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Towards subsurface geospatial planning in Europe

GSEU WP6 Workshop: Towards a 3D Geomodel of Europe
Webinar, 12-13 October 2026

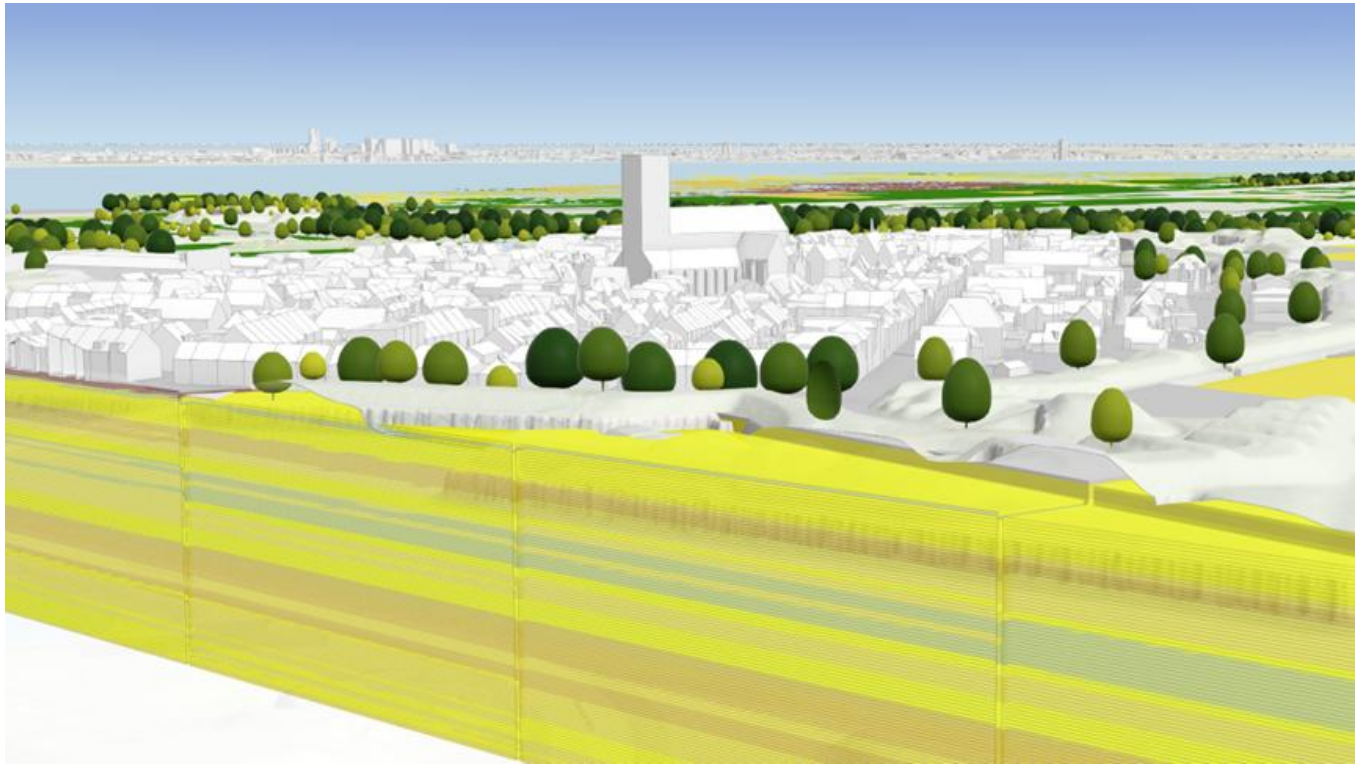
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The Geological Surveys of Europe

Introduction

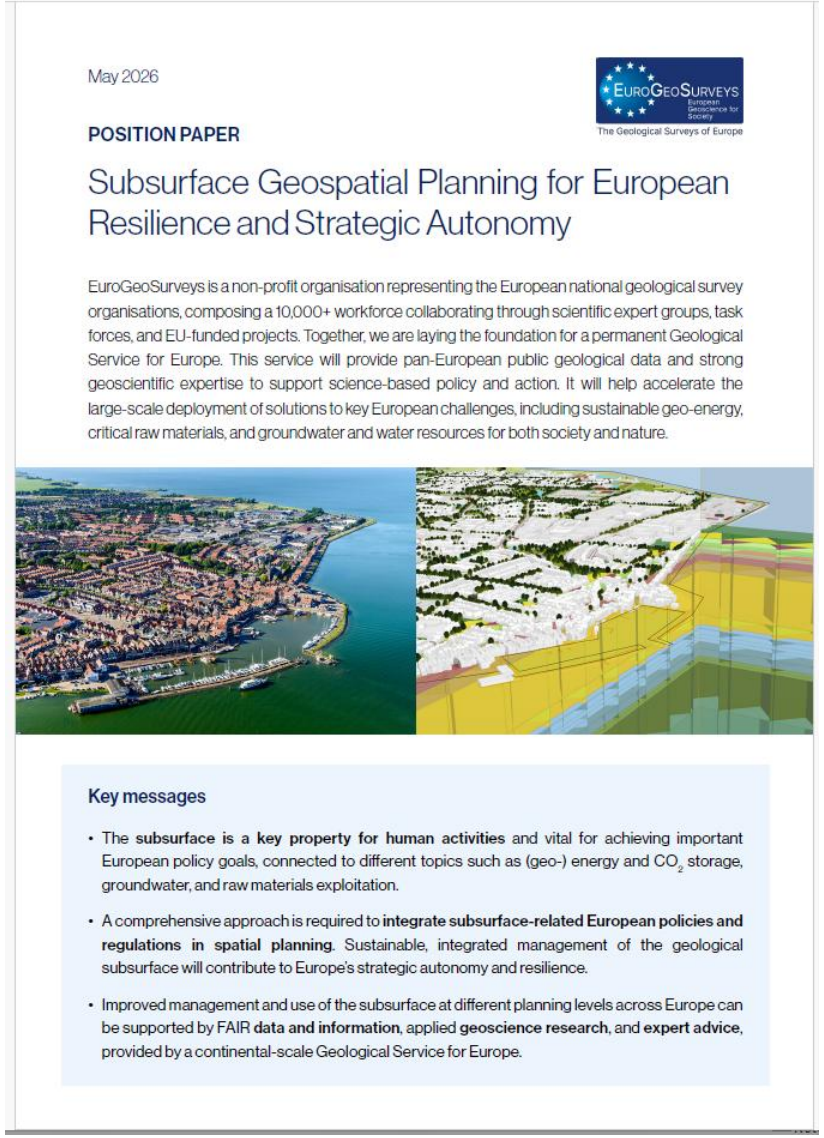
- Explore ‘EU subsurface spatial planning policy use case’ for 3D Geomodel Europe
- From EGS Taskforce “Subsurface Integrated Spatial Planning”

  …to explore the need for a *Subsurface Spatial Planning Directive*
- Position Paper “Subsurface Geospatial Planning for European Resilience and Strategic Autonomy”
- Requirements 3D Geomodel Europe



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GSE Position Paper on EU spatial planning



May 2026

EuroGeoSurveys
The Geological Surveys of Europe

POSITION PAPER

Subsurface Geospatial Planning for European Resilience and Strategic Autonomy

EuroGeoSurveys is a non-profit organisation representing the European national geological survey organisations, composing a 10,000+ workforce collaborating through scientific expert groups, task forces, and EU-funded projects. Together, we are laying the foundation for a permanent Geological Service for Europe. This service will provide pan-European public geological data and strong geoscientific expertise to support science-based policy and action. It will help accelerate the large-scale deployment of solutions to key European challenges, including sustainable geo-energy, critical raw materials, and groundwater and water resources for both society and nature.

Key messages

- The **subsurface is a key property for human activities** and vital for achieving important European policy goals, connected to different topics such as (geo-) energy and CO_2 storage, groundwater, and raw materials exploitation.
- A comprehensive approach is required to **integrate subsurface-related European policies and regulations in spatial planning**. Sustainable, integrated management of the geological subsurface will contribute to Europe's strategic autonomy and resilience.
- Improved management and use of the subsurface at different planning levels across Europe can be supported by FAIR **data and information**, applied **geoscience research**, and **expert advice**, provided by a continental-scale Geological Service for Europe.

- "Subsurface geospatial planning for European resilience and strategic autonomy"
- Target groups: EU, national, regional and local policy makers
- Inventory 'subsurface' EU policies and regulations (CRMA, NZIA, WFD, …)
- Alignment with GSE strategy supporting subsurface integrated spatial planning:
  - Data and Information
  - Research
  - Advise
- Examples

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‘Subsurface’ EU policies and regulations



EU Legislation / policy	Goal
Critical Raw Materials Act (CRMA)	Enhance self-sufficiency of mineral raw materials in the EU
Water Framework Directive (WFD)	Prevent and reduce pollution, promote sustainable water use, protect and improve the aquatic environment and mitigate the effects of floods and droughts
Groundwater Directive (GWD)	Protect groundwater against pollution and deterioration
European Water Resilience Strategy (EWRS)	Ensure secure, clean, and affordable freshwater supply
Urban Wastewater Treatment Directive	Manage wastewater and adapt to climate change, supporting also nature-based solutions
Net Zero Industry Act (NZIA)	Achieve carbon neutrality by 2045
Soil Monitoring Law	Specify required conditions for healthy soils through evaluation and monitoring of soils
Nature Restoration Law	Preserve and increase biodiversity and landscape resilience
INSPIRE	Provide standardised geospatial information for sustainable development, public administration, public safety, and environmental decision-making.
Marine Spatial Planning Directive	Promote the sustainable growth of the EU’s Blue Economy, development of marine areas and use of marine resources
Carbon Capture and Storage (CCS) Directive	Provide a regulatory framework for CCS, and support to competent authorities and storage site operators so that CO_2 can be safely stored underground.
Renewable Energy Directive (RED)	Speed up the EU’s clean energy transition by increasing the share of renewables in its energy mix (geothermal energy)

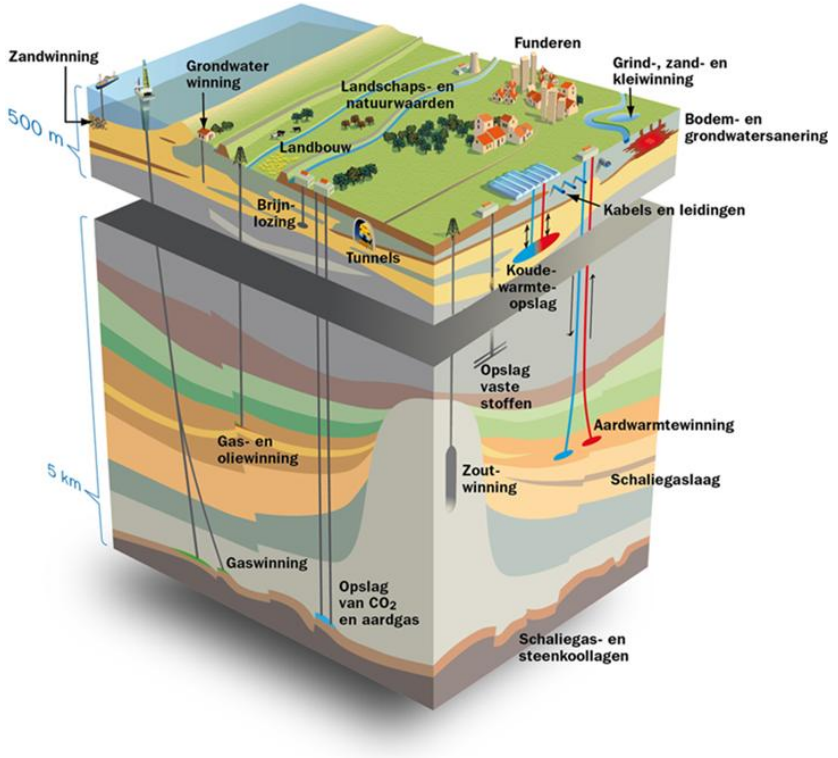
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Subsurface impacts and interferences

- Drinking water ⟷ energy storage
- Geothermal potential ⟷ urban development
- Industrial development ⟷ soil/groundwater quality
- Groundwater quality ⟷ Agriculture, biodiversity
- Mineral occurrences ⟷ land use claims
- Underground infrastructure ⟷ water resilience
- CCS development ⟷ Marine spatial planning



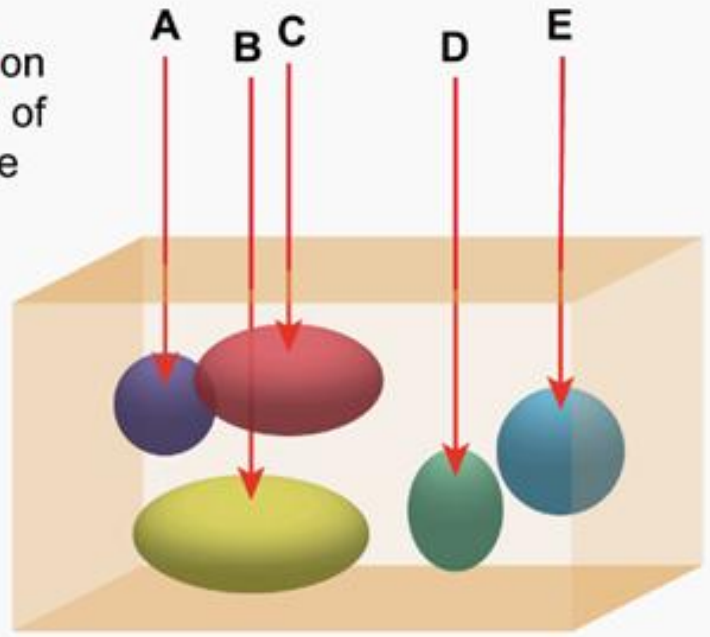
Change focus

EU policies and regulations:
- Energy Transition – New Green Deal
- Critical Raw Materials Act (CRMA)
- Net Zero Industry Act (NZIA)
- Water Framework Directive (WFD)
- Soil Monitoring Law
- Nature Restoration Law
- INSPIRE
- Carbon Capture and Storage Directive (CCS)
- Marine Spatial Planning Directive

Current

EU policies and regulations

'Siloed' focus on certain aspects of the subsurface



'one topic' decisions

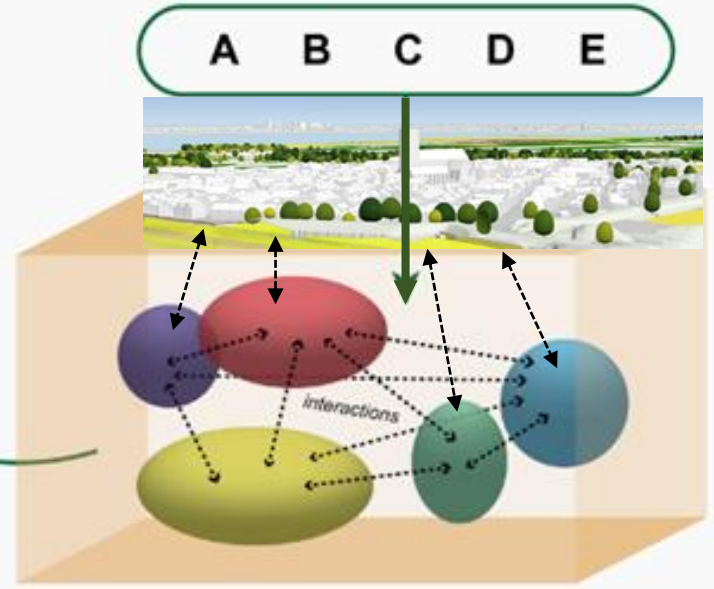
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Proposed

EU policies and regulations **integrated in SISP**

Subsurface integrated spatial planning (SISP)

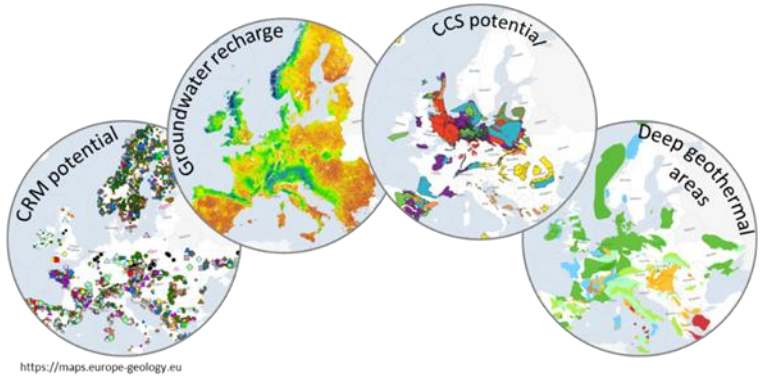
Geoscience data and information



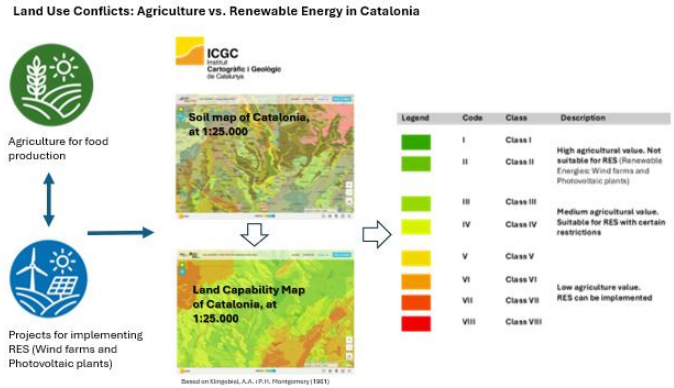
Comprehensive decisions

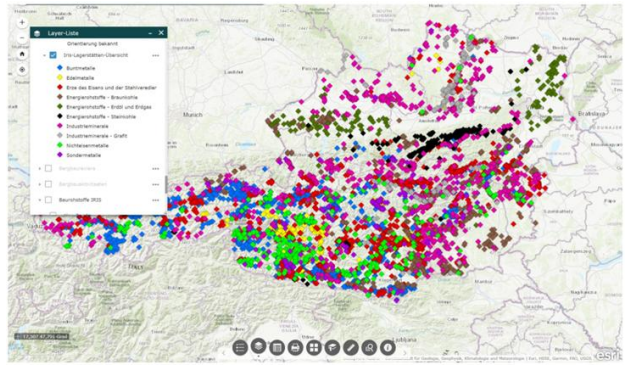
Examples

- **Pan-European** information to support European policy making for (competing) **subsurface resources**



- **Land use conflicts:** Agriculture vs. renewable energy in Catalonia





- **The Austrian Mineral Resources Plan**



- **Key Register for the Subsurface**

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Recommendations

- Develop EU policy to advance subsurface geospatial planning:
  - Stimulate **interaction** and consultation between different EU-departments
  - develop **'holistic' EU-policy strategies**, frameworks, regulations for competing/ interfering subsurface activities
  - Integration of subsurface related EU regulations in **regional planning practices**
- Invest in geoscientific ('subsurface') research
- Develop capacity for expert policy advise and decision support
- Sustainable provision of geoscientific data and information



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Conclusion

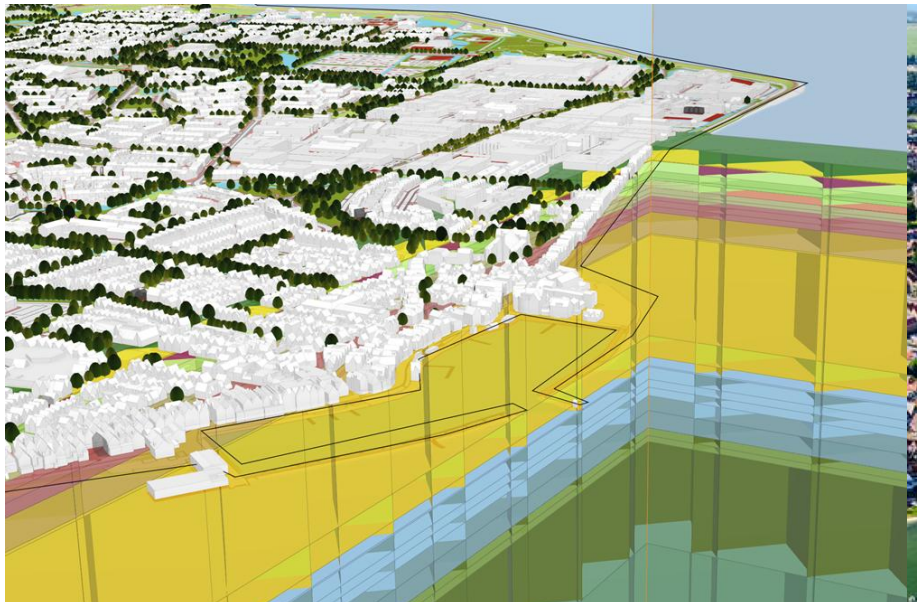
European spatial planning is non-existent (also not for subsurface), but…

- Multiple EU regulations from different policy domains interfere in subsurface space
- Implementation European ‘subsurface’ regulations takes place at national, regional and local level
- Spatial planning of subsurface is clearly 3D/ (4D) topic, like geo(-hydro-)logy

Requirements ‘EU 3D Geomodel’

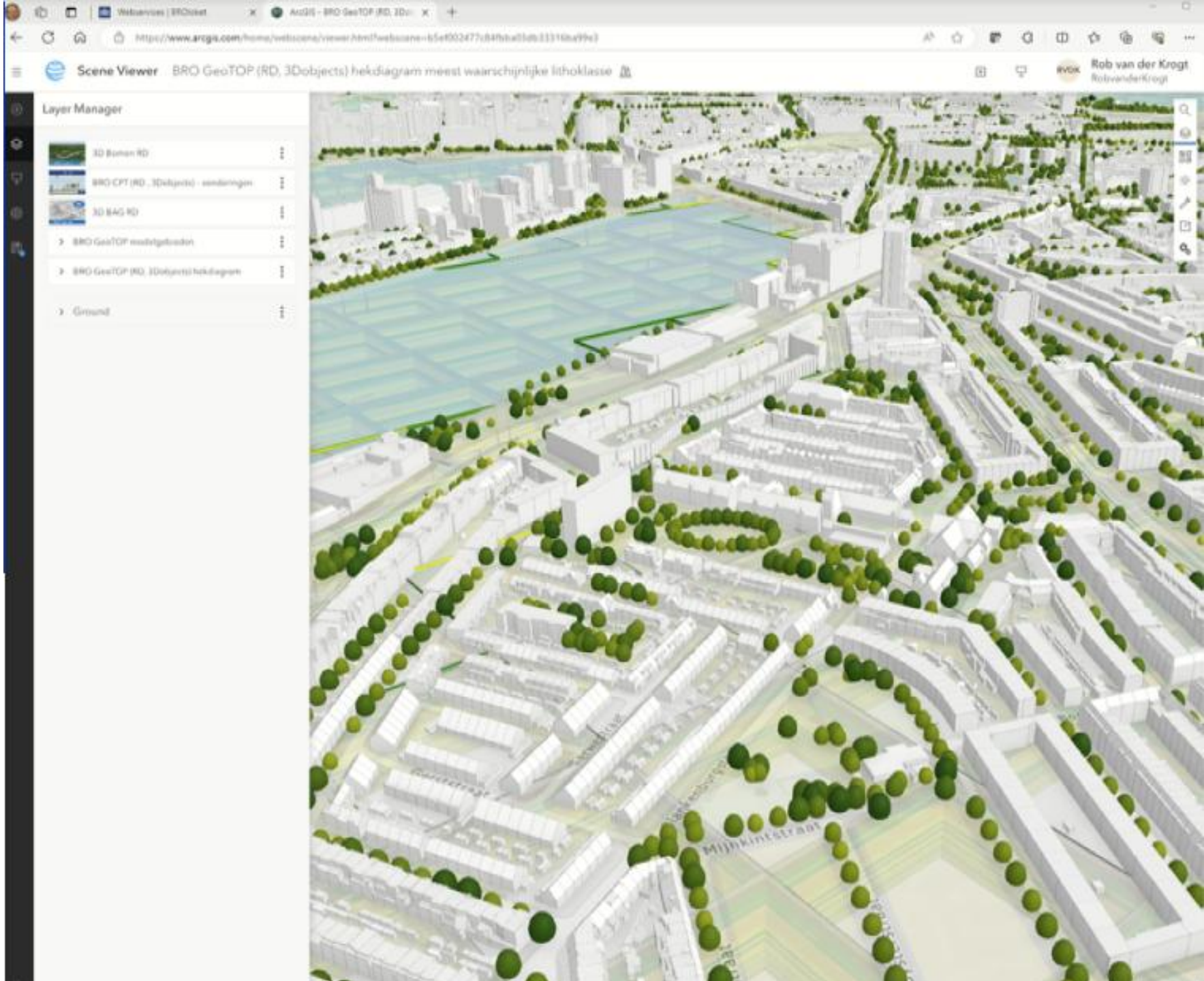
‘3D European Geoscience information’, that facilitates:

- …interaction/ integration EU policies different domains
- …communication/ visualization subsurface properties, processes, interactions
- …implementation EU regulations in ‘subsurface planning’ at national, regional and local level
- …access to local/ regional information, from an EU perspective
- …combined evaluation of 3D Geoscience and spatial/ physical planning information
- …evaluation/ comparison of spatial decision making and impacts across Europe





3D View geology and surface planning



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Thank you for your attention

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