OR/15/069 Evolution of the national bedrock model

The initial build covered England and Wales (Figure 1) and was funded by the Environment Agency of England and Wales (EA) in 2009-10 (Schofield et al. 2012). In 2010-12 BGS funded the extension of the network of sections to Scotland, whilst additional infill sections were added in England and Wales and cross-sections were aligned along the coast to give the overall model the familiar boundary of the British coastline. Sections in northern Scotland were continued across the Minch to the Outer Hebrides and similarly to Orkney, but the coverage was not extended at the time to include Shetland or Northern Ireland.

Figure 1 The initial fence diagram for England and Wales as delivered to the EA in 2010 (from Schofield et al. 2012).

In 2012 additional funding from the EA enabled a few further sections to be inserted in England and Wales, whilst many others were deepened in key sedimentary basins with potential shale gas source rocks. This was part of a project to design a risk screening tool for the possible impact of shale gas activities on aquifers (Mathers et al. 2012a). The final model produced was the GB3D v2012 dataset (Figure 2). This model covered the onshore area of Great Britain (England, Scotland and Wales) and the Isle of Man and comprised 121 cross-sections with a total linear length exceeding 20,000 km, built to depths varying between 1.5 and 6 km.
In 2014 funding from Radioactive Waste Management Directorate (RWMD) resulted in two significant advances in the development of the GB3D model. Firstly, a study extended the GB3D_v2012 dataset by the incorporation of a few additional sections in England and Wales and the extension and realignment of many sections to include 305 deep stratigraphic boreholes (Mathers et al. 2014b). Subsequently, there was a study to provide a nearshore extension of the fence diagram at least 20 km offshore (Figure 3), with an additional 46 sections and 32 key offshore wells. The updated GB3D model was released in February 2015, accompanied by brief accounts of the regional geology of England, Wales and Northern Ireland, also funded by RWM Ltd., which were published in 2014 and are available for download at http://www.bgs.ac.uk/research/ukgeology/regionalGeology/home.html.

*Figure 2* The completed GB3D_v2012 model for Great Britain from the southwest.
The current study, funded by RWM Ltd, extends the fence diagram model to Northern Ireland and its surrounding nearshore area, to provide a network of subsurface information comparable to England and Wales, released as UK3D_v2015.

At all stages the model has been constructed using the Geological Surveying and Investigation in 3D software (Kessler & Mathers, 2004[4]; Kessler et al. 2009[5]). The methodology and sources used in the construction of the GB3D dataset have been thoroughly documented by Mathers et al. (2012b[3], 2014a[6] and b[7]) and in this report.

References


Category:

- OR/15/069 The construction of a bedrock geology model for the UK: UK3D v2015