Geophysics
Powerful seismic interpretation for your play

Release Notes

GVERSE Geophysics 2019.4

Contents

Introduction

We are pleased to announce the release of GVERSE® Geophysics 2019.4.

This document provides an introduction to the Geophysics software features and benefits. It also lists the changes available in this release.

What is GVERSE Geophysics?

GVERSE Geophysics is a new, intuitive and easy-to-use seismic interpretation system with powerful 3D visualization and interpretation capabilities. GVERSE Geophysics enables geoscientists to execute end-to-end workflows for basic interpretation and more advanced geophysical tasks. The Geophysics software is part of the GVERSE application suite (http://www.gverse.com).

GVERSE consists of geoscience and engineering solutions focused on workflow optimization and enhancing productivity of teams working on diverse geological and geophysical projects.

Main Features

In-Depth Horizon Interpretation

Access multiple picking modes to mark picks & track horizons across multiple 2D and 3D surveys.
- 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 and automatically pick all faults in a volume or pick manually with flexible picking and editing tools for vertical, horizontal & three-dimensional seismic displays.
- Rose diagrams for faster analysis & decisions.
- Correlation windows & fault projection to assist picking in noisy data.
- Fault polygons & heave calculations.

Cutting Edge Geobody Analysis

Pick structures on seismic volumes as geobodies. Interpolate picks, track signatures to automatically detect and extract geobodies from seismic data.
- 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 GVERSE Geophysics.
- View and interact with multiple observations for each formation or fault in a well.

Comprehensive Synthetic Modeling

Create or edit synthetic seismograms in SynView – an integrated editor with no extra license required.

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

Robust, Reliable Depth Conversion

Experience fast & reliable depth conversion with an extensive set of options suitable for all of your depth 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.
- Depth Mode to instantly convert time scenes to depth.
- Variety of velocity QC tools.

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

Blazing Fast 3D Environment

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 and Well Displays

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

- 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 and observations, well logs, production and microseismic data.

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.

Crossplot Seismic, Attributes & Logs

Create scatter plots for seismic, surfaces and well logs for insight into relationships between data.
- Crossplots for sections, horizons, geobodies, wells or volumes.
- Select and display anomalies on maps & 3D.
- Complete annotation toolset.

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.

Indigenous Mapping Capability

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

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. A true multi-
screen, 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.

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. Our fast and highly intuitive viewers offer all tools for efficient interpretation workflows.

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.

Installing GVERSE Geophysics

GVERSE Geophysics along with its 3D module, is installed seamlessly as part of the GeoGraphix installation. For system prerequisites and installation instructions, refer to the GeoGraphix Installation Guide on the GVERSE GeoGraphix Support Portal > Knowledge Center > Release Notes and Installation Guides page.

What's New in GVERSE Geophysics 2019.4

Display Surfaces and Probes in Depth Mode

Horizon, fault surfaces, and timeslices can now be viewed in depth mode of time interpretations to enable a better understanding of subsurface structures according to their respective depth.
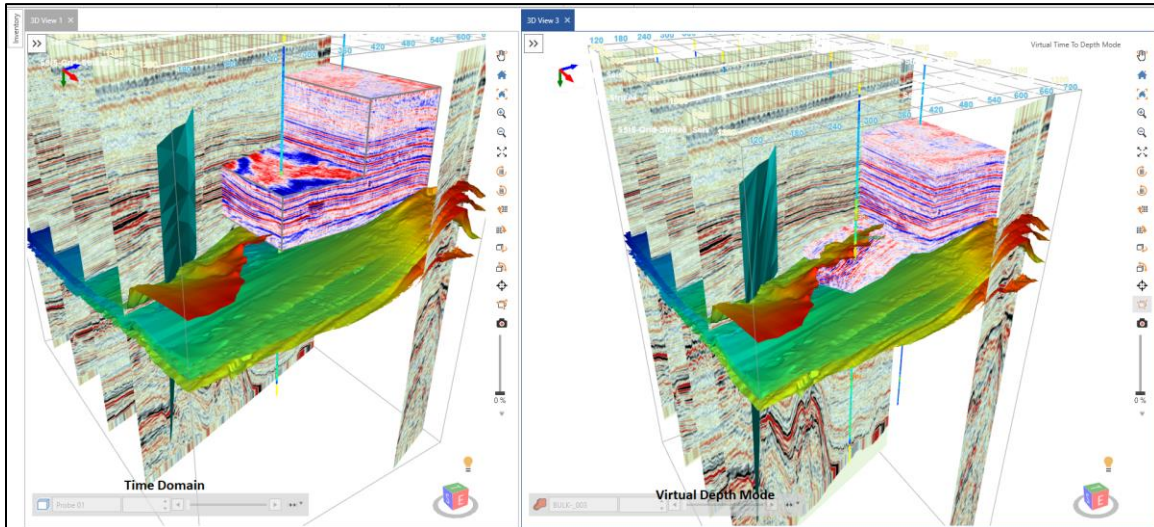
Automatically Grid Velocities and Depth for Horizons

Grid velocities and depths for all horizons in the interpretation automatically with a single click instead of re-gridding each horizon manually.
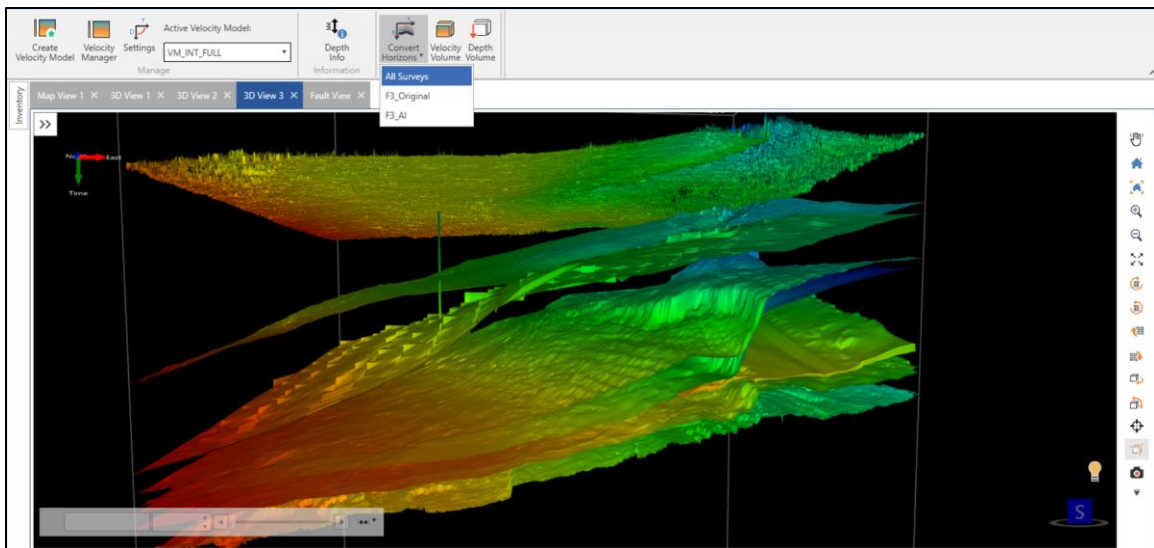
Depth Control Points in Velocity Model

Digitize or import depth control points and use them in velocity model building for more accurate depth conversion.

Simultaneous Flattening in Depth Mode

You can now flatten the scene and enable the Depth mode at the same time. Depth conversion occurs before flattening the scene. Geobodies can also be flattened now.

Add Multiples in Synthetic

All possible transmission paths including internal inter-layer paths can be added to a synthetic to reflect any multiples in seismic within the synthetic.
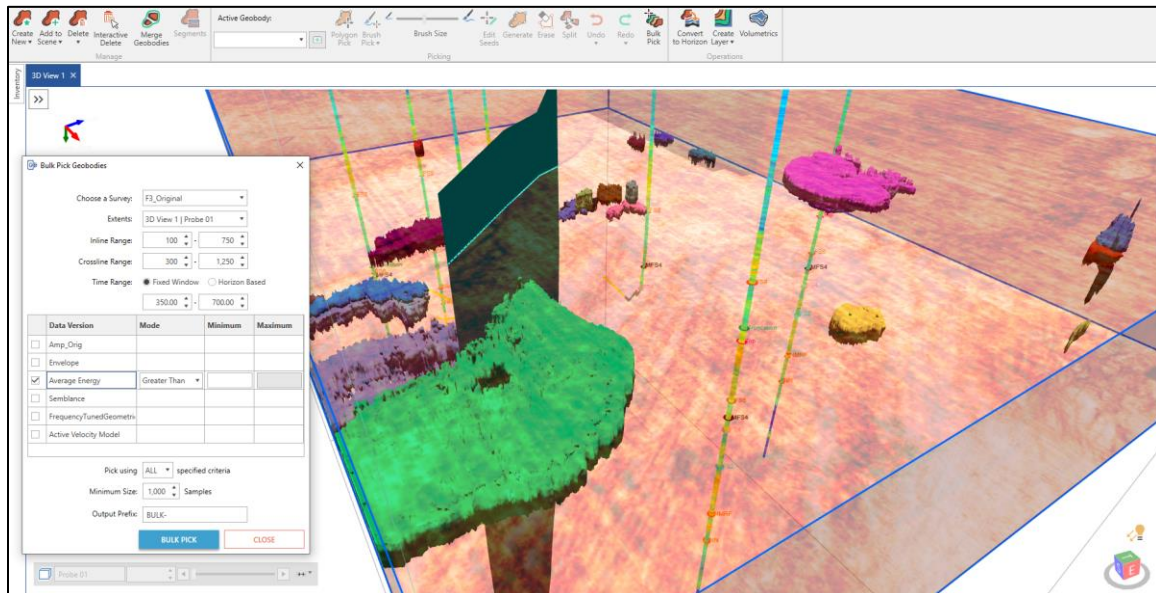
Backus Averaging

Upscale sonic and density logs data to create more robust synthetics with Backus Averaging.
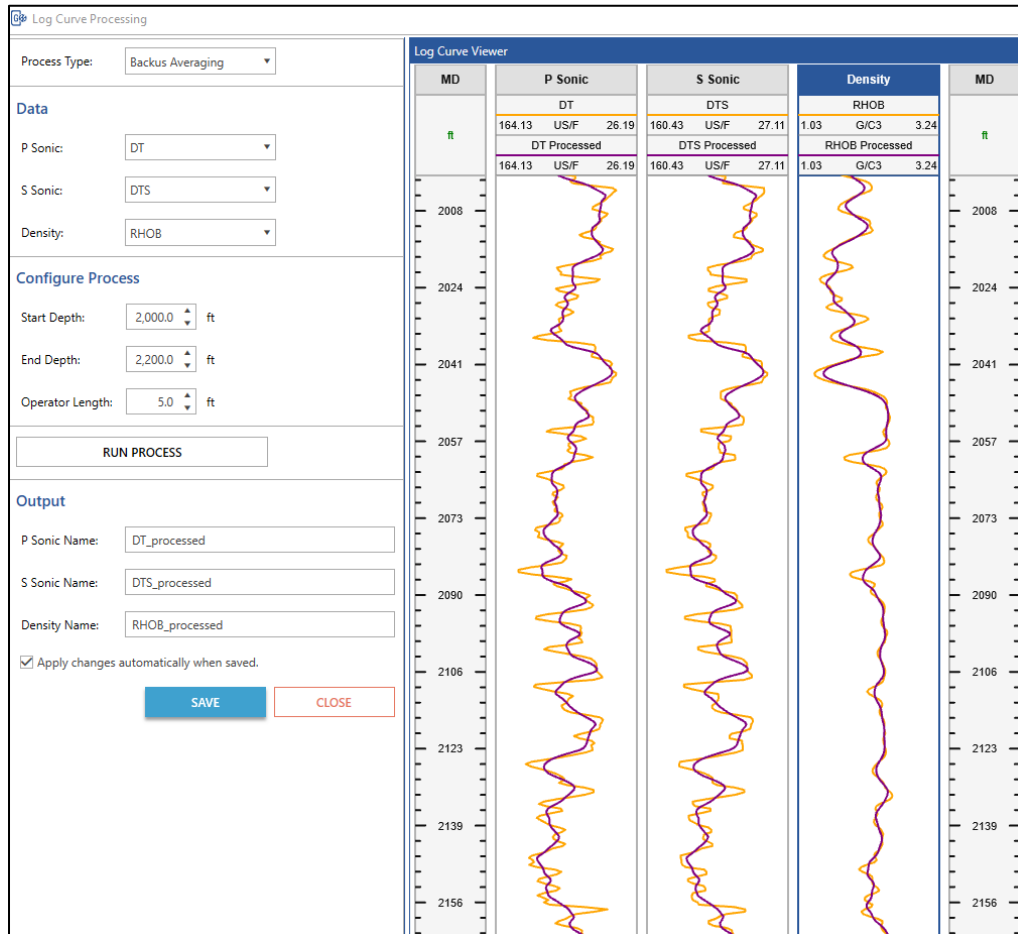
Bulk Pick Geobodies

Geobodies can now be picked and generated in bulk using multiple volumes to define picking criteria. Bulk picking provides a quick way to identify possible structures of interest in the subsurface.

Merge and Split Geobodies

Multiple geobodies can now be merged into a single geobody. Merged geobodies can be split in multiple geobodies.

## Delete Geobodies Interactively

Multiple geobodies can now be selected in 3D view and deleted from the scene.

Edit Geobody Surfaces

Edit geobody surfaces and interactively remove undesirable portions of the geobody surface directly in the 3D view.
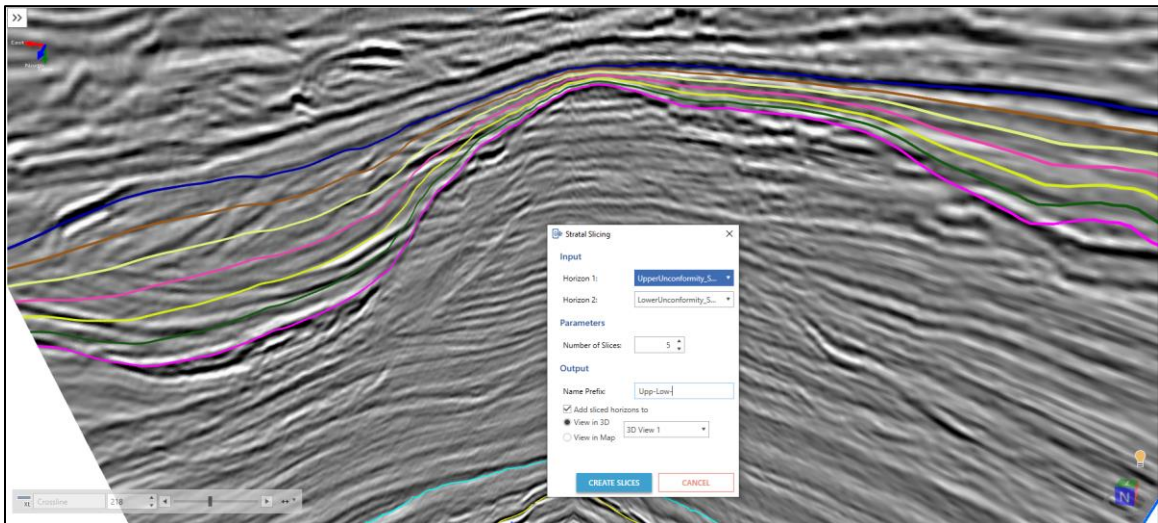
Amplitude Thresholds for Geobody Tracking

More flexibility in defining amplitude thresholds for geobody tracking allowing easier use of more kinds of seismic and attribute data for tracking geobodies.
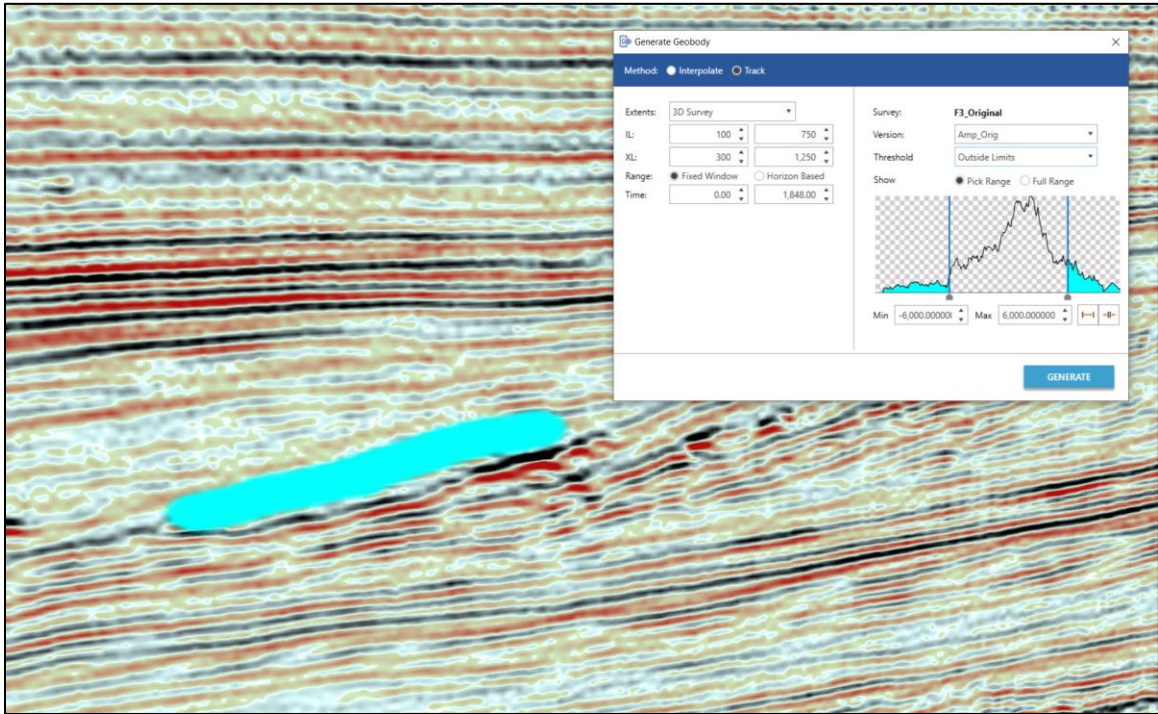
Stratal Slicing

Create proportionally sliced horizons between two existing horizons to get deeper stratigraphic insights.

Polygon Management

Create, save and re-use polygons on maps. Polygons can be named and saved with the interpretation and reused as and when required. Polygons can also be shared across interpretations.
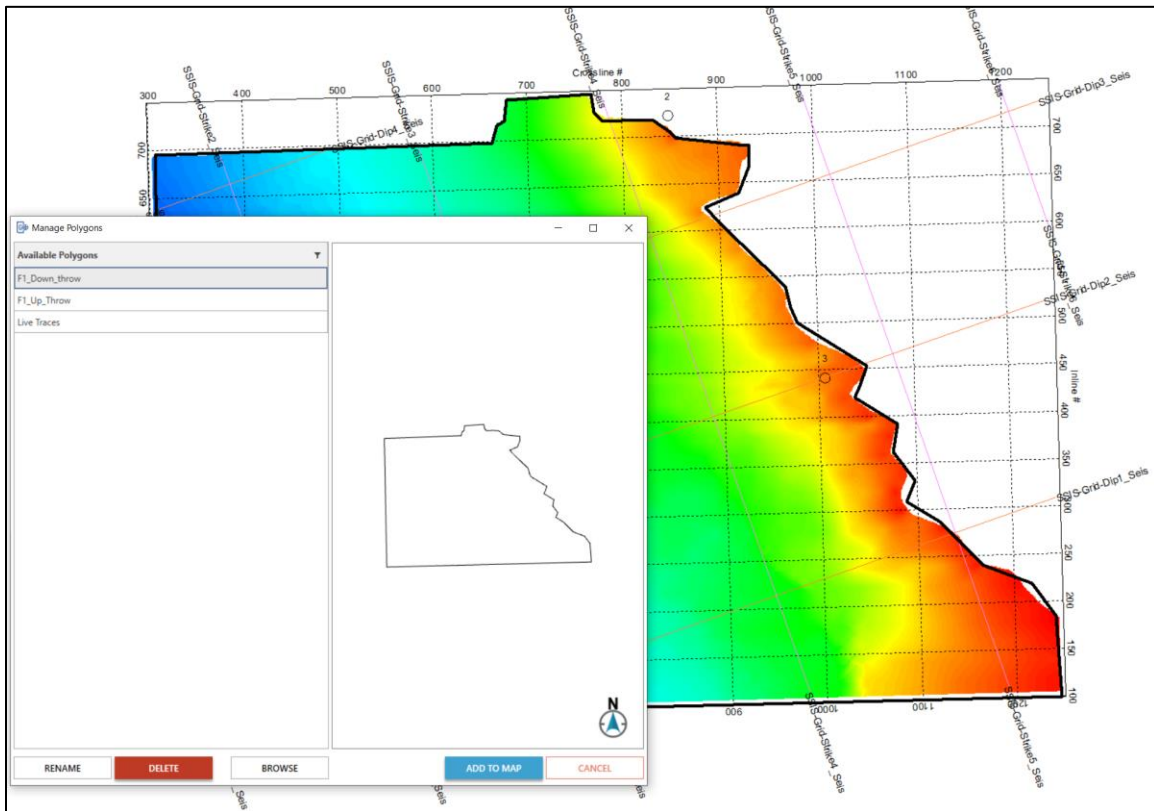
Open GVERSE Geomodeling Cross Sections as Arblines

You can now open any GVERSE Geomodeling cross section as an arbitrary line in GVERSE Geophysics.

Inter-App Cursor Tracking

The mouse cursor is now tracked between GVERSE Geomodeling and GVERSE Geophysics. The cursor is tracked between the 3D, map, and section views of both applications.
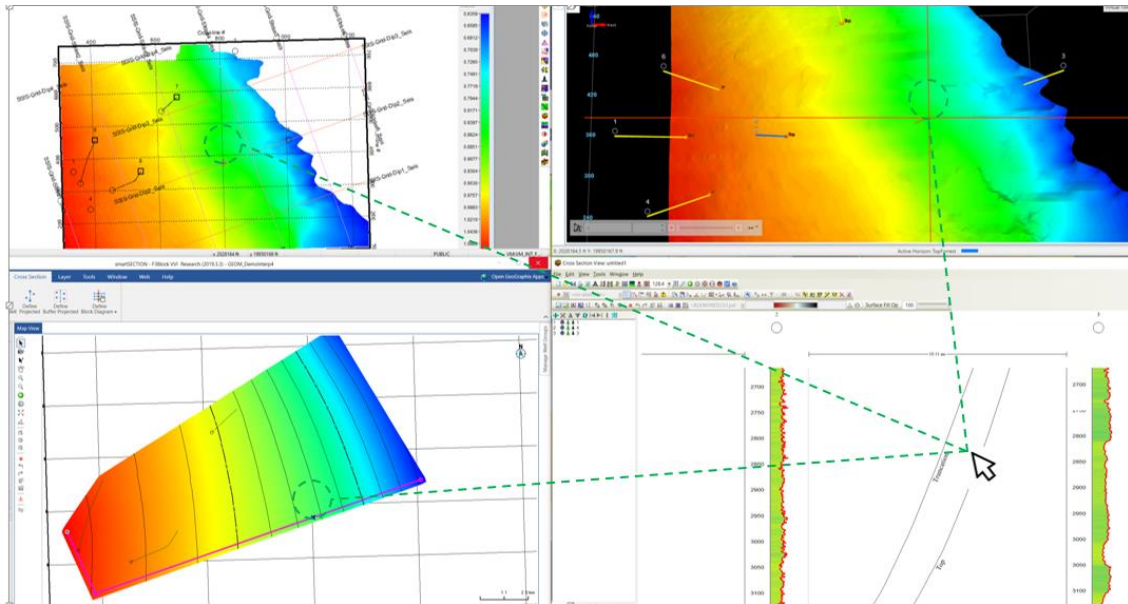
Common Color Palettes for Seismic Backdrops in GVERSE Geomodeling

Color palettes defined in GVERSE Geophysics interpretations can be used to display seismic data in GVERSE Geomodeling cross sections.
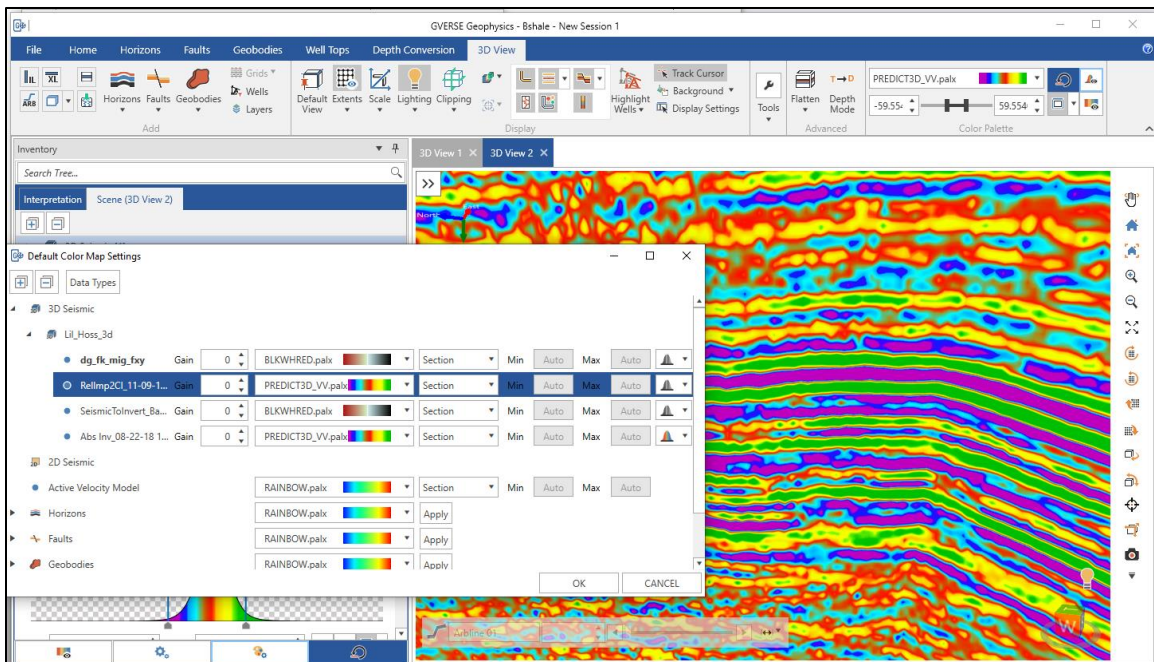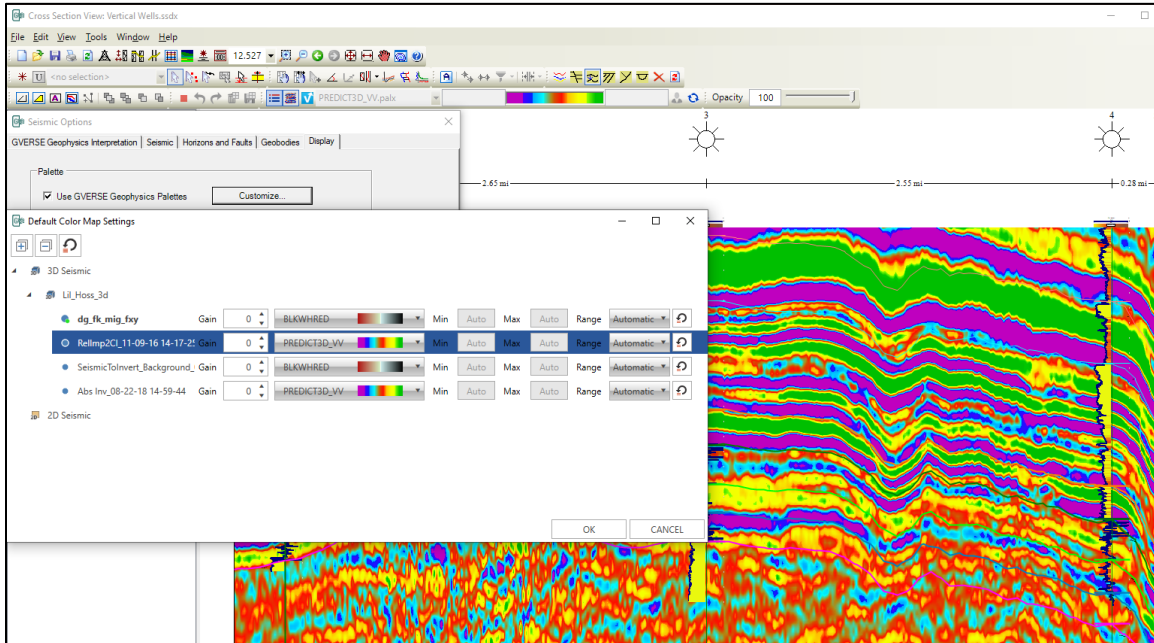
Merge Overlapping Fault Polygons on Map

When any part of a new digitization overlaps the existing manual fault polygon, the two polygons can be merged to create a single fault polygon.

Stereonet Plot

Stereonet plots can now be created for faults which are used to perform detailed fault orientation and stress analysis.

Convert Fault Intersection to Segment

Fault intersections and projections can be converted into a separate fault segment.

Split Fault Segments in Vertical Sections

Fault segment splitting functionality is now also available on vertical sections. Split segments can be edited, deleted, unassigned or reassigned individually.
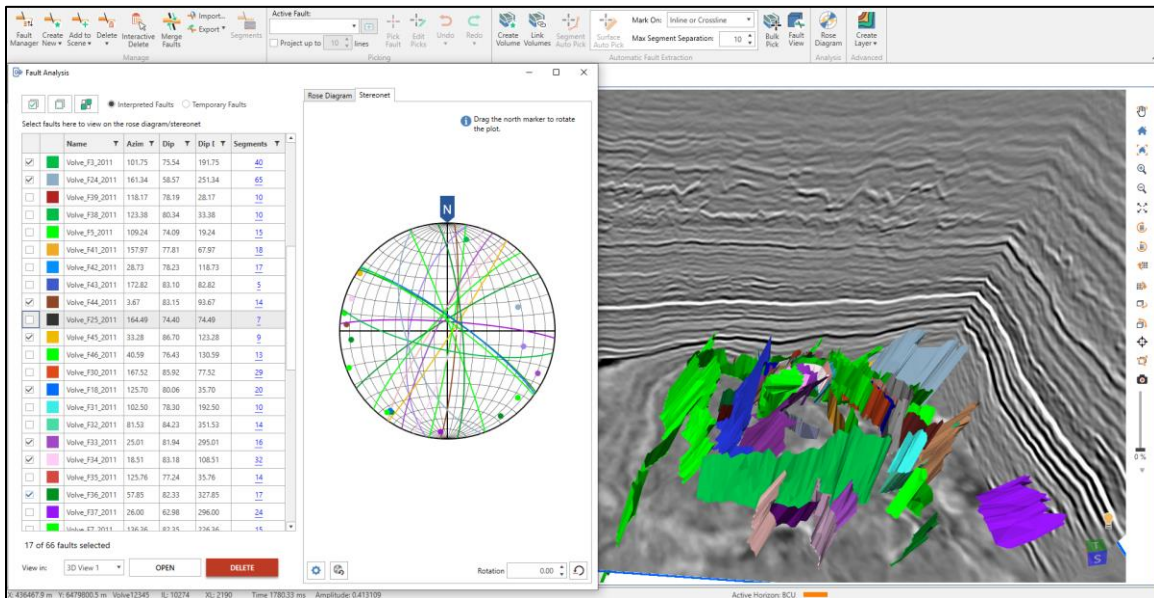
Activate Velocity Surveys in Bulk

Velocity surveys can now be activated for wells in bulk, enabling easier switching and/or activation of time depth tables for all wells in the interpretation.

Edit Version Information

Version information can now be edited, enabling you to change basic information, and correct any mistakes in the metadata.

SEG-Y Loading Improvements

Automatically detect survey geometry, line increments and start depths in SEG-Y data.

Select Version for SEG-Y Export

Choose the data version to create SEG-Y for when exporting 3D seismic instead of only exporting the active version.

Batch Extract Curves

Extract data from multiple seismic volumes at multiple well locations and save as log curves in the database or as LAS files on disk.
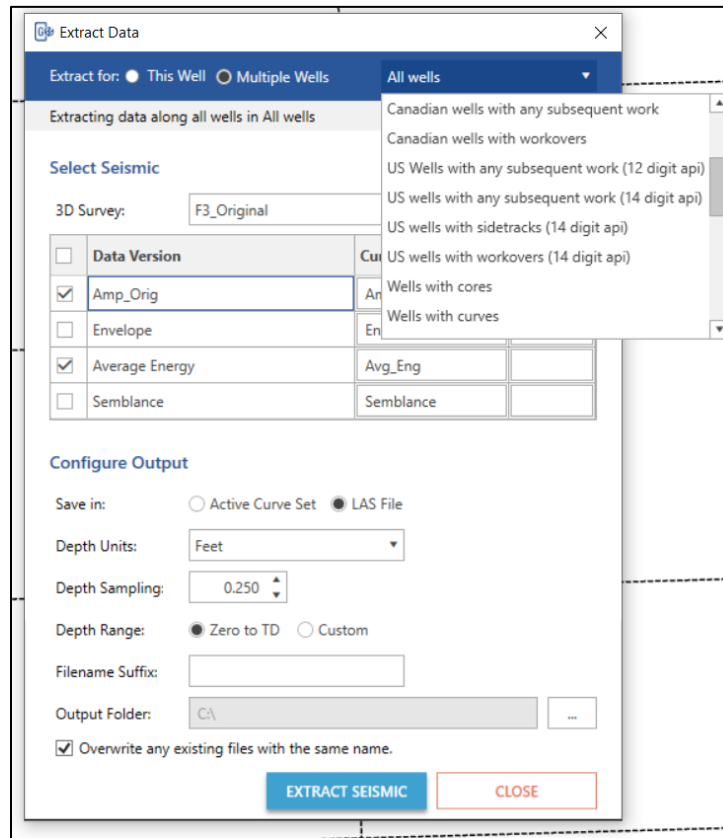
Post Distance on Seismic Section Header

Length of the section is now posted on the vertical seismic section header, which shows the distance along an arbline or any other seismic section.

Open Arbline along Wellbore

Open arblines along wellbores. Choose to open the arbline only along the horizontal portion of the well. Add trailing and leading distance to extend arbline in front and behind the bore.

More Units for Distances, Areas and Volumes

View distances in more units including feet, meters, miles, and kilometers. Area calculations include square miles and square kilometers. Volume units for thousand, million, billion, and trillion cubic feet and cubic meters are also supported.
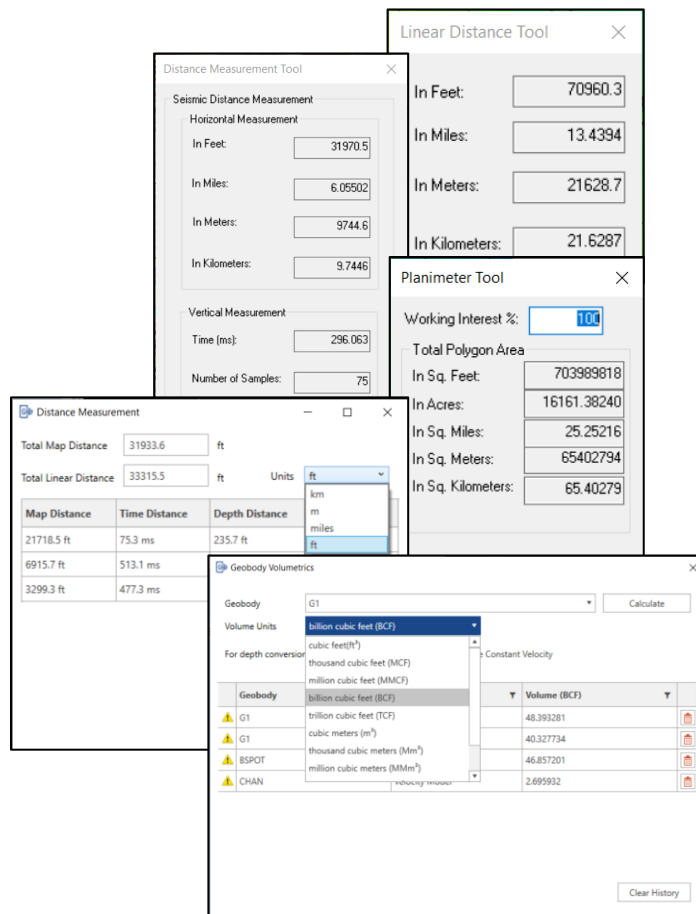
Change Wellbore Color

Change the color of deviated wellbores on the main map view to easily identify wellbores on the map.

Buttons to Control Horizontal and Vertical Scale

Buttons in the seismic view sidebar let you quickly control the horizontal and vertical scale of the seismic without having to adjust display settings from the dialog.

Multi-Survey Auto Pick

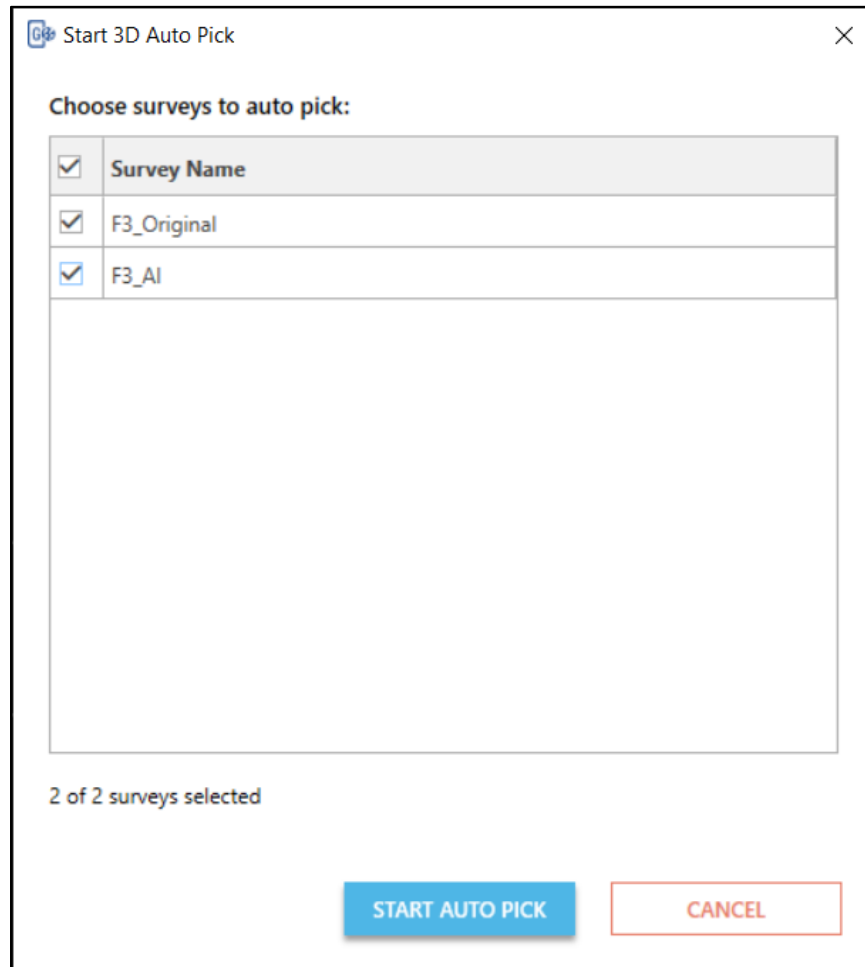Surveys can now be chosen when autopicking horizons. This makes horizon picking faster as there is no need to re-pick an already picked horizon.

Flatten on Right-Click

Flatten a vertical section on a horizon using the right-click context menu of the horizon.

Easier Access to SEG-Y Loader

Launch SEG-Y Loaders directly from the interpretation without launching a separate instance of GVERSE Geophysics.

Easier Access to Interpretation Browser

Access the Interpretation Browser from the 3D module for quicker access to horizons, faults, geobodies, 2D shifts, and polygons from other interpretations.

Create IsoMap Layers in GVERSE Geophysics 3D Module

You can now access the Layer Creation dialog box directly from GVERSE Geophysics 3D module, instead of switching to the main interface to create IsoMap layers.

Consistent Pick Modes

Pick modes are now synchronized across GVERSE Geophysics. When a pick mode is enabled is one module, it is also enabled in the other module of GVERSE Geophysics.

Performance Improvements

Significantly faster horizon export, fault polygon editing, working with the Fault Manager, and 3D autopick interpolation.

Fixed Issues

ID	Description
220823	While creating a velocity model, the **Control Points** column disappeared if the default gridding method was changed from **Minimum Curvature** to **Inverse Distance** or **Normalized Inverse Distance**. This issue has been fixed.
218495	Application crashed when subsetting Z-axis of the seismic data with phase shift already applied. This issue has been fixed.
216529	The **Print to PDF** functionality using the **Only Wiggles** option resulted in a black colored image of the seismic section in the PDF file. This issue has been fixed.
215872	The **Attribute and Surface Calculator** dialog box used to freeze when the secondary monitor was set as the main display. This issue has been fixed.
157503	Horizon correlation resulted in a surface containing spikes when executed for multiple surveys with shared horizons. This issue has been fixed.

Third Party Applications

We acknowledge that certain third party code has been bundled with, or embedded in, our software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found in the Geophysics help file.

To access the 3rd party license agreements:

1. Either press **<F1>** or click the **Help** button 🔵 located at the top right corner**.**

   The Help window displays.

2. In the **Contents** pane, locate the **Third Party Acknowledgements** help topic as shown in the image below.
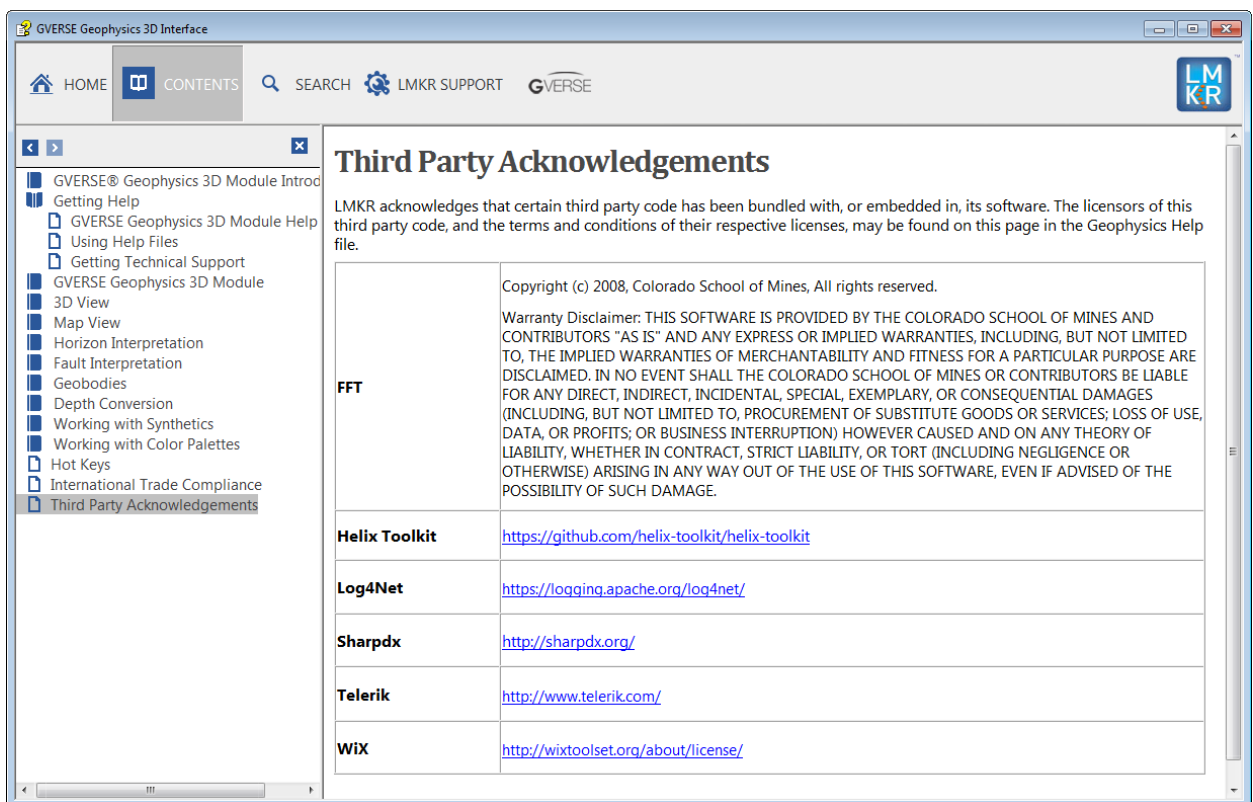
International Trade Compliance

This application is manufactured or designed using U.S. origin technology and is therefore subject to the export control laws of the United States. Any use or further disposition of such items is subject to U.S. law. Exports from the United States and any re-export thereafter may require a formal export license authorization from the government. If there are doubts about the requirements of the applicable law, it is recommended that the buyer obtain qualified legal advice. These items cannot be used in the design, production, use, or storage of chemical, biological, or nuclear weapons, or missiles of any kind.

The ECCNs provided here (if available) represent our opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at support@lmkr.com.

Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, the customer, or the country of destination, and an export license may be required by the Department of Commerce prior to shipment. The U.S. Bureau of Industry and Security provides a website to assist you with determining the need for a license and with information regarding where to obtain help.

The URL is: http://www.bis.doc.gov.

Definitions

ECCN - Export Control Classification Number - The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups. The CCL is available on the EAR Website.

EAR - Export Administration Regulation - The EAR is a set of regulations that are administered by the Bureau of Industry and Security, which is part of the US Commerce Department. In general, the EAR govern whether a person may export a thing from the U.S., re-export the thing from a foreign country, or transfer a thing from one person to another in a foreign country. The EAR apply to physical things (sometimes referred to as "commodities") as well as technology and software.

The EAR number and the License type for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	EAR Number	License	Last Updated On
GVERSE Geophysics	EAR99	EAR	03/28/2018

Contacting GVERSE GeoGraphix Support

We are committed to providing the highest level of technical customer support in the industry. With an average tenure of more than thirteen years, our highly trained and experienced staff of technical analysts is comprised of geoscientists, engineers, land professionals, petrophysicists, and system specialists.

Please refer to our Customer Support timings mentioned below to ensure that you have access to our support analysts assigned to your region. When getting in touch with GVERSE GeoGraphix support, please remember that real-time support will not be available during bank holidays or after office hours. If you do get in touch with GVERSE GeoGraphix Support outside of work hours, please leave a voice message with a brief description of the issue that you are facing. Your voice message will be used to automatically create a support case for you. This will enable our analysts to attend to your issue and provide you with a resolution as soon as possible

North & South America	Europe, Middle East & Africa
Monday – Friday 8 am – 6 pm CST* Toll Free (US/Canada) : +1 855 449 5657 **Colombia:** +57 1381 4908 **United States:** +1 303 295 0020 **Canada:** +1 587 233 4004 *Excluding bank holidays*	**UK:** Monday – Friday 8 am – 5 pm* +44 20 3608 8042 **UAE:** Sunday – Thursday (Dubai GMT+4) 8 am – 5 pm* +971 4 3727 999 *Excluding bank holidays*
Asia Pacific & Australian Continent	**Southwest Asian Countries**
Malaysia: Monday – Friday (Kuala Lumpur GMT+8) 9 am – 6 pm* +60 32 300 8777 *Excluding bank holidays*	**Pakistan:** Monday – Friday (Islamabad GMT+5) 9 am – 6 pm* +92 51 209 7400 *Excluding bank holidays*

Helpful Links

Name	Website Address
GVERSE Homepage	http://www.gverse.com