EGDI-Scope - Scoping Study for a pan-European Geological Data Infrastructure

User Needs for Datasets and Services

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Overview of WP2

The overall aim of Work Package 2 is to assess stakeholder requirements for a future European Geological Data Infrastructure (EGDI). The work package is subdivided into four tasks as listed below and illustrated in Fig. 1;

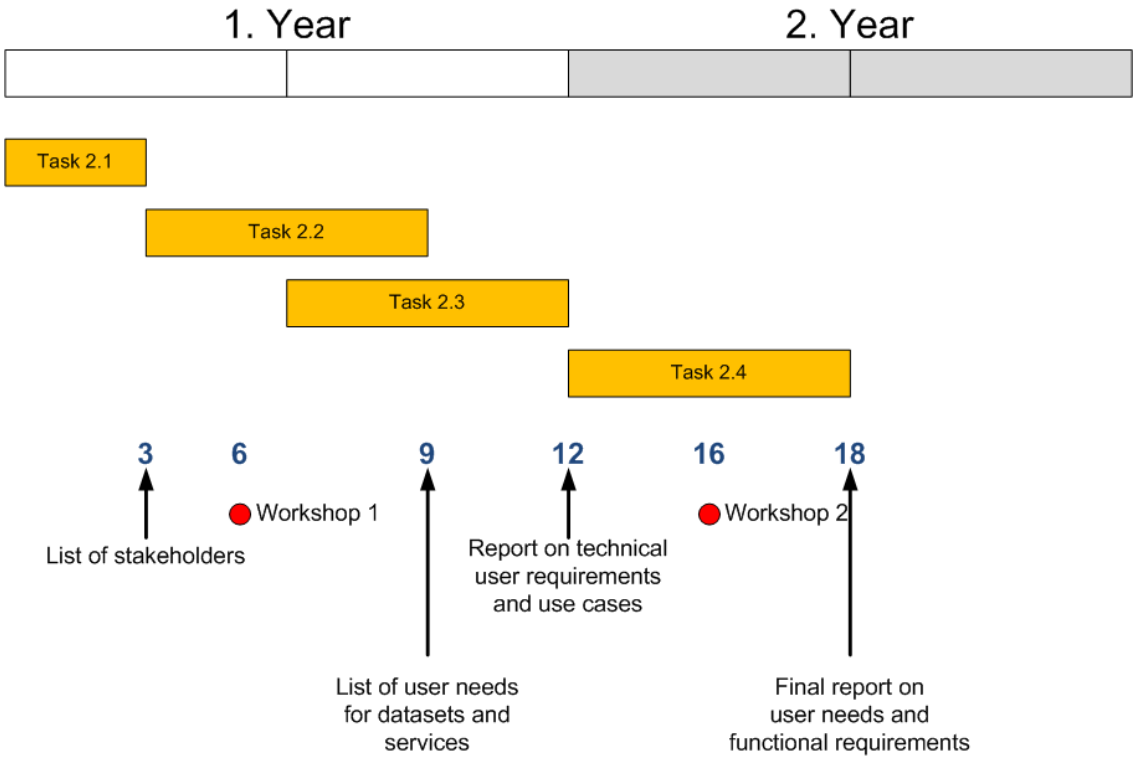
2.1 Identification of stakeholders

2.2 Stakeholder consultation

2.3 Specification of functional requirements and use cases

2.4 Stakeholder feedback

Four deliverables are to be submitted during the 18 months WP2 is lasting. D2.1 (list of stakeholders) was delivered 31. October 2012, and the present document represents D2.2 (user needs for datasets and services), which is the result of Task 2.2 – Stakeholder Consultation. At present Task 2.3 is also carried out, which has some overlap with Task 2.2 due to the involvement of stakeholder surveys in both tasks. Furthermore, it has shown out not be appropriate to distinguish to strictly the user needs for datasets and services from the technical requirements and use cases. Therefore, the present deliverable will contain some components that could be argued to belong in D2.3, whereas D2.3 on the other hand will contain updates to the results of this deliverable since continuous stakeholder involvements and use case development will reveal more dataset and service needs.



Methodology

A fundamental approach of the stakeholder consultation activities has been to avoid as much as possible to duplicate the effort of previous projects, but rather build on earlier experiences. Since the scope of the present project is very broad and the resources relatively small, an in-depth analyses of the very specific user requirements within all fields of geology is impossible, but the task has been focused on acquiring the information that is necessary for the other work packages to carry on their analyses and for the project as a whole to be able to deliver an implementation plan for a future European Geological Data Infrastructure at the end.

The user requirements have been acquired mainly by consulting the stakeholders that were identified in task 2.1. More stakeholders, however, have become involved along the way and the gross list of stakeholders will keep growing since it is essential for the project to have input from as many potential users and data providers as possible.

Various types of user need surveys have been conducted as will be further described in the next section. A questionnaire survey was launched in order to target as many user groups as possible, also from users not directly included in the list of stakeholders. More in-depth information has been obtained through a dedicated stakeholder workshop, participation in conferences, face-to-face meetings and targeted email correspondence. The type of information stemming from these different types of surveys can be rather diverse, and hence the listing of user requirements is categorized accordingly later in this document.

WP2 Activities until now

Stakeholders

Work package 2 used the first months of the project to identify and contact stakeholders and assemble two groups; the stakeholder panel and stakeholder forum. The results of these activities were described in deliverable 2.1. However, the list of stakeholders is dynamic and people has been added or exchanged since the first deliverable. The present list of stakeholders is included as Annex 1 to this document.

Stakeholder Workshop

On the 14th of November a stakeholder workshop was arranged in Brussels with a dedicated meeting for members of the Stakeholder Panel the evening before. The participants in these events comprised – besides the project members - representatives of the European Commission (DG ENTR, DG JRC, EEA), representatives of European projects and programmes (EPOS, GEOSS, Copernicus, EMODnet, GeoSeas, TerraFirma, PanGeo), European institutions like ESA and EFG, a number of EuroGeoSurveys expert group chairs and a private company representative (Insurance Europe). The workshop was divided in two sections; the morning session was concentrated on describing the project to the stakeholders, whereas the afternoon was arranged as a breakout session, where three groups discussed the themes; Earth Resources, Geohazards and soil/climate/environment/marine/geochemistry/water. The input from the three breakout groups were compiled in a report that was distributed to all stakeholders. This report is included as Annex 4 to this document.

Bilateral stakeholder communication

A number of stakeholder meetings have been arranged, either on an individual basis (DG ENTR, EEA, EFG), during workshops (DG RTD, DG JRC, REA, EPOS, GEOSS) or by email (PanGeo, EEA, Mineral Resources Expert Group (EGS)). It was planned to use specific use cases to facilitate discussions during these meetings and deduct user requirements based on this. However, in reality most time was spend during the meetings discussing about the project. This has been very good in terms of knowledge sharing and mutual understanding, and a good foundation for the continuation of the stakeholder consultation activities has been established.

Questionnaire

A user need questionnaire was launched earlier this year through the project homepage and by mail to all stakeholders on the list as well as to project members. Furthermore, all stakeholders were asked to forward the questionnaire to those they thought relevant. The European Federation of Geologists (EFG) was specifically asked to distribute the questionnaire amongst their members, which has led to input from especially a number of private companies.

The questionnaire was constructed to allow stakeholders to fill in the form with only a small amount of effort. At the same time most questions should be answered using free text. This approach was used based on the assumption that in-depth analyses of descriptive answers would provide more value to the project than a larger number of multiple-choice answers that would mainly have been useful for conducting statistics. An assessment of the results can be found later in this document, and all returned questionnaires are included as Annex 3.

Participation in meetings and workshops

Part of the WP2 activities has been participation in meetings, conferences and workshops in order to learn from presentations and map the virtual landscape in which EGDI should fit in, as this in itself puts requirements on the system. Furthermore, these events have been used to meet and discuss with stakeholders. The following events have been attended by members of the project as part of WP2:

- GeoSeas final workshop, Cork, October 2012
- EyeOnEarth conference, Dublin, March 2013
- EuroGeoSource final workshop, Brussels, March 2013
- EGU general assembly, Vienna, April 2013
    - Marine data management splinter meeting
    - Session on “Integrated Research Infrastructures and Services to users: supporting excellence in a science for society”
- GEPW-7 (GEO European Projects Workshop), Barcelona, April 2013

Use cases

It was agreed by the project consortium to structure part of the initial scoping study around three very specific use cases, which should be described in detail in order to assess the actual user needs for data, services and functionality in relation to existing data, possible architectural solutions and legal aspects. Furthermore, the use cases should as much as possible be used to shed light on possible interfaces between EGDI, data providers and other e-Infrastructures like EPOS and GEOSS.

Initially, it was decided to include use cases relating to the areas with a highly actual societal impact; mineral resources, geohazards and environment. The following use cases are at the moment treated in this respect;

1. Rare Earth Elements (relates to the just initated FP7 project EURare and should demonstrate how a future EGDI would fit into the European Innovation Partnership on Raw Materials and more specifically how EGDI could be the sustainable platform for results that come out of projects like EURare, Minerals4EU, EuroGeoSource and Promine)
2. Ground stability in large cities (relates to the PanGeo project, and should demonstrate the possible interfaces between EGDI, EPOS and GEOSS)
3. Environmental issues relating to shale gas exploitation (Should demonstrate interfaces to INSPIRE and European institutions like EEA and JRC)

User Needs

User and Stakeholder Categories

The present report deals with user needs for datasets and services. In order to assess this, an effort has been done in order to identify users and user groups. Because the final aim of this scoping project is very comprehensive – namely an infrastructure addressing all kinds of issues that involve geological data from the national geological survey organisations - the potential group of users is consequently very large and the process of getting to know the real users of the system has been iterative and is still ongoing.

The term '*users'* in this assessment, is used in the broad sense of the word. It is envisaged the EGDI will host and serve the data of many past, present and future European projects. Each of these projects has a very specific target, addressing very specific end user needs. Hence, in many cases, the end user needs of EGDI will mirror the needs of the end users of such inherited projects.

Users in the meaning of the present report are not only end users, but also for example geological experts that will utilize harmonized geological data in the EGDI for the purpose of producing derived products (maps, statistics, reports etc.) for policy makers, which can then be considered the real end users. Another broad "user group" is other scientific communities that would be able to utilize the geological data and information held by the EGDI together with data and information from their own databases and e-infrastructures to produce combined products for their end users. In that case, both the database/e-

Infrastructure managers, the researchers from the other community(ies) and their end users would impose requirements on the EGDI and should be consequently be considered *users* in the scope of this project.

Following the considerations above, it is suggested to address the following general user groups by the present project;

High level end users

Users such as policy makers that will not need direct access to the EGDI, but who depend on the ability for experts to have access to up-to-date, reliable, pan-European data in order to respond quickly to requests for information.

EGDI-Scope stakeholders belonging to this category includes DG ENTR – Raw Materials, DG JRC – INSPIRE, DG ENV – INSPIRE and ETP-SMR.

System end users

Users that will access the EGDI directly in order to find data and information of use to their line of business.

Stakeholders belonging to this category include the end users of all the systems that are under consideration by the EGDI-Scope project as being suitable for conversion into the future sustainable data infrastructure (EGDI) such as OneGeologyEurope, Promine, Eurogeosource, EURare, Minerals4EU, PanGeo, Subcoast, Terrafirma, EMODnet-geology and GeoSeas, InGeoClouds. In EGDI-Scope these are represented by coordinators or core team members of these projects who have insight into the user needs related to the data covered by each project.

More specifically, a number of EGDI-Stakeholders also belong to the category of system end users. These are EEA, EFG, Insurance Europe as well as geological experts from different domains represented by the chairs of the EGS Expert Groups. Since the latter should in the future be able to use EGDI as an operational platform in the process of delivering answers to the high level end users (i.e. policy-makers), these are considered of high importance when analysing requirements for data and functionality.

Besides the various user groups, other stakeholder categories include;

Data providers

These are stakeholders that will feed data into a future EGDI, and since the EGDI should be a sustainable platform serving data and services from the National Geological Survey Organisations,

representatives of all EuroGeoSurveys members are involved in the project and can be considered belonging to this category.

Other stakeholders

Organisations that have an interest in EGDI-Scope to ensure integration to other projects and programmes (on a political or technical level).

Stakeholders in this category include (please note that some overlap with above-mentioned categories exists) DG Connect, DG RTD, DG ENTR – GMES, EEA, DG JRC – INSPIRE, ESFRI, REA, ESA, EuroGeographics, GSAF, OAGS, Minerals and Metals Group, GEO Secretariat, UNECE, UNESCO as well as a number of past and ongoing European projects (OneGeologyEurope, EPOS, Promine, Eurogeosource, EURare, Minerals4EU, PanGeo, Subcoast, Terrafirma, EMODnet-geology, GeoSeas and COOPEUS).

Types of Requirements

One important issue of WP2 is to identify business- and user requirements and translate them into system requirements. Two types of user requirements are typically distinguished; functional and non-functional. The following definitions of these two terms have been adopted in this project and the requirements will be categorised accordingly.

Functional requirements

Requirements regarding how the system (portal) should behave in order to facilitate the needs of a user. This can be specific requirements for searching or viewing datasets etc.

Non-Functional requirements

Requirements that relate to what the system should be – not how it behaves. This can be requirements to performance and update frequency etc. A special type of non-functional requirements relates to the content (datasets) of the system and the answers (services) this content should be able to provide to end users.

Business requirements from high-level end users (policy makers)

Some high level business requirements have been identified, which should be considered as a fundament for the more specific user needs mentioned later;

- Data should be open and freely available (European Commission)

- Data specification should be in line with the INSPIRE specifications (European Commission and data providers (i.e. NGSO representatives))
- Data should be interoperable with data from other communities (European Commission, e.g. Marine Knowledge 2020).
- The European Parliament "…encourages the use of common standards and practices that would facilitate the exchange and exploitation of available geological data…" (Report on an effective raw materials strategy for Europe).
- EGDI should be coordinated with the European Innovative Partnership on Raw Materials (WP 3) (European Commission, DG ENTR)
- Data should be of use in solving societal problems (European Commission)
- The usability of data from past projects should be increased (European Commission - REA)
- Data should be maintained on a sustainable platform (European Commission)
- EGDI should complement WISE (Water Information System for Europe) and generation of new datasets to include/link into WISE would be welcome (EEA)

User needs for datasets and services (non-functional requirements)

This section is mainly based on input from three break-out groups assigned to discuss user requirements within different thematic areas during the first stakeholder workshop held in Brussels in November 2012. An extensive list of topics that according to the stakeholders should be covered by EGDI was identified and is given in a distilled form below (please see Appendix 4 for the full report). Each of the entries in the list below can be considered a theme, and for each theme the need for services and consequently underlying datasets can be defined. For example "shale gas" covers several use cases; one being the need for policy makers to see areas of shale gas potential in the EU, which demands that a map of shale gas prospects is served by the EGDI. Another shale gas use case could be the need of the European Environment Agency to assess the environmental impact on shale gas extraction - a use case which demands the present of boreholes and groundwater information in the EGDI. It is not an aim of the present report to go into details with all thematic areas. A number of use cases will be selected and studies in more details in D2.3.

The thematic areas that the EGDI-Scope team and stakeholders assessed to be appropriate to consider for the implementation of the EGDI are (but not limited to):

Resources

- **Energy minerals / resources**
  - Shale gas, oil shale, shale oil
  - Solid fuel minerals

        - Oil and gas
        - Gas hydrates
    - **Non-energy minerals / resources**
        - (Rare) Metals
        - Industrial minerals
        - Construction materials
    - **Other natural resources**
        - Freshwater
        - Soils
        - Seas and oceans
    - **Other resources**
        - Geothermal
        - Capacity for CCS
        - Secondary raw materials and waste as a resource

Geohazards

- Earthquakes
- Volcanic (incl. ash clouds)
- Flooding (lowlands)
- Subsidence
- Landslides
- Flooding with landslides (mountainous areas)
- Tsunami
- Geo chemical, for example
    - Radon and other natural gas emissions
    - Mercury and other heavy metals

Other

- Soil
- Climate
- Environment
- Health
- Water / Hydrogeology
- Marine geology
- Geological baseline data
- Environmental geochemistry
- 3D geology

User needs of "system end users" (public sector)

The content of this section is mainly based on and the responses to the questionnaire survey and the input from the break-out groups at the stakeholder workshop. Filled in questionnaires from 13 geological surveys, one Hungarian university and a Spanish public environmental institution were so far received.

The general picture of the needs for data in terms of type and medium are very diverse mirroring the fact that most geological surveys deal with a large variety of geological disciplines and work with all possible data to fulfil assignments on local as well as region scales. There is, however, a clear tendency for people to prefer GIS files, OGC web services and relational databases as their data medium. Furthermore, even though availability of data is essential, most public stakeholders value harmonised and/or interoperable data (in contrast to the private companies, see below)

Some specific user requirement came out of the questionnaire responses as follows (please note that they are randomly ordered and that some may be contradictory because they stem from different stakeholders);

Functional requirements

- Spatial data should be made available as e.g. shape files in internationally recognized projections.
- Grid layers should be downloadable in NetCDF format
- It should be possible to make on-line overlay/combination of data
- Metadata should be searchable
- The functionality should respect local (regional/national) data structure and language as well as its English translation.
- There should be immediate hazard information

Non-functional requirements

- Current data portals are difficult to find on the Internet, i.e. EGDI should be easy to find.
- Standard portrayal rules should be followed
- Access and download conditions should be clear
- Map viewer should be quick and simple
- Availability of data more important than portal functionality
- Stereographic 1970 projection should be supported

- Seafloor data and especially high resolution bathymetry is important
- Data should be described by a data specification and metadata should be based on ISO 191**
- EGDI should give free access to open data, and the data should be followed by INSPIRE metadata
- There should be update guarantee
- There should be easily access to harmonised and interoperable data
- Harmonised and “researchable” data
- I would be best if all data have standard formats and projection method
- It would probably be easiest to make web links to the data web sites of national geological associations rather than duplicating everything on a European level
- EGDI should serve as a robust, huge data cloud
- EGDI should include 3D functionality and maybe also interpreted layers from remote sensing.

User needs of “system end users” (private companies)

At time of writing six private companies have returned a filled in questionnaire; two from the energy sector, three from the environmental consultancy sector and one dealing with natural resources (water). Five out of six of these private companies value available data over harmonised or interoperable data. The companies of course need data to support their field of business and typically acquire their own data of get them from the national geological survey organisations. This mainly reflects the fact that many tasks of such companies are carried on a local scale, where detailed knowledge is needed.

With regard to the data medium required by the companies, then online view, GIS files and printed maps predominate. No private companies in the survey have special requirements relating to data access and only a few legal barriers are reported.

Most of the companies are aware of (and use) European-level data portals like OneGeologyEurope, GeORG (Geopotential of the Upper Rhine Graben), Aegos (African-European Georesources Observation System) Transenergy (Transboundary Geothermal Energy Resources of Slovenian, Austria, Hungary and Slovakia), Thermomap (Area mapping of superficial geothermic resources by soil and groundwater data), EWater and Foregs (Geochemical Atlas of Europe). A more in-depth analysis of the experiences with these portals will be conducted in the next deliverable D2.3.

Some more specific user needs from the questionnaire responses of the private companies are as follows;

Functional requirement

- There should be a good search engine

Non-functional requirements

- EGDI should include earthquake data, geological maps, borehole data and hydrogeological maps
- Data storage and –retrieval should be straight forward and quick
- EGDI should promote availability of the more recent data

Needs related to integration with other infrastructures

At the moment a large number of projects and programmes deal with e-Infrastructures in the geoscientific domain. Some of these are European-level infrastructures, but there seems to be a general tendency for global collaboration, mainly with the United States and Australia. EGDI will be the primary platform by which the pan-European and cross-border geological data owned by the national geological survey organisations in Europe will be maintained and served. Such data are rarely used isolated. Added value will be gained from combining such data with data from other domains and by ensuring interoperability with major non-European or even global infrastructures. It is therefore essential for EGDI-Scope to analyse the potential interfaces with other initiatives, both with regard to data content and technical interfaces. These are the tasks of work package 3 and 4. As a basis for this, work package 2 has been exploring the main infrastructures that should be considered and engaged high-level representatives in the stakeholder forum. In the following section, the preliminary result of this will be described. Next step in this process will be to develop use case descriptions that will demonstrate the possible interactions between EGDI and other infrastructures. The initiatives to address will be;

- **EPOS:** European Research Infrastructure on Earthquakes, Volcanoes, Surface Dynamics and Tectonics
- **GEOSS**: Global Earth Observation System of Systems
- **EyeOnEarth**: 'global public information network' for creating and sharing environmentally relevant data and information online through interactive map-based visualisations.
- **COOPEUS**: International cooperation between the EU and the USA on common data policies and standards relevant to global research infrastructures.
- **ICORDI**: International Collaboration on Research Infrastructures
- **UN-GGIM**: United Nations Initiative on Global Spatial Information Management.
- **ENVRI**: Implementation of common solutions for a cluster of ESFRI infrastructures in the field of Environmental Sciences.

- **ODIP**: Ocean Data Interoperability Platform.
- **EarthCube**: Developing a Community-Driven Data and Knowledge Environment for the Geosciences

User needs related to thematic areas

During the stakeholder workshop each of three break-out groups provided input to the project which was compiled in a report that is included as Appendix 4 to this document. Readers are kindly asked to go to this appendix for valuable information on the user need for a European Geological Data Infrastructure.

Conclusions

EGDI-Scope has identified a number of stakeholders and categorised them into high-level end users, system end users, data providers and "other stakeholders". The business requirements of the high-level end users as well as the functional and non-functional requirements of the system end users have been identified through stakeholder interviews, a questionnaire survey and a stakeholder workshop.

The needs for geological datasets and services are diverse and cover most geological disciplines. A large number of thematic areas are of relevance for the EGDI, and for each such area, a number of datasets and services can be identified. This makes the potential extent of the EGDI enormous, and the scoping study unmanageable if everything should be covered. EGDI-Scope will therefore according to the project plan select a few concrete use cases and study these in detail in D2.3 ("Report on technical user requirements and use cases") in order to be able to present/discuss them with stakeholders at the second stakeholder workshop and turn them into system requirements to be included in D2.4 ("Final report of user needs and functional requirements". These use cases will be integrated with the process of prioritizing thematic areas and related datasets in order to guide and contribute to the implementation plan of the EGDI, as final result of the EGDI scoping study.

European Commission

Wim Jansen	DG Connect
Michael Massart	DG ENTR
Milan Grohol	DG ENTR
Slavko Solar	DG ENTR
Hugo de Groof	DG ENV – INSPIRE
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European Projects

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Massimo Cocco	EPOS
Helen Glaves	GeoSeas, ODIP
Claire Roberts	Pangeo
Luke Bateson	PanGeo
Richard Burren	Pangeo
Geraint Cooksley	Terrafirma

European Communities

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Ruth Allington	EFG
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Dave Lovell	EuroGeographics

Non-European Communities

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Harald Fritz	GSAF
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Global Communities

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	Stuart Marsh	Earth Observation
	Clemens Reimann	Geochemistry
	Peter Britze	GeoEnergy
	Marek Graniczny	International Cooperation and Development
	Henry Vallius	Marine Geology
	Nikolaos Arvanitidis	Mineral Resources
	Rainer Baritz	Soil Resources – Superficial deposits
	Hans-Peter Broers	Water Resources

Appendix 2: Example of use case (preliminary)

Use Case: Rare Earth Elements

Use Case: Rare Earth Elements

Thematic area: Raw Materials

End user group: Policy makers within the EU

Consulted end users

- Milan Grohol DG ENTR
- Slavko Solar DG ENTR

Potential cooperation partners

- EuroGeoSource
- ProMine
- EURARE
- Minerals4EU
- EIP – WP3

Important papers

- The Raw Materials Inititative
- Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the regions making raw materials available for Europe's future wellbeing – Proposal for A European Innovation Partnership on raw materials.
- Report on an effective raw materials strategy for Europe

End user needs and requirements

Overall user need: To be able to evaluate the occurrences of REE within the European countries

Questions to be answered by EGDI:

- Where do REE as such occur within Europe?
- Where do individual rare earth elements occur?
- What are the grades, composition and tonnages of the REE occurrences?
- What are the main REE-bearing minerals in the deposits
- What is the U content of the deposits?
- What other minerals/metals are associated with the deposits?
- Are the occurrences licensed to anyone and if yes then who?
- What is the physiography of the surroundings; i.e. are there any lakes and rivers in danger of being contaminated by mining waste or flotation chemicals?
- Are there any sustainable energy sources nearby that can be used in mines and extraction/refinement plants?

Required end products

- Distribution of REE in Europe (Map)
- Distribution of individual rare earth elements in Europe (Map)
- ???

Required functionality (*to be completed*)

EGDI-Scope aspects (*to be completed*)

Available datasets (type and geographical relevance)

Legal and licensing aspects including use limitations and potential pricing policies

Interoperability protocols/aspects

Plan for integration of data into the EGDI

Appendix 3: Results of questionnaire action

Private companies

Organisation	
Name:	AFPG
Country:	France
Sector (Public or private):	private
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Energy
Contact Person	
Name:	Boissavy
Position:	President
Email address:	Christian.boissavy@orange.fr
Phone (optional):	+33678633756
Geological Data	
For what purpose do you use geological data?	Deep geology
What geological data do you use?	Cross section of deep wells and related data such as, logging, geological cross section, test, hydrogeological data, analysis etc…
Do you need/use basic raw geological data or interpreted thematic data?	All data even no interpreted are used
Where do you get your geological data?	Data base of geological surveys especially in France
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Online view
Which data are easily accessible?	In the French data base everything easy to access
Which data are NOT easily accessible?	
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation*	Available data

of content) or **available data** (not necessarily standardised)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	No
Do you have any current legal barriers relating to your use of geological data?	No
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	Georg, Aegeos, Transenergy
Do you use any European data portals (specify which)	Georg, Aegeos, Transenergy
What portals are good in terms of data content, and why?	Looking to any data
What portals are good in terms of functionality, and why?	Data available is the key
What portals are not good, and why?	NA
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	BSS from BRGM
Are any of these good?	BSS is OK
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Availability of the more recent data
May we contact you on a personal basis for more detailed information?	Y
May we send you future information about the EGDI-Scope project?	Y

Organisation	
Name:	WorleyParsons
Country:	Spain
Sector (Public or private):	Private
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Environmental Consultancy
Contact Person	
Name:	Maria Jose Rubial
Position:	Geologist | Study Manager
Email address:	mjrubial@gmail.com
Phone (optional):	
Geological Data	
For what purpose do you use geological data?	Environmental risk assessment and management
What geological data do you use?	Soil and groundwater data
Do you need/use basic raw geological data or interpreted thematic data?	Both
Where do you get your geological data?	Geological surveys, Local geological services, field studies, others
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	online view, GIS files, relational databases, Excel files, Printed maps
Which data are easily accessible?	Printed maps
Which data are NOT easily accessible?	
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without*	Available data

harmonisation of content) or **available data** (not necessarily standardised)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	No
Do you have any current legal barriers relating to your use of geological data?	No
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	Yes
Do you use any European data portals (specify which)	No
What portals are good in terms of data content, and why?	--
What portals are good in terms of functionality, and why?	--
What portals are not good, and why?	--
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	The Geological and Mining Institute of Spain http://www.igme.es/internet/default.asp
Are any of these good?	yes
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Those described previously in this questionnaire
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	Core Laboratories
Country:	UK
Sector (Public or private):	Private
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Oil Industry
Contact Person	
Name:	Dr. Salvatore Morano
Position:	Senior Petrographer
Email address:	smorano@alice.it
Phone (optional):	
Geological Data	
For what purpose do you use geological data?	Reservoir quality assessment
What geological data do you use?	Sedimentology, stratigraphy, petrography, geochemistry etc.
Do you need/use basic raw geological data or interpreted thematic data?	Yes
Where do you get your geological data?	Collecting data in house and fieldwork
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Oil industry software, Office and others
Which data are easily accessible?	All
Which data are NOT easily accessible?	
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without*	Harmonised data

harmonisation of content) or **available data** (not necessarily standardised)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	No
Do you have any current legal barriers relating to your use of geological data?	
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	No
Do you use any European data portals (specify which)	No
What portals are good in terms of data content, and why?	
What portals are good in terms of functionality, and why?	
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	Core Laboratories datsesets
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Downloading examples/templates related to my discipline
May we contact you on a personal basis for more detailed information?	Only via email
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	PAVLOS TYROLOGOU
Country:	Greece
Sector (Public or private):	Private
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	*Environmental & Geological Consultancy*
Contact Person	
Name:	PAVLOS TYROLOGOU
Position:	GEOLOGIST
Email address:	Pavlos.tyrologou@gmail.com
Phone (optional):	00306979023932
Geological Data	
For what purpose do you use geological data?	CONSULTANCY
What geological data do you use?	MAPS
Do you need/use basic raw geological data or interpreted thematic data?	BOTH
Where do you get your geological data?	Geological survey, online
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	PRINTED MAPS, gis fles, online view
Which data are easily accessible?	Printed maps but costly
Which data are NOT easily accessible?	Gis files
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without*	Available data

harmonisation of content) or **available data** (not necessarily standardised)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	no
Do you have any current legal barriers relating to your use of geological data?	Occasionally, standard copyright policies might apply
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	no
Do you use any European data portals (specify which)	no
What portals are good in terms of data content, and why?	
What portals are good in terms of functionality, and why?	
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	http://geophysics.geo.auth.gr/ss/ http://macroseismology.geol.uoa.gr/ http://www.seismo.ethz.ch/static/GSHAP/ http://earthquake.usgs.gov/hazards/ http://wija.ija.csic.es/gt/earthquakes/ http://www.consrv.ca.gov/cgs/rghm/psha/Pages/index.aspx http://earthexplorer.usgs.gov/ http://landsat.usgs.gov/products_data_access.php http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/DLGs
Are any of these good?	yes
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Earthquake data, geological maps, borehole data, hydrogeological maps
May we contact you on a personal basis for more detailed information?	YES
May we send you future information about the EGDI-Scope project?	YES

Organisation	
Name:	UBeG GbR
Country:	Germany
Sector (Public or private):	Private
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Environmental Consultancy, Civil Engineering (Geothermal Energy, Engineering Geology, Geotechnics)
Contact Person	
Name:	Burkhard Sanner
Position:	Senior Geologist
Email address:	b.sanner@ubeg.de
Phone (optional):	+49 6441 212910
Geological Data	
For what purpose do you use geological data?	Environmental and geothermal studies, design of geothermal installations
What geological data do you use?	Mainly lithology and tectonics, hydrogeology; for geothermal, thermal properties, underground temperature and geothermal heat flux
Do you need/use basic raw geological data or interpreted thematic data?	Mainly interpreted data
Where do you get your geological data?	Maps from Geological Surveys, own investigation and database, other sources (literature)
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Online view, GIS on CDROM, printed maps
Which data are easily accessible?	Lithology, stratigraphy, tectonics, groundwater
Which data are NOT easily accessible?	Thermal properties etc.
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a*	Available data

single dataset), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	No
Do you have any current legal barriers relating to your use of geological data?	Data from wells, data collected und mining las
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	Onegeology Europe, GeORG, Transenergy, Thermomap (not in the list, http://www.thermomapproject.eu/)
Do you use any European data portals (specify which)	As above
What portals are good in terms of data content, and why?	Transenergy (geothermal data!), Thermomap (as a tool, the data content is yet covering too shallow ground)
What portals are good in terms of functionality, and why?	
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	Geothermal portals of German state geological surveys (I attach a list)
Are any of these good?	Yes
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Appendix to questionnaire from UBeG GbR

Weblinks to public guidelines and databases on shallow geothermal energy in Germany

Guidelines and web-based information systems of the German states (Bundesländer) concerning design and licensing of GSHP (links valid and checked as of August 2012):

Joint Geothermal Portal of the State Geological Services
http://www.geothermieportal.de/geothermie_6.0/

Baden-Württemberg, guideline as pdf, 4th ed. 2005, LGRB Freiburg
http://www.lgrb.uni-freiburg.de/lgrb/home/leitfaden_erdwaerme
detailed maps at:
http://www.lgrb.uni-freiburg.de/lgrb/Fachbereiche/geothermie/is_geothermie

Bayern (Bavaria), guideline as pdf, 4th ed, 2012, StMUGV, Munich and LfU, Hof
http://www.bestellen.bayern.de/shoplink/stmug_klima_00006.htm
further information, database, etc. at:
http://geoportal.bayern.de/energieatlas-karten/

Berlin, status Feb. 2012, SenStadtUm (senatorial office for city development and environment)
http://www.stadtentwicklung.berlin.de/umwelt/wasser/wasserrecht/pdf/leitfaden-erdwaerme.pdf
detailed maps at:
http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/k218.htm

Brandenburg, in 2012 no valid guideline; a guideline was provided until 2011: 1st ed. 2009, ETI Potsdam
http://www.eti-brandenburg.de/energiethemen/geothermie/
detailed maps (currently only for hydrogeology) at:
http://www.geo.brandenburg.de/hyk50

Bremen, 2-papge paper of GDfB (Bremen Geological Survey), without date, Bremen:
http://www.gdfb.de/pdf/TuR_Hinweise_EWS.pdf

Hamburg, 3rd ed. 2011, office for city development and environment:
http://www.hamburg.de/wasser/151658/start-erdwaermenutzung.html

Hessen, 4th ed. 2011, HLUG, Wiesbaden
http://www.hlug.de/start/geologie/erdwaerme-geothermie/oberflaechennahe-geothermie/downloads.html
detailed maps at:
http://www.hlug.de/start/geologie/erdwaerme-geothermie/oberflaechennahe-geothermie/kartenstandortbeurteilung.html

Mecklenburg-Vorpommern, 1st ed. 2006, LUNG Güstrow
http://www.lung.mv-regierung.de/insite/cms/umwelt/geologie/produkte/ews_leitfaden.htm
(only a summary and appendix avaliable online, full version can be ordered online)
detailed maps at:
http://www.umweltkarten.mv-regierung.de/atlas/script/index.php

Niedersachsen (Lower Saxony), 1st ed. Dec. 2006
http://www.umwelt.niedersachsen.de/themen/wasser/grundwasser/leitfaden_erdwaermenutzung/8927.html

detailed maps at:
http://memas01.lbeg.de/lucidamap/index.asp?THEMEGROUP=WASSER

Nordrhein-Westfalen, various online sources incl. Simple site check, offline database on a CD-ROM:
http://www.gd.nrw.de/l_gt.htm
brochure with summary of the offered material:
http://www.gd.nrw.de/zip/gbrosgt.pdf
detailed maps (site-check) at:
http://www.geothermie.nrw.de/viewer.html

Rheinland-Pfalz, 5th ed. 2012, MULEWF, Mainz and LGB, Mainz
http://www.lgb-rlp.de/erdwaerme_d.html
detailed maps at:
http://mapserver.lgb-rlp.de/php_erdwaerme/index.phtml

Saarland, 1st ed. 2008, MfU, Saarbrücken
http://www.saarland.de/dokumente/ressort_umwelt/08-05_Leitf_Erdwaerme.pdf
no detailed maps

Sachsen, 4th ed. 2011, SMULG, Dresden/Freiberg
https://publikationen.sachsen.de/bdb/artikel/11868
detailed maps at:
www.umwelt.sachsen.de/umwelt/geologie/26631.htm

Sachsen-Anhalt, 1st ed. 2012, LGAB, Halle
http://www.sachsenanhalt.
de/fileadmin/Elementbibliothek/Bibliothek_Politik_und_Verwaltung/Bibliothek_LAGB/geothermie/portal/info_geothermie.pdf
detailed maps / site-check at:
http://www.geodaten.lagb.sachsen-anhalt.de/lagb/?pgid=18

Schleswig-Holstein, 2nd ed. 2011, LANU, Flintbek
http://www.umweltdaten.landsh.de/nuis/upool/gesamt/geologie/geothermie_2011.pdf
no detailed maps

Thüringen, preliminary guideline document, Feb. 2010, TLVWA, Weimar
http://www.tlug-jena.de/geothermie/dokumente/arbeitshilfe_erdwaerme.pdf
detailed maps at:
http://www.tlug-jena.de/geothermie/index.html

Organisation	
Name:	SRK Consulting
Country:	UK/Turkey/Sweden
Sector (Public or private):	
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Natural Resources
Contact Person	
Name:	Rob Bowell
Position:	Corporate Consultant
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Phone (optional):	+4429290348150
Geological Data	
For what purpose do you use geological data?	Resource evaluation, environmental assessment, g Engineering geology, hydrogeology, geochemistry
What geological data do you use?	Publications, e-prints, maps
Do you need/use basic raw geological data or interpreted thematic data?	yes
Where do you get your geological data?	Self-aquired, from companies
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Online view, GIS, 3D modeling, PDF files, excel files, maps
Which data are easily accessible?	Online view
Which data are NOT easily accessible?	Raw data
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Available data

Do you have any specific requirements relating to data access (data formats, projections etc.)?	no
Do you have any current legal barriers relating to your use of geological data?	no
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	**EWATER, FOREGS**
Do you use any European data portals (specify which)	**EWATER, FOREGS**
What portals are good in terms of data content, and why?	**both**
What portals are good in terms of functionality, and why?	EWATER more than FOREGS
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	USGS, USEPA, INAP
Are any of these good?	USGS-Exceptional
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Data storage/retrieval to be straightforward and quick; good search engine
May we contact you on a personal basis for more detailed information?	Yes- email is best
May we send you future information about the EGDI-Scope project?	Yes- email is best

Public institutions

Organisation	
Name:	Federal Institute for Geosciences and Natural Ressources (BGR)
Country:	Germany
Sector (Public or private):	public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey, natural resources
Contact Person	
Name:	Kristine Asch
Position:	Unit head geological information systems and maps
Email address:	Kristine.Asch@bgr.de
Phone (optional):	00495116433324
Geological Data	
For what purpose do you use geological data?	Data compilations, combination with different themes /soil, geochemistry), risk assessment, urban and regional planning, mineral resources assessment, groundwater studies
What geological data do you use?	Lithology, age, structures, genesis
Do you need/use basic raw geological data or interpreted thematic data?	both
Where do you get your geological data?	Other geological surveys, field mapping (in technical cooperation projects)
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	GIS files and relational data bases, scanned paper maps (georeferenced), web services (WMS)
Which data are easily accessible?	European and national
Which data are NOT easily accessible?	Those still to map, those in Technical cooperation projects
What do you find most important: **Harmonised data** (*Individual*	Harmonised data, interoperable data, any available data, - depending on the

datasets harmonised to act as a single dataset), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	project purpose
Do you have any specific requirements relating to data access (data formats, projections etc.)?	ESRI files, interchange format such as shape, internationally recognized and known projections
Do you have any current legal barriers relating to your use of geological data?	For any private data, in particular borehole data
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	OneGeology-Europe, EMODNET, AEGOS (not yet implemented), INSPIRE, GS Soil, OneGeology, GEORG, OpenStreetMaps (OSM), GeoPortal,
Do you use any European data portals (specify which)	OneGeology and OneGeology-Europe, ERMOS, NIBIS - Portal of the State Geological Survey of Lower Saxony (http://nibis.lbeg.de/cardomap3/)
What portals are good in terms of data content, and why?	OneGeology,OneGeology-Europe to get a global and European overview. ERMOS http://www.seisonline.bgr.de/karto/SEIS-Online.html Easy to view, easy to use NIBIS: complete large scale spatial geoscience data of the state of Lower Saxony, themes
What portals are good in terms of functionality, and why?	ERMOS http://www.seisonline.bgr.de/karto/SEIS-Online.html Immediate delivery of actual data of earthquakes and their magnitude in Germany
What portals are not good, and why?	It is difficult to find most of the portals without a specific searching machine as

	that machine is not yet available
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	E.g. the ESRI portal USGS EROS; UN Data, UN Spider, OpenStreet Map
Are any of these good?	Yes, ESRI http://www.esri.com/data/free-data/, USGS EROS http://data.un.org/ and UN Data have unambiguous links and data can be easily selected. Not so good: http://www.un-spider.org/network more for expert use, no simple l Open Street Map less practical, use is cost free but it offers a poor user interface and only raster data
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	On-line overlay/combination of data, standard portrayal rules, access and download conditions, immediate hazard information
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	Czech Geological Survey
Country:	Czech Republic
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey
Contact Person	
Name:	Dana Capova
Position:	Deputy Director for Informatics
Email address:	dana.capova@geology.cz
Phone (optional):	
Geological Data	
For what purpose do you use geological data?	statutory task of the state geological survey is to produce, collect, process, maintain and provide geological data
What geological data do you use?	primary raw data (geological, mineralogical or paleontological descriptions, geochemical and geophysical measurements, etc.), maps (geological, hydrogeological, geohazard, soil and mineral resources maps at different scales), interpreted specific products etc.
Do you need/use basic raw geological data or interpreted thematic data?	We produce geological data as well as interpreted data, which is more understandable for general public
Where do you get your geological data?	Primary exploration,

	measurements, mapping and interpretation, also fulfilling statutory obligation to collect data from other subjects executing geological exploration
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Enterprise GIS - online map server, online web applications, OGC web services, though providing all required formats
Which data are easily accessible?	Online data served via mapserver or web applications (example: online geological maps at different scales, hydrogeological maps, maps of geohazards, soil maps, mineral resources maps, borehole data...)
Which data are NOT easily accessible?	Primary raw data (deliberately), geological documentation (low financial support of digitizing of paper documents)
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Depending on purpose and available resources: Harmonised data(long term, expensive), **interoperable data** (for some purposes ideal compromise), available data (not too time consuming, not too expensive, not suitable for most purposes)
Do you have any specific requirements relating to data access (data formats, projections etc.)?	Not relevant
Do you have any current legal barriers relating to your use of geological data?	Not relevant
Geological online services	
Do you know any European data portals	Participating on creation of

(specify which)? *Please find list of portals in the back*	OneGeology-Europe, eWater, eEarth, PanGeo, INSPIRE geoportal, GEOMIND, AEGOS, EuroGeoSource
Do you use any European data portals (specify which)	OneGeology-Europe, eEarth
What portals are good in terms of data content, and why?	OneGeology-Europe – harmonised data model across European countries that enables data queries, eEarth – excellent content, though after time less providers, outdated standard, outdated technology
What portals are good in terms of functionality, and why?	OneGeology-Europe – multilingual portal, interesting tools (dynamic legend, data filters), multilingual European metadata catalogue
What portals are not good, and why?	eEarth – not many countries involved, outdated technology, eWater – outdated technology
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	OneGeology
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Metadata search, simple quick map viewer
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	yes

Organisation	
Name:	British Geological Survey
Country:	UK
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey
Contact Person	
Name:	Luke Bateson
Position:	Remote Sensing Geologist and Project manager
Email address:	lbateson@bgs.ac.uk
Phone (optional):	+44115 9363043
Geological Data	
For what purpose do you use geological data?	Day to day activities, especially in the interpretation of satellite derived ground motion data and prediction of possible areas of geohazards
What geological data do you use?	All
Do you need/use basic raw geological data or interpreted thematic data?	Both
Where do you get your geological data?	Internal to survey, EU projects such as PanGeo, SubCoast, one Geology/One Geology Europe
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	GIS
Which data are easily accessible?	Our own (BGS) and those made available via online portals etc
Which data are NOT easily accessible?	
What do you find most important: **Harmonised data** (*Individual datasets*	Available data

harmonised to act as a single dataset), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	No, we can deal with most formats and projects etc.
Do you have any current legal barriers relating to your use of geological data?	No
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	SubCoast, PanGeo, One Geology, one Geology Europe, AEGOS, EuroGeoSource, ProMine, GeoSeas,
Do you use any European data portals (specify which)	SubCoast, PanGeo, One Geology, One Geology Europe,
What portals are good in terms of data content, and why?	Harmonised nature of 1GE allows us to develop additional datasets from the core geological data
What portals are good in terms of functionality, and why?	I am generally not to worried about portal functionality, as long as I can see the available data and download it then I am happy
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	No.
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Ability to search via a map (zoom scroll) and location for data. Select data to download (specify datasets, extent etc)
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	Geological Institute of Romania
Country:	Romania
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Natural resources, Geological Survey
Contact Person	
Name:	George Tudor
Position:	Scientific researcher
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Phone (optional):	+40 21 3060416
Geological Data	
For what purpose do you use geological data?	GIS databases
What geological data do you use?	Geological maps, mineral resources
Do you need/use basic raw geological data or interpreted thematic data?	Interpreted thematic data
Where do you get your geological data?	Geological maps, published works, reports
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	GIS files, relational databases, OGC Web services
Which data are easily accessible?	Printed maps, OGC Web services
Which data are NOT easily accessible?	GIS files, relational databases
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Harmonised data
Do you have any specific requirements relating to data access (data formats, projections etc.)?	ArcGIS formats, Stereographic 1970 projection

Do you have any current legal barriers relating to your use of geological data?	Yes, reserves/resources data are confidential
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	OneGeology, OneGeology-Europe, Promine, EuroGeoSource
Do you use any European data portals (specify which)	No
What portals are good in terms of data content, and why?	OneGeology-Europe, data are harmonised
What portals are good in terms of functionality, and why?	OneGeology-Europe
What portals are not good, and why?	OneGeology, data are not harmonised
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	No
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Filter data, export data
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	State Geological and Subsurface Survey of Ukraine
Country:	Ukraine
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological survey
Contact Person	
Name:	Boris Malyuk
Position:	Acting Deputy Director, UkrSGRI
Email address:	bmalyuk@ukr.net
Phone (optional):	+380-97-245-33-66
Geological Data	
For what purpose do you use geological data?	geological survey and research
What geological data do you use?	any
Do you need/use basic raw geological data or interpreted thematic data?	both basic and interpreted thematic data
Where do you get your geological data?	own data and data from private companies
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	printed maps, GIS files, Excel files, PDF files
Which data are easily accessible?	Ibid
Which data are NOT easily accessible?	online view, relational databases, OGC Web services
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	harmonized and interoperable data

Do you have any specific requirements relating to data access (data formats, projections etc.)?	not so far
Do you have any current legal barriers relating to your use of geological data?	classified and confidential data
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	OneGeology, OneGeology –Europe, ProMine, GEMAS, EuroGeoSource
Do you use any European data portals (specify which)	Ibid
What portals are good in terms of data content, and why?	Ibid
What portals are good in terms of functionality, and why?	Ibid
What portals are not good, and why?	n.a.
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	n.a.
Are any of these good?	n.a.
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	harmonization and interoperability
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	yes

Organisation	
Name:	Cyprus Geological Survey
Country:	Cyprus
Sector (Public or private):	public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological survey
Contact Person	
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Geological Data	
For what purpose do you use geological data?	Geological data is the core of our organization and are used to consult the state on all geological matters
What geological data do you use?	Geological, geochemical, geophysical, geohazard, hydrogeological, mineral deposit maps including data on groundwater quality, rock and soil chemistry, borehole and earthquake data
Do you need/use basic raw geological data or interpreted thematic data?	We use, produce and need both raw and thematic data
Where do you get your geological data?	We perform our own geological research
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	GIS files, pdf files, archived printed maps and SQL databases
Which data are easily accessible?	All of the above
Which data are NOT easily accessible?	Old chemical analysis data and analog maps not indexed in any digital catalogues

What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Both harmonised and interoperable data are most important
Do you have any specific requirements relating to data access (data formats, projections etc.)?	Yes, we use specific projections and specific legends to our geological maps
Do you have any current legal barriers relating to your use of geological data?	no
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	One Geology, One geology Europe, PanGeo, GEMAS, Earthquake data portal
Do you use any European data portals (specify which)	One Geology, One geology Europe, PanGeo
What portals are good in terms of data content, and why?	Both the one geology and JRC portals because they are easy to use and serve as very collective tools
What portals are good in terms of functionality, and why?	PanGeo, very easy to use and access data
What portals are not good, and why?	OneGeology, not friendly to use
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	Mrdata.usgs
Are any of these good?	Very good and easy to use
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	The ease with which a user can download data
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	Yes (we are partners in the project)

Organisation	
Name:	Geological Survey of Ireland
Country:	Ireland
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey
Contact Person	
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Phone (optional):	
Geological Data	
For what purpose do you use geological data?	Mapping and modeling geological processes and phenomena
What geological data do you use?	
Do you need/use basic raw geological data or interpreted thematic data?	both
Where do you get your geological data?	Surveying or compilation
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	GIS files
Which data are easily accessible?	Online GIS data
Which data are NOT easily accessible?	Archived data,
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Available data
Do you have any specific requirements relating to data access (data formats, projections etc.)?	No technical requirements, but ideally free to re-use.

Do you have any current legal barriers relating to your use of geological data?	No
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	ECORD, Emodnet-geology, GEMAS, Geo-Seas, GLOBOVOLCANO, OneGeology, One Geology Europe, PanGeo, SubCoast,
Do you use any European data portals (specify which)	OneGeology, PanGeo, Geo-Seas, GEMAS
What portals are good in terms of data content, and why?	PanGeo; A free and consistent data on Eurpoean urban geohazards.
What portals are good in terms of functionality, and why?	PanGeo; interrogation and export functions.
What portals are not good, and why?	OGE is slow
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	Geological Survey of Ireland data portals, BGS geotechnical portal, IFFI, Irish EPA, Irish Marine Insitute, Irish Spatial Data Exchange (www.isde.ie)
Are any of these good?	All of these are good
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Download in a readily consumable format
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	GTK
Country:	Finland
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey
Contact Person	
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Geological Data	
For what purpose do you use geological data?	Science, engineering, national security etc.
What geological data do you use?	Sea floor & subsea floor data
Do you need/use basic raw geological data or interpreted thematic data?	Need raw data, but also use interpreted thematic data.
Where do you get your geological data?	We collect with our vessels
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Meridata format acoustic and seismic profiles together with ArcGIS
Which data are easily accessible?	None for outsiders before publication/release (a question of national security)
Which data are NOT easily accessible?	All before publication/release
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Available data

Do you have any specific requirements relating to data access (data formats, projections etc.)?	We normally use only own data, thus no requirement. If bathymetric data would be available (Hydrographic Office's data) we would use it in standard HO format.
Do you have any current legal barriers relating to your use of geological data?	Yes, issues of national security
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	EMODnet, 1Geology, ECORD, FOREGS, ProMine, MAREMAP, MAREANO, SeaDataNet
Do you use any European data portals (specify which)	EMODnet
What portals are good in terms of data content, and why?	EMODnet, visual
What portals are good in terms of functionality, and why?	1Geology
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Seafloor data access, but not necessary as we mostly use our own data. Data on bathymetry on high resolution, however, very important.
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	Geological Survey of Norway
Country:	Norway
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Natural resources, Research, Environment Information, Landscape, Geological survey
Contact Person	
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Geological Data	
For what purpose do you use geological data?	It is our every day topic
What geological data do you use?	All kinds
Do you need/use basic raw geological data or interpreted thematic data?	
Where do you get your geological data?	From our own databases and web-services.
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	GIS files, relational databases, Web services
Which data are easily accessible?	All data from our national spatial infrastructure
Which data are NOT easily accessible?	Data from other countries
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Interoperable data
Do you have any specific requirements relating to data access (data formats, projections etc.)?	Data should be described by a data specification and metadata based on !SO 191** standards

Do you have any current legal barriers relating to your use of geological data?	National legislation in other countries
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	eEarth, EuroGeoSource, eWater, Geo-Seas, GMES, OneGeology, OneGeology-Europe, ProMine
Do you use any European data portals (specify which)	geoNorge.no, OneGeology-Europe, ProMine, Geodata.se, dinoloket.nl, GEUS.dk, bgr.de/karten, bgs.ac.uk/data
What portals are good in terms of data content, and why?	geoNorge.no. The amount of data available, and the way they are documented.
What portals are good in terms of functionality, and why?	Geodata.se. Easy and nice GUI.
What portals are not good, and why?	-
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	Nobody I use in my work
Are any of these good?	-
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	That they can give free access to open data, followed by INSPIRE metadata
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	yes

Organisation	
Name:	State Geological Institute of Dionyz Stur
Country:	Slovakia
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey
Contact Person	
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Geological Data	
For what purpose do you use geological data?	groundwater resources assessment, hydrogeological maps, groundwater vulnerability maps
What geological data do you use?	mostly geological maps
Do you need/use basic raw geological data or interpreted thematic data?	raw geological data are preferred
Where do you get your geological data?	at our dpts. of regional geology
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	GIS files
Which data are easily accessible?	country geological maps
Which data are NOT easily accessible?	international geological maps in more detail scale (1:200 000, 1:100 000 and even more detailed)
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	interoperable data (as harmonisation leads to loss of information)
Do you have any specific requirements relating to data access (data formats,	projection should be better in metric (more suitable for data

projections etc.)?	inputs/outputs from hydrogeological models)
Do you have any current legal barriers relating to your use of geological data?	copyrights
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	http://geoportal.onegeology-europe.org http://ewater.geolba.ac.at
Do you use any European data portals (specify which)	http://geoportal.onegeology-europe.org
What portals are good in terms of data content, and why?	don't know good portals in data content
What portals are good in terms of functionality, and why?	don't know good portals in functionality
What portals are not good, and why?	language () / accessibility / content (too uniform legend)
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	no
Are any of these good?	don't know
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	functionality respecting local (regional / national) data structure and language and both its English translation, non-uniform data description
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	yes

Organisation	
Name:	Geological and Geophysical Institute of Hungary (MFGI)
Country:	Hungary
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	geological and geophysical survey
Contact Person	
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Phone (optional):	
Geological Data	
For what purpose do you use geological data?	We produce geological data
What geological data do you use?	core data
Do you need/use basic raw geological data or interpreted thematic data?	both
Where do you get your geological data?	we produce it
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	relational databases, GIS files, OGC web services
Which data are easily accessible?	metadata
Which data are NOT easily accessible?	Core data
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	available data
Do you have any specific requirements relating to data access (data formats, projections etc.)?	no
Do you have any current legal barriers	no

relating to your use of geological data?	
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	1GE, EuroGeoSource, ThermoMap, TRANSENERGY, DORIS, eWater, eEarth, GeoMIND, SARMA, SNAP-SEE, TJAM, Pangeo, ProMINE, OneGeology,
Do you use any European data portals (specify which)	Not really.
What portals are good in terms of data content, and why?	harmonized data; available for the whole project region data
What portals are good in terms of functionality, and why?	has good webmap; easy to reuse (WMS, WFS, print); uptodata
What portals are not good, and why?	Only metadata; missing data; using special (not standardised) units
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	USGS
Are any of these good?	Yes
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Really good search function, clear access possibilities, update guarantie
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	yes

Organisation	
Name:	Geological and Geophysical Institute of Hungary
Country:	Hungary
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	*Academia and research*
Contact Person	
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Geological Data	
For what purpose do you use geological data?	Mapping
What geological data do you use?	Data of boreholes
Do you need/use basic raw geological data or interpreted thematic data?	Yes, all kinds
Where do you get your geological data?	Institute archive
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Printed maps, GIS files, relational databases
Which data are easily accessible?	Printed maps
Which data are NOT easily accessible?	GIS files, relational databases
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	**interoperable data**
Do you have any specific requirements relating to data access (data formats, projections etc.)?	There would be better if all data have standard formats and projection method

Do you have any current legal barriers relating to your use of geological data?	bourocracy
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	EuroGeoSource, EWATER, FOREGS, OneGeology-Europe, ProMine, TRANSENERGY
Do you use any European data portals (specify which)	EuroGeoSource, OneGeology-Europe,
What portals are good in terms of data content, and why?	OneGeology-Europe, it serves good maps and data
What portals are good in terms of functionality, and why?	EuroGeoSource, it is a first type of raw materials' database
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	USGS
Are any of these good?	yes
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Harmonised, researchable
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	yes

Organisation	
Name:	Croatian Geological Survey
Country:	Croatia
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey, Research, Education
Contact Person	
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Geological Data	
For what purpose do you use geological data?	Production of geological maps, reports, studies, research, education
What geological data do you use?	All kinds of geological maps, all kinds of geological analytical data.
Do you need/use basic raw geological data or interpreted thematic data?	Both of them
Where do you get your geological data?	Own survey
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Printed maps, Excel files, GIS files, PDF files, relational databases (in development)
Which data are easily accessible?	Printed maps
Which data are NOT easily accessible?	GIS data
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	1. Interoperable data 2. Harmonised data 3. Available data
Do you have any specific requirements relating to data access (data formats,	No.

projections etc.)?	
Do you have any current legal barriers relating to your use of geological data?	Yes. Law restriction.
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	http://portal.onegeology.org/; http:/weppi.gtk.fi/publ/foregsatlas/ http:/gemas.geolba.ac.at
Do you use any European data portals (specify which)	http:/weppi.gtk.fi/publ/foregsatlas/ http:/gemas.geolba.ac.at
What portals are good in terms of data content, and why?	http:/weppi.gtk.fi/publ/foregsatlas/ http:/gemas.geolba.ac.at We used the data from this portals for our geochemistry projects
What portals are good in terms of functionality, and why?	http:/weppi.gtk.fi/publ/foregsatlas/ http:/gemas.geolba.ac.at Easy accesible.
What portals are not good, and why?	No answer.
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	No.
Are any of these good?	-
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Easily accesible harmonised and interoperable data.
May we contact you on a personal basis for more detailed information?	Yes.
May we send you future information about the EGDI-Scope project?	Yes.

Organisation	
Name:	University of Miskolc
Country:	Hungary
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Education, research
Contact Person	
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Phone (optional):	
Geological Data	
For what purpose do you use geological data?	Teaching, research
What geological data do you use?	Articles, books, maps
Do you need/use basic raw geological data or interpreted thematic data?	Rather interpreted data
Where do you get your geological data?	I use many sources
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Mostly online view
Which data are easily accessible?	It varies
Which data are NOT easily accessible?	
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Available data
Do you have any specific requirements relating to data access (data formats, projections etc.)?	No
Do you have any current legal barriers relating to your use of geological data?	No
Geological online services	

Do you know any European data portals (specify which)? *Please find list of portals in the back*	FOREGS, GEMAS, EuroGeoSource, OneGeology, ProMine, PanGeo
Do you use any European data portals (specify which)	All the above mentioned, except Promine and PanGeo
What portals are good in terms of data content, and why?	All the used portals are good in terms of data content and functionality
What portals are good in terms of functionality, and why?	
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	IUGS
Are any of these good?	yes
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	
May we contact you on a personal basis for more detailed information?	yes
May we send you future information about the EGDI-Scope project?	yes

Organisation	
Name:	Jürgen Amor
Country:	Spain
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Environmental Consultancy and Industrial Waste Management
Contact Person	
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Geological Data	
For what purpose do you use geological data?	Subsurface structure interpretation
What geological data do you use?	Boreholes
Do you need/use basic raw geological data or interpreted thematic data?	Raw geological data
Where do you get your geological data?	Site investigation
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Autocad, GIS files, pdf, images, excel files, (printed maps are available digitally in Spain 1:50.000, some regions 1:25.000).
Which data are easily accessible?	All Spanish geological maps are easily available online.
Which data are NOT easily accessible?	In Spain borehole data from site investigations, unlike well data.
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Available data.
Do you have any specific requirements	Depends on the digital

relating to data access (data formats, projections etc.)?	format of the document to be downloaded.
Do you have any current legal barriers relating to your use of geological data?	All geological maps freely available. Generated geological information from site investigations depends on confidentiality.
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	No
Do you use any European data portals (specify which)	No
What portals are good in terms of data content, and why?	N/A
What portals are good in terms of functionality, and why?	N/A
What portals are not good, and why?	N/A
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	No
Are any of these good?	N/A
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Probably the easy way would be to coordinate with national geological associations and via weblinks go direct to national data web sites, rather than duplicating everything on a European level.
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	swisstopo / Swiss Geological Survey
Country:	Switzerland
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey
Contact Person	
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Phone (optional):	
Geological Data	
For what purpose do you use geological data?	Production of geological data (2D, 3D), consultancy
What geological data do you use?	- Geological maps - Geotechnical maps - Geophysical maps - Geological 3D models - Original mapping - Geological cross sections - Geophysical raw data - Seismic sections - Borehole data - Rock collections and drill cores - Geological reports
Do you need/use basic raw geological data or interpreted thematic data?	Both
Where do you get your geological data?	- From private contractors - From some cantons - From some Federal Offices - From universities - Field observations by swisstopo
What is your most important data medium (online view, GIS files, relational databases,	- Printed maps - GIS files

Excel files, PDF files, Printed maps, OGC Web services, other)?	- Online views - Pixel maps
Which data are easily accessible?	- Geological Atlas of Switzerland 1:25,000 (printed maps, GIS files, pixel maps) - Geological maps 1:500,000 (The Last Glacial Maximum, Geological Map, Hydrogeological Maps, Tectonic Map, Gravimetric Map) (printed maps, GIS files, pixel maps)
Which data are NOT easily accessible?	Borehole data
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation of content*) or **available data** (not necessarily standardised)?	Harmonised data
Do you have any specific requirements relating to data access (data formats, projections etc.)?	If possible ESRI compatible
Do you have any current legal barriers relating to your use of geological data?	- Regarding geological reports and borehole data (rights to inspection, copy rights) - Mineral royalty - Intellectual property rights (IPR)
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	- OneGeology - OneGeology-Europe - GeoRG - TRANSENERGY - InfoTerre - BRGM
Do you use any European data portals (specify which)	- OneGeology - OneGeology-Europe - GeoRG - TRANSENERGY - InfoTerre - BRGM
What portals are good in terms of data content, and why?	- OneGeology: Harmonised data on a small scale - OneGeology-Europe: Cross-boundary harmonisation

What portals are good in terms of functionality, and why?	No preference
What portals are not good, and why?	- OneGeology-Europe Why (one significant bug): You have to know which web browser to use. For example, some important functionalities are not working with Internet Explorer.
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	http://map.geo.admin.ch/ http://www.geologieviewer.ch/ http://www.geologieportal.ch/
Are any of these good?	http://map.geo.admin.ch/ http://www.geologieportal.ch/
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	- One portal - Search data - View data - Query data - View results - Download data
May we contact you on a personal basis for more detailed information?	Yes
May we send you future information about the EGDI-Scope project?	Yes

Organisation	
Name:	State Geological Institute of Dionýz Štúr
Country:	Slovak Republic
Sector (Public or private):	Public
Thematic area: (*Natural resources, Environment agencies, Environment Information, Environmental Consultancy, Planning, Education, Academia and research, Insurance, Landscape, Heritage, Civil engineering, Geological survey, Other*)	Geological Survey
Contact Person	
Name:	Marian Zlocha
Position:	GIS, remote sensing, 3D modeling specialist
Email address:	Marian.zlocha@geology.sk
Phone (optional):	+421 911 628 007
Geological Data	
For what purpose do you use geological data?	Hydrogeology, engineer & geochemical geology, ecology, regional geological mapping
What geological data do you use?	Water, drills, own terrain data, own laboratory samples, archive, maps,
Do you need/use basic raw geological data or interpreted thematic data?	Both
Where do you get your geological data?	Terrain, laboratories, archives
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Online views, GIS and 3D models, DB, web services
Which data are easily accessible?	All but printed maps
Which data are NOT easily accessible?	Printed maps
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*), **interoperable data** (*served through common standards allowing exchange between systems, but without harmonisation*	Interoperable data

of content) or **available data** (not necessarily standardised)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	INSPIRE compliant, we prefer ESRI standards, WGS-84 (ETRS-89), Gauss Krueger should be fine
Do you have any current legal barriers relating to your use of geological data?	
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	Promine, PanGeo, Eurogeosource, GMES, OneGeology, Transenergy
Do you use any European data portals (specify which)	PanGeo, ProMine, Transenergy
What portals are good in terms of data content, and why?	ProMine, Eurogeosource -mines, critical metals data
What portals are good in terms of functionality, and why?	Eurogeosource, ProMine -querying
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	No
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Robust huge data clouds, querying, 3D functionality, maybe also interpretated layers from remote sensing (imageries with very high density)
May we contact you on a personal basis for more detailed information?	
May we send you future information about the EGDI-Scope project?	Please yes

Appendix 4: Report from break-out session, Brussels, November 14th 2013

EGDI-Scope Stakeholder workshop Brussels, November 14th 2012

Report from break-out groups

TABLE OF CONTENTS

Introduction

On November 14th, an EGDI-Scope workshop was held in Brussels with participation of project members and stakeholders (see agenda in Appendix A and a list of participants in Appendix B). The meeting had two major aims; first of all to disseminate the overall concept of EGDI-Scope to a wide range of communities with interest in geological data and information, and secondly to get as much input as possible from the participating stakeholders of relevance to the project.

The discussions were carried out in the scope of three break-out sessions where stakeholders and project representatives were divided according to their areas of expertise and interests. Three topics were selected for these groups;

1. Earth Resources
2. Geohazards
3. Other thematic areas
    - Soil/Climate/environment/health
    - Water/hydrogeology
    - Oceanographic/marine
    - Environmental chemistry/geochemistry

The groups were asked to mainly consider existing pan-European datasets which are freely available. The following questions were presented prior to break-out sessions as inspiration and in an attempt to guide the discussions in the groups;

Each group was asked to focus on the most relevant use cases from a European or international/ cross-border perspective (regional or national issues and cases are supposed to be covered by national and regional data infrastructures). During many of the discussions the term “Use case” was interpreted in a broader sense, more or less describing “Thematic Areas” and relevant issues connected to these areas.

Connected to use cases or thematic areas the participants were asked to investigate the use and availability of geological data and information, as well as requirements (functional, technical, legal) requirements for a geological data infrastructure.

Thematic Area: Resources

Description

- This topic covers resources in a broad sense. The types of resources to be considered in the EGDI should include (but not be limited to):

  - **Energy minerals / resources**
    - Shale gas, oil shale, shale oil
    - Solid fuel minerals
    - Oil and gas
    - Gas hydrates
  - **Non-energy minerals / resources**
    - (Rare) Metals
    - Industrial minerals
    - Construction materials
  - **Other natural resources**
    - Freshwater
    - Soils
    - Seas and oceans
  - **Other**
    - Geothermal
    - Capacity for CCS
    - Secondary raw materials and waste as a resource

User Groups

- Policy makers influencing land-use
- EU - Strategic information
- EU - Supporting development of EU policy for the benefit of development of member states
- Developers/investors
- Regulators considering proposals for exploration or implementation
- Public concerned with the possible effects of resource exploitation (incl. NGOs, individuals)
- Academic community
- European Geological Surveys – to provide specific services based on the data
- Member states attracting inward investment in exploration and resource exploitation

Data needed

- Geoscience baseline data allowing potential and current environmental conditions to be determined

  - Resources (relevant geology)
  - Groundwater (relevant scale and scope)
  - Seismicity
- Other baseline datasets that users may wish to overlay
  - Relief
  - Land-use
  - Populations
  - Ecology
  - Environmental monitoring
- Other primary datasets users may need/want to access
  - Borehole data
  - Monitoring data

Problem issues

- Data availability, access and delivery
  - Completely open?
  - Functionality?
  - Portal/overview or multi-layered (if a portal overview, at what level?)
  - Downloadable or just for viewing?
- Harmonisation or standardisation of data
  - can it truly be done?
  - at what level should harmonisation be achieved? (derived data could be harmonized, but not primary data – possibly too difficult but also due to various policies in the countries)
  - Is it necessary for harmonisation to be achieved – is it enough to explain and map the variations?
  - Great idea to standardise, as long as you do it my way
  - The level at which this can be achieved will determine the basic level for the EGDI 'product'
- Below the harmonised level, classification systems ("this data created according to xx classification system")
- Combining available data to get a better evaluation of resources as none of them are fully complete
- Confidentiality of data – recovering cost of collecting costly data
- Quality of data – descriptors of confidence and standards – variances documented
- Be careful about presenting 'derived' data – state the purpose for which it was created
- Some users will trust the derived data, but some others not and would like to access primary data to process them by themselves
- Open access to data presents problems with mis-use and misunderstanding
- Trust – how to build it/how to maintain it
- What does EU need? What should it need for its functions?

- To address the requirements from EC Directives
- To share not only data, but also best practices to create products

Shale gas – specific user issues

- The need for baseline environmental data
- The need to know where shale gas will be safe to explore
- The need for waste management options to be considered
- The need for monitoring
- Learning from best practice/pilot studies through data arising

Minerals – specific user issues

- The need for thematic minerals data (instead of stratigraphic information) – where is the potential for minerals?
- Linkage with production statistics – supply side planning
- Avoidance of sterilisation/safeguarding
- Where don't we know enough (to allow targets to be identified, to assess impact of mineral exploitation?)
- Transnational/transborder industry therefore harmonisation at some level needed.

Thematic Area: Geohazards

Description

- This topic covers geohazards in a broad sense. The types of hazards to be considered in the EGDI should include (but not be limited to):

  - Earthquakes
  - Volcanic (incl. ash clouds)
  - Flooding (lowlands)
  - Subsidence
  - Landslides
  - Flooding with landslides (mountainous areas)
  - Tsunami
  - Geo chemical, for example
    - Radon and other natural gas emissions
    - Mercury and other heavy metals

Use cases & user communities

- Hazard management by public agencies
- Insurance cases:
  - International benchmark studies;
  - Generic access to freely available (risk) data;
  - Prevention (responsibility in most cases not with insurance companies)
- International/ EU-Legislation (existing and in progress), e.g. EU Directives
- International frameworks for planning
- Dedicated user communities:
  - European Environment Agency (EEA)
  - Insurance companies (possible but insurance group needs to consider position)
- General: the *subsidiarity principle* is very important for a proper analysis of relevant use cases at European and international scale: what authorities at what level have which capability and responsibility with regard to geohazards and prevention?

Possible collaboration

- The European Plate Observing System - EPOS (with regard to data infrastructure development, certain datasets for researchers community; connection research infrastructure: (Super-)sites, laboratories, equipment)
- Common Operations of Environmental Research Infrastructures (ENVRI project)

Problem issues

- Scope – What does EGDI have to deliver: everything from (raw) data (results from (field) acquisition) to actionable information and fully developed decision support models ?? Relevant chain from field acquisition to integrated valuable information (supply <=> demand):
  1. data acquisition => 2. raw data (for research community) => 3. geological mapping & models => 4. multidisciplinary integration of scientific information => 5. integration in decision support models, systems and models => 6. decisions in use cases (stakeholders from policy and industry)

- Define users, there are many users groups, depending on the thematic areas and use cases, with different requirements with regard to level of data/information (raw to decision support info) – see chain described above
- Question: is the objective of EGDI-scope to design an infrastructure to collate and distribute existing data or to also create new models or datasets from the data?
- Need to define a roadmap for EGDI, consider phased development:
  - Phase 1: Organize data integration and continuity
  - Phase 2: Delivery data services: integrated data products for scientific users + training
  - Phase 3: Virtualisation – putting data together and allow users to generate their own products
  - Phase 4: Delivery of information to stakeholders from policy and industry (EGDI objective)

- For some specific geohazards (e.g. volcanic risks), full chain is operative. For many others, the information delivery from geology consists only of a limited contribution to integrated risk assessment, for example a certain parameter describing the risk for ground subsidence,
- For an EGDI it must not be excluded that some datasets could be delivered including the charge of a fee for access.

Insurance and legal aspects

- Insurance industry insures assets but will not pay for prevention measures/data (in some countries insurance tax is (partly) reserved to enable prevention measures)
- Insurance industry insures assets but will not pay for valuable risk information, unless it may have value for very specific business cases.
- Re-insurers are probably a relevant target group, because they may invest in relevant datasets at higher scale levels (e.g. GEM)
- Additional exploration of relevant use cases at European level with regard to geohazards and (re-)insurance is required, including the (potentially necessary) role of EU policy makers

- Need to make sure licensing is considered, since IPR needs to be protected.
- Related to governance of EGDI – who is the legal entity governing – EGS?
- Relevant experience with these legal issues from OneGeologyEurope

General discussion on legal and governance issues with regard to hazard information: make very clear who has what responsibilities, e.g. geological surveys and institutions are responsible for scientific quality of the information, pub lic agencies or other users for the interpretation and translation of it within the framework of decision making, where also other information is relevant.

Thematic Area: Background values, Geochemistry

Description

- Knowledge about geochemical background values in soils on a European scale can be important for decisions on land use, estimation of the relative quality of e.g. agricultural soils, determination of the impact on the environment caused by flooding or pollution hazards.

Use cases & user communities

- Policy makers (to monitor agricultural soils)
- Industry (to document impact on environment)
- Engineering & consultancy companies
- Environmental organizations (Vulnerability studies)

Data needed

- Derived products: The maps from the geochemical atlas produced by the GEMAS project
- Background data: The georeferenced point data (1 sample per 2,500 km^2) that have acted as input to the maps. Today these reside in Excel spreadsheets.

Possible collaboration

- JRC

Thematic Area: Seabed information

Description

- The European Commission (and lots of other stakeholders) has great interest in geological information from the marine domain as describe in the green paper “Marine Knowledge 2020”. EGDI could very well be the platform through which the results of e.g. the EMODnet-geology and Geo-Seas projects are disseminated in the future.

End users

- A large group of stakeholders is already organized through MODEG (Marine Observation and Data Expert Group).
- Local governments
- European level legislation
- Researchers
- Industry (fisheries, oil and gas, offshore mineral resources, wind mill companies)

Data needed

- Derived products: Seamless multi-resolution digital seabed map of European waters and other maps as produced by e.g. EMODnet-Geology
- Data: Geological and Geophysical source data; e.g. borehole information, side scan sonar, sub bottom profiler and multichannel reflection seismic data, dredge samples etc. Today, the geo-seas project ensures harmonization, accessibility and reusability of many such data.

Possible collaboration

- EMODnet: The pilot project successfully produced offshore geological maps of the North Sea region. Now, a tender is out for a follow-up project which will produce Europe-wide maps (geology, geochemistry etc.) through the engagement of 36 European partners.
- Geo-Seas: Project that aims at providing access to distributed geological and geophysical data through a central metadata repository
- ODIP: New project that is focused on standards and best practice for developing a common approach to marine data management. The project is funded in parallel by FP7 in Europe, the NSF in the USA and the Australian government.
- ICORDI: International Collaboration on Research Data Infrastructures.
- ECORD: European Consortium for Ocean Research Drilling.

Thematic Area: Detailed geological maps

Description

- Today the OneGeology-Europe portal serves a pan-European geological map at scale 1: 1 mill. This scale, however, is far too low to be of real use to anyone. Many users request more detailed geological information. EGDI-Scope should analyze the possibilities for production of harmonized geological maps at higher scales. This analysis should take into account legal aspects, use restrictions, the needed level of interoperability, the possible level of interoperability etc.

End users

- Policy makers
- Researchers
- Industry

Data needed

- Detailed geological maps

Possible collaboration

- OneGeology-Europe+
- All surveys need to work together

Thematic Area: Potential CO_2 storage sites (onshore and offshore)

Description

- Fossil fuels will most likely continue to be used for the foreseeable future and it is therefore imperative that cost-effective solutions are found to establish near zero emission technologies of a high environmental standard. Accordingly, the capture and storage of CO2 associated with cleaner fossil fuel power plants is deemed to be an essential factor for fossil fuels to be part of the sustainable energy scenario. Environmentally safe geological storage of CO2 is a fundamental goal of the CCS Directive. It states that "the purpose of environmentally safe geological storage of CO2 is permanent containment of CO2 in such a way as to prevent and, where this is not possible, eliminate as far as possible negative effects and any risk to the environment and human health"

End users

- Public
- Governments
- EU

Data needed

- Maps showing suitable locations for CO_2 storage

Possible collaboration

- CO_2-STOP

Other Thematic Areas to Consider

- nD (3D, 4D or 5D) geological information onshore and offshore
- Storage of radioactive waste

Conclusions and Next Step

The stakeholder inputs from the workshop contained in this document are very general and rough, but provide a very good starting point for the stakeholder consultation activities of WP2 within the EGDI-Scope project which is planned to be carried out within the next year.

In the coming months, each thematic area will be assessed and relevant stakeholders will be approached in order to produce a more comprehensive analysis. Special emphasis will, in the first phase, be on defining more specific use cases and evaluate the relevance of these use cases for policy makers on a European level. Furthermore, the data needed for each use case will be specified in more detail and dependencies will be examined.

Another stakeholder workshop will be arranged in September 2013, where a second iteration of relevant thematic areas and use cases will be conducted, and a thorough discussion of functional requirements will be an important point on the agenda.

Appendix A: Agenda

09.30 – Registration

10.00 – Opening and introduction to workshop (Rob van der Krogt, Coordinator EGDI-Scope)

10.10 – Welcome Address on behalf of EuroGeoSurveys

10.15 – Introduction to EGDI-Scope (Rob van der Krogt)

10.50 – Stakeholder involvement in EGDI-Scope (Mikael Pedersen, GEUS)

11.05 – Coffee break

11.20 – Role and strategic development of the Geological Surveys in Europe and connection with EGDI-Scope (Luca Demicheli, EuroGeoSurveys)

11.45 – The need for Geological Data – Example from the Raw Materials sector (Slavko Solar, DG ENTR)

12.30 – Lunch

13.30 – Break-out-sessions- (3 Groups: 1. Earth Resources/ 2. GeoHazards/ 3. Environment, climate, water):
- international/European themes and challenges
- availability of geological data and information
- requirements (functional, technical interfaces, legal) for a geological data infrastructure

15.15 – Reporting from break-out-groups

15.45 – Wrap-up of the day and follow-up (Rob van der Krogt)

16.00 – Drinks

Appendix B: List of participants

Name	Country	Organisation
Alan Stevenson		EMODnet
Carlo Cipolloni	Italy	ISPRA
Claudia Delfini	Belgium	EGS
Dana Capova	Czech Republic	CGS
Fernando Pérez Cerdan	Spain	IGME
Francesco Gaetani		GEOSS
François Robida	France	BRGM
George Tudor	Romania	GIR
Geraint Cooksley		Terrafirma
Gerold Diepolder	Germany	BEA
Hazel Napier	United Kingdom	BGS
Helen Glaves		GeoSeas
Isabel Fernandez		EFG
Jan Høst	Norway	NGU
Jasna Sinigoj	Slovenia	GEoZS
Jean-Jacques Serrano	France	BRGM
Jérôme Béquignon		ESA
Jørgen Tulstrup	Denmark	GEUS
Katy Lee	United Kingdom	BGS
Kostas Laskaridis	Greece	IGME
Luca Demicheli	Belgium	EGS

Name	Country	Organisation
Ludovit Kucharic	Slovak Republic	SGUDS
Marlies Schijf	The Netherlands	TNO
Martin Schiegel	Austria	GBA
Massimo Cocco		EPOS
Mikael Pedersen	Denmark	GEUS
Milan Grohol		European Commission – DG ENTR
Patrick Wall	Belgium	EGS
Peter Britze	Denmark	GEUS
Pierre-Yves Declercq	Belgium	GSB
Rainer Baritz	Germany	BGR
Rob van der Krogt	The Netherlands	TNO
Ruth Allington		EFG
Sarah Gerin		Insurance Europe
Slavko Solar		European Commission – DG ENTR
Waldemar Gogolek	Poland	PGI-NRI