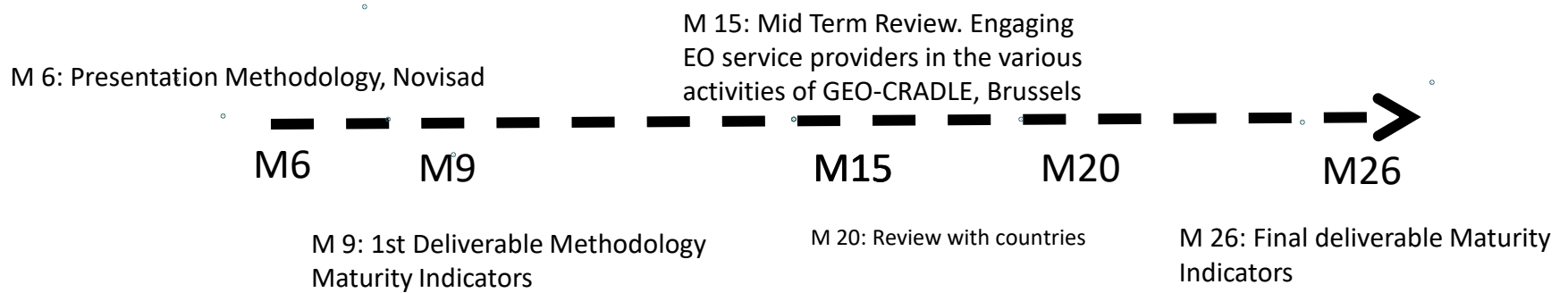
1st phase: focusses on the establishment of a robust **methodology** and some preliminary assessment of few countries as model for the maturity indicators

2nd phase: devoted to the **analysis of all the countries** and its presentation in a maturity card.

**lessons learned** from the application of the proposed methodology and proposals for further improvements in the future.



# Timeline





# Methodology plan

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- (i) Integration of project tasks: next phase
- evaluate and interpret country capacities from the inventory
  - review the gap analysis to help tie the maturity indicators with the rest of the GEO-CRADLE project
- (ii) Desk research by country partners: based on available literature and publications ongoing
- (iii) Comparative assessment: based on the desk research and benchmarking (other country) next phase
- (iv) Semi-structured interviews with country partners & organizations ongoing
- (v) Validation of findings by experts: assure overall quality of the report and to avoid inclusion of incorrect findings. feedback rounds next phase
- (vi) Action on incomplete data or N/A ongoing



# Definition maturity indicators

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- Parameters by which the maturity of the country related to Earth Observation and geo-information capabilities will be 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:

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

For each indicator a table has been produced:

description, parameteres, constrains, gap analysis, comments





# Indicators table

Ref.	Indicators	Description	Parameters	Constraints	Q / R	Gaps analysis (Task T3.1) Check-list for inventorying: additional inputs & Qs to complement	Maturity indicators (T.3.2.)  Data required to assess each indicator at country level	Comments
1.1.	<b>National Infrastructure</b>	<p>It will understand the Earth Observation Strategy by country. The goal here is to get a wide picture of the engagement in the area of Earth observations, the number and geographical distribution of EO service public and private organizations within the GEO-CRADLE region. Additional information will be provided by looking for the total n. employees for each country (public/private) and where possible classifying the companies by size. It will help to identify the collaborative EO projects and if there is partnerships for implementing EO tasks and activities. It will answer Qs as where does sit the data discovery, access, and interoperability in the countries. This component focuses on supporting willing national and regional institutions to develop monitoring capacities through the use of Earth observation and modelling.</p> <p>Until recent years, EO satellites used to be built and operated by the governmental organizations. However, launching of the private sector owned commercial remote sensing satellites, which are capable of capturing high resolution imagery, not just started a new era but also encouraged some countries to have their own remote sensing satellites. New generation of small satellites are also part of the scene.</p> <p>Developing a space programme including EO satellites</p>						
1.1.1.	Own space-borne capacity	Get a wide picture if countries are operating their space borne capacities (EO satellites, ground segments)	-N. of satellites operated by the country.  -Type of mission	Lack of response at country level	Q / R	Requested additional inputs. for each sat capacities, it has been requested (i ) title (ii) geographic coverage (region) (iii) catalogues (iv) web server (year collection of data (v) temporal resolution of data acquisition (vi) data availability policy	Request to country representative space borne capacity operated by the country.	It will provide information on the space -borne infrastructure: number of organizations but most important the type of satellites and how those are operated up to date.



# Benefits & Constraints

## Benefits

- 1) providing **quality feedback** to drive direction of involvement in the EO per country
- 2) supporting **decision-making** in future and focusing attention on what matters most
- 3) providing a **common language for communication** and helping understand performance
- 4) providing a way to **see if the investment** in the EO sector is working
- 5) serving as risk triggers and **early warning signs**

## Constraints

- 1) **availability of data** and literature for selected indicators
- 2) necessary to limit the sample of the number of **interviews**
- 3) **comparison** of countries is challenging



# Capacities

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## - National Infrastructure

Own space-borne capacity, access to 3rd party missions, ground base/ in-situ monitoring networks, modelling & computing , EO data exploitation platforms

## - Critical mass of EO researchers

N. of public organizations, courses offered by universities, diversity & maturity courses, N. of researchers, papers published

## - Industry base

N. companies, scale companies, employment numbers, resellers, existence clusters

## - Space authority

Space policy, organization chart

## - Capacity building

National R&D investment, EO focus actions



# Cooperation

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## **Impact of GEO**

Participation in GEO, designated Office, actions on SBA´s, provision of data to GEOSS

## **Impact of Copernicus**

Project using copernicus, organisations involved

## **Participation to international efforts**

ESA, WMO, EUMETSAT, GEOSS, UN-system, INSPIRE, OGC

## **Funding**

R&D participation



# National Uptake & Awareness

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## **Events**

Events networking, thematic workshops

## **Dissemination activities**

Networking, data portals

## **National policy implementation**

Policy, budget

## **Penetration**

Use (awareness, adoption, R&D uptake...)



# Maturity Card

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- will characterize the EO capacity in the countries providing concrete information on its activities.
- will identify the content's relative maturity of indicator per country
- provide a framework to semi-objectively classify each of the indicators and ensure metrics usage to be comparable in country regions but also over time.
- aim is to assign each of the information provided by country partners into a set of boundaries, to ensure comparison with other countries.



Country Maturity card examples:  
 1st Draft evaluating maturity.  
 Information to be completed in  
 the coming months



# Country

## Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure		<b>COOPERATION</b>	impact GEO		<b>UPTAKE</b>	events	
	eo research			impact Copernicus			dissemination	
	industry base			international			policy	
	space authority			funding			penetration	
	capacity building							

## Detail assessment

capacity	indicator	level	cooperation	indicator	level
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		organizations involved			
	n. public organizations		international	ESA	
	univ. courses offered			meteorological	
	diversity/maturity courses			CEOS	
	n. researchers			INSPIRE	
	papers published			Int. agreements	
industry base	n. companies		funding	R&D participation	
	scale companies				
	employment				
	resellers, partnership				
	clusters				
space authority	space organization				
capacity building	national R&D				
	eo focus actions				

uptake	indicator	level
events	networking	
	thematic workshops	
dissemination	networking	
	data portals	
policy	policy implementation	
	budget	
penetration	use	





# Israel

## 1. Capacities

Focus on country and regional EO activities. How the sector using EO in Geo-Cradle area look like?

Ref.	Indicators	Maturity indicators (T.3.2.)	Country partner answer
1.1.	National <u>Infrastructure-It will understand the Earth Observation Strategy</u> by country.		
1.1.1.	<u>Own space-borne capacity</u>	<u>Request to country representative information on space borne capacity operated by the country. (N. of satellites operated by the country and the type of mission)</u>	<u>satellites, 2 commercial photogrammetric satellites, 3 military satellites, 3 research and telescopes.</u>
1.1.2.	<u>Access to 3rd party missions (own ground stations)</u>	<u>Request to country representative and thematic experts in the country but also in the region if he knows who operates the ground station (satellite operator or 3rdparty mission).</u>	ISA - Israel Space Agency
1.1.3.	<u>Ground-based / in-situ monitoring networks and facilities</u>	<u>Requested additional inputs on the number of organizations operating the equipment necessary to control and to acquire data from EO satellites and in-situ (active or passive remote sensors, meteo /atmospheric/water sensors, etc.) (Total number of Organizations with ground based/in-situ capacities. Number of stations. Location &amp; region)</u>	<u>At least 13 organizations operate either portable or static equipments for water, soil, veg, weather or spectra monitoring. the total number of measurement points is over 3300</u>
1.1.4.	<u>Modelling and computing capacities</u>	<u>If organizations do have the modelling and computing processing capacities (high-performance computer (HPC)) then they are asked to provide a short description of what it is used for. It is important to have an overview on the number of models, (ie. models for atmospheric modelling, what those are, what is the status and the research owner (Total number of Organizations with modelling &amp; processing capacities and Total number of models)</u>	<u>All organizations have sufficient computing and processing capacities for their needs (18 organizations), they used different models and algorithms depend on their needs. In general I would say that the number of models and algorithms exceeds 100.</u>
1.1.5.	<u>EO data exploitation platforms (provision of VA services and products)</u>	<u>Request about coordinating monitoring networks, integrated analysis &amp; modeling capacity. -Names of organizations with data exploitation products (Type pf organization according to classification system)</u>	
1.2.	<u>Critical Mass of EO researchers: Identification of the different groups of researchers both in research institutions &amp; universities/academia and how big these groups are.</u>		
1.2.1.	<u>Number of public organizations</u>	<u>Country partners should be able to provide the names of the organisations and what they do (the classification - information of those institutions activity and areas). It is assumed that these organizations do not go beyond in the value chain. So any public organization that represents more than user they will appear in section 1.1.</u>	<u>spectrum of requirements in space, air, land, sea and cyber. A world leader in all of its main areas of activity:</u> <u>Satellites and Space Systems</u> <u>Defense Systems, Missiles and</u> <u>Intelligence Weapons</u>
		<u>Request to country representative &amp; desk research on the number of courses offered: Information about the quantity of courses and the investment in the future. The country partner</u>	<u>Sensing and Image Processing (2h), Spectroscopy of Soil and Vegetation (2h), Remote Sensing to monitor air</u>





# Maturity level

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- **Level 0: initial**: The indicator provides guidance to think about the country approach. The intention is to raise awareness and aid to country partners in thinking about the status of the indicator and its performance. The content may also describe promising research results that may have been demonstrated in a constrained setting.
- **Level 1: basic**: The indicator describes country practices that are in early pilot use and are demonstrating some successful results.
- **Level 2: intermediate**: The indicator describes country practices that are in limited use in industry or government organizations for the EO sector.
- **Level 3: advanced**: The indicator describes country practices that have been successfully deployed and are in widespread use. Experience reports and case studies are typically available to evaluate this level.
- **Level 4: optimized**: The indicator describes practices that have been fully integrated and optimized by the country.



# Indicators boundaries

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assess the country maturity of a given set of indicators

boundaries will relate to the degree of formality and optimization of the group of indicators (capacities, cooperation and uptake)

- (0) no commitment to perform space-borne capacity
- (1) ability to perform the capacity
- (2) capacity performed; at least 1 satellite operated by the country
- (3) more than 1 mission, future mission planning with improvement degree
- (4) well developed capacity in a full integrated structure



# Indicators boundaries (space borne)

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Example: **Space borne capacity operated by the country**

**ISRAEL:** Israel has an advanced space-borne capacities. 5 communication satellites, 2 commercial photogrammetric satellites, 3 military satellites, 3 research and telescopes, 4 university/students satellites, 2 probes. Launching capacity (4) **well developed capacity in a full integrated structure**

**ROMANIA:** Since 2011 research institutes and private companies are contributing to ESA missions. Several satellites have been building up to now: microsatellite [Goliat](#) (2012), launched into orbit by the European Vega rocket, on its first operational flight. Goliat has been developed by [Romanian Space Agency](#), [Institute of Space Science](#), [BITNET](#) and [ELPROF](#) artificial nanosatellites RoBiSAT, part of the QB50 constellation. Robisat 1 and Robisat 2 will be sent to the ISS at the end of 2016 on the Cygnus CRS OA-7, being developed by the [Institute of Space Science](#). (3) **more than 1 mission, future mission planning with improvement degree**



# Indicators boundaries (space borne)

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Example: Space borne capacity operated by the country

EGYPT: There was a LEO satellite that deorbited since October 2010, it is in the process of developing new satellites **(2) capacity performed; at least 1 satellite operated by the country**

ALBANIA: This activity is not in function in Albania. None of the public institutions or private institution has contributed in satellite building or launching in space. It is come from the lack of knowledge in using these data or in lack of financial support. **(0) no commitment to perform space-borne capacity**



# Indicators boundaries (companies)

Example: N. of companies

GREECE: There are 59 companies in total: (i) Satellite operator: 1 (ii) Data reception and distribution: 0 (iii) Data reseller: 0 (iv) Value-adding services: 11 (v) Downstream / GIS services: 1 (vi) Consultancy - studies: 12 (vii) Hardware / software provision: 34 (see tab 1.3)

Level 4: the country has more than 20 companies representing all the categories covering the EO value chain.

N°	Company Name	EARSC classification	Scale	Employment	Reseller
1	Adamant Composites	(vii) Hardware / software prov	micro	9	no
2	Advanced Microwave Systems	(vii) Hardware / software prov	micro	6	no
3	Advent Technologies	(vii) Hardware / software prov	small	14	no
4	AeroPhoto	(vi) Consultancy - studies	micro	1	no
5	Alma Technologies	(vii) Hardware / software prov	micro	6	no
6	Althom Engineering	(vi) Consultancy - studies	mediu	51	no
7	Analogies	(vii) Hardware / software prov	micro	9	no
8	Aratos Technologies	(iv) Value-adding services	small	10	no
9	Attisat	(vii) Hardware / software prov	micro	6	no
10	Creative Systems Engineering	(vii) Hardware / software prov	micro	2	no
11	Datalabs	(vii) Hardware / software prov	small	10	no
12	Dedalos	(vii) Hardware / software prov	micro	3	no
13	Draxis environmental	(v) Downstream / GIS services	small	10	no
14	EKBY	(vi) Consultancy - studies	mediu	53	no
15	ELFON LTD	(vii) Hardware / software prov	mediu	70	no
16	Emtech	(vii) Hardware / software prov	micro	7	no
17	Epsilon	(vi) Consultancy - studies	mediu	51	no
18	Eulambia Advanced Technologies	(vii) Hardware / software prov	micro	4	no
19	European Sensor Systems	(vii) Hardware / software prov	small	15	no
20	Fasmetrics	(vii) Hardware / software prov	small	20	no
21	Feac Engineering	(vi) Consultancy - studies	micro	1	no
22	Geoapikonisis	(iv) Value-adding services	small	13	no
23	Geoset	(vi) Consultancy - studies	small	12	no
24	Geosfaira	(iv) Value-adding services	micro	7	no
25	Geosystems hellas	(iv) Value-adding services	micro	7	yes
26	Geotopos	(vi) Consultancy - studies	small	32	no
27	Hellas Sat	(i) Satellite Operator	mediu	60	no
28	Hellenic Aerospace Industr	(vii) Hardware / software prov	large	1380	no



# Indicators boundaries (companies)

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Level 0: no private companies in the EO domain

Level 1: between 1-5 companies in the country serving any category in the EO value chain (i) satellite operator: defined as the owner of a satellite system (ii) data reception and distribution: owner or operator of a ground station (EO) (iii) data reseller: satellite or other data from non-EU sources (iv) value-adding services: company using EO data to produce products (v) downstream / GIS services: but with a satellite data element. (vi) consultancy - studies / analyses not VA services. (vii) hardware / software provision. **FYROM, Egypt, Morocco, Cyprus, Bulgaria**

Level 2: the country has between 5-10 companies serving at least 3 categories covering the EO value chain. **Turkey, Serbia, Tunisia,**

Level 3: the country has between 10-20 companies. **Romania**

Level 4: the country has more than 20 companies representing all the categories covering the EO value chain. **Israel, Greece,**



# Country

- Level 0: initial (Albania, FYROM)
- Level 1: basic (Bulgaria)
- Level 2: intermediate ( Marocco, Cyprus, Egypt, Tunisia, Serbia)
- Level 3: advanced (Greece, Romania, Turkey)
- Level 4: optimized (Israel) (N/A)

## Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure		<b>COOPERATION</b>	impact GEO		<b>UPTAKE</b>	events	
	eo reserach			impact Copernicus			dissemination	
	industry base			international			policy	
	space authority			funding			penetration	
	capacity building							

## Detail assessment

capacity	indicator	level	cooperation	indicator	level
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		organizations involved			
	n. public organizations		international	ESA	
	univ. courses offered			meteorological	
	diversity/maturity courses			CEOS	
	n. researchers			INSPIRE	
	papers published			Int. agreements	
industry base	n. companies		funding	R&D participation	
	scale companies				
	employment				
	resellers, partnership				
	clusters				
space authority	space organization				
capacity building	national R&D				
	eo focus actions				

uptake	indicator	level
events	networking	
	thematic workshops	
dissemination	networking	
	data portals	
policy	policy implementation	
	budget	
penetration	use	





Advanced (+)



Israel

### Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	●	<b>COOPERATION</b>	impact GEO	↻	<b>UPTAKE</b>	events	●
	eo reserach	↻		impact Copernicus	○		dissemination	↻
	industry base	●		international	↻		policy	●
	space authority	●		funding	↻		penetration	↻
	capacity building	●						

### Detail assessment

capacity	indicator	level	cooperation	indicator	level	
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	N/A		impact Copernicus	projects	○
eo research	n. public organizations	↻		organizations involved	○	
	univ. courses offered	↻	international	ESA	↻	
	diversity/maturity courses	↻		meteorological	●	
	n. researchers	↻	CEOS	○		
industry base	papers published	●		INSPIRE	○	
	n. companies	●		Int. agreements	N/A	
	scale companies	●	funding	R&D participation	↻	
	employment	●				
	resellers, partnership	●				
	clusters	N/A				
space authority	space organization	●				
capacity building	national R&D	●				
	eo focus actions	●				

uptake	indicator	level
events	networking	↻
	thematic workshops	●
dissemination	networking	↻
	data portals	○
policy	policy implementation	●
	budget	●
penetration	use	↻

draft assessment

LEGEND eo maturity card ○ initial ↻ basic ↻ intermediate ↻ advanced ● optimized





Advanced



ROMANIA

### Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	🔴	<b>COOPERATION</b>	impact GEO	🔴	<b>UPTAKE</b>	events	🟡
	eo reserach	🔴		impact Copernicus	🔴		dissemination	N/A
	industry base	🟡		international	🟡		policy	🔴
	space authority	🟢		funding	N/A		penetration	🟡
	capacity building	🟡						

### Detail assessment

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

draft assessment

LEGEND eo maturity card

○ initial 🟡 basic 🟡 intermediate 🟡 advanced 🟢 optimized



Advanced



# Turkey

## Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	🔴	<b>COOPERATION</b>	impact GEO	🔴	<b>UPTAKE</b>	events	🟡
	eo reserach	N/A		impact Copernicus	🔴		dissemination	🔴
	industry base	🟡		international	🟢		policy	🔴
	space authority	🔴		funding	🟡		penetration	🟡
	capacity building	N/A						

## Detail assessment

capacity	indicator	level	cooperation	indicator	level
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	N/A
	eo data exploitation	N/A		impact Copernicus	projects
eo research	n. public organizations	🟢	organizations involved		🔴
	univ. courses offered	🟡	international	ESA	🟡
	diversity/maturity courses	🟡		meteorological	🟢
	n. researchers	N/A		CEOS	🟢
papers published	N/A	INSPIRE		🟢	
industry base	n. companies	🟡	funding	Int. agreements	🟢
	scale companies	🟢		R&D participation	🟡
	employment	🟢			
	resellers, partnership	🟢			
	clusters	🟡			
space authority	space organization	🔴			
capacity building	national R&D	N/A			
	eo focus actions	🟡			

uptake	indicator	level
events	networking	🟡
	thematic workshops	🟡
dissemination	networking	🟢
	data portals	🟡
policy	policy implementation	🟢
	budget	N/A
penetration	use	🟡

draft assessment

LEGEND eo maturity card

○ initial 🟡 basic 🟡 intermediate 🟡 advanced 🟢 optimized



Advanced (-)



Greece

### Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	🔄	<b>COOPERATION</b>	impact GEO	🔴	<b>UPTAKE</b>	events	🔄
	eo reserach	●		impact Copernicus	●		dissemination	●
	industry base	🔄		international	🔴		policy	🔴
	space authority	📈		funding	N/A		penetration	●
	capacity building	🔴						

### Detail assessment

capacity	indicator	level	cooperation	indicator	level
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	N/A
	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	N/A
	employment	●			
	resellers, partnership	📈			
clusters	📈				
space authority	space organization	📈			
capacity building	national R&D	🔴	<b>uptake</b>	<b>indicator</b>	<b>level</b>
	eo focus actions	📈	events	networking	●
				thematic workshops	📈
			dissemination	networking	●
				data portals	●
			policy	policy implementation	🔄
				budget	N/A
			penetration	use	●

draft assessment

LEGEND eo maturity card

○ initial 📈 basic 📈 intermediate 🔄 advanced ● optimized



Intermediate (+)



SERBIA

### Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	▲	<b>COOPERATION</b>	impact GEO	N/A	<b>UPTAKE</b>	events	N/A
	eo reserach	↻		impact Copernicus	↻		dissemination	↻
	industry base	▲		international	↻		policy	▲
	space authority	○		funding	↻		penetration	↻
	capacity building	▲						

### Detail assessment

capacity	indicator	level	cooperation	indicator	level
infrastructure	space borne	○	impact GEO	participation GEO	N/A
	access 3rd party missions	▲		designated GEO office	▲
	ground based/ in-situ	▲		actions on SBA's	N/A
	modelling & computing	↻	provision data to GEOSS	●	
	eo data exploitation	●	impact Copernicus	projects	↻
eo research	n. public organizations	↻		organizations involved	↻
	univ. courses offered	●	international	ESA	N/A
	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	↻			
	clusters	▲	<b>uptake</b>	<b>indicator</b>	<b>level</b>
space authority	space organization	○	events	networking	N/A
capacity building	national R&D	▲		thematic workshops	●
		▲	dissemination	networking	↻
	eo focus actions	▲		data portals	●
		▲	policy	policy implementation	↻
				budget	▲
			penetration	use	↻

draft assessment

LEGEND eo maturity card

○ initial ▲ basic ▲ intermediate ↻ advanced ● optimized



Intermediate ( )



# TUNISIA

## Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	🔴	<b>COOPERATION</b>	impact GEO	🟡	<b>UPTAKE</b>	events	🟡
	eo reserach	🟡		impact Copernicus	🟡		dissemination	🔴
	industry base	N/A		international	🔴		policy	🟡
	space authority	🟡		funding	🟡		penetration	N/A
	capacity building	🔴						

## Detail assessment

capacity	indicator	level	cooperation	indicator	level
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	🟡	organizations involved	🔴		
eo research	n. public organizations	🟡	international	ESA	🟡
	univ. courses offered	🔴		meteorological	●
	diversity/maturity courses	🟡		CEOS	○
	n. researchers	●		INSPIRE	N/A
	papers published	●		Int. agreements	●
industry base	n. companies	🔴	funding	R&D participation	🟡
	scale companies	N/A			
	employment	N/A			
	resellers, partnership	N/A			
	clusters	N/A			
space authority	space organization	🟡			
capacity building	national R&D	🔴			
	eo focus actions	🔴			

uptake	indicator	level
events	networking	🟡
	thematic workshops	●
dissemination	networking	●
	data portals	🔴
policy	policy implementation	🟡
	budget	🔴
penetration	use	N/A

draft assessment

LEGEND eo maturity card ○ initial 🟡 basic 🟡 intermediate 🟡 advanced ● optimized



Intermediate (-)



CYPRUS

### Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	basic	<b>COOPERATION</b>	impact GEO	basic	<b>UPTAKE</b>	events	basic
	eo reserach	intermediate		impact Copernicus	basic		dissemination	basic
	industry base	basic		international	basic		policy	initial
	space authority	basic		funding	basic		penetration	basic
	capacity building	basic						

### Detail assessment

capacity	indicator	level	cooperation	indicator	level
infrastructure	space borne	initial	impact GEO	participation GEO	basic
	access 3rd party missions	initial		designated GEO office	basic
	ground based/ in-situ	basic		actions on SBA's	N/A
	modelling & computing	basic	provision data to GEOSS	initial	
	eo data exploitation	basic	impact Copernicus	projects	basic
eo research	n. public organizations	basic		organizations involved	basic
	univ. courses offered	optimized	international	ESA	basic
	diversity/maturity courses	basic		meteorological	optimized
	n. researchers	basic		CEOS	initial
industry base	papers published	basic	INSPIRE	basic	
	n. companies	basic	Int. agreements	initial	
	scale companies	basic	funding	R&D participation	basic
	employment	basic			
	resellers, partnership	N/A			
clusters	initial				
space authority	space organization	basic			
capacity building	national R&D	basic			
	eo focus actions	N/A			

uptake	indicator	level
events	networking	basic
	thematic workshops	basic
dissemination	networking	basic
	data portals	basic
policy	policy implementation	initial
	budget	N/A
penetration	use	basic

draft assessment

LEGEND eo maturity card

○ initial ▤ basic ▥ intermediate ▧ advanced ● optimized





Intermediate (N/A)



Egypt

### Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
CAPACITY	infrastructure	🔴	COOPERATION	impact GEO	🔴	UPTAKE	events	🔴
	eo reserach	🔴		impact Copernicus	○		dissemination	🔴
	industry base	🔴		international	N/A		policy	🔴
	space authority	🔴		funding	N/A		penetration	🔴
	capacity building	🔴						

### Detail assessment

capacity	indicator	level	cooperation	indicator	level
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/A
	n. researchers	N/A		CEOS	○
	papers published	🔴		INSPIRE	○
industry base	n. companies	🔴		Int. agreements	N/A
	scale companies	🔴	funding	R&D participation	N/A
	employment	🔴			
	resellers, partnership	🔴			
	clusters	🔴			
space authority	space organization	🔴			
capacity building	national R&D	🔴			
	eo focus actions	🔴			

uptake	indicator	level
events	networking	🔴
	thematic workshops	🔴
dissemination	networking	🔴
	data portals	○
policy	policy implementation	🔴
	budget	🔴
penetration	use	🔴

draft assessment

LEGEND eo maturity card

○ initial 🟡 basic 🔴 intermediate 🟢 advanced ● optimized



Intermediate (N/A)



# Marocco

## Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	🔴	<b>COOPERATION</b>	impact GEO	🔴	<b>UPTAKE</b>	events	🟡
	eo reserach	🔴		Impact Copernicus	N/A		dissemination	🔴
	industry base	N/A		international	🔴		policy	N/A
	space authority	N/A		funding	🔴		penetration	🟡
	capacity building	🔴						

## Detail assessment

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

draft assessment

LEGEND eo maturity card

○ initial 🟡 basic 🟡 intermediate 🟡 advanced ● optimized





Basic (+)



# Bulgaria

## Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	basic	<b>COOPERATION</b>	impact GEO	basic	<b>UPTAKE</b>	events	basic
	eo reserach	intermediate		impact Copernicus	intermediate		dissemination	basic
	industry base	intermediate		international	intermediate		policy	basic
	space authority	intermediate		funding	intermediate		penetration	basic
	capacity building	basic						

## Detail assessment

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

uptake	indicator	level
events	networking	intermediate
	thematic workshops	intermediate
dissemination	networking	intermediate
	data portals	intermediate
policy	policy implementation	intermediate
	budget	intermediate
penetration	use	intermediate

draft assessment

LEGEND eo maturity card

○ initial ▽ basic ▲ intermediate ↻ advanced ● optimized



Initial (N/A)



**FYROM**

### Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level
<b>CAPACITY</b>	infrastructure	○	<b>COOPERATION</b>	impact GEO	○	<b>UPTAKE</b>	events	N/A
	eo reserach	N/A		Impact Copernicus	N/A		dissemination	N/A
	industry base	N/A		international	N/A		policy	N/A
	space authority	○		funding	●		penetration	●
	capacity building	N/A						

### Detail assessment

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

uptake	indicator	level
events	networking	N/A
	thematic workshops	●
dissemination	networking	●
	data portals	N/A
policy	policy implementation	●
	budget	N/A
penetration	use	●

draft assessment

LEGEND eo maturity card

○ initial ● basic ● intermediate ● advanced ● optimized



Initial (N/A)



# Albania

## Score card

maturity indicators	indicators	level	maturity indicators	indicators	level	maturity indicators	indicators	level	
<b>CAPACITY</b>	N/A	infrastructure	▮	<b>COOPERATION</b>	▮	<b>UPTAKE</b>	N/A	events	▮
		eo reserach	N/A				dissemination	N/A	
		industry base	N/A				policy	▮	
		space authority	○				penetration	▮	
		capacity building	○						

## Detail assessment

capacity	indicator	level	cooperation	indicator	level	
infrastructure	space borne	○	impact GEO	participation GEO	○	
	access 3rd party missions	N/A		designated GEO office	▮	
	ground based/ in-situ	▮		actions on SBA's	N/A	
	modelling & computing	▮		provision data to GEOSS	▮	
eo research	eo data exploitation	N/A	impact Copernicus	projects	○	
	n. public organizations	N/A		organizations involved	○	
	univ. courses offered	N/A		international	ESA	○
	diversity/maturity courses	N/A		meteorological	●	
industry base	n. researchers	▮		CEOS	○	
	papers published	N/A		INSPIRE	▮	
	n. companies	N/A		Int. agreements	N/A	
	scale companies	N/A	funding	R&D participation	▮	
space authority	employment	N/A				
	resellers, partnership	N/A				
	clusters	N/A				
	space organization	○				
capacity building	national R&D	▮				
	eo focus actions	○				

uptake	indicator	level
events	networking	▮
	thematic workshops	N/A
dissemination	networking	N/A
	data portals	▮
policy	policy implementation	▮
	budget	▮
penetration	use	▮

draft assessment

LEGEND eo maturity card

○ initial ▮ basic ▮ intermediate ▮ advanced ● optimized



# Validation

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- Draft assessment (maturity cards) should be compared with each country partner
- Specific teleconferences to discuss the results
- Country partners to propose a group of experts (NCPs or industry professionals) so new validation should be in place
- Gather new information & collecting data or gaps
  - GEO-CRADLE inventory (WP2)
  - Gap analysis (WP3.1)
  - Pojection of pilot projects (WP3.4)
- Biobliography regional projects...
  - AfriGEOSS, BalkanGEONet, BRAGMA, IASON, OBSERVE...etc
- Country assessments should be repeated and refined (ensuring that the appropriate data has been gathered)
  - New round of assessements in 6 months



# Future

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- implementation of a maturity matrix will allow a country to gain insight into the current situation of the implementation of EO country capacities
- highlight the critical factors to lead to successful EO strategy implementation
- explore on the implementation of strategic plans:
  - leading initiatives
  - direct financial support to GEO/Copernicus activities
  - follow up actions.

A single set of indicators is not and cannot be used to uniquely decide the maturity of a country.

assessment provides the basis to decide upon a "defensible" level of maturity, and provides a chain of semi-quantitative evidence that can be used to support the assignment of given "scores" against the different indicators