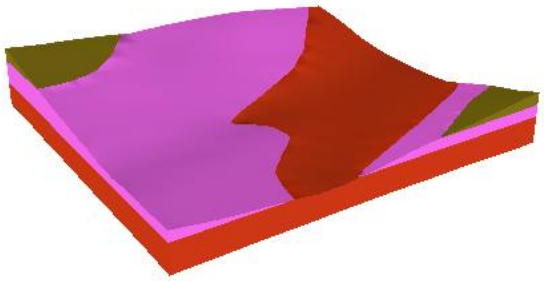
GSI3D SAMPLE DATA INFO DOCUMENT

GSI3D 2011 ships with a small sample project file and some supporting model data. The sample project is not a real-world geological scenario; it is designed to demonstrate how your own data can be formatted, compiled and then calculated into a 3D model using GSI3D. The sample data is not exhaustive and represents the minimum set of data types that would typically be used to initiate a 3D modelling project in GSI3D.



3D view of calculated sample project in the full version of GSI3D

For further information on import file formats and for detailed descriptions of the data types supported by GSI3D and how to manipulate them please refer to the GSI3D User Manual, which is available for download from the GSI3D Research Consortium website http://www.gsi3d.org.uk.

WHERE SHOULD THE SAMPLE DATA BE INSTALLED?

The sample data is provided as a ZIP file that can be unpacked and placed anywhere on your system so long as all of the unpacked files are kept together in the same folder. For a standard Microsoft Windows installation it is suggested that you use the following folder so that the software and the data are held together:-

- C:\Program Files\GSI3D 2011\SampleData

WHAT IS INCLUDED IN THE SAMPLE DATA?

The sample data is based on a fictional geological model scenario with a basic layer-cake geology comprising three geological units and covering a geographic area of approximately 1km^2. The model has been built using the full version of GSI3D. If you are using the demonstrator version of GSI3D you will see only a subset of the entire model because the amount of data that can be loaded into the workspace at any one time in the demonstrator is restricted.

SAMPLEBOREHOLES.BID

This file contains borehole log index data or borehole map for the sample project. It is essentially a list of borehole log names together with their map grid coordinates and start height elevation values. It should be used in conjunction with the corresponding BLG file that is also provided.

SAMPLEBOREHOLES.BLG

This file contains the borehole log downhole information. Each borehole named in the BID file has one or more log interval entries in this file detailing the drilled depth at which the various geological unit bases are encountered. The interval codes in this file correspond with the codes used in the sample project GVS file.

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SAMPLE.GVS

This file contains a list of the geological units present in the sample model in stratigraphic order from top to bottom. Each entry in this list has a value for STRATIGRAPHY, LITHOLOGY and CHRONOSTRATIGRAPHY which enables GSI3D to apply different legend colours to each geological unit. The legend colours are held in the GLEG file.

SAMPLE.GLEG

This file contains a list of all possible legend attributes from the GVS file together with their corresponding RGB (red, green, blue) colour values.

SAMPLETERRAINDATA.ASC

This file contains a grid of digital terrain model (DTM) elevation values in standard ASCII grid file format. This is the raw data for the model capping surface that all GSI3D models need. This file is included for completeness as an example of the grid data that can be imported into GSI3D; within a GSI3D project triangulated versions of grid data are used instead to build and calculate the model. Refer to section 4.6 in the User Manual for more detail on the process of importing grid data as the model capping surface.

SAMPLEPROJECT.GSIPR

This is the master project file for the sample data. It is ready prepared with the above data sets pre-loaded. Because some data in a GSI3D project are held in separate files you should ensure that all of the sample data files are kept together in the same folder as the project file so that they can all be found by GSI3D when the project loads.

THE SAMPLE PROJECT

The project file (.gsipr) contains the references to the necessary external files such as the GVS and GLEG files, as well as its own data representing the geological interpretation in the form of geological unit distribution maps and cross sections – *"the model"*. Additionally it has two triangle mesh surfaces (TIN objects) which are triangulated versions of the terrain grid.

GEOLOGICAL UNITS

The geological units each have a distribution map comprising one or more polygons or "*envelopes*" per-unit. There are three geological units in the sample project, although only two will be loaded if the software is run in demo-mode.

The three geological units are, in stratigraphical order from top to bottom:-

1. Sandstone
2. Mudstone
3. Limestone

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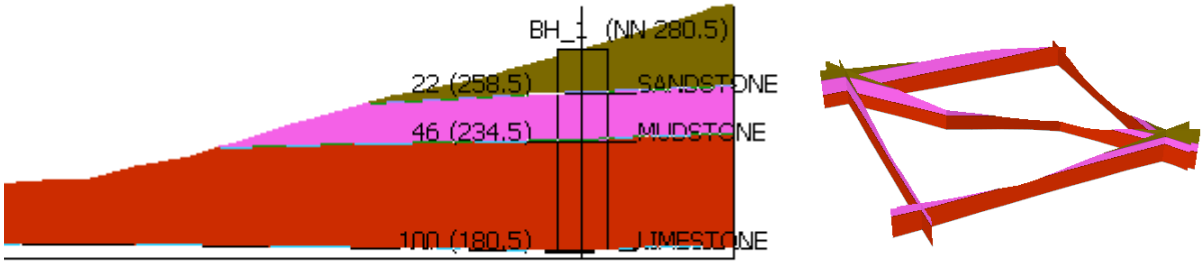
Left to right: *Sandstone distribution map, Mudstone distribution map, Limestone distribution map, Composite map (i.e. geological map)*

CROSS SECTIONS

The cross sections in the project are the geological interpretation at depth for the project area. There are five sections in the sample project; four bounding or "*docking*" sections to constrain the edges of the model and one section running roughly diagonal across the middle of the project area from corner to corner, using the available boreholes. In demo-mode only two of the five sections will be loaded.



Left: *Portion of a cross section showing borehole data and three correlated geological units,*
Right: *all five correlated sections in 3D view – "the fence diagram".*

TIN SURFACES

These are triangulated versions of the terrain data grid; for details of how to load a grid of data into a TIN object please refer to the User Manual section 3.2.2: "*Create new TIN*".

TIN objects are stored within the GSIPR file as raw data (i.e. indexed XYZ data plus triangle vertex index values). There are two TIN objects held in the sample GSIPR file:-

- ***DTM*** is used to provide a general model capping surface covering all model objects, for example to cap each section in the project with a topographic profile.
- ***Calculation TIN*** is a subset of the DTM that is used to calculate the model. It is trimmed to a smaller area within the project to show how an exact region of the model can be calculated into a clean stack of volumes.

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CALCULATING THE SAMPLE MODEL

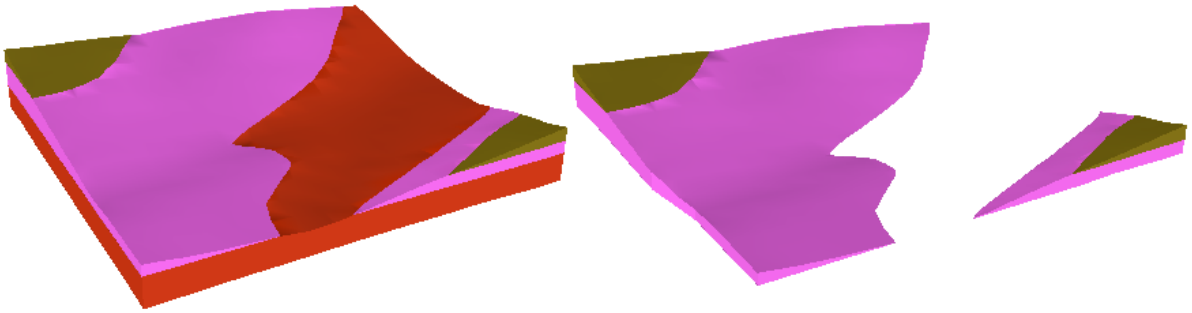
To calculate the model, first load the GSIPR file into GSI3D and then select the TIN that will be used to bound the calculation:-

- Choose ***File > Properties***;
- In the dialog box, click ***DTM - for calculation***;
- In the selection box, choose ***CalculationTIN*** from the pull-down listing;
- ***OK*** both boxes.

Next run the calculation engine:-

- Choose ***Analysis > Calculate triangulated volumes***;
- In the model calculation dialog box, click ***Start***;
- When the calculation has completed (one or two seconds) click ***OK***.

To view the calculated model, Right-click on the geological units folder in the map window object listing and choose ***Link all objects to 3-D window***.



Left: *calculated model in full version of GSI3D,* ***Right:*** *calculated model in demo version*

The model can be calculated in both the full and demo versions of the software, but in demo mode only a portion of the model will be produced, as shown above-right.

To understand what geometry has been produced it is useful to *"explode"* the model in the 3D window. To do this:-

- In the 3D window, click the ***Exploded*** tab;
- Click the ***Explode model*** check box;
- Slide the controls to explode and translate the model in the X, Y and Z directions.

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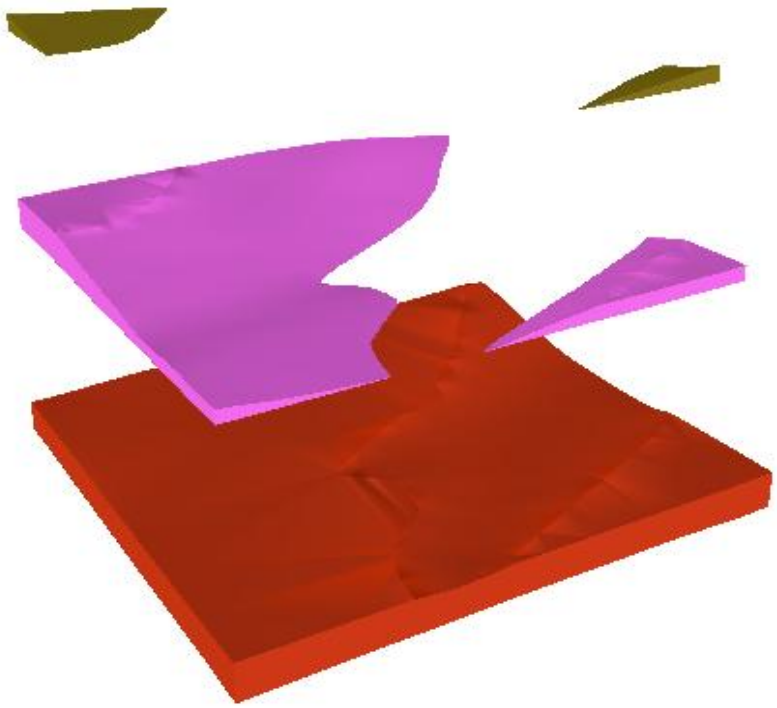

Exploded view of calculated 3D model in full version of GSI3D

HOW MAY I USE THE SAMPLE DATA?

The sample data is intended as a basic guide only to some of the types of data that can be imported into GSI3D and is provided on an "as is" basis. Both the data and the geological scenario represented by the data are highly simplified and entirely fictitious. You are therefore welcome to use and modify the sample data in any way you choose.

If you are a GSI3D Research Consortium member and would like to enquire about consultant assistance with formatting and compiling the data for your own modelling projects please contact the GSI3D Helpdesk, as detailed in your membership documentation, to discuss your requirements.

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