

OPEN PUBLICATION OF THE VOXEL MODEL OF THE SHALLOW SUBSURFACE OF ANTWERP FOR A SUSTAINABLE DEVELOPMENT OF THE URBAN AREA

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Since September 2022 the Department of Environment & Spatial Development of the Flemish government manages and publishes the near-surface geological voxel model of the Antwerp (Flanders, Belgium) urban area and its port, modelled by VITO. The major infrastructure works in that area offered new field data acquisitions and the opportunity to refine the geological interpretations. These major infrastructure works challenge environmental policy officers to develop a good understanding of the composition and potential applications of the subsoil. The voxel model includes these new data and geological insights and supports knowledge building of the subsurface.

Publication of the research results according to the FAIR-principles is key to the department: The model is published on the FRIS research portal, Flanders Research Information Space, linked with the institutional repository. This portal stimulates re-use of the publicly funded scientific data according to the Flemish Free Open Data License.

The model is also published on the Flanders Soil and Subsoil database (DOV), the portal managing multi-disciplinary subsurface (INSPIRE compliant) datamodels, tools and applications. This portal already hosts two voxel models in a Natural Resources Viewer, focusing on the occurrence and re-use of loam, gravel and coarse sand outside of licensed extraction pits.

The new urban voxel model is published in an open csv data file on a content oriented download page and

in a 2D, publicly accessible and user friendly online viewer, allowing combination with other thematic data layers. Through different functionalities, the thematic viewer enables geological, hydrogeological and geotechnical prospection and inclusion of subsurface data in geothermal projects, temporary dewatering, re-use of excavated soil, stability studies, infiltration projects etc. The variation in the lithological composition can be consulted at a point location or along a vertical profile in the users' area of interest. Also, volumes of the lithologies of interest can be calculated for any area and depth range. Specific parameters of importance for geotechnical engineering studies, such as glauconite content and carbonate content, presence of stony layers and shell beds, are given extra attention during the modelling of the geological layers. This compositional information is also given when querying the voxel model results. This open data approach, in combination with tailored made and easy to use functionalities, raises subsurface knowledge for policy makers, industry and citizens and facilitates a more sustainable use and management of the subsurface in the urban area.

DOV is taking steps to make the voxel dataset available in a machine-readable format, to be compliant with the European Commission's implementing regulation 2023/138 of high-value datasets. The publication on the research portal and on the DOV increases the impact of the model results and of both types of portals.