

Geological Spatial Database

A tool for capturing and visualising geological map data

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Onshore geology maps at a scale of 1:10 000 are created by land survey geologists from their field data, boreholes, mine plans and other data sources. Customer demands have grown for digital data in the form of computer-generated maps and Geographical Information System (GIS) data layers. A limited number of 1:10 000 scale maps are produced digitally by the drawing office. However, due to lack of resources, the majority are created manually by geologists. Digital data can be captured from manual compilations or the data can be compiled within a digital system, reducing the number of processes that

lead to a digital product. The requirement for a digital capture system for these data was easily identified.

At an early stage it was realised that surface geology should be captured in the form of geological data-sets, rather than cartographical information suitable only for paper map production. Subsequently, a digital system was designed that enabled spatial data to be captured in a GIS environment with its geological attributes stored in associated database tables. For example, an area of Middle Coal Measures in the Fife district is digitised as a polygon and the attached database table holds the infor-

mation that describes that polygon: stratigraphy — Middle Coal Measures; lithology — siltstone and sandstone.

The Geological Spatial Database (GSD) system is designed to enable geologists to capture their field data and supporting information in digital form to create an integrated data-set. It is an ArcView®-based system, additional programming has extended the basic software to give geological menus and data-entry forms. The system is designed to be easy to use, requiring minimal software training and enabling geologists to capture an enhanced data-set in the form of digital map data with geological attributes for use in GIS and surface modelling manipulations.

The data-sets generated by geologists are part of the corporate data holdings. The GSD uses corporate dictionaries to ensure standardisation of data-sets, and facilitates the creation of local project dictionaries based on the BGS Lexicon and Rock Classification Scheme. For example, a local dictionary of lithostratigraphy is created from which solid geology polygon attributes are selected.

Standard BGS symbol sets are available within the GSD and allow geologists to pick from the same symbol libraries as used for BGS map production.

Although the GSD was designed to enable geologists to digitise data recorded at 1:10 000 scale, it can be used to capture geological data at any resolution and adapted to incorporate other data types. The ability to overlay a number of different layers provides a powerful visualisation tool. Combinations of geological layers with data created in surface modelling packages and external data sources enables an immediate overview of the relationships between geology and man's activities in any one location. Example non-BGS data-sets include Ordnance Survey topography, Sites of Special Scientific Interest (SSSIs), land use, planning applications and extent of coal mining. The standard ArcView® GIS manipulation tools can then be used to create new thematic data layers to assist in decision making and generate new products to meet changing customer requirements.

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Attribute table for solid geology polygons for Fife (captured by Alison Sowerbutts).