



From paper reports to 3D models for all – Irish geodata in urban settings

Sophie O'Connor and Beatriz Mozo Lopez
Geological Survey Ireland (sophie.oconnor@gsi.ie)

Communicating the subsurface is a challenge. Geoscientists are trained to visualise what is underneath them and to see the subsurface in 3D, whereas planners, policy makers and the people impacted by both (i.e., the public) are not.

Over many years, Geological Survey Ireland has developed several services in different formats to help pull together information about the subsurface, to present it in an organised manner and to portray it in three dimensions. Underpinned by the organisation's commitment to open data and re-use of public sector information, these services are:

- National Geotechnical Borehole Database
- Geotechnical Viewer
- 3D models and model viewer

Assembled over several decades, the National Geotechnical Borehole Database has expanded with the submission of ground investigations that have been carried out ahead of development projects by the private and public sectors. It acts as a secure, national repository and is a valuable resource for:

- planning and optimising future ground investigations;
- understanding the subsurface and urban geology;
- for helping construct 2D and 3D models.

For ease of access, data and reports from the National Geotechnical Borehole Database are published on the Geotechnical Viewer, freely available to all. The online Geotechnical Viewer displays ground investigations as digitised, georeferenced polygons, with an associated downloadable report in .pdf format. Several thousands of ground investigations projects are presented.

With time and technical and software advances, Geological Survey Ireland has produced urban 3D geological models using the National Geotechnical Borehole Database. A primary function of these models is visual communication of the subsurface to geoscientists, professionals from other disciplines, researchers, students and members of the public.

Our urban 3D models can assist with:

- Resource (water and geothermal) mapping;
- Understanding and characterising urban geology, with potential relevance for basement impact assessment, Sustainable Drainage Systems (SuDS), flooding and, subsurface management;
- Optimising geotechnical investigation, design and construction;
- De-risking human activities from impact of our subsurface environment;
- Investigating impact of human activities on environment around and beneath us, e.g., dewatering;
- and informing policy, planning, protective and climate adaptation measures.

3D geological models allow everyone to visualise the subsurface and can be used to communicate the geoscience behind policy, thereby making defensible decisions visible. To ensure the 3D models are easily accessible by all, Geological Survey Ireland have a 3D model viewer where no software or zip file downloads are needed. The 3D model viewer has Interactive and Augmented Reality functionality.

Recognising the importance of freely available, accessible data for non-geoscientists, Geological Survey Ireland has created and smoothed pathways for stakeholders to access and visualise geological data in urban settings.