

OneGeology – MAKING GEOLOGY ACCESSIBLE

Ian Jackson ⁽¹⁾

(1) *British Geological Survey, Nottingham, NG12 5GG, UK. ij@bgs.ac.uk*

KEY WORDS: *accessibility, web services, global, geological surveys, IYPE, GeoSciML*

A VERY SHORT HISTORY



On 6 August 2008, at the opening of the 33rd International Geological Congress in Oslo, Simon Winchester, author of the best-selling book about the English geologist, William Smith and his “Map that changed the world”, launched the web portal of a global project called OneGeology. Had you used the term OneGeology 32 months earlier – or typed it into Google - you would have registered a blank. The project and its name did not exist. So what is this project that appeared from nowhere in 2006 and took centre stage at the IGC in 2008?



Figure 1. Geological data from across the world in real time

At the beginning of 2006 and with the potential stimulus of the UN International Year of Planet Earth (IYPE) very much in mind, an embryonic idea was presented at short notice to the General Assembly of the Commission for the Geological Map of the World (CGMW) in Paris. Could we use this UN Year to begin the creation of an interoperable digital geological dataset of the planet at 1:1 million scale? Would it be possible to design and initiate a multi-lateral and multi-national project that mobilised geological surveys, as part of an ongoing contribution, to act as the drivers and sustainable data providers of this global dataset? Could we synergistically use this vehicle of creating a tangible geological map to accelerate progress of an emerging global geoscience data model and interchange standard? Finally, could we use the project to transfer know-how to developing countries and reduce the length and expense of their learning curve, while at the same time allow them to serve maps and data that could attract interest and investment? These aspirations, plus the chance to generate a global digital geological dataset to assist in the understanding of global environmental problems and the opportunity to raise the profile of geoscience as part of IYPE, seemed more than enough reasons to take the proposal forward.



Throughout 2006 geologists and geological surveys around the world were canvassed for their views on this proposition and in the autumn of 2006 it was apparent that the concept was proving attractive to more than enough geological surveys and international bodies to organise a meeting to kick-off the initiative; an initiative which had by now adopted the name “OneGeology”. This kick-off meeting took place in March 2007, in Brighton, UK. Eighty-one participants from forty-three nations and fifty-three national and international bodies discussed the OneGeology aims and how best to achieve them. The workshop was a success and participants unanimously agreed a “Brighton Accord”. This Accord gave the OneGeology initiative the international backing it needed but just as importantly, OneGeology through the Brighton meeting and Accord, captured the imagination of the world’s press and media and the story was taken up across the globe, increasing the profile of IYPE, the relevance of geoscience and placing OneGeology very much in the public eye. The goals that the Brighton meeting 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 interoperability in the geosciences and the take up of a new “standard” (GeoSciML)

EXCEEDING EXPECTATIONS

The international project coordination and technical teams began work on these goals immediately and in less than 18 months made astounding progress. They made significant amounts of geological map data accessible – currently 94 nations are participating and up to 40 of these are serving data. They delivered a web map portal and the protocols, registries and technology to “harvest” and serve data from around the world. They exchanged

know-how and produced guidance (“cookbooks”) and provided support so that any geological survey can participate and serve their data. They moved forward and raised the profile of a crucial data model and interoperability standard – GeoSciML.

The technology to achieve OneGeology is not complex, but in terms of the scale of the deployment it is world leading. A basic principle of OneGeology is that it must be open to all geological surveys to participate, regardless of development status and the project has devised protocols and systems to ensure this. OneGeology is thus open to those who currently possess only traditional paper geological maps, and to those operating sophisticated web mapping systems. The end-user does not require specialist software, only access to the Internet via a web browser. In this first phase OneGeology is delivering digital geological map data from participating nations using Web Map Services (WMS). This is a distributed, dynamic and sustainable model, which leaves the data where it is best looked after and updated; that is 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 that data. OneGeology technology is compliant with the international Open Geospatial Consortium (OGC) Web Map Service standard. Geological surveys may use a variety of software (e.g. MapServer) 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 on and off, change its opacity and even transfer it to Google Earth.

The deliverables above are not the limit of the project achievements. In delivering its portal and technical protocols OneGeology has progressed something major global and regional bodies (including the United Nations and the European Union) have been advocating for some years – the creation of a spatial data infrastructure for planning and policy-making. The project has now been

unanimously endorsed by the Directors of the geological surveys of the world meeting in Oslo and is providing a tangible catalyst for future collective and coherent action by surveys. Google references to OneGeology grew from 4000 on 1 August 2008 to over 220 000 in mid-August; it is not the size of this number 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 4 weeks, from Nature to Vatican Radio, each in its own way presenting an opportunity to describe to audiences, who we would usually never reach, why geology is important to society - and never more important at a time of intense interest in energy needs and the impact of climate change.

The OneGeology initiative has made progress in other areas too. The European Commission, under its eContent*plus* programme, has agreed to fund a 2-year, €3.25 million, 19 nation project known as OneGeology-Europe. This will move OneGeology forward faster and allow developments in higher resolution and applied data too. In the USA the National Science Foundation is providing almost \$700 000 for a similar initiative in the 50 US states – a Geoscience Information Network. These and other continental initiatives will be well linked to ensure complementarity of development and maximum synergy and benefit globally.

WHY AND WHAT NEXT?

For the OneGeology team – geoscientists, informatics experts, managers and communicators - the experience of the last year has been exhilarating. OneGeology is, in many ways, unlike most other international

geological projects that have gone before. It is, in every sense, a child of its time – an open Internet paradigm, a project whose technical interoperability (sharing) goals are in reality its whole ethos. The project has been allowed to grow and extend as just as fast and as wide as its actors agree to take it, for the most part free from the territoriality and bureaucracy that frequently inhibit such initiatives. That it has been allowed this freedom is a credit to those who run geological surveys around the world because it is absolutely beyond doubt that a conventionally run (and thus constrained) OneGeology project would not have achieved its goals so spectacularly and in such a short space of time.

Where does OneGeology go next and how can we sustain the progress made? The team are now taking steps to put in place a robust, and yet still flexible, governance and operational structure. They are also continuing the technical progress, increasing the number of nations serving data and moving towards Web Feature Service technology which will provide significantly more functionality. Some difficult questions remain however: how to fund and provide continuity for a growing and thus more demanding infrastructure and user base? Whether to expand the portal to include map data from academia, commerce and the public (and how to maintain authentication if that happens)? Should OneGeology serve more downstream geoscience data – and try to spread the best practice in advanced applied or thematic information delivery in national geological surveys, for example geohazards, or carbon capture sites?

These are big challenges but with the same open and determined approach that OneGeology has adopted in its short life to date, none of them are insoluble.

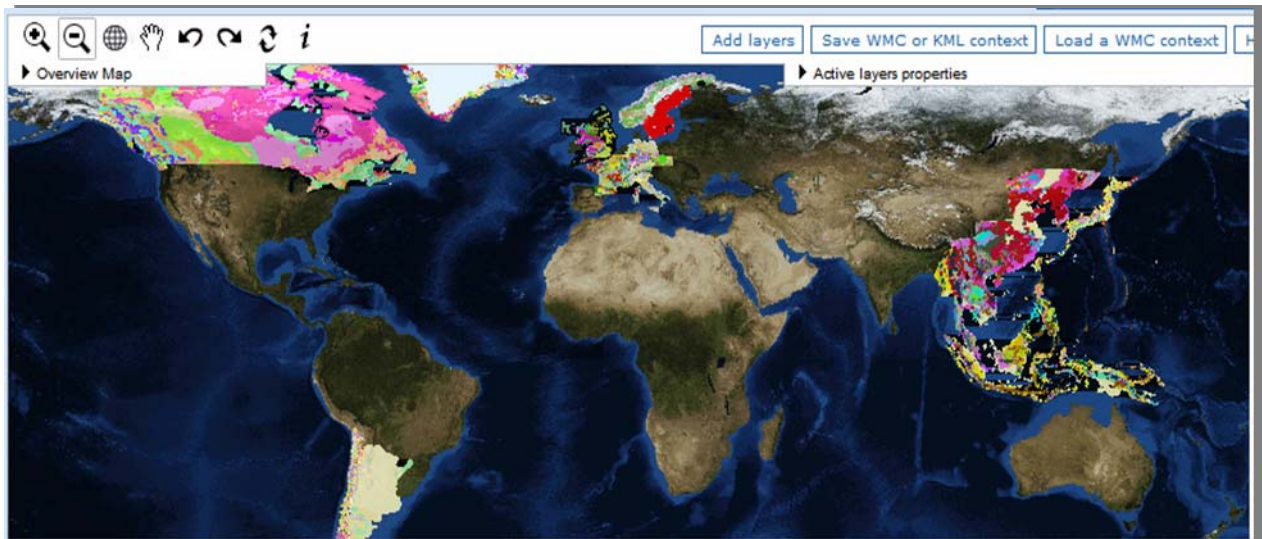


Figure 2 – A screen shot from of the OneGeology web portal

ACKNOWLEDGEMENTS

I would like to acknowledge the work of scientists, informatics experts and managers in geological surveys and global and regional organisations around the world. Without their effort, commitment and goodwill OneGeology would still be a concept.