

## Petrophysics 2022.1



# GVERSE® Petrophysics

## Integrated log analysis for comprehensive interpretation

GVERSE® Petrophysics is a petrophysical application designed to assist geoscientists and petrophysicists in analyzing and interpreting well log data and characterizing the reservoir using simple to advanced log interpretation workflows in a large multi-well multi-user environment.

GVERSE Petrophysics supports the import of digital data from numerous sources and provides you with integrated data views and analysis. Using this application you can view, edit, and analyze well log data in three different views:

- **Log View**
- **Crossplot View**
- **Report View**

GVERSE Petrophysics enables you to quickly analyze well log data using industry standard petrophysical algorithms. In addition, the Python API for GeoGraphix lets you utilize all data in the GeoGraphix project, including logs, formations, production and completion information, in scripts written in the Python programming language.

GVERSE Petrophysics is integrated with GVERSE Geo+, XSection, GeoAtlas, and ZoneManager for a more comprehensive interpretation.

#### Disclaimer

GVERSE Petrophysics accesses log and well data from the common project database, displays this data in log, cross plot, and report templates, and creates petrophysical parameters extracted for the petrophysical model for display or export for further analysis. You can use log templates created in GVERSE Petrophysics to display curves in GVERSE Geo+ and XSection, and create cross sections from wells displayed in GVERSE Petrophysics, view WellBase information for wells displayed in GVERSE Petrophysics, and create IsoMap layers from GVERSE Petrophysics curve data statistics. In addition to these integration features, when working with well data in GeoAtlas, GVERSE Geo+, or XSection, you can easily view the selected wells in GVERSE Petrophysics.

## Key Benefits

**Intuitive Language:** GVERSE Petrophysics uses a simple and intuitive scripting language. With little effort, users create sophisticated petrophysical models. These models can then be applied to individual wells for detailed analysis or to thousands of wells to generate reservoir-to-regional scale formation characterizations. Utilizing log template displays and petrophysical interpretations, users then view the petrophysical models from single-well log templates to multi-well cross sections to 3D fence diagrams.

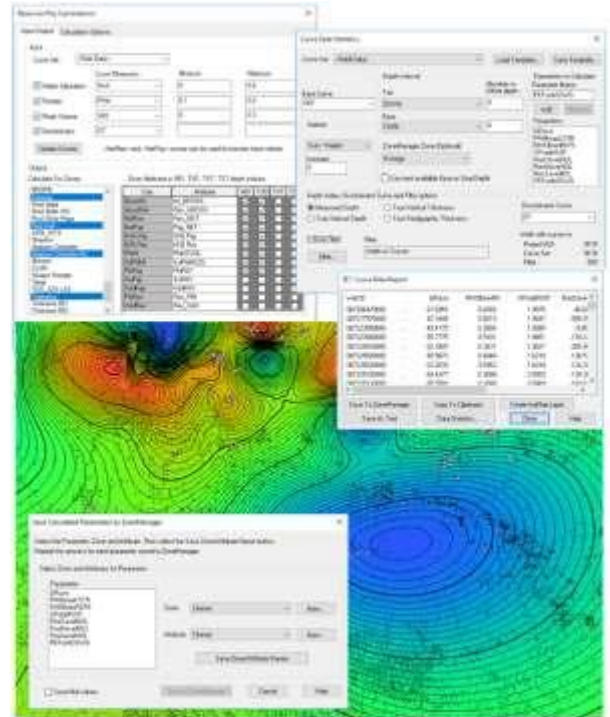
**Scalable Functionality:** GVERSE Petrophysics includes over 250 predefined standard log analysis equations as well as several predefined water saturation, lithology, and coal bed methane (CBM) models. The equations are grouped into easy-to-understand families of calculations that can be copied and edited into a script to solve most formation analysis problems. For the more sophisticated user, GVERSE Petrophysics can be linked to external models created in Visual Basic, C, or C++ code. External models offer unlimited analytical complexity as well as integration with presentation, attribute extraction, and mapping utilities.

**Seamless Petrophysical Analysis, Attribute Extraction, and Mapping:** Users can extract attributes generated in the petrophysical models within formation zones of interest and/or filtered well-sets for direct map layer creation, statistical analysis, or export. GVERSE Petrophysics easily links to ZoneManager, GeoGraphix attribute analysis application, to support well-by-well/zone-by-zone parameters for petrophysical models or read/write parameters for Pickett Plot analysis.

## Key Features

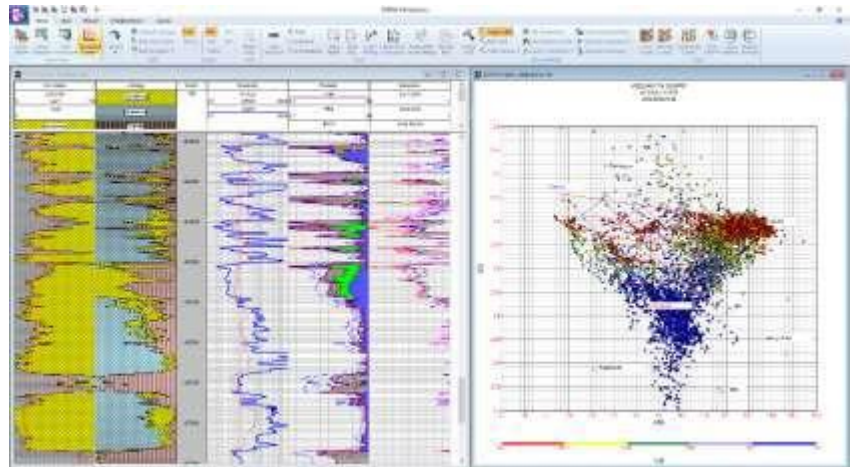
### Multi-Well Interpretation

- Perform one-step reservoir pay summations for common reservoir attributes such as gross, net, net/gross, porosity feet, and hydrocarbon-filled porosity with corrections for true, vertical, and stratigraphic thickness.
- Generate virtually any statistic from curve-derived attributes over a zone or depth interval of interest with Curve Data Statistics.
- Easily confirm results using data-distribution histograms, statistics, and cross plots.
- Map the results directly in GeoAtlas, GVERSE Geo+, or save results to ZoneManager attributes.
- Create proposed completion stages and perforation cluster intervals, then save as proposed completion records in the WellBase Completion table. These records are available for data posting symbology on the well log templates.



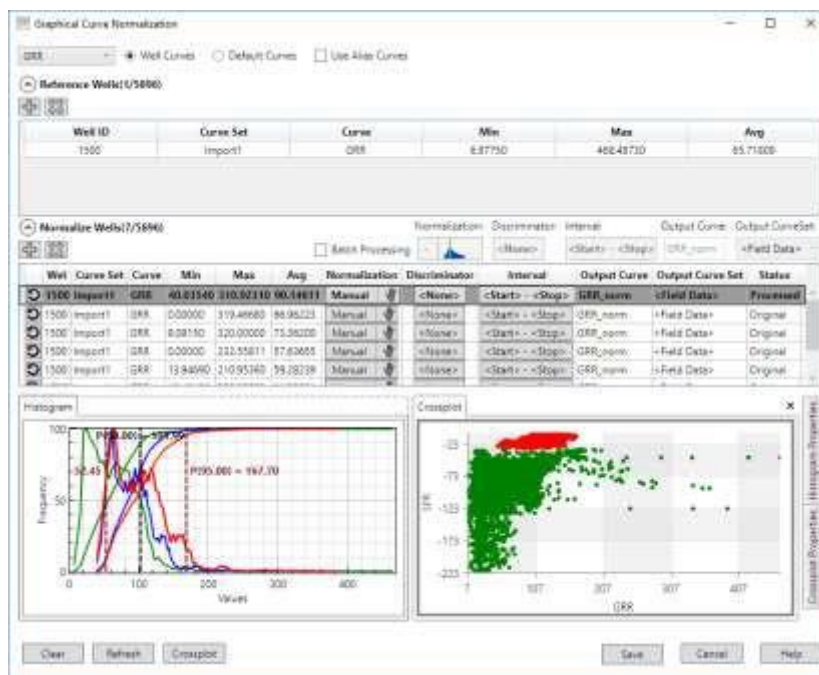
### Petrophysical Analysis

- Easily perform quick and interactive log calculations for standard interpretations and reconnaissance with user-defined equations.
- Utilize pre-written interpretations for 3 and 4-mineral determinations and Archie, Dual-Water, Indonesian, and Modified Simandoux saturation models.
- Link complex, external models written in C, C++, or Visual Basic.
- Build and save personal equations with user-defined equations comprised of over 250 pre-defined standard log analysis equations.
- Calculate Poisson's Ratio and Young's Modulus using mechanical properties/UDE Group.
- Utilize standard Halliburton, Schlumberger, and Baker Atlas charts for environmental corrections or digitize additional charts.



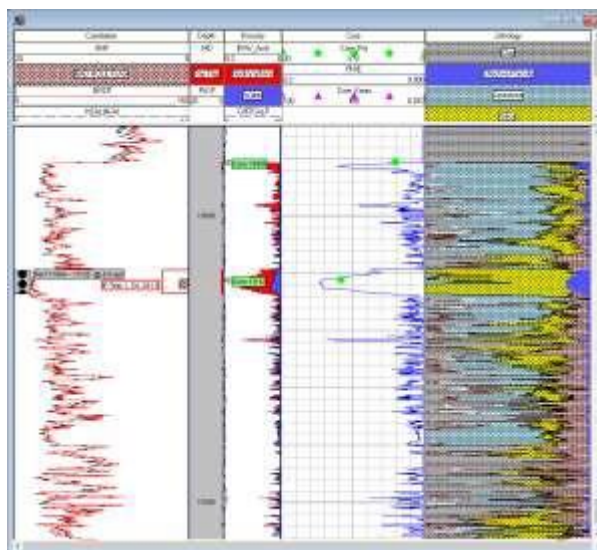
## Curve Data Management

- Import standard LAS, LBS, ASCII, DLIS, and LIS/TIF data files.
- Automatically merge and splice curves using the curve import tool or optionally merge or splice at user defined depths.
- Benefit from project-based mnemonic inventory, mnemonic aliases, and unit conversions.
- Manually or bulk normalize curves using the graphical curve normalization utility which includes average, single, and two-point normalization methods.
- Utilize single or multi-well curve copy, renaming, deletion, rescaling, min/max clipping and filter smoothing tools.
- View standard core curve analysis attributes plus 200 user-defined core curves attributes.
- Combine multiple curve mnemonics for similar curve types in hierarchical order based on a pre-determined preference.



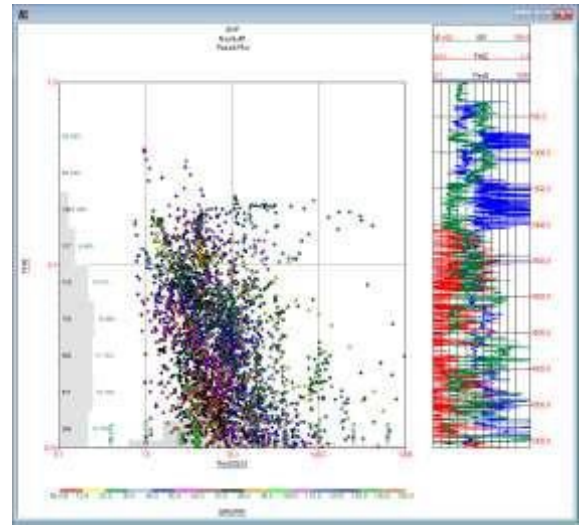
## Log Analysis and Display

- Control presentation templates to display curve and depth-registered images with virtually unlimited tracks, curves, colors, and pattern fills.
- Display different track types including linear, logarithmic, mineral percent, depth registered images, text, core description, lithology pattern fills, tadpoles, and descriptions.
- Easily cut, copy, and paste curves between tracks using the on-screen presentation editing feature.
- Automatically post DST, core, perforation, mechanicals, IP, casing, tubing, and zone information.
- Interactively pick and display formation and fault markers and user-defined attribute intervals.
- On-screen QC editing of curves including performing simple or complex depth shifting, adjusting SP baseline shifting, and utilizing curve patch tools.



### Cross Plot Analysis and Display

- Display data relationships over total well depths, user-specified depth range, or one or more zone(s).
- Create three-axis display with linear or logarithmic scale, user-controlled symbols, size and color, Z- axis color spectrum, and X and Y axis histograms.



### Multi-Well Cross Plots

- Benefit from multi-level discrimination with user-drawn polygon capabilities.
- Differentiate between wells by assigning colors to individual wells for better analysis.
- Fit curves using linear regression, reduced to major axis, and polynomial regression capabilities.
- Interactively determine the Formation Water Resistivity (Rw), Bound Water Resistivity (Rwb) and Cementation Exponent (m) using the Pickett plot.

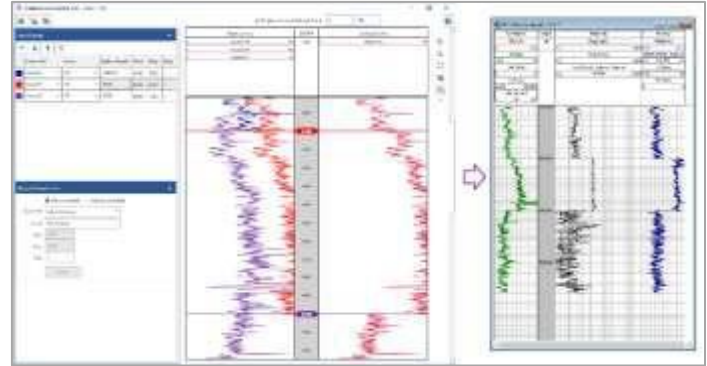
### Customizable Reports

- Create user-defined well reports such as net pay, average porosity, water saturation, total porosity feet, or hydrocarbon-filled porosity.
- Define curve choices, sample rates, depth interval, or zone selection using the provided tabular list.
- Export to tab or comma delimited text files, or copy results to the Microsoft® Windows® clipboard.

Well ID	Formation	Parameter 1	Parameter 2	Parameter 3	Parameter 4	Parameter 5	Parameter 6	Parameter 7
FT01-0000	FT01-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT02-0000	FT02-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT03-0000	FT03-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT04-0000	FT04-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT05-0000	FT05-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT06-0000	FT06-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT07-0000	FT07-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT08-0000	FT08-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT09-0000	FT09-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150
FT10-0000	FT10-0000	0.150	0.150	0.150	0.150	0.150	0.150	0.150

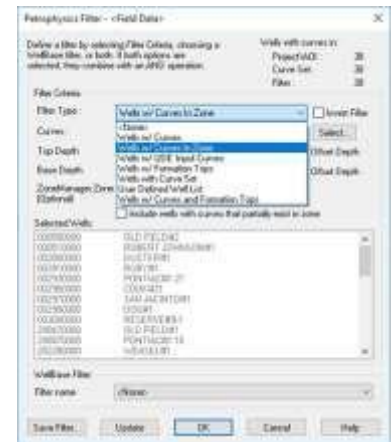
### Graphical Curve Splice

- Graphically splices the curve data for different runs in a well.
- Combine two or more input curves logged on different depth ranges to form a continuous composite curve into one single dataset, so that the measurements are available over the greatest possible depth interval.
- Display the single composite curve as a new curve in Log View of GVERSE Petrophysics.



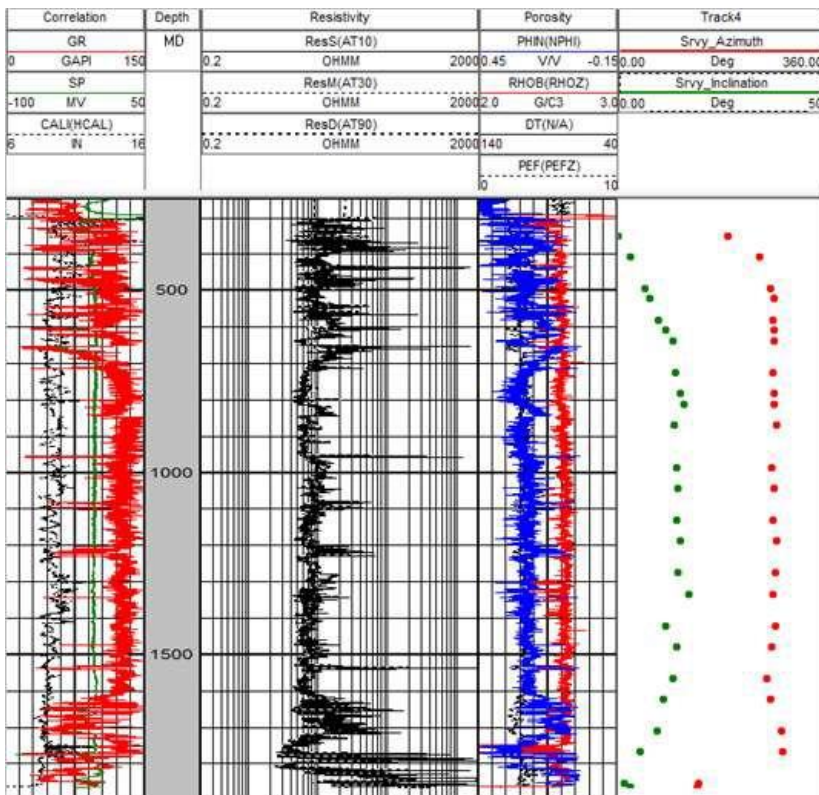
### Filter Wells with Curves in Zone

- Define Wells with Curves in Zone filter to refine the inventory.
- The filter focuses on only the wells with curves lying fully or partially in the corresponding zones.



### Survey Curves

- Display the Survey Curves in GVERSE Petrophysics using the Azimuth and Inclination survey data from WellBase.
- Use the Survey Curves as discriminator curve or in equations in UDE models.



#### Disclaimer

## Release Highlights 2022.1

### View Curves from Multiple Curve Sets

Use well logs from multiple curve sets on the same log template at their native step rates regardless of field data assignment. No merging or splicing required!

### Python API for GeoGraphix

Leverage machine learning and artificial intelligence on your GeoGraphix projects through Python. Run scripts written in the Python programming language on well data, grids and seismic.

### Digitize Log Curves

Digitize curves in DepthRegistration to create vector curves out of raster logs. Create new logs or QC existing logs by overlaying on the raster. Save to the database in new or existing curve sets.

### Create Interval Curves

Utilize values from the new Data Fields for Intervals feature in WellBase and create more meaningful interval curves. Curves take the value of data field at picked depths.

### Change Field Data in Bulk

Assign field data curve set in bulk using a hierarchical list of available curve sets. Use any type of curve set: import, merged, spliced, computed, and composite curve sets.

### Eliminate Null Curves in UDE Outputs

Keep the database & queries clean by creating UDE outputs only for wells with non-null data.

### Resizable Dialogs

Resize all key dialogs like Default Settings, Log Template Properties, and many others for easier viewing of data in the dialogs, Dialogs remember the size to minimize need to resize often.

## Requirements

### Minimum

- 2.4GHz 64-bit Intel class or better
- 8 GB RAM
- 1,024 x 768 graphics resolution
- CD-ROM drive
- 19-inch monitor

### Recommended

- Quad 2.4 GHz 64-bit Intel class or better
- 16 GB RAM or greater
- NVIDIA GeForce or Quadro - 2GB VRAM
- DVD-RW drive
- Dual 21+-inch monitors

### Software

- Microsoft® .NET 4.5
- Microsoft DirectX 11

### Operating System(s)

- Windows® 7 Professional x64
- Windows® 7 Enterprise x64
- Windows® 7 Ultimate x64
- Windows® 10 Professional x64
- Windows® 10 Enterprise