

## Improvements and New Functionality

### 1. Drillholes

#### a. Performance

- i. Use of GPCL so more than 10,000 holes possible

#### b. Editing

- i. Added persistence for structural data and relaxation
- ii. Numeric drill log calculator
- iii. Advanced assay/property compositing wizard
- iv. Single drillhole design tool with model geological log and 3 file csv export

#### c. Visualisation

- i. Scaling of numeric logs are under user control for individual or full drill hole set.
- ii. Drillhole section projection distances can be set and persisted/saved for each section

#### d. Selection Lists

- i. User can save drillhole selection lists for Compute, Compositing, Export and Mesh grid creation functions.

#### e. Statistics

- i. Histograms/Stats are available for individual or multiple drillhole sets using selection lists.

### 2. Geology modelling

#### a. Performance

- i. Multithreaded Compute
- ii. Multithreaded Plot the Model to section

### 3. 3D Geology – points

#### a. Editing

- i. Linked to point sets in 3D Viewer

### 4. 2D Viewer

#### a. Image Manager

- i. Level of detail tiles are used to render high resolution images
- ii. The Image Manager allows the user to control the visibility of currently displayed 2D mesh grids and all image backdrops for the current section –
  - On/Off
  - Stack order
  - Transparency
  - Smooth resampling (2D Mesh grids only).

#### b. Section management

- i. Section state is maintained from one GeoModeller session to another.
  - Projected data
  - Display options (Fill, Lines, Model geology, Data selections, Presentation options etc)
- ii. Section tabs are restored in sorted order.
- iii. Only one row of Section tabs is maintained and then all other displayed sections are available via a drop down list.
- iv. Sections can be created from a SEG Y file with associated backdrop

#### c. Visualisation

- i. Re-written with GPU tool kit for added performance
- ii. True type fonts for text
- iii. Improved section labelling
- iv. Pan and zoom using middle mouse and mouse wheel respectively

### 5. Mesh Grids

#### a. Micro-seismic

- i. Cartesian focal mechanism plot of points selected in 3D
- ii. Time series plot
- iii. 3D scaled ball style plot for events/attribute including error bars
- iv. Visual filter of 3D point cloud using multiple attributes, including time

#### b. Calculator

- i. Improved usability
  - Copy/Paste
  - Manual typing

#### c. Set Calculator for Vertex meshes;

- i. Union; Intersection; Difference; Symmetric Difference
- ii. Allows setting of distance confusion threshold

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- a. Define and Compute Drift
  - i. Complex control of property distributions within a set of Formations using known boundary conditions ie velocity, density
- b. SEG Y 2D/3D
  - i. 2D SEG Y files directly generates a 2D section and backdrop
  - ii. 3D SEG Y file imported and visualisation as a Mesh Grid

## 9. Interpolation

- a. Multithreading
  - i. Variogram modelling, Kriging, Domain Kriging and Gaussian Simulation are now multithreaded

## 10. Inversion

- a. EM
  - i. 1D Airborne EM Inversion
  - ii. Apparent Conductivity
  - iii. 2D Airborne EM Forward modelling from your geology model - ArjunaAir
  - iv. 2D Airborne EM Inversion- New, SUD solver
  - v. Support for Time Domain systems including GeoTEM, QuestEM, Tempest, SkyTEM, VTEM, VTEM Plus and Frequency Domain systems (DigHEM, Resolve)
  - vi. MPI is implemented for 1D and 2D inversion; 1D runs in parallel with each flight line as a separate process; 2D uses a cell based parallel processing strategy.
  - vii. Fully integrated into the GeoModeller 2D geophysics and Mesh Grid environments enabling immediate visualisation of results with geology and other geophysical datasets or grav/mag stochastic inversion outputs.

## 11. Stochastic Inversion

- a. Magnetics and Gravity
  - i. Optimised Tensor component inversion including FTG and Falcon
  - ii. Variable Z support using sgrid format added to inversion
  - iii. Fixed cells is implemented for drill holes using a drill hole selection list and a user-defined range of influence.
  - iv. The geological provenance – the reliability of observed data – can be used to fix geological boundaries during inversion.
    - Observed
    - Interpreted
    - Inferred
    - Model Constructor
    - Unspecified

- iii. Default Tops and Bottoms Formations created by stratigraphic pile ordering: Physical Property Control added

## 6. Export

- a. 3D PDF
  - i. Export 3D Geological Model and Drillholes to 3D PDF
- b. Feflow
  - i. Export has been improved to automate population of the Feflow export/import file with litho-indices and geological gradients (GeoModeller 3 component angles) as phi and theta.
- c. EarthSci
  - i. Export 3D Geological Model, Drillholes, voxets, and 3D geological data to EarthSci format
- d. GoCAD SGRID
  - i. Export variable Z voxets to GoCAD SGRID format

## 7. Import

- a. Mesh Grids
  - i. SEG Y 2D and 3D
  - ii. Import of Seismic picks with auto section creation, Douglas Puecker point thinning and Formation geometry calcs (Dip/DipDirection) at 2D seismic section intersections.
  - iii. GoCAD SGRID format voxets
  - iv. Seismic horizon import workflow available

## 8. Product Engineering

- a. Geomodeller has been re-engineered using Eclipse platform
- b. This will improve future product development and plug-in capacity
- c. Initial improvements in window management apparent in 2014
- d. GPCL for 3D graphics



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