Estonia
Estonian Land Board

Enriching Estonia's national 3D dataset with geological information

"Our life depends heavily on subsurface resources, primarily groundwater and minerals; geothermal energy is used ever more widely. High-quality aggregates, along with adequate knowledge about the site's geological layout and ground stability, are crucial for the rapidly evolving construction sector. While exploiting the resources, we must avoid contaminating the underground space. Coherent geological data visualised in 3D is enabling us to tackle these challenges as brand-new workflows become available for data analysis and decision-making."

Tambet Tiits
Director General,
Estonian Land Board

Estonia can now be viewed from a different perspective thanks to a new 3D web application service developed by the Land Board.

The Estonian Land Board's Geo3D strategy (2023-2026) recognises that fusing geological expertise with the visible world representation is one key to enabling more sophisticated planning procedures.
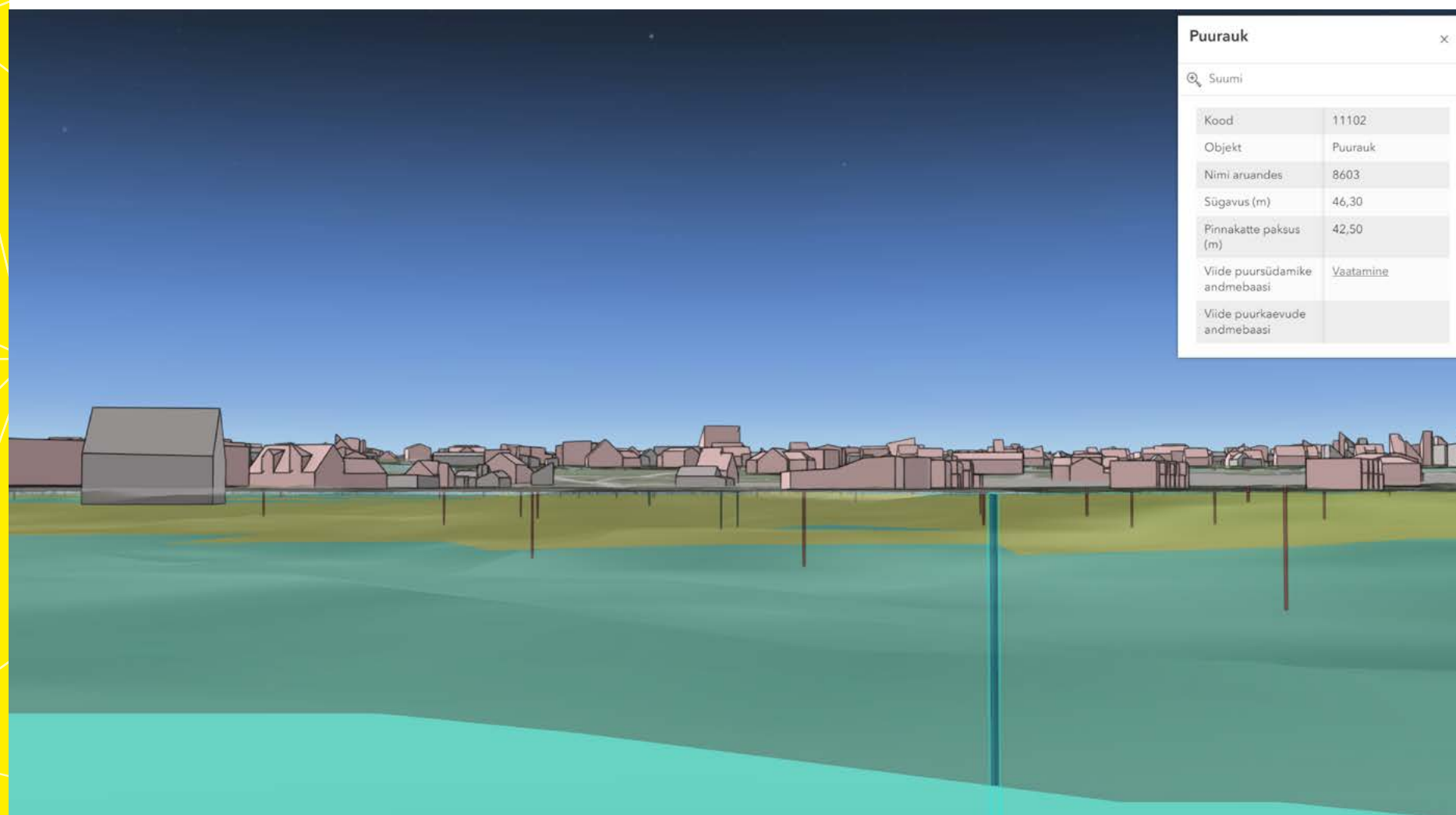
The new 3D Geology app supports underground spatial planning by offering a more realistic insight into the subterranean realm. Currently, the prototype displays LOD2 buildings, three types of terrain models (Digital Elevation Model (DEM), sedimentary bedrock relief, and crystalline basement relief), subsurface successions, cylindrical boreholes, and geotechnical sites (extruded downwards).

Previously the Land Board's 3D mapping and modelling activities were related to buildings and other aboveground features, with the first public 3D web application launched in 2021.

New layers and user functionality are continuously added to both apps.

Visit the
3D Geology app

Benefits

• Delivers quick overview of the geological successions and study depths.

• Provides new tools for subsurface spatial analysis.

• Enables better groundwater yield, flow, and vulnerability estimations.

• Supports volume calculations, virtual boreholes, and cross sections used in mineral exploration and mine planning.

• Demonstrates preliminary geotechnical characteristics, allowing slope and abandoned mine stability predictions.

• Favours environmental impact assessment and continuous monitoring to reduce the risks of geological hazards.

• Allows more precise calculations of the infrastructure developing and running costs.

• Serves as a basis for future geological studies by integrating 2D and 3D aboveground and underground datasets.

LOD2 buildings, geological succession (coloured layers denote different formations), and boreholes (with an attribute query of a 46.3 m deep borehole) as shown in the app.