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BGS·SIGMA - Digital mapping at the British Geological Survey

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Geological mapping methods have evolved significantly over recent decades and this has included the transition to digital field data capture. BGS has been developing methodologies and technologies for this since 2001, and has now reached a stage where our custom built data capture and map compilation system (BGS·SIGMAv2015) is the default toolkit, within BGS, for bedrock and superficial mapping across the UK and overseas. In addition, BGS scientists also use the system for other data acquisition projects, such as landslide assessment, geodiversity audits and building stone studies.

BGS·SIGMAv2015 is an integrated toolkit which enables assembly, interrogation and visualisation of existing geological information; capture of, and integration with, new data and geological interpretations; and delivery of digital products and services. From its early days as a system which used PocketGIS run on Husky Fex21 hardware, to the present day system, developed using ESRI's ArcGIS built on top of a bespoke relational data model, running on ruggedized tablet PCs with integrated GPS units, the system has evolved into a comprehensive system for digital geological data capture, mapping and compilation.

The benefits, for BGS, of digital data capture are huge. Not only are the data being gathered in a standardised format, with the use of dictionaries to ensure consistency, but project teams can start building their digital geological map in the field by merging data collected by colleagues, building line-work and polygons, and subsequently identifying areas for further investigation. This digital data can then be easily incorporated into corporate databases and used in 3D modelling and visualisation software once back in the office.

BGS is now at a stage where the free external release of our digital mapping system is in demand across the world, with 3000 licences being issued to date, and is successfully being used by other geological surveys, universities and exploration companies. However, we recognise that in some areas usage is restricted due to access to the software platform used by the system. To combat this, and to try and facilitate access to the system for all, BGS is now developing the BGS·SIGMA companion app. This will be developed for smart phones and tablets, and as well as enabling users of open source software to access to the system it will also facilitate rapid point based mapping, something BGS geologists are increasingly required to carry out.

Alongside this, BGS is also developing a set of modular, re-usable tools for data capture, storage, manipulation and delivery that will help organisations, which are just starting their journey into the digital world, to learn from our experiences and implement a system that is already fully integrated and can be customised for specific user requirements.