



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

---

**GEO-CRADLE Pre Kick-Off Meeting**  
**Friday, 18<sup>th</sup> of February, 2016**  
**Regional workshop on WP2 - Inventory of**  
**capacities and user needs**  
**T2.2 In-Situ Networks**

*Eleftheria Poyiadji*  
*EOEG Deputy Chair*  
*Institute of Geology and Mineral Exploration*



## WP2/T2.2: In-Situ Networks

---

### Objective

- ❑ To develop an inventory of the available in-situ infrastructure and networks in the RoI
- ❑ to determine their status and needs, targeting the collection and harmonisation of the existing inter-disciplinary datasets
- ❑ To support the efforts towards the integration of the fragmented environmental in-situ sensors available in the RoI.

### Partners

**EGS**, NOA, IBEC, CEDARE, CERT, TAU, CUT, UZAY, SRTI, INOE, USCM, INCA, CIMA, AOA, INS

### Deliverables

D2.2: Inventory of in-situ instrumentation and regional networks [month 5]

Database containing the inventory of the available in-situ infrastructure along with the list of products, their quality indicators, and IPR issues, and networking activities.



## WP2/T2.2: In-Situ Networks



The Geological Surveys of Europe

EGS brings together the national geological surveys of Europe (including the Balkans)

GEOL. SURVEY	COUNTRY
IGME-EL	Greece
PGI-NRI	POLAND
IGME-ES	Spain
AGS	Albania
CGS	Czech republic
GIR	Romania
GSD	Cyprus
GSFBH	Federation of Bosnia & Herzegovina
GSM	FYROM
GSM	Montenegro
GSRS	Rep Srpska
HGI_CGS	Croatia
KGS	Kosovo

Geological Surveys are both, **Providers of in situ data** and **Intermediate users** combining in situ data with space-born data



# WP2/T2.2: In-Situ Networks

<b>8.30 - 12.00</b>	<b>EGS Networking Event</b>	
<b>08.30 - 08.45</b>	<b>Registration</b>	
<b>08.45 - 09.30</b>	<b>Welcome and Introductions</b>	
08.45 - 08.50	Welcome of participants / Opening of the EGS Networking Event Session	R. Livadaros, General Director, I.G.M.E.
08.50 - 09.00	GEO-CRADLE project	H. Kontoes, NOA, Project Coordinator
09.00 - 09.10	EuroGeoSurveys, the Geological Surveys of Europe	L. Demicheli, EGS Secretary General
09.10 - 09.20	Earth Observation and Geohazards Expert Group	Gerardo Herrera, EOEG Chair
09.20 - 09.30	EGS contribution to GEO-CRADLE project	E. Poyiadji, EOEG Deputy Chair
<b>09.30 - 10.15</b>	<b>Brief Presentation of EGS Relevant Projects</b>	
09.30 - 09.40	EO-MINERS and Minerals 4EU	Veronika Kopackova
09.40 - 09.50	FOREGS and GEMAS Geochemical Atlases of Europe	Alexandros Demetriades
09.50 - 09.55	GEONICKELL	Marianthi Stefouli
09.55 - 10.00	SNAP-SEE	Kiki Hatzilazaridou
10.00 - 10.05	PROMINE	Vassiliki Aggelatou
10.05 - 10.15	GEOMIND and INGEOCLOUDS	Artemios Atzemoglou
<b>10.15 - 10.35</b>	<b>Coffee Break</b>	
<b>10.35 - 11.40</b>	<b>Brief Presentation of the Participating National Geological Surveys</b>	
10.35 - 10.40	The Albanian Geological Survey	Enton Bedini
10.40 - 10.45	The Croatian Geological Survey	Zeljko Dedic
10.45 - 10.50	Geological Survey Department, Cyprus	Niki Koulermou
10.50 - 10.55	The Czech Geological Survey	Veronika Kopackova
10.55 - 11.00	Federation of Bosnia & Herzegovina	Vedad Demir
11.00 - 11.05	The Geological Survey of FYROM	Dejan Pavlov
11.05 - 11.10	Institute of Geology and Mineral Exploration (Greece)	Fotini Chalkiopoulos
11.10 - 11.15	The Kosovo Geological Survey	Fidaim Sahiti
11.15 - 11.20	The Geological Survey of Montenegro	Slobodan Radusinovic
11.20 - 11.25	Geological Survey of the Republic of Srpska	Boban Jolović
<b>12.00</b>	<b>Closing Presentations - Discussion</b>	
11.30 - 11.40	Preparation of the next EGS Networking Event in Morocco	Céline Andrien <i>or</i> Isabel Pino
11.40 - 12.00	Overall Discussion – Closing of the Session	All
<b>12.00 - 13.00</b>	<b>Lunch Break</b>	

## Athens EGS networking event

## Experience from relevant projects

## Participating National Geological Surveys

## Organisation of next EGS networking event and discussion



## WP2/T2.2: In-Situ Networks

---

Athens EGS networking event

Experience from relevant projects



### EO-MINERS (2010-2013)

Scientific objective 1: Define environmental, socio-economic, societal and sustainable development criteria and indicators to be possibly dealt with EO

Scientific objective 2: Demonstrate the capabilities of integrated EO-based methods and tools in: monitoring, managing, contributing to reducing the environmental and societal footprints of all phases of a mining project

Access to raw materials

Earth Observation methods

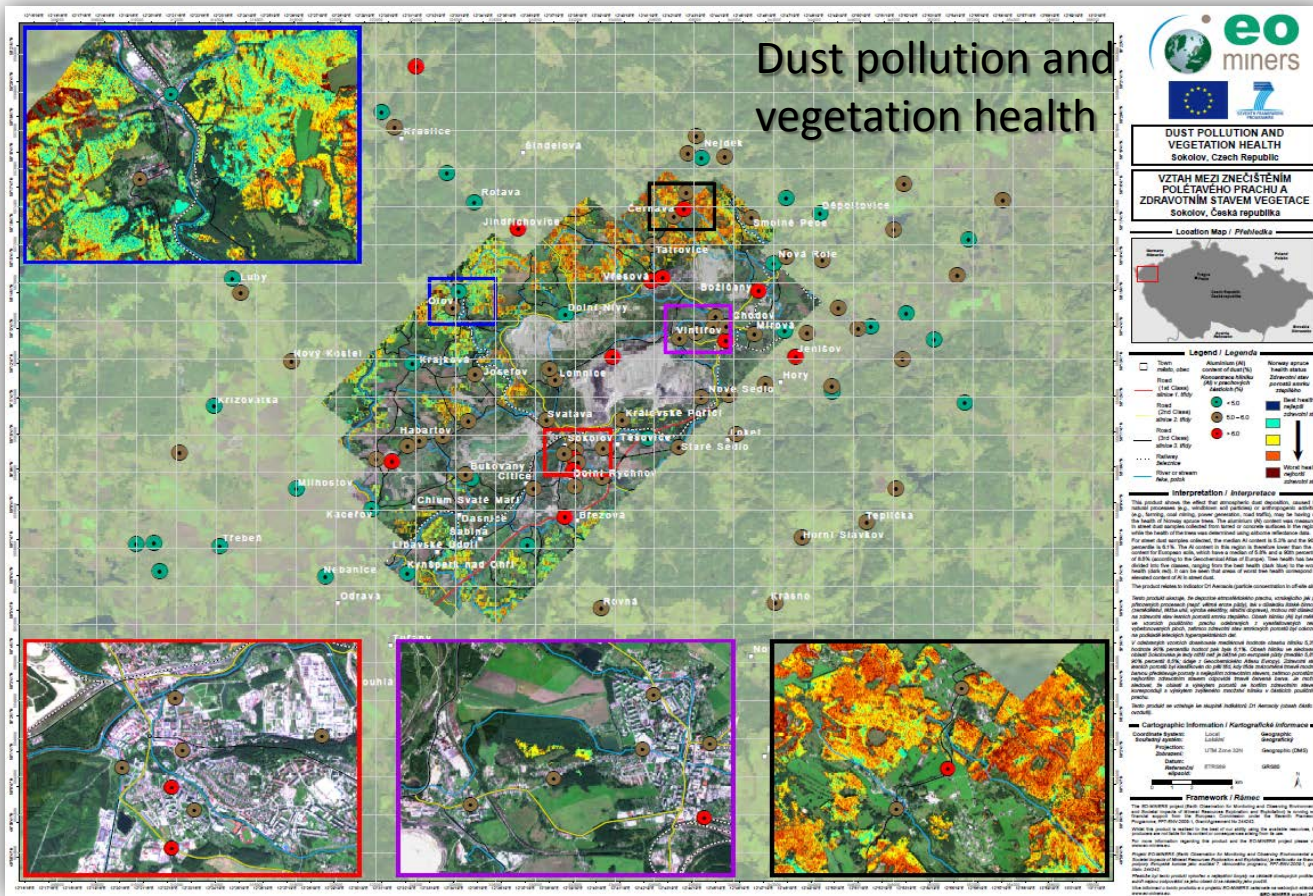




# WP2/T2.2: In-Situ Networks

## Athens EGS networking event

## Experience from relevant projects



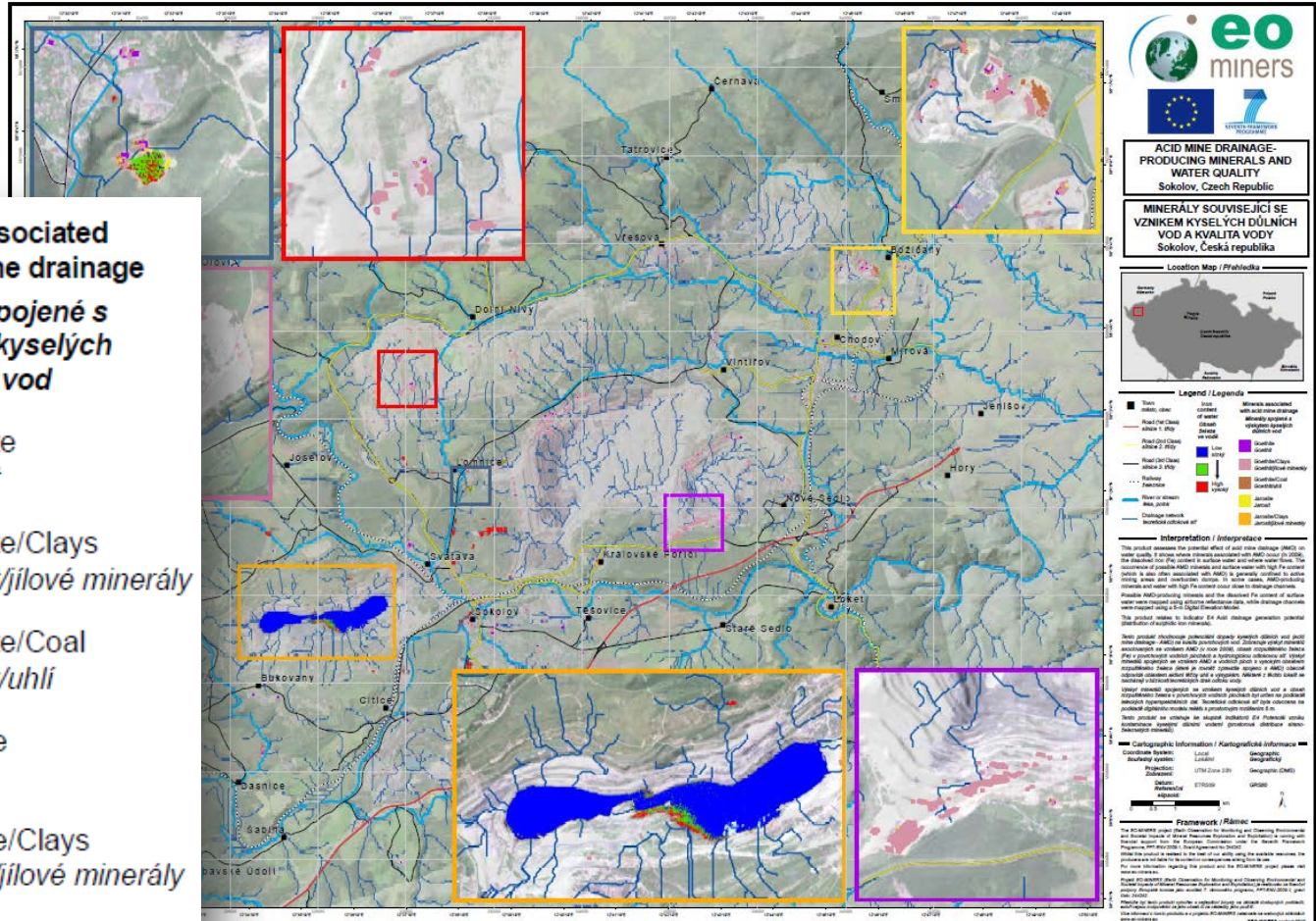




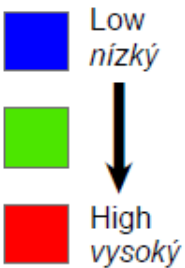
# WP2/T2.2: In-Situ Networks

Athens EGS networking event

Mineral Mapping used for water quality assessment



Iron content of water  
Obsah železa ve vodě



Low  
nízký

High  
vysoký

Minerals associated with acid mine drainage

*Minerály spojené s výskytem kyselých důlních vod*

- Goethite  
*Goethit*
- Goethite/Clays  
*Goethit/jílové minerály*
- Goethite/Coal  
*Goethit/uhlí*
- Jarosite  
*Jarosit*
- Jarosite/Clays  
*Jarosit/jílové minerály*

it



## WP2/T2.2: In-Situ Networks

Athens EGS networking event

Experience from relevant projects



Develop an EU Mineral intelligence network structure delivering a web portal, a European Minerals Yearbook and foresight studies

Access to raw materials

**Minerals4EU –**  
the leading European minerals information network structure providing tools and expertise to enhance resource efficiency, minerals supply security and support sustainable minerals development for Europe



<http://www.minerals4eu.eu/>

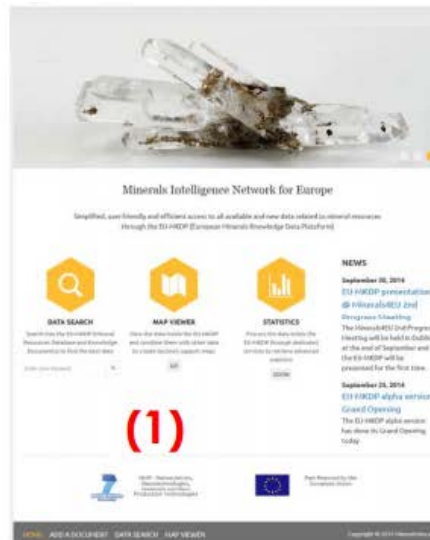
Nikolaos Arvanitidis, Scientific Coordinator, SGU/EGS MREG



## Athens EGS networking event

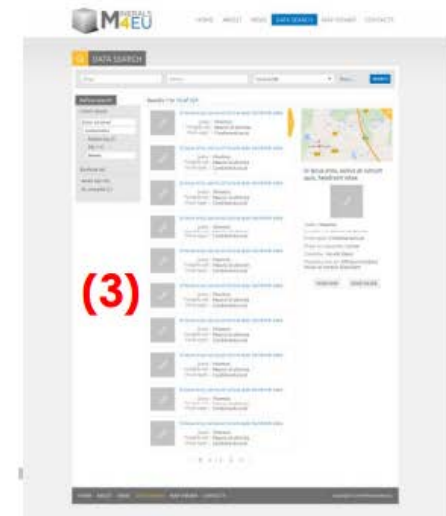
## Experience from relevant projects

- 4 parts (front office)
  - Editorial (1)
  - Map Viewer (2)
  - Search (3)
  - Services such as the e-Minerals Yearbook (4)



- 1 part (back office)
  - Documents management

■ <http://minerals4eu.brgm-rec.fr>





## WP2/T2.2: In-Situ Networks

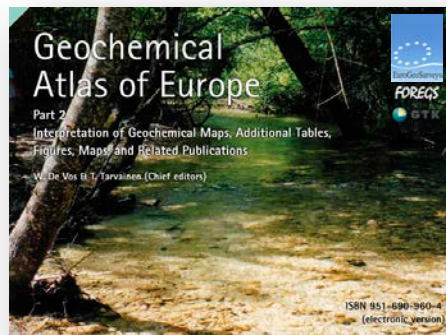
Athens EGS networking event

Experience from relevant projects

### FOREGS Geochemical Atlas of Europe

To provide high quality geochemical baseline data for Europe for multi-purpose use by using standardised sampling, sample preparation and analytical methodologies.

The Geochemical Atlas of Europe can be used for effective land use planning, *i.e.*, to decide if the particular land is fit for:



- Mineral exploration,
- Agriculture,
- Forestry,
- Animal husbandry,
- Land use policy,
- Health related research,
- Environmental policy,
- Construction of new towns, *etc.*

Food security

Access to raw materials



## WP2/T2.2: In-Situ Networks

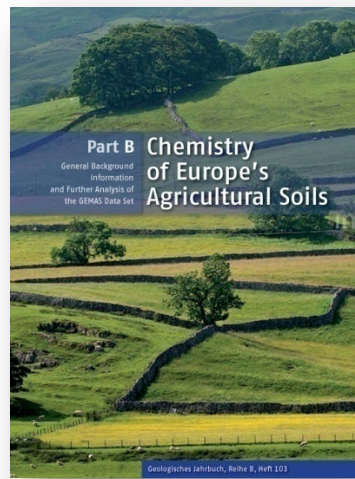
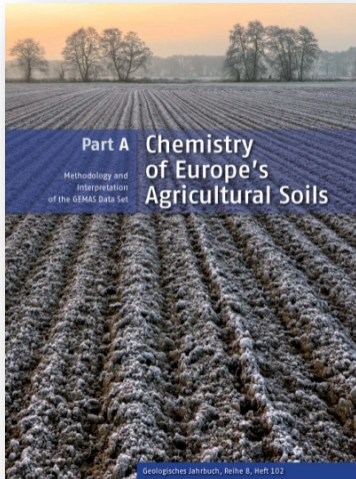
Athens EGS networking event

Experience from relevant projects



GEMAS – GEochemical Mapping of Agricultural and grazing land Soil of Europe

The GEMAS atlas results can be used for effective land use planning:



- Agriculture,
- Grazing land,
- Mineral exploration,
- Land use policy,
- Health related research,
- Environmental policy,
- Construction of new towns, *etc.*

Food security

Access to raw materials





## WP2/T2.2: In-Situ Networks

Athens EGS networking event

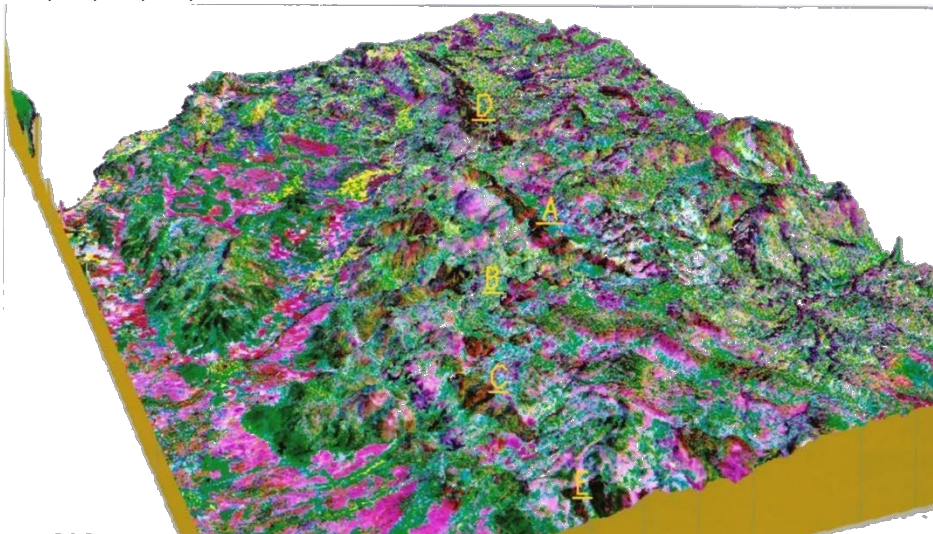
Experience from relevant projects

**GeoNickel**

Integrated Technologies for Minerals Exploration,  
Pilot Project for Nickel Ore Deposits

to enhance the geological and geophysical knowledge on nickel ore deposits, and  
to develop novel, **integrated nickel exploration methods and tools.**

A,B,C,D,E: Features related to Ni laterites



Access to raw materials

Earth Observation methods

A,B,C,D,E: The Cretaceous limestones that typically overlay the laterites are shown with dark colours. Accurate delineation has been carried out for the first time for the whole of the 1250,000 Pittcol map sheet





## WP2/T2.2: In-Situ Networks

Athens EGS networking event

Experience from relevant projects

### SNAP-SEE

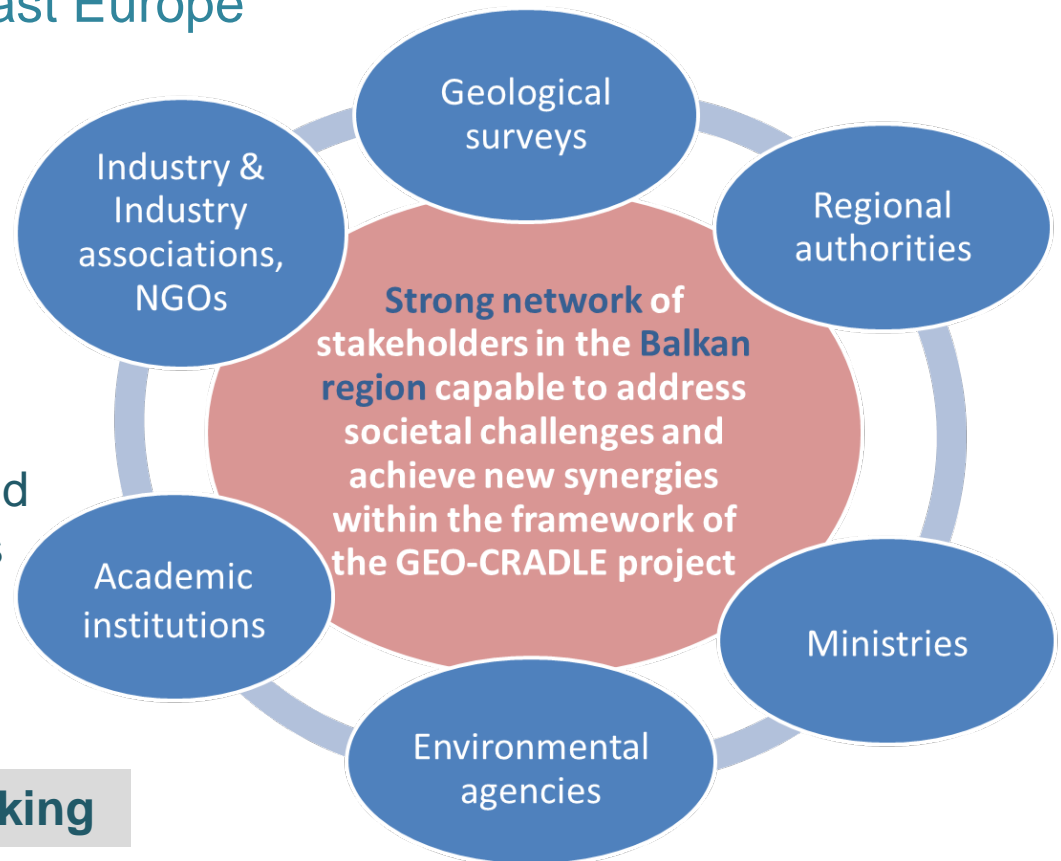
Sustainable Aggregates Planning  
in South East Europe

SNAP-SEE project addressed a key question: How can SEE countries

- improve their aggregates planning processes,
- integrate planning for primary and secondary aggregates to increase resource efficiency, and
- raise knowledge capacity levels among interested stakeholders

**Access to raw materials**

**Networking**





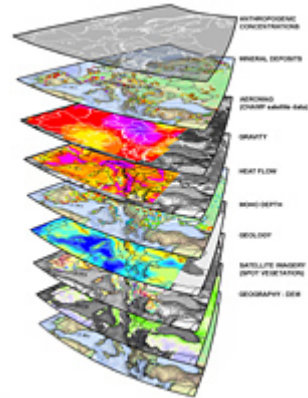
# WP2/T2.2: In-Situ Networks

## Athens EGS networking event

## Experience from relevant projects



### Nano-particle products from new mineral resources in Europe



development of a Pan-EU GIS data management and visualization system for natural and man-made mineral endowment and the realization of a Pan-EU predictive resource assessment.

develop **robust 4D geomodels visualized in user-friendly software**

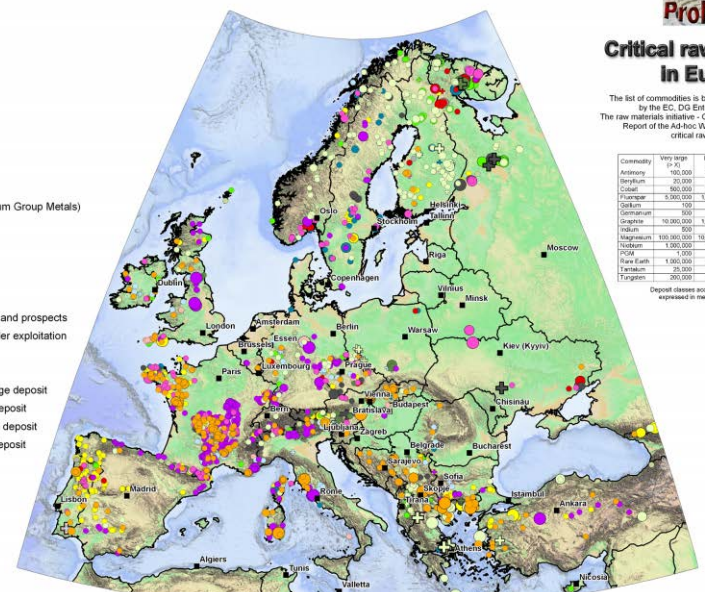
develop innovative new mineral products and new methods of extracting metals from ores and mining wastes,

**Eco-efficient metal production methods and utilization of secondary materials**

- Commodity**
- Antimony
- Beryllium
- Cobalt
- Fluorspar
- Gallium
- Germanium
- Graphite
- Indium
- Magnesium
- Niobium
- PGM (Platinum Group Metals)
- Rare Earth
- Tantalum
- Tungsten

- Pattern**
- Old deposits and prospects
- Deposits under exploitation

- Deposit size**
- Very large deposit
- Large deposit
- Medium deposit
- Small deposit



**ProMine**  
**Critical raw materials in Europe**  
 The list of commodities is based on the report published by the EC, DIO Enterprise and Industry: The raw materials initiative - Critical raw materials for the EU. Report of the Ad-Hoc Working Group on delimiting critical raw materials.

Commodity	Very large (≥ 25)	Large (10-25)	Medium (5-10)	Small (< 5)
Antimony	102,000	25,000	2,000	5,000
Beryllium	20,000	2,000	200	50
Cobalt	160,000	80,000	8,000	200
Fluorspar	5,000,000	1,000,000	200,000	50,000
Gallium	500	50	10	1
Germanium	500	50	20	1
Indium	10,000,000	1,000,000	100,000	10,000
Niobium	500	50	20	1
Niobium	100,000,000	10,000,000	1,000,000	100,000
Rare Earth	1,000,000	500,000	10,000	2,000
Tantalum	1,000	50	10	1
Tungsten	20,000	2,000	1,000	100
Tungsten	200,000	50,000	5,000	500

Deposit classes according to the tonnage expressed in metric tons (1,000 t/y).



## WP2/T2.2: In-Situ Networks

---

### Athens EGS networking event

### Experience from relevant projects

#### **GEO.M.IND**      **Geophysical Multilingual Internet- Driven Information Service**

was developed to meet the needs of people & organizations who potentially use geophysical data.

is a web based information service to search, display and order geophysical data from across Europe

#### **Main project achievements**

- Developed unique software for data management:
  1. MDE (Metadata editor)
  2. Portal (<http://www.geomind.eu/portal/home.jsf>)
- Implementation of advanced methodological solutions:
  1. Dynamic multilingualism
  2. XML transformations between different data structures
  3. ISO standard extension for geophysical data
- Big amount of collected metadata sets from different EU countries (over 1 million)
- Wide dissemination of project results through Project web site



# WP2/T2.2: In-Situ Networks

Athens EGS networking event

Experience from relevant projects



**InGeoCloudS**  
Inspired GEOdata CLOUD Services

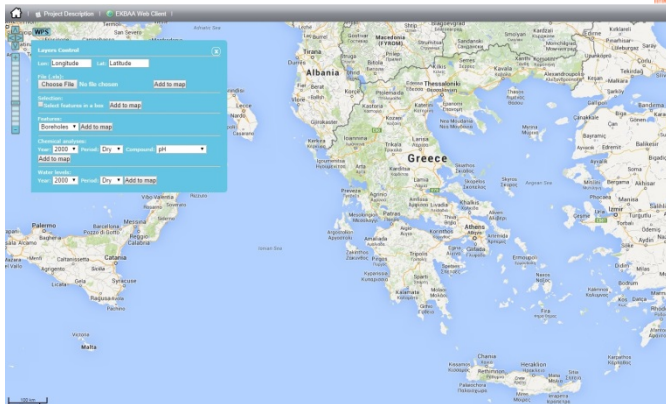
## INspired GEOdata CLOUD Services

The project demonstrated that a **Cloud infrastructure** can be used by **public organisations** to provide more efficient, scalable and flexible services for creating, sharing and disseminating **spatial environmental data**

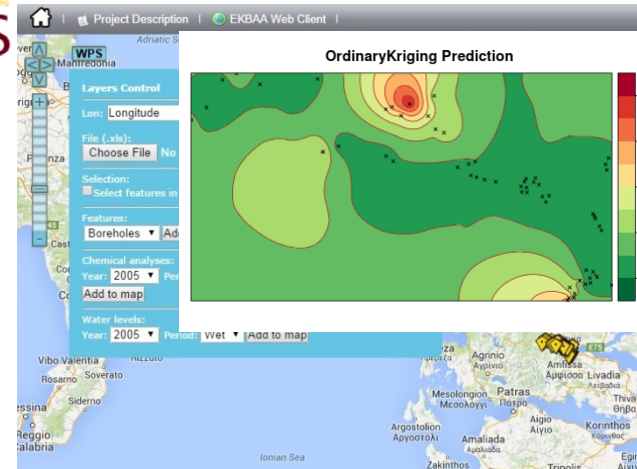
Publishing boreholes, chemical analysis and water level data



Geoprocessing (kriging)



[http://portal.ingeoclouds.eu/sitools/client-user/Groundwater\\_OK/project-index.html](http://portal.ingeoclouds.eu/sitools/client-user/Groundwater_OK/project-index.html)







# WP2/T2.2: In-Situ Networks

## Athens EGS networking event

## Experience from relevant projects



**GEOLOGICAL KNOWLEDGE AND SKILLS IN AFRICAN GEOLOGICAL SURVEY - Pan-African Project**

**Feasibility Study (2013-2015)  
The project (2016 – 2019)**



**Czech Republic, Denmark, Finland, France, Italy, Lithuania, Poland, Slovenia, Spain and Sweden**



**Algeria, Angola, Botswana, Burkina Faso, Burundi, Cameroon, Djibouti, DR Congo, Egypt, Ethiopia, Ghana, Ivory Coast, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, South Sudan, Swaziland, Tanzania, Togo and Zambia**



**Collection and analysis of questionnaires  
Replies from 23 countries**



## WP2/T2.2: In-Situ Networks

### Athens EGS networking event

Gap analysis of geoscientific mapping

Mineral resources assessment gap analysis

Geohazard mapping and monitoring and  
Geoheritage gap analysis

Capacity building and training concept  
Geoscience information infrastructure and  
management



### Experience from relevant projects





## WP2/T2.2: In-Situ Networks

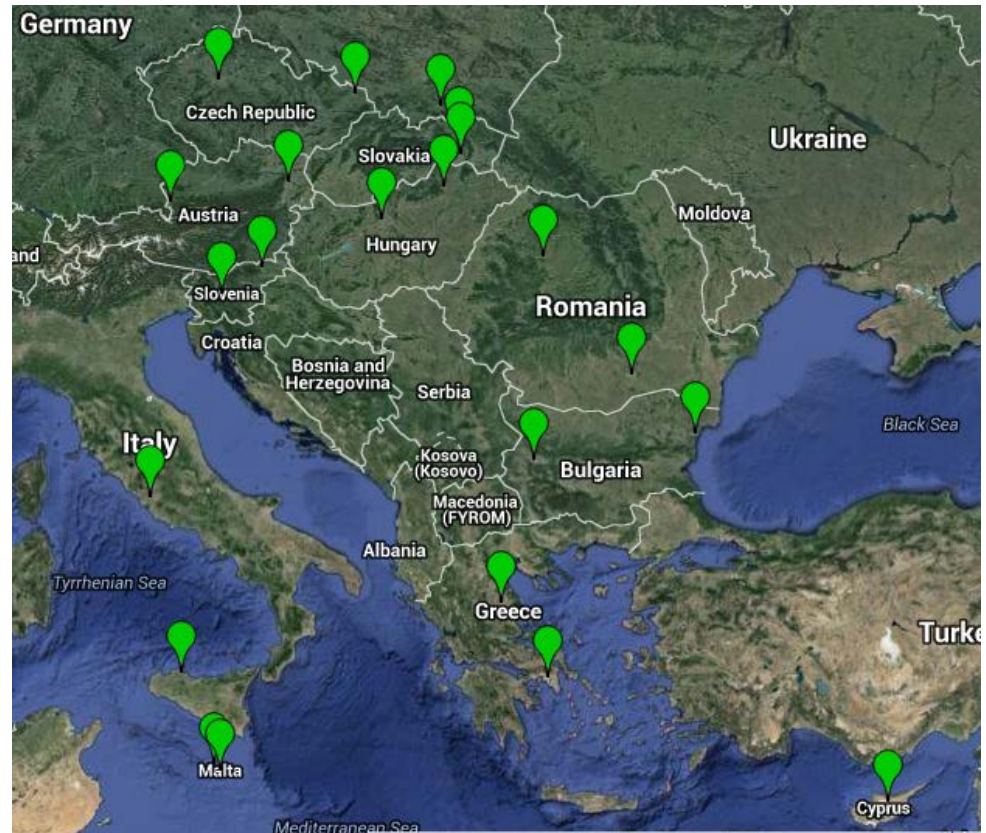
Athens EGS networking event

Experience from relevant projects



Enabling Access to Geological Information in Support of GMES

1. Free and open access to geohazard information in support of Copernicus
2. Free to view, download and use pan-European geohazard information service; standardised geohazard information across 52 towns
3. Delivered via the One Geology Europe portal, Google Earth and as direct download – inspire compliant







## WP2/T2.2: In-Situ Networks

---

### Athens EGS networking event Participating National Geological Surveys

#### Existing networks in Balkans, Middle East and North Africa

There is a good interrelation between Geological Surveys in Balkans – All members of EGS - Many common projects

Some of the Geological Surveys have links to Middle East and Africa

#### Past projects experience

Large experience from past and ongoing projects

They can be used as demonstration projects towards the survey of end-users needs





# WP2/T2.2: In-Situ Networks

## Athens EGS networking event

## Participating National Geological Surveys

### Existing in situ data

Large amount of in situ data, most of them freely available

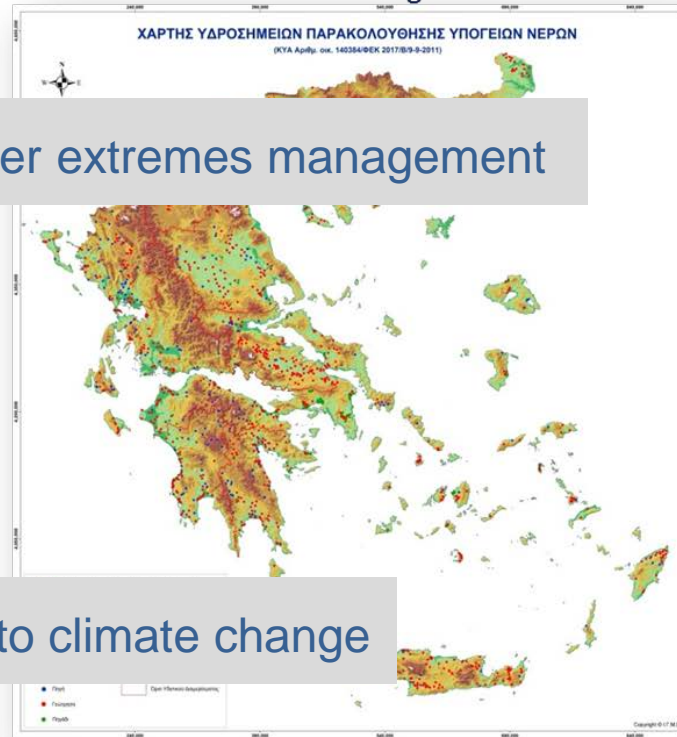
2<sup>nd</sup> – 3<sup>rd</sup> Community Support Framework (2000 – 2008)

600 monitoring stations



NSRF (2013 – 2015)

1400 monitoring stations



Food security and water extremes management

Adaptation to climate change

Hydrogeology



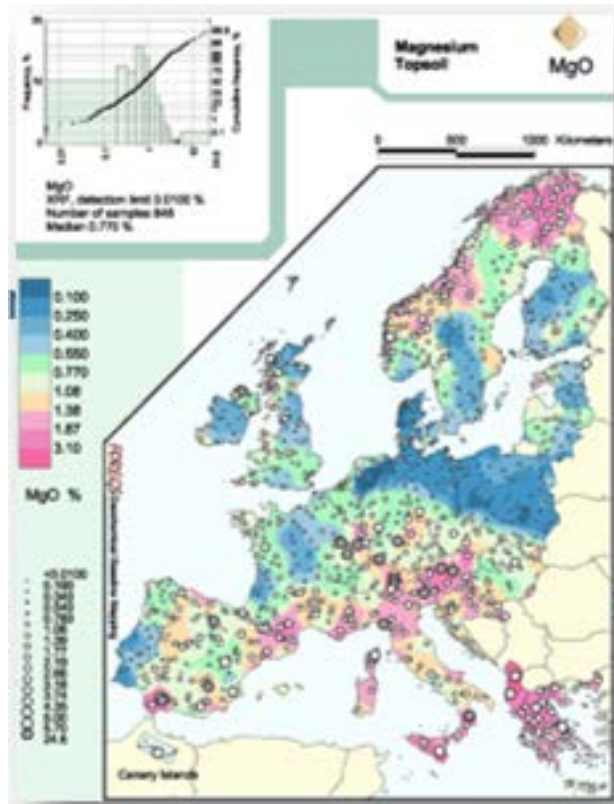
# WP2/T2.2: In-Situ Networks

Athens EGS networking event

Participating National Geological Surveys

## Existing in situ data

Large amount of in situ data, most of them freely available

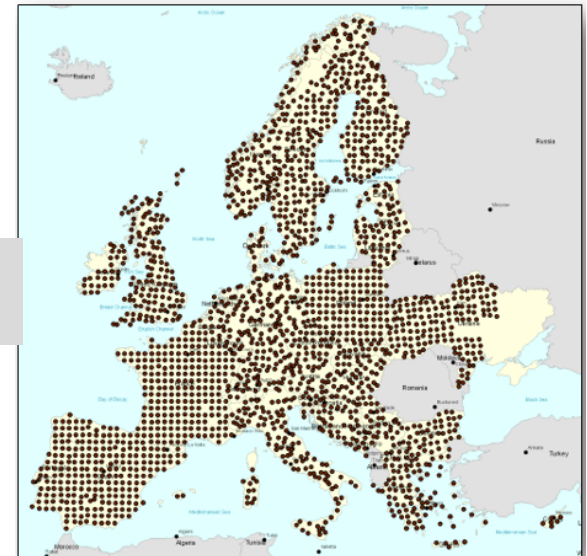


## Geochemistry

Food security  
(Gr)  
0-10 cm (N = 2024)



Agricultural soil ( $A_p$ )  
0-20 cm (N = 2108)







# WP2/T2.2: In-Situ Networks

Athens EGS networking event

Participating National Geological Surveys

## Existing in situ data

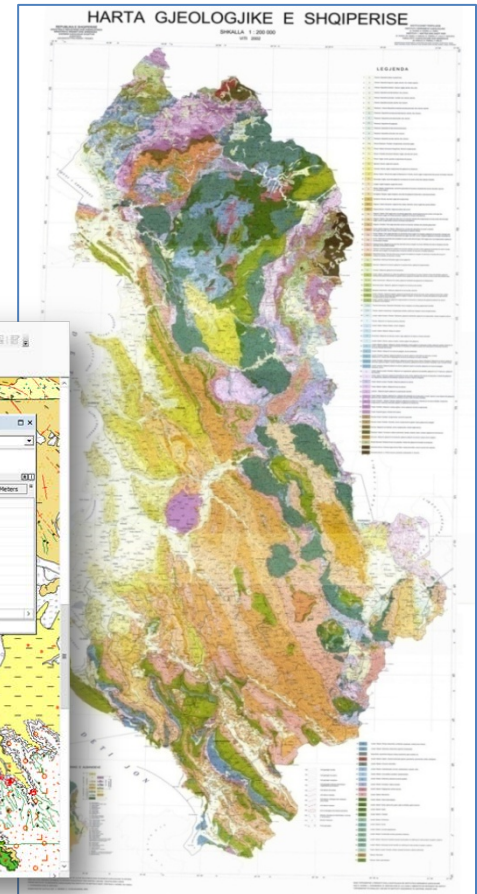
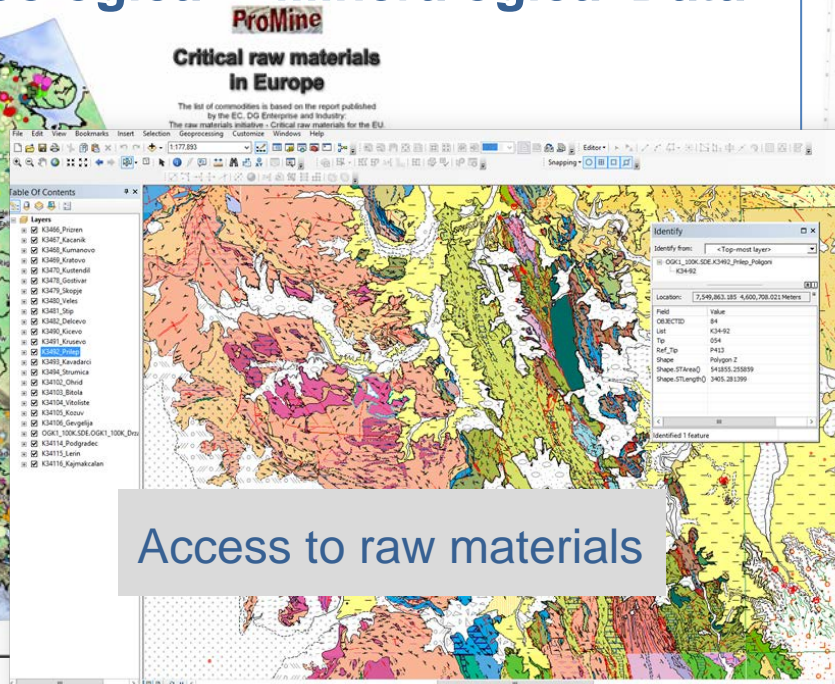
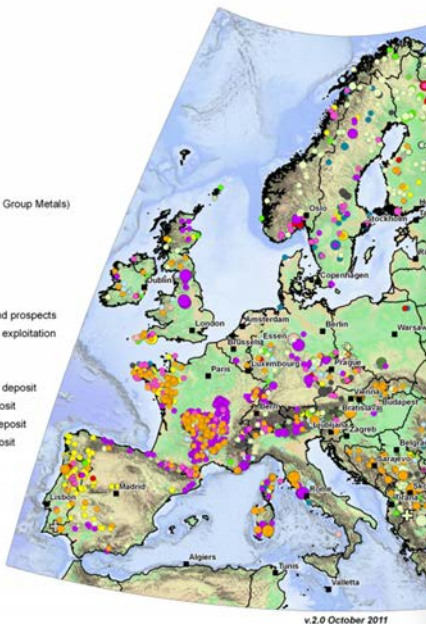
Large amount of in situ data, most of them freely available

## Geological – Mineralogical Data

- Commodity
- Antimony
  - Beryllium
  - Cobalt
  - Fluorspar
  - Gallium
  - Germanium
  - Graphite
  - Indium
  - Magnesium
  - Niobium
  - PGM (Platinum Group Metals)
  - Rare Earth
  - Tantalum
  - Tungsten

- Pattern
- Old deposits and prospects
  - Deposits under exploitation

- Deposit size
- Very large deposit
  - Large deposit
  - Medium deposit
  - Small deposit



Access to raw materials



## WP2/T2.2: In-Situ Networks

---

**Athens EGS networking event**

**Participating National Geological Surveys**

### **Possible stakeholders and Relevant legislations and IPR issues**

Every Geological Survey have already presented lists of Stakeholders in their country and from Monday these will be recorded accordingly

Every GS will act as the local contact point for their country





## WP2/T2.2: In-Situ Networks

---

### Athens EGS networking event

### Participating National Geological Surveys

Existing networks in Balkans, Middle East and North Africa

## Next steps

Interaction with all WP2 Task leaders

Partners NOA, IBEC, CEDARE, CERT, TAU, CUT, UZAY, SRTI, INOE, USCM, INCA, CIMA, AOA, INS that participate in T2.2 should appoint a representative

WP4 Task leaders should define what information on in situ data are essential for the pilot cases

Building of questionnaires tailored to user needs



Thank You!!!  
Σας Ευχαριστώ!!!