



# 3D geological models in the 3D viewer



Rialtas na hÉireann  
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**Geological Survey**  
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## Document Information

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Prepared By	Date	Comment
Beatriz Mozo Lopez	09/07/2024	

Reviewed by	Date	Comment

Approved By	Date	Comment
		Geological Survey Ireland

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Version 1	09/07/2024	First draft of the manual	Beatriz Mozo Lopez
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# 1. Introduction

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This document gives a small description of all the 3D models that are in the 3D geological viewer. There is also a table that summarises the datasets use for the creation of each of the models.

Depending on their intended application and audience, 3D models are developed at different scales and to different depths below the ground surface. The software and generalised datasets used to create individual models are summarised in [Table 1](#).



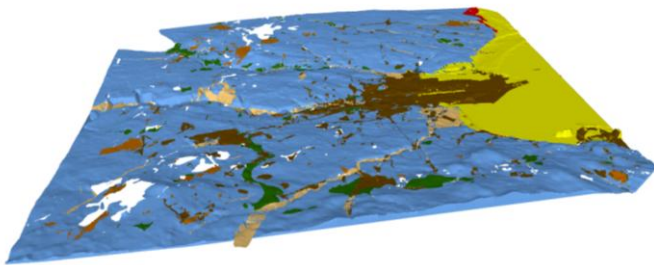
## 2. Quaternary Models

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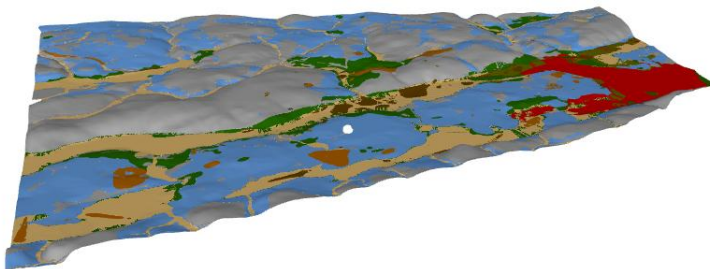
For the geotechnical engineering and construction sectors, 3D models can offer a key element of geotechnical risk management by identifying areas requiring more site investigation. Our Quaternary 3D models may help stakeholders understand and characterise urban geology and can have basement impact assessment, SUDS, flooding, and subsurface management applications.

There are five quaternary models.

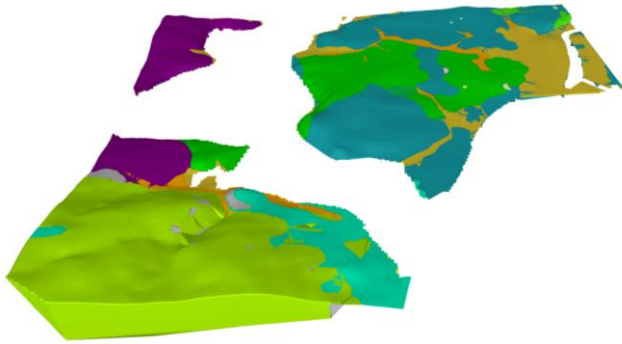
- **Dublin city.** This model is an interpretation of our 1:50,000 scale Quaternary map of Dublin using a subset of the National Geotechnical Borehole Database and was created with Subsurface Viewer software.



- **Cork city.** This model is an interpretation of our 1:50,000 scale Quaternary map of Cork using a subset of the National Geotechnical Borehole Database and was created with Subsurface Viewer software.



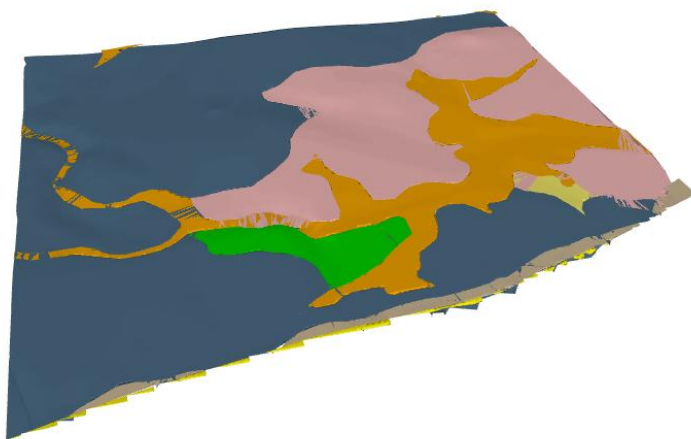
- **Wexford.** This model is an interpretation of our 1:50,000 scale Quaternary map of Co Wexford using a subset of the National Geotechnical Borehole Database and was created with Subsurface Viewer software.



- **Rosslare.** This model is an interpretation of our 1:50,000 scale Quaternary map of Co Wexford using a subset of the National Geotechnical Borehole Database and was created with Subsurface Viewer software.



- **Kilmore.** This model is an interpretation of our 1:50,000 scale Quaternary map of Co Wexford using a subset of the National Geotechnical Borehole Database and was created with Subsurface Viewer software.



## 3. Bedrock Models

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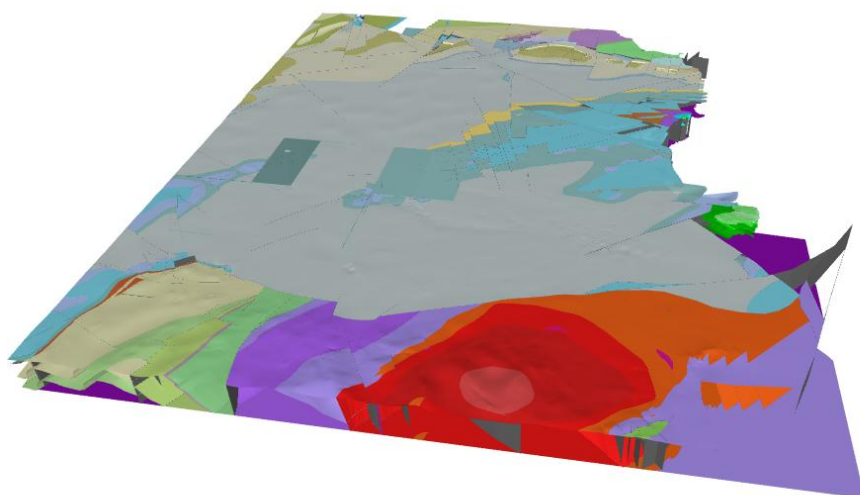
The bedrock models are an interpretation of the bedrock of different areas of Ireland and at different depths.

Some of the bedrock models built in house are key to the spatial assessments of the GeoERA Hotlime project and GeoConnect<sup>3d</sup>.

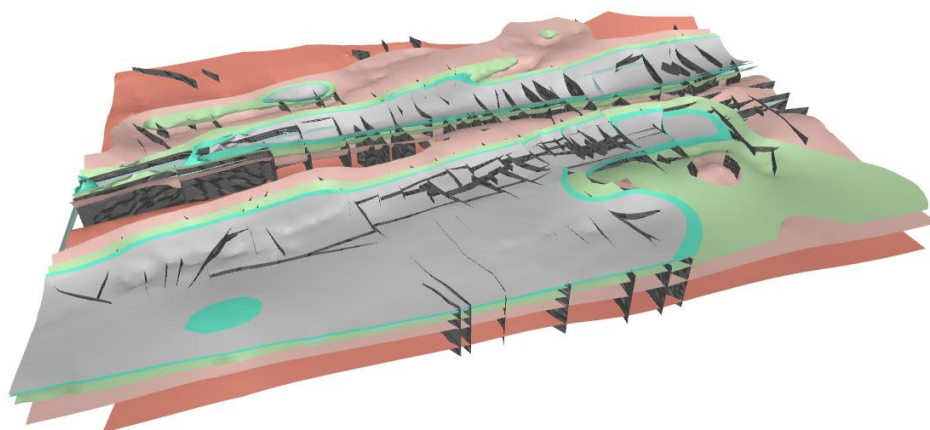
GSI host models that have been developed in collaboration with academic institutions and other geoscience organisations like iCrag, Trinity College Dublin and The Swiss Institute for Speleology and Karst Studies and models done by third parties like Arup

There are seven bedrock models:

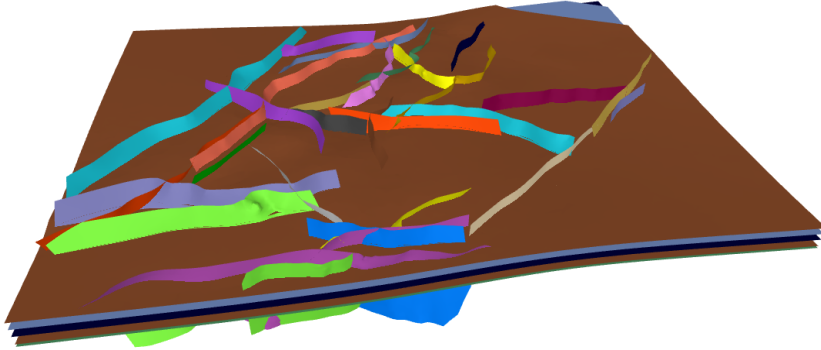
- **Dublin Geourban.** It is an interpretation of our 1:50,000 scale bedrock map of Dublin, using cross-sections, outcrop, and borehole data. It was created with GOCAD-SKUA software. It was developed as part of the GeoEra funded Hotlime project.



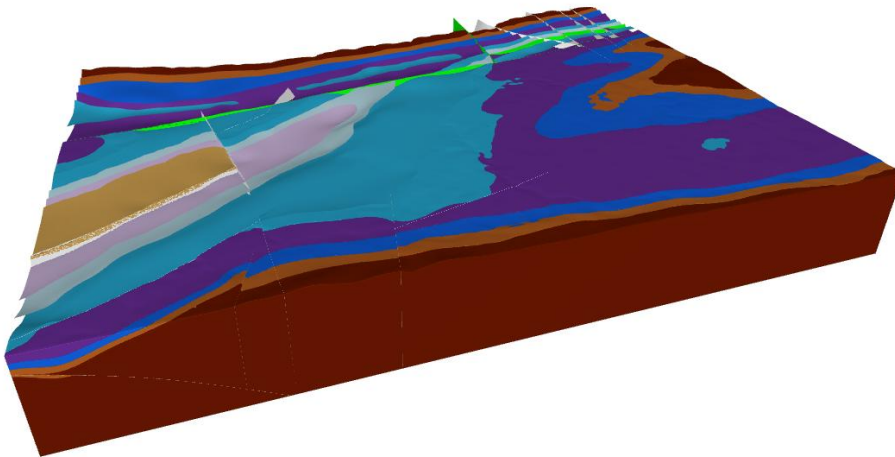
- **Cork Geourban.** The Bedrock 3D model of Cork is an interpretation of our 1:50,000 scale bedrock map of Cork, using cross-sections, outcrop, and borehole data. It was created with GOCAD-SKUA software.



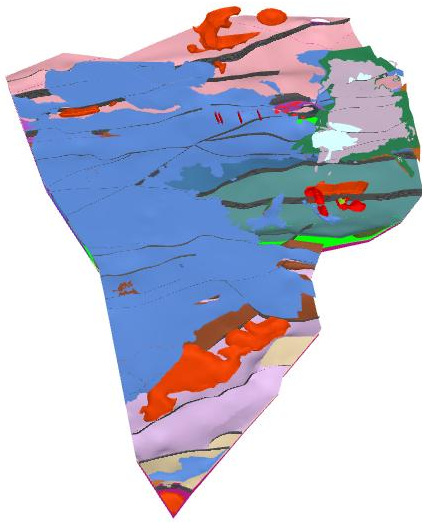
- **Lough Allen.** This model is an interpretation of our 1:50,000 scale bedrock map of the Lough Allen area. This model uses the fault network developed by an iCrag funded research project. It was developed as part of the GeoEra funded Hotlime project.



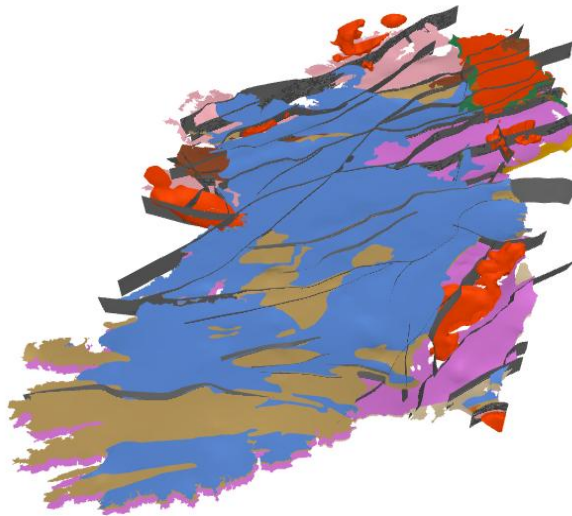
- **North Cork.** The Bedrock 3D model of North Cork is an interpretation of our 1:100,000 scale bedrock map of North Cork, using cross-sections, outcrop, and borehole data. It was created with Geomodeller software. It has been developed in collaboration with Trinity College Dublin and The Swiss Institute for Speleology and Karst Studies.



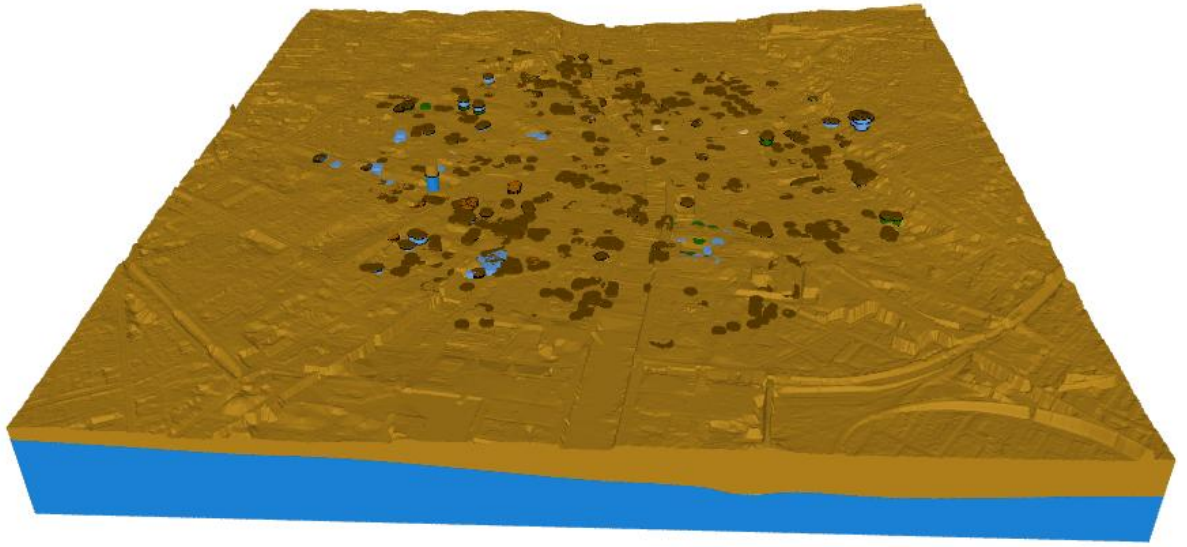
- **Deep Geology 3D.** is an interpretation of our 1:500,000 scale bedrock map of Ireland, using cross-sections, and the 500,00k bedrock map.



- **Geoconnected3D.** Nationwide 3D bedrock model based on the GSI 1:1M geological map, geological cross sections from the GSI 1:100k maps and drilling. This model uses the structural framework methodology developed as part of the GeoEra Geoconnect3d project.



- **Arup/TII Dublin Calp model.** Model of the Calp limestone in Dublin City Centre, produced by Arup for TII with ground information data collected from three large scale infrastructure projects, namely MetroLink, Metro North, and DART Underground along with supplementary GSI and in-house Arup data. The Calp model displays the depth to and weathering characteristics of the Calp Limestone in the city centre.



## 4. Summary of the models in the viewer

This table summarises the models that are in the 3D geological viewer.

Model name	Source	Software used	Generalised Datasets used	Year created
Dublin Quaternary	GSI Geological Mapping programme	Subsurface Viewer	Shapefile of the National Quaternary Sediments 1: 50,000 National Geotechnical Database boreholes, DTM	2013
Cork Quaternary	GSI Geological Mapping programme	Subsurface Viewer	Shapefile of the National Quaternary Sediments 1: 50,000 National Geotechnical Database boreholes, DTM	2013
Co.Wexford models	GSI Geological Mapping programme	Subsurface Viewer	Shapefile of the National Quaternary Sediments 1: 50,000 National Geotechnical Database boreholes, DTM	2021
Dublin Bedrock	GSI Geological Mapping programme	GoCAD Skua	1:50k bedrock map, DTM, Boreholes (GSI, Open file, EMD), Shapefiles of the bedrock map, cross sections of the 50k map	2015
Lough Allen (input from iCRAG)	GSI Geological Mapping programme and iCRAG	GoCAD Skua	1:50k bedrock map, fault network developed by iCrag, bedrock boreholes.	2021
Bedrock Geology of North Cork	Trinity College Dublin, GSI Groundwater & Geothermal Unit and The Swiss Institute for Speleology and Karst Studies	Geomodeller	1:50k bedrock geology map, cross-sections, outcrop and borehole data, karst database	2016

Cork Geourban	GSI Geological Mapping programme	GoCAD Skua	1:50k bedrock map, DTM, Boreholes (GSI, Open file, EMD), Shapefiles of the bedrock map, cross sections of the 50k map	2016
Deep 3D Geology	GSI Geological Mapping programme	GoCAD Skua	1:1M bedrock map, geological cross sections from 1:100K bedrock map, bedrock boreholes.	2015
GeoConnect <sup>3d</sup>	GSI Geological Mapping programme	GoCAD Skua	1:1M bedrock map, geological cross sections from 1:100K bedrock map, bedrock boreholes.	2021
Arup/TII Dublin City Calp model	Arup	Leapfrog	Ground information data collected from three large scale infrastructure projects, namely MetroLink, Metro North, and DART Underground along with supplementary GSI and in-house Arup data.	2026

Table 1 Software and data used to produce GSI's 3D models.