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

Functional User Requirements and Use Cases

Project Number:	312845
Project Acronym:	EGDI-Scope
Call (part) identifier:	FP7-Infrastructures-2012-1
Founding scheme:	Coordination and support action
Deliverable number:	D-2.3
Dissemination level:	Internal and External
Partners:	EGS, TNO, BRGM, BGS, GEUS
Start month:	7
End month:	12
Author(s)	Mikael Pedersen (GEUS)
Checked by:	Jørgen Tulstrup (GEUS)
Approved by:	Rob van der Krogt (Coordinator, TNO)

TABLE OF CONTENTS

Overview of WP2

The overall aim of Work Package 2 is to assess the requirements of end users and other stakeholders 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

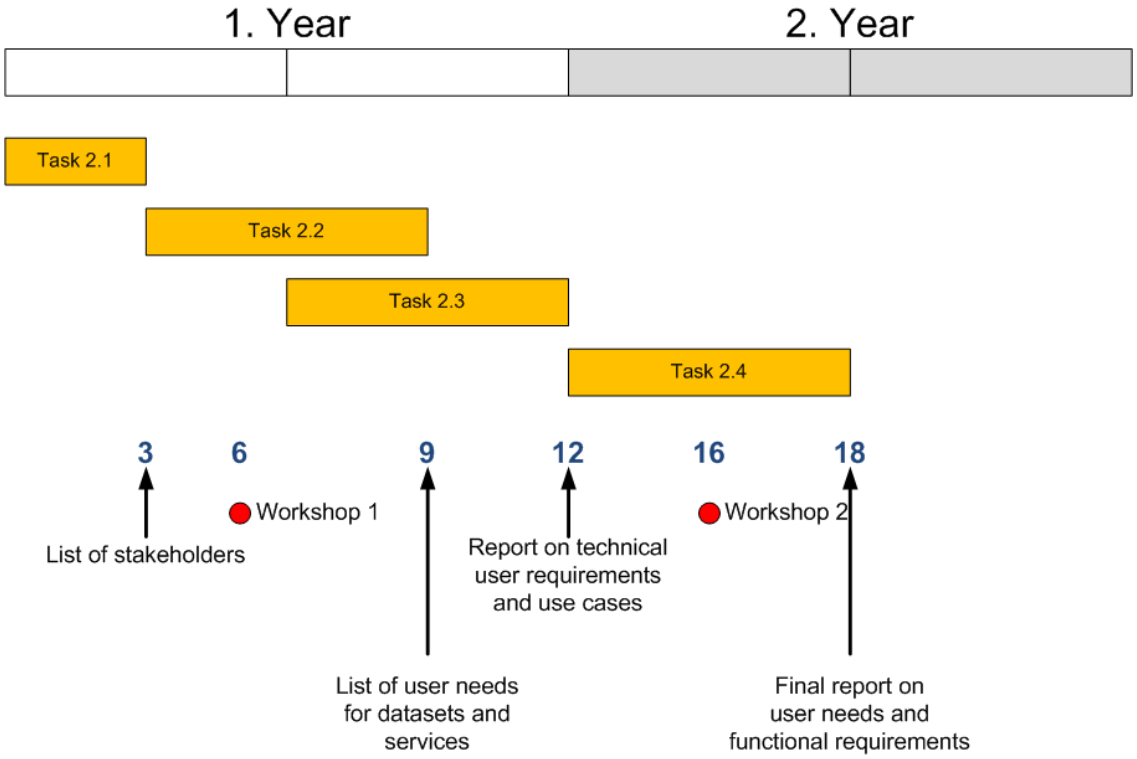
2.2 Stakeholder consultation

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 the 31th of October 2012, and D2.2 (user needs for dataset and services) was delivered the 30th of April 2013.

This document represents D2.3 (technical requirements and use cases), which is an outcome of Task 2.2 (Stakeholder Consultation) and Task 2.3 (Specification of functional requirements and use cases).



Methodology

The general approach used in work package 2 was described in D2.2. In summary, an important aspect of WP2 has been to identify stakeholders, but also to analyse the general user scenario in order to be able to target the various user groups in the most convenient way.

User and Stakeholder Categories

As defined in D2.2, four general types of users/stakeholders are distinguished. Each of these can be subdivided according to the sector they represent. For the purpose of overall system design, the general categories are the most useful, whereas subdivision of end users, and the more fine-grained requirements imposed by each of these groups will be more dealt with for each of the selected use cases.

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. As also mentioned in D2.2, 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.

Assessment of requirements

The input for the analysis on functional requirements has mainly been the reports from the break-sessions of the stakeholder workshop held on the 14th November 2012 and a questionnaire survey conducted in the

spring of 2013. Parts of the result of the questionnaire action were reported in D2.2, whereas this report analyse in more detail the responses to the questionnaire section on “geological online services”. The eight questions in this section, were formulated in order survey the stakeholder’s experiences with already existing data portals as a way to indirectly get a picture of the functionality that is needed. The eight questions are as follows;

1. Do you know any European data portals (specify which)?
   (*list of portals provided in the back of the questionnaire*)
2. Do you use any European data portals (specify which)?
3. What portals are good in terms of data content, and why?
4. What portals are good in terms of functionality, and why?
5. What portals are not good, and why?
6. Are you familiar with any non-European data portals (national, international etc.)? Please specify which.
7. Are any of these good?
8. Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?

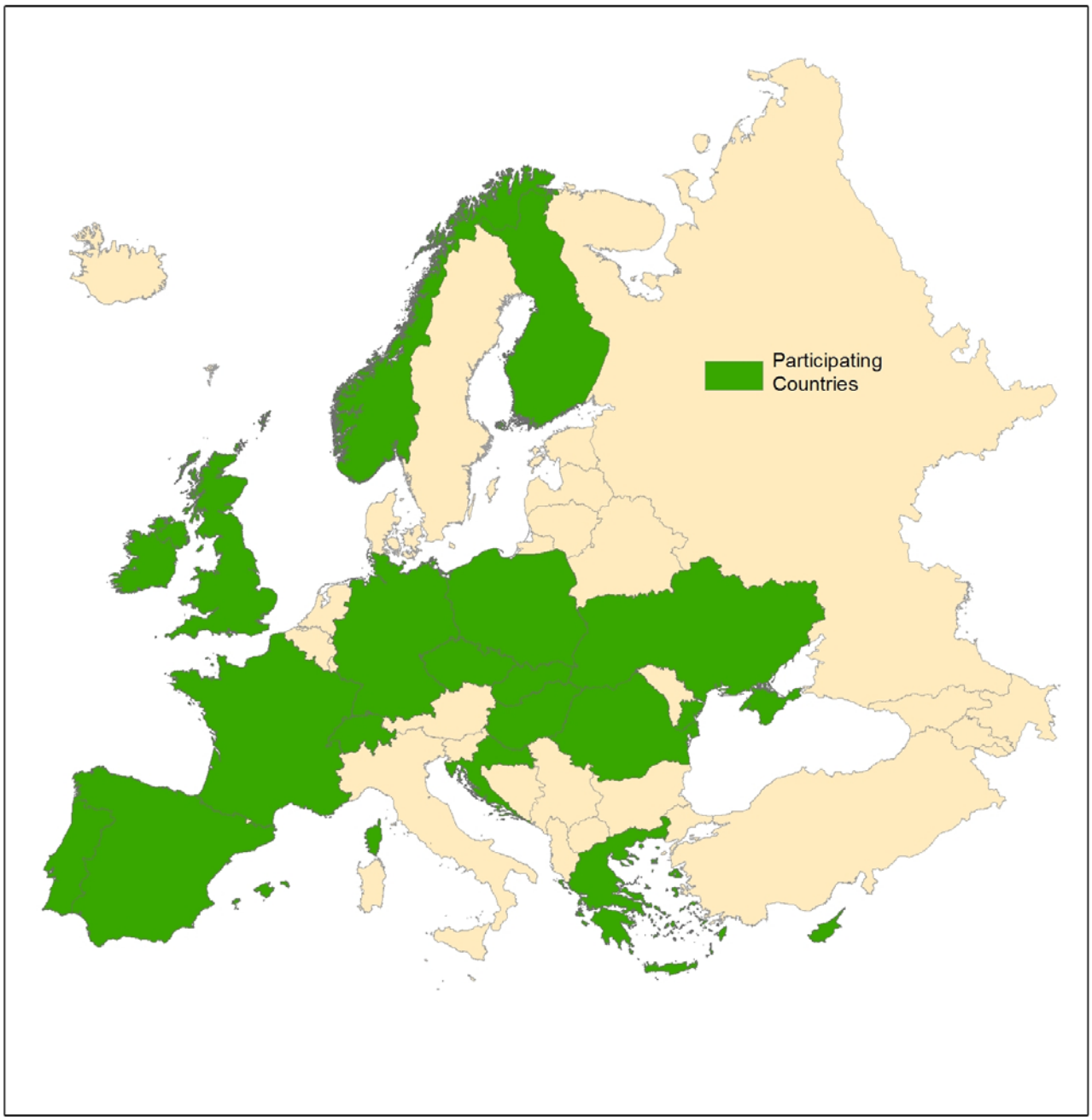
A total of 30 questionnaire responses were received. 20 of these were included as an appendix to D2.2, but since then ten more filled questionnaires have been received. A compilation of all 30 questionnaires are included as a separate annex to this deliverable.

The following section analyses the information provided by the questionnaires.

Result of questionnaire survey

Introduction

A total of 30 filled questionnaires were received. Of these seven are from private companies and 20 from public institutions. Figure 1 illustrates the geographical distribution of the participating stakeholders.



Question 1: Do you know any European data portals?

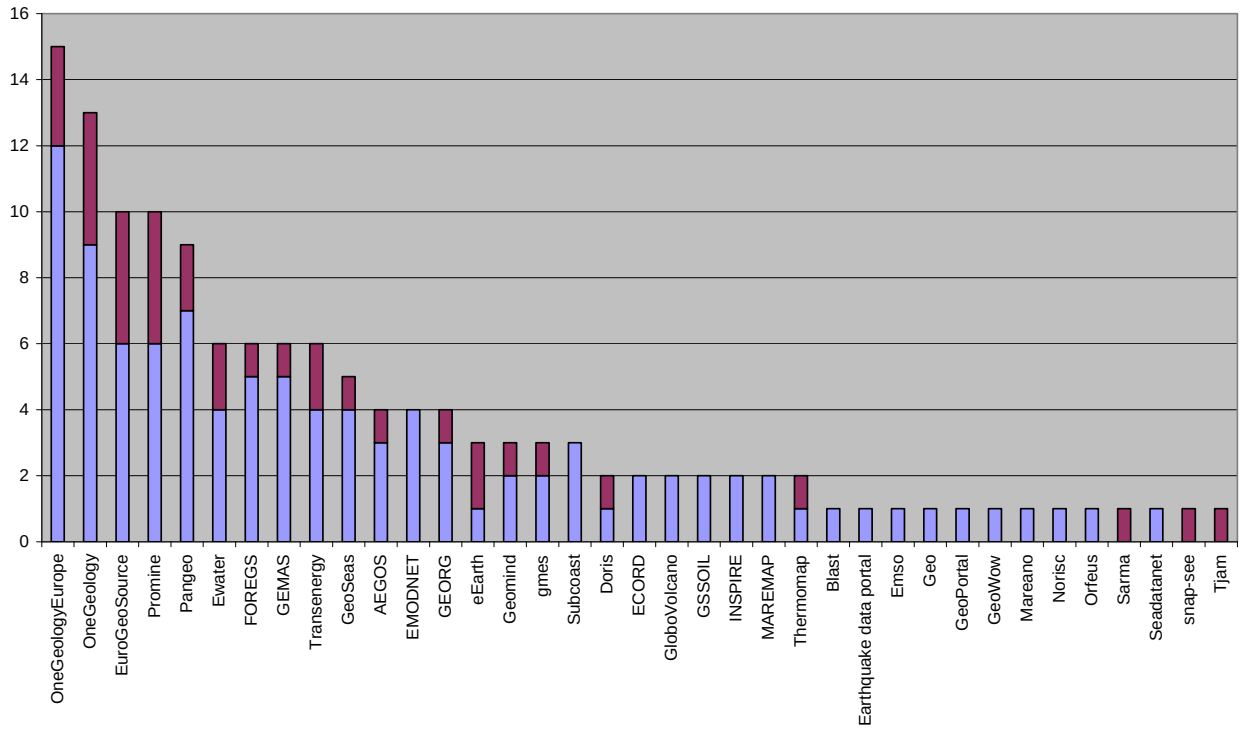
The purpose of this question is to get a general picture of how aware the different users are of the various European data portals. The question was accompanied by a list of 33 data portals, which was included as an appendix to the questionnaire. In the list, both the OneGeology and OneGeologyEurope portals were listed as "European" portals, even though it is not entirely correct to consider OneGeology as a European portal since it covers the entire world. In the following, however, both portals will be considered together.

The diagram below depicts the number of times the various portals have been mentioned in the questionnaire. Red columns represent private companies and blue represent public institutions.

It is clear that the OneGeology and the OneGeologyEurope portals are the most known portals in Europe. This is most likely due to the massive branding of the OneGeology initiatives as well as the fact that the most European countries have participated in the two projects.

On the list, the OneGeology portals are succeeded by EuroGeoSource, Promine and PanGeo – all recent projects with many participants.

It is worth mentioning, that almost all listed portals have been mentioned as "known", and that even a few additional portals were mentioned by the participating stakeholders.

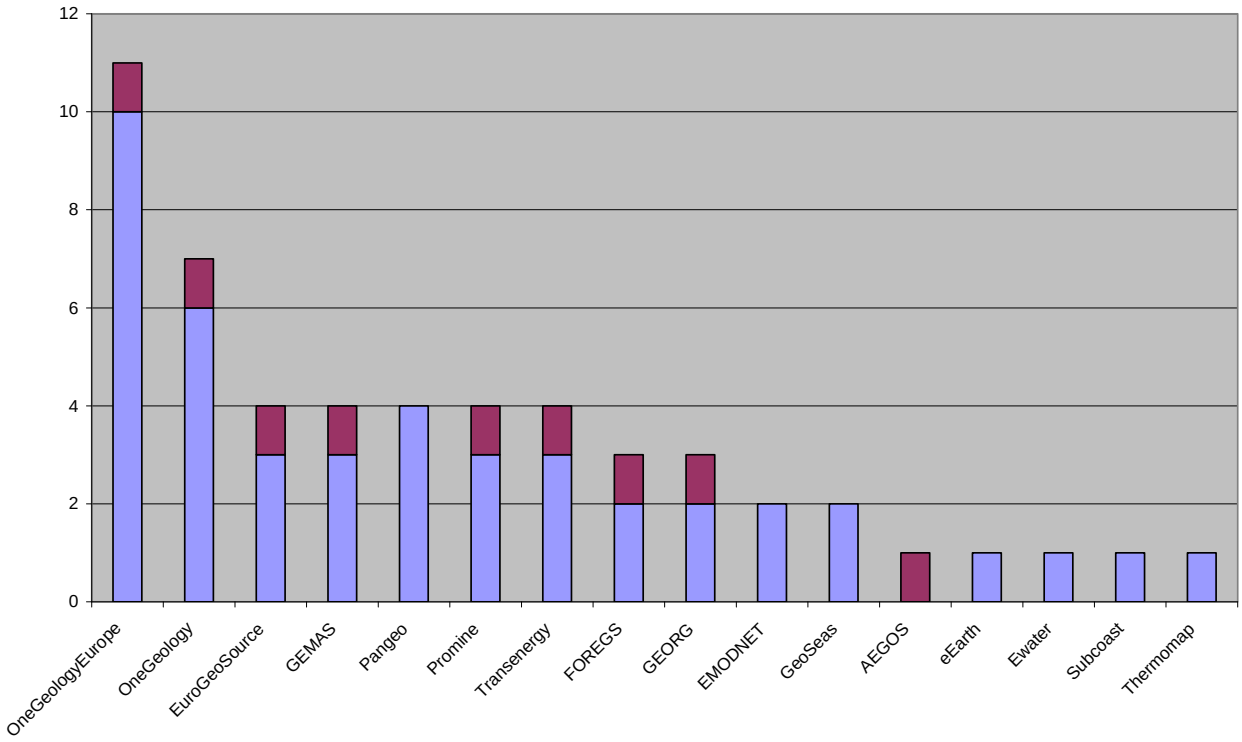


Question 2: Do you use any European Data Portals

The diagram below shows the distribution of answers to this question. Not surprisingly, a considerable lower number of portals are used than actually known.

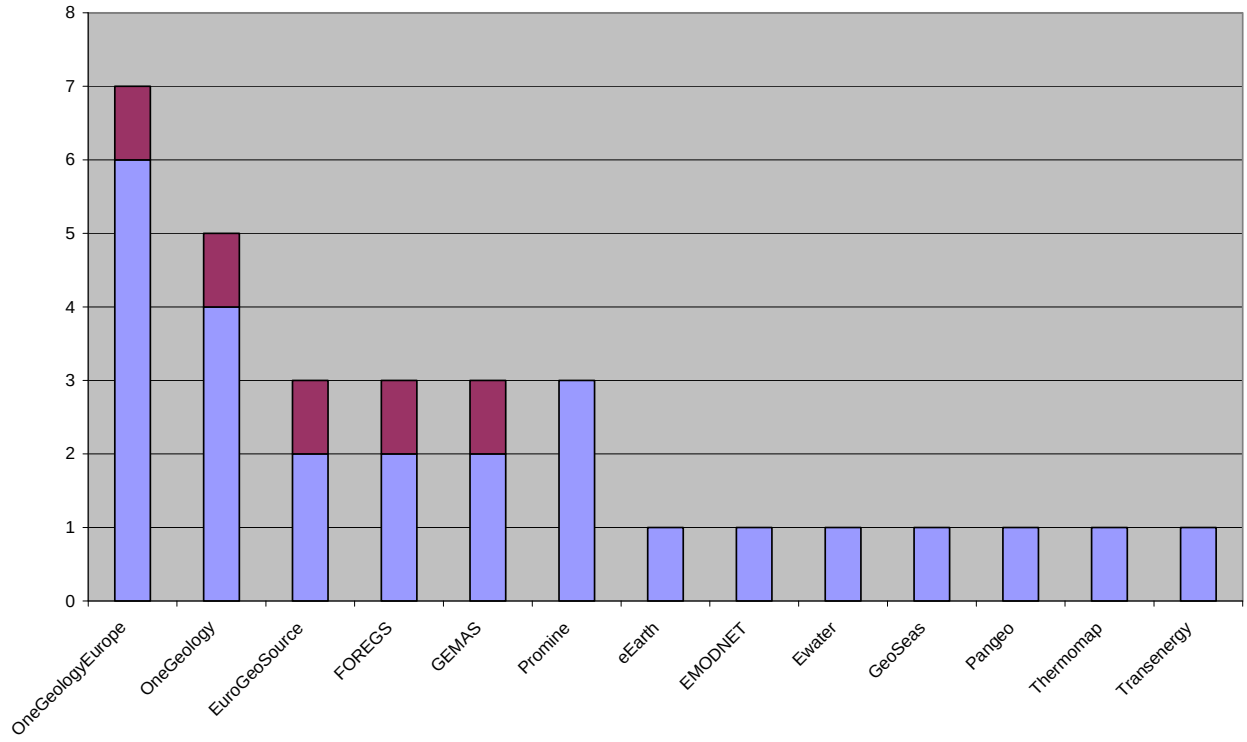
As for question 1, the OneGeologyEurope and OneGeology portals top the list. Interestingly, the OneGeologyEurope portal is considerably more used than the OneGeology portal. This is probably due to the fact that European companies and institutions have a bigger need for European geological information rather than geological maps from non-European countries. Another factor could be that the geological information on the OneGeologyEurope portal is harmonised and that the complete, harmonised dataset is a product, which cannot be obtained in that scale (1: 1 mil.) by any other means. Another widely used geological map of the entire Europe has a scale of 1: 10 mil. for comparison.

Following the OneGeology portals on the list of most used portals, are EuroGeoSource (mineral and energy resources in Europe), GEMAS (geochemical atlas of Europe), PanGeo (ground stability information for a number of large cities), Promine (Information on mineral occurrences across Europe) and Transenergy (Geothermal energy portal).



Question 3: What portals are good in terms of data content, and why?

The data portals that the responding stakeholders find the most useable in terms of data content are illustrated in the diagram below. The result indicates that the portals containing geological maps, resources and geochemical data as being considered best in terms of data content. It is noteworthy that portals like PanGeo and Transenergy, which in question 2 were rated as much used, is not considered very good in terms of content. There are no indications in the questionnaire responses as to why.



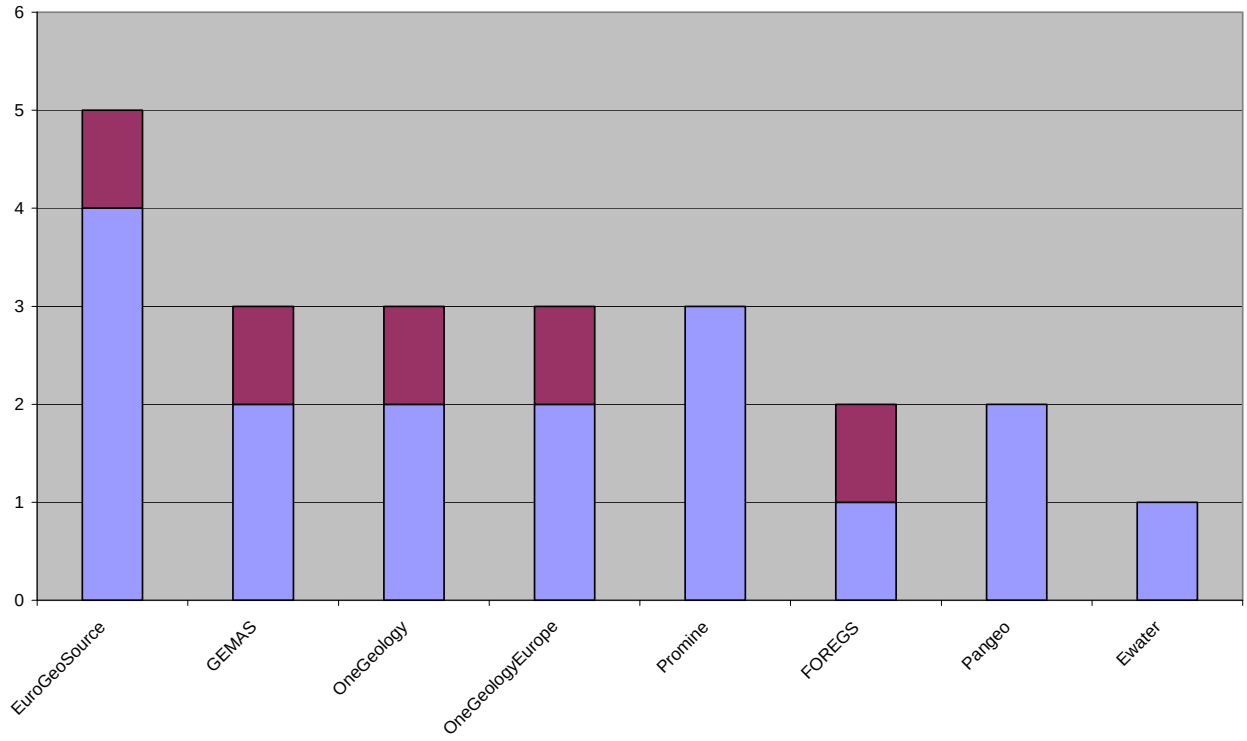
Specific comments

- One user states that Thermomap is a useful tool, but content-wise still covers too shallow ground.
- One user writes that OneGeology and OneGeologyEurope are good for getting global overviews.
- A number of users point to the fact that the harmonised content of OneGeologyEurope is very useful as it allows data queries and development of additional datasets from core geological data.
- One user points to eEarth as a very good portal content wise. However, there are too few providers and the standards and content are outdated.
- One user writes that Geoseas provides a good range of data types of use for marine geoscience research.
- One user states that the information on ore type and resource potential of primary and secondary minerals in the Promine portal allows prognostic evaluation and prediction.

- One user writes that both the OneGeology and JRC portals are good as they are easy to use and serve as collective tools.
- One user states that PanGeo is good because it provides free and consistent data on urban geohazards.
- One user states that he has directly been able to use data from FOREGS and GEMAS in his geochemistry project.

Question 4: What portals are good in terms of functionality, and why?

The answers received to this question are illustrated below. Interestingly, the OneGeology-portals do not score high in the question – the EuroGeoSource portal is the best rated.

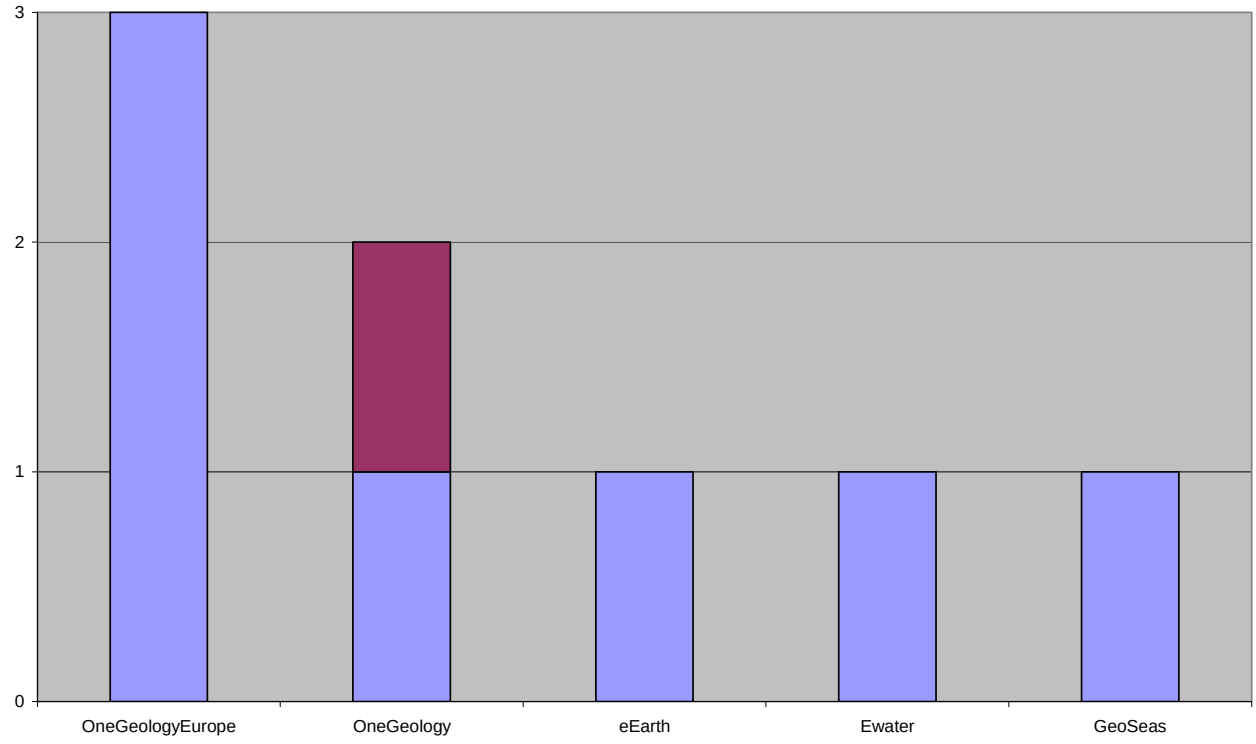


Specific comments

- OneGeology and OneGeologyEurope to get a global and European overview
- Seisonline (http://www.seisonline.bgr.de/karto/SEIS-Online.html) – Easy to view, easy to use, immediate delivery of near-to-real-time earthquake data in Germany
- OneGeologyEurope – multilingual portal, interesting tools like dynamic legend and data filters
- Functionality not important – the real need is to be able to see and download data
- PanGeo – very easy to use and access data
- PanGeo – interrogation and export functions
- PanGeo – clear and easy to use and has direct pass to Google Earth
- Geodata.se – Easy and nice GUI
- FOREGS – easy accessible
- EuroGeoSource and Promine are good for quering

Question 5: What portals are not good, and why?

Consistent with the result in question 4 where the OneGeology and OneGeologyEurope portals scored relatively low in functionality, they are also the two portals that the most users have pointed out as not being very good. One user states that OneGeology is not friendly to use, another that OneGeologyEurope is slow, a third that it is a problem that OneGeologyEurope is browser dependant and a fourth that OneGeologyEurope has too limited functionality.



Specific comments

- One user has a general comment about the difficulty in finding the portals, because no dedicated search engine exits at the moment.
- One user finds that eEarth is poor in terms of functionality because not many countries are involved, and because the technology is outdated. The same user also finds the eWater portal outdated with regard to functionality.
- One user mentions language, accessibility and content (too uniform legend) as bad factors.
- One user writes that the portals that contain only metadata, but no real data are not good.

Question 6 & 7: Are you familiar with any non-European data portals? Are any of these good?

Around the world, a lot of data portals exist. Some of these may be good in terms of functionality. The purpose of this question was to harvest the good experiences of the responding stakeholders in order to gain inspiration for the EGDI. Below is a list of non-European data portals that people find good:

- BSS from BRGM (is OK)
- The Geological and Mining Institute of Spain
- An extensive list from Greece…
- Geothermal portals of German state geological surveys (list attached)
- USGS[1] (Exceptional, Really good search function, clear access possibilities, update guarantie)
- ESRI
- USGS EROS and UN Data (unambiguous links and data can be easily selected)
- Mrdata.usgs (very good and easy to use)
- Geological Survey of Ireland data portals
- BGS geotechnical portal
- IFFI
- Irish EPA
- IUGS
- Map.geo.admin.ch
- www.geologieportal.ch
- GeoMapApp
- http://www.geoportal.gov.pl/
- Irish Marine Institute
- Irish Spatial Data Exchange (www.isde.ie)

[1] The USGS portal has been mentioned as very good by five different stakeholders.

Question 8: Which functionality would be the most useful for you in a future European Geological Data Infrastructure?

The reason for this question was to get a good overview of the most important functional requirements for EGDI. The responses are

Functional requirements

- Good search engine
- On-line overlay/combination of data
- Immediate hazard information
- Metadata search
- Simple quick map viewer
- Ability to search via a map (zoom scroll) and location for data
- Ability to download datasets from within a specified geographic extent
- Filter data
- Export data
- Easy downloadable data
- Download in readily consumable formats
- Functionality respecting local (regional/national) data structure and language and both its English translation, non-uniform data description
- Web links to national data web sites (rather than dublicating on a European level)
- One portal where data can be searched, viewed, queried and downloaded
- 3D functionality
- WMS, WFS, WCS and WCPS
- Possibility to display information about data owner and availability

Non-functional requirements

- Availability of recent data
- Data storage and retrieval should be straightforward and quick
- Standard portrayal rules
- Access and download conditions
- Harmonisation and interoperability
- Free access to open data, followed by INSPIRE metadata
- Really good search function, clear access possibilities, update guarantie
- Harmonised, researchable data
- Easily accessible harmonised and interoperable data
- Robust huge data clouds
- Interpreted layers from remote sensing (high density imagery)
- Availability of geological maps

- Mineral data, thematic maps, market figures, pdf reports, 3D modelling pdfs and those anticipated in the Minerals4EU project

Speed operation, effective search of information

Use Cases

Introduction

Four use cases were selected by the EGDI-Scope project consortium for the purpose of study in details the user needs and other conditions of relevance for the implementation of a future EGDI. The use cases were deliberately chosen to represent different policy areas and different stakeholder groups, and are as follows;

1. Geohazards – Ground Instability in densely populated areas
2. Raw Materials - Rare Earth Element potential within the European Union
3. Renewable Energy – Planning for offshore Wind Farms
4. Environment (biodiversity) – Ecosystem mapping and assessment

The use cases are focussed around some case studies that have been structured to

- Describe the use situation and how geological data are used
- Assess the user requirements for data and functionality
- Assess the availability of geological datasets to fulfil the requirements (together with WP3)
- Study the dependencies towards previous and ongoing projects
- Demonstrate interfaces to other e-Infrastructures
- Assess legal, licensing and governance aspects together with WP5
- Studying issues of relevance for the EGDI architecture (together with WP4)
- Study issues of relevance for the implementation of EGDI and conversion of existing datasets.

The development of the use cases have been conducted in close cooperation with relevant stakeholders, through stakeholder meetings and email correspondence.

The use cases will be “living documents” that will be improved until the last WP2 deliverable in Moth 18. At time of writing, each use case has addressed a number of unsolved issues, and it is the plan that many of these issues should be discussed during the second stakeholder workshop, which takes place in Malta on 10th September. Subsequently, the use cases will be updated, and should in the end contain answers and recommendations that will feed directly in to the final implementation plan. Examples of how the current state case studies will be turned in to more traditional use cases to deliver specific requirements are included for the Geohazards and Raw Materials use cases.

Use Case 1: Ground instability in densely populated areas

Introduction

A number of European projects have been dealing with ground stability assessments in densely populated areas. These include TerraFirma, PanGeo and SubCoast. The TerraFirma project ends in June 2013, SubCoast in September 2013 and PanGeo in January 2014. Like many other European projects, the sustainability of the data generated within the scope of the projects is an issue. EGDI could potentially be the future, sustainable platform for these data (or a part of them). Therefore, the EGDI-Scope consortium considers how that would work in practice and what aspects should be taken into account in the implementation plan.

The present use case focuses on the PanGeo data, and the purpose is to demonstrate the role of a future European Geological Data Infrastructure (EGDI) in sustaining and further developing the results of the PanGeo project (and thereby indirectly other similar projects like TerraFirma and SubCoast). The use case will importantly elucidate the relationship between *in situ* data and Earth Observations and analyse the collaboration with other infrastructures like EPOS and GEOSS.

Basic information

End user groups: Local authorities, insurance companies and the general public

Overall user need: To evaluate the risk of ground instabilities in densely populated areas of Europe.

Involved stakeholders

- Claire Roberts (NPA Satellite mapping (a CGG company), Coordinator, PanGeo)
- Richard Burren (NPA Satellite mapping (a CGG company)
- Luke Bateson (BGS, WP 3 and 7 leader, PanGeo)
- Francesca Cigna (BGS)
- Peter Roll Jacobsen (PanGeo participant, GEUS)
- Florence Beroud (Project adviser for PanGeo, REA, European Commission)
- Massimo Cocco (Coordinator, EPOS)
- Geraint Cooksley (Coordinator, TerraFirma)
- Rob van der Krogt (Coordinator, SubCoast)

Potential cooperation projects and programmes

- PanGeo
- TerraFirma
- SubCoast
- EPOS

- GEOSS
- ESA

Overview of PanGeo

PanGeo is a service proposed in response to FP7 GMES Downstream Call 3 (released July 2009). The objective of PanGeo is to enable free and open access to geohazard information in support of GMES. This is being achieved by the production of a Geohazard Data Layer supported by a Geohazard Description for 52 of the largest towns listed in the GMES Land Theme's Urban Atlas, and involves all 27 countries of the EU.

Count	Partner #	Survey	LUZ 1	LUZ 2
1	14	Austria	**Salzburg**	**Vienna**
2	15	Belgium	**Brussels**	**Liege**
3	16	Bulgaria	**Sofia**	**Varna**
4	17	Cyprus	**Lefkosia**	N/A
5	18	Czech Republic	**Prague**	**Ostrava**
6	19	Denmark	**Copenhagen**	**Aalborg**
7	20	Estonia	**Tallinn**	**Tartu**
8	21	Finland	**Helsinki**	**Turku**
9	5	France	**Lyon**	**Toulouse**
10	22	Germany	**Berlin**	**Hannover**
11	23	Greece	**Athens**	**Larissa**
12	24	Hungary	**Budapest**	**Miskolc**
13	25	Ireland	**Cork**	**Dublin**
14	26	Italy	**Palermo**	**Rome**
15	27	Latvia	**Riga**	**Liepaja**
16	28	Lithuania	**Vilnius**	**Kaunas**
17	29	Luxembourg	**Luxembourg**	N/A
18	30	Malta	**Valetta**	**Gozo**

Count	Partner #	Survey	LUZ 1	LUZ 2
19	4	Netherlands	**Amsterdam**	**Rotterdam**
20	31	Poland	**Warsaw**	**Nowy Sacz**
21	32	Portugal	**Lisbon**	**Faro**
22	33	Romania	**Bucurest**	**Cluj-Napoca**
23	34	Slovakia	**Kosice**	**Presov**
24	35	Slovenia	**Ljubljana**	**Maribor**
25	36	Spain	**Zaragoza**	**Murcia**
26	37	Sweden	**Stockholm**	**Göteborg**
27	2	UK	**Stoke**	**London**

Existing Terrafirma results

Table 1: Confirmed towns for PanGeo processing. Green cells from Terrafirma. White cells indicate new PSI processing

PanGeo data and products

An important part of the PanGeo project has been the development of a manual[2] that describes how to develop and deliver ground stability information through the PanGeo portal. This thorough description facilitates the generation of geohazard datasets that fulfil a common set of standards and therefore are directly comparable across Europe.

The ground stability information is generated by geologists in the participating geological surveys and is based on a combination of PSI data, geological data and auxiliary data. The PSI data originates in ESA, but have been processed and delivered in "PSI Packs" to the survey representatives by PSI providers (FUGRO (now CGG) NPA LIMITED, Tele-Rilevamento Europa, GAMMA REMOTE SENSING RESEARCH AND CONSULTING AG and ALTAMIRA INFORMATION SL). Based on the interpretation of PSI derived average annual displacement rates, and associated ground motion time series data, and/or geological data, in situ observations and other deformation measurements a number of ground instability polygons are digitized in

[2] PanGeo deliverable 3.5 – Production Manual.

a GIS environment around the areas that display the highest degree of subsidence or upheaval. Evaluation of the cause of ground motion is assessed for each of these polygons based on a combination of high resolution geological information (geological maps, superficial deposit maps, measurements of active faulting and neotectonics, mass movement information etc.) and auxiliary information including data on land use, historic land use, digital terrain models, indirect evidences from building damages etc.

The geohazard information is then classified according to a set list of values and the polygons are attributed with this as well as supplementary information according to some standards outlined in the production manual.

A geohazard description report is written for the city, and the polygons and report are subsequently quality assured by BGS. The resulting information is made available via the PanGeo web page, where it can be downloaded in a variety of formats (PDF, shp, kmz). It is also made available by the responsible survey as an INSPIRE compliant WMS and WFS service accessible via the PanGeo portal.

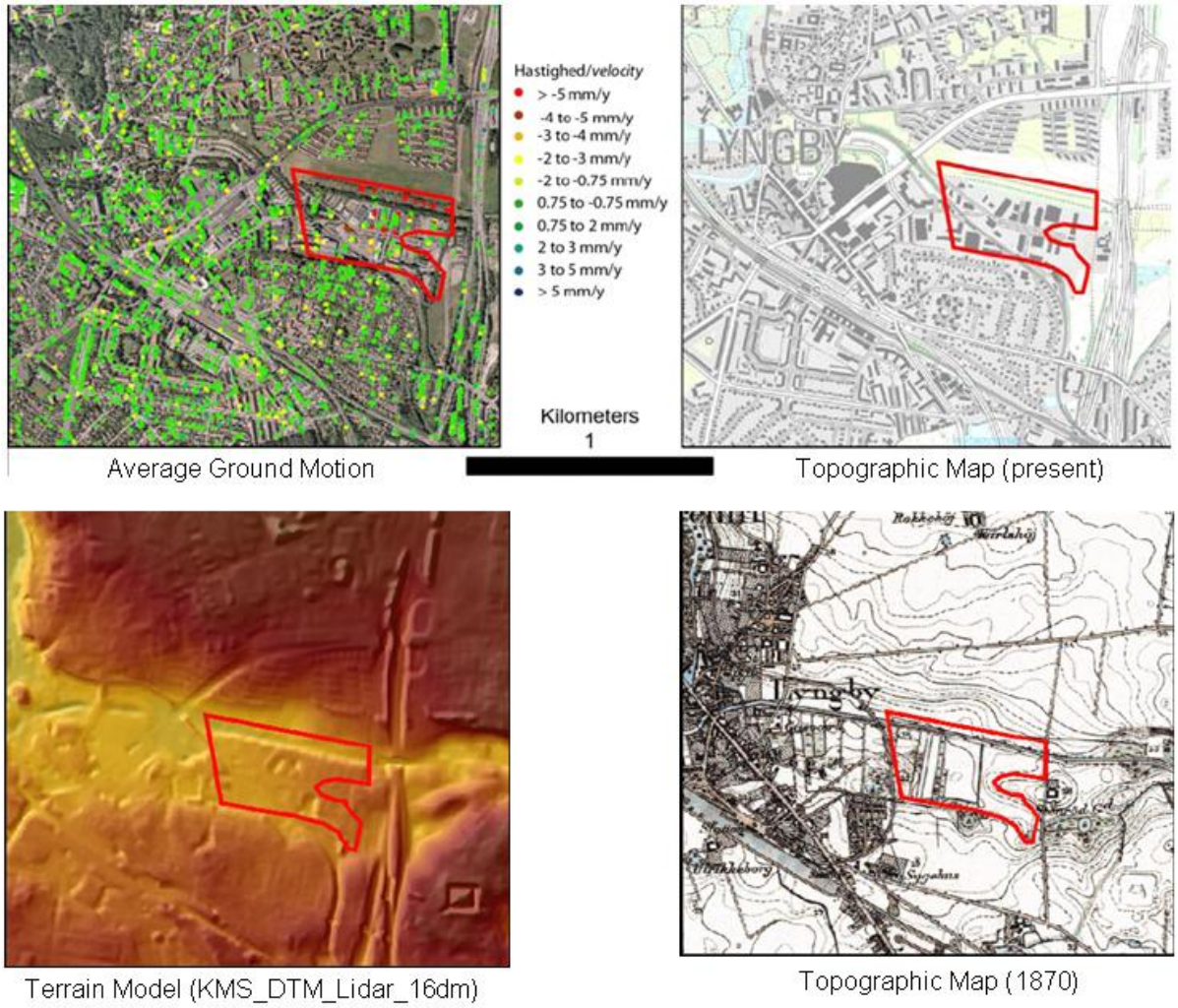


Figure 1. Illustration of the data involved in classifying an area of subsidence (Copenhagen in this case). In this case, the geohazard has been classified as follows: Hazard category: Man Made (Anthropogenic) Ground Instability. Hazard Type: Made Ground.

The ground stability polygons are included in a web portal, where they can be viewed on top of a topographic map or in combination with information from the Urban Atlas. The portal builds on OneGeologyEurope technology and is hosted by BRGM. In line with the INSPIRE specifications and the OneGeologyEurope architecture, the polygons themselves are served as WMS'es by the geological surveys.

The PanGeo homepage also provides the possibility for viewing the ground stability polygon in Google Earth. This facility, however, is not based on a distributed service architecture, but pulls the polygons directly out of the central database hosted by NPA. This is also the situation for the downloadable data.

PanGeo Data Policy

All products generated by the PanGeo project (ground stability polygons and geohazard descriptions) are made available free of charge. Some conditions relate to the use of the data, these can be found in the PanGEo user license: http://www.pangeoproject.eu/eng/pangeo_user_licence.

The PSI data, processed specifically for the PanGeo project, used to generate the geohazard information, however, will not be made available, as these are legally owned by the PSI provider and considered commercial products. However, PSI data for 27 out of the 54 cities comprised by PanGeo were already processed within the TerraFirma project and are not subject to these restrictions. The TerraFirma project has not made publically available any data, but ESA has recently funded a TerraFirma Legacy project with the purpose of making the TerraFirma data freely available. This includes 100 PSI dataset for large European cities, 27 of which are included in the PanGeo project. The Terrafirma Legacy project intends to make all 100 PSI datasets available as view-datasets (basically bitmaps) through OneGeologyEurope as a non-distributed dataset, the portal will offer very little functionality due to the limitations of the portal. However the portal will allow users to download the full PSI dataset for use in their own GIS.

PanGeo sustainability model

NPA is committed to maintain the PanGeo database and PanGeo webpage. BRGM is committed to maintain the PanGeo map portal.

Towards the end of the PanGeo project, a model for sustaining the system, including adding new cities is developed. The model will probably involve signing of a MoU between NPA (system owner), BGS (QC of new information) and BRGM (hosting the 1GE portal) and the PSI providers. If a new city would like to have a ground stability assessment performed after the end of the PanGeo project, they should contact NPA, who will direct them to the national geological survey of the country in question. PSI data will be processed and acquired through a PSI provider on a turn-by-turn basis, and the assessment will be performed by the geological survey. The final product will be validated by BGS and delivered to NPA for inclusion in the database. Finally, the ground stability polygons will be set up as a WMS by the geological survey and registered in the PanGeo map portal by BGRM. There will be developed an income sharing model for this future scenario.

PanGeo stakeholders

The PanGeo project contains a work package which is concerned with obtaining stakeholder feedback. A Local Authority Feedback Group (LAFG) has been established, which consists of six local authorities (Toulouse, Faro, Rome, Ljubiana, Gotherburg).

EGDI-Scope aspects

This section evaluates special aspects of relevance for EGDI-Scope. This includes issues regarding which data should be "imported" to EGDI, which data should be exchanged with other systems, what is the status of the available data, are there any special functional requirements to EGDI coming out of this use case, possible exploitation models etc.

The diagram below illustrates the conceptual understanding of the information flow between geological experts and various users in a potential future use scenario. The ultimate end user group is decision makers in local authorities. These, however, communicate with the geological community through departments of physical/territorial planning and civil protection agencies. In some cases, private consultancy companies might be hired to do risk assessments for the local authorities based on the ground instability information provided by the system.

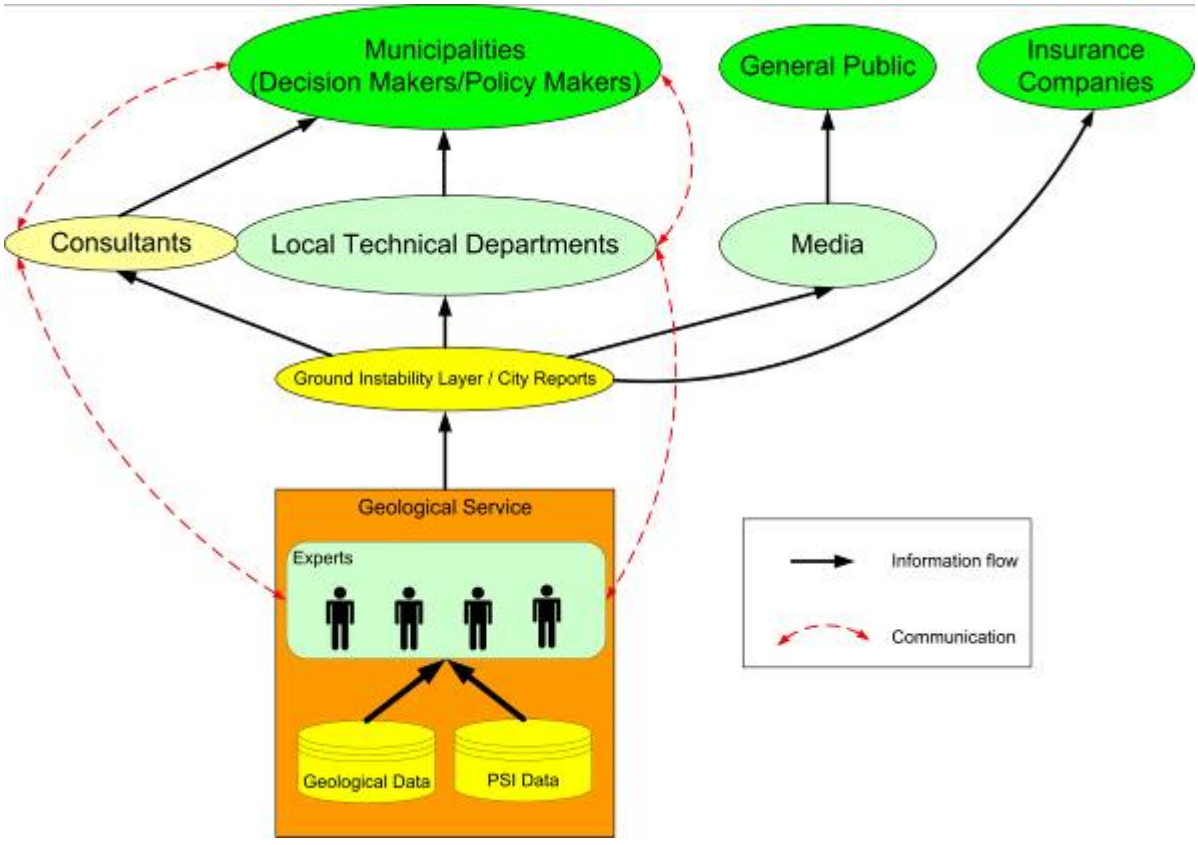


Figure 2. Conceptual model illustrating the flow on information between end users and geological experts.

Examples of the type of information required by end users:

- What is the risk of ground instability in a given area?
- What is the cause of ground instability in a given area?
- What landuse types within a city are affected by ground instability
- What population is affected by ground instability in a city
- Average annual displacement rates
- Ground motion time series

Needs for linked information

- Land use data from the European Commission's Urban Atlas

Required end products

- Interactive and printed maps with ground stability layer on top
- Geohazard descriptions for the areas involved

Required functionality

- Geohazard and demographic information for ground stability polygons (click-info).
- Display of PSI data:
    - Average annual velocities
    - Cumulative displacements
- GIS Inquiry tools such as the visualisation of ground motion time series for individual PSI points (click-info, click a point and visualise a graph of movement in time). Inspiration could be gained by looking at the Italian data portal "Geoportale Nazionale", maintained by the Ministry of Environment, and containing PSI data with time series for the entire Italy (www.pcn.minambiente.it/viewer).Download of geohazard descriptions
- WMS/WFS
- Visualisation in Google Earth

Available datasets (type and geographical relevance)

The PanGeo project has developed a ground stability GIS layer and a geohazard description report for a number of cities around Europe. The coverage is shown on the map below where green flags represent datasets that are complete (May 2013), whereas red flags represent datasets that are in progress. The target scale of the datasets is 1: 10 000.

Figure 3. Distribution of cities included in the PanGeo project**.**

Legal and licensing aspects including use limitations and potential pricing policies

The PanGeo sustainability model was described above. From an EGDI perspective, it could be relevant to consider having a clause in the MoU stating that if the OneGeologyEurope portal is merged with a future EGDI, the role of BRGM in the MoU should potentially be replaced by the body who will be maintaining the EGDI in the future.

Interoperability protocols/aspects

The geohazard polygons are at the moment visualised in the PanGeo map portal using a distributed architecture of OGC services. This is in line with INSPIRE. However, there seem to be no ISO 1911x metadata associated with the distributed datasets.

The polygons are attributed using a standard developed in PanGeo. The PanGeo data should be compliant with the Natural Risk Zones INSPIRE specifications.

Plan for integration of data into the EGDI

The PanGeo ground stability polygons are already now published through OneGeologyEurope and will probably automatically be inherited when/if OneGeologyEurope merges with EGDI.

PSI data for 27 of the 52 cities will also be made freely available through OneGeologyEurope and should also automatically be inherited by a potential future EGDI.

The Terrafirma Legacy project will make the PSI data for the remaining 73 Terrafirma sites available through OneGeologyEurope. However there are no plans to make the PSI data for the remaining 25 PanGeo towns available for free.

In addition to PanGeo and Terrafirma also the SubCoast project, dealing with the assessment of Subsidence hazards in coastal lowlands in Europe, provides an opportunity for integration of ground instability data (from Earth Observation and in situ data sources) in the EGDI. This project will be finalized after September 2013 and introduces the new concept of a so-called 'Dynamic DEM' referring to time dependent digital elevation mapping (at mm-scale), including actual applications in pilot areas.

The Role of EGDI in the global e-Infrastructure landscape

The figure to the right illustrates the various interfaces that EGDI will have to the surroundings in the scope of the ground instability data.

First of all, there will be a need for EGDI to take over the role of the current PanGeo portal, meaning that the PanGeo data should be made available for the targeted end users from EGDI through a web portal.

Furthermore, the PanGeo datasets (the ground stability polygons) should most likely be integrated with the natural risk zone theme of INSPIRE.

Both PSI data and ground stability polygons would be good candidates for integration with EPOS and GEOSS (SBA: Disaster).

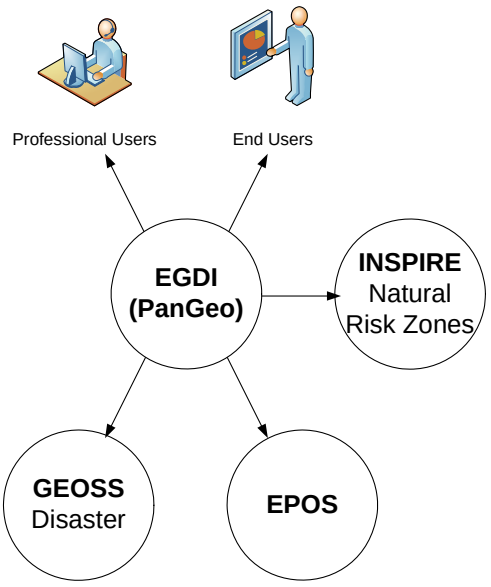


Figure 4. The interfaces between EGDI and surrounding users and infrastructures within the scope of ground stability data.

Tentative future architecture

The two illustrations below show the tentative flow of data for a) a potential future EGDI web portal and b) the EPOS or GEOSS infrastructures. Scenario a is more or less the same as exists in the PanGeo architecture today with the exception that the central repository today is hosted by NPA.

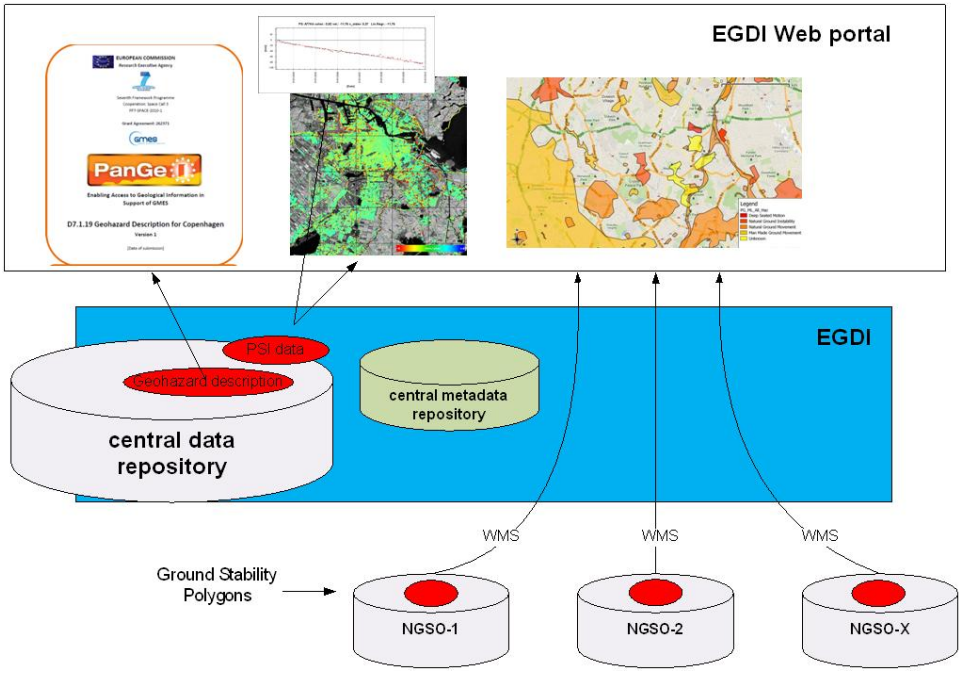


Figure 5. The tentative flow of ground stability data in a future EGDI web portal scenario.

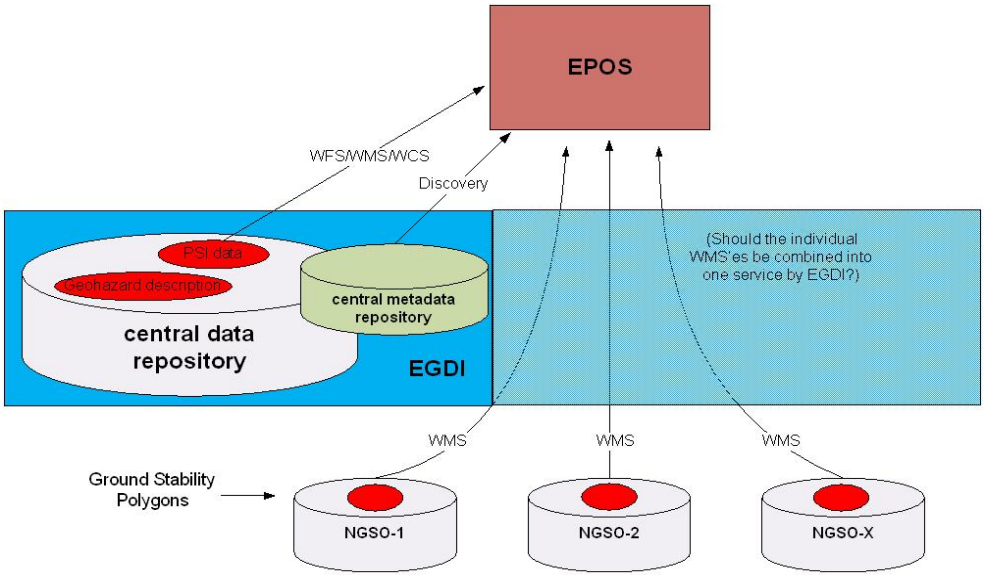
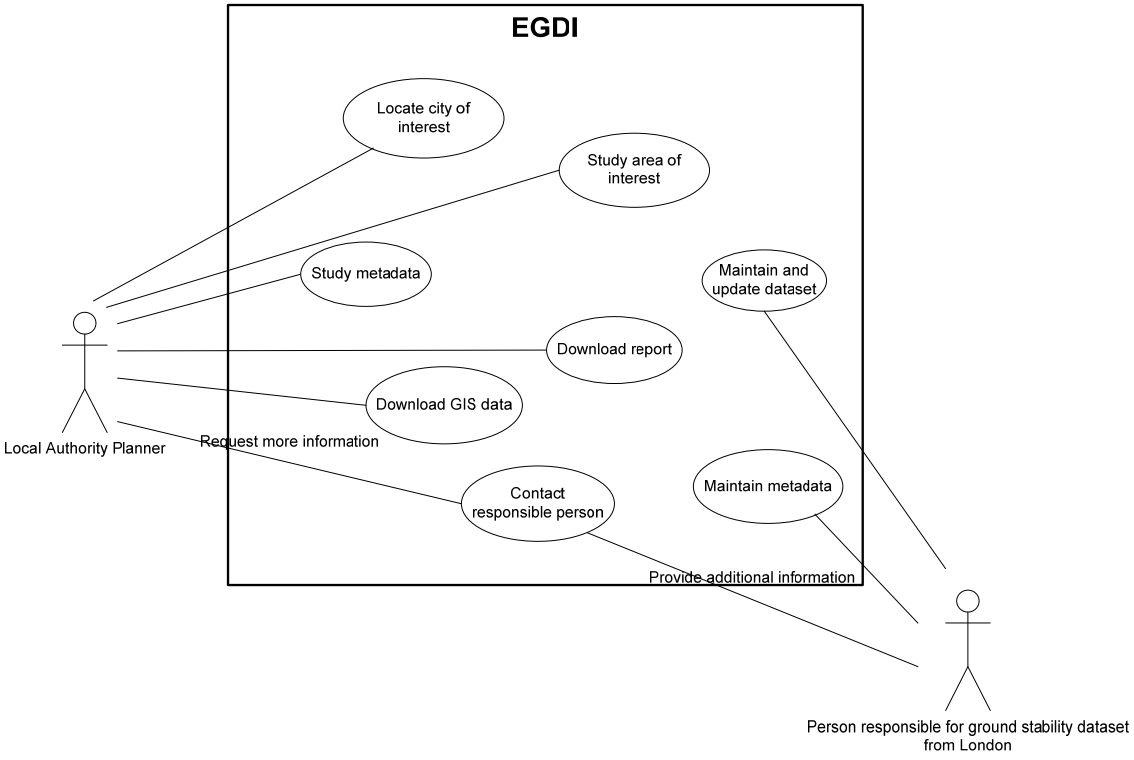


Figure 6. The potential flow of data between a future EGDI and other data infrastructures like EPOS.

Use Case Diagram



Flow of Events

1. A local authority planner (L.A.) in London wants to know if a certain area of the city is prone to subsidence.
2. L.A. searches the Internet for “subsidence London”.
3. In the top of the list of results, L.A. finds a link to EGDI.
4. L.A. clicks the link and opens the EGDI data portal with the PanGeo subsidence layer switched on.
    a. Option a) EGDI displays a map of Europe with symbols at the location of all cities where subsidence data exist. Clicking a symbol will make the map zoom in to the extent of the chosen city and the ground stability polygons will be made visible.
    b. Option b) The link from the Internet search engine will automatically take the user to a zoom of the city searched for on the Internet.
5. L.A. zooms in on the area of interest and inspects whether there is registered observed or potential subsidence (indicated by a ground stability polygon).
6. If yes, L.A. clicks on the polygon an read the interpreted causes of ground instability.

7. L.A. turns on the PSI data layer and studies the average rate of subsidence in measuring points in the area of interest (colour coded according to accompanying legend)
8. L.A. clicks a series of the data points to see time series of the ground motion
9. L.A. inspects when the dataset was last updated and by whom
10. L.A. clicks a link to the geohazard report of London and downloads the report.
11. L.A. downloads the ground stability layer for London as an ArcGIS project
12. L.A. contacts the person responsible for the dataset and asks for elaborated information

Requirements from this use case

Requirements for EGDI datasets

- Ground stability polygons (from PanGeo)
- PSI data
  - Imagery
  - Time series
- Metadata (including up-to-date information about contact point for dataset)

Requirements for EGDI-linked datasets/services

- Urban Atlas

Non-functional requirements

- It should be possible to find EGDI on the Internet by searching for e.g. “subsidence <city name>”

Requirements for functionality

- City search (potentially externally controlled in case of event 4b)
- Zoom-dependent display (event 4a)
- Zoom and pan
- Click-info
- Display of legend on top of map
- Time series display (graphs)
- Easy access to metadata about the displayed dataset
- Download of reports associated with dataset
- Download of ArcGIS projects (geometry and legends)

Use Case 2: Rare Earth Element Potential within the European Union

Introduction

In various communication papers, the European Parliament and the European Commission has suggested insufficient cooperation between the national geological surveys in Europe and requested increased collaboration and increased use of common standards and practices in order to facilitate the exchange and exploitation of available geological data to serve international and European policy development. Such statements have been made especially in relation to various Raw Materials reports. It is therefore a priority of the EGDI-Scope project to analyse in what way a future European Geological Data Infrastructure (EGDI) would be able to support the needs of the EU in this area. One mean to achieve this goal is by the use of a specific use case relating to a group of critical raw materials, the Rare Earth Elements (REE). China today controls about 95 % of the world's REE production, making the sustainable supply of these elements for European industry highly vulnerable. In an FP7 call, the European Commission addressed this issue, and subsequently awarded 9 million Euro for the EURare project which was initiated in February 2013. The present use case connects closely to this project, and to another new FP7 project – Mineals4EU – which deals more generally with mineral occurrence information across Europe.

Basic use case information

End user group: Policy makers within the EU as well as private companies, academia and the public.

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

Consulted stakeholders

- Milan Grohol DG ENTR
- Slavko Solar DG ENTR
- Nikolaos Arvantidis, Chair of Mineral Ressorces Expert Group (EGS)
- Andrew Bloodworth, Science Director for Minerals and Waste, BGS
- Joseph Mankelow, Team Leader – Mineral Resources and Policy, BGS
- Teresa Brown, Mineral Statistic, BGS
- Per Kalvig, Head of Center for Mineral Resources and Materials, GEUS

Potential cooperation projects

- EuroGeoSource
- ProMine
- EURARE
- Minerals4EU

- EIP-RM – WP3
- MINVentory

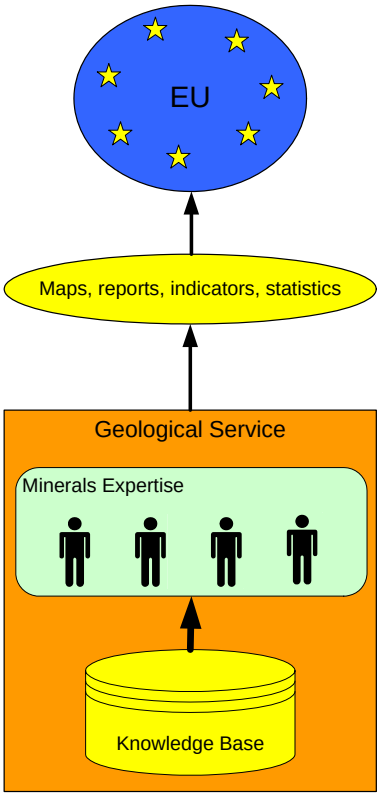
Important papers

- 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

General Considerations

From the perspective of EGDI-Scope, the concrete ideas behind the European Commission's need for a "geological service" are important since they influence the user categories that should be addressed within this study, and consequently the data content, architecture and governance model of a future EGDI. A part of the analysis leading to the description of the present use case, therefore, has been to discuss this aspect with relevant stakeholders. The outcome is a simple, conceptual model shown to in Figure 1, which can be described as follows;

- The European Commission needs a single point of access to geological knowledge from the geological surveys – i.e. a "geological service"
- The European Commission's expectations of a "geological service" is, that it should consist of geological expertise utilizing harmonized geological information. The source of this information is referred to by the Commission as the geological "knowledge base", and the EGDI could very well play the role of the knowledge base in the future.
- The European Commission will not necessarily need direct access to the EGDI, but will require various derived and interpreted products such as maps and statistics which will be compiled by the minerals experts from information in the geological knowledge base as well as from other sources (e.g. reserves estimates from industry etc.).



The consequence of this simplified model is that there are basically two general user groups that should be dealt with in the current use case;

1. End users: For example European politicians basing policy on the derived products coming out of the “Geological Service” and, hence, will only put indirect requirements on the content and functionality of the “Knowledge Base”. Other end users could be the general public or private companies.

2. Professional users: These will be the people that utilize harmonized geological information in the “Knowledge Base”. Many such users will be geological experts from within the national geological surveys. Minerals4EU is a project proposed in response to an FP7 call. This call mentions the establishment of a “permanent network”. This network is probably to be considered both future users and future suppliers of raw material information in the “Knowledge Base”.

   Other users could be mining or finance companies, other geological scientists or scientist from non-geological domains that utilize geological data together with other information to produce combined products or make multi-disciplinary assessments. The professional users are very important for the current use case, as they pose direct requirements on the content and functionality of the “Knowledge Base”, and thereby a potential future EGDI.

EGDI-Scope aspects

Examples of the type of information required by the European Commission

	Potentially to be answered by EGDI?
Where do REE as such occur within Europe?	Yes
Where do individual rare earth elements (HREE, LREE and individual elements) occur?	Yes
What are the grades, composition and tonnages of individual REE occurrences?	No
What are the main REE-bearing minerals in the occurrences?	Yes
What is the U content of the occurrences?	Yes
What is the geology of an occurrence (age, host rock, host rock age, terrain, type, genesis, etc.)?	Yes
What other minerals/metals are associated with an occurrence (i.e. bi-products)?	Yes
Are the occurrences licensed to anyone and if yes then who?	Yes
What is potential for finding hitherto unknown deposits in a given area?	No
How "good" is a deposit (in terms of tonnage/grade/mineral composition/etc.)?	No
What are the reserves and resources of REE (total, HREE, LREE, individual elements) in Europe?	Yes
What are the reserves and resources of REE (total, HREE, LREE, individual elements) in individual countries within Europe?	(Yes) Not always possible

Examples of required end products

- Distribution of REE (total, HREE, LREE and individual elements) occurrences in Europe (Map)
- Reserves and resources in Europe and in individual countries (Reports, Excel spreadsheets, maps)

Examples of required functionality

- Interactive map functionality
- Download of printable maps
- WMS/WFS functionality
- Download in Excel format
- Download in GIS format
- Various search facilities (to be specified)

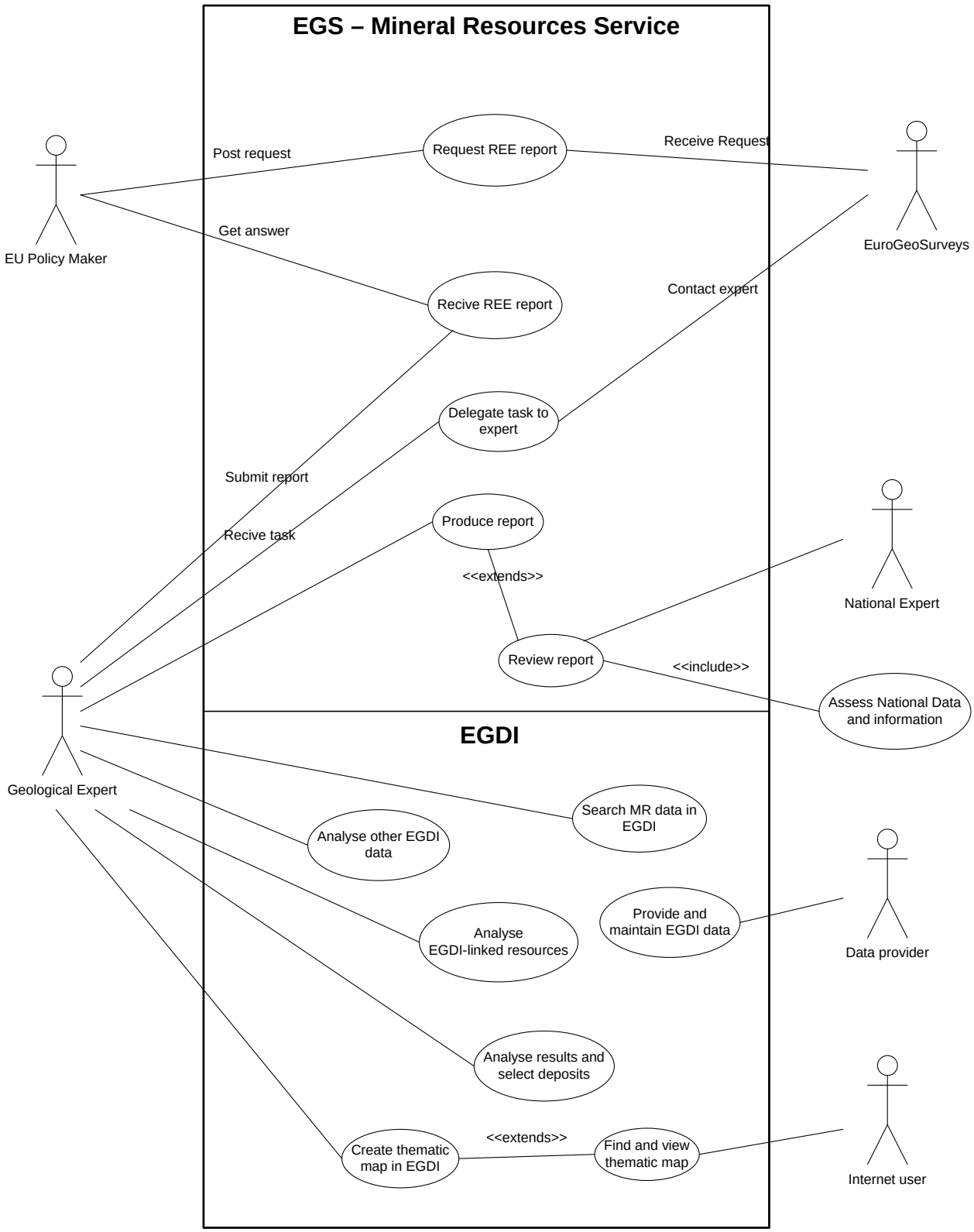
Presently available datasets (type and geographical relevance)

- Mineral occurrence databases exist in most countries, but they typically don't contain information regarding "how good" an occurrence is, and how likely it is for it to go into production.
- Promine has produced a pan-European mineral occurrence database also containing REE information. No differentiation into HREE or LREE, however, exists on the portal.
- EuroGeoSource has collected mineral resource information, but only REE occurrences in Greenland are present.
- Minerals4EU will include the development of a Mineral Statistics Yearbook (probably a virtual product), and will for that purpose collect information on exploration licenses, reserves and resource numbers for primary as well as secondary raw materials (recycling). Production numbers are already being compiled each year in the European Minerals Statistics (BGS). Questionnaires are at the moment being distributed to all countries to gather information. Reserve and resource numbers will be reported as they are stored at the institutions, i.e. the definition of reserves and resources will vary according to the classification system used by the individual countries. It will be a task of Minerals4EU to harmonise as much as possible these numbers relative to the UNFC standard.
- Resource and reserve estimates will be impossible to produce on a deposit basis because companies are not willing to deliver the numbers and because the numbers are dependent on a number of factors that will change through time such as metal prices etc.
- MINventory – a "scoping" project started in December 2012 and funded directly by DG ENTR to gather information about where in Europe mineral statistics exist and who are responsible. MINventory will provide a metadata portal. The project is led by is Oakdene Hollins.

Legal and licensing aspects including use limitations and potential pricing policies

- Mineral occurrence data already exist within most geological surveys, most of which are already published through project like ProMine and EuroGeoSource. It should be analysed whether any mineral occurrence data exist that are not freely available and why.
- Production statistic data are already being compiled on a yearly basis by BGS staff (and similar groups in a few other countries like Germany). The numbers are based on data, which are obtained from the national statistical agencies or geological surveys within the individual countries. These data are usually easily obtainable since companies are being taxed according to the actual production, and therefore obligations exist in most countries to report such information to the public authorities.
- Precise numbers on reserves and resources are impossible to obtain for various reasons:
    - Private mining companies are not willing to give away this kind of information
    - The numbers are dependent on factors like market prices which change continuously, and hence the numbers are of very little use.
- Exploration licensing information is in many instances (but not all) maintained by geological surveys.

Use Case Diagram



Flow of Events

1. A European policy-maker contacts EGS and asks for an overview of the ten rare earth element deposits in Europe most likely to be exploitable in the future.
2. EGS assigns a mineral resource expert to answer the question.
3. The expert searches the EGDI for Mineral Deposits having Commodity= REE and Mining=No. The result is a gross list of REE deposits and a map showing their location.
4. The expert filters the result list according to a) resource numbers and b) total grade of REE.
5. A drill-down analysis of the highest ranking deposits on the list helps the expert categorise the list in terms of predominance of light or heavy REE.
6. Further analysis will reveal the deposits where the mineralogy supports economically viable extraction of the metals.
7. The expert now studies the details of each deposit in order to evaluate if it contains bi-product which can be of economic importance.
8. Also based on EGDI data, the expert will assess if the Uranium content can pose a problem (for health and security reasons this is politically important).
9. From the above mentioned criteria, the expert has now narrowed down the list of interesting deposits and the result list and map now show only the deposits selected by the expert.
10. By geographical inspection on an interactive map provided by the EGDI interface, the expert will now assess the proximity of the mineral deposits on the filtered list to important ground water reservoirs (EGDI layer), shale gas prospects (EGDI layer), other hydrocarbon prospects (potentially an EGDI layer), settlements (an EGDI-integrated layer), nature parks (an EGDI-integrated layer), critical biotopes (EGDI-integrated layer) etc.
11. Furthermore, the expert should preferably be able to integrate licensing information through EGDI-integrated external web services.
12. The expert now exports the detailed information regarding each of the interesting deposits in Excel, Word or PDF format. He furthermore generates a series of maps (as jpg files) displaying the geographical relationship between the deposits and the occurrence of ground water bodies, nature parks, lakes, rivers, infrastructure, biotopes, etc.
13. The expert writes a report containing the result of the above mentioned analyses with inclusion of the downloaded deposit details and the generated maps.
14. On the EGDI resource portal, the expert finds contact details of the delegated mineral resource expert in each of the countries where interesting deposits have been identified.

15. The report is sent to these national experts for comments.

16. The national experts review the report based on their (and their colleague's) experience, national data and information etc, and return the report.

17. The EGS-appointed expert incorporates the received comments and sends the report to the requesting policy maker.

18. The report will contain a map and a description of the relevant deposits, targeting many politically relevant issues such as

    - Economy (tonnage, grade, composition, bi-products, costs of extraction (related to mineralogy), infrastructure),
    - Health (e.g. Uranium content of deposits)
    - Environment (proximity to vulnerable biotopes, ground water reservoirs, lakes, rivers, nearby sources of sustainable energy)
    - Land use (proximity to ground water bodies, shale gas reservoirs, nature parks, settlements etc.)
    - Private sector aspects (existing licenses etc.)

19. (Optional) The expert defines a thematic map in EGDI consisting of a suitable base layer (e.g. a generalised geological map) and the deposits pointed out in the report to be important (a subset of the mineral occurrence data layer).

20. (Optional) The expert types in some general metadata for the thematic map (title, responsible party, abstract etc.) and a link to the report.

21. (Optional) A user on the Internet searching for REE deposits Europe will find a link to the thematic map defined by the expert. The link will open the EGDI data portal with the general geological map and the mineral occurrence layers pre-selected – only showing the deposits pin-pointed by the expert.

Requirements from the REE use case

Requirements for EGDI datasets

- Mineral deposit data, including
  - Location of deposit
  - Resources numbers
  - Commodity
  - Mining (yes/no)

  - Grade of total REE, LREE, HREE and relevant bi-products (including Uranium)
  - Mineralogy
- Ground water bodies
- Shale gas reservoirs
-

Requirements for EGDI-linked datasets/services

- Licensing information
- Land cover (lakes, rivers, towns)
- Infrastructure (roads, railroads, etc.)
- Ecosystem maps
- Nature parks

Requirements for other EGDI resources

- Contact information for national mineral resource experts

Requirements for functionality

- Search criteria: commodity and mining info
- Interactive map display
- Result list sorting (resource numbers and grade)
- Result list filtering (i.e. “select from the list, and remove others”)
- Interaction between result list and interactive map (only show selected deposits on map)
- Export of mineral resource information as Excel, Word or PDF files
- Map generation (as jpg files)
- Optional: The possibility to define thematic maps.

Use Case 3: Renewable Energy - Planning for offshore Wind farms

Introduction

The EU aims to get 20% of its energy from renewable sources by 2020 in order to reduce fossil fuel dependency and limit greenhouse gas emission (COM(2013) 175). Offshore wind energy generation is well placed to play a significant role in achieving this goal, and Europe is already the world leader in offshore wind power.

In the process of selecting suited locations for wind farms, various studies need to be performed according to national as well as European legislation. Such studies include geophysical/geotechnical site surveys as well as Environmental Impact Assessments.

Individual countries have different procedures for the process leading to the development of offshore wind farms. In Denmark for example, the State conducts pre-assessment of selected sites, and subsequently calls for tenders based on these investigations, whereas in other countries like the UK, it is up to the successful bidders to perform the necessary assessments.

The current use case is mainly inspired by the Forewind project in which four partners (RWE, SSE, Statkraft and Statoil) formed a consortium in 2008 in response to the Crown Estate's third round for UK offshore wind farms. In 2010, the consortium was announced development partner for Dogger Bank, and since then various assessment reports have been published on the project homepage (http://www.forewind.co.uk).

It is the aim of the present use case to evaluate how geological data are used in the various assessment studies for offshore wind farms and how a future European Geological Data Infrastructure (EGDI) can facilitate more successful offshore wind farm projects in order to support the EU goals for increased use of renewable energy, increased competiveness in the private sector and job creation.

Basic Use Case Information

End user groups

- Private companies planning for the construction of wind farms
- Governmental agencies preparing calls for tender and evaluating applications
- Environmental agencies doing e.g. habitat mapping

Policy Framework

- The Marine Strategy Framework Directive

Overall user need

- Easy access to available geological and geophysical data and information in an area of interest.

Involved stakeholders (to be extended)

- Henry Vallius (GTK, Chair of EGS' marine geology expert group)
- Alan Stevenson (BGS, Coordinator of EMODnet geology)
- Helen Glaves (BGS, Coordinator of Geo-Seas and ODIP)
- Jørgen Overgaard Leth (GEUS, Marine geology expert)

Potential cooperation projects, partners and programmes

- EMODnet-geology
- Geo-Seas
- ODIP (Ocean Data Interoperability Platform)
- COOPEUS (Strengthening the cooperation between the US and the UK in the field of environmental research infrastructures)
- ICORDI (International Collaboration on Research Data Infrastructures)
- ECORD (European Consortium for Ocean Research Drilling)
- MODEG (Marine Observation and Data Expert Group)

Important documents

- Marine Knowledge 2020 Green Paper
- Interim Evaluation of the European Marine Observation and Data Network (SWD(2012)250)
- Marine Strategy Framework Directive (2008/56/EC)
- EIA Directive 85/337/EEC
- EMODnet-Geology Final Report
- Environmental Statement – Dogger Bank Creyke Beck

The use of geological data in the Forewind project

Geological and geophysical data are used for a variety of purposes in the planning and application phase of a wind farm project. The boundaries of the wind farm development zones are established taking into account the nature of the sea bottom, the potential impacts on the environment and potential submerged archaeological sites. Generally, two types of assessments are performed; a geophysical/geotechnical ground investigation should ensure the structural safety of the offshore installations, whilst an Environmental Impact Assessment (EIA) should evaluate the potential impact off the wind farm on the environment.

In the Forewind project, geological and geophysical data have more specifically been used in the following assessments;

- **Ground investigation**: Sediment types need to be understood in potential wind farm development zones. Different sediment types pose varying degrees of challenge for cable and foundation installation, resulting in higher costs in more challenging areas. For this purpose, borehole *information, seabed samples and various seismic data types* where used in the process of delimiting suited wind farm zones and selecting offshore cable corridors.
- **Mapping of marine physical processes**: The magnitude of the physical process effects caused by the planned Dogger Bank installations were assessed by modelling the behaviour of waves, tidal currents and sediments based on *geophysical and geotechnical data as well as seabed sediment samples*.
- **Marine water and sediment quality**: Water quality deterioration may be caused by re-suspension of contaminated sediments in the construction phase. This risk was in the Forewind project assessed by analysing *metals and hydrocarbons in seabed samples* at relevant sites.
- **Marine and intertidal ecology**: Development of wind farms should avoid areas where rare habitats occur or where the habitat diversity is high. *Seabed substrate data* is an important input to habitat mapping since coarse-grained sediments support more diverse animal and plant communities than fine-grained sediments.
- **Impact on other marine users**: Conflicts of interest may be present in areas of wind farm planning, since offshore areas may be subject to a variety of other uses such as oil and gas activities, carbon capture and storage, underground coal gasification etc. Assessment of these potential uses of a given area is therefore an important aspect to take into consideration when planning for wind farms. Even though this assessment in a wind farm project is not based directly on geological or geophysical information, the knowledge of a given area as potentially interesting in terms of hydrocarbon exploitation or CO_2 storage rely solely on such data.
- **Marine and coastal archaeology**: An assessment of potential submerged archaeological sites was conducted as part of the Forewind project. *Geological and geophysical data together with multibeam bathymetry* provide important input to the mapping of prehistoric submerged landscapes as well as to locating important ship and airplane wrecks.

For the purpose of the above mentioned studies, the Forewind project carried out a number surveys to acquire geophysical data, drill boreholes and collect seabed samples. However, as the area in question is

big, and because the costs of conducting surveys and drillings are high, desktop studies on existing data were in a number of cases undertaken initially in order to target as much as possible these operations. The easy availability of free and open geological and geophysical data will due to this fact, be of high value to contractors that are preparing for wind farm applications, but also for national authorities that evaluate these applications.

Availiable Datasets

Geological and geophysical data have for many years been acquired by geological A number of European projects have for many years worked on putting together harmonised geological and geophysical data and making these available via the web. The most important of these projects to be considered by EGDI-Scope is EMODnet-geology and Geo-Seas.

EMODnet-geology

EMODnet-geology is the geological part of the European Marine Observation and Data Network (EMODnet), the aim of which is to improve access to marine data. A number of preparatory actions were conducted from 2008 to 2010 within the domains of biology, chemistry, geology, hydrography and physical habitats to test the general approach. The geological part was coordinated by BGS and run by a consortium comprising 14 geological survey organisations. The main data deliverable was a harmonised 1:1 million seamless, marine substrate map covering the Baltic Sea, the Greater North Sea and the Celtic Sea. This map was compiled by GTK from all freely available data in the area and was subsequently published through the OneGeologyEurope portal with the associated metadata residing in the EU-SEASED portal, which was maintained by the Geo-Seas project.

The next phase of the EMODnet-geology project is planned to start in 2013 and will aim to increase the resolution to 1: 250 000 and extend coverage to the Mediterranean Sea.

Figure 2. The 1:1 million marine substrate map displayed on the OneGeologyEurope portal.

Geo-Seas

The Geo-Seas project lapsed from 2009 to 2013 and was an Integrated Infrastructure Initiative (I3) of the Research Infrastructures programme within FP7. The project has been implementing an e-infrastructure of 26 marine geological and geophysical data centres from 17 European countries through which a large number of geological and geophysical data can be discovered and acquired.

Figure 3. The content of the Geo-Seas metadatabase visualised in the OneGeologyEurope portal.

One of the main outcomes of Geo-Seas is an ISO 19115 compliant metadatabase called “Geo-Seas Common Data Index (CDI)”. This database incorporates the metadata inventories of a number of legacy EU projects such as EuroCore, EU Marsin, EuroSeismic, EU SeaSed, SeiScan and SeiScanex. Metadata records are uploaded by the data providing partners to the Geo-Seas portal where they are stored in the CDI. No automatic process for updating the central metadatabase has been developed within the process. The CDI is hosted by the private company MARIS, and underlies a number of web portals such as SeaDataNet and EU-SeaSed.

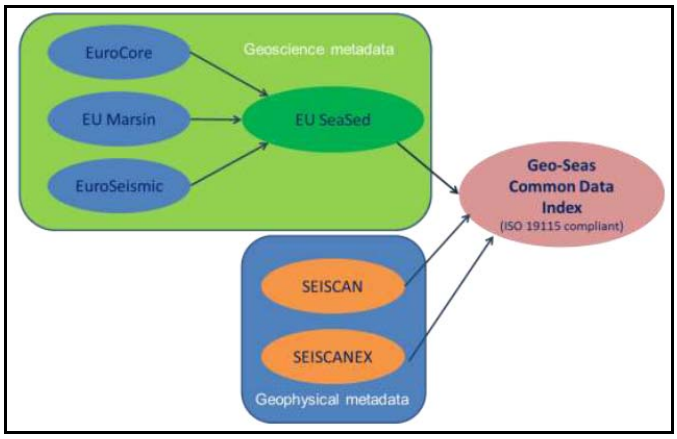


Figure 4. Overview of legacy EU projects that have been taken into account in the Geo-Seas project.

On the Geo-Seas portal, the CDI is searchable, and subsequent access to real data is achieved through an order/checkout process, allowing data providers to charge for data if necessary.

The real data will usually be made available through web services set up in the data provider's sever environments. Seismic data, however, need some to be hosted on a special environment to allow preview functionality. Therefore, such data are hosted by dedicated servers, which are maintained by one of the partners.

Besides, the CDI, the Geo-Seas project has been successful in developing a number of tools for data visualisation (seimic, boreholes and 3D).

EGDI-Scope aspects

- The marine substrate map and other datasets (sediment accumulation rates, areas of aggregates, location of submarine slides) from the preparatory EMODnet-geology project are simple GIS layer, which are now hosted by the OneGeologyEurope portal. These could easily be converted to a future EGDI platform.
- It should be noted, that as opposed to the onshore OneGeologyEurope geological map, the datasets developed by the preparatory EMODnet-Geology project are not distributed. It remains uncertain whether the 1: 250 000 marine map that is going to be prepared by the next phase of EMODnet-geology will be based on distributed architecture in line with the INSPIRE guidelines, but the final decision will have effect on the future maintenance plan of EGDI.
- In 2012, the Commission released an interim evaluation of EMODnet (SWD(2012)250). A few statements in that report feed indirectly into the requirements for the EGDI;
    - *"The continuity between the land and sea layers in the geology portal is certainly an advantage but it was hard to separate and analyse only the marine layers".*
    - *"Data providers need to know what data is being used for so some of the portals have user identification procedures. However, lengthy or inhomogeneous procedures can discourage data users. There is as yet no single sign-in procedure for all EMODnet portals".*
    - *"ENV and EEA have been particularly interested in the possibility of using EMODnet to help Member States report the state of Europe's seas as part of their obligations*

under the Marine Strategy Framework Directive (Directive 2008/56/EC) and their continued presence in the monitoring process has assured that this is possible".

- *"It is not yet possible to reach all the data with a single signing-in. Some data holders insist on a separate user authorisation procedure. The objective must be to arrive at a single sign –in for all data".*

portal	good first impression	portal intuitive to use	instructions were useful	data easy to find	portal had advanced features and functions	data was easy to access	data was comprehensive	data was in convenient format
biology	***	**	***	**	**	***	**	***
chemistry	***	***	***	***	***	**	***	***
geology	**	**	*	*	**	**	**	**
hydrography	***	***	***	***	***	**	***	***
physical habitats	**	**	***	**	**	***	**	***

- If data from Geo-Seas' Common Data Index (CDI) should be part of a future EGDI, it raises some issues. In February 2013, all Geo-Seas data centres signed an exploitation agreement, which obliges them to maintain their data content and connectivity to the Geo-Seas infrastructure for a period of three years. Since the Geo-Seas infrastructure is hosted by the private company MARIS, inclusion of the same data in an EGDI would mean that the data providers should maintain the content of two different systems. Possibly, all EGS members would be willing to do this, but many data providers in the Geo-Seas context are non-EGS members and would be more difficult to persuade. One solution to this could be to only consider Geo-Seas data in EGDI after the end of the period covered by the exploitation agreement.

Use Case 4: Geology and Soils - Ecosystem Mapping

Introduction

Biodiversity is imperative to human society, providing food, fresh water, clean air, shelter, medicine and much more. Together with climate change, loss of biodiversity is the most critical global environmental threat and gives rise to substantial economic and welfare losses. This fact is addressed by the EU in it's biodiversity strategy towards 2020 (COM(2011)244), where a number of targets and actions are specified to halt biodiversity loss and the degradation of ecosystem services.

The European Environmental Agency (EEA) plays a key role in the Biodiversity strategy of the Commission and will work with Member States to reach the 2020 targets. The ecosystem mapping and assessment described within the current use case relates to Target 2 ("Maintain and Restore Ecosystems and their Services") of the Biodiversity strategy – more specifically to Action 5, which deals with "Improve Knowledge of Ecosystems and their Services in the EU").

This EEA use case description (as a stakeholder of EGS-research and infrastructure) is part of a larger set of soil-related use cases; the part presented here concentrates on geoscientific studies/data sets about soils. EEA primarily deals with land use and climate change-related effects on soils and soil functioning. With regard to the conditions of soils, several geoscientifc aspects are relevant as well; these are described here with the aim that EGS could analyse its capacity to develop/provide the relevant information via its future infrastructure.

Basic Use Case Information

End user groups

- The European Environment Agency (EEA)

Overall user need

- To characterise ecosystems in terms of geochemistry.
- To assess how geochemical conditions of ecosystems affect biodiversity.

Policy framework

- EU biodiversity strategy to 2020

Involved stakeholders (to be extended…)

- Geertrui Louwagie (EEA, Project manager soil assessments and reporting)
- Rainer Baritz (BGR, Chair of Superficial Deposit Task Force)

- Clemens Reimann (NGU, Chair of Geochemistry Expert Group)

Potential cooperation projects, partners and programmes

- Mapping and Assessment of Ecosystems and their Services in Europe (MAES)

Important documents

- EU biodiversity strategy to 2020 (COM(2011)244).

General description of EEA workflow

As part of the responsability towards EU's biodiversity strategy, the EEA performs European-level ecosystem mapping and assessment. This work in conducted from a number of input parameters such as the classes contained in the CORINE land cover dataset. This European level mapping and assessment is too coarse grained to directly be of use for decision making, but an important aspect of the work is to develop methodologies, which can subsequently be adopted by Member States.

The added value of Geological Data in EEA's ecosystem assessment

a. Geo-chemical characterisation of soils and sediments can be used as a baseline to compare the current soil condition under management with natural background "pollution" [such a baseline would be part of a soil condition evaluation with regard to ecosystem services]. (status EGS: many nationally existing data sets are not yet compiled; some harmonization needs have to be developed when dealing with data based on different analytical methods).

b. such a baseline assessment requires spatial lithological data sets (status for Europe: IHME-litho, and Quarternary map; more attribute data sets and higher resolution not yet compiled for Europe); the spatial data sets are also needed to upscale local measurements (see former questionnaires regarding existing soil).

c. soil nutrient and acidity data are expected to be particularly relevant in this respect [potential source: GEMAS]. Since species habitats in soils also depend on nutrient status and acidity (following Ellenberg), all relevant European data sets are important (including those from geological services), EGS needs to be part of interdisciplinary working groups which integrate and evaluate the respective data sets.

Available geological datasets

The GEMAS dataset

The EGS geochemical mapping project (GEMAS) has recently produced a high quality pan-European dataset of geochemistry from agricultural and grazing soils. The dataset will be published as a series of maps later this year (??), and can supply important information for the ecosystem assessment performed by EEA.

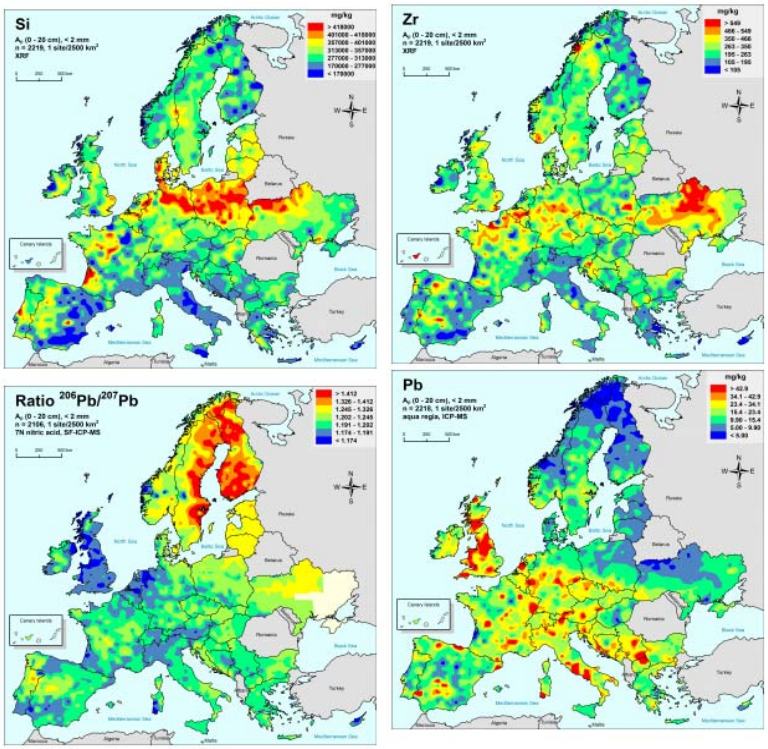
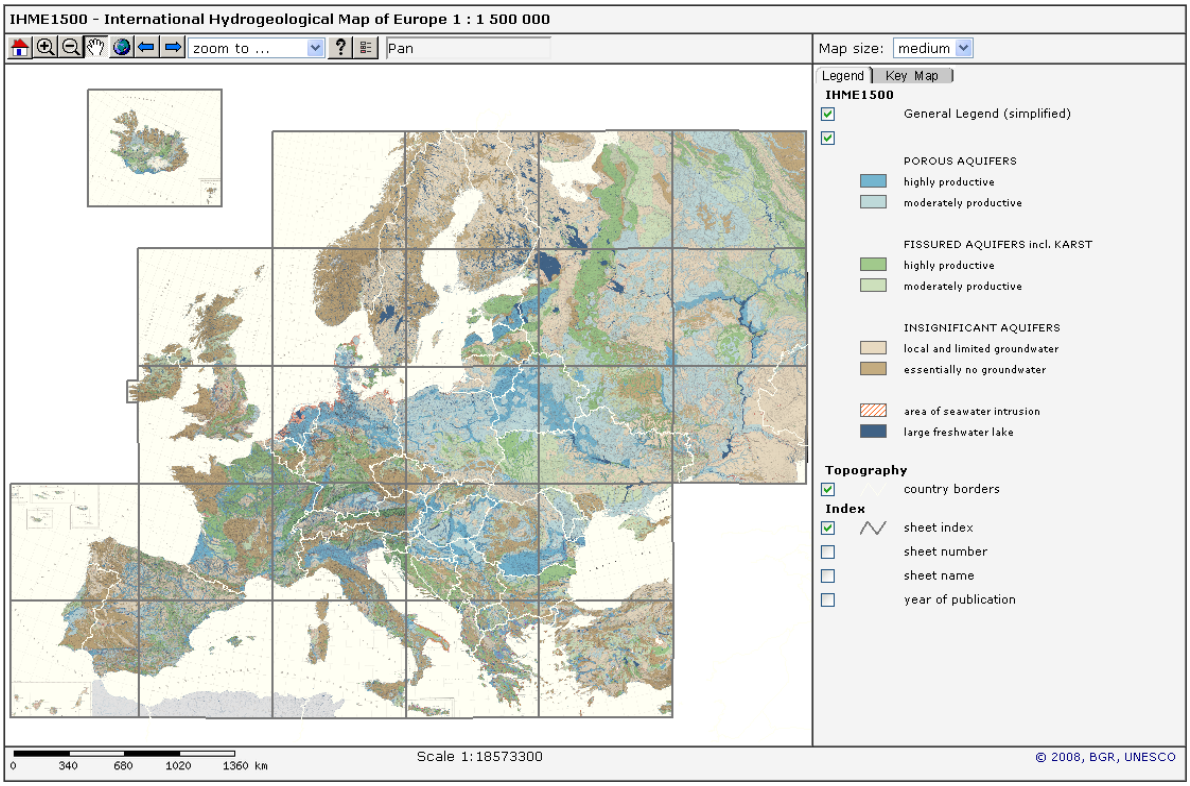


Figure 5. Examples of geochemical distribution maps based on the GEMAS dataset.

The International Hydrogeological Map of Europe (IHME)



http://www.bgr.bund.de/EN/Themen/Wasser/Veranstaltungen/workshop_ihme_2013/ihme-2013_node_en.html

Next steps

The current deliverable concludes the analysis of the questionnaire action that was launched earlier this year. Furthermore, it reports four use case descriptions that have uncovered a number of issues that need to be addressed in the final implementation plan to be delivered by EGDI-Scope at the end of the project period. The second stakeholder workshop will take place in Malta on 10th September preceded by a full consortium meeting the day before. Based on the outcome of the first stakeholder workshop, the questionnaire survey, stakeholder consultations and use case descriptions, a number of questions will be prepared for the break-out-sessions that will be arranged during the Malta meetings. It is anticipated that the outcome of the meetings will be a clearer picture of the stakeholder expectations for a future EGDI as well as a list of more concrete functional requirements.

The last activities of WP2 towards the final deliverable (D2.4) in Month 18 will be to update the use cases and compile the main outcomes of D2.2, D2.3 and the second stakeholder workshop into a final report that can be used directly for the purpose of the dataset prioritisation (WP3), architecture design (WP4), governance model (WP5) and implementation plan (WP1).

Conclusions

The present report has presented the direct and indirect functional requirements that can be deducted from the questionnaire survey that was launched earlier in 2013. The results in general reveal that stakeholders mostly value infrastructures that

- Are easy, fast and intuitive to use
- Have good and updated content
- Have good search engines
- Have good facilities to access data – both through OGC web services and for download

Four use case descriptions are included in this report. These have shed light on some concrete user scenarios and the availability of existing European datasets to fulfil these scenarios. Furthermore, the use cases have analysed the main issues that need to be addressed in order for a future EGDI to take over the maintenance of such datasets. The use cases will supply important input to the forthcoming stakeholder workshop in Malta on 10th September, where many such issues will be discussed. After the Malta workshop, the use cases will be updated so they can feed directly into the architecture design and implementation plan.

Appendix A: 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*	Available data

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?	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
Email address:	rbowell@srk.co.uk
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

Organisation	
Name:	TARH lda
Country:	Portugal
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*)	Natural resources, environmental consultancy
Contact Person	
Name:	Jose Martins Carvalho
Position:	Partner
Email address:	Jmc@tarh.pt
Phone (optional):	+351917548859
Geological Data	
For what purpose do you use geological data?	Site investigation, hydrogeological and environmental studies
What geological data do you use?	Geological maps
Do you need/use basic raw geological data or interpreted thematic data?	both
Where do you get your geological data?	Generally at the national geological surveys
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Pdf files, prited maps, gis files
Which data are easily accessible?	Pdf files
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 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 would prefer GIS files
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*	http://www.lneg.pt/
Do you use any European data portals (specify which)	http://www.lneg.pt/
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.	
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Availability of geological 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

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
Email address:	george.tudor@igr.ro
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	
Name:	Zomenia Zomeni
Position:	Senior geological officer
Email address:	zzomeni@gsd.moa.gov.cy
Phone (optional):	357-22409230
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	
Name:	Ray Scanlon
Position:	Head of Information Management
Email address:	Ray.scanlon@gsi.ie
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	
Name:	Henry Vallius
Position:	EGS Marine Geo EG chair
Email address:	Henry.vallius@gtk.fi
Phone (optional):	+358 40 825 2221 (cell)
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	
Name:	Per Ryghaug
Position:	Chief Engineer, Geomatics
Email address:	Per.Ryghaug@ngu.no
Phone (optional):	
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	
Name:	Peter Malík
Position:	Dpt. of Hydrogeology & geothermal Energy, Head
Email address:	peter.malik@geology.sk
Phone (optional):	++421259375416
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	
Name:	László OROSZ
Position:	head of department
Email address:	orosz.laszlo@mfgi.hu
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	
Name:	Peter SCHAREK
Position:	Retired senior research associate
Email address:	pscharek@gmail.com
Phone (optional):	
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	
Name:	Josip Halamić
Position:	Director
Email address:	josip.halamic@hgi-cgs.hr
Phone (optional):	+385-1-61 60 749
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	
Name:	Eva Hartai
Position:	associate professor
Email address:	foldshe@uni-miskolc.hu
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	
Name:	Jürgen Amor
Position:	Dept. Soil Contamination
Email address:	jurgen@emgrisa.es
Phone (optional):	
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	
Name:	Daniel Gechter
Position:	Project manager
Email address:	Daniel.Gechter@swisstopo.ch
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

Organisation	British Geological Survey
Name:	Helen Glaves
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:	Helen GLaves
Position:	Senior data manager
Email address:	hmg@bgs.ac.uk
Phone (optional):	
Geological Data	
For what purpose do you use geological data?	Discovery and access. I am co-ordinator for the EU funded Geo-Seas project that has developed an e-infrastructure for the dissemination of marine geoscience data
What geological data do you use?	Various marine geoscience data
Do you need/use basic raw geological data or interpreted thematic data?	The Geo-Seas e-infrastructre is concerned with the exchange of raw marine geological and geophysical data
Where do you get your geological data?	Geo-Seas e-infrastructure/ other relevant discovery and access services, directly from other geological surveys/repositories depending on requirements
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	Web services
Which data are easily accessible?	Data from geological surveys are often readily available. Generally publicly

	funded archives seem to be providing better access to data holdings. This is proabaly due to the impact of the INSPIRE directive
Which data are NOT easily accessible?	Access to data held by industry, especially exploration such as oil and gas, is often highly restricted
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)?	The use of data from multiple sources is of increasing importance for those engaged in marine research. Interoperability of data is therefore of prime importance as this allows use of a dataset in combination with data from other multiple sources.
Do you have any specific requirements relating to data access (data formats, projections etc.)?	Data needs to have ISO complaint metadata
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*	Geo-Seas, OneGeology-Europe, GEO, BLAST, EMODNET-Geology, EMSO, MAREMAP, GeoWOW, GMES. ORPHEUS, Pangaea
Do you use any European data portals (specify which)	Geo-Seas, One-Geology, EMODNET-Geology
What portals are good in terms of data content, and why?	The Geo-Seas portal does provide a good range of data types relevant to marine geoscience research.
What portals are good in terms of functionality, and why?	
What portals are not good, and why?	One Geology-Europe portal has very limited functionality which could be improved. Geo-Seas portal is dated in terms of the interface and its functionality. However, the portal will be updated as part of a second phase of the project if further funding can be secured in the future.
Are you familiar with any non-European data portals (national,	GeoMapApp http://www.geomapapp.org/index.htm

international etc.)? Please specify which.	
Are any of these good?	GeoMapApp is good as far as it goes
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Functions to use WMS, WFS, WCS, and WCPS would allow the use of the data sets being delivered via the EGDI infrastructure in combination with coverage data available from other web services.
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:	EGS MREG
Country:	EU
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:	NIKOLAOS ARVANITIDIS
Position:	Chair
Email address:	nikolaos.arvanitidis@gtk.fi
Phone (optional):	00358503486396
Geological Data	
For what purpose do you use geological data?	Mineral Exploration, Resource Estimation, Economic Geology
What geological data do you use?	Thematic maps, geochemical data, mineralogical data, borehole logs,
Do you need/use basic raw geological data or interpreted thematic data?	Both, depending on the study and the target
Where do you get your geological data?	Geological Surveys, websites, publications, other geo-data holders
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, databases, excel files, pdf files, printed maps
Which data are easily accessible?	Printed and digital maps, PDF files
Which data are NOT easily accessible?	Relational databases, GIS files, private company 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*	All types of data are important depending on the study to be delivered. Of course interoperable data are sometimes very progressive in terms of

of content) or **available data** (not necessarily standardised)?	concluding things. I miss integrated data based on independent GIS layers (e.g. geochemical, geophysical, mineralogical etc) which are very valuable in mineral exploration and metallogenetic modelling.
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, if you exclude the private sector.
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	ProMine, EuroGeoSource, GS Soil, Norisc, Doris, OneGeology Europe, FOREG, GEMAS, GeoMind, GeoSeas, GLOBVOLCANO, SubCoast, Pangeo
Do you use any European data portals (specify which)	ProMine, EuroGeoSource
What portals are good in terms of data content, and why?	ProMine providing information on the ore type and resource potential of both primary and secondary minerals, allowing prognostic evaluation and predicting
What portals are good in terms of functionality, and why?	They are all OK.
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	Raw Materials Group, USGS, BGS, Global Reporting Initiative providing information on exploration, mining and marketing issues.
Are any of these good?	USGS
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Mineral data, thematic maps, market figures, pdf reports, 3D modelling pdfs and those anticipated in the Minerals4EU project.

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:	Polish Geological Institute – National Research Institute
Country:	Poland
Sector (Public or private):	Public sector
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:	Katarzyna Jóźwik
Position:	specialist
Email address:	katarzyna.jozwik@pgi.gov.pl
Phone (optional):	
Geological Data	
For what purpose do you use geological data?	For making maps (geological, geotourist), creating/filling in digital databases
What geological data do you use?	Geological units and structures, tectonics, boreholes' profiles, mineral appearances, mineral and fossil fuels resources
Do you need/use basic raw geological data or interpreted thematic data?	both
Where do you get your geological data?	From researchers who did the geological mapping as well as from computer files (GIS, Corel) and inner databases.
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
Which data are easily accessible?	For example data regarding single deposits or single map sheets.
Which data are NOT easily accessible?	Data from wider area or data concerning properties/quality

	of some mineral/energy resources
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.)?	Popular GIS formats e.g. shapefiles
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, INSPIRE geoportal
Do you use any European data portals (specify which)	Seldom
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.	National - http://www.geoportal.gov.pl/
Are any of these good?	YES
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Possibility to display information about data owner and availability; WMS servers
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:	Polish Geological Institute – National Research Institute
Country:	Poland
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:	Maria Przyłucka
Position:	Specialist
Email address:	maria.przylucka@pgi.gov.pl
Phone (optional):	+48 22 45 92 578
Geological Data	
For what purpose do you use geological data?	GIS analysis, study subsidence and uplift of the ground
What geological data do you use?	Detailed Geological Map of Poland (DGMP), Geo-Enviromental Map, data about mining and deposits,
Do you need/use basic raw geological data or interpreted thematic data?	Rather thematic data
Where do you get your geological data?	On webportal IKAR and MIDAS and from National Geological Archive
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?	From MIDAS webdatabase shp GIS files are very easily accessible; DGMP on some areas is ready in digital format and in some is not
Which data are NOT easily accessible?	Some vector DGMP are not easily accessible
What do you find most important: **Harmonised data** (*Individual datasets harmonised to act as a single dataset*),	Available data and the known and easy procedure to acquire them

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.)?	Data should be in shp, geotif format, plus WMS service
Do you have any current legal barriers relating to your use of geological data?	Some data are not public and is hard to have access to them, even if I'm part of the Geological Survey
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	http://www.doris-net.eu/ http://www.emergencyresponse.eu/gmes/en/ref/home.html http://www.onegeology.org/ http://onegeology-europe.brgm.fr/geoportal/ http://www.pangeoproject.eu/ http://www.subcoast.eu/
Do you use any European data portals (specify which)	For my work I don't use them
What portals are good in terms of data content, and why?	All of above portal have similar "data tree"
What portals are good in terms of functionality, and why?	PANGEO portal is clear and easy to use and it has direct pass to Google Earth
What portals are not good, and why?	
Are you familiar with any non-European data portals (national, international etc.)? Please specify which.	www.geoportal.gov.pl
Are any of these good?	The portal is good because it provides WMS access, but sometimes it works really slow
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:	Polish Geological Institute – National Research Institute
Country:	Poland
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:	Paweł Lewandowski
Position:	
Email address:	pawel.lewandowski@pgi.gov.pl
Phone (optional):	
Geological Data	
For what purpose do you use geological data?	we collect and manage geological data – it is one of our statutory task
What geological data do you use?	data on deposits and mining areas
Do you need/use basic raw geological data or interpreted thematic data?	we need basic raw data
Where do you get your geological data?	from geological documentations and administrative decisions
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 databases
Which data are easily accessible?	Geological documentations and administrative decisions concerning mining areas are sent to PGI-NRI according to law regulations
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)?	
Do you have any specific requirements relating to data access (data formats, projections etc.)?	no we have not but ... some of the information is confidential and user to get to them, must have the appropriate permissions
Do you have any current legal barriers relating to your use of geological data?	yes – legal regulations are not clear
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	yes but for our purpose we do not need to use them
Do you use any European data portals (specify which)	
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.	
Are any of these good?	
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?	
May we send you future information about the EGDI-Scope project?	

Organisation	
Name:	Polish Geological Institute-National Research Institute
Country:	Poland
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:	Waldemar Gogołek
Position:	
Email address:	waldemar.gogolek@pgi.gov.pl
Phone (optional):	
Geological Data	
For what purpose do you use geological data?	For gathering, processing and distributing to end users
What geological data do you use?	All kinds
Do you need/use basic raw geological data or interpreted thematic data?	No
Where do you get your geological data?	Geological Archive, Internet
What is your most important data medium (online view, GIS files, relational databases, Excel files, PDF files, Printed maps, OGC Web services, other)?	OGC Web services, GIS files, relational databases
Which data are easily accessible?	OGC Web services, GIS files, relational databases, printed maps
Which data are NOT easily accessible?	Online view
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*	Interoperable data

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?	No
Geological online services	
Do you know any European data portals (specify which)? *Please find list of portals in the back*	AEGOS, EuroGeoSource, OneGeology, OneGeology Europe
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.	https://gbank.gsj.jp/geonavi/geonavi.php
Are any of these good?	
Which functionalities would be the most useful for you in a future European Geological Data Infrastructure?	Speed operation, effective search of 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