



CHALLENGES FOR THE DEVELOPMENT OF EU-SCALE THEMATIC MAPS SUPPORTING THE MANAGEMENT OF GROUNDWATER QUALITY IN EUROPE

Initiated in July 2018, the GeoERA project HOVER intends to link geological settings and hydrogeological processes to the natural quality of groundwater and the risk of transfer of anthropogenic dissolved elements to aquifers. Information and communication technologies involved will allow production of thematic maps and web services at regional to pan-European scale that will be made available for a large public audience through the European Geological Data Infrastructure (<http://www.europe-geology.eu/>)

Maps and Web services proposed at EU Scale

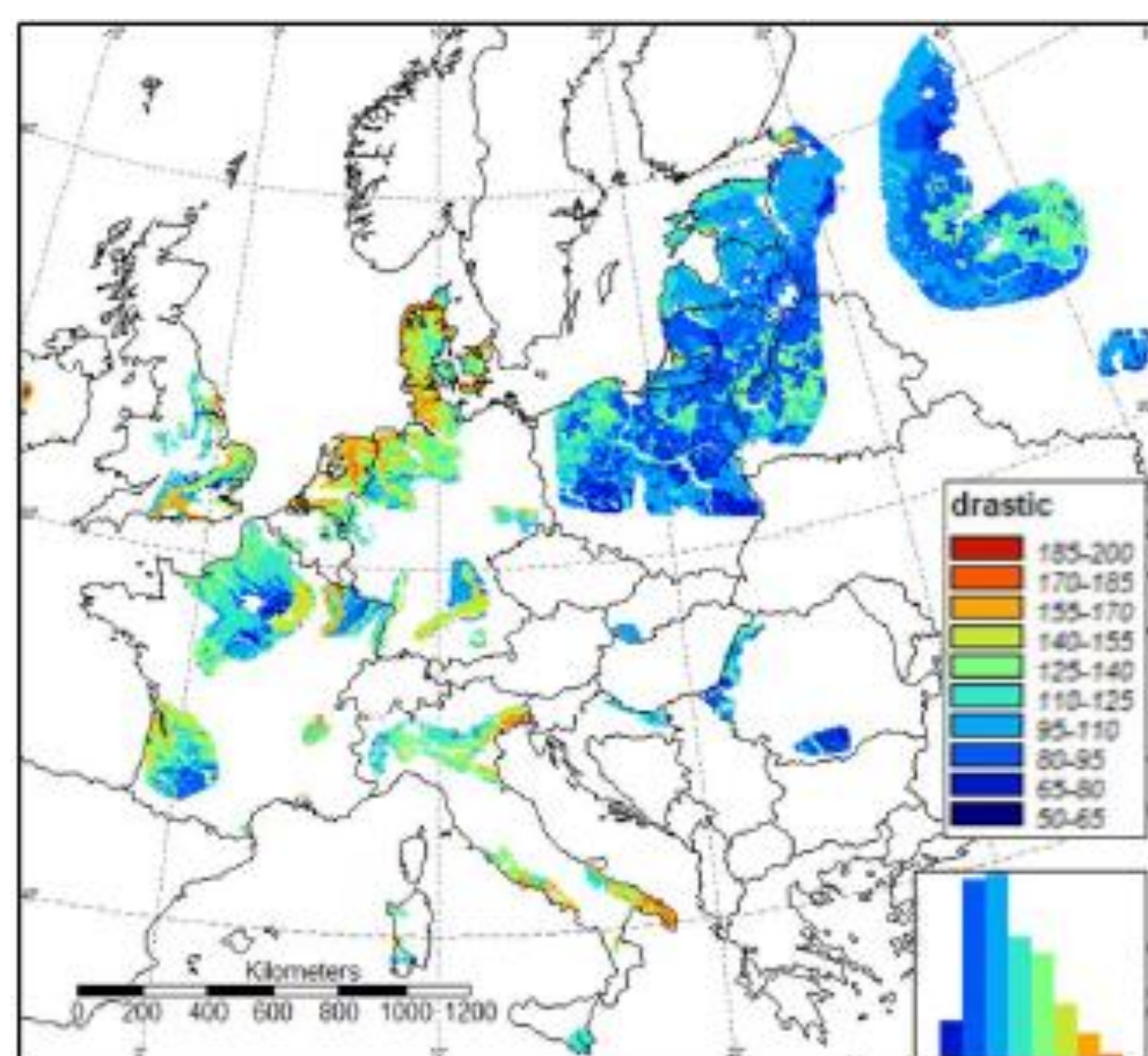
- For hydrogeochemistry and Health : **Pan European information layers of special waters and indicators of chemical anomalies of natural origin - Development of European exposure maps of selected elements (and indicators) based on GIS interpolation of measurements**
- For Nitrate and pesticide transport from soil to groundwater receptors - **Maps of groundwater-N travel time**
- For **Groundwater Age DIStributions** and residence times in European aquifers - **Maps and cross sections on the information platform / EGD I showing spatial distribution of groundwater age and vulnerability classes in selected European aquifers**
- For groundwater vulnerability - **vulnerability of the upper aquifer to pollution using GIS and geo data infrastructure techniques**
- For emerging contaminants (EC) - **GIS-layers published by a GeoERA (EGDI) web service on the selected ECs**

Challenges to face

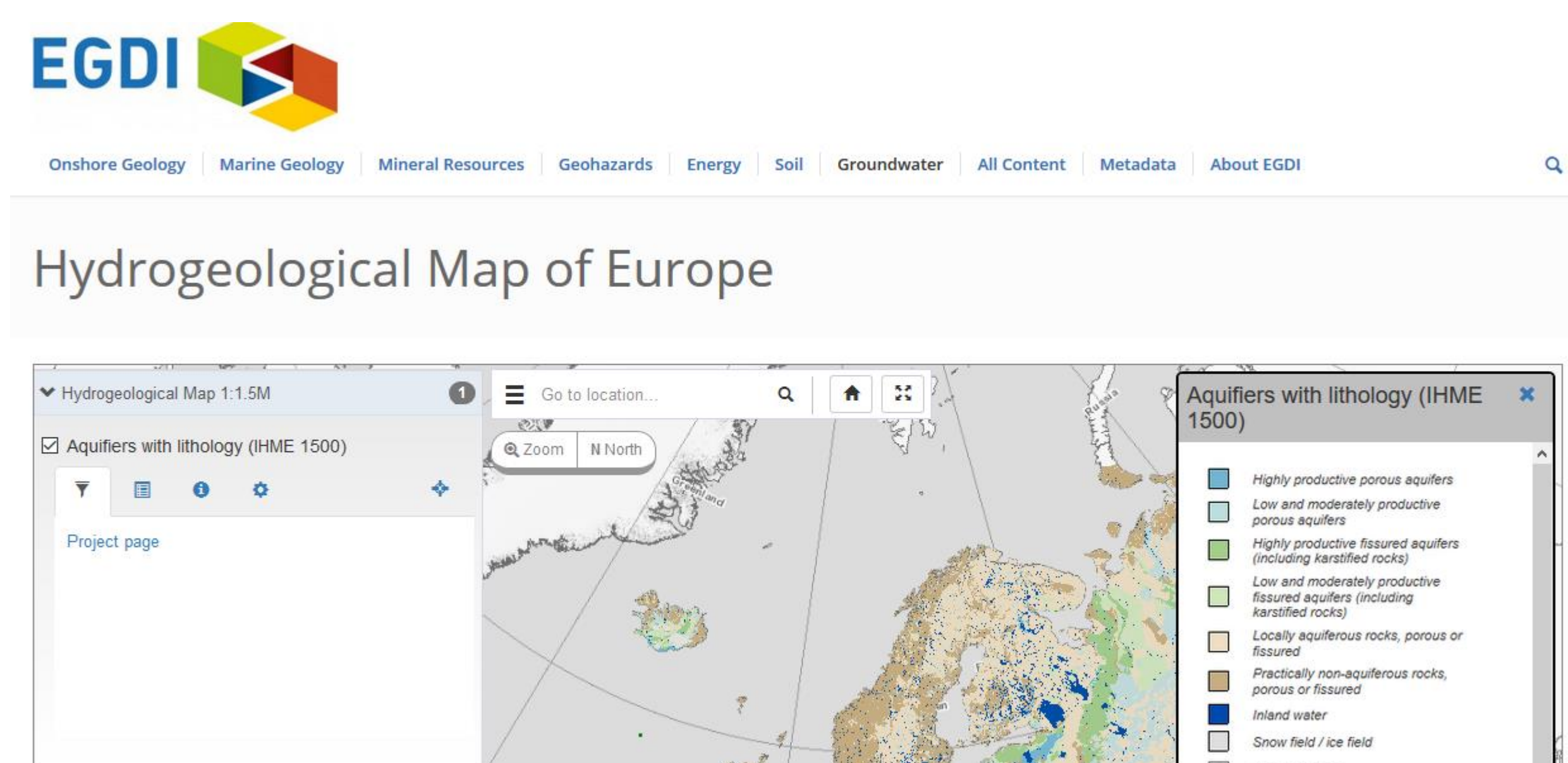
Heterogeneity of data available in each country, including heterogeneity in density and frequency of molecules analyzed, in data formats used and additional but necessary information (metadata such as geological context, depth of wells...).

Raw data ownership and confidentiality – Only few countries have free access database containing all data on groundwater quality and quantity – Some cannot be published because considered as sensitive information (e.g. concentrations of As) – Reuse or publication of data existing (and up to date) somewhere else is not recommended/possible

Scale dependency – Upscaling and downscaling have to be handled carefully – A product developed at large scale (Pan-European) is based on information adapted to that scale, users may be tempted to focus on areas of specific interest, the information not being accurate for that scale. Also for small size countries, one cell of the datagrid can include the whole country (e.g. Malta, Netherland)



Preliminary DRASTIC application with readily available data at pan-EU scale – (prepared by A. Günther, BGR)



The information platform – Web site where the maps produced during HOVER will be made available

Proposed solutions

- Creating indicators i.e. processed data representing various data extrapolated at a specific unit. The working units is defined following geological and hydrogeological criteria. Example of indicators to be mapped at EU scale:
 - Thermal water - location of the outlet using the EEA reference 1 km raster grid
 - Denitrification potential – point information extended at hydrogeochemical unit
 - Travel times for nitrate in the unsaturated zone
 - DRASTIC index classes - information mapped at pilot areas
 - Number of EC seek and found – information extended at country level

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