

LECTURE 2 - AVAILABILITY OF GEOLOGICAL DATA

by Nikolas Ovaskainen



FREE ACCESS

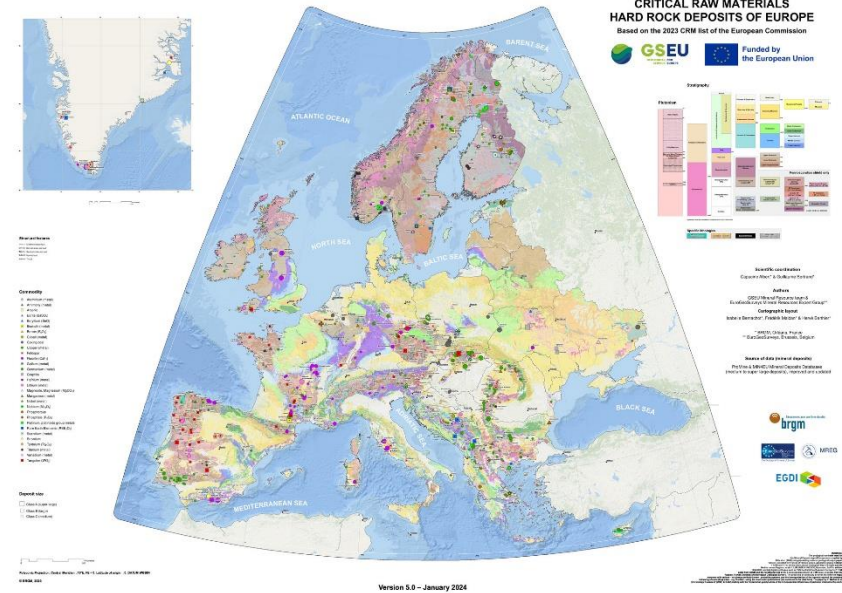
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CIRAN Introduction

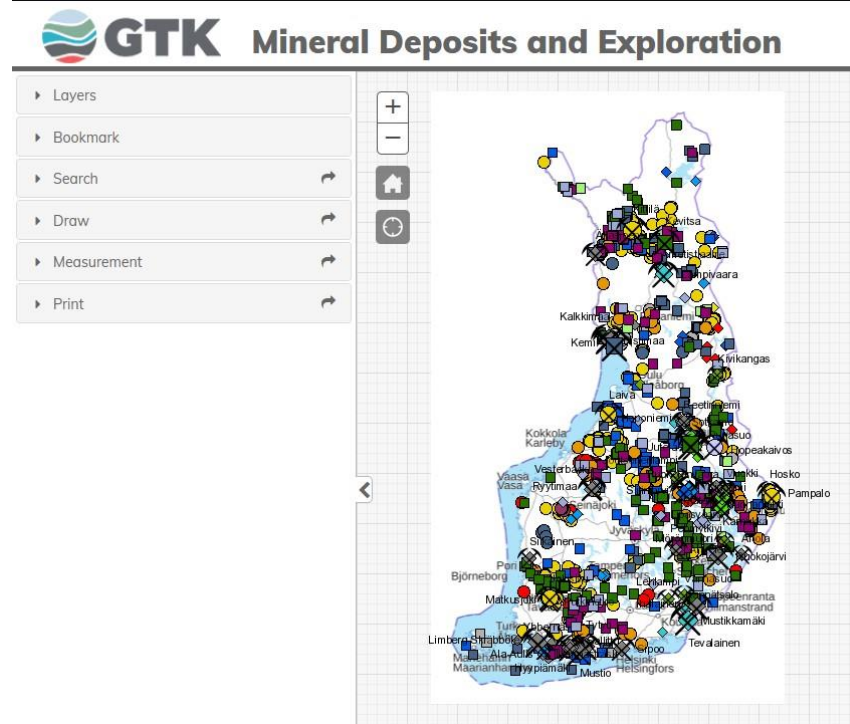
- The European Union has labelled specific commodities as critical for European industry and, e.g., green transition objectives
- The primary source for many of these commodities are mines where extraction is done from bedrock mineral deposits
- Through mineral exploration and establishment of mines, the locations of occurrences of CRMs have been mapped across Europe
- Due to different mining histories and geological potential for mineralization, countries differ in terms of CRM occurrence reporting and extraction. Therefore, mining must happen at specific locations
- However, multiple prior Horizon Europe projects have started and are continuing the work of integrating and harmonizing European mineral occurrence data to provide a mineral inventory for the European Union of available CRMs



PDF map of hard rock deposits of Europe
(https://tupa.gtk.fi/kartta/erikoiskartta/ek_102.pdf)

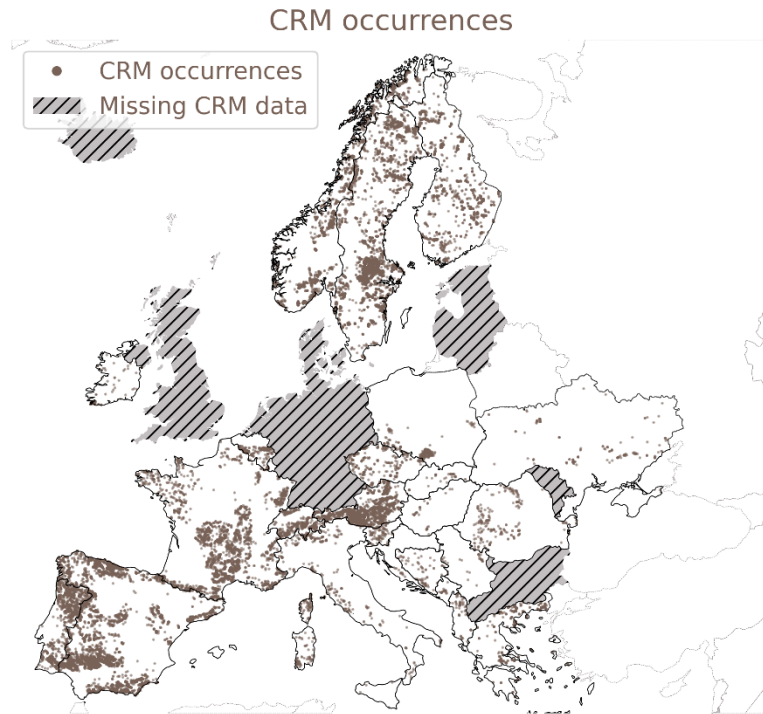
CIRAN Data sources

- European geological data infrastructure (EGDI) platform
 - Harvests, validates, and harmonizes data from geological organizations across EU member states
 - <https://maps.europe-geology.eu>
- S&P Capital IQ Pro
 - Proprietary platform with data on mines and deposits
 - Data origins unclear, and raw data cannot be openly shared with research results due to licensing
- National platforms
 - Country-specific information and probably most accurate and up to date
 - But not harmonized across Europe -> Difficult to compare countries



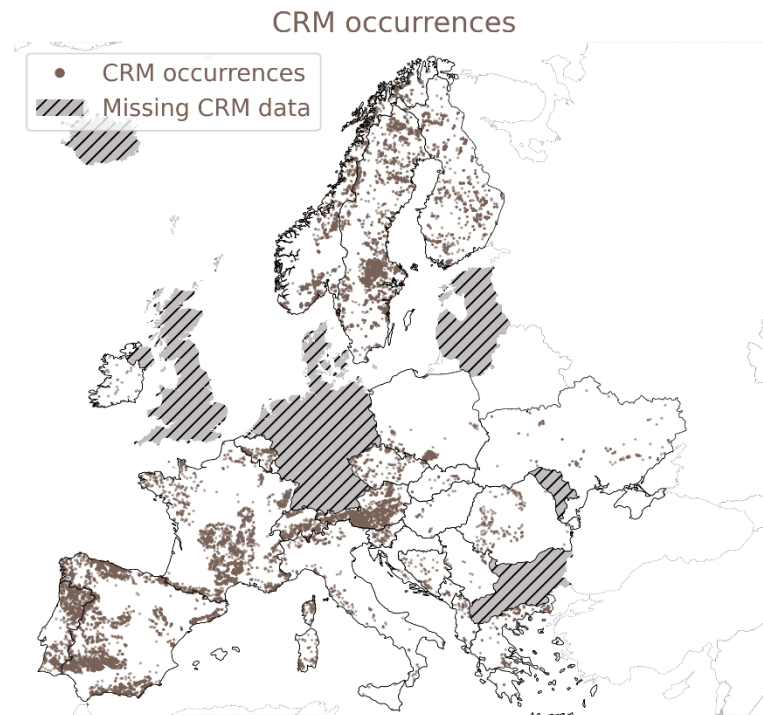
Snapshot of a national platform – Geological Survey of Finland (<https://gtkdata.gtk.fi/mdae/>)

- The European Geological Data Infrastructure (EGDI) portal holds the most representative data on European Critical Raw Material (CRM) occurrences
- EGDI Data has been partly collected by prior Horizon Europe projects like MINTELL4EU (primary/secondary raw materials) and FRAME (focused on CRMs)
- The "MIN4EU harmonized dataset" integrates results, with a specific subset "Critical raw material occurrence points 2023" very useful to estimate CRM inventory within Europe
 - Point data with varying contents as attributes, such as the commodity and size of the deposit
- A processed version of CRM occurrences, with additional national data, has been published as a PDF map which is useful for visualization purposes of CRMs



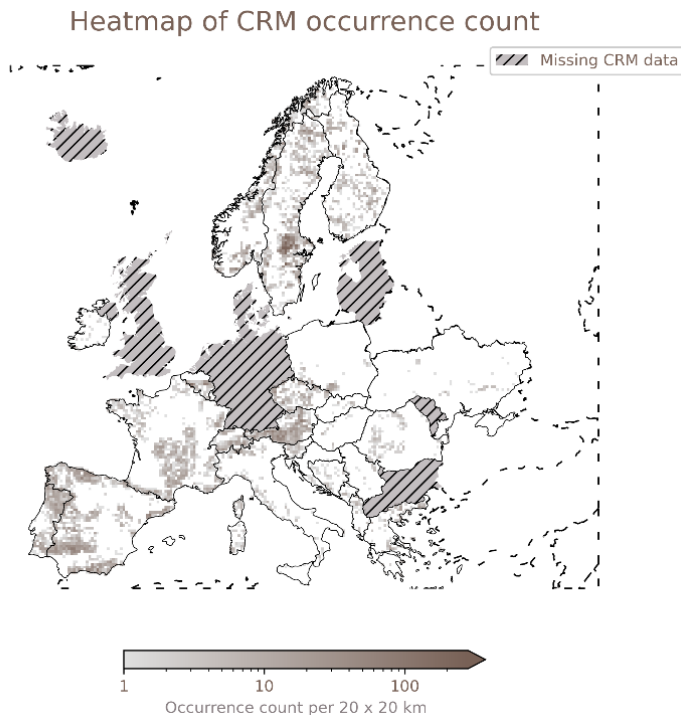
CRM occurrence point data in "MIN4EU harmonized dataset".

- Surface mineral occurrences, and especially mines, often cover a spatial extent on the surface of the Earth, which could be represented by polygons, however you will mostly find point data sources. Consequently, at least for surface occurrences, polygon data would be more representative
- The dataset contains CRM data from many EU and other European countries but as of June 2024 is lacking full coverage
- Furthermore, the data counts vary by country and reporting of what is an “occurrence” more than likely varies by country. Subsequently, it can be expected that there are many uncertainties in the harmonized data still.
- Overall, however, the data covers most European countries and contains data on many of the CRMs

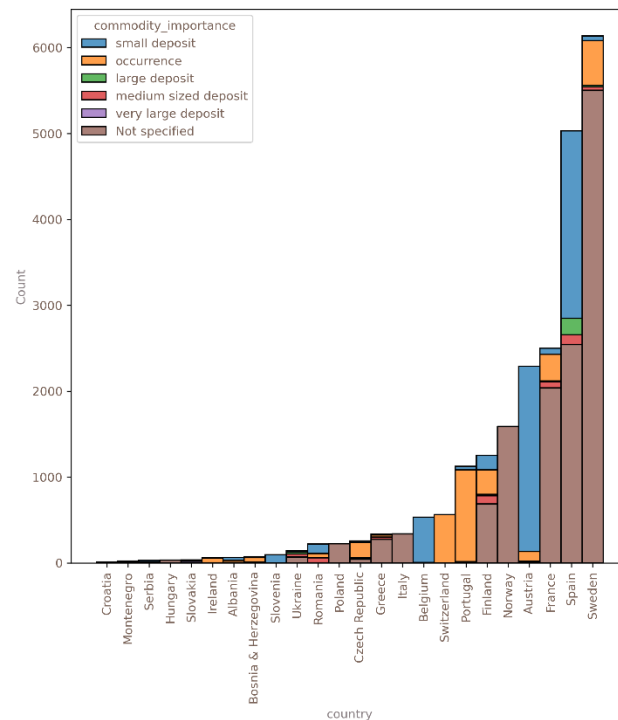


"MIN4EU harmonized dataset", and subsequently
"Critical raw material occurrence points 2023", has no
data from, e.g. Germany and the UK

CIRAN Where are the CRMs

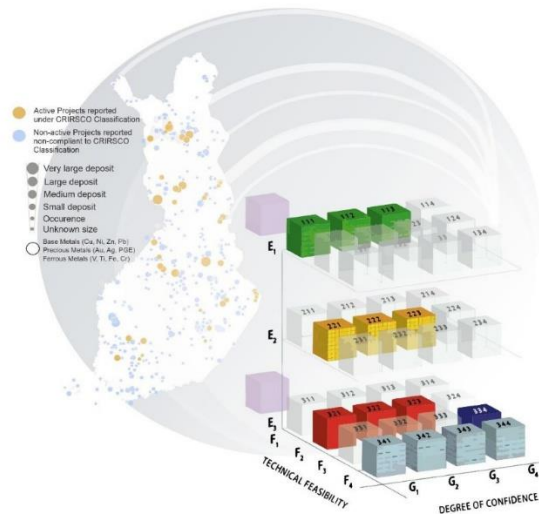


"MIN4EU harmonized dataset" heat map which shows concentrations of CRM occurrences across Europe



"MIN4EU harmonized dataset" importance column values. Note the high number of "Not specified" values, i.e., much work is still required to properly gather deposit size data

- Commercial projects need evaluate the projects through CRIRSCO templates which for Europe is PERC or similar CRIRSCO template – see resource classification chapter
- United Nations Framework Classification for resources (UNFC) is a classification schema for raw materials that requires specification of, among many other factors, size of deposits
- Aligning and providing data for UNFC is a pre-requirement for achieving “Strategic project” status under the Critical Raw Materials Act of the European Commission
- UNFC estimate will also be a requirement following the Critical Raw Materials Act
- Consequently, future raw material occurrence data can be expected to slowly get updated with UNFC data which enables more thorough analysis of the CRM inventory of Europe



Mineral resources of Finland classified according to the UNFC code

Pasi Eilu, Taina Eloranta, Janne Hokka

Front page of Geological Survey of Finland report with UNFC classification information (<https://hakku.gtk.fi/fi/publications?id=22135>)

Can you find and mine critical raw materials anywhere in Europe?

Is there a European data platform for geological resources?

Where can your national data repository on critical raw materials be found? Make a search!

What resource classification instruments are mainly in use?

CIRAN Suggested reading

- European Geological Data Infrastructure (EGDI), 2024. European Geological Data Infrastructure platform. URL <https://data.geus.dk/egdi>.
- S&P Global, n.d. S&P Capital IQ Pro Global Mining Intelligence. URL <https://www.spglobal.com/marketintelligence/en/campaigns/metals-mining>.
- Geological Survey of Finland (GTK). URL <https://gtkdata.gtk.fi/MDaE/index.html>
- GSEU Mineral Resource team, EuroGeoSurveys Mineral Resources Expert Group, 2024. Critical raw materials Hard rock deposits of Europe. URL https://tupa.gtk.fi/kartta/erikoiskartta/ek_102.pdf
- Eilu, P., Eloranta, T., Hokka, J., 2022. Mineral resources of Finland classified according to the UNFC code (Open File Work Report No. 8/2022). Geological Survey of Finland, Espoo, Finland. URL <https://hakku.gtk.fi/fi/publications?id=22135>



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