

GeoVIEWER.WA — adding value to geological mapping

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Introduction

For more than 100 years the Geological Survey of Western Australia (GSWA) has acquired, enhanced, archived, and disseminated regional geological, geophysical, geochemical, mineral, and petroleum data as a fundamental component of its work program.

GeoVIEWER.WA signifies a new direction in GSWA's approach to managing and distributing these geoscientific data on digital video disc (DVD) and compact disc (CD). *GeoVIEWER.WA* will be the foundation for delivering several very distinct DVD/CD products including the 1:100 000 Geological Information Series, mines and mineral deposits data, geochronology, and a catalogue of products.

The primary objectives of *GeoVIEWER.WA* are to:

- enable GSWA customers to access spatial and associated textual data distributed on our data DVD/CDs;
- allow more control over the display and analysis of geoscience data distributed on our data DVD/CDs;
- position GSWA to take advantage of evolving technologies in its operations and in design and delivery of products.

GSWA recently released a number of much-enhanced geological 'maps' that include not only the interpreted geology, but all the underlying data that went into constructing the map: lithological and structural data, petrographic reports with photomicrographs, site photos, and geochemical data, as well as other

datasets such as aeromagnetic, gravity, radiometric, and satellite images and orthophotography.

As an easy-to-use interface, *GeoVIEWER.WA* (Fig. 1) improves access through visualization, query, and integration of raster, vector, and point data using common tools that do not require specialized GIS skills. Each point or polygon can be interrogated on the virtual map, and the relevant summary, full description, or report, including photographs, are displayed in seconds. The displayed maps and reports can be printed or pasted directly into any Microsoft Windows-based program. Full Explanatory Notes to accompany the map will also be included on the DVD/CD rather than being published separately, giving GSWA the opportunity to include many more colour photographs than would otherwise be possible.

GeoVIEWER.WA also provides complete flexibility to the user in the presentation of the data including labelling, ordering, and rendering of all data, which can be any combination of ESRI shp, MapInfo tab, geoTIFF or ECW. The viewer also supports transparency in the presentation of layers.

Technical overview

GeoVIEWER.WA was developed to have standard 'Windows' look and feel. This makes the application intuitive to customers and requires minimal learning to be able to get the most from any data package.

GeoVIEWER.WA was built using a modular approach and following object-oriented development guidelines. This concept enables a

more robust framework and a scalable architecture that provide additional functionality and the potential for future customizing to better service customers' needs.

The viewing tool was developed using AspMap by VDS Technologies. The software is supplied as a collection of Dynamic Link Libraries (dll) on a royalty free distribution license, thus ensuring the cost of distributing the software need not be passed on to the customer.

The properties and methods of the dlls are accessed through the Visual Basic 6.0 (VB) development environment. Through the use of these dlls in conjunction with Windows system functionality, controlled through customized VB code, *GeoVIEWER.WA* has been built to allow not only the display and query of the supplied spatial data but also the linking to non-spatial data. This non-spatial data is held as Microsoft Access Databases and Adobe's Portable Document Format (PDF). Figure 2 shows the process flow.

Data connection

In addition to *GeoVIEWER.WA*, the key element in providing data in this format is the increasing sophistication of GSWA's databases that house the spatial, numeric, and textual data. These databases fit within GSWA's corporate schema and are related through a SITES table. These databases include:

- WACHEM — geochemical data
- WAMIN — mineral occurrence data
- WAPIMS — petroleum administrative and exploration data

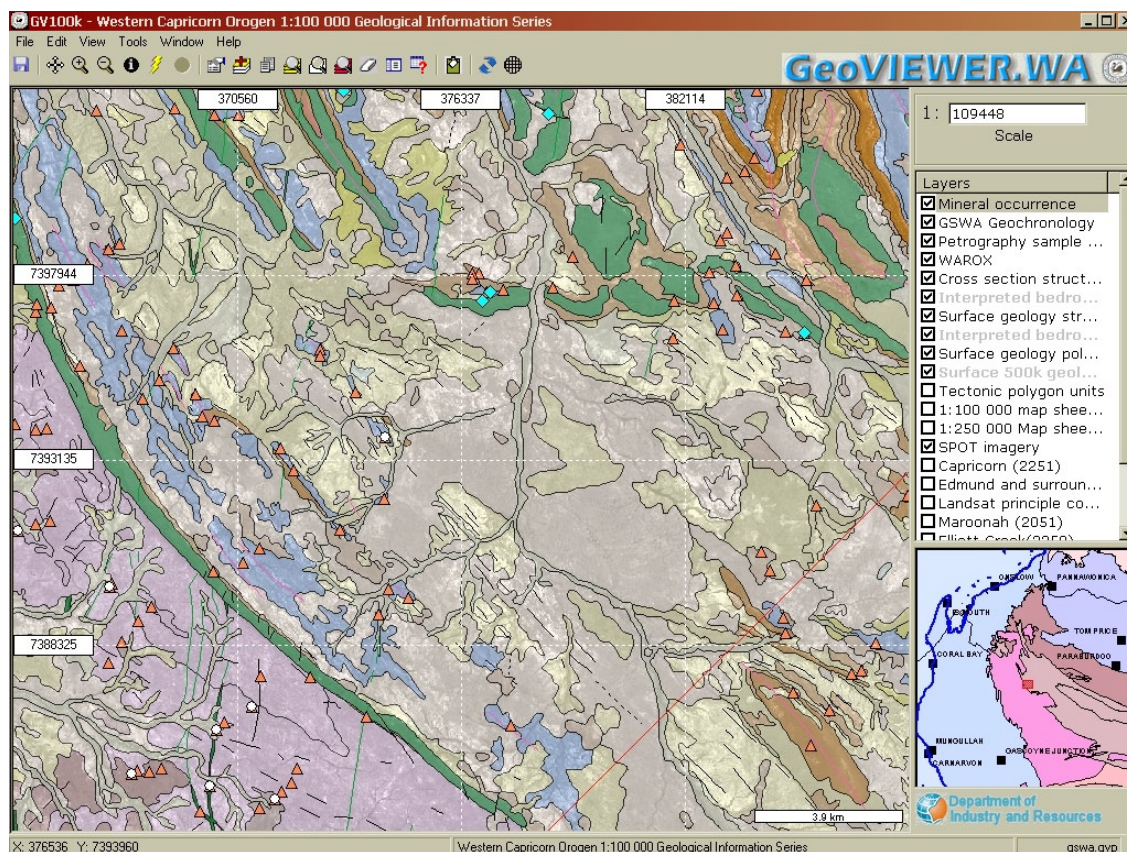


Figure 1. GeoVIEWER.WA interface

- GEOCHRON — geochronology data
- WAROX — sample details, field observations, photos, and related reports
- EXACT — exploration activity summaries.

All new data are now entered into these databases. In addition to the new data, a substantial quantity of legacy data spanning the last 100 years of GSWA activities throughout the State is being added on a project by project basis. It is hoped to incorporate much of this legacy data into the new 1:100 000 Geological Information Series as they are produced, but clearly that will not always be possible in the short term.

GeoVIEWER.WA allows the linking of spatial and associated textual data through one easy-to-use tool, which controls the display and reporting of data. Through the advanced query functions, customers can construct

and link complex database queries to the supplied GSWA data, or through a primary/foreign key link to their own databases (Fig. 3).

Tool box

You can interact with the data through a set of tools provided in the interface (see Fig. 4):

Save Project

Save changes made to GeoVIEWER.WA GVP file.

Recentre Mode

Use the recentre tool by pointing to a location on the map. The Map Display will recentre on the point you selected.

Zoom In Mode

To zoom in on a particular position on the Map Display, click that position once with this tool. To zoom to a particular area on the Map Display, drag a box over the area with this tool.

Zoom Out Mode

Same as the zoom-in tool but zooms out from the position you click or the area you drag over.

Identify Mode

Click on a layer in the Layer Manager to make it active. Click on the Identify button, and then select a feature in the Map Display to return information about that feature. This button will be 'greyed' out if the active layer is an image or raster dataset.

Hyperlink Mode

Click on the Hyperlink button, and then select a feature to see any information linked to the active layer. If there is no linked information then this button will do the same as the Identify button.

Textual Search

This option is specific to the GSWA Catalogue products and will be 'greyed' if the product layer does not exist on the CD/DVD.

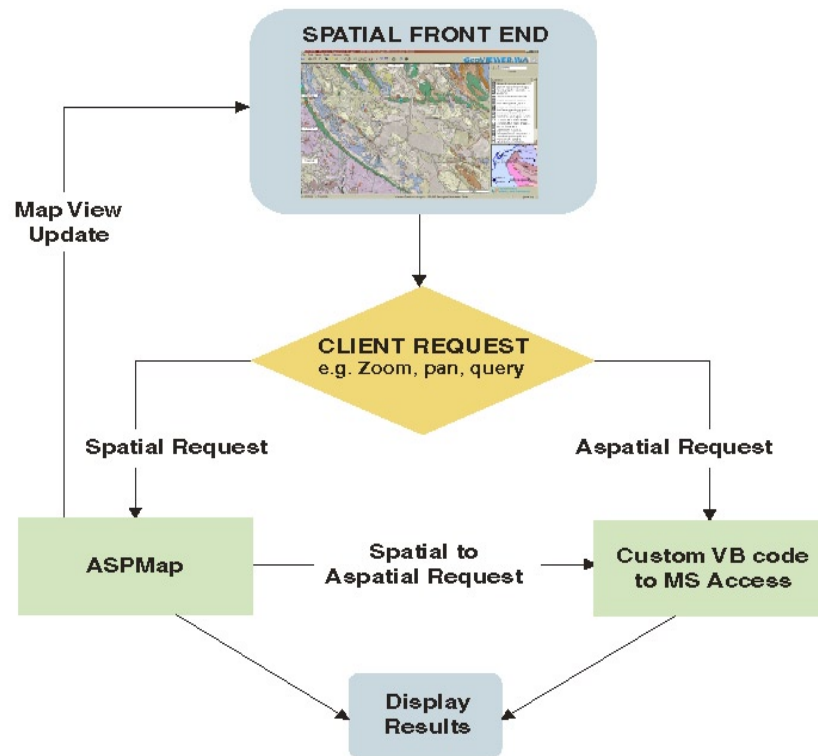


Figure 2. Process flow diagram

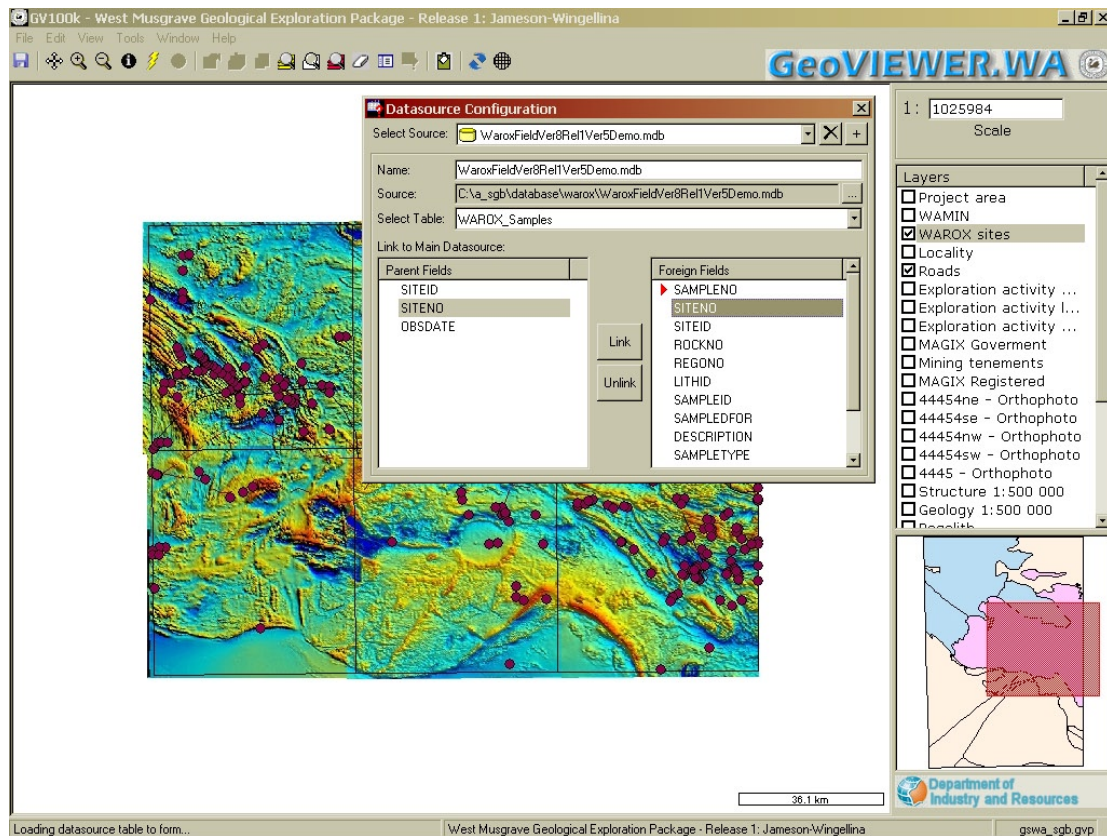


Figure 3. Linking to an external database



Figure 4. Tool bar

Click on the Textual Search button, and then specify your search criteria.

Edit Layer Properties

Click to view or modify the way the active layer is drawn in the Map Display.

Add Layers

Click to select the layers you want to add to the Layer Manager.

You can also add local datasets to the data menu. GSWA's strategy is to provide updated geoscience data via the Internet from GSWA's Data and Software Download Centre (www.doir.wa.gov.au/gswa). Customers can download updated data at no cost and store these data on their hard drive. Using *GeoVIEWER.WA* these data can be loaded into the viewing tool.

View Report

Click on this button to view the associated report. This button is greyed out if there are no associated reports.

Zoom to Full Extent

Zooms to the full spatial extent of all the layers in your Map Display. For example, if you have zoomed in a couple of times on your view, click on this button to zoom to the extent of all layers.

Zoom to Layer Extent

Click to zoom to the extent of the active layer.

Zoom to Selected

Click to zoom to the extent of the selected features.

Clear Selection

Click on this button to remove any selected features that are highlighted.

Display Legend

View a legend for features displayed in your Map Display.

Query Layer

Create and run query expressions. You can add new and delete existing data sources used by the Layer Query Builder.

Copy Map Image to Clipboard

Click on this button to copy your Map Display to the clipboard. To copy the overview map to the clipboard, place your cursor over the overview map, then press the right mouse button. To copy the map legend to the clipboard, place your cursor over the map legend, then press the right mouse button.

Refresh Current Map

Refresh your Map Display by clicking this button.

Add Grids to Map

Add map coordinate grid lines to your map by clicking on this button.

Conclusion

GeoVIEWER.WA, as a state-of-the-art geoscientific data product, provides the most up-to-date data from GSWA's continuously updated databases, delivered in a timely manner and at no cost via a user-friendly DVD/CD interface.

GeoVIEWER.WA is changing the concept of the traditional geological map. GSWA is moving away from the standard map-centric structure, to a data-centric approach in the delivery of geoscience and associated data. By making the geoscientific data readily accessible, these DVD/CD data can be integrated with local data and incorporated into decision-making processes, thereby promoting mineral and petroleum exploration in Western Australia.