GVERSE® GeoGraphix®

gverse.com/geographix

PRODUCT OVERVIEW

ABOUT US

1985 — GeoGraphix migrated to the Windows operating system

1993 — GeoGraphix purchased by Landmark

1998 — Mathtech (LMKR) became partners with Landmark; Discovery Suite released

2010 — LMKR became the exclusive licensee of GeoGraphix in charge of development, maintenance and support, marketing and sales

2019 — GVERSE GeoGraphix released and a new brand created

2020 — Supporting our clients to meet their goals above and beyond

GeoGraphix (fondly referred to as GGX), was founded in Denver, Colorado to build the world's first geoscience software on Windows. GVERSE GeoGraphix is the latest evolution in G&G software that delivers advanced geological and geophysical interpretation at an exceptional price. The latest release of GVERSE GeoGraphix includes revamped geophysics, fast subsurface modeling and a laser-like focus on the core workflows geoscientists use every day.

GVERSE® GeoGraphix®

GVERSE GeoGraphix is a complete geoscience platform offering leading-edge mapping, geological, geophysical & petrophysical interpretation, structural modeling, well and field planning, and state-of-the-art 3D visualization.

Key Strengths:

- Tight integration that combines industry-leading technologies supported by a common data and project architecture
- Scalability that meets everyday workflow requirements of consultants as well as multinational oil companies
- Flexible licensing that allows you to pay for what you need/use
- Functionality tailored to both conventional and unconventional workflows
- Low requirement of IT support in-terms of hardware requirements, installation, and set-up time
- Cost efficient, at 30% less than comparable offerings, it is the smart solution for today's geoscientist
- User-based pricing models

GVERSE GeoGraphix consists of geoscience and engineering solutions focused on workflow optimization and enhancing the productivity of teams working on diverse geological and geophysical projects. GVERSE GeoGraphix applications give you fast, easy-to-use scalable tools that are interoperable with other known geoscience software suites, creating a truly collaborative ecosystem built around future technology trends leveraging big data, cloud, and deep learning.

GeoGraphix A market leader in G&G software*

Significantly enhanced geophysical interpretation

A market leader in G&G software for unconventional plays

Value-based and cost-effective

*Kimberlite report

GEOLOGY SOFTWARE

A dynamic set of geological interpretation tools for structural and stratigraphic analysis, mapping and geosteering.

GeoGraphix for Geology provides a dynamic set of integrated tools that help today's geoscientists accomplish their day to day tasks more easily and accurately. Whether you are working in an unconventional shale play or exploring for a conventional reservoir, GeoGraphix for Geology offers a diversified set of modules that can be used stand-alone for individual use or networked together within asset teams to provide an integrated platform for your interpretation workflows.

Key Benefits

Accuracy

Improved accuracy of reservoir understanding through dynamic surface modeling including conformance, unconformity trimming, fault offset and polygon generation, channel modeling, subcrop maps, and automatic isochore and isopach mapping.

Integration

Seismic data visualization and integration into the geomodel through real-time depth conversion of horizons, faults, and seismic backdrop.

Analysis

Log data management and interpretation to create presentation quality log templates; find relationship between attributes on multi-well cross plots, and perform industry-standard and customized multi-well log analysis with user-defined petrophysical models.

Real-time data

Geosteering while drilling to ensure the wellbore stays on target and the geomodel is updated in real time to make the next well better than the last.

Visualization

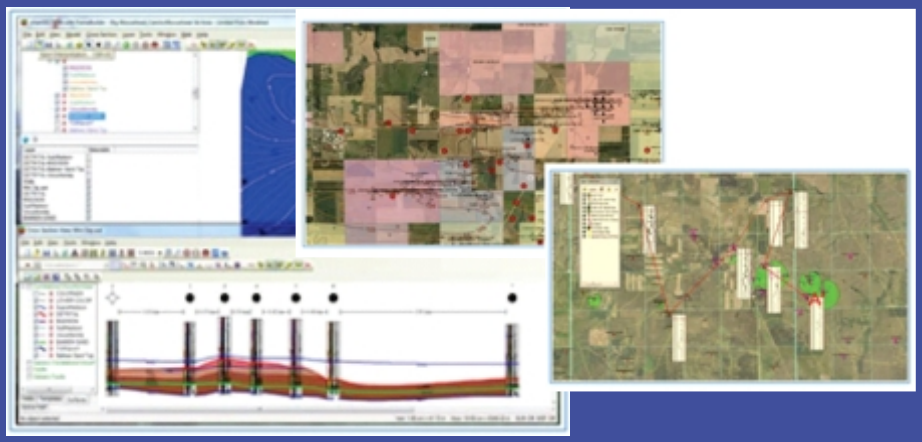
A dynamic 3D environment to interpret surfaces and faults, and to visualize seismic backdrops on fence diagrams.

Speed

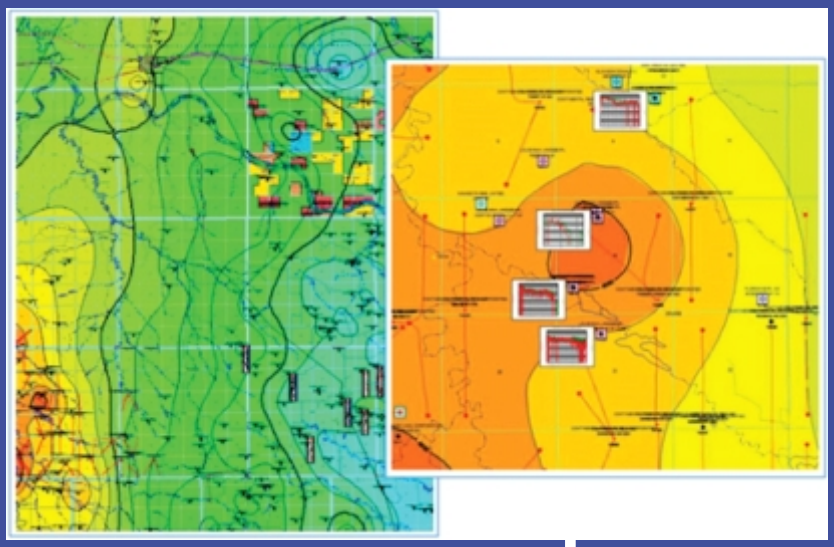
Fast and accurate cross section building, correlation, and on-the-fly geomodeling in a robust 3D environment.

MAPPING

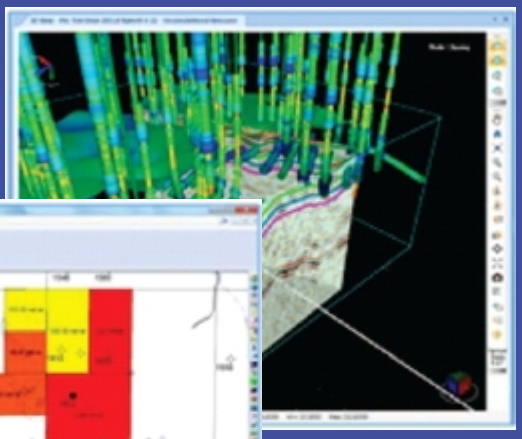
3D visualization of geologic cross sections and fence diagrams with interpolated well logs attributes and map layers provides increased insight into the true nature of the sub-surface geology.

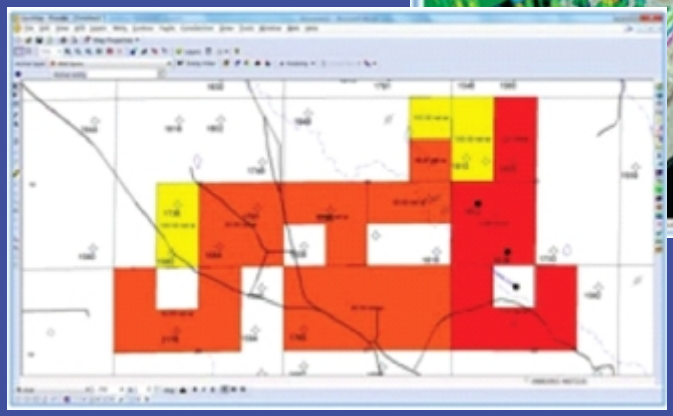


GeoAtlas
ESRI based map displays for high quality presentations.

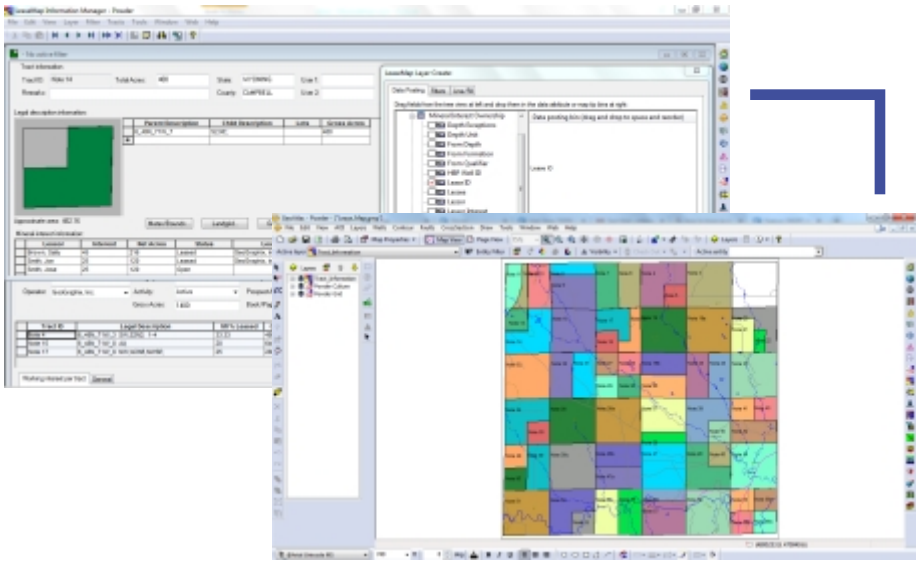


IsoMap
Powerful surface gridding and contouring application that combines a wide variety of data sources into a single surface or attribute layer.





Advanced 3D visualization
Subsurface interpretation software that includes the latest DirectX 11 gaming technology to render high resolution subsurface models.



LeaseMap
Complete understanding of any region's mineral interest ownership and leasehold status.

Scalable Functionality
Includes over 250 predefined standard log analysis equations as well as several predefined water saturation, lithology, mechanical, and coal bed methane models.

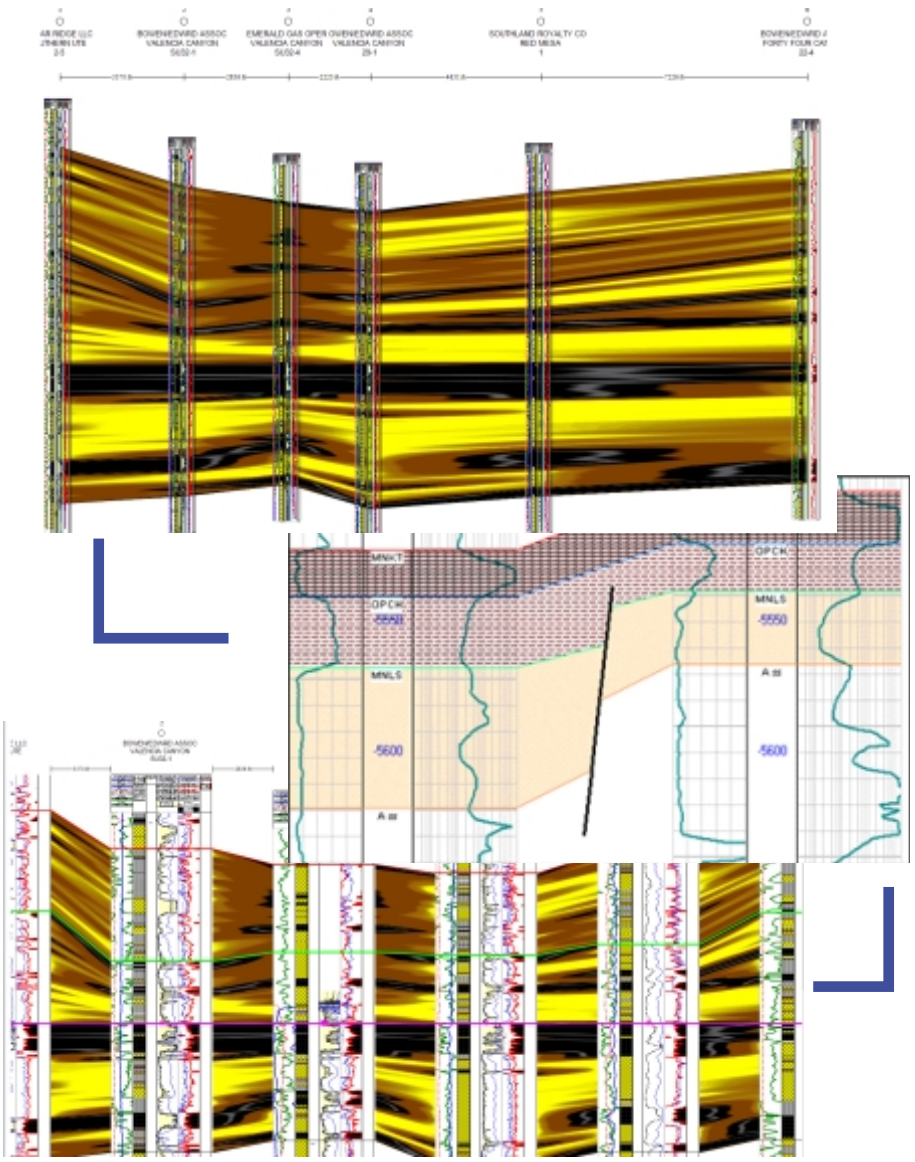
WELL CORRELATION

Fast and Robust Well Correlation Solution:
Xsection module is a fast and robust Well Correlation Software of GeoGraphix which supports creation of cross sections that can have as many as 1000 wells.

Stratigraphic and Structural Cross Section:
Quickly toggle between structural and stratigraphic datum with keyboard shortcuts.

Support for Raster:
Quickly and easily rectify and depth register raster logs, and digitize curves on Image Tracks in GVERSE Petrophysics.

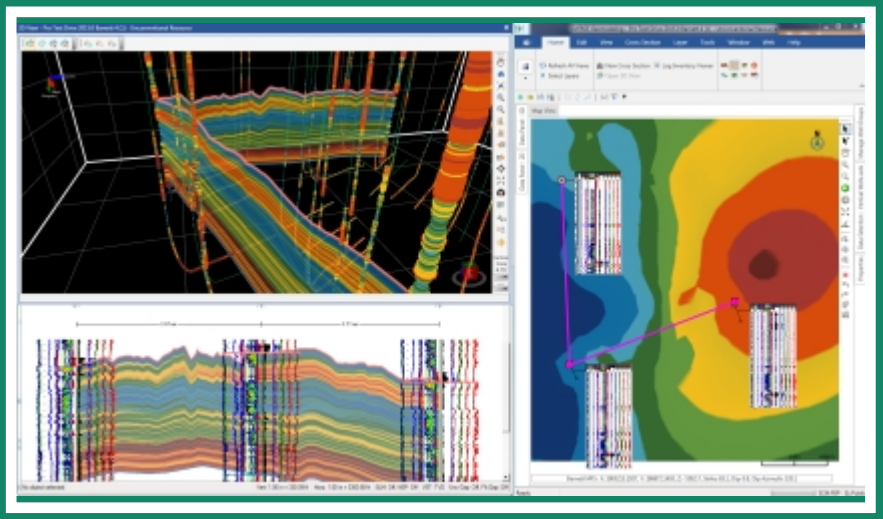
Lithology and Interpolation Fill:
Display the stratigraphic column lithologies on cross sections and interpolate log values within formations and between wells.

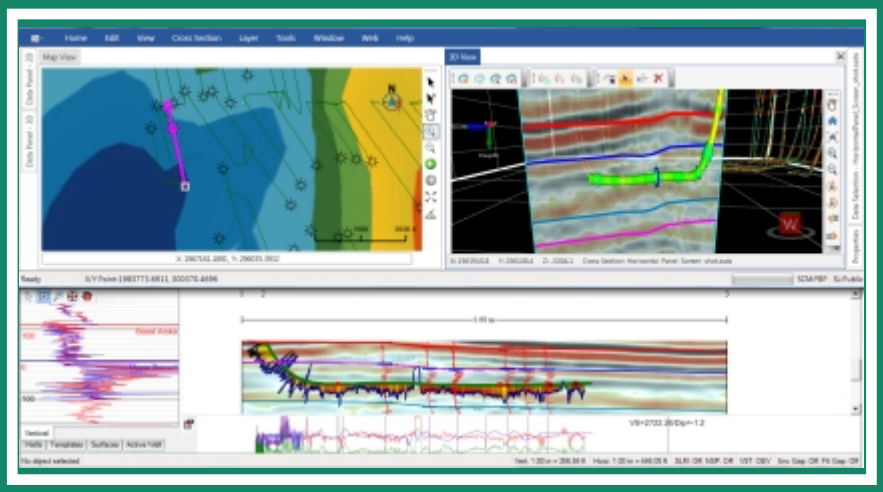


GEOMODELING

Our geomodeling software combines geological and geophysical surfaces, petrophysical attributes, and engineering data within an integrated 3D environment to visualize the developing geomodel.

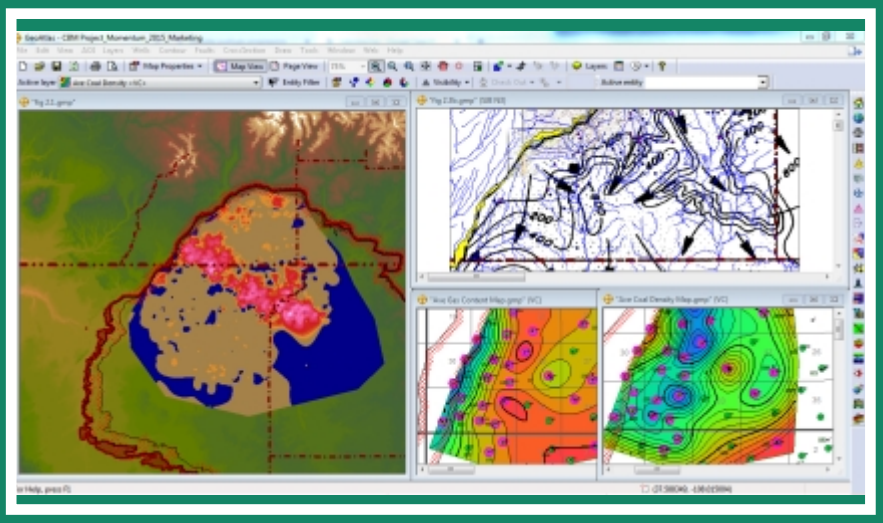
Real-time Integrated Visualization of Results:
Geomodel while interpreting on synchronized cross sections, 3D fence diagrams, and map view.





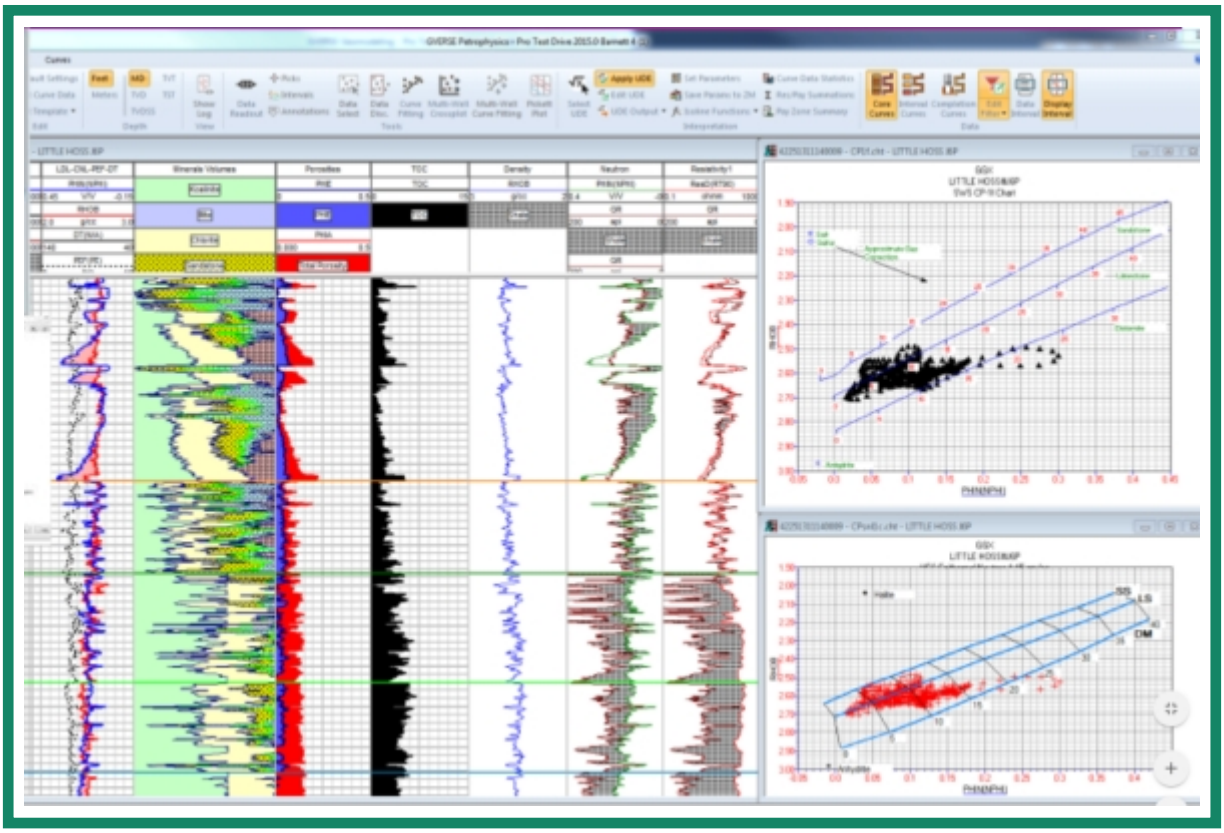
Quick and Easy:
Quickly load and display large datasets. Dynamically subset the play with Modeling Regions for maximum performance and accuracy.

Flexibility:
Quickly pick surfaces on cross sections and map view, clip the 3D scene, create integrated cross sections and fence diagrams, and define modeling regions and well groups for greater workflow flexibility.



PETROPHYSICS

GVERSE Petrophysics log analysis software is the ideal tool for performing full reservoir characterization on well datasets of all sizes and complexities in multi-zone projects.



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 and save the results to ZoneManager, an ASCII report, or create an IsoMap gridded layer for display in GeoAtlas and the GVERSE Geomodel map view.

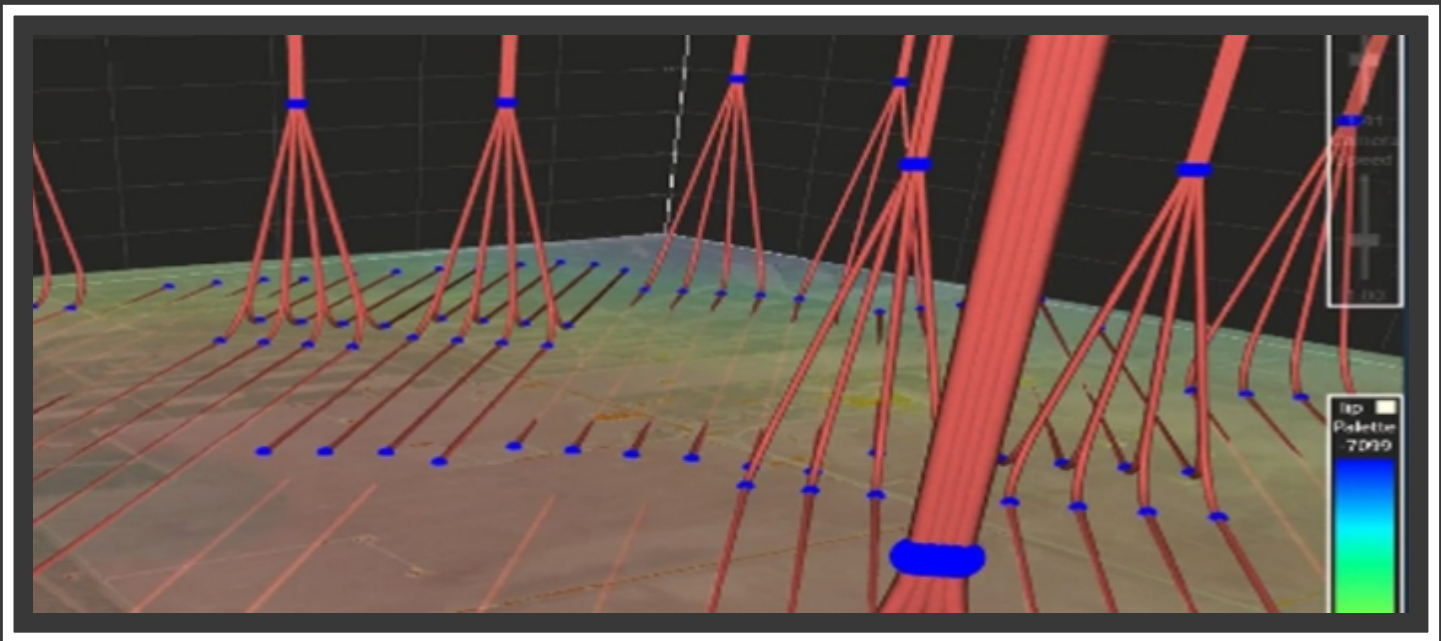
Multi-mineral Models
Leverage the multi-mineral equations for both a 3 Mineral and a 4 Mineral model with Dual Water, Indonesian, and Modified Simandoux water saturation computations, to calculate mineral proportions and water saturation and display the model results (virtual output curves) for a well by opening the well using the appropriate input curve set and the available mineral model templates.

Multi-well Cross Plot Analysis and Display
Benefit from the multi-level discrimination functionality with user-drawn polygon capabilities. Use multi-well crossplots to fit curves using linear regression, reduced to major axis, and polynomial regression capabilities, and interactively determine the Formation Water Resistivity (Rw), Bound Water Resistivity (Rwb) and Cementation Exponent (m) using the Pickett plots. Crossplot feature also provides you with the ability to display data relationships over total well depths, user-specified depth range, or one or more zone(s).

FIELD PLANNING

Well Planning Software

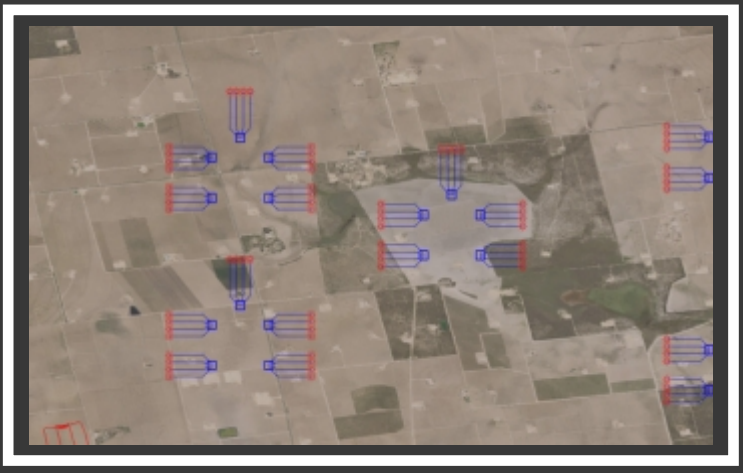
Use GVERSE Planner to plan wells within geologic surfaces or geomodels. Quickly create deviation surveys, and target and geoprognosis reports.



Well Planning
Interpreters can visualize their geologic data, create targets and generate a final well plan.

Quick Modification
Modifications to existing wells are quick and easy.

Enhances Collaboration Streamlined workflows that reduce work time.



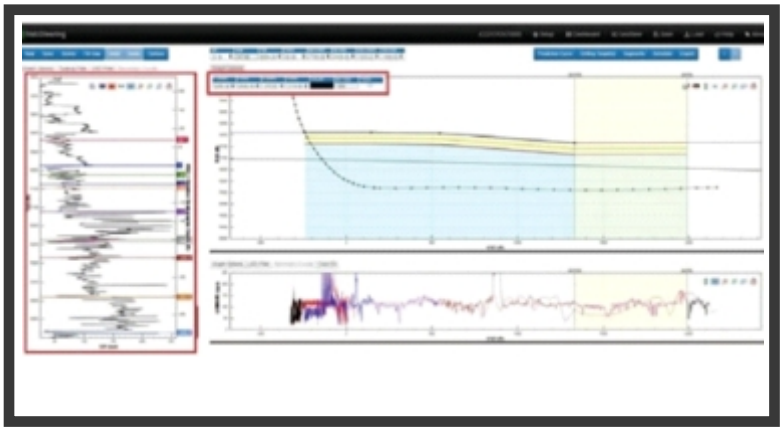
Field Planning Software

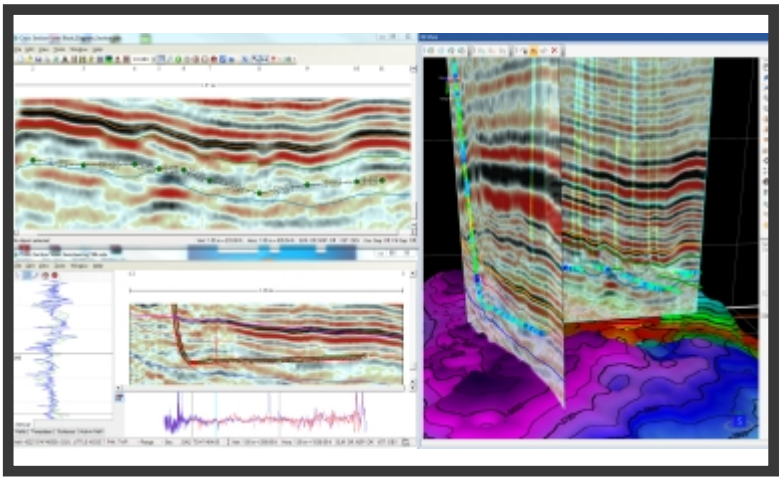
GVERSE® FieldPlanner offers powerful field planning capabilities that result in time and cost reductions, allowing field planners to create, save, analyze, and manage multiple field plan scenarios to determine optimal hydrocarbon production.

- Plan hundreds of wells intelligently within minutes.
- Take into account surface lease and subsurface hazards with flexibility.
- Quickly create, save, and analyze multiple field plan scenarios.
- Generate geoprognosis reports from the well plan.
- Analyze field plan scenarios to determine optimal hydrocarbon production.

GEOSTEERING

GVERSE® WebSteering is specifically designed to help geosteer horizontal wells in thin pay zones and to direct the drill bit in real time. It is the only web browser based geosteering application in the industry that delivers optimal well placement with simple data loading and full integration with GeoGraphix.





Flexible
Geosteer wells in the office, at home, or in the field.

Simple
Load LWD and survey data by drag and drop or by connecting to a WITSML server. Data is saved into LMKR GeoGraphix projects with a single button click.

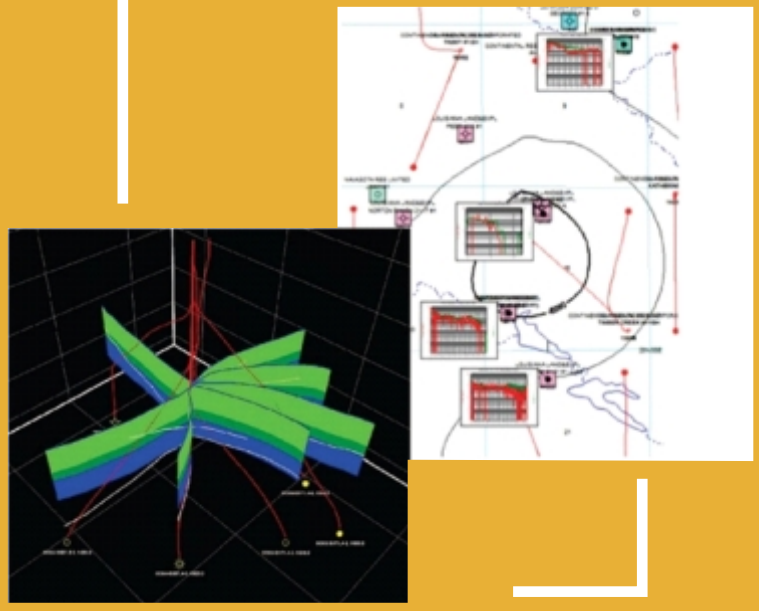
Integrated
Select gridded IsoMap surfaces from GeoGraphix to display against the drilling well for more accurate Geosteering and send the interpretation back to GVERSE Geomodeling to update the geologic model.

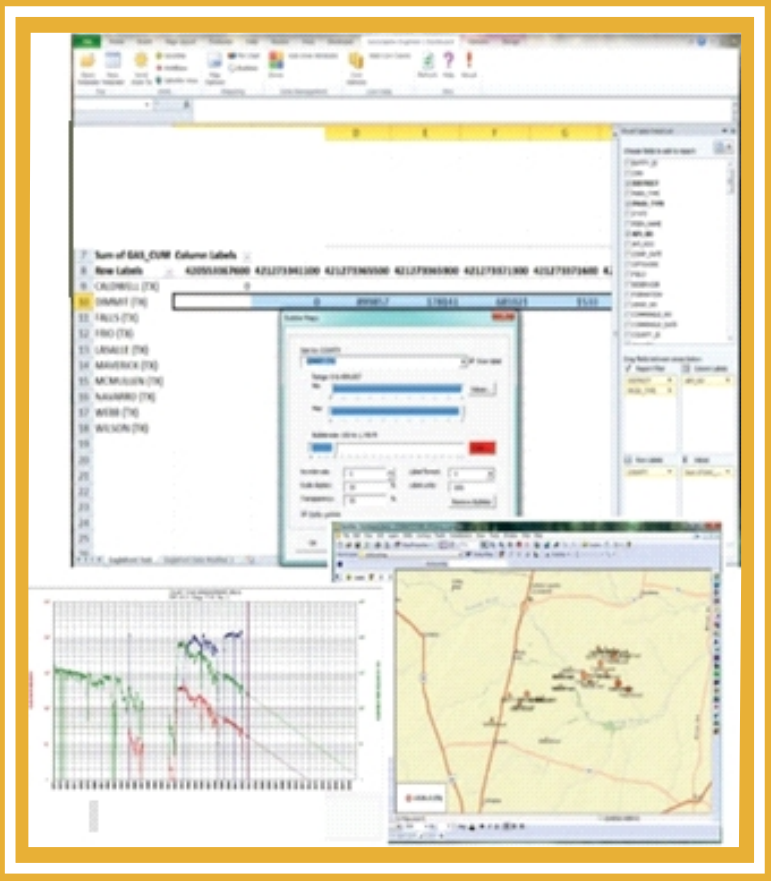
Lease Management
GeoGraphix for land management provides users with the means to capture vital lease information, filter that information to display specific conditions, and to augment this with needed geological layers. This enables the land professional to make better and more informed decisions quickly.

ASSET MANAGEMENT

GeoGraphix for asset teams:

- Gives you a comprehensive tool kit for finding hydrocarbons.
- Removes the barriers between geological disciplines and to provide seamless access to all project data.
- Handles networked project sizes of hundreds of thousands of wells including millions of monthly production records and pick markers for concurrent use access via a fully relational database.
- Stores project data in a powerful relational database to ensure integration of your critical data and to provide exceptional search and QC capabilities.





Engineering and Production Analysis
To an asset team, GeoGraphix provides an easy solution that identifies factors in engineering, geology, and petrophysics that impact key field development and production decisions of placing new wells, or maintaining current ones.

Engineers monitor production data to calculate estimated ultimate recovery and to estimate the life of a well. When forecasting production data is required, WellBase production analysis allows a user to calculate EUR and ERR using exponential or hyperbolic functions.

Requirements

Software

To run these applications, you need one of the following operating systems installed on your system:

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

Licenses

The following licenses are required to run the software:

- GeoGraphix license version 2019.2
- GVERSE Geomodeling license version 2019

Hardware

Minimum

- Core i5
- 8 GB RAM
- Any DirectX 11 capable card
- 2 GB VRAM

Recommended

- Core i7 Quad-core and above with latest generation
- 16+ GB RAM
- SSD drives recommended
- Any DirectX 11 capable card

GEOPHYSICS
SOFTWARE

Powerful seismic interpretation for your play

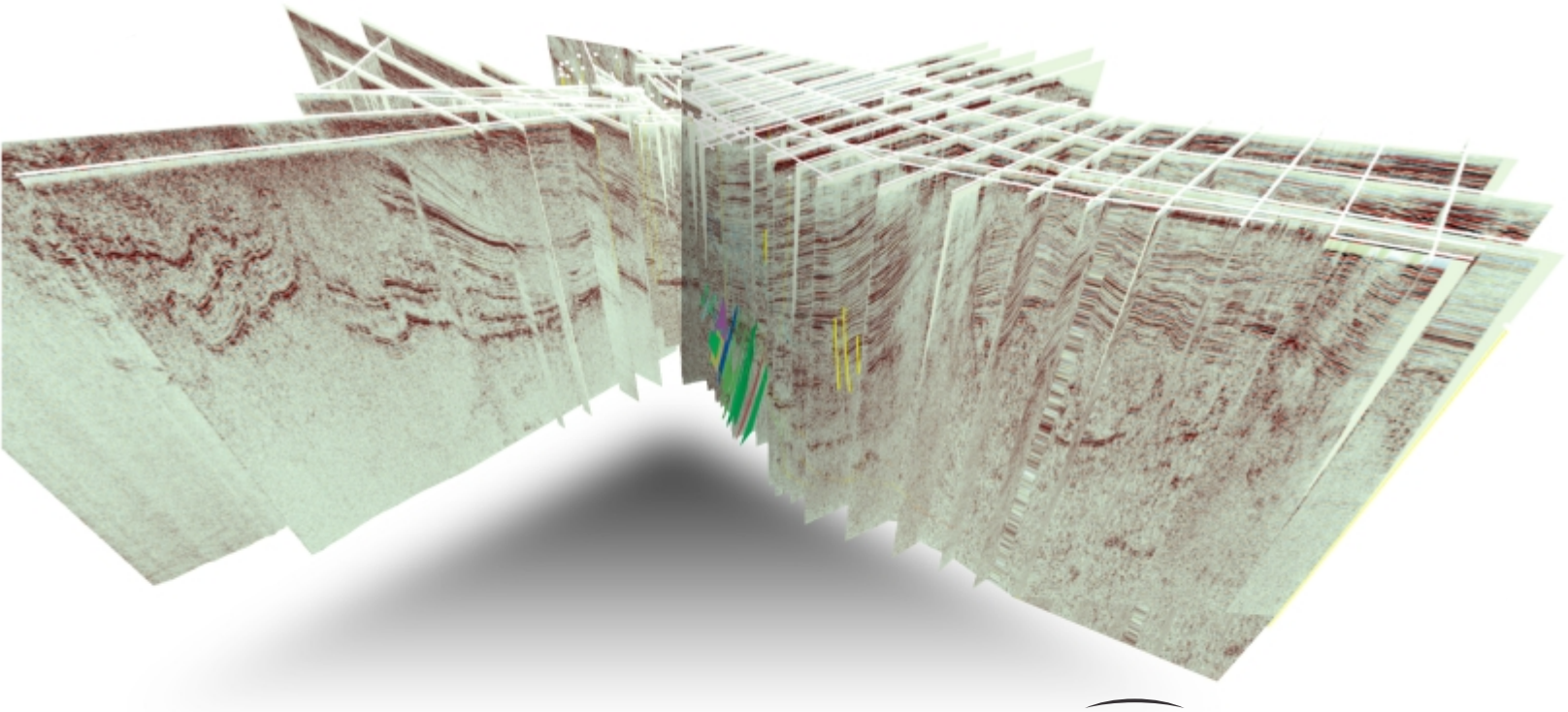
Complete and easy-to-use seismic interpretation system with powerful 3D visualization and interpretation capabilities. GVERSE Geophysics enables geoscientists to execute end-to-end workflows to provide an integrated platform for your interpretation.

Seismic Interpretation Software

Powerful, 2D and 3D seismic interpretation system for rapid prospect generation

GVERSE® Geophysics software is a powerful, fully integrated 2D and 3D seismic interpretation system that provides a full range of fit-for-purpose interpretation capabilities, attribute analysis, and mapping tools. Whether exploring complex structural areas or looking for subtle stratigraphic traps, today's geoscientist can use the numerous tools offered by GVERSE Geophysics to solve these otherwise challenging problems.

GVERSE Geophysics database along with project management tools when combined with the entire GVERSE GeoGraphix software system, connect data for a complete interpretation without any need for inter-application data transfers.



Key Benefits

Full Integration

Maximize your investment with full integration between our geological, geophysical and mapping tools. Access most everyday workflows within the base package & license.

Superior Visualization

Gain deeper insights into subsurface structures and data in our specialized 2D & 3D viewers.

Speed & Performance

Work with large seismic files and hundreds of thousands of wells without compromising performance even on off-the-shelf hardware.

Accuracy & Reliability

Make quick, accurate structural or stratigraphic interpretations with an extensive toolset for horizon, fault and geobody interpretation.

On-The-Fly Attributes

Obtain a better understanding of your seismic data with on-the-fly attribute computation.

Ease of Use

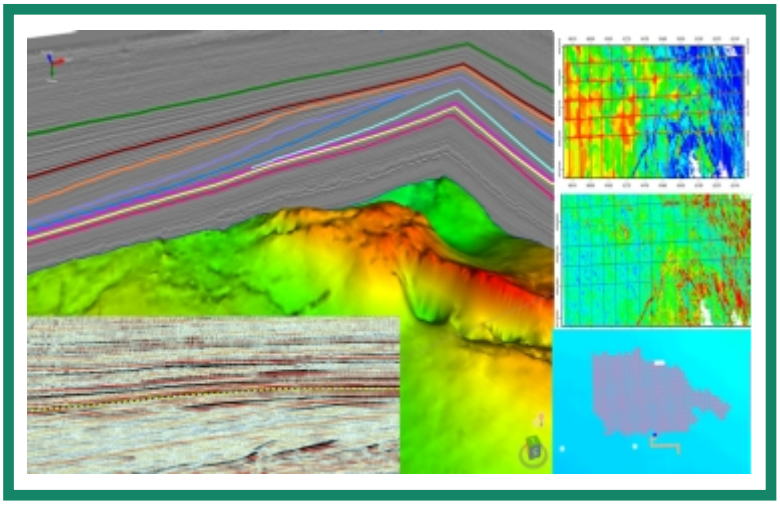
Leverage a simple, intuitive UI to focus solely on making decisions that matter.

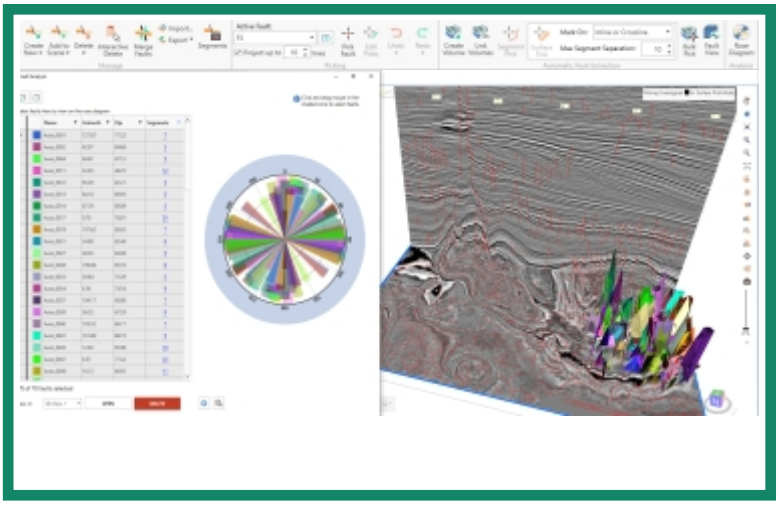
SEISMIC INTERPRETATION

In-Depth Horizon Interpretation

Access multiple picking modes to mark picks & track horizons across multiple 2D & 3D surveys.

- Comprehensive set of pick parameters.
- QC features like confidence, pick order, pick type & pick relationships.
- Multi-Z horizon picking for 2D data.
- Snapping, smoothing, merging, dip & azimuth calculations and other operations.





Rapid Fault Picking & Analysis

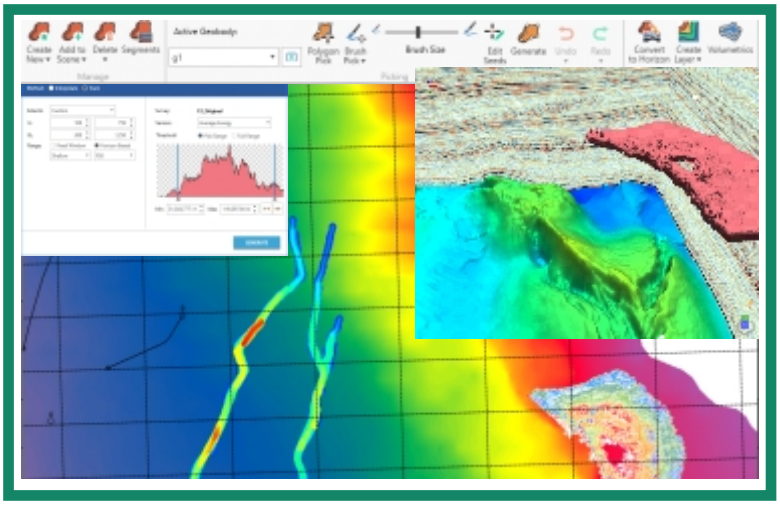
Detect automatically or pick manually with flexible tools for vertical, horizontal & three-dimensional seismic displays.

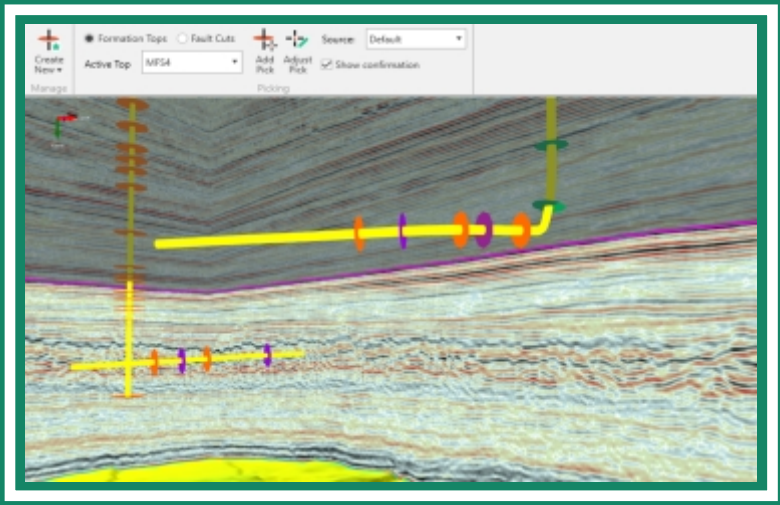
- Rose diagrams for faster analysis.
- Correlation windows & fault projection to assist picking in noisy data.
- Fault polygons & heave calculations.

Geobody Analysis

Interpolate seeds or track signatures to extract geobodies from seismic.

- Calculate volumetrics, map thicknesses, convert to horizons, compute attributes.
- Drape data on geobodies or show intersections on sections.
- Create layers to bring geobodies to other GeoGraphix apps.





Integrated Well Top Picking

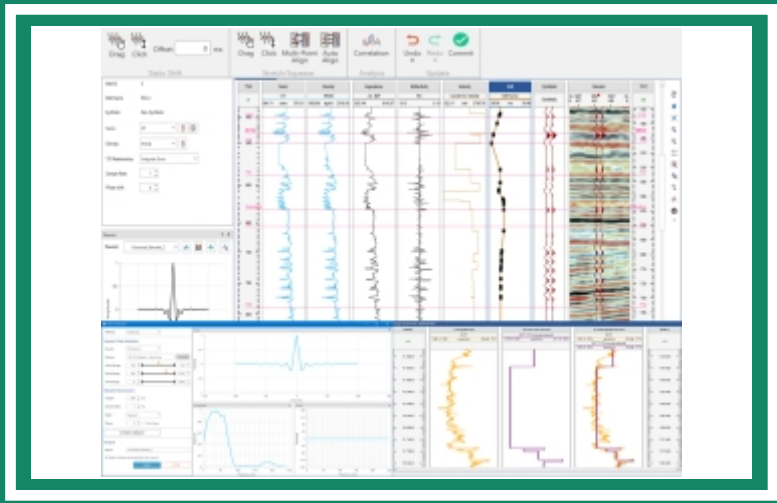
Add new or adjust existing picks for formation tops and fault cuts in a well directly from the geophysics app. View & interact with multiple observations for each formation or fault.

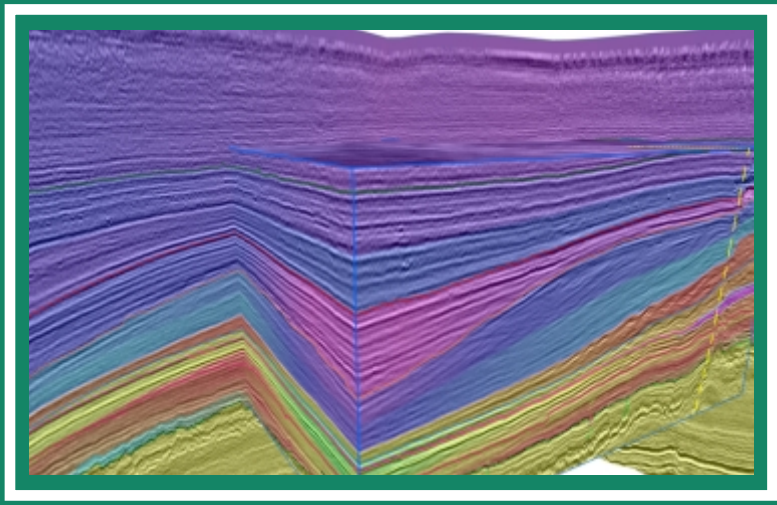
TIME-DEPTH WORKFLOWS

Comprehensive Synthetic Modeling

Simplified synthetic workflows in SynView – an integrated editor with no extra license required.

- Adjust & update synthetic with undo-redo in SynView or in 3D.
- Create & edit wavelets or extract from seismic.
- Calibrate, estimate, process & edit input curves.
- Drift, correlation & spectrum analyses. Calculate optimum time & phase shifts.
- Work with deviated wells.





Robust, Reliable Depth Conversion

Experience fast & reliable depth conversion with options suitable for all conversion requirements.

- Half-a-dozen types of velocity models including ability to use velocity cubes as models.
- Unique 3 component horizons & comprehensive conversion options.
- Dynamic depth conversion to keep backdrops in GVERSE Geomodeling up to date.
- Instantly convert time scenes to depth.
- Variety of velocity QC tools.

DATA MANAGEMENT & VISUALIZATION

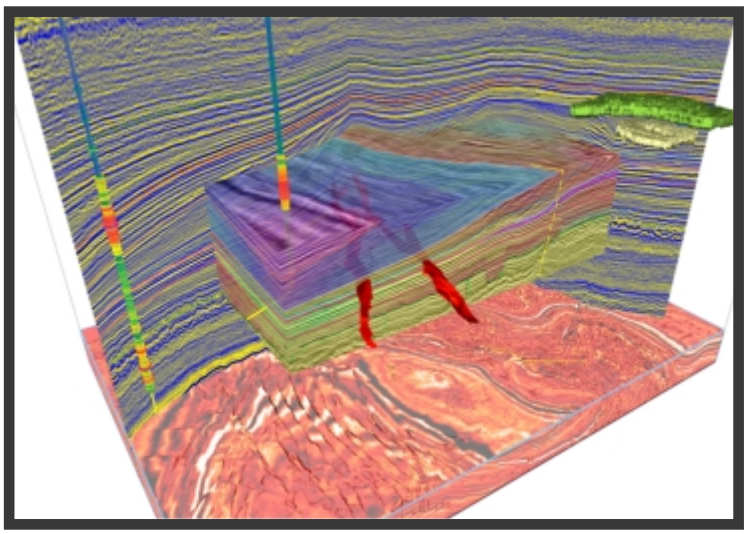
Effortless Data Management

Perform rapid interpretation in large 2D, 3D or combination projects with our 64-bit architecture. Versatile SEG-Y readers built to handle most commonly encountered scenarios.

Interactive Mistie Analysis

Easily balance 2D, 3D and 2D-3D datasets and auto-calculate phase, gain & time relationships.

- Add, edit & search shifts in a single location.
- Import and export shift values.
- Interactive line balancing to match lines easily.



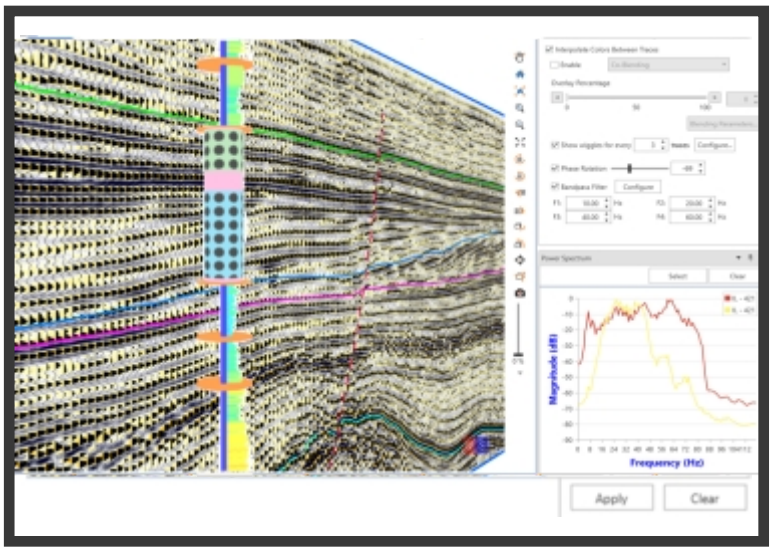
Blazing Fast 3D

Use an engine built for subsurface data to view your seismic, wells and other data in 3D. The LOD format does not compromise performance even with very large seismic files. Voxels, blending, selective transparency and other advanced features let you visualize structures for deeper insights and better decisions for your play.

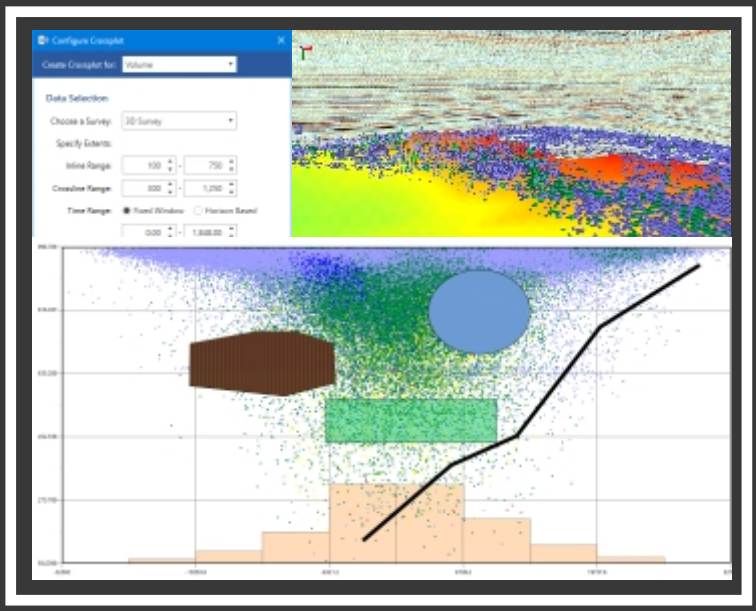
Versatile Seismic & Well Displays

Feature rich vertical, horizontal and three-dimensional seismic viewers with detailed well data posting capabilities.

- Load data into RAM for faster visualization.
- Wiggles, power spectrums, phase rotation, filters & other processing tools.
- Default color palettes based on data type.
- Display wellbores, tops & observations, well logs, production data, microseismic and more.



INTERPRET, ANALYZE & MAP



Crossplot Seismic, Attributes & Logs

Create scatter plots for seismic, surfaces & well logs for insight into relationships between data.

- Crossplots for sections, horizons, wells or volumes.
- Select and display anomalies on maps & 3D.
- Complete annotation toolset.

Attribute & Surface Calculations

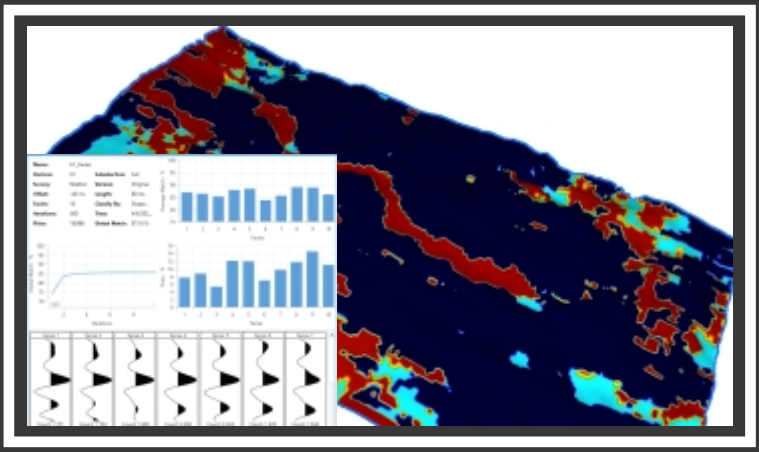
Compute attributes with multiple options in an easy to use interface.

- Flexible windowing options.
- Integration with Zone Manager.
- Surface-to-surface calculations.
- Extract seismic data at well locations.

Indigenous Mapping Capability

Fulfill mapping needs with a built-in mapping framework or leverage the full capabilities of GeoAtlas with seamless integration.

- Multiple base maps with unique set of display parameters and color palettes.
- Comprehensive gridding and contouring options for maps and surfaces.
- Export or import layers to and from other GeoGraphix apps.

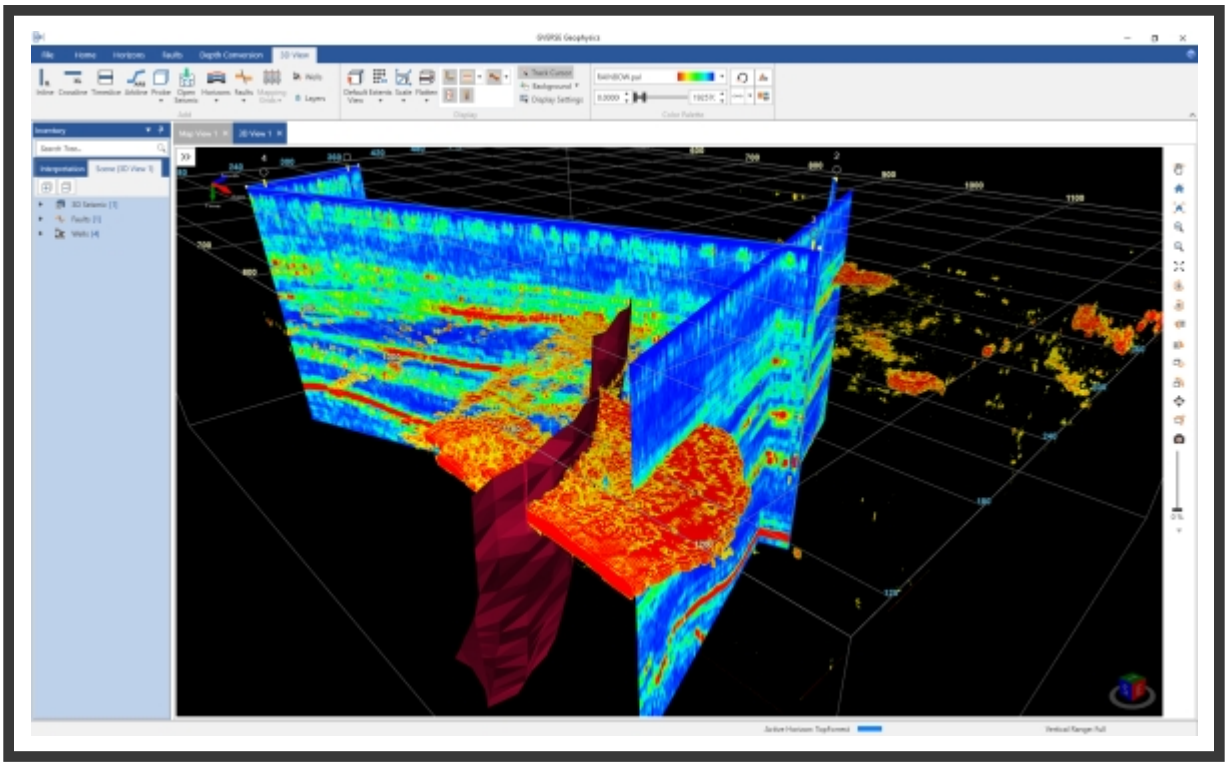


Intelligent Facies Classification

Use the power of machine learning and neural networks to classify facies on horizons with automatic waveform classification by a self-organizing maps algorithm.

EASE OF USE & TRUE MOBILITY

Leverage the latest in technology to minimize your learning curve and focus on what's important. No more digging through tons of menus and dialogs to find what you are looking for. The multi-screen enabled, ribbon-based interface puts everything you need right in front of you. GVERSE Geophysics supports remote, desktop and mobile environments to accommodate some of the industry's largest regional projects while reducing the need for IT support.



SCAN™

SCAN software is an optional extension of the seismic processing module pSTAx. SCAN calculates Event Similarity Prediction (ESP) similarity volumes as well as Structure Cubes from the input data. With SCAN, the geoscientist readily identifies subtle discontinuities in the seismic data potentially related to geological features. This tool provides a cost-effective alternative to project outsourcing. Key features include:

- Easy identification of linear features such as faults, fractures, reefs and channels.
- Interpretation of subtle discontinuities in seismic data.
- Identification of subtle stratigraphic changes such as channel thickening.

Optional/Add-on Module pSTAx® Post-Stack Processing Software

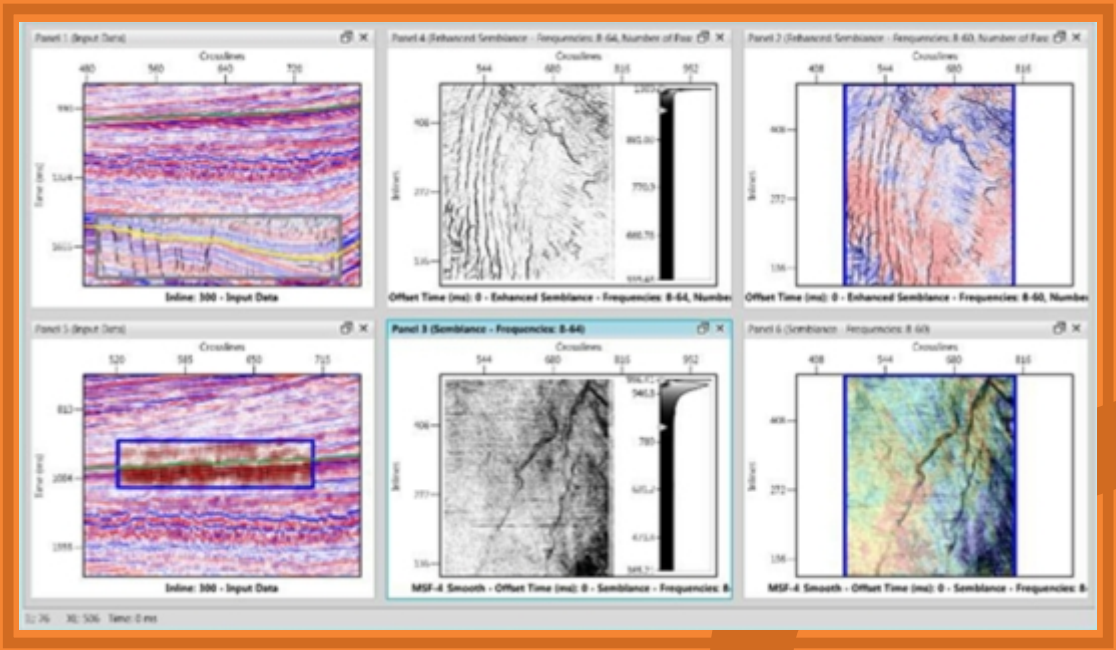
With pSTAx software, geoscientists perform post-stack processing flows directly from the desktop, no external reprocessing necessary. pSTAx can be used as a standalone application supporting SEG-Y formatted seismic data, or in conjunction with GVERSE Geophysics, as geoscientists accomplish input and output using bricked formats.

Standard, post-stack processing functions, such as amplitude scaling, correlations, convolution, filtering, and phase rotation build an ideal desktop environment for the quick and easy evaluation of the effects of new processing flows.

SEISMIC ATTRIBUTE ANALYSIS

GVERSE Attributes

GVERSE Attributes enables geoscientists to harness the full power of seismic attributes by drastically reducing the time, effort, and disk space required for attribute analysis. Fast, on-the-fly computation, and real-time visualization of seismic attributes in a multi- pane viewer lets interpreters perform detailed, in-depth attribute analysis quickly and efficiently, maximizing the value of their seismic data.



The multi-paned viewing environment, unmatched by any software in the industry, along with streamlined workflows and high resolution 3D seismic attributes help boost performance. The value of seismic data for seamless interpretation is maximized by fast, on the fly visualization of seismic attributes which allows for in-depth attribute analysis with immediate feedback.

SEISMIC ATTRIBUTE ANALYSIS

Key Benefits

Real-time Visualization of Results

Having intensively minimized processing time, GVERSE Attributes offers an integrated viewer to display attributes for the selected IL/XL/TS computed on-the-fly using GPU. After adjusting attribute parameters and seeing results in real-time, the user can generate the attribute for the entire dataset and load the resulting volume into GVERSE Geophysics (or equivalent interpretation software).

Fast, Powerful 3D Engine

View on-the-fly attributes in 3D to gain deeper insight in your attribute analysis. In addition to computing attributes on inlines, crosslines and timeslices, users can view probes, arblines and horizon surfaces with attributes applied on them in real time to gain more useful information faster and more efficiently.

Effort and Time saving

As compared to traditional tools, GVERSE Attributes allows geoscientists to harness the full power of seismic attributes by drastically reducing the time, effort and disk space required for attribute analysis. Attributes are computed on-the-fly on controlled input data to let users view attributes results before they commit to creating volumes, saving both processing and analysis time. Attribute volumes are created on-demand eliminating the need for intermediate volumes and significantly reducing data and disk management.

Flexibility

Features like the ability to save parameters for all available attributes and saving the complete state of the workspace to a file saves time as the user can resume work from where left off and also be able to share his/her workspace with others. The workspace can contain all the information in the application including the input files, any subsets, the view state (all view panels, attributes displayed on those panels, the seismic IL/XL/TS opened, and the parameters for the attributes displayed) along with any other data.

Integration

The application integrates seamlessly with GGX Discovery as it reads seismic amplitude date from GVERSE Geophysics and exports volume to GVERSE Geophysics.

Key Features

- On-the-fly attributes for any inline, crossline, timeslice, or for probes, horizons and arblines using GPU.
- Compare attributes and parameters quickly and efficiently in multiple panes or in 3D space.
- Compute over 50 physical and geometric attributes, including frequency-tuned attributes using the patented CAPS technique.
- Level of Detail (LOD) encoding for faster performance on large datasets.
- Define mathematical expressions to combine existing attributes and create custom attributes.
- Automatic Fault Extraction attributes to highlight faults.
- Structure Oriented Smoothing to enhance structural features in seismic.
- Change and edit color palette, view histograms and assign default palettes for attributes.
- Co-blending and RGB blending to visualize multiple attributes simultaneously.
- Generate volumes for selected attributes.
- Loss-less compression of SEG-Y datasets for optimized performance.
- Seamless integration with GVERSE Geophysics.

Requirements

Software

To run these applications, you need one of the following operating systems installed on your system:

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

Licenses

The following licenses are required to run the software:

- GeoGraphix license version 2019.2
- GVERSE® Geophysics license version 2

Hardware

Minimum

- 2.4 GHz 64-bit processor
- 8 GB RAM
- Any DirectX 11.1 capable card comparable with Nvidia® GeForce GTX 430 with 1GB VRAM.
- 1366 x 768 screen resolution

Recommended

- Quad 3.2 GHz 64-bit processor
- 32 GB RAM
- Any DirectX 11.1 capable card comparable with Nvidia®GeForce GTX 1060 with 6GB VRAM.
- [For GVERSE Attributes]High-end NVidia GeForce GTX Graphics card X70 -X95 (where X represents GeForce Series 400 onwards) with minimum 2GB dedicated GDDR5 VRAM
- Solid state hard disk (SSD)
- 1920 x 1080 screen resolution
- 4 GB VRAM

GVERSE® GeoGraphix®

gverse.com/geographix

PRODUCT OVERVIEW