

# Simplified Hydro-stratigraphic 3D Groundwater Model Fact Sheet

## Overview

The 3D models are intended to provide a convenient way of visualising the distribution of simplified hydro-stratigraphic layers across Natural Resource Management (NRM) regions, providing a basic understanding of the main aquifers and groundwater quality in each NRM region. The modelled stratigraphy depths, water level and salinity data (sourced from the State's Groundwater Database SA Geodata) can be used as a guide of regional conditions. However, the user must be aware that the model is a simplified representation only.

The restricted coverage and density of data points limit the model's accuracy. Data points for each modelled layer are provided and can be used as a guide to the model's accuracy. Where there is a greater density of data points the model is likely to be more reliable. That said there has not been rigorous data validation and verification with respect to development of the model layers. Furthermore, the water level and salinity data layers have been generated using all available data irrespective of age. In many cases, the only available water level and salinity data was recorded at the time of drilling, which may be several decades old. As a result the interpolated surfaces in the model may not accurately reflect the current state of the groundwater resources.

The extents of each of the outcropping stratigraphic surfaces were initially based on the 1:2,000,000 Geology layer (obtained from the South Australian Resources Information Geoserver (SARIG) developed by the Department of Manufacturing, Innovation, Trade, Resources and Energy) which, was then simplified to represent only major hydro-stratigraphic units. For example, where there are small areas of Quaternary sediments overlying Basement sediments, these are not depicted. This is because as the Quaternary sediments are thin and may only periodically be saturated they have not been considered as a major hydro-stratigraphic unit for the purpose of these products. Subsurface extents are derived from drillhole log interpretations where available and in some cases combined with previously derived extents of basins and troughs, e.g. St. Vincent's Basin and the Polda Trough.

The authors have tried to make the extents and surfaces in the models as accurate as possible; but recommend further refinement and note the models should be used as a guide only.

## Understanding the Reduced Standing Water Level

Reduced Standing Water Level (RSWL) data is displayed in metres above Australian Height Datum (mAHD). In some cases the water level appears above the ground surface. This may be a realistic representation for confined aquifers where the water in the aquifer is under pressure. However, for unconfined aquifers the appearance of the water level above the ground surface is only a result of error in either or both of the water level surface model and the ground surface model. Care should be taken with interpretation of these surfaces and the location and density of point data carefully considered.

Also included as part of the display are the location points for each interpolated unit or surface, basin extents, palaeochannel extents, satellite imagery and roads.



## Minimum requirements

The 3D models are provided in 3D PDF format ensuring easy accessibility. They can be viewed in:

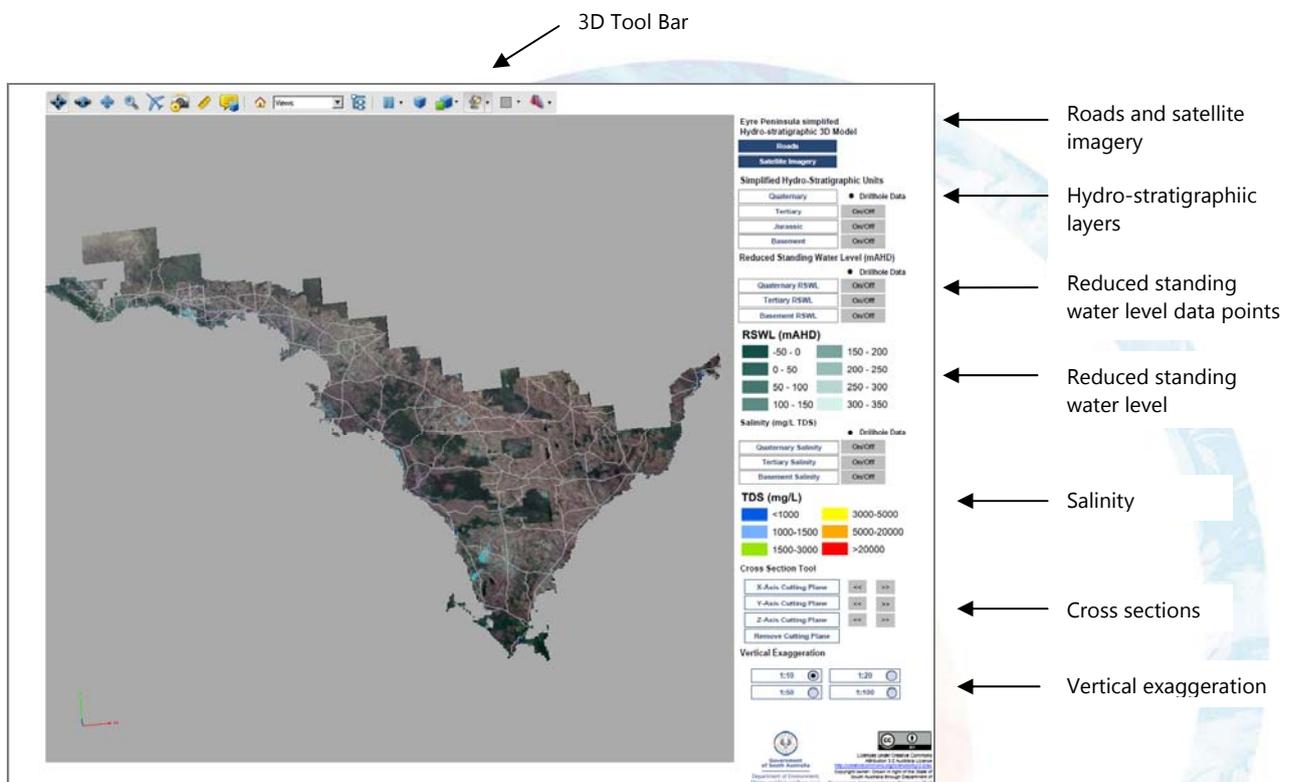
- Adobe Reader 10.0 or later
- Acrobat Acrobat 10.0 or later

Visit the Adobe website (<http://www.adobe.com/>) for a free download of the latest Acrobat Reader.

**Note:** The current version of Adobe Mobile Reader, for mobile devices, does not support 3D PDF viewing. A 3D PDF Reader for Apple iOS devices, is available from the Apple Store. An Android version was not available at the time of writing.

## 3D model tools

This section provides an overview of the tools available for working with a 3D model.



## 3D toolbar

The extended version of the 3D toolbar is shown below. If you are viewing a shortened version, right-click the toolbar and select Extended.



1. **Rotate:** (default) Applies Rotate mode to the pointer, in the model view. Drag the pointer in the direction that you want; the model rotates and tilts on the central axis.
2. **Spin:** Applies Spin mode to the pointer, in the model view.
3. **Pan:** Applies Pan to the pointer, in the model view.
4. **Zoom:** Applies Zoom mode to the pointer, in the model view. In the model view, click and drag the pointer up (zoom in) or down (zoom out).
5. **Fly:** Activates fly over mode. Best used when viewing the model horizontally. Click the model and move the mouse forward to start the 'fly over' animation. Release the mouse button to stop.
6. **Camera Properties:** adjust camera view properties - camera presets, alignment, position target, parameters.
7. Allows the user to input precise camera view angles and positioning.
8. **3D Measure Tool:** Enables you to measure tool, in meters. Point switches to a cross-hair and a red dot appears. On the model, click the starting point, then double-click at the end point. See **Measuring layer thickness** below.
9. **Add 3D Comment:** Add a comment to a selected location on the model.
10. **Default View:** Return to the default view, i.e. scale and orientation of the model when first opened. Useful for clearing comments or measurements.
11. View selection: Select a view of the model, e.g. top or bottom. If you have used the measure tool, each measurement is added to the selection.
12. **Toggle Model Tree:** Opens the Model Tree panel showing the list of layers that make up the model. Enables you to refine layer selections. See **Using the map layers** below.
13. **Pause Animation:** Not applicable for these models.
14. **Use Perspective Projection:** switch between perspective projection (realistic view of the 3D image) & orthographic projection (unrealistic view that enhances 3D image depth. The scale is only true at centre of the 3D image).
15. **Model Render Mode:** Enables you to apply different renders to the model.
16. **Enable Extra Lighting:** Enables you to apply different light effects to the model.
17. **Background Color:** Enables you to select a different background colour.
18. **Toggle Cross Section:** Enables you to select cross section properties. See also Cross Section Tool below.



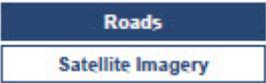
## Navigating the model view

Depending on the model selected from 3D toolbar, e.g. Rotate or Pan, you navigate the model by dragging the pointer across the model view. In addition to the features on the 3D Toolbar, you can:

- Zoom in/out using the mouse wheel to zoom in (roll forward) or out (roll back).
- Title and rotate by dragging the pointer in an direction.
- Maximise the view by pressing Ctrl-L. Press Esc to return to normal view.

## Using the map layers

A series of tools are provided to the right of the model view, which enables easy selection of model layers.

- **Roads and Satellite Imagery:** Toggle on Roads and/or Satellite Imagery. In this example, Roads is selected; Satellite Imagery is not.  

- **Basins/Areas:** Available only where relevant. Shows outlines of the selected basins and/or areas.
- **Simplified Hydro-Stratigraphic Units:** Groups of formations broadly by geological age. Note that Basement, if available, refers to hard rock aquifers relating to the Achaean to early Palaeozoic era.
- **Reduced Standing Water Level (mAHD):** Layers showing the elevation of the water level, typically measured in meters Australian Height Datum (mAHD). RSWL is calculated by subtracting the depth to water from the reference elevation. A negative value indicates that the water level is below mean sea level. A legend of RSWL ranges by colour is provided. See also *Understanding the water level data* above.
- **Salinity (mg/L TDS):** Layers showing salinity levels measured as Total Dissolved Solids (TDS), in milligrams per litre (mg/L), of a water sample. A legend of TDS ranges by colour is provided.
- **Cross Section Tool:** Enables you to view cross sections at any location, in the X, Y or Z plane
- **Vertical Exaggeration:** Enables you to exaggerate the vertical features. Default selection is 1:10.

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