

GeoGraphix® 2017.2

Experience performance that speaks volumes
With a completely integrated geoscience system



© 2001 - 2018 Landmark Graphics Corporation. All Rights Reserved.

This publication has been provided pursuant to an agreement containing restrictions on its use. The publication is also protected by Federal copyright law. No part of this publication may be copied or distributed, transmitted, transcribed, stored in a retrieval system, or translated into any human or computer language, in any form or by any means, electronic, magnetic, manual, or otherwise, or disclosed to third parties without the express written permission of:

Landmark Graphics Corporation

Building 1, Suite 200, 2101 CityWest, Houston, Texas 77042, USA P.O.

Box 42806, Houston, Texas 77242, USA

Phone: 713-839-2000

Help desk: 713-839-2200

FAX: 713-839-2401

Internet: www.lgc.com

AND

LMKR Holdings

Corporate Headquarters

Unit No. B1501, Latifa Tower,

Sheikh Zayed Road,

Dubai, UAE, P.O.Box 62163.

Phone: +971 4 372 7900

FAX: +971 4 358 6386

Internet: www.lmkr.com

Trademark Notice

DecisionSpace, Discovery, GeoGraphix (stylized), GeoGraphix Exploration System, GeoLink, GES, GESXplorer, GMAplus, IsoMap, LeaseMap, LogM, OpenWorks, OpenWorks Well File, PRIZM, SeisVision, Xsection are trademarks, registered trademarks or service marks of Landmark Graphics Corporation.

All other trademarks are the property of their respective owners.

Note

The information contained in this document is subject to change without notice and should not be construed as a commitment by LMKR. LMKR assumes no responsibility for any error that may appear in this manual. Some states or jurisdictions do not allow disclaimer of expressed or implied warranties in certain transactions; therefore, this statement may not apply to you.

Contents

GeoGraphix® and Discovery™ on OpenWorks® 2017.2.....	1
New Features at a Glance	4
System Requirements	5
GeoGraphix Workstation and Laptops.....	5
GeoGraphix Project Server.....	8
Compatibility Matrix	11
New Features	12
GVERSE Geophysics.....	12
smartSECTION/Geomodeling.....	16
PRIZM	18
QueryBuilder	20
WellBase	20
Fixed Issues	21
Geophysics	21
smartSECTION/Geomodeling.....	21
PRIZM	21
GeoAtlas.....	21
SeisBase.....	22
DefCon2	22
QueryBuilder	22
WellBase	22
Known Issues.....	23
WellBase	23
GeoAtlas.....	23
QueryBuilder	23
DefCon2	23
Discovery on OpenWorks.....	24
Third Party Applications.....	25
International Trademark Compliance	26
Definitions.....	27
Contacting LMKR Support.....	28

GeoGraphix® and Discovery™ on OpenWorks® 2017.2

LMKR is pleased to announce the release of the GeoGraphix® and Discovery™ on OpenWorks® 2017.2 software.

This release includes new and updated geophysical interpretation tool for GeoGraphix, and also brings many new features and performance improvements, which are highlighted in the New Features section of this document.

This document also provides important information regarding the system requirements and valuable resources that will allow you to get the most out of the GeoGraphix 2017.2 release.

Note: Users upgrading from GeoGraphix 2017.1 to GeoGraphix 2017.2 do not require a new license. New users or users upgrading from other versions of GeoGraphix need a valid LMKR license. The LMKR License Management Tool (LMT) must be installed to configure the license. Download the latest LMT from the **LMKR Support Portal - Downloads** page (<http://support.lmkr.com/>). See the “LMKR Licensing” section of the Installation Guide for Release 2017.2 for more information.

Note: If working in a network environment, in order for all computers to work together on shared projects, ALL computers (clients and servers) must be updated to the same version of the software. It is intentional that computers with different versions of GeoGraphix software cannot and should not be connected with each other.

GeoGraphix 2017.2 is an integrated product suite that incorporates shared data management and geological, petrophysical, and geophysical interpretation software. It utilizes a Sybase (GXDB) database in GeoGraphix Discovery mode, or accesses the OpenWorks®/SeisWorks® (Oracle) database in Discovery on OpenWorks mode.

The GeoGraphix software consists of the following:

GVERSE™ Geophysics

- 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.

GVERSE™ Geomodeling

- An integrated environment for modeling that incorporates existing mapping and cross section features of smartSECTION® with a newly built 3D View. It takes your smartSECTION interpretations to a whole new level with 3D modeling, while also enabling you to fully utilize the existing smartSECTION features.

Pro 3D

- Enables interpreters to get the most from their data by quickly creating powerful and informative base maps, fence diagrams and seismic backdrops. Using the Pro 3D window you can show IsoMap® structural surfaces, cultural layers, wells, seismic data, cross sections and fence diagrams in the 3D Scene.

Field Planning

- The advanced field planning tool is designed to reduce the time required for efficient field development. It provides the ability to create, save, analyze and manage multiple field plan scenarios before committing them to the database. Designed for horizontal well plans, the Field Planner includes determination of the optimum location and orientation of wells. These proposed wells can all be visualized by creating a layer for display in GeoAtlas™.

Data Manager™ includes ProjectExplorer™, Coordinate System Manager™, WellBase™, SeisBase™, QueryBuilder™, LandNet™, LeaseMap™, and ZoneManager™.

- The GeoGraphix and Discovery on OpenWorks project and data management engine

GeoAtlas™

- The map display and montage environment working on ESRI MapObjects

IsoMap®

- The gridding contouring engine, featuring 10 powerful gridding algorithms

XSection™

- A fully integrated geological interpretation tool and cross section display tool

PRIZM™

- An interactive petrophysical and log analysis system

smartSECTION®

- Map view for viewing GeoAtlas layers and defining cross sections for picking tops and faults for structural and sequence stratigraphic analysis

Discovery™ 3D

- The 3D scene viewer that uses the most recent video and X-Box tools to display seismic and geologic data in three dimensions

pStaX™

- The post stack processing module for enhancing seismic character and detecting anomalies related to geologic features

SCAN™

- The patented semblance calculation for enhanced fault interpretation

LogM Advanced Synthetics™

- The geophysical application used for interactively editing well logs and evaluating synthetic trace character response

LogM Modeling™

- The 2D forward seismic waveform, ray tracing and structural modeling tool to predict seismic response away from the well

STRUCT™ Model Entry

- The comprehensive forward seismic structural modeling tool that is used to determine the seismic response of complex geologic structures in areas where there is little or no well control

Discovery™ on OpenWorks®

- Enables the GeoGraphix software to access OpenWorks and SeisWorks projects, and uses the OpenWorks and SeisWorks data within the GeoGraphix framework

Xchange Tools

WellXchangePlus™

- Transfer well information to or from two GeoGraphix projects, or between GeoGraphix and OpenWorks

SeisXchange™

- Transfer seismic data between Geophysics and SeisWorks

GridXchange

- Transfer of map point sets and grids from GeoGraphix to OpenWorks

Note: SeisBase, LandNet, LeaseMap, LogMModelBuilder (LogM Modeling), LogM Well Editor (LogM Advanced Synthetics), Field Planner, and Advanced 3D Visualization (Pro 3D) are not available in the current version of Discovery on OpenWorks.

New Features at a Glance

The new features available in the GeoGraphix 2017.2 release are listed below.

GVVERSE Geophysics

- A new seismic interpretation tool for GeoGraphix with powerful 3D visualization and interpretation capabilities. Click [here](#) for details.
- Velocity modelling improvements: ability to use active velocity for depth conversion of horizons and support for using velocity cubes to build a velocity model. Click [here](#) for details.

smartSECTION/Geomodeling

- Clipping options toolbar added. Click [here](#) for details.
- Log start\stop and stratigraphic datum clipping options added. Click [here](#) for details.
- Measure distance and angle between two wells. Click [here](#) for details.
- Model WellBase point surfaces as triangulated surfaces. Click [here](#) for details.
- Dockable 2D and 3D data panels. Click [here](#) for details.
- Show confidence data on cross sections. Click [here](#) for details.

PRIZM

- View modified date for curved data. Click [here](#) for details.
- Quickly view log curve with or without applying a user defined equation model. Click [here](#) for details.
- View start and stop depths for individual curves. Click [here](#) for details.

QueryBuilder

- Filter curve data using well curve top depth and curve base depth, and last modified date. Click [here](#) for details.

WellBase

- Add data for up to 200 user defined fields in the Core table. Click [here](#) for details.
- Plug and Cuttings added as new and default options for Core Type. Click [here](#) for details.

For details on the above new features, fixed issues and known issues for the GeoGraphix 2017.2 release, click on the following.

- [New Features](#)
- [Fixed Issues](#)
- [Known Issues](#)

System Requirements

In the following sections, you will find hardware and software system requirements for this release of GeoGraphix and Discovery on OpenWorks:

- GeoGraphix Workstation
- GeoGraphix Project Server

System requirements can vary considerably, depending on your computing environment and software objectives. Please contact your Sales Representative or Customer Support if you have questions or need more information about system requirements.

Important Notes:

- Users upgrading from GeoGraphix 2017.1 to GeoGraphix 2017.2 require a new Geophysics license. New users or users upgrading from other versions of GeoGraphix also need valid LMKR licenses. Please contact COS@lml.com to request a license. The LMKR License Management Tool (LMT) must be installed to configure the license. Download the latest LMT from the **LMKR Support Portal - Downloads** page (<http://support.lml.com/>). See the “LMKR Licensing” section of the Installation Guide for Release 2017.2 for more information.
- Discovery on OpenWorks is compatible with OpenWorks for Windows 5000.10.3.02 and SeisWorks 5000.10.
- Please also refer to the GeoGraphix Customer Support Portal (<http://support.lml.com>) for up-to-date information on system requirements for all GeoGraphix products.

GeoGraphix Workstation and Laptops

The requirements for GeoGraphix Workstation and Laptops are as follows:

Software and Hardware Requirements

We recommend using the latest Microsoft service packs and security patches. The following table lists the operating systems which are supported.

Supported Operating System	RAM	CPU
Windows® 7 Professional x64	8 GB Minimum	Pentium i5/i7 or any Quad Core Processor
Windows® 7 Enterprise x64	16+ GB recommended	
Windows® 7 Ultimate x64		
Windows® 10 Professional x64		
Windows® 10 Enterprise x64		

Note 1: We recommend using the latest Microsoft service packs and security patches. GVERSE Geophysics and GVERSE Geomodeling specifically require Windows platform update package KB2670838 installed on the machine, in case the operating system is Windows 7.

Additional Requirements and Recommendations

- DVD-ROM required for media installation. Download installation available through Electronic Software Delivery at <http://support.lmkr.com>.
- DCOM/Firewalls configured to allow remote access. Only necessary if sharing projects.
- Microsoft .NET 4.5.1 runtime required.

Graphics Hardware Requirements

We recommend the following Graphics Hardware to run the GeoGraphix applications:

Applications Support Level	Required Operating System	Graphics Hardware
All GeoGraphix Applications including Discovery 3D and advanced 3D visualization (Pro 3D), and GVERSE Geomodeling	Refer to the supported operating systems mentioned on the previous page.	2 GB Minimum 4 GB Recommended DirectX 11 capable hardware (see Note 2 below)
GVERSE Geophysics	Refer to the supported operating systems mentioned on the previous page.	<p>Minimum</p> <ul style="list-style-type: none"> • 2.4 GHz 64-bit processor • 8 GB RAM • Any DirectX 11.1 capable card comparable with Nvidia® GeForce GTX 430 with 1GB VRAM. DirectX is not shipped with GeoGraphix 2017.2. You must download and install it separately. • 1366 x 768 screen resolution <p>Recommended</p> <ul style="list-style-type: none"> • 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. DirectX is not shipped with GeoGraphix 2017.2. You must download and install it separately. • Solid state hard disk • 1920 x 1080 screen resolution

Note 1: Microsoft DirectX End-User Runtime (June 2010) is required to run Discovery 3D, advanced 3D visualization (Pro 3D), GVERSE Geomodeling, and GVERSE Geophysics.

Note 2: To run Discovery 3D, advanced 3D visualization (Pro 3D), and GVERSE Geomodeling, it is recommended that an NVIDIA DirectX 11 compatible card be used. We recommend using the latest video drivers and MS updates for your system.

Optional Software Requirements

The following table lists the software requirements for using different tools available in GeoGraphix.

Tools	Software Requirements
Spreadsheet import utility in WellBase, SeisBase, and LeaseMap	Excel 2007, 2010 or 2013 (32 or 64 bit) In case the macros are not working in Excel, ensure the gxdb.xla file is present in the relevant Microsoft Office Library installation folder, and the net pipe adapter service is running.
Selected Help files	Adobe Reader
For Discovery on OpenWorks, GridXchange, and SeisXchange	OpenWorks for Windows 5000.10.3.02 – Basic or Full (recommended) Install available on Landmark’s LSM. (See Notes on the next page), and SeisWorks 5000.10 (for seismic workflows)
ESRI geo-referenced images and ESRI CAD file import in GeoAtlas	ESRI ArcGIS Runtime Engine 10.2.x or 10.3.x or 10.4.x or 10.5 (included in the 3rd Party Installer).
For LOGarc™ Version 4.1.0.3 access in smartSECTION	To use the LOGarc™ feature, the LOGarc™ Version 4.1.0.3 software must be downloaded from IHS LogTech Canada, LTD and a valid account must be in place. You must have administrator rights to the computer on which you will load the software.

Notes for Discovery on OpenWorks: The OpenWorks Full installation requires Hummingbird Exceed. The Oracle client installation in use with the OpenWorks Full installation requires that the “Administrator” option be selected. The “Administrator” option type includes the SQL Plus and the Oracle Database Utilities components, which are needed to run Discovery on OpenWorks, as part of the total OpenWorks package.

Note: Hummingbird Exceed is not required for the OpenWorks Basic installation. If the OpenWorks Basic installation is used, the Oracle client installation can use the “Administrator” option, which will include all of the needed components. Or, the Oracle client installation for the OpenWorks Basic installation can use the “Custom” installation type. However, the following components must be installed with the “Custom” installation type:

- Oracle Database Utilities 11.2.0.4
- SQL *Plus 11.2.0.4
- Oracle JDBC/THIN Interfaces 11.2.0.4
- Oracle Net 11.2.0.4

GeoGraphix Project Server

The requirements for GeoGraphix Project Server are as follows:

Software and Hardware Requirements

We recommend using the latest Microsoft service packs and security patches. The following table lists the operating systems which are supported.

Supported Operating System	RAM	CPU
Windows® Server 2008 R2 Standard x64	32 GB Minimum	Intel Xeon Processor or
Windows® Server 2008 R2 Enterprise x64	64+ GB Recommended	Equivalent
Windows® Server 2012 R2 Standard x64	SSD Drives Recommended	Quad 2.4GHz 64-bit or better

Additional Requirements and Recommendations

- DVD-ROM is required for media installation.
- DCOM/Firewall must be configured to allow remote access. For DCOM configuration recommendations, refer to the white papers on the LMKR Support Portal.

Server performance is subject to a large number of variables. It is impossible to give specific recommendations here, but these are some guiding principles to use. In general, multi-user performance of a GeoGraphix project server is best when the server is dedicated to GeoGraphix and not shared with other applications, especially database applications or intensive file-system applications. In addition, consideration should be made for the number of GeoGraphix users and the size and number of concurrently accessed projects. At some point, having multiple project servers becomes a better solution than having all users on one server. Generally, somewhere between 10 and 20 users is when a second server might be suggested.

Networking

Networking performance depends on the number of users trying to access a server simultaneously, as well as the bandwidth requirements for those users. Recommendations for server bandwidth typically specify server connectivity at a higher bandwidth than an individual user. For instance, users running at 100 Mbit should be accessing a server running on a 1-Gbit backbone. If users are at 1 Gbit, consider running multiple 1-Gbit connections or a single higher-bandwidth connection on the server.

Database Cache

A large database cache is an important factor to consider when dealing with multiple users accessing large databases. The database engine is capable of addressing a practically unlimited amount of cache memory. The best way to size the memory is to estimate the memory requirements for other running applications and allow the database cache to dynamically allocate any remaining free memory. The engine will only allocate what it needs when using dynamic allocation up to the maximum specified.

It is highly recommended that you let the database engine use as much cache memory as it requires on the host server. Increasing database cache memory is the quickest and most effective way to improve database-related performance on large network projects.

On a workstation, it might be appropriate to reserve 1 to 2 GB for the OS and file system cache and 2 to 4 GB for other running applications. On a dedicated project server, not much memory needs to be reserved for other applications. The ideal maximum varies by the project size, the number of users, and other load considerations. But as a general rule, the higher you can set the maximum, the better.

Storage

A great deal of GeoGraphix's access patterns on a server deal with file I/O. Database access, raster images, and seismic data are examples of files that benefit substantially from a fast disk sub-system. Server environments also place a high importance on data integrity and reliability. At a minimum, consider using a RAID 5 (stripe-set with parity) array. As the size of disks increase, you may also want to consider a hot swap drive and/or RAID 6 (striped with dual parity). Using a controller card with its own cache can also help improve performance.

Network Attached Storage (NAS), Storage Area Networks (SAN), and Other Non-Windows Storage Solutions

There are two typical methods used for accessing external storage devices from a project server: iSCSI and CIFS.

- iSCSI allocates a block of storage on the external device and makes it appear to be a physical disk on the project server. This has the advantage of a 100% compliant file system. However, since the external device sees the allocation as one big file, it can make backing up and restoring of individual files using the external device's capabilities more difficult. Standard backup and restore procedures from the server will still work.
- Using CIFS for external storage devices depends greatly on the vendor's implementation of the CIFS protocol used by the Windows platform. In general, a 100% compliant implementation of CIFS for a performant system is required. In particular, vendor's implementation of the "File Change/Notify" functionality has been problematic. Devices based on Windows Storage Server should be 100% compatible since it shares its components with Windows. Implementations based on UNIX/Linux are where problems occur due to the fact that the kernel level support is not present. Due to these uncertainties with CIFS implementations LMKR does not technically support CIFS.

Compatibility with OpenWorks Software

The Discovery™ on OpenWorks® (DOW) software directly links a GeoGraphix application to the data in an OpenWorks® project, and provides a shared project environment for interpretation applications. Landmark Software has delivered the OpenWorks and DOW software for Release 5000 and will continue to provide updates and enhancements to these products. When planning your uptake of Release 5000 and verifying your workflow, you should consider version compatibility between the OpenWorks software and the Discovery on OpenWorks software.

In the compatibility table below, the table indicates the level of compatibility of previous releases and of upcoming scheduled and planned releases. This table will be updated as new releases are planned. The objective is to provide closely coupled compatible versions of the software to allow you to more easily take up current releases.

LMKR performs full release testing for those combinations indicated as Release, R, in the table, but may not exercise full release testing on other version combinations. For these iterative releases, LMKR performs compatibility testing between the OpenWorks and DOW software (indicated as Compatibility, C, in the table). See the table below for the level of testing for each version combination. Although LMKR does not anticipate any integration issue, in these cases it is recommended that customers also verify compatibility in their own environment.

LMKR supports the versions listed as Release in the table. However, while LMKR has completed compatibility testing, LMKR/GeoGraphix Support may not be able to fully support the versions listed as Compatibility in the table. When customers request support for a Compatibility environment, LMKR/GeoGraphix Support works on a best effort basis to troubleshoot any issues, and if an issue needs additional attention, LMKR/GeoGraphix Support reports such issues to LMKR Research & Development. The LMKR/GeoGraphix Support Team cannot guarantee any resolution service levels associated with issues from a compatibility environment.

Combinations which have not been tested, either in the full release or in a compatibility environment, are indicated by U (untested). P indicates the indicated versions are probably incompatible, as the OpenWorks version has a newer development kit (devkit) than that of the indicated DOW version. Blank cells in the table indicate that OpenWorks and GeoGraphix are incompatible and will not operate together.

For the most current version of this information and an overview of suggested compatibility test paths, please refer to the LMKR Technical Support Solution Document KBA-65218-F9D7D5.

Compatibility Matrix

Discovery on OpenWorks

OW License 5000	DOW License 5000.02											
GeoGraphix Version	2017.2	2017.1	2016.1	2015.1	2015.0	2014.0	2013.0	2012.0.0	5000.0.2.5	5000.0.2.1	5000.0.2.0	5000.0.1.1
OW 5000.10.3.02	R	R	C	U	U							
OW 5000.10.1.05			R	R	R							
OW 5000.8.3.01			R		C	R						
OW 5000.8.1.1							R					
OW 5000.8.0.0								R				
OW 5000.0.3.5								C	R			
OW 5000.0.3.0								C	C	R		
OW 5000.0.2.9								U	U	U	U	
OW 5000.0.2.8								U	U	U	U	
OW 5000.0.2.7								U	R	R	R	
OW 5000.0.2.2												R
OW 5000.0.2.0												
OW 5000.0.1.7												
OW 5000.0.1.6												
OW 5000.0.1.5												
OW 5000.0.1.4												
OW 5000.0.1.2												
OW 5000.0.1.1												
OW 5000.0.0.3												R

Legend

R = Release level full testing

C = Compatibility level basic testing

U = Untested

P = Probably incompatible since OW and GeoGraphix are running different OW devkits.

A blank cell indicates that OW and GeoGraphix are incompatible

New Features

This section contains a brief description of the exciting new features included in the 2017.2 release.

GVERSE Geophysics



LMKR is pleased to announce the release of GVERSE Geophysics - 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.

Main Feature

- 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. And 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 modelling 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.

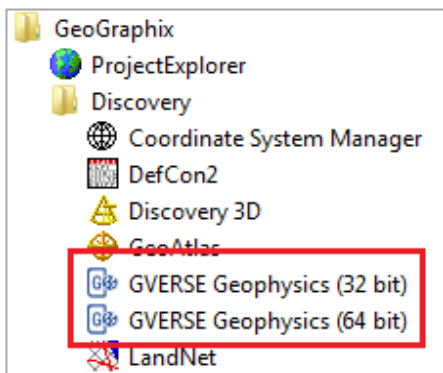
Installing GVERSE Geophysics

GVERSE Geophysics along with its 3D module, is installed seamlessly as part of the GeoGraphix installation. For details, refer to the GeoGraphix Installation Guide.

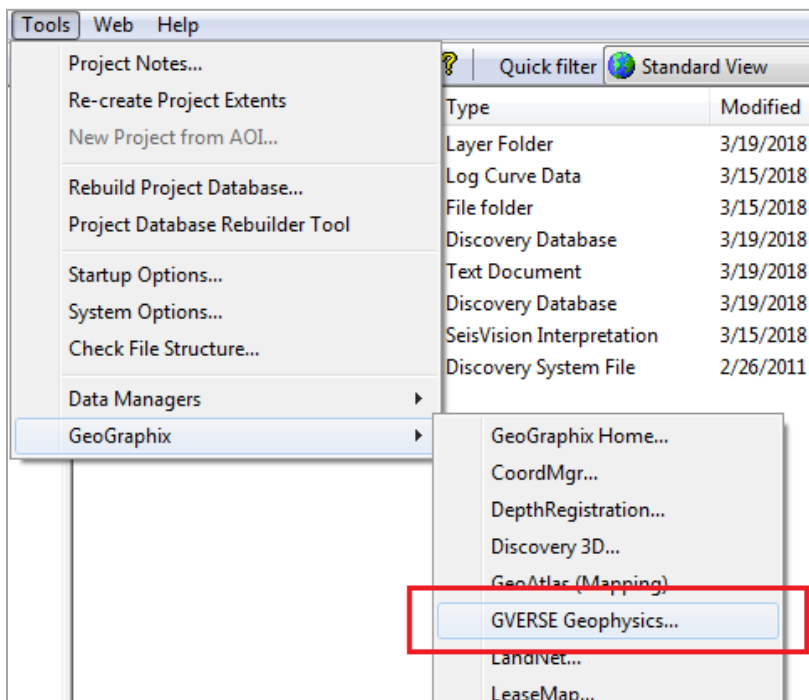
Launching GVERSE Geophysics

After successful installation of GeoGraphix, GVERSE Geophysics can be launched in any of the following three ways:

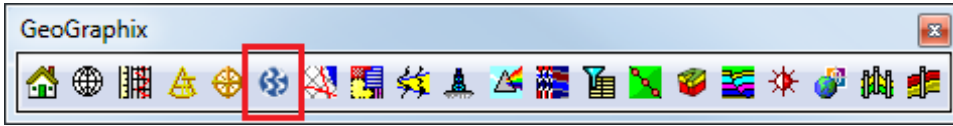
- From the **Start** menu, select **Start >> Programs >> GeoGraphix >> Discovery >> GVERSE Geophysics (32 bit & 64 bit)**




- From the menu bar of Project Explorer or other GeoGraphix *Discovery* applications, select **Tools >> GeoGraphix >> GVERSE Geophysics**



- Click the **GVERSE Geophysics** button  on the GeoGraphix toolbar in any other Discovery application.



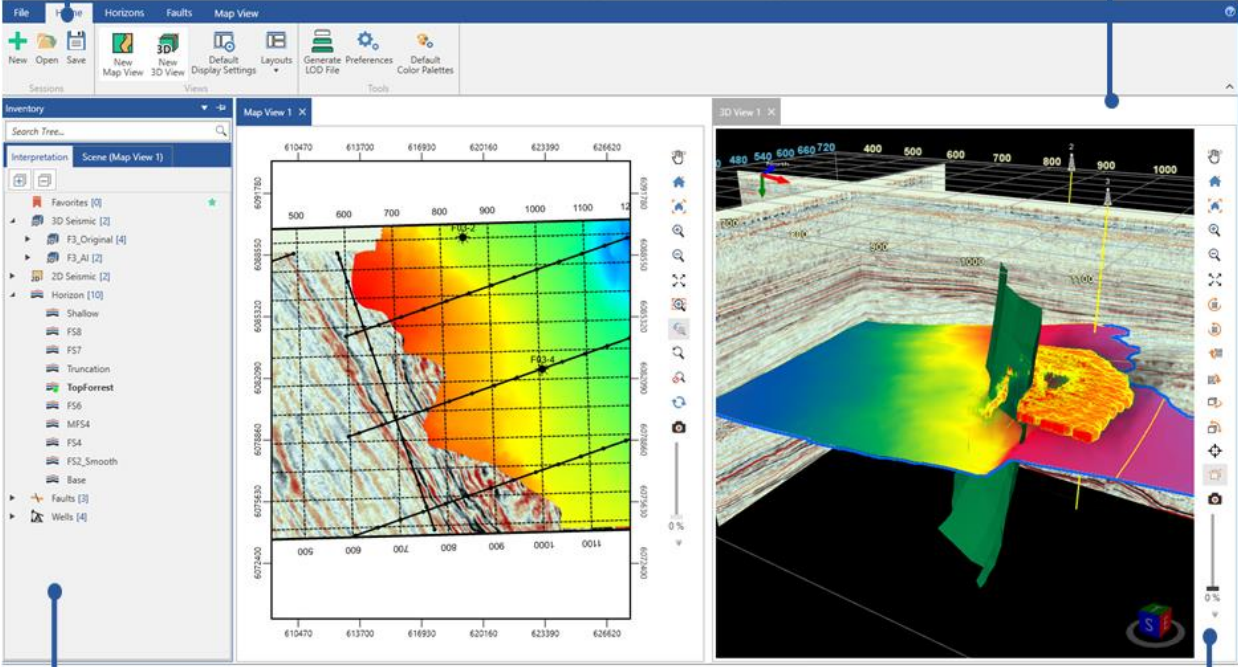
Launching 3D Module of GVERSE Geophysics

To open the 3D module of GVERSE Geophysics, from the 3D View toolbar, click the **Launch 3D View** button .

The 3D module of GVERSE Geophysics launches as a separate instance from within the main GVERSE Geophysics interface. Once launched, all data in the interpretation can be accessed from within the 3D module. You can also use the 3D View toolbar to view seismic sections and interpretation objects such as horizons and faults, in the 3D module directly from the main map.


3D Module Tabs
Provide access to File menu, Home, Horizons, Faults, Map View and 3D View tabs

Map/3D Views
Provide visualization and control of seismic objects available in the active survey



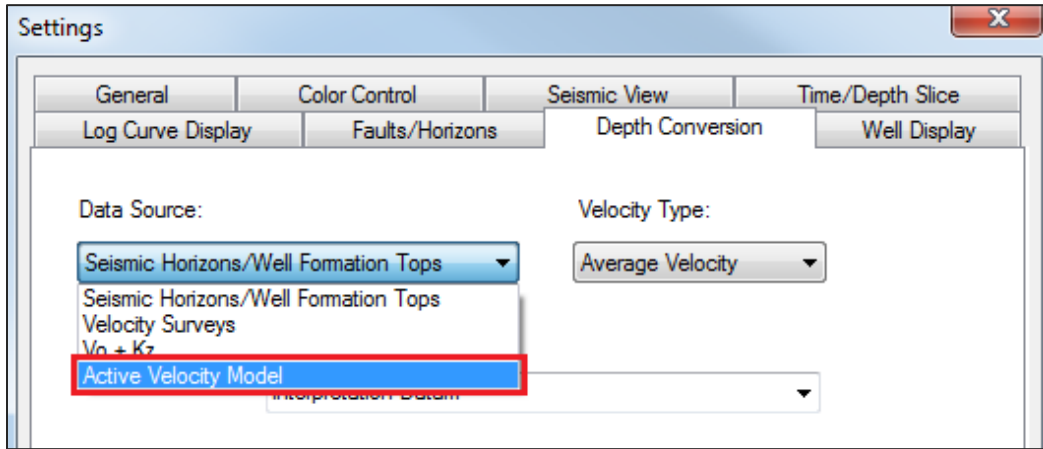
Inventory Pane
Provides access to all the seismic data, picked horizons and faults, well data and mapping grids through Interpretation and Scene trees

Map/3D View Sidebar
Allows access to all the common options that can be applied to Map/3D view

Note: To access the online help for the 3D module, either press **<F1>** or click the **Help** button  located at the top right corner.

Active Velocity Model for Depth Conversion

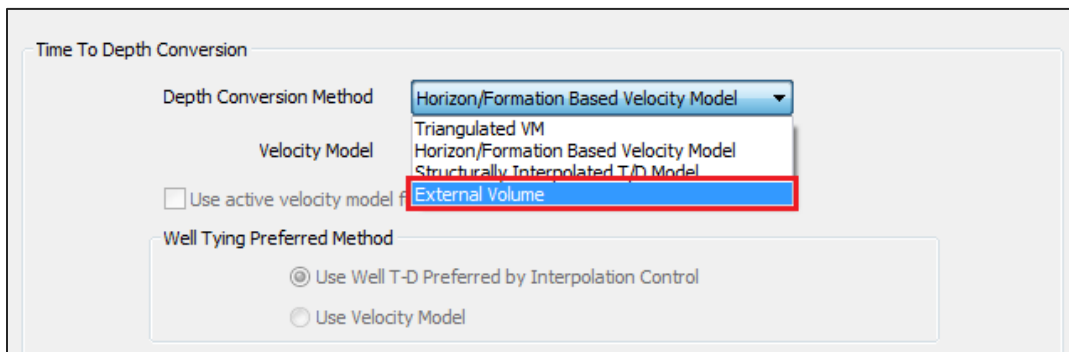
Set Active Velocity Model for depth conversion of horizon surfaces. To set this model as the data source, from the main menu, select **Interpretation >> Settings >> Depth Conversion >> Data Source >> Active Velocity Model**.



Using External Volume for Depth Conversion

Select External Volume as the Depth Conversion Method to use a velocity cube file created either in different GVERSE Geophysics interpretations or using an external software. With this method you can now use the same model across different interpretations and applications.

To use this depth conversion method, from the main menu, select **Depth Conversion >> Velocity Manager**, and then choose **External Volume** from the **Depth Conversion Method** drop-down list.

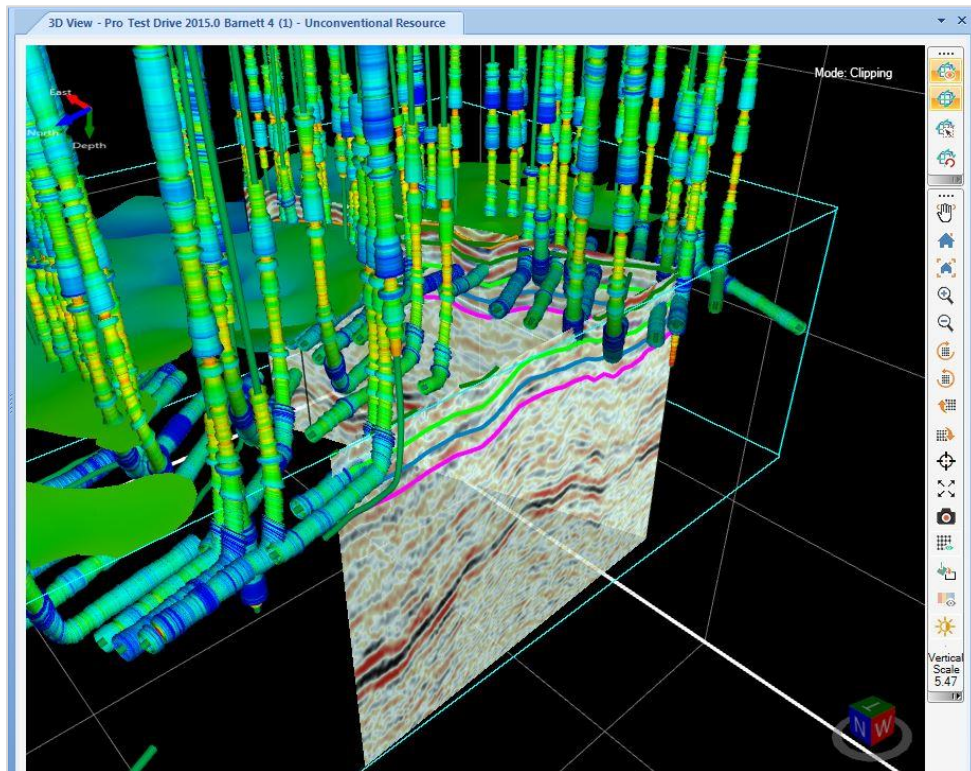


smartSECTION/Geomodeling

Clipping Options Toolbar

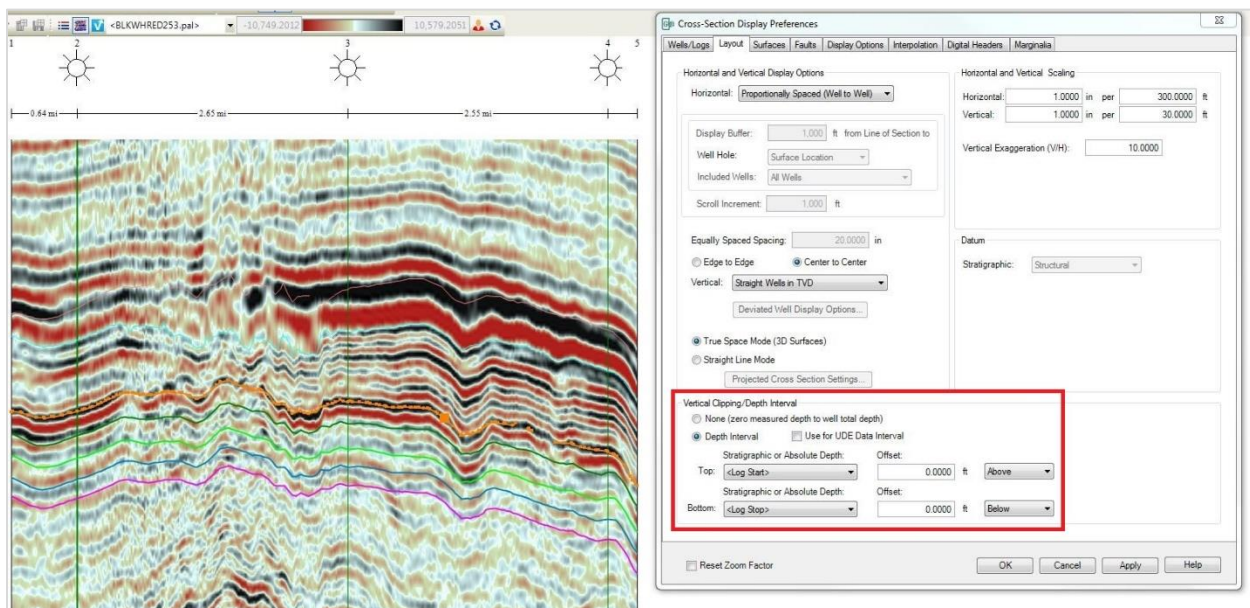
Working in the 3D View with multiple layers is made easier with the **Clipping Options** toolbar.

You can use the options to enable or disable clipping mode, select the objects to be clipped, and view the boundaries of objects as you clip them.



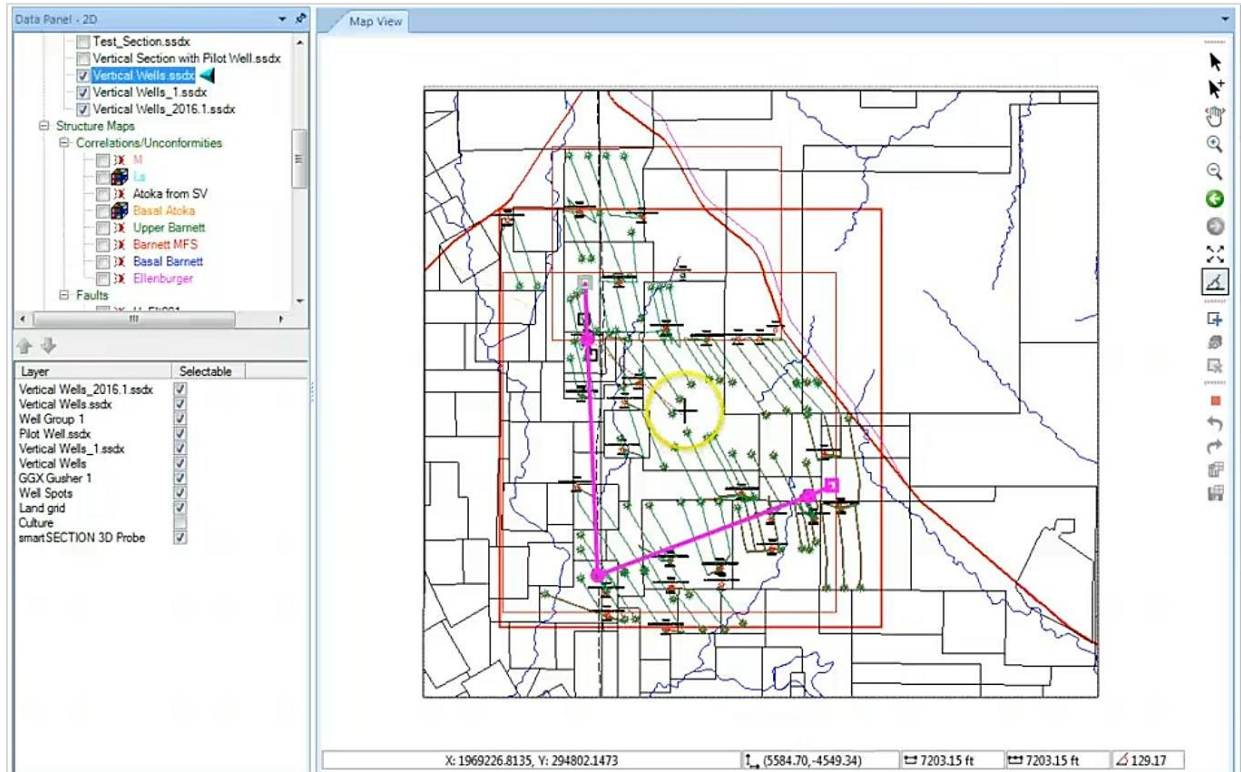
Log Start\Stop and Stratigraphic Datum Clipping Options

Clipping option is added to the Layout tab of the **Cross Section Display Preferences** dialog box. You can now choose to clip the log from the top or bottom so that it starts and ends where curve data starts and ends. To clip the logs, go to **Cross Section Display Properties** dialog box and enter the desired values in the **Vertical Clipping/Depth Interval** group box.



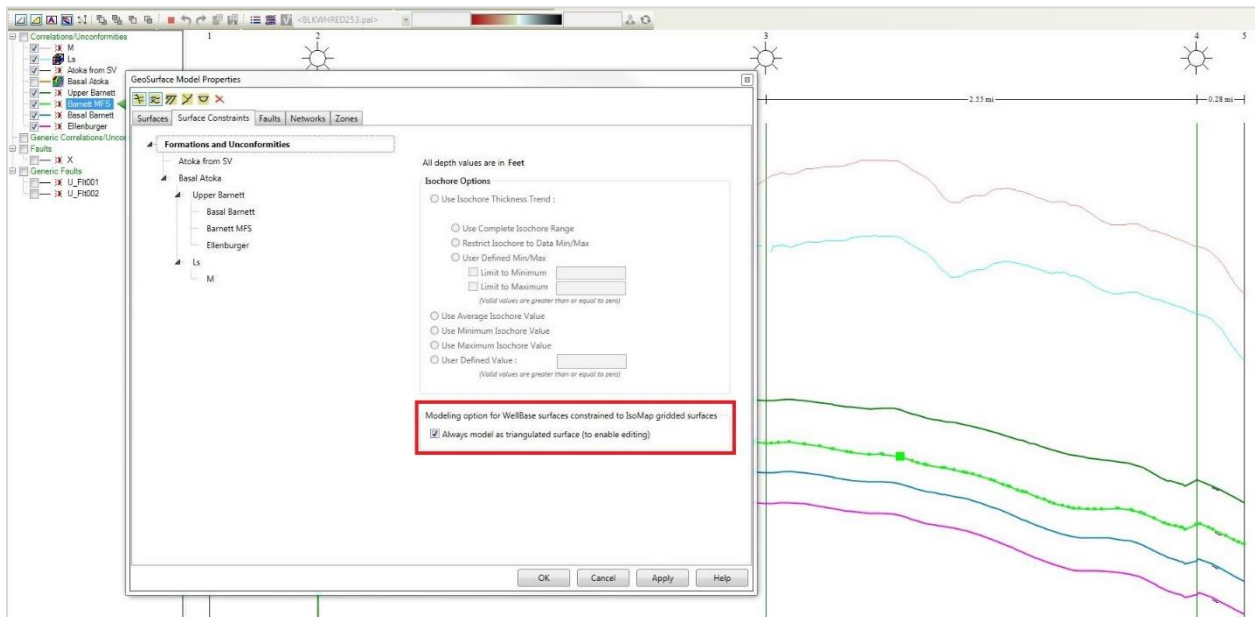
Distance and Angle Tool

The Distance and Angle tool is added to the **Map View** toolbar. You can use it to measure distance and angle between two wells in the Map View.



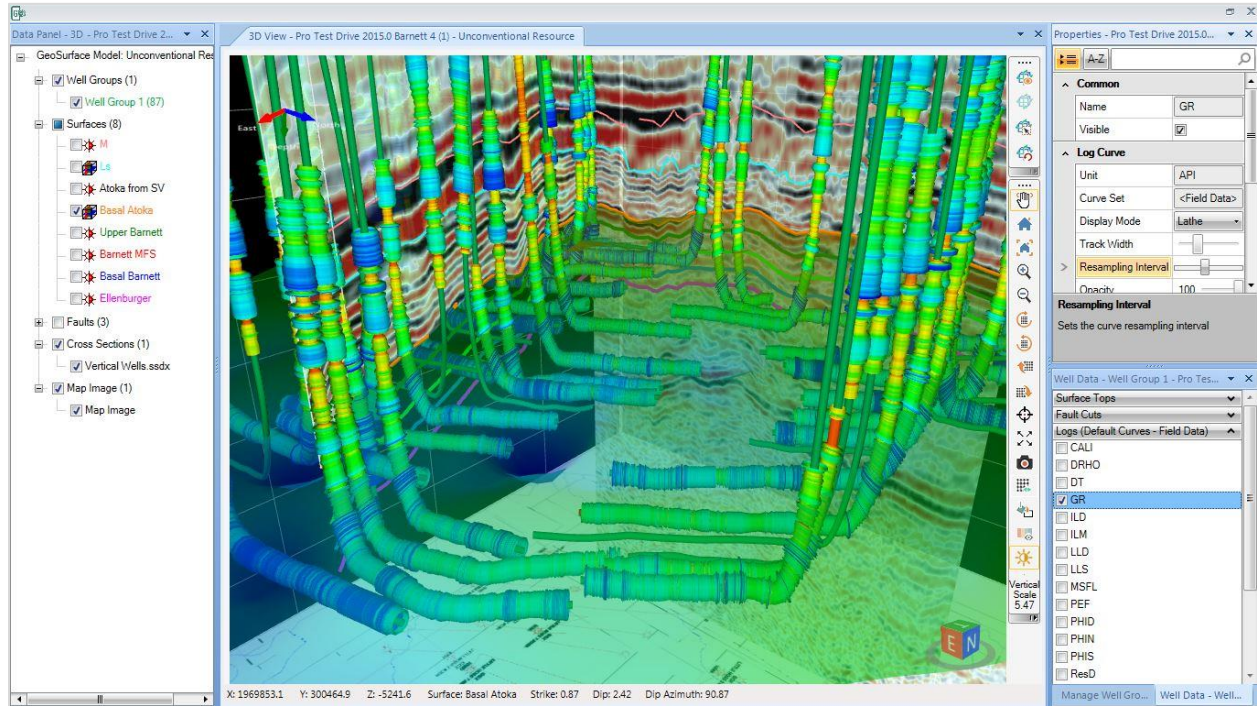
Modeling Option for Surfaces

An option for modeling the WellBase point surfaces as Triangulated Surfaces is added to the **Surface Constraints** tab of the **GeoSurface Model Properties** dialog box. When this option is selected, the interwell points of the well-base point constrained surface are visible in the cross section view.



Dockable 2D & 3D Data Panels

Data Panels 2D and 3D are dockable and can be placed anywhere on your workspace. Grab the top bar of the data panel and drag it to the desired location for your ease of use.



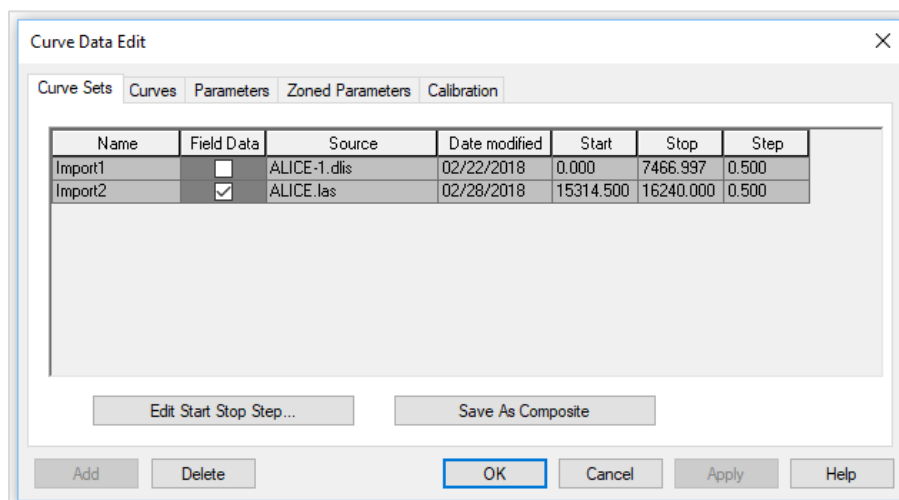
Posting Properties

A new field Confidence is added to the **Posting Properties** dialog box. You can use it to show confidence data on the cross sections.

PRIZM

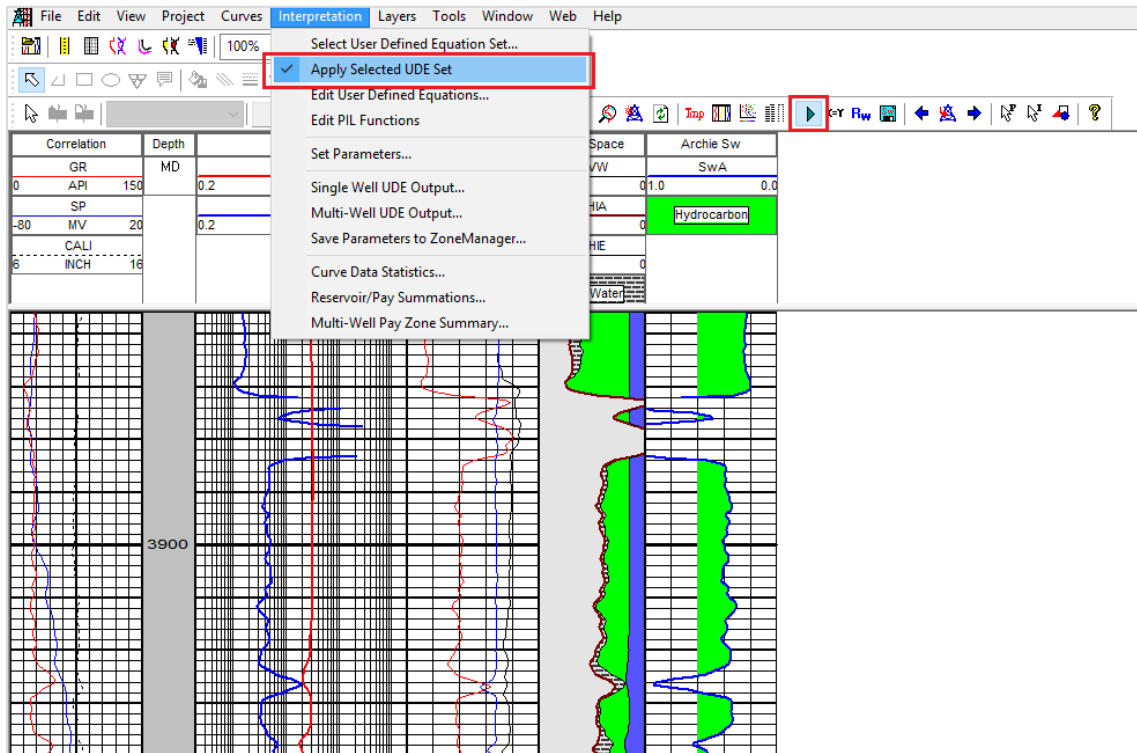
Curve Data Date Modified

A field for Date Modified is added to the **Curve Data Edit** dialog box which displays the date when the curve set was imported for the first time. The date is updated if further modifications are made to the same curve data. You can also use the Date Modified as a filter for the log curve data in QueryBuilder.



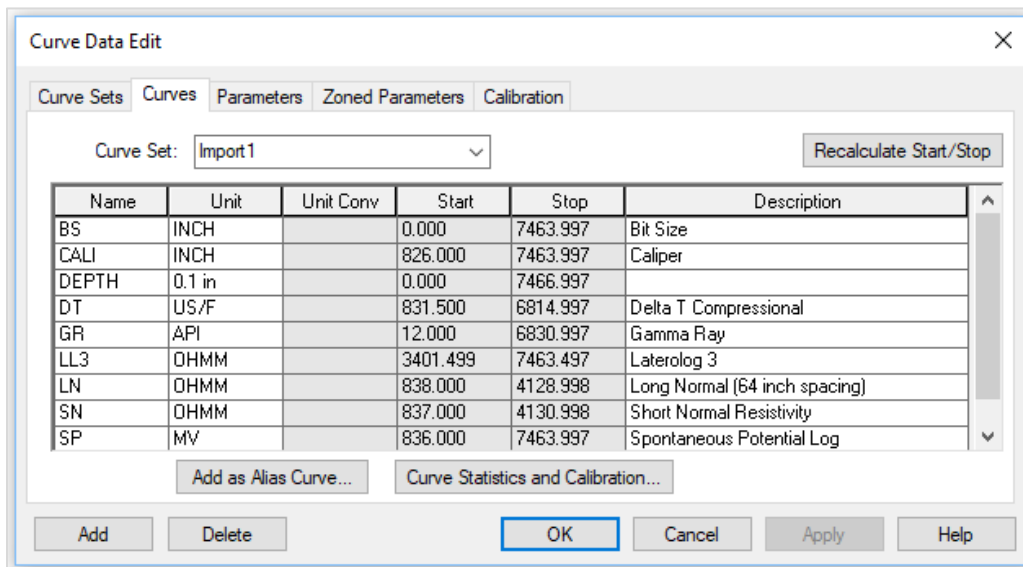
Toggle Button for User Defined Equation Model

A toggle option is added to the Standard toolbar that enables you to quickly view the log curve with or without applying a **User Defined Equation** model.



Curve Start-Stop Depths

Two new fields for curve Start and Stop depths are added in the **Curve Data Edit** dialog box that display the values where individual curves start and stop. This information enables you to see the interval over which the curve extends. The Start Stop depths can also be used as filters in QueryBuilder.



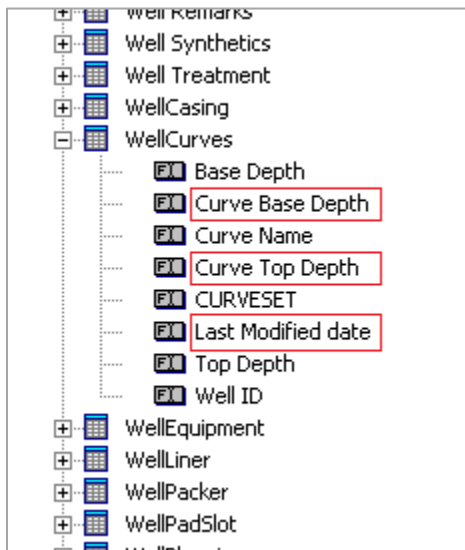
QueryBuilder

Filter Curve Data using Curve Top Depth, Curve Base Depth and Last Modified Date

Filter curve data for all wells using three new fields, Curve Top Depth, Curve Base Depth and Last Modified date in the WellCurves table.

- Curve Top and Base Depth fields enable you to see the interval over which the curve extends.
- The Last Modified date field displays the date when the curve set was imported for the first time. The date is updated if further modifications are made to the same curve data.

The Curve Top Depth, Curve Base Depth and Last Modified date fields in QueryBuilder can also be used in PRIZM where they are referred to as Curve Start depth, Curve Stop depth and Date Modified respectively.



WellBase

User Defined Core Fields

Add data for up to 200 user defined fields in the Core table.

Core Types in WellBase

Plug and Cuttings added as new and default options for Core Type along with the existing Conventional and Sidewall core types.

Fixed Issues

The following customer reported issues were fixed in this release.

Geophysics

ID	Description
153824	The 2D trace model with datum elevation in LogM generates correctly, and hence, the out of memory error message no longer generates.
153439	The active version of a 3D survey is set properly. Previously, at initiation, the attribute library did not honor the active version of the 3D survey while generating the attribute surface.
12930	The coordinate information and XY values of the trace model generated in LogM export to the synthetic SEG-Y file successfully.

smartSECTION/Geomodeling

ID	Description
15292	Provided an angle and cumulative distance drawing tool in the Map View of smartSECTION/Geomodeling for measuring the angle and distance between two wells.
157144	Added support for color palettes in network projects to actively listen to new palettes being added by multiple users accessing the same project. Previously, applying custom color palettes on log curves in an interpretation caused the interpretation to be unusable for other users in a multiuser environment.

PRIZM

ID	Description
144026	Made the decimal precision in PRIZM Xplot adaptive. Previously, unnecessary zeros were shown on the Xplot if values in decimals were displayed on the Xplot.

GeoAtlas

ID	Description
151171	The location measurements of a layer no longer change after applying a transformation.
138443	In a customer specific scenario, transformation is applied correctly, hence, the datum shifts accordingly.

SeisBase

ID	Description
139579	The Spreadsheet Import gxdb.xla file correctly populates in the Seismic Event table.

DefCon2

ID	Description
121239	The bottom hole location (latitude and longitude values) from DA records were mapped to the Proposed Survey tab instead of the Survey tab for IHS297 import. This issue is fixed by updating the IHS297 Well Import for DA records.
149455	BH offsets were imported to the Proposed Survey tab without the directional indicator from the R1 record. Mapping in IHS297 Well Import is updated to fix this issue.

QueryBuilder

ID	Description
145129	QueryBuilder no longer crashes after adding user defined core fields.

WellBase

ID	Description
120598	Unable to calculate wellbore for manually entered BH XY values in XY projects. This issue is fixed by validating the latitude and longitude values for latitude/longitude projects only.
124285	Correct county name displays in the scout ticket view and the list view for the same well.

Known Issues

This section lists the known issues in this release.

WellBase

ID	Description
157350	The Well List in the WellBase Bar is not updated on cloning any well in the Well List view.
157163	Spread sheet import generates a server busy error followed by a crash for a blank project.
157162	The Find option does not honor the replaced well ID.
155012	Pivot report is not generated on Excel 2016 64-bit.
151826	Additional columns are added to the Core tab while copying/pasting data.
148030	Survey labels in the wellbore viewer are not correctly displayed for a survey starting from 0.
139619	The proposed survey table message displays the wrong description on attempting to add a record without providing a survey ID.

GeoAtlas

ID	Description
152869	The PRJ files are not updated to reflect the new coordinate system when layers are transformed to a new map projection.

QueryBuilder

ID	Description
142881	Buttons are distorted on expanding or stretching the Filter Criteria dialog.

DefCon2

ID	Description
157186	Legal description data do not show under the survey legal location field after using the regular import option.

Discovery on OpenWorks

ID	Description
156001	While cloning a well in DOW, the data not found error displays.
156318	The Default.glp file is missing while transferring data from OW to GXDB using WellXchangePlus.

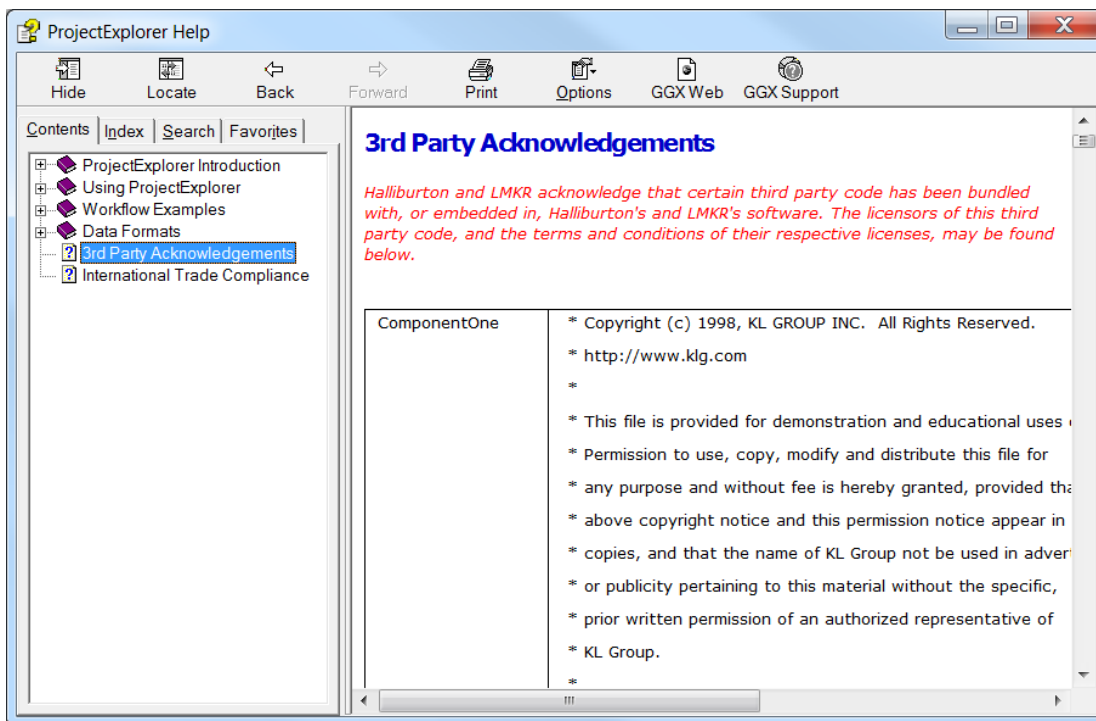
Third Party Applications

LMKR uses various third-party applications in the development of its software.

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 GeoGraphix Help files:

1. Open your help files.
2. In the list of topics on the left, locate the **Third Party Acknowledgements** topic and click to open the topic.

A list of third party applications and their details display.



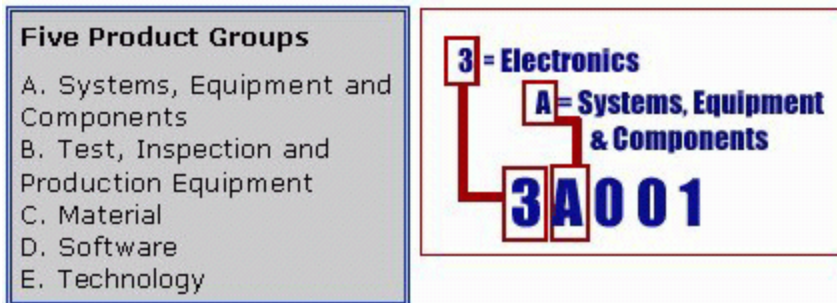
International Trademark Compliance

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 represent LMKR's 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

CCATS (Commodity Classification Automated Tracking System) - the tracking number assigned by the U.S. Bureau of Industry and Security (BIS) to products formally reviewed and classified by the government. The CCATS provides information concerning export/re-export authorizations, available exceptions, and conditions.

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](#).

The ECCN number, License Type, and the CCATS Numbers for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	ECCN Number	License	CCATS Number	Last Updated On
GeoGraphix	--	-	-	-
LMKR License Manager	5D002C.1	ENC	G055172	6/19/2007

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 and South America	Europe, Middle East & Africa
<p>Monday – Friday 8am-6pm CST Toll Free (US/Canada) : +1 855 GGX LMKR (449 5657) Colombia : +57 1381 4908 United States : +1 303 295 0020 Canada : +1 587 233 4004 *Excluding bank holidays</p>	<p>UK Monday - Friday 8am - 5pm +44 20 3608 8042 *Excluding bank holidays</p> <p>UAE Sunday - Thursday (Dubai GMT+4) 8am - 5pm +971 4 3727 999</p> <p>Egypt Sunday - Thursday +0800-000-0635 *Excluding bank holidays</p>
Asia Pacific & Australian Continent	Southwest Asian countries
<p>Malaysia Monday - Friday (Kuala Lumpur GMT+8) 9am - 6pm +60 32 300 8777 *Excluding bank holidays</p>	<p>Pakistan Monday - Friday (Islamabad GMT+5) 9am - 6pm +92 51 209 7400 *Excluding bank holidays</p>

Helpful Links

Name	Website Address
LMKR home page	http://www.lmkr.com
LMKR Support Portal	http://support.lmkr.com