

June 2014

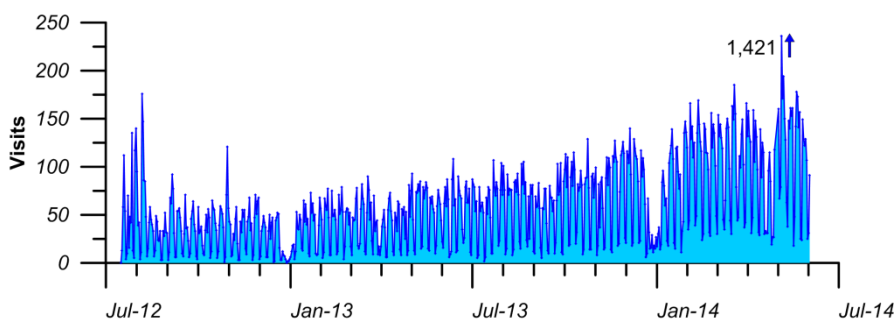
Project Newsletter and Update

Welcome

Welcome to the fourth newsletter of the Visualising Victoria's Groundwater (VVG) project. It's almost 2 years since the VVG website was launched and the original research project has now been completed. The project outcomes are greater than we originally anticipated and we sincerely thank all the partners and collaborators involved for their participation and goodwill. It could never have happened without your support. The VVG portal will continue to be kept current and accessible beyond the formal completion of the project.

Web portal usage

Around 17,000 users have visited the site, with over 83,000 page views in 41,500 visits, 60% of whom are returning visitors. The number of visits has increased steadily, now averaging over 150 visits per workday. The peak of daily visitors (1,421 visits/day) occurred recently, following an interview about the VVG aired on the ABC radio's Country Hour on April 29th 2014 (more details below in VVG in the media).



EPA data online

Three data sets managed by EPA Victoria have now been added to the VVG portal and include:

- the EPA audit reports, which refer to a searchable list of properties issued with a certificate or statement of environmental audit (under the Environmental Protection Act 1970);
- the groundwater quality restricted use zones (GQRUZs), that are areas where one or more beneficial uses of groundwater have been restricted; and

VVG Update

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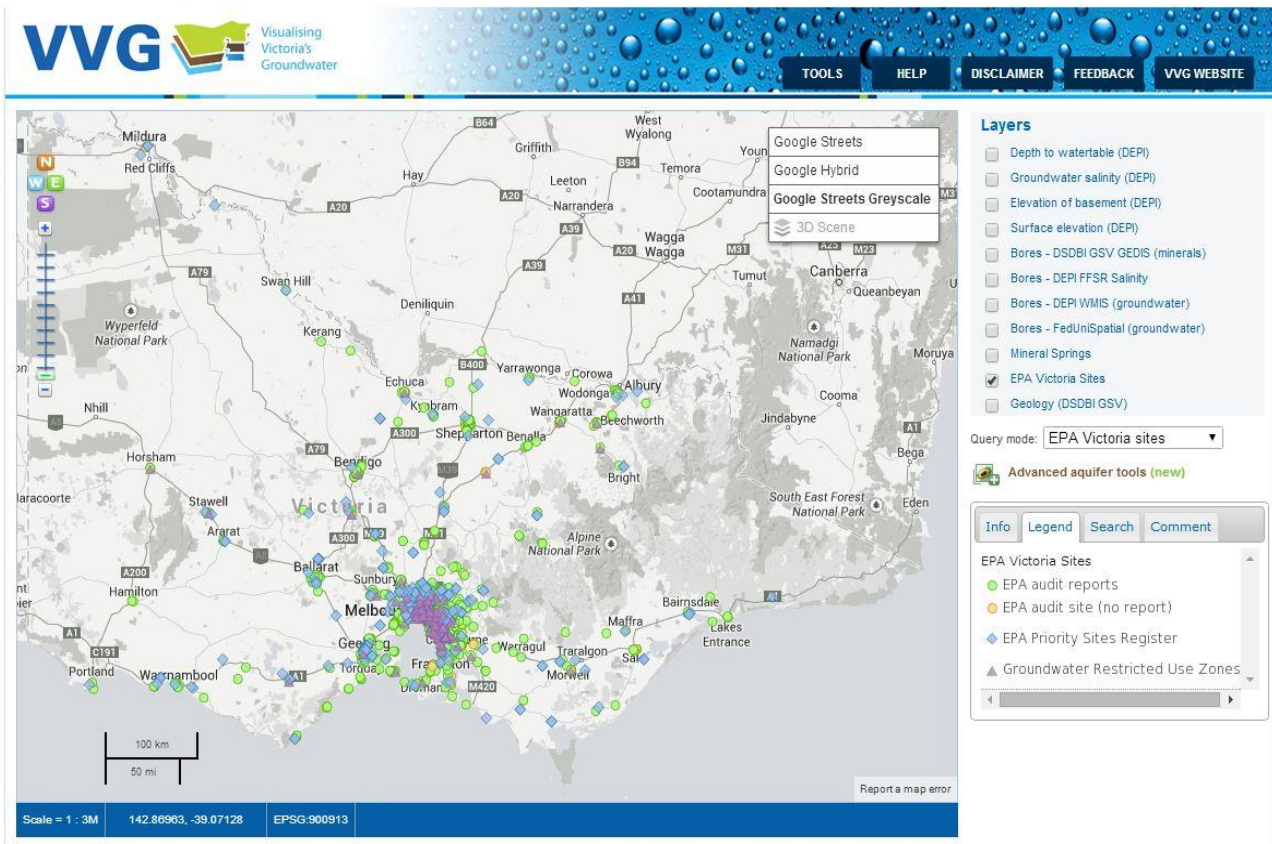
[Research](#)

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- the priority sites register (PSR) which consists of a publicly available list of sites for which the EPA Victoria has issued a clean-up or pollution abatement notice to deal with land and/or groundwater that presents an unacceptable risk to human health and/or the environment.

These sites are shown spatially on the VVG portal by selecting 'EPA Victoria Sites' in the layers menu. Sites can be queried by selecting 'EPA Victoria Sites' in the query mode and then clicking the site of interest. The query box will show basic site details along with a link to the EPA Victoria website where you can download further information regarding the selected site.



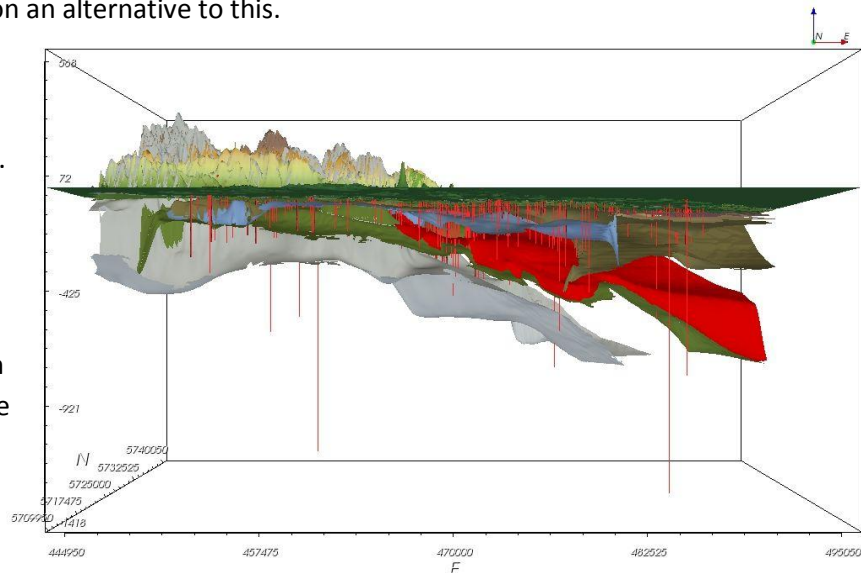
(Above) EPA Victoria sites

3D visualisation

As a result of the collaboration with Queensland University of Technology (QUT), three-dimensional visualisation of Victoria's groundwater systems is now available through the VVG web portal. The 3D tool uses technology developed by QUT's groundwater systems research group, under the leadership of Professor Malcolm Cox. The tool allows you to flip scenes from the VVG portal into a pseudo 3-dimensional perspective and rotate, slice and adjust the vertical exaggeration. The views include the various aquifer surfaces (the Victorian Aquifer Framework), surface elevation, geology and bores from the Water Management Information System (WMIS) managed by the Department of Environment and Primary Industries (DEPI). Viewing requires a modern browser such as the latest versions of Chrome, Firefox, Internet Explorer or Safari. An internet connection of at least 2 Megabits per second and a widescreen monitor are also recommended. The tool uses websockets (working in HTML5) which are currently

accessed through Port 30001, which some organisations (such as some Government Departments) may have blocked. We are working on an alternative to this.

(Right) An example VVG 3D visualisation scene centred on Alberton, in the Gippsland Basin. The view is looking towards the north, with the Mesozoic basement rocks outcropping in the Strzelecki Ranges on the left hand side. Vertical exaggeration has been set at x15. Some of the deeper bores were drilled for hydrocarbon or stratigraphic exploration.



For details, check the user guide: www.vvg.org.au/cb_pages/3d_visualisation.php.

VVG video documentary

The short documentary film that was commissioned to record the VVG project and its collaborative nature can now be accessed on [YouTube](https://www.youtube.com) or alternatively from the homepage of the [VVG website](http://www.vvg.org.au). The documentary, which has recorded more than 620 views to date, was made by Wind and Sky Productions (www.windsky.com.au) whose professional commitment to the task resulted in a superb outcome. As a result, the VVG project has received further interest from a number of media outlets and has also been linked into industry newsletters. We acknowledge our partners who participated in the making of the documentary for their time and efforts in making it such a success.

New VVG team member

Ms Kirsten McKenna joined the VVG team in July 2013 as a Research Assistant and VVG portal administrator. Kirsten completed her Bachelor of Science (Geology) at the University of Ballarat in 2011 and has worked as a graduate hydrogeologist in the consulting industry for a time. Kirsten has an excellent understanding of groundwater data and its use within industry and research sectors. Kirsten's contact details can be accessed via: www.vvg.org.au/cb_pages/project_staff.php.

VVG user guide and FAQs

In response to user feedback, we have now included some extensive help pages on the VVG site, which can be accessed from the homepage menu: www.vvg.org.au/cb_pages/user_guide.php. The guide is intended to assist users to explore the full potential of the site and to access the deeper layers of data and associated functions now available. Similarly, a series of frequently asked questions (FAQs) are also emerging in response to the feedback from users. These will continue to grow over time. The FAQs are also available from the homepage menu: www.vvg.org.au/cb_pages/faq.php. Please send your comments or suggestions to improve the portal useability to Kirsten at ke.mckenna@federation.edu.au.

Research

Although the initial VVG research project has now been completed, the research continues through new collaborations and partnerships that have emerged.

VVG project evaluation survey

An evaluation of the VVG project has just commenced, with ethics approval granted by FedUni's Human Research Ethics Committee (HREC) and in compliance with the University's Policy on the Responsible Conduct of Research. The data will be invaluable in helping direct the future of the VVG research and development.

Three surveys have been implemented:

- a pop-up **snapshot survey** to inform us of why people use the site, what data or information they are seeking and whether the data is trusted. It is intended as a quick measure of the value in making data available.
- an **online survey** aimed at repeat users of the site to assist us in evaluating the functionality, range of data and benefits of the VVG portal, both in its current form and how it might be enhanced into the future.
- a **phone survey** aimed at the collaborators and partners in the VVG site to record their experiences of participating in the research project, explore the values and impacts that the VVG portal may have brought to their organisations, and their vision for future VVG research projects.

The intention is to use the evaluation surveys, together with the website analytics, to analyse the benefits and values of making public data more readily available. By exploring why people are seeking groundwater data, the types of data they use and how they would like to access it, we hope to enhance our research into spatial knowledge management and improved data delivery. We intend to publish the findings of this research in the scientific literature.

Conference presentations

The progressive outcomes of the VVG research project have been presented at numerous conferences during the past two years, most recently at the International Association of Hydrogeologists Congress (IAH2013) in Perth. Abstracts about the project have also been accepted for the [Digital Rural Futures Conference](#) at the University of Southern Queensland, Toowoomba, in June 2014 and the [IAH 2014](#) conference in Marrakech, Morocco in September. For a full list of research publications, refer to www.vvg.org.au/cb_pages/research_outputs.php

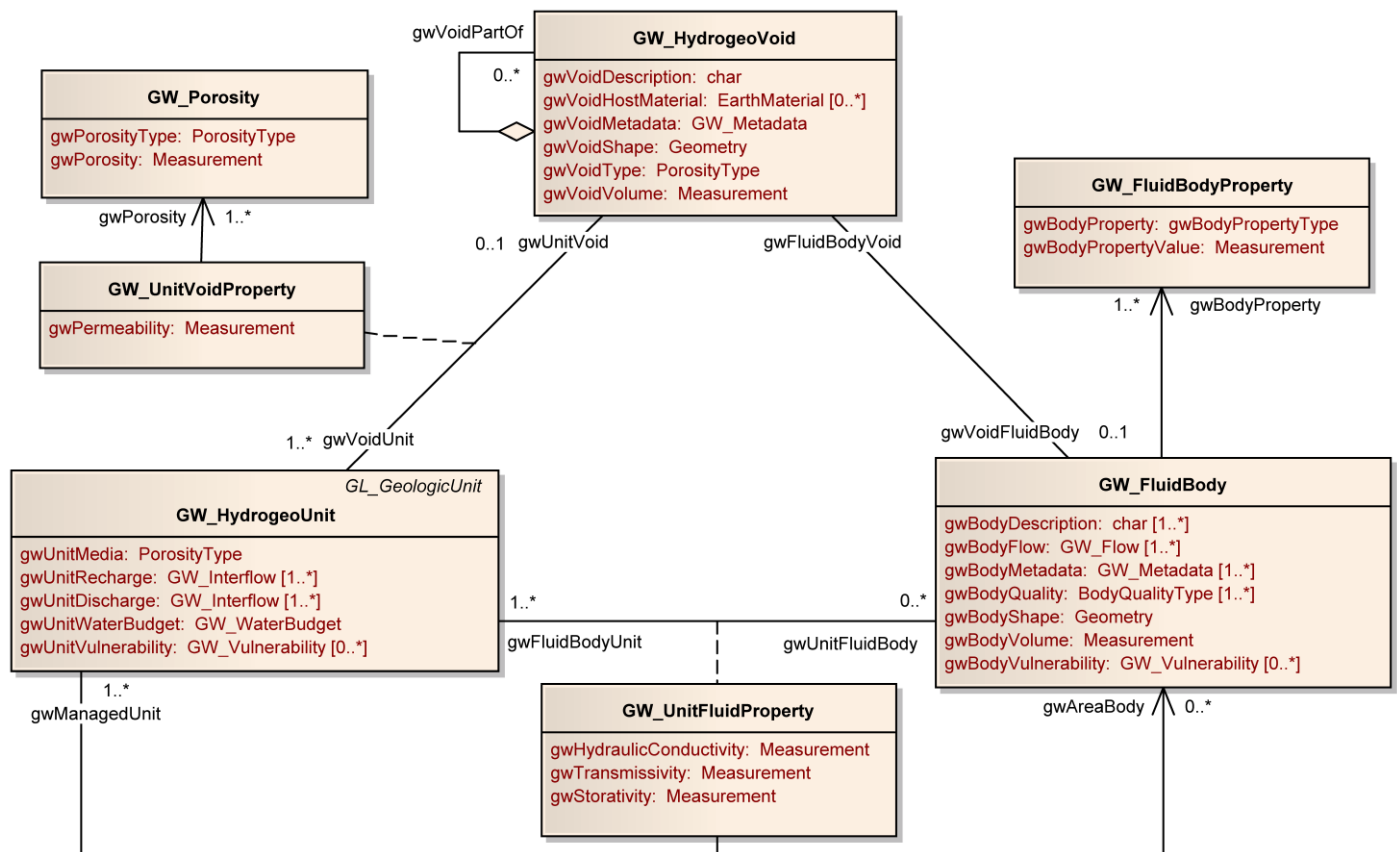


GW2IE progress

Progress continues in the [Groundwater Interoperability Experiment \(GW2IE\)](#), which aims to develop and implement *GroundwaterML* (groundwater markup language) version 2.0 (GWML2) with the intention of adopting this as the international standard for groundwater data exchange. The GW2IE is guided by the [Open Geospatial Consortium \(OGC\) Hydrology Domain Working Group \(HDWG\)](#) and includes European, North American and Australasian participants, including VVG's Dr Peter Dahlhaus, who is representing FedUni's collaboration in the GW2IE experiment.

A GWML2 conceptual model has been developed using unified modelling language (UML), via a series of regular teleconferences. A workshop held recently in Vienna enabled the conceptual model to be translated into a logical model, which appears to satisfy the requirements of the various national groundwater information systems, including the European Commission's [INSPIRE](#) model and the Canadian [GWML1](#) model, as well as the United States Geological Survey, New Zealand GNS and Australian Bureau of Meteorology information systems. This will be followed by the development of an extensible markup language (XML) schema from the logical model, coded into GWML2 and other existing OGC standards (such as [GeoSciML](#) and [O&M](#)). Finally, OGC standard web-services from existing databases (such as those delivered by the VVG) will be tested through five use-cases representing typical examples of the need for interoperable groundwater data exchange.

The intention is to complete the GW2IE experiment by September 2015.



(Above) A section of the [GWML2 conceptual model](#).

BoM research agreement signed

FedUni has signed a research agreement with the Bureau of Meteorology (BoM) to collaborate on the development of a 3D visualisation tool for the [National Groundwater Information System \(NGIS\)](#). The NGIS federates the groundwater data from all the states and territories in the Commonwealth of Australia and will be available through the Australian Groundwater Explorer portal later this year. The research partners also include QUT and Natural Resources Canada (NR Can). The intention is to jointly develop a pilot 3D visualisation tool which is standards based, and which is capable of presenting OGC-compliant groundwater data and information. The deployment of the pilot tool will be tested in the NGIS environment.

The tool has two components: 1) a browser 'front end' being developed by FedUni's [Centre for eCommerce and Communications \(CeCC\)](#) technical team under the leadership of Andrew Macleod; and 2) a rendering engine developed by Allan James, Senior Visualisation and Software Development Officer at the Visualisation and eResearch (ViseR) section of the [Institute for Future Environments \(IFE\)](#) at QUT, under a research collaboration with FedUni.

VVG in the media

[ABC Radio's statewide program 'Country Hour'](#) aired an [interview](#) with FedUni's Dr Peter Dahlhaus about the VVG project. The story summarised the evolution of the VVG project and examined how Victorian groundwater data is now accessible to the general public via the VVG web portal. Presenter of the radio program, Libby Price, described the site as a 'one-stop shop of groundwater information' with ground water data now accessible 'via a couple of clicks on your computer'.

Since the interview was aired, there has been a significant increase in the number of visitors to the VVG website signifying the popularity of the story with listeners of the Country Hour program.

VVG Awards

2013 proved to be a successful year of awards and nominations for VVG. The success began in July 2013 when VVG received a [Victorian iAward](#) following its nomination in the Regional category of the awards. The iAwards are the premier awards platform in Australia and recognise achievements and innovation in ICT across all facets of the economy.

(Right) Andrew Macleod, Peter Dahlhaus and Helen Thompson after receiving the iAward following the awards presentation in Melbourne in August 2013.



Following on from its success at the State iAwards, VVG then became a Merit Award recipient in the Regional category for the National iAwards, leading to a nomination for the [APICTAs](#), the Asia-Pacific ICT Alliance, where VVG was a finalist in the Sustainability and Environmental Technology category. CeCC's Dr Helen Thompson attended the awards ceremony in Hong Kong in November 2013.

VVG was also a finalist in the Innovation category of the 2013 Australia and New Zealand Internet Awards ([ANZIAS](#)). These annual awards celebrate the achievements of organisations, businesses and individuals that have made significant contributions to the development and use of the Internet in Australia and New Zealand.

The recognition that VVG has received through these awards acknowledges the contribution and success of the VVG team and the project's collaborating partners in using interoperable technologies to successfully capture, aggregate and spatially depict Victoria's groundwater systems.

Meeting of project partners

The next meeting of project partners and collaborators is scheduled for **Wednesday July 16th 2014** at the iiNet Conference Room, [Greenhill Enterprise Centre](#), Technology Park, Mt Helen. This will be the final meeting to wrap up the original project, celebrate the success of the project and the **2nd birthday of the VVG website**. It will also be an opportunity to discuss future developments, collaborative research and funding for VVG.

The meeting will commence at 10am (morning tea available from 9:30am) and conclude at 2pm. Lunch (and Birthday Cake) will be provided. An agenda will be sent out shortly.



Geological cake, sourced from:

<http://blogs.agu.org/mountainbeltway/2011/01/31/aw30-the-bake-sale/>