

Ian Jackson, of the OneGeology Executive, explains how geological survey organisations around the world are co-operating to make vital data available to all users of geological information everywhere.

OneGeology: improving access to geoscience globally

Contributing scientific solutions to the challenges of landslides and earthquakes, minerals and mining, water supply and flooding, pollution and erosion, and — not least — climate change and energy supply, depends absolutely on geological data. Like most things environmental, few of these challenges respect national or scientific domain frontiers and if we want to assess and address these environmental challenges holistically then we need access to holistic data too. Rich environmental data does exist in each nation, but when it is available, and in many instances it is exceptionally difficult to discover, then it exists in different formats and via different services, with different access conditions. OneGeology is a global initiative to improve the accessibility of one fundamental environmental dataset — geological map data. In addition it is improving the interoperability of those data and the exchange of know-how and experience. OneGeology has been hugely successful and today 116 nations are participating, with 50 of those nations serving geological data to a dynamic web map portal.

a tangible geological ‘map’ to accelerate progress of a data model and interchange standard for the geosciences. At the same time the initiative would transfer know-how to developing countries, reduce the length and expense of their learning curve and help them to serve maps and data that could attract investment.

Fourteen months after its conception in 2006, at a meeting in Brighton, UK, 83 representatives of the international

Why do OneGeology?

The OneGeology concept grew out of several stimuli: the UN International Year of Planet Earth; increasing demand for geological surveys to produce digital data for their territories; the spatial data infrastructures being planned in many nations and regions (such as the INSPIRE Directive in Europe); the frustratingly slow development of interoperability in the geosciences; and last but not least, the need to address the digital divide between the developed and developing nations. OneGeology’s proposition was to design and initiate a multinational project to mobilise geological surveys to act as the drivers and sustainable data providers of a global dataset, and to use the vehicle of creating



The OneGeology web portal provides dynamic access to geological map data from 50 countries.

geosciences community unanimously endorsed the idea and set goals for a global launch at the 33rd IGC in Oslo in August 2008. The goals agreed for OneGeology were deceptively simple. They were to:

- improve the accessibility of geological map data
- exchange know-how and skills so that all nations could participate
- accelerate the sharing of data (interoperability) in the geosciences and the take up of a new 'standard' (GeoSciML).

To these, as a result of the global media profile of the initiative, a fourth was added:

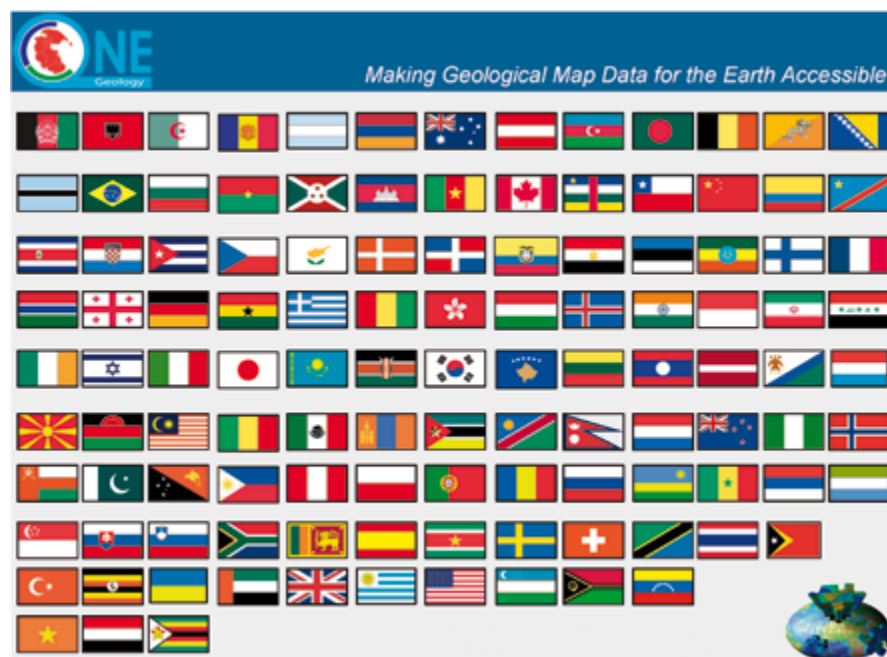
- to use OneGeology to raise the public profile and understanding of geoscience.

The technology

The technology to achieve OneGeology is not complex, but it is state-of-the-art and the implementation and scale of the deployment is world-leading. A basic principle of OneGeology is that it must be open to all geological surveys to participate, regardless of their development status and the project has devised protocols and systems to ensure this. OneGeology delivers digital geological map data from participating nations using Web Map Services and Web Feature Services. This is a distributed, dynamic and sustainable model, which leaves the data where they are best looked after and updated: with the provider nations. Each survey either registers its web service with the OneGeology Portal or works with a partner survey (a 'buddy') to serve the data. OneGeology technology is compliant with international Open Geospatial Consortium Web Map Service standards. Geological surveys may use a variety of software to serve their data. The portal displays the map data served by each country and provides users with the ability to zoom, pan, switch map data layers on and off, change their opacity and even transfer them to Google Earth. The end-user does not require specialist software, only access to the Internet via a web browser.

Exploiting the limelight

Google references to OneGeology grew to over 220 000 by August 2008; its



OneGeology has global appeal — 138 organisations from 116 nations are participating at the time of going to press.

web map portal received 29 million hits in one month. It is not the size of these numbers alone that excites; when you look more closely at some of these web pages you see the way that 'liberating' the data has allowed others to innovate and use their imaginations — from new teaching resources for geography students, to animated mash-ups and fly-throughs of Mount Fuji. The outreach has not stopped at the science and academic community. Media interest in OneGeology has been extraordinary — over 700 articles and broadcasts worldwide in four weeks after Oslo, from *Nature* to Vatican Radio, each in its own way describing to audiences, who we would usually never reach, why geology is important to society. The work and profile has paid off in other ways. The European Commission, under its eContent^{plus} programme, has funded a two-year, €3.25 million, 20-nation project known as OneGeology-Europe. This has moved OneGeology forward faster and allowed developments in higher resolution and applied data.

In conclusion

Some would dismiss OneGeology as not being front-line science. To sharply focused researchers, OneGeology may not seem over-ambitious and the

achievements none too ground-breaking. However, to draw that conclusion would be to fail to comprehend the scale of the scientific, technical, logistical, cultural and political challenges of a project that attempts deployment internationally and especially into the developing world. Perhaps also it would seriously underestimate the importance of sharing, applying and disseminating our science. Without improved web access to, and interoperability of, geological map data, life in a digital era will be increasingly frustrating for geoscientists and their clients, and increasing the value and impact of geoscience will be significantly more difficult to achieve.

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