



Integrated geoscience data visualisation and exploration – GeoVisionary

Ricky Terrington, Bruce Napier, and Luz Ramos

British Geological Survey, Keyworth, Nottingham, United Kingdom (rte@bgs.ac.uk)

The British Geological Survey (BGS) provides a wide variety of options for communicating and delivering geoscience data, information and knowledge to external partners and the public. These include the traditional reports, maps and GIS data products. However since the early 2000's, the BGS has invested significant resources into developing its 3D geosciences knowledge base which has lead to advancements in visualising geoscience data. This in turn has lead to the improvement in the communication of surface and subsurface data, which has, in turn, led to far larger volumes of data that challenged visualisation technology.

The BGS has developed a number of applications and exports to feed into this 3D environment such as those commonly used which include 3D PDFs (Adobe Acrobat), 3D shapefiles (ESRI) and KML/KMZ (GoogleEarth files). Bespoke software such as GroundhogTM and the LithoFrame Viewer has also been developed to help the user analyse 3D geology through synthetic boreholes and cross-sections. All of the above mentioned have limitations when visualising this type of 3D data due to the integration of data, file sizes and the limitations of the software applications.

The most advanced of all of these 3D applications that have been developed is GeoVisionary. Initially, the BGS commissioned UK Virtual Reality specialists, Virtualis Ltd., to create an immersive 3-dimensional visualisation and interpretation software environment to capture linework and descriptive information in a virtual 3D environment either on their desktop PC or in specialised 3D suites, replicating the work undertaken by field geologists. GeoVisionary has since developed into an environmental application for visualising all different types of subsurface and surface data while suffering none of the limitations of other applications due to its ability to stream terabytes of data seamlessly.

GeoVisionary is able to integrate a wide variety of GIS and CAD based data with the highest resolution elevation models available. Advancements have been made with regards to being able to visualise large complex datasets such as voxel grids, point clouds and time series data for property and process modelling. For example, this has been particularly important for hydrogeologists for visualising variation in the depths of water tables over time.

GeoVisionary provides dynamic 3D/4D visualisation of both natural environmental data with human infrastructure. Subsequently the visualisation and analysis of this data has improved, and so too has the communication of the complexities of geoscience data to stakeholders.