MINATURA DELIVERABLE D1.1

OVERVIEW OF SPATIAL DATA AVAILABLE

Version 2.0

Summary:

This deliverable gives an overview of spatial data available in the form of a table with accompanying report, where data gaps for the case study countries are identified and possible alternatives (proxies) are indicated.

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**Other beneficiaries:**

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**Revision history**

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<td>Michiel van Eupen, Anouk Cormont</td>
<td>2015-07-27</td>
<td>First concept</td>
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<td>Version 1.1a</td>
<td>Snježana Miletić</td>
<td>2015-07-29</td>
<td>Listing the selected case study areas, informing that case studies will be done at different levels</td>
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<td>John Cowley</td>
<td>2015-07-29</td>
<td>Suggestions on the wording; better explanations</td>
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<td>Version 2.0</td>
<td>Michiel van Eupen, Anouk Cormont</td>
<td>2015-07-31</td>
<td>Adaptation of Word and Excel documents according to the changes suggested by Snježana Miletić, John Cowley and Christian Marasmi and considerations of Gerry Sutton</td>
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**Approval status**

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<td>2015-07-31</td>
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<td>Project leader</td>
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**Diffusion List**

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1. EXECUTIVE SUMMARY

This deliverable gives an overview of spatial data available in the form of a table with accompanying report, where data gaps for the case study countries are identified and possible alternatives (proxies) are indicated.

This overview indicates the relationship between mineral resources of economic value and other competitive land use considerations, including urbanisation, the provision of infrastructure and the extent of environmental designations, which may constrain the development of underlying mineral resources. The deliverable lists the selected MINATURA case study areas across the EU that provide an adequate representation of the range of mineral resources of importance to the EU and the varied land use and socio-economic competition. The case studies thereby also significantly reflect the range of habitats, climates and other physical considerations across the EU which produce different operational imperatives and which require different mitigation responses when considering mineral extraction.

2. INTRODUCTION

The exploitation of minerals in Europe is an indispensable activity to ensure that the present and future needs of the European society can be met. This means that sufficient access is required to explore and exploit minerals. At the same time the mineral requirements of our society must be met without compromising the ability of future generations to meet their own needs. Accordingly, potentially exploitable mineral deposits (known deposits, abandoned mines and historical mining sites) need to be assessed against other land uses, taking into account criteria such as habitats, other environmental concerns, priorities for settlements, etc. Decisions on the development or management of these diverse land uses requires adequate consideration of their significance and the exclusiveness; the positive or negative impacts associated with their development and the extent to which harm may be reversed, mitigated or offset; and consequences of the development on the surrounding area.

The objective of WP1 is to identify potential mineral resources in relation to current and future competition between development of those mineral resources and other land uses, based on existing methodologies and approaches at EU and national level. And by doing so, the basis for a concept and methodology for protecting mineral deposits of public importance can be developed (to be accomplished in WP2).

As a first step in the localization of potential mineral resources and the extent of land use competition, WP1 will collect required existing spatial data for the MINATURA case study areas. Such data will include current existing spatial databases like the delineation of Natura 2000 areas, Nationally Designated areas (CDDA) and other (national/regional) protected areas, Corine land cover, population density maps, spatial planning zones, and locations of actual and potential mining resources and claims. Most probably, not all required data is available for all case study areas.

In task 1.1, WP1 identified the availability of the spatial data and indicated possible applicability of comparable data (e.g. proxies) in case of data gaps. Gaps in data availability could have consequences for the development and functionality of the regulatory framework concept for the EU as a whole.

3. METHODOLOGY

During the kick-off meeting of the MINATURA2020 project (March 3-4, 2015), the European Commission made clear that inclusion of as many case study areas as possible would be preferred to be able to base the regulatory framework on a wide and representative coverage. Therefore, on March 17, 2015 we have sent an email to all MINATURA project partners, asking to fill out an
inventory about spatial data availability. This inventory was ready-made in Excel (see Figure 1). We indicated some of the data we supposed to be relevant in all cases, but we made the inventory open to further suggestions.

Based on the received information, WP1 and the MINATURA management team chose the final case study areas to be worked with. We therefore used transparent criteria for the selection, such as geographical coverage (incl. balance regarding onshore/offshore), scope and scale, data completeness and availability, and coverage of issues.

Additionally, we asked the project partners to indicate previous and ongoing projects of which they are aware of, where comparable data is being or has been gathered. In that case, we asked to provide us with links and contact persons. Moreover, we asked to indicate links and contact persons to achieve useful spatial information (on minerals) at EU level known by the project partners. This would allow us to indicate possible applicability of comparable data (e.g. proxies) in case of data gaps.

![Figure 1 - Ready-made Excel form for the spatial data inquiry](image)

To gather information about spatial data beyond the partner countries and on EU level, we have contacted Robert Holnsteiner and Sebastian Wagner (Austria), Aurela Shtiza (Germany), Nikolaos Arvanitidis (rare earth elements on EU scale) and Daniel Cassard (EU scale; Minerals4EU project). The WP1 team has executed internet searches for additional useful maps on EU scale.
We have filled out the inquiry for the Netherlands and Flanders ourselves, since Dutch is our mother tongue and we know where to search for the data sources.

After we received the filled-out inquiries, we have merged them into 2 Excel documents; one for the inquiries of the countries and one for the inquiries of the EU data. In the first sheet of the country specific inquiry document, we have harmonised the inquiries, with one column per country. In this summarizing overview, we have indicated per mineral group (critical minerals, industrial minerals, deposits of aggregates) whether there is spatial data available (through a web portal) or not, and whether this data is further specified, e.g. per mineral.

4. RESULTS

Supplementary to this deliverable, we provide the Excel tables with the results of the spatial data inquiry (currently – July 16, 2015 – available at: https://www.dropbox.com/s/3x1zx38ceqiaikkb/Minatura%20WP1.1%20data%20inventory%20CaseStudydata.xlsm?dl=0
and https://www.dropbox.com/s/ik1cyb8h3iw5jpl/Minatura%20WP1.1%20data%20inventory%20EUdata.xlsm?dl=0 both available in the MINATURA Dropbox.
The harmonized overview of the inquiry results is included as Annex to this deliverable (Annex 1).

The countries that responded to the inquiry, or that have been included based on external input are (in alphabetical order):

- Belgium (Flanders)
- Croatia
- Germany
- Hungary
- Italy (Emilia-Romagna)
- Montenegro
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Sweden
- the Netherlands
- United Kingdom - onshore
- United Kingdom & Ireland – offshore

Previous and ongoing projects where useful data is being or has been gathered, that are taken up in the inquiry, are:

- ProMine
- EU-SEASED
- Hydrogeological Map of Europe
- Minerals4EU
- EMODnet portal for Seabed Habitats in Europe

During a Skype meeting amongst Project Coordinator Günter Tiess and the WP1 and WP4 leaders (June 11, 2015), the final selection of MINATURA case study countries was discussed. We agreed it would be best for consistency to work with the same set of case study countries – and case study areas therein – in both work packages.

Based on the DoW and the reasons explained below, we selected the following case study countries (with case study areas):
Onshore: Hungary (Tályya village and surrounding Zemplén-Tokaj hills), Italy (Emilia-Romagna Region), Poland (Dolnośląskie Province), Portugal (Serras d’Aire e Candeeiros), Slovenia (whole territory), Sweden (Norrbotten Country) and United Kingdom (South West England and South Wales)

Offshore: Ireland/UK (Irish and Celtic Sea)

Reasons why this selection is a bit different from the DoW:

- Sweden (onshore) will be included - reasons: all necessary data is available, deposits of National Interest defined and delineated.
- Portugal will be included in WP1 - reasons: it was already the case for WP4, all necessary data is available.
- Belgium (offshore) will not be included – reasons: no partners that can deliver data
- SEE (South-East Europe) as a region will not be included – reasons: too heterogeneous, lack of required data, some countries from SEE are already included.
- Adriatic Sea will not be included – reasons: no partners representing this area as a whole; might be interesting for policies, less interesting for spatial analysis.

Hence, we’ll work with one case study region for offshore. We considered this to be enough, as our focus is more on the onshore part.

The aforementioned eight case study countries will be examined at different scopes and scales (local, regional and/or national level) at a later stage of the MINATURA project (Tasks 1.2 and 1.3, WP4).

Looking at the spatial data inquiries, filled out by the MINATURA partners from the case study regions, we extracted the following interim conclusions:

- Restrictions on spatial data seem to disappear gradually. General data is often available and freely downloadable via online portals. This complies with the INSPIRE agreements. However, the user-friendliness of these portals is not always optimal: on some portals it is difficult to find the relevant maps, despite the build-in search functions (e.g. nationaal georegister for the Netherlands).
- The availability of specific spatial data, e.g. on the occurrence of particular minerals, varies among countries and minerals. Due to for instance strategic importance, not all mineral deposits are publically accessible, only those of major availability (e.g. Slovenia). Moreover, some countries have indicated the spatial data availability of the specific minerals of which deposits exist within their territories or case study regions, while other countries have indicated the spatial data availability on minerals only very generally.
- In some cases, qualitatively good spatial data is available for the local scale, whereas data of this quality is not or limitedly available on the national scale (e.g. Emilia-Romagna).
- In some cases, only analogous spatial data is available (paper maps). The downloadability may be limited to single (local) map sheets, downloadable one at a time or in non-GIS formats (like PDF) only. Often the use of the data is limited to just viewing the maps at a portal using WMS/WFS format (e.g. Sweden, Portugal, Slovakia, EU data).
- Data gaps in availability are indicated with an N or an X in the harmonized overview of Annex 1. These gaps are limited for the case study areas – which is one of the reasons these areas are selected as case study areas for the project. As a proxy, EU scale data could be used, e.g. from the Minerals4EU or ProMine projects. The Minerals4EU EU FP7 project is currently completing the work on geo-portal components and data from EU and national providers. The M4EU database (i.e., the database in Excel format, based on the M4EU data model and allowing end users to download and work with raw data) will most likely be available mid-September 2015 (pers. comm. Daniel Cassard).
- Some EU data e.g. from ProMine (ProMine maps of mineral potential, predictive maps and Geophysics) are only available through a map viewer in WMS/WFS format, not useable for further calculations planned in WP1.
- Looking at the datasets put forward as being of importance by all the case study areas (see Excel tables), it appears to be challenging to map extraction suitability for various minerals purely based on the available EU scale maps. This extraction suitability is dependent not only
on geology, mineral deposits and physical extractability, but also on e.g. accessibility to the markets and processing facilities, restrictive policies and social resistance. Defining all these issues on an EU scale in a comparable manner needs to take into account the specific member state and minerals characteristics. The currently known EU datasets cannot deal with all these particular properties in a good manner; the resulting suitability maps would be very generic and therefore irrelevant from a policy making perspective at member state level and below. To improve EU datasets for policy making at the EU-level a bottom up refinement appears to be an effective approach. Therefore, it seems more worthwhile to map extraction suitability based on (predominantly) member state information, using maps on a local to regional scale. Combinational dependencies based on local information can eventually be scaled up and used at EU level in the form of a policy framework.

- Real gaps in data availability will show up after Task 2.1, to be executed in the autumn of 2015 (see next section). Then we will know if we were able to map extraction suitability and zones of conflict.

5. FOLLOW-UP

As a next step in the procedure, we will investigate how the spatial data should be combined to identify potential mineral resource areas for a selection of important minerals and the extent and/or significance of competition with other land uses. This will be done using good practices, expert knowledge, a literature review, and existing mapping tools. The use of the available spatial databases, and rules to combine them, will be verified in this stage during a set of interactive workshops with MINATURA partners from the case study countries.

In a participative way, potential suitable areas for mining activities and zones of conflict will be identified using the mapping tool QUICKScan (http://www.quickscan.pro/). QUICKScan is both an approach and a software tool that is applied in group process with policy makers and experts to develop and explore potential policy options and assess likely impacts of those options through data integration. The QUICKScan software tool encompasses a spatial modelling environment with functionalities to assess societal and environmental conditions, diagnose patterns and interactions and uncertainties thereof, implement alternative responses (e.g. spatial scenarios) and evaluate the impacts of those responses. It allows combining tacit expert knowledge with available spatial and statistical data. This task will provide WP2 with sufficient spatial data, mechanisms and rules to formulate the mapping framework. The use of the QUICKScan software tool on the case study countries will also be presented to stakeholders at the first round of workshops (task 5.2).

To evaluate whether and to what extent new conflicts will rise, or conflict zones will expand or diminish in future, upcoming land use change for the coming decades will be incorporated in the mapping of potential extraction suitability. Based on existing EU socioeconomic pathways MINATURA will develop a logframe to forecast future land use for the case study countries. Forecasting future land use will be done using the iCLUE model (Verweij et al. in prep.) The iCLUE model is a flexible, generic land use modelling framework which allows scale and context specific specification for regional applications. Applications of the iCLUE model and its precursors CLUE-S and Dyna-CLUE (Verburg et al. 1999) have been made around the world in many different environments. Typical applications include the simulation of deforestation, land degradation, urbanization, land abandonment and integrated assessment of land cover change. Taking into account the socio-economic scenarios and expected pathways described above, the iCLUE-model will project future land use, in terms relevant to the context of mining and extraction suitability, showing the future impact on the suitability. These projections will be used in WP2 to evaluate the implications for the requirements in the mapping framework. WP4 and WP5 will use these results to discuss the extent of potential conflicts with other land use types and users.
REFERENCES

EMODnet, http://www.emodnet.eu/

EU-SEASED, http://www.eu-seased.net/welcome_flash.html


QUICKScan, http://www.quickscan.pro/


ANNEX 1

Harmonized overview of the inquiry results on spatial data availability - see next pages
Countries marked in green are the MINATURA case study counties/areas
<table>
<thead>
<tr>
<th>Country</th>
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<td>This project focuses on the study of minerals and their distribution in the North. It aims to provide data and information to support sustainable development and environmental conservation.</td>
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<td>This project focuses on the study of minerals and their distribution in the Central region. It aims to provide data and information to support sustainable development and environmental conservation.</td>
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<td>This project focuses on the study of minerals and their distribution in the Northern region. It aims to provide data and information to support sustainable development and environmental conservation.</td>
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**Key Points**

- The project aims to study the distribution of minerals and their impact on sustainable development and environmental conservation.
- Data and information provided will support decision-making processes.
- The project involves collaboration with universities and research organizations across Europe.

**Contact Information**

For more information, please contact:

- [Email Address]
- [Website]

**References**

- [List of related articles and publications]
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Further details on regional usage, population statistics, and protection levels can be found in the linked documents for each region. The table is intended to provide an overview of the distribution and protection status of various species within the specified areas.