



# Geophysics

Powerful seismic interpretation for your play

## Release Notes

GVERSE Geophysics 2019.2



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# Introduction

LMKR is pleased to announce the release of GVERSE® Geophysics 2019.2.

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 by LMKR (<http://www.lmkr.com/gverse>).

LMKR 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

- View 2D and 3D seismic data in highly optimized 3D viewer
- Visualize volumes with voxel rendering
- View horizons, faults, wells and associated well data, ISOMap layers and much more in 3D
- Big data support with the new LOD format
- Powerful color palette control with histogram and selective transparency
- Blending to visualize data from multiple versions simultaneously
- Interpret horizons and faults directly in the 3D view
- View surveys, lines, wells, surfaces, layers on highly customizable maps
- Seamless interactivity between map and 3D views
- Import external cubes and use as your velocity model
- Use velocity model for depth conversion of horizons
- View velocity values on seismic sections in real time
- Work on multiple screens with dockable windows
- Save and share work as sessions
- Full backward compatibility for existing interpretations

## Benefits

**Blazing Fast 3D Visualization:** GVERSE Geophysics introduces a brand-new 3D viewer that is built on an engine designed and optimized for seismic and related data. It's never been easier to view your seismic sections, horizons, faults, wells and wellbore data, and much more in the 3D space. The new LOD format does not compromise performance even with very large seismic files. With features such as voxel rendering and co-blending, you can visualize subsurface structures like never before, gain more insight into your data, and make better decisions for your play.

**Interpretation in 3D:** Pick your horizons and faults directly in the 3D viewer. Mark seeds picks and run the auto-trackers directly from the 3D view. With all horizon and fault picking and editing modes available, you can quickly mark your structures and instantly see what they look like in the 3D space.

**Do More with Your Velocity Models:** Import external velocity cubes and use them as your velocity model, visualize velocity values directly on your sections and horizon surfaces, or use the velocity model for T/D conversion of horizons. The velocity modeling improvements will help you get a more accurate picture of the subsurface.

**Easy to use, Intuitive Workflows:** 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.

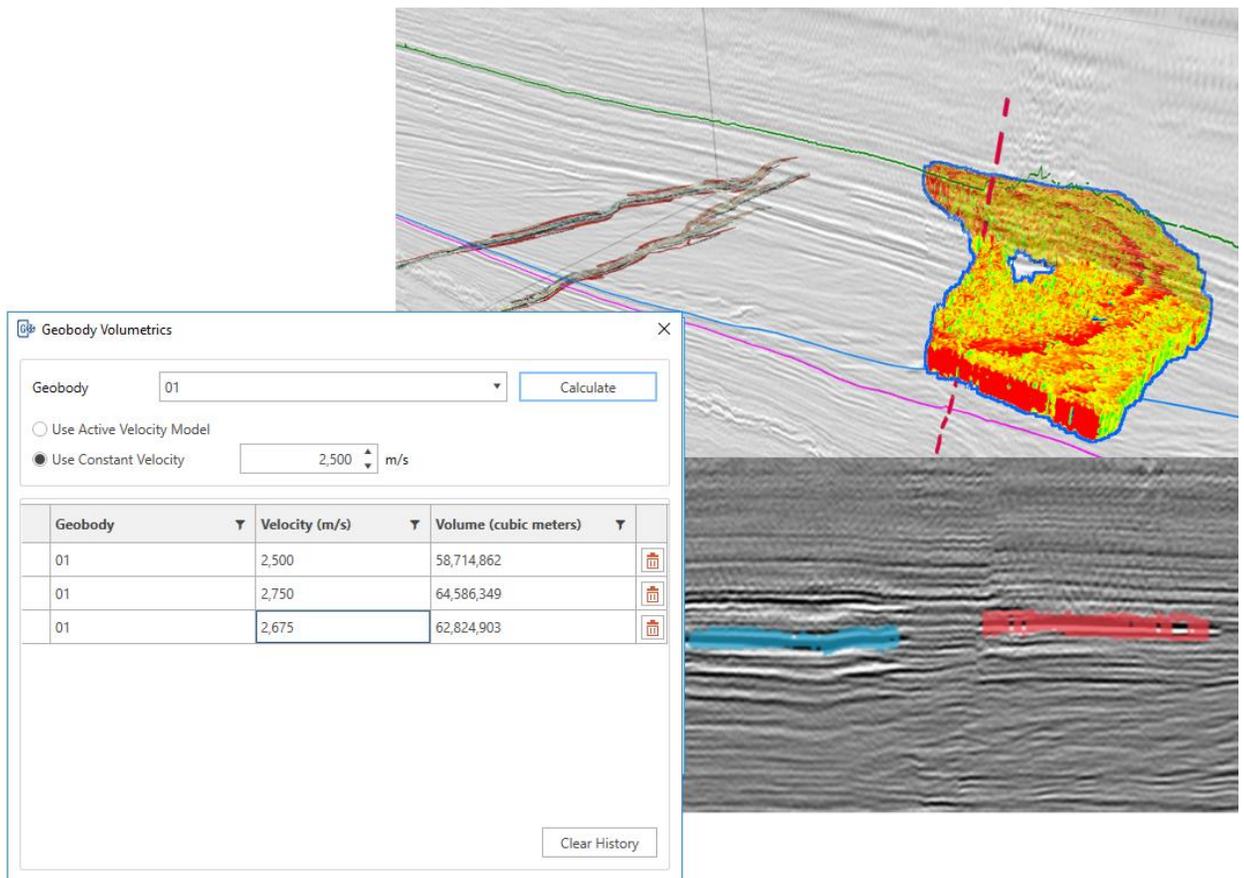
## Installing GVERSE Geophysics

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 LMKR Support Portal > Knowledge Center > [Release Notes and Installation Guides](#) page.

# What's New in GVERSE Geophysics 2019.2

## Interpreting Geobodies

- Pick and save structures on seismic and attribute volumes as geobodies by selecting the relevant options under the **Geobodies** tab.
- Interpolate picks or track seismic signatures automatically.
- Drape data directly on the body using the **Display Settings** pane, or show intersections with seismic sections from the context menu.
- Make volumetric calculations in the 3D module by selecting the **Geobodies** tab and clicking the **Volumetrics** button from the **Operations** menu.



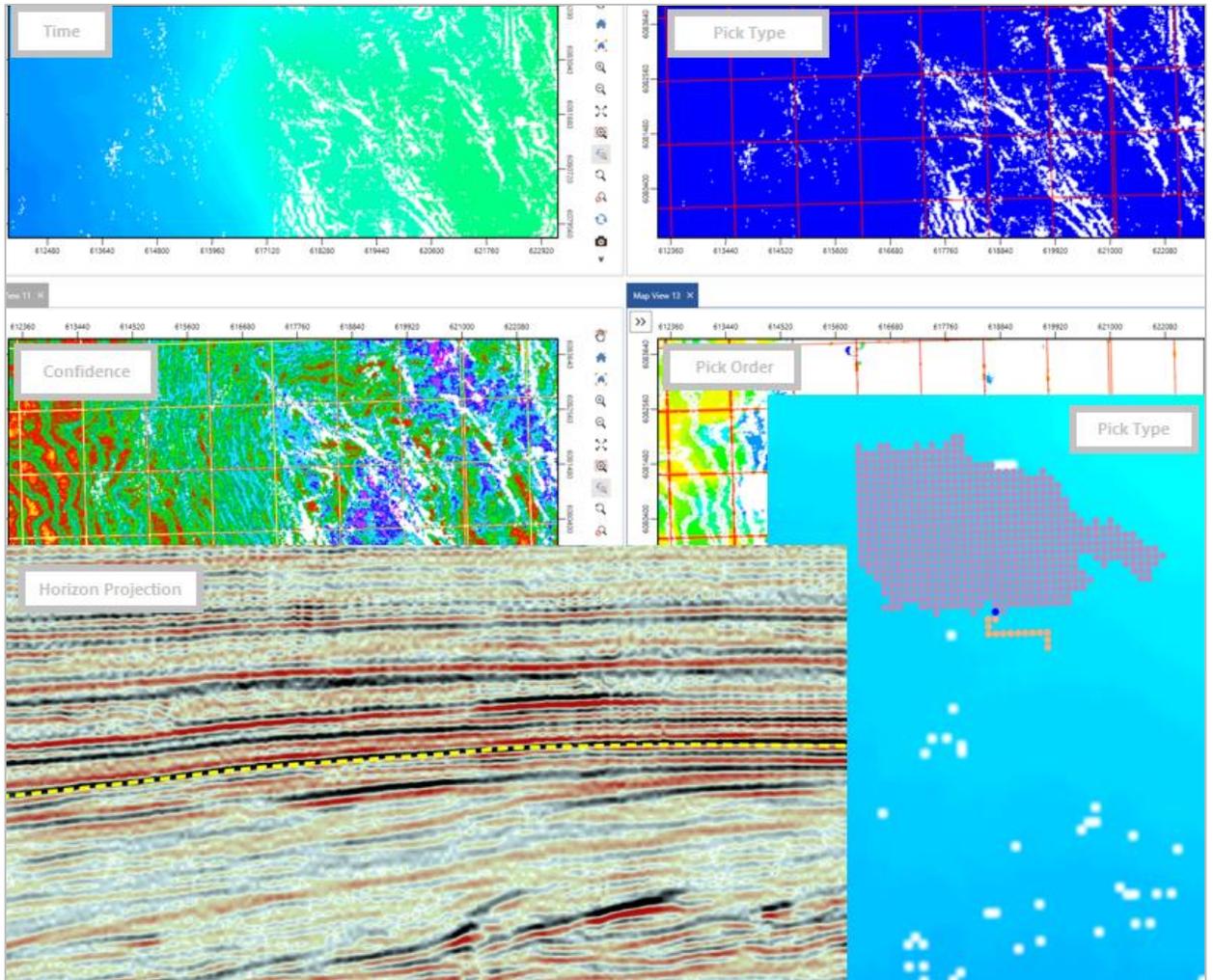
The screenshot displays a 3D seismic volume with a geobody highlighted in yellow and red. A dialog box titled "Geobody Volumetrics" is open in the foreground, showing a table with the following data:

Geobody	Velocity (m/s)	Volume (cubic meters)
01	2,500	58,714,862
01	2,750	64,586,349
01	2,675	62,824,903

The dialog box also includes a "Calculate" button, radio buttons for "Use Active Velocity Model" and "Use Constant Velocity" (selected), and a "Clear History" button.

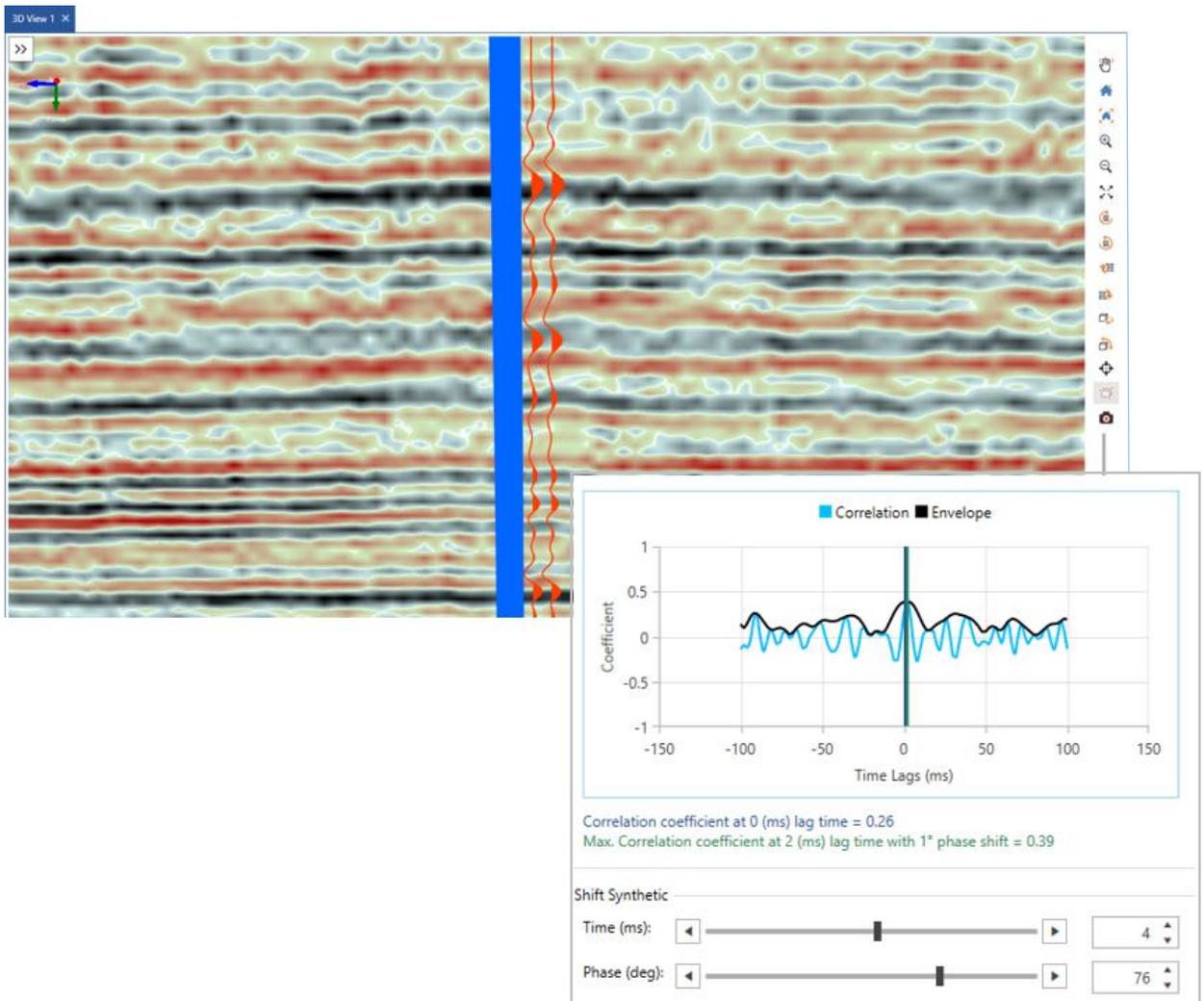
## Setting Horizon Pick Attributes

- Create confidence, pick order and pick type maps. This option is available for both **Map** and **3D** Views, and can be accessed by selecting the required horizon attribute surface from the active horizon's **Scene** tree.
- Edit horizons using pick attribute criteria.
- Identify and eliminate potential bad picks using pick relationship displays.
- Guide your picking by projecting horizon picks on to unpicked sections. The horizon picks can be projected by selecting the **Project up to X lines** check box under the **Horizons** tab and entering the number of required guiding lines.



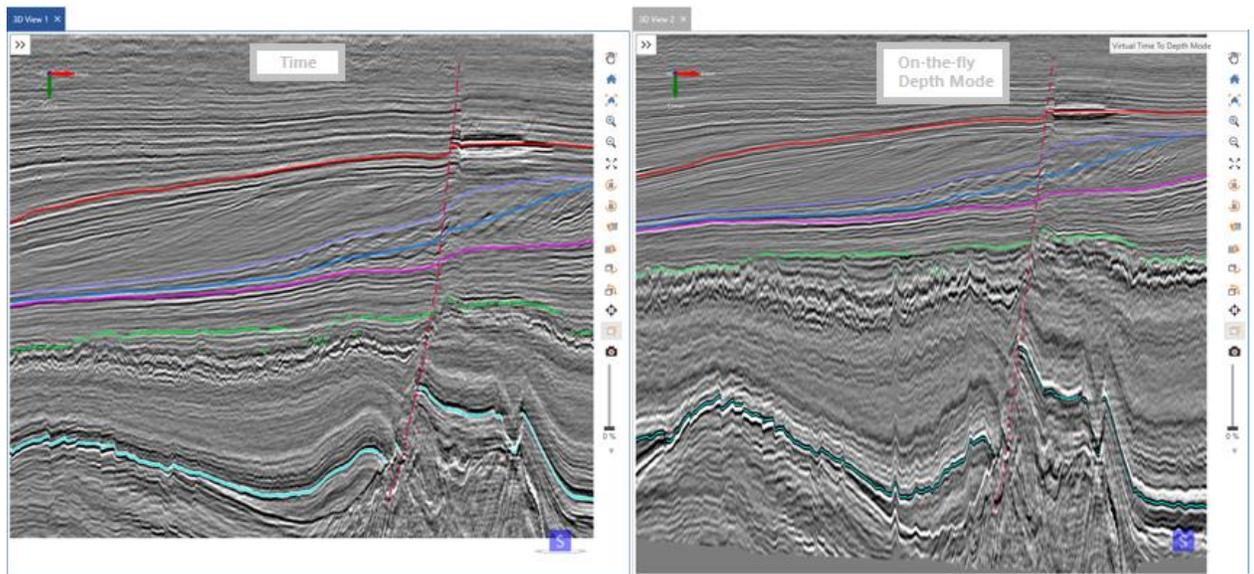
## Tie Synthetic in 3D

- Shift, stretch and squeeze synthetic traces using different controls within the 3D viewer. Select the **Synthetics** tab and use the **Drag**, **Click**, or **Manual** modes from the **Static Shift** menu to shift the synthetic traces. There is an option to stretch/squeeze the synthetic using the **Drag** or **Click** modes from the **Stretch/Squeeze** menu.
- Auto-calculate optimum time and phase shifts to maximize correlation between synthetic and seismic. The optimum time and phase shifts are automatically calculated by clicking the **Shift to Max. Correlation** button in the **Well To Seismic Correlation** dialog, which can be accessed by clicking the **Correlation** button from the **Synthetic** tab.
- View changes to interval velocity due to modifications in synthetic.



## Build Better Velocity Models

- Switch to Depth mode in time interpretations and convert entire time scenes to depth on-the-fly. To do so, click the **Depth Mode** button from the **3D View** tab.
- Use improved algorithms to build more robust velocity models.
- Incorporate fault polygon information in the model.



## Enhanced Wells & Well Data Display

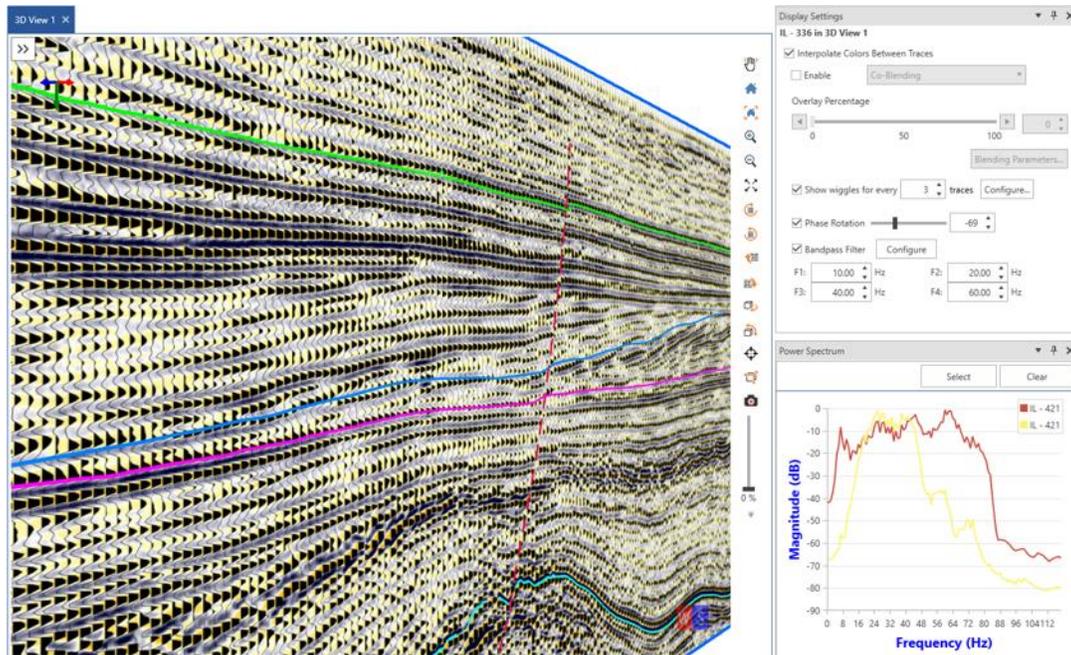
- Extract seismic data along wellbores. This option is for deviated wells and aids in displaying exact data closer to the wellbore. To do so, select a deviated wellbore in the **3D View** and then **select <Survey Name> > Arbline Along Bore** from the context menu.
- View measured depth (MD) along wells in time scenes.
- Highlight specific wells on maps and 3D scenes using pre-defined filters. The wells can be filtered using the **Highlight Wells** option from the **Display** menu either in **Map** or **3D View** tab.
- Display multiple perfs within a completion zone. Perfs can be displayed alongside wellbores using the well's **Display Settings** pane.
- Use aliases for well log display.

The image displays a software interface for well data visualization. On the left, the 'Highlight Wells' settings pane is open, showing a list of data types with checkboxes. 'Completions' is checked. Below the list, there are options to 'Highlight wells that match' with a dropdown set to 'ALL' and a 'Color' dropdown set to blue. 'Apply' and 'Clear' buttons are at the bottom of the pane. To the right, a 3D visualization of a wellbore is shown, featuring a blue vertical line with several orange horizontal rings and a central section with a blue and black polka-dot pattern. On the far right, a 'Depth Info' window is open, displaying a table with well data.

3 in 3D View 1	
Time	899 ms
MD	920 m
TVDSS	-890 m
TVD (from well datum)	920 m

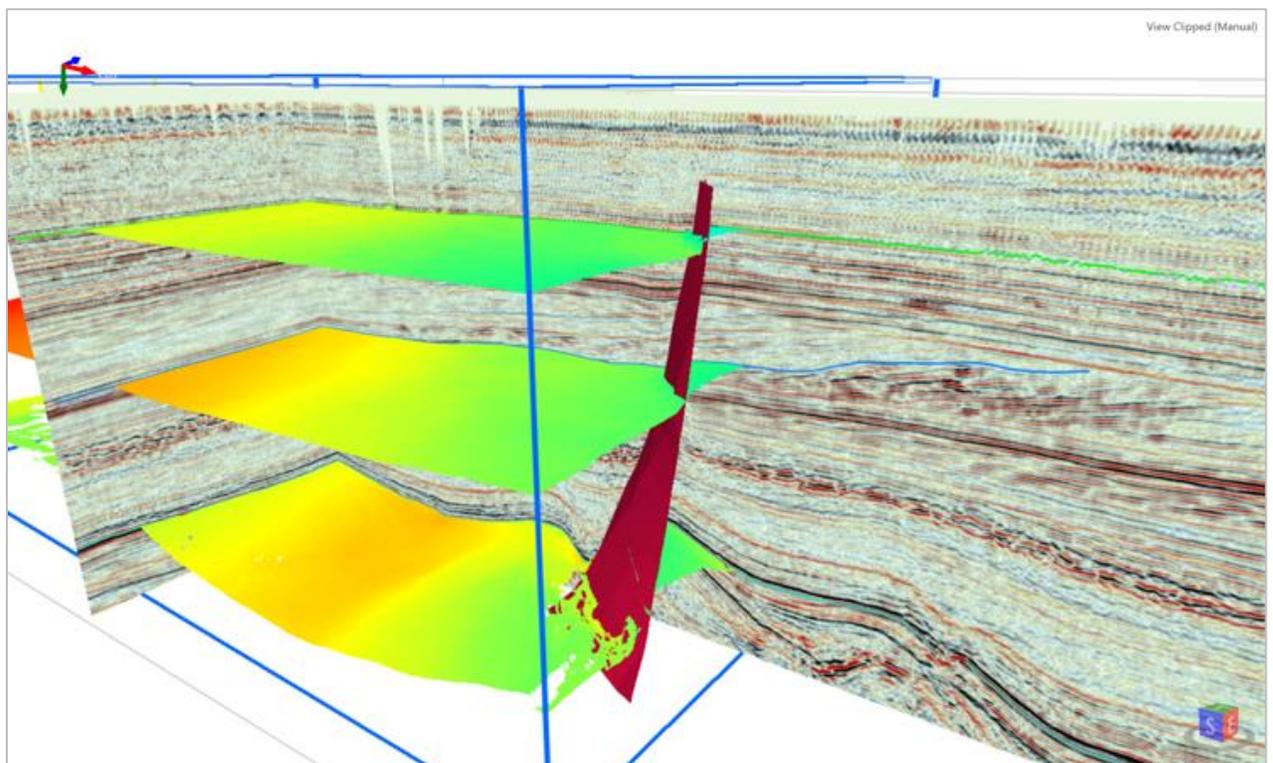
## Improved Seismic Visualization

- Load seismic volumes to RAM for faster data visualization. To do so, right-click the desired version in the **Interpretation** tree, and select **Load in Memory** from the context menu.
- Apply phase rotation and bandpass filters to sections. These filters can be applied from the **Display Settings** pane for all seismic sections except for timeslices, probes and volumes.
- Compute and compare power spectrums for seismic. Power spectrum window can be accessed by clicking the **Power Spectrum** button from the **Tools** menu under the **3D View** tab.
- Overlay wiggles on sections using the Display Settings pane.



## Enhanced Usability

- Show contours on horizons in **3D View** by selecting **Show Contours** from the horizon's context menu.
- Clip the 3D scene to an area of interest (AOI) using the **Clipping** drop-down list from the **Display** menu of the **3D View** tab.
- More control on hiding and removing items from a scene from the respective context menus.
- Easier access to commonly used actions within the context menu for various seismic objects.
- Extensive **Horizon** and **Fault** lists in main and 3D interfaces. To access these lists;
  - Main Interface:  
Horizons: Select **Horizons > Horizon Manager** from the menu bar.  
Faults: Select **Faults > Fault Manager** from the menu bar.
  - 3D Module:  
Horizons: Select **Horizons** tab, and then select **Horizon Manager** from the **Manage** menu.  
Faults: Select **Faults** tab, and then select **Fault Manager** from the **Manage** menu.
- Calculate distance between points or along a path on the map or 3D scene. To do so, click the **Measure Distance** button from the **Tools** menu in **Map** or **3D View** tab.



## Fixed Issues

ID	Description
170501	The horizon surfaces picked in GVERSE Geophysics and used as seismic backdrop in GVERSE Geomodeling display properly, after a mechanism is identified to discard the temporary files properly.
171700	All operations related to a horizon and fault displayed as an intersection on a seismic section are available in the corresponding context menus.
171702	Disks representing formation tops display perpendicular to the wellbore direction. This is especially useful for horizontal wells.
174018	A new TD pair in the user defined velocity table allows for specifying a time value for the total depth point of a well.
175023	Any processing (filters) applied to sections in SynView is enforced on all seismic traces. This enables seismic traces to match sections opened in SynView.
180710	A target horizon can be specified for any set of control points being imported using the interpretation browser. The points are directly imported to the specified target horizon.
180711	Units for data in interpretation browser are in sync with those in the target interpretation.

## Known Issues

ID	Description
181863	<p><b>GVERSE Geophysics 3D Module</b> - Faults are not incorporated in structurally interpolated T/D models.</p> <p><b>Workaround:</b> To incorporate faults in structurally interpolated models, Velocity control points should be more than three (3) in number.</p>
183427	<p><b>GVERSE Geophysics Main Interface</b> - Units for curves are not updated when user overwrites an existing curve.</p> <p><b>Workaround:</b> Units are updated once a curve is saved with a new name.</p>
186468	<p><b>GVERSE Geophysics 3D Module</b> - 3D View is unaware of 'Update Wells' process from main interface of GVERSE Geophysics.</p> <p><b>Workaround:</b> When the GVERSE Geophysics 3D Module is open, wells should be updated from the 3D Module instead of the main interface.</p>

187648	<p><b>GVERSE Geophysics 3D Module</b> – Wellbores located at the clipping extents boundary cannot be selected in 3D View.</p> <p><b>Workaround:</b> Change the <b>Well Drawing Mode</b> from <b>Tube</b> to <b>Line</b>. Well Drawing Mode is changed from the <b>Preferences</b> dialog box.</p>
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## Third Party Applications

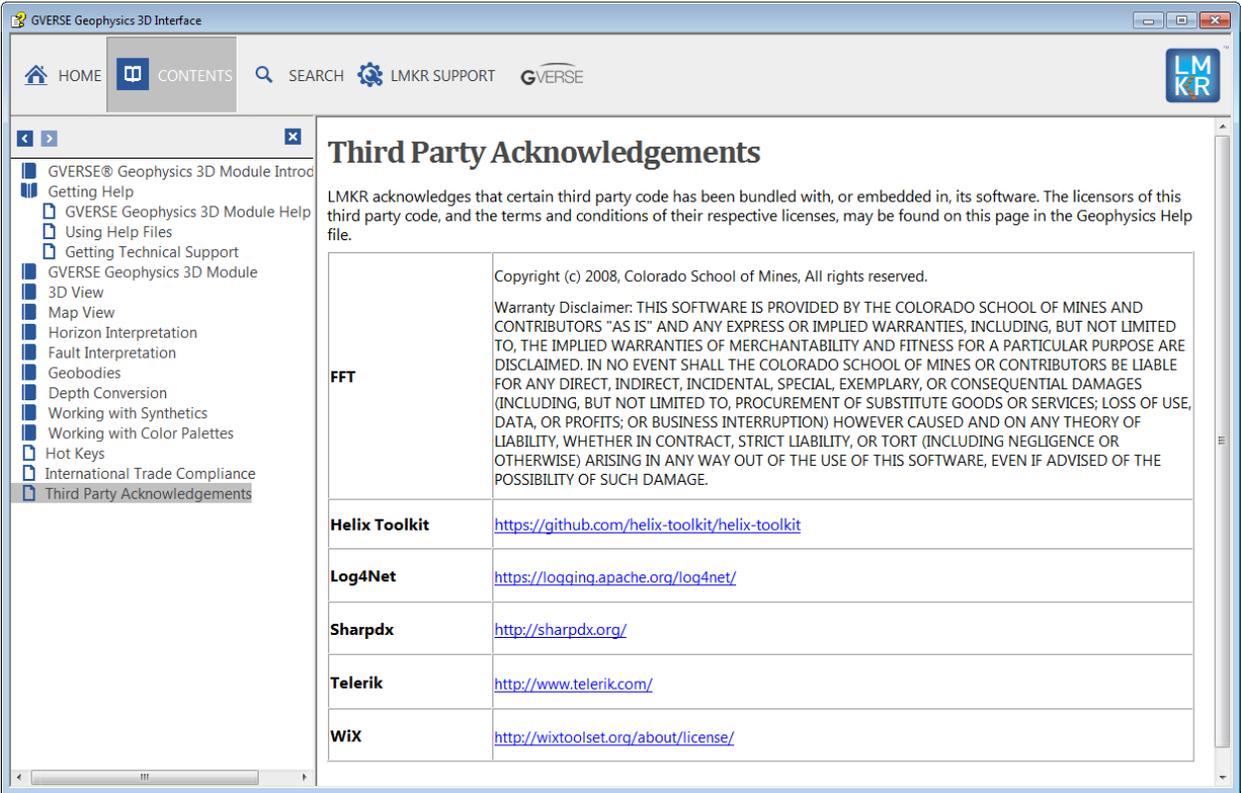
LMKR acknowledges that certain third party code has been bundled with, or embedded in, its software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found in the Geophysics help file.

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.

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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.

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

## Contacting LMKR Support

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

## Helpful Links

Name	Website Address
LMKR Homepage	<a href="http://www.lmkr.com">http://www.lmkr.com</a>
LMKR GVERSE	<a href="http://www.lmkr.com/gverse">http://www.lmkr.com/gverse</a>
LMKR Support Portal	<a href="http://support.lmkr.com">http://support.lmkr.com</a>