

20 & 21 October 2014
Athens, Greece

The EuroGeoSurveys Earth Observation / GEO Activities

EGS Gerardo Herrera,
Chair of Earth Observation &
Geohazards Expert Group **EOEG**
EGS Eleftheria Poyiadji,
Deputy Chair **EOEG**
EGS Patrick Wall,
Scientific Policy Officer
EGS Dr Marianthi Stefouli, EO
EKBA / IGME

2nd South-Eastern Europe GEO Workshop
on Integrating Earth Observation Data
and Services for monitoring the
Environment, protecting the citizens and
stimulating the regional economic growth



Providing a Geological Service for Europe

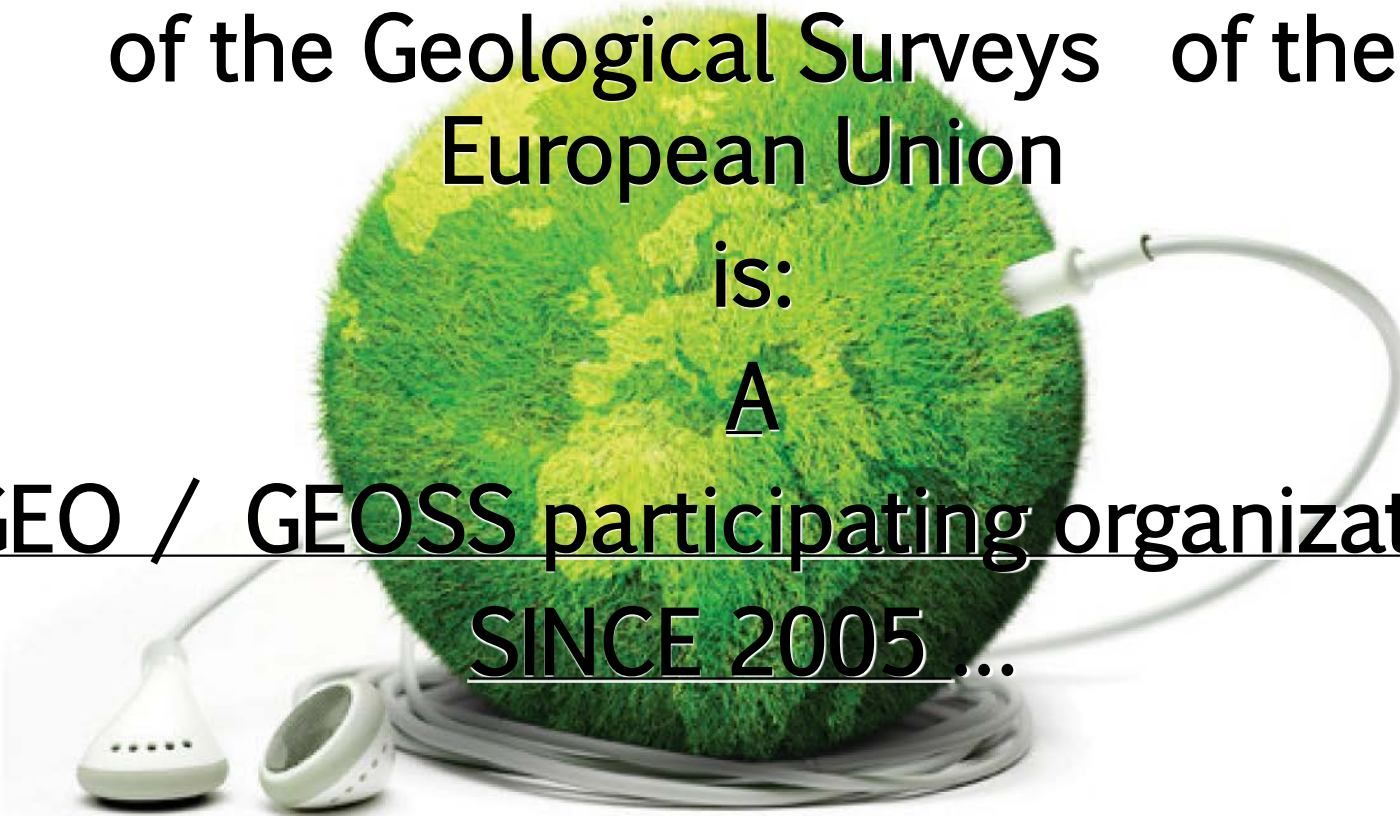
**EuroGeoSurveys / EGS- The Association
of the Geological Surveys of the
European Union**

is:

A

GEO / GEOSS participating organization

SINCE 2005 ...



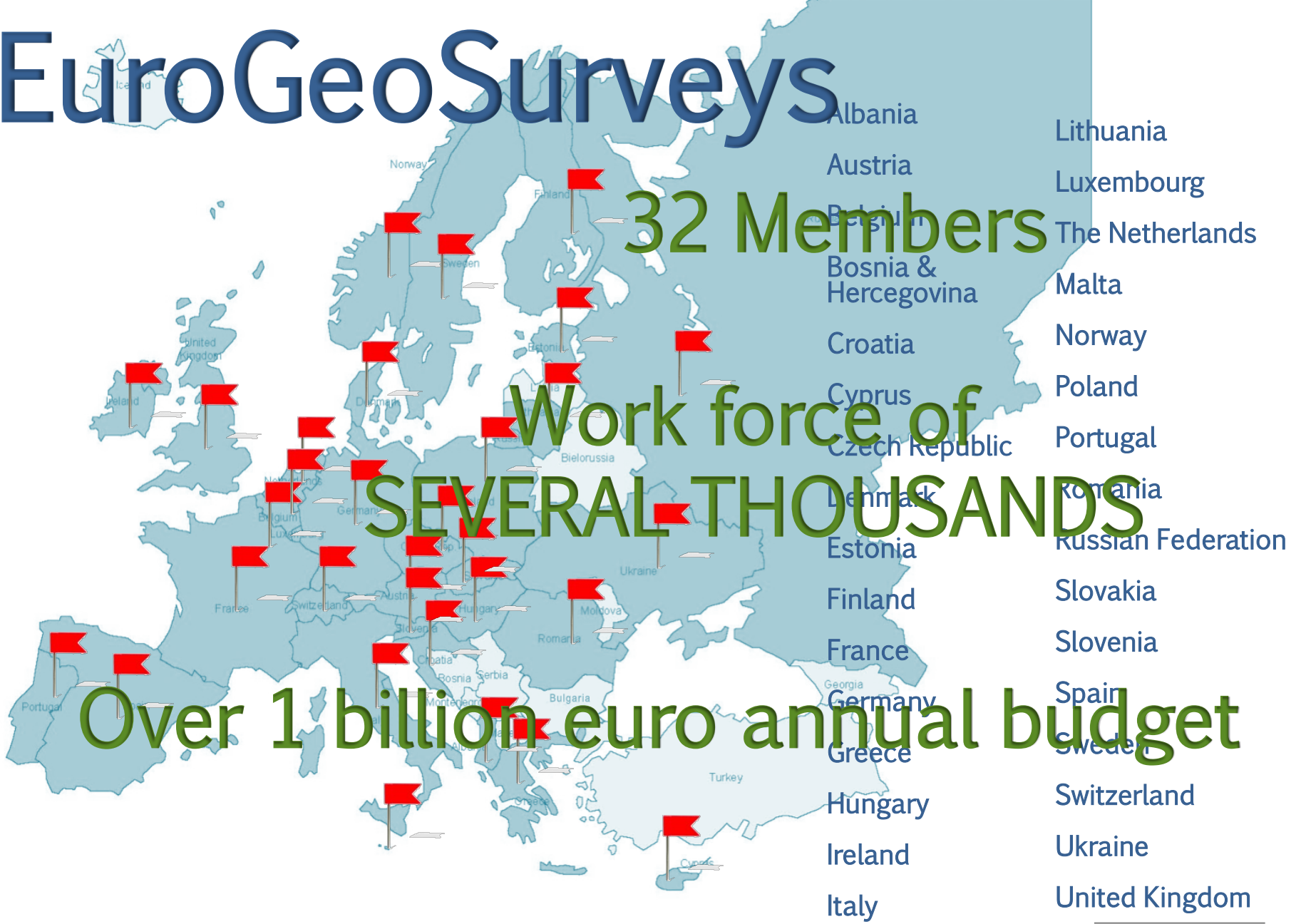
40 Years Listening to the Beat of the Earth

EuroGeoSurveys

32 Members

Work force of
SEVERAL THOUSANDS

Over 1 billion euro annual budget



- Albania
- Austria
- Belgium
- Bosnia & Herzegovina
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Lithuania
- Luxembourg
- The Netherlands
- Malta
- Norway
- Poland
- Portugal
- Romania
- Russian Federation
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- Ukraine
- United Kingdom



EuroGeoSurveys - The Geological Surveys of Europe



MANDATE

The Geological Surveys of Europe are responsible for the:

- Research
- Collection
- Management
- Interpretation
- Delivery of data Information, on land and marine subsurface



EGS MISSION

Provision of public Earth science knowledge to support:

- EU's competitiveness
- Social well-being
- Environmental management
&
- International commitments



EGS VISION

To establish by 2020, a common
European Geological Knowledge Base
and to provide a Geological Service for
Europe in GEO Strategic Areas



EuroGeoSurveys contributed to

- INSPIRE Directive;
- The Raw Materials Initiative;
- The EC's Maritime Policy
- The Soil Thematic Strategy;
- The Water Framework Directive;
- The Mining Waste Directive;
- The Resource Efficiency Policy;
- The Coastal Zone Policy;
- The Directive on the Geological Storage of CO₂.

&

Over 250
EU projects
since 1998



EARTH OBSERVATION AND GEOHAZARDS EXPERT GROUP (EOEG)

Networking Activities – reference to EO
Projects at European level



40 Years Listening to the Beat of the Earth

EuroGeoSurveys contribution to GEO - Mission and vision (2009-2015)

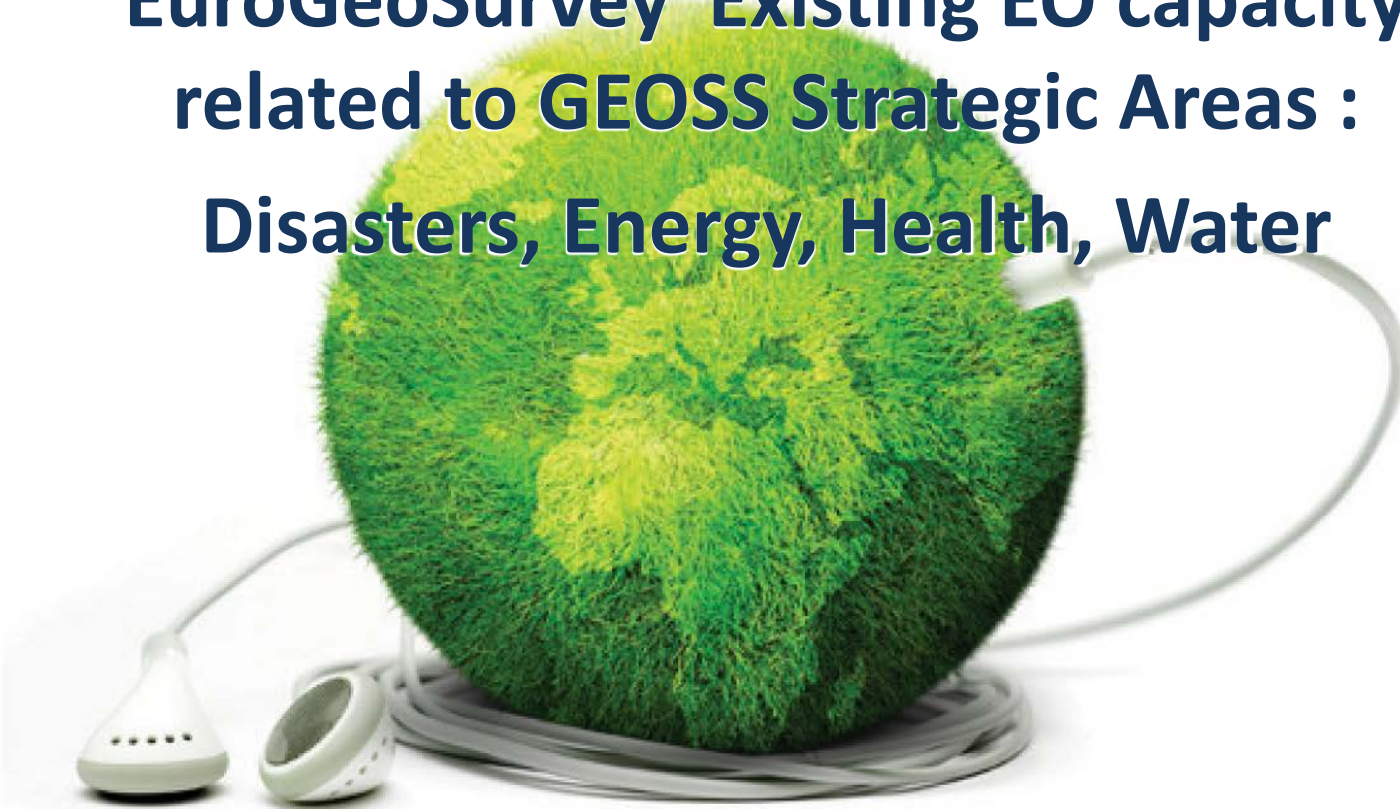
The EGS Earth Observation and GeoHazards Expert Group (EOEG) was set up in 2009 to provide geoscientific expertise in support to European and International related policies...

The Vision is to become the European centre of excellence for geological applications of Earth Observation, including assisting GEO in implementing GEOSS, participating in the Copernicus Programme and in delivering geo-information...



Providing a Geological Service for Europe

**EuroGeoSurvey Existing EO capacity
related to GEOSS Strategic Areas :
Disasters, Energy, Health, Water**



40 Years Listening to the Beat of the Earth

EuroGeoSurveys contribution to GEO

The Geological Surveys of Europe operate in various fields relevant to the development of the GEOSS 10-year Implementation Plan...

They directly address issues of concern to society such as those of the GEO Societal Benefit Areas. These include natural disasters, health, energy, water and climate...



EGS PROJECTS

Marine Geology



Soil



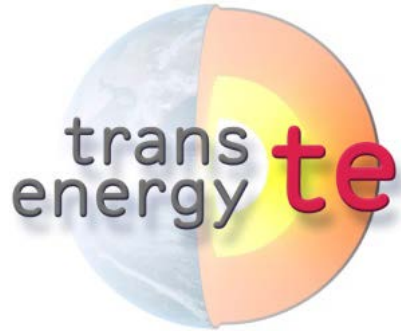
GS Soil



EuroGeoSurveys - The Geological Surveys of Europe



EGS PROJECTS



GeoEnergy

ThermQMap



Mineral Resources

~13000 records for the ProMine database..



EuroGeoSurveys - The Geological Surveys of Europe



EuroGeoSurveys contribution to GEO

The focus for GEO has been on working with sister surveys in Africa to develop together their capacity to contribute geological data and information of use to the global observing systems, by developing the African-European Geo-resources Observing System, AEGOS.

This has also allowed EGS-EOEG to develop a place for minerals within GEO that did not previously exist, now adopted in the GEO Work Plan 2012-15 and to support the AfriGEOSS initiative ...



EGS PROJECTS



Spatial
Information
INSPIRE



Earth
Observation
Geohazards

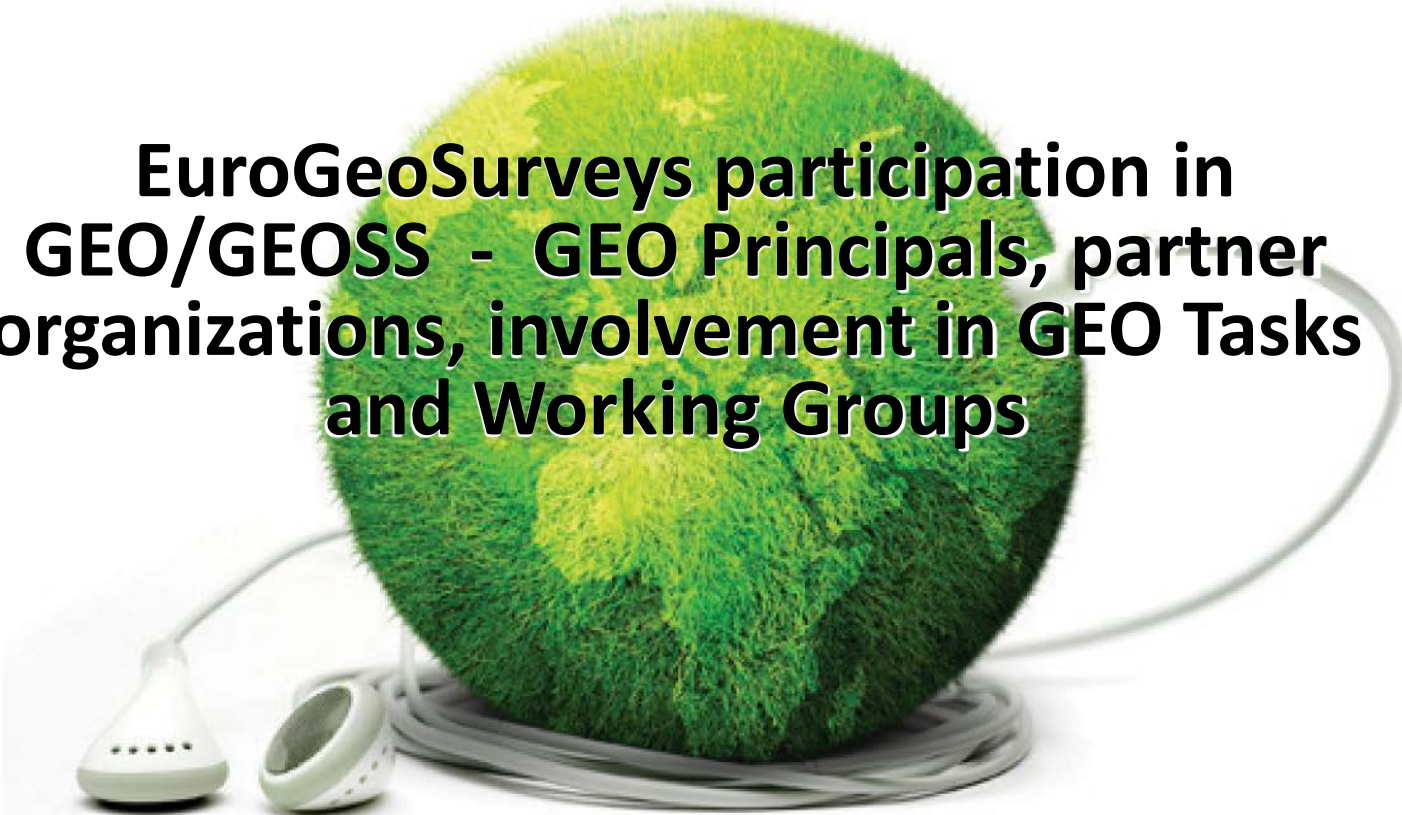


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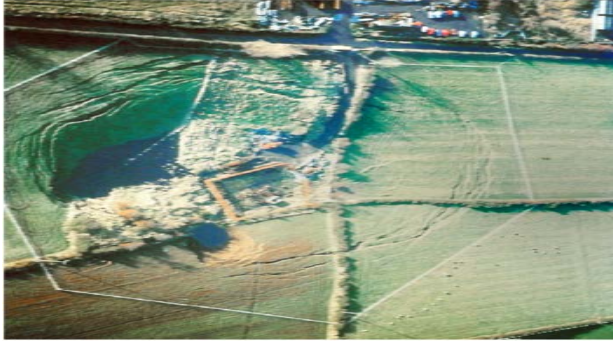
Providing a Geological Service for Europe

**EuroGeoSurveys participation in
GEO/GEOSS - GEO Principals, partner
organizations, involvement in GEO Tasks
and Working Groups**

A green, grassy globe representing Earth, connected to a white stethoscope, symbolizing listening to the Earth's heartbeat.

40 Years Listening to the Beat of the Earth

FP7 PanGeo Project



PanGeo has established a free, online geohazard information service for 52 of the largest towns of the EU27



PanGeo exposes services directly to Local Authority and Survey users



Further exploit capabilities of SAR interferometry for measurements of terrain-motion

All 28 EU Geological Surveys in project



EO - MINERS

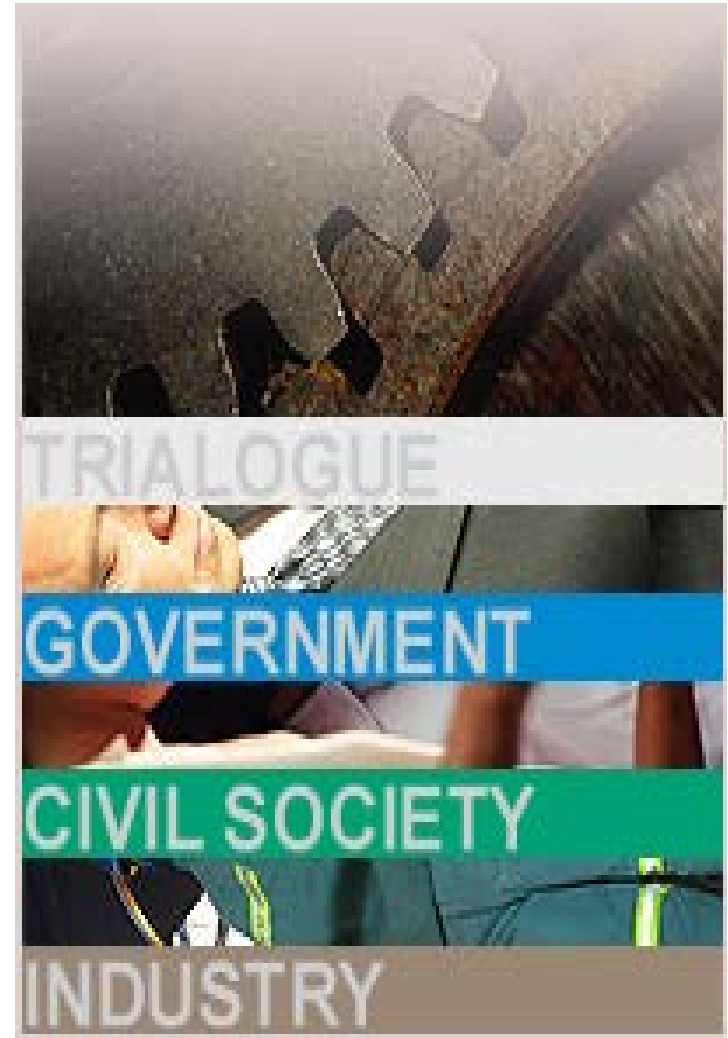


Earth Observation for Monitoring and Observing Environmental and Societal Impact of Mineral Resources Exploration and Exploitation

*developing a
sustainable “trialogue”
between mining industry,
regulators and civil society*

Mr. Stéphane Chevrel s.chevrel@brgm.fr

www.eo-miners.eu



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Remote Sensing for Detection, Mapping & Monitoring of Landslides & Ground Deformations



Advanced Downstream Services for the detection, mapping, monitoring & forecasting of ground deformations at different temporal & spatial scales, providing products useful for all phases of the risk management cycle: vulnerability assessment, preparedness & recovery management



Contact: Gerardo Herrera

E-mail: g.herrera@igme.es



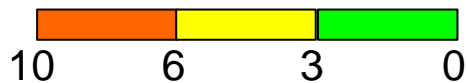
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HIGHLIGHTS: LANDSLIDE MAPPING



ERS | 1992 – 2000



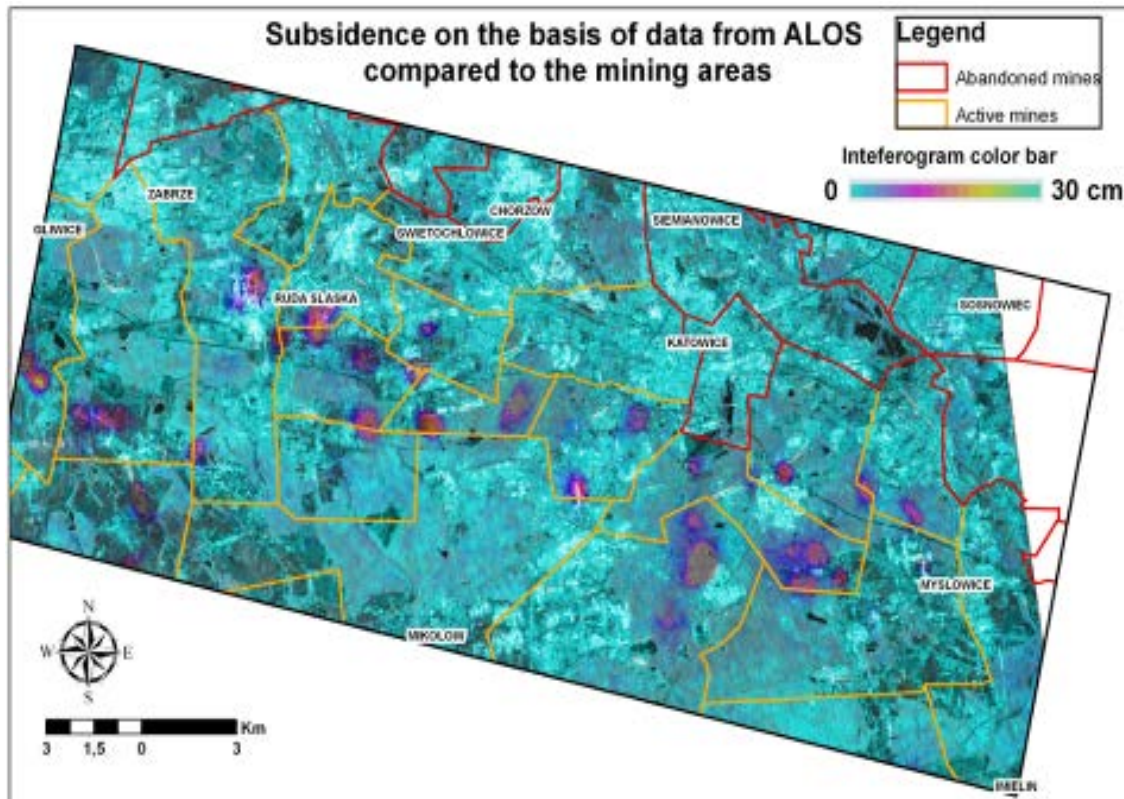
ALOS | 2006 – 2010



WWW.DORIS-PROJECT.eu - www.LAMPRE-PROJECT.eu



HIGHLIGHTS: MONITORING MINING SUBSIDENCE



WWW.DORIS-PROJECT.eu - www.LAMPRE-PROJECT.eu



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HIGHLIGHTS: MONITORING URBAN AREAS



MONITORING OF VALENCIA HARBOUR



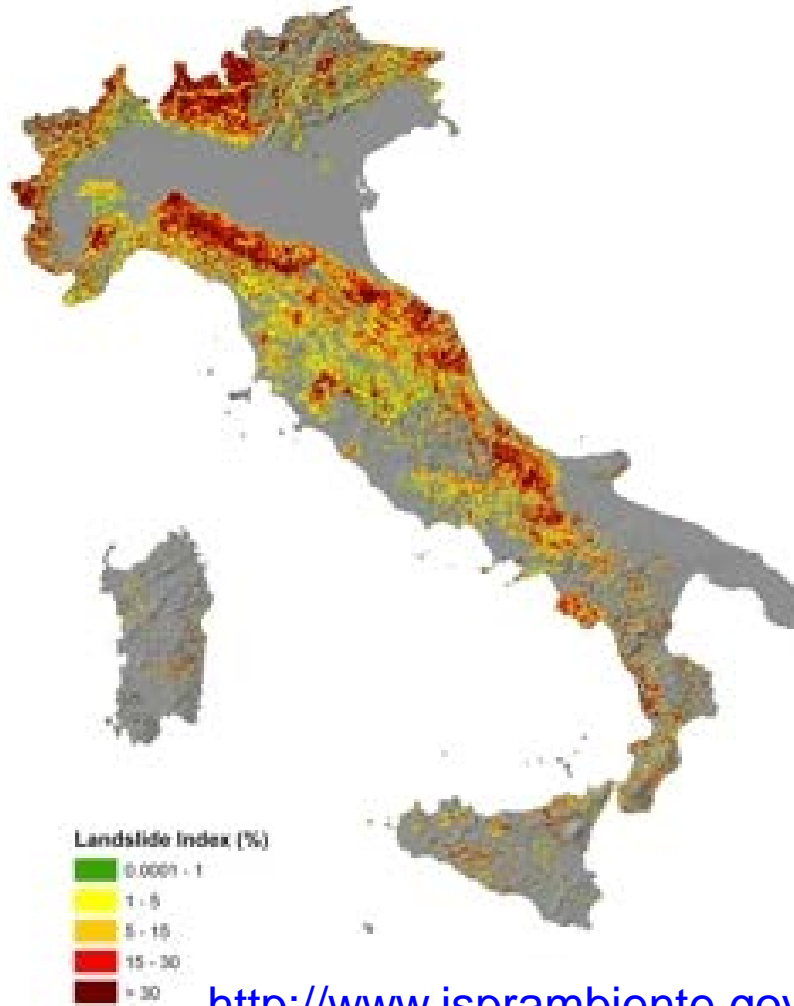
WWW.DORIS-PROJECT.eu - www.LAMPRE-PROJECT.eu



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Italian Landslide Inventory (IFFI)



Identifying and mapping
landslides over the whole
Italian territory

The IFFI inventory collects
about 470,000 landslides
covering about 6.9% of the
italian territory

Contract

alessandro.trigila@isprambiente.it

http://www.isprambiente.gov.it/en/projects/iffi-project?set_language=en



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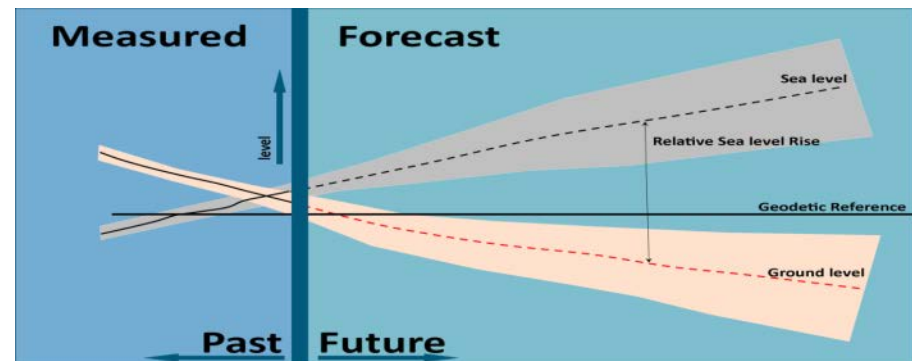
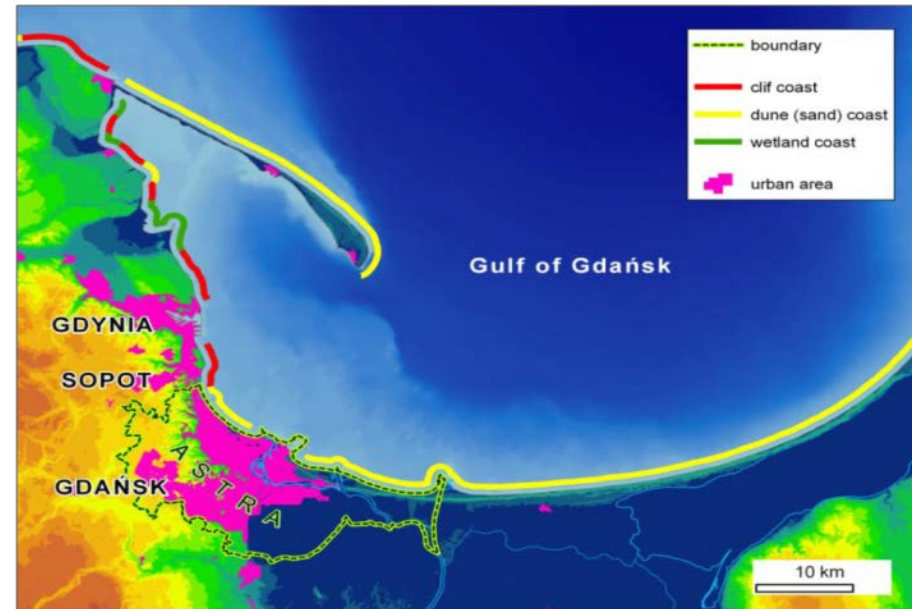
The Inspired Geodata CLOUD Services project aims at demonstrating the feasibility of employing cloud based services. Access is provided to geospatial public sector information, especially targeting the geological, geophysical and other geo scientific information



SUBCOAST



A collaborative project aimed at developing a GMES-service for monitoring and forecasting subsidence hazards in coastal areas around Europe (2010-2013)



EEE Catalogue (INQUA project)

A global catalogue of Earthquake Environmental Effects



To collect in a standard format the wealth of information of environmental / geological effects induced by seismic events

Contract

luca.guerrieri@isprambiente.it

<http://www.eeecatalog.sinanet.apat.it/terremoti/index.php>



EuroGeoSurveys - The Geological Surveys of Europe

Italian Hazard from Capable Faults



The objective is to identify and characterize all the capable faults affecting the Italian territory, according to literature, and integrated and validated by Earth observation studies.

Contact

eutizio.vittori@isprambiente.it

<http://www.isprambiente.gov.it/en/projects/italy-hazards-from-capable-faulting?>

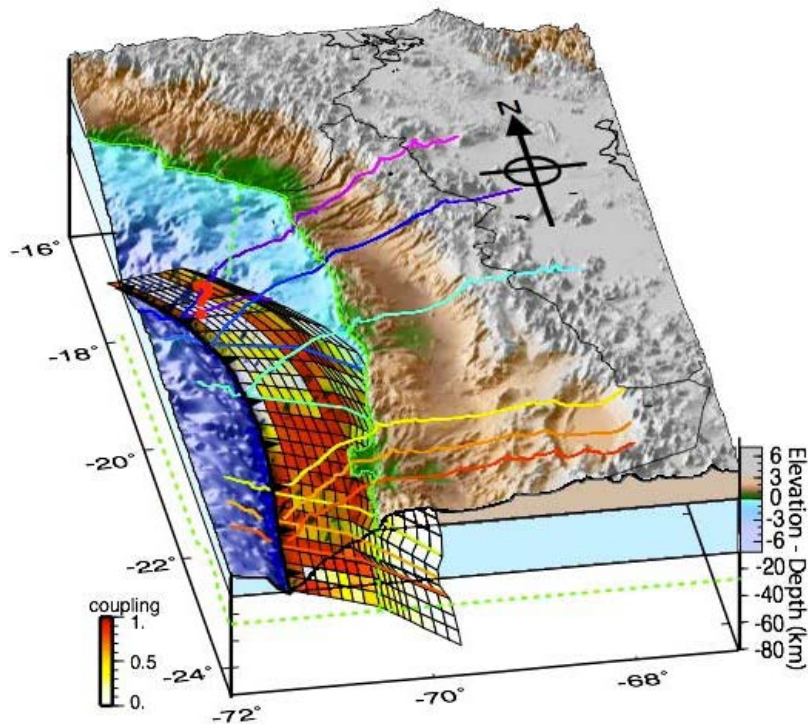


Subduction & Intraplate earthquakes

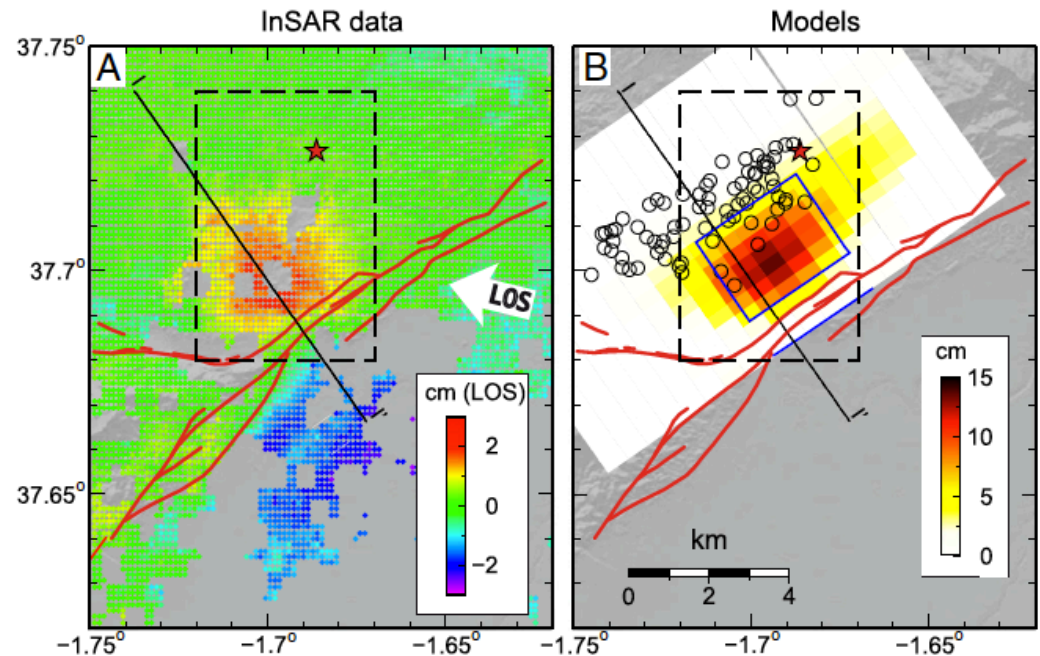


Instituto Geológico
y Minero de España

Interseismic coupling North Chile

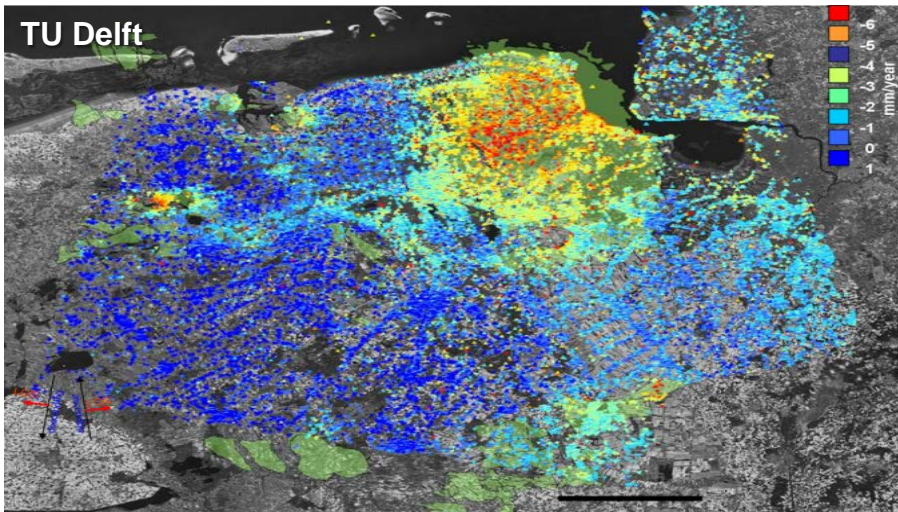
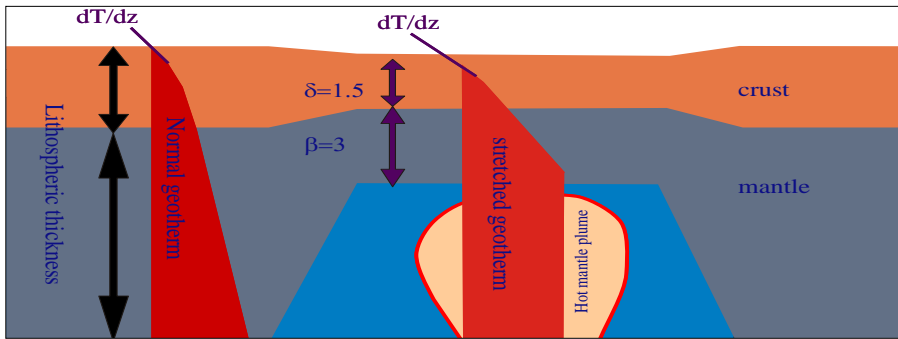


Lorca Earthquake Spain, Mw 5.2 (May 2011)



Remote sensing for E&P/ gas storage

Monitoring deformations due to gas exploration/production



On InSAR monitoring of the ground surface movement associated with the shale gas exploration activities in Poland

Katarzyna Chowaniec (1), Zbigniew Parsid (1), Tomasz Wójcickowski (1), Piotr Niesiaruk, (1) Patryk Marikonić (2)

1. Polish Geological Institute - National Research Institute 2. PPO Lab

About the project

Polish Geological Institute - National Research Institute (PGI-NRI) initiated the demonstration project (a pilot study) that aimed to monitor potential terrain surface deformation associated with hydraulic fracturing on selected shale gas investigation site in Poland. The synergy approach between SAR interferometry and GNSS will be applied.

The InSAR Interferometry

This project itself as an important technique in monitoring and measuring ground deformation activity... The main goal of the project is to monitor potential terrain surface deformation associated with hydraulic fracturing on selected shale gas investigation site in Poland. The synergy approach between SAR interferometry and GNSS will be applied.

Data series:

- TerraSAR-X
- Cosmo SKYMED
- Sentinel-1

Archival data:

- ERS-1
- ERS-2
- Envisat

The monitoring infrastructure

includes of geologic (existing GNSS) benchmarks, and the radio corner reflectors (CR), that will be deployed prior to any fracking operations. A series of SAR data from high resolution systems (TerraSAR-X or Cosmo-SkyMed), as well as Sentinel-1 when available, will be acquired. The expected ground deformation measurements in combination with CR-interferometry will reveal any potential deformations in the given field, while the Precise point receivers (GNSS) based on real-time solutions will bring the observations about the water table. Moreover, the analysis will be performed in a perspective of time and space. GNSS (in case of AGA II), that will decrease relative any long-term, of potential surface deformation occurred with the shale extraction.

The specifics

about the decision making process on different issues need to be considered:

- the number, dimension, deployment strategy of the reflectors;
- number of images;
- data processing strategy;
- algorithms;
- logics involved in regulating the test sites.

Hydraulic fracturing

is the most common procedure of shale gas production worldwide, while retaining much controversy regarding environmental impacts. According to the Polish legislation, since 1st June 2011 the natural gas-producing shale gas areas are treated as mining areas. For shale areas, the law requires observation of any changes occurring on the surface and in the subsurface, as well as cooperation with stakeholders within a shale area to ensure its safety.

The toolbox

for data processing and interpretation of SAR and GNSS data is currently being developed as a part of the project by PGI-NRI and PPO Lab.

living planet symposium 9-10 September 2011 Edinburgh, UK

European Space Agency



EuroGeoSurveys participation in GEO/GEOSS - GEO

The EOEG has made a strong start in minerals and geohazards and is now well placed in order to develop these new application areas in the coming years...

GEO and GMES, COPERNICUS, HORIZON 2020 offer considerable potential to advance the use of EO in other aspects of the geosciences agenda, in areas such as pollution and waste management, energy, groundwater resources and soils...



Providing a Geological Service for Europe



• **Status of
Strategy related
to EO activities**

40 Years Listening to the Beat of the Earth

EGS STRATEGY

Three main pillars:

1. *A joint research programme with impact at EU policy level*

2. *Harmonizing, sharing and providing pan-European geological data, building a common European Geological Data Infrastructure EGDI*

3. *Sharing knowledge, capacities and infrastructure*



EGS STRATEGY

EOEG supports the:

*Endorsement of
Geneva
Declaration*

European
Geological
Data
Infrastructure
EGDI structure
to boost the
GEOSS
capacity to
deliver

*Open exchange
/ joint provision
of
Geoscientific
data*



GEO future perspectives

Influence post-2015 Working Group
to include landslides and subsidence
in the GEO Disasters Societal Benefit Area and
Geohazard Community of Practice.

Deliver harmonized geo-information on geohazards
(landslides, subsidence, earthquakes...)



GEO future perspectives

- Secure EO data legacy of previous projects: TerraFirma, Pangeo, Doris and Subcoast, etc. through their integration into the EGDI.
- Provide Earth Observation validation in-situ benchmarks at EU level for new satellite missions SENTINEL, ALOS PALSAR, PAZ
- Seek EO opportunities for other EGS expert groups to expand geology within GEO (i.e. the Geo-resources tasks)



Providing a Geological Service for Europe

EuroGeoSurveys Infrastructure – Data and Services related to GEOSS (EO, in-situ, space based)



40 Years Listening to the Beat of the Earth

EuroGeoSurveys participation in GEO/GEOSS - GEO

EGS could contribute to GEOSS by establishing a successful integration of space-based and airborne Earth Observation data with information that cannot be detected with the aid of remote sensing techniques, the so-called in-situ data.

The geosciences community is one of the world's largest in-situ data providers. The best example of the contribution of EGS to the component of the Global Datasets Task is the "OneGeology" project.



EuroGeoSurveys participation in GEO/GEOSS - GEO

The European contribution to OneGeology, the OneGeology-Europe web service and metadata catalogue is now fully maintained by EuroGeoSurveys guaranteeing its sustainability.

A considerable effort is needed for geosciences based in-situ data to be prepared so as to serve GEOSS in the same way as One Geology.

EGS very much look forward to working jointly with the GEO community to overcome these challenges and continue to increase the geosciences contribution...



EuroGeoSurveys participation in GEO/GEOSS - GEO

EuroGeoSurveys - EGS could actively contribute to the future implementation of the GEO and the GEOSS through 2025.

EuroGeoSurveys could contribute to the development of :

Increased synergies with major EU initiatives (Copernicus, INSPIRE).

Future engagement of the business sector in supporting GEO/GEOSS

Filling out the gap for in situ data in the renewed GEOSS.

Establish User engagement and usability of GEOSS data...(The next generation of the GEOSS infrastructure that is related to aspects of geoscientific issues).



EuroGeoSurveys GEO contribution

Maximising subsurface added value for raw materials, soil and groundwater, storage, and ecosystem services, and *minimising environmental impacts* and footprints.

Optimising society's resilience to natural hazards, reducing the loss of human life and environmental, economic and material damage resulting from them.



CONCLUSION

Geological knowledge and information are essential to make optimal use of the geosphere

The ultimate purpose of the *European Geological Service* is to provide a common *single access point* for EU bodies and other stakeholders.

