



Digital Field Mapping with the British Geological Survey

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The BGS•SIGMA project was initiated in 2001 in response to a major stakeholder review of onshore mapping within the British Geological Survey (BGS). That review proposed a significant change for BGS with the recommendation that digital methods should be implemented for field mapping and data compilation. The BGS•SIGMA project (System for Integrated Geoscience MApping) is an integrated workflow for geoscientific surveying and visualisation using digital methods for geological data visualisation, recording and interpretation, in both 2D and 3D. The project has defined and documented an underpinning framework of best practice for survey and information management, best practice that has then informed the design brief and specification for a toolkit to support this new methodology.

The project has now delivered BGS•SIGMA2012. BGS•SIGMA2012 is an integrated toolkit which enables assembly and interrogation/visualisation of existing geological information; capture of, and integration with, new data and geological interpretations; and delivery of 3D digital products and services. From its early days as a system which used PocketGIS run on Husky Fex21 hardware, to the present day system which runs on ruggedized tablet PCs with integrated GPS units, the system has evolved into a complete digital mapping and compilation system. BGS•SIGMA2012 uses a highly customised version of ESRI's ArcGIS 10 and 10.1 with a fully relational Access 2007/2010 geodatabase.

BGS•SIGMA2012 is the third external release of our award-winning digital field mapping toolkit. The first free external release of the award-winning digital field mapping toolkit was in 2009, with the third version (BGS-SIGMAmobile2012 v1.01) released on our website (<http://www.bgs.ac.uk/research/sigma/home.html>) in 2013. The BGS•SIGMAmobile toolkit formed the major part of the first two releases but this new version integrates the BGS•SIGMAdesktop functionality that BGS routinely uses to transform our field data into corporate standard geological models and derivative map outputs.

BGS•SIGMA2012 is the default toolkit within BGS for bedrock and superficial geological mapping and other data acquisition projects across the UK, both onshore and offshore. It is used in mapping projects in Africa, the Middle East and the USA, and has been taken to Japan as part of the Tohoku tsunami damage assessment project. It is also successfully being used worldwide by other geological surveys e.g. Norway and Tanzania; by universities including Leicester, Keele and Kyoto, and by organisations such as Vale Mining in Brazil and the Montana Bureau of Mines and Geology. It is used globally, with over 2000 licenses downloaded worldwide to date and in use on all seven continents.

Development of the system is still ongoing as a result of both user feedback and the changing face of technology. Investigations into the development of a BGS•SIGMA smartphone app are currently taking place alongside system developments such as a new and more streamlined data entry system.