



# BGS serves up data-to-go

The British Geological Survey (BGS) is developing innovative ways to open up access to its geospatial data. Wayne Shelley, Andrew Marchant, Patrick Bell and Keith Westhead explain how

The information world is on the move. Rapidly developing web and communication technologies are making geospatial data much more accessible to a new generation of environmentally-aware users.

Smartphones, tablet computers, GPS technologies and innovative web services are combining to enable providers of geospatial data, such as the British Geological Survey, to deliver maps and data to users whenever and wherever they need them.

The latest development from the BGS is the free 'iGeology' app available for the iPhone, iPad and Android smartphones. This app allows users to interrogate a geological map and related databases, to help them understand the environment and landscape around them.

## 500 geology maps in your back pocket

Since its launch in late 2010, iGeology (pictured right) has been downloaded over 60,000 times from 56 countries around the world. It was featured on BBC Radio 4's Material World and was iTunes' No.1 free education app in September 2010. But this is just one component of BGS' OpenGeoscience initiative ([www.bgs.ac.uk/opengeoscience](http://www.bgs.ac.uk/opengeoscience)). Launched in December 2009, OpenGeoscience offers free online



access to an extended portfolio of BGS maps, photos, reports and data for non-commercial purposes such as private study, research and educational activities, and also for business innovation. This accelerated open access provision aims to encourage the use of BGS geoscience information in tackling the key environmental issues (climate change, sustainable energy, geological hazards such as earthquakes and landslides) facing the world today.

## Driven by interoperable web services

With spatial information technology evolving so rapidly, the data and web services that drive our desktop and mobile applications are designed to be as reusable and interoperable as possible. A key feature of OpenGeoscience is the use of Web Map Services (WMS) to deliver BGS geospatial datasets. Web Map Services (WMS) provide a simple method of requesting georegistered map images. These maps can be accessed by a variety of GIS applications, where they can easily be combined with local GIS data, as well as WMS served by other organisations, enabling multidiscipline investigation of data. ([www.opengeospatial.org/standards/wms](http://www.opengeospatial.org/standards/wms)).

The use of WMS has been further advanced as it is an enabling technology in initiatives such as the EU INSPIRE Directive that aim to open up access to public sector knowledge, information and data.





The BGS received a Highly Commended award for iGeology at the Esri UK 2011 GIS Vision Awards. The award was presented to Wayne Shelley, lead developer, for the free App that offers geological maps at 1:50,000 scale.



The Geology of Britain web viewer (showing detailed 1:50,000 scale geology for the British Geological Survey headquarters in Keyworth, Nottingham) is underpinned by the same web map services as iGeology.

## 70 new Web Map Service layers

The OpenGeoscience release of the BGS Digital Geological Map of Great Britain at 1:50,000 scale (DiGMapGB-50) was the first time in the world that detailed (street-level scale), attributed and query-able geological mapping has been made freely available using the internet. In addition, all data available through BGS GeolIndex, a map based index to BGS data collections ([www.bgs.ac.uk/geolindex](http://www.bgs.ac.uk/geolindex)) has been made available via WMS. Comprising over 70 onshore and offshore layers, the GeolIndex datasets include information on boreholes, earthquakes, landslides, fossils, active mines and quarries, rock samples, geochemistry and geophysics. Full details of BGS data available as WMS layers can be found at: [www.bgs.ac.uk/data/services/wms.html](http://www.bgs.ac.uk/data/services/wms.html)

## Advantages of open access

By utilising the web, OpenGeoscience allows BGS to provide readily available information in interoperable formats that users can combine in their own systems with their own information.

The user community has been keen to take advantage of OpenGeoscience and a number of "mashups" have already been created (<http://www.bgs.ac.uk/data/services/mash-ups>). BGS data is being joined with the Ordnance Survey OpenSpace service showing how users can access and combine large scale datasets from key industry data providers.

The data is being consumed into online portals such as OneGeology. Applications integrating BGS geology data with Sites of Special Scientific Interest (SSSI) and cave information have also been developed.

Rapidly developing viewing platforms such as tablet PCs mean the public are ever-more hungry for viewable maps, and web map services have the capability to meet this demand. By providing a self-service, web-based delivery mechanism, BGS can provide information in interoperable forms that people can access and utilise how best suits their needs.

It would have been impossible to make the information so widely available using previous manual methods of data preparation and delivery.

Before OpenGeoscience, BGS had no effective way of providing multiple customers with small packages of spatial geological mapping, particularly for non-commercial use. Many of these customers just 'wanted to see' what lay beneath their feet and did not need to license the full GIS data. The web map services provided through OpenGeoscience meets the requirements of many of these customers and enables the data to reach a much wider user community. The same is true of the photographs, data, reports and software resources on OpenGeoscience, many of which previously had to be delivered 'manually' but which can now be accessed 'automatically' by the user through the OpenGeoscience interface.

## Web services as part of a 'freemium' model

The new technologies used by OpenGeoscience, and in particular the WMS layers, have enabled the BGS to more fully implement an innovative 'freemium' business model for spatial data provision, which successfully balances open access provision through viewing services against continued charged access to the fully

featured GIS datasets for commercial business uses. As part of this, OpenGeoscience works well alongside our well-established BGS data licensing and geological advice services (e.g. BGS GeoReports - <http://shop.bgs.ac.uk/GeoReports/>). This innovative freemium model shows the way forward for satisfying the apparently converse demands in the geospatial sector for both greater open access and greater commercial exploitation of information resources.

## Web Service future

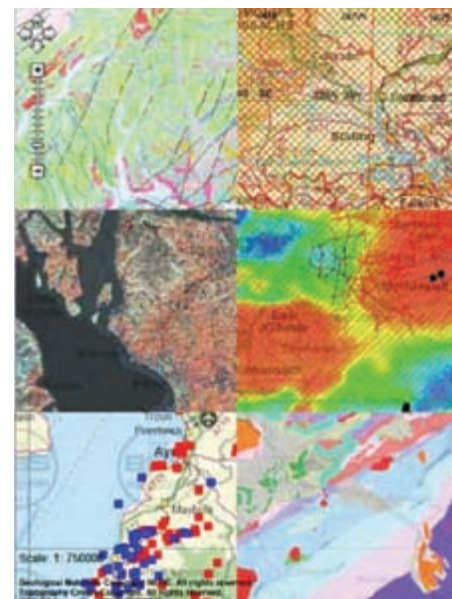
New web technologies, such as Web Map Services and mobile applications, are now an established part of the geospatial information delivery portfolio for public sector information providers such as the BGS. Their relatively low cost, both in development and maintenance, enable access to geospatial information to be opened up to a much wider audience. Coupled with an innovative 'freemium' approach to the use of the information, these new delivery methods enable us to meet both the developing demands of the open access and commercial business sectors.

As web and mobile technologies become ever-more sophisticated, a new generation of users will emerge for geospatial information. They will make uses of this information in ways we can only imagine, for the benefit of the environment and society as a whole. The popularity of iGeology show us how the right technology at the right time can make geography an indispensable part of everyday life, instantly putting public spatial data into the hands and pockets of potential users.

*Wayne Shelley and Andrew Marchant are Senior GIS Developers; Patrick Bell is Web Systems Team Leader, and Keith Westhead is Head of Knowledge Exchange, all with the British Geological Survey ([www.bgs.ac.uk](http://www.bgs.ac.uk))*



The Glencoe Boundary Fault, Stob Mhic Mhartuin, Lochaber. British Geological Survey Poo2751



A selection of Web Map Services layers available from [www.bgs.ac.uk/data/services/wms.html](http://www.bgs.ac.uk/data/services/wms.html)