

# Introducing IHS Kingdom 2015





## K2015 – Enhancing our Strengths

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**New Project Explorer**

**Dynamic Depth Conversion  
Dynamic Map Update  
Enhanced Geosteering  
VuPAK® Geology**

**Trace Calculator Enhancements  
AVOPAK Enhancements  
VelPAK Enhancements  
GeoSyn  
New Fault Attributes  
SeismicDirect**

**Blue Marble Upgrade  
.msi Installers  
Multi-Project Upgrade**



## Version 2015

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**Includes a number of innovative features providing end-users with more control, enhanced accuracy, and time savings**

- [Project Explorer](#)
- [Dynamic Depth Conversion Enhancements](#)
- [Dynamic Map Update](#)
- [Enhanced Geosteering](#)
- [GeoSyn](#)
- [New Fault Attributes](#)
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- [VelPAK Enhancements](#)
- [Seismic Inversion](#)
- [VuPAK® Geology](#)
- [Blue Marble Upgrade](#)
- [Infrastructure Enhancements](#)
- [Additional Enhancements](#)



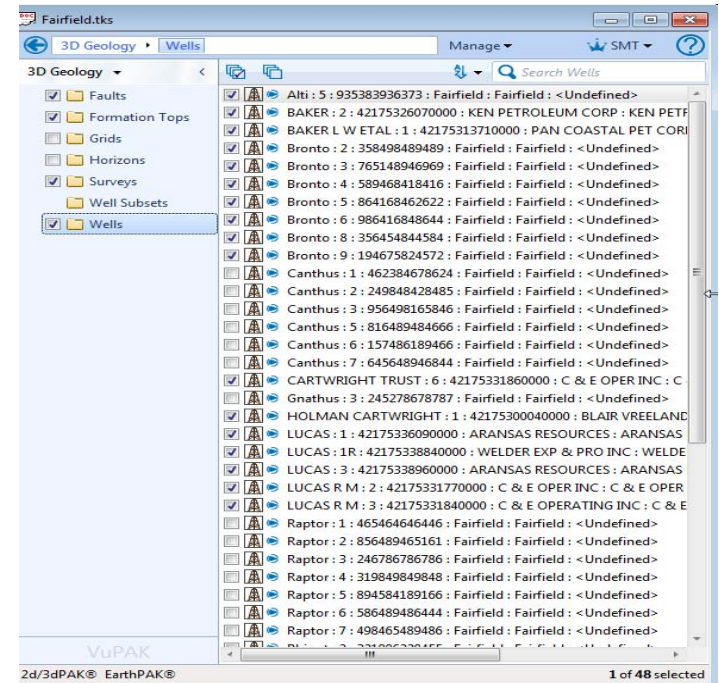
# Project Explorer - Manage Large Projects More Efficiently

## New and Improved Project Tree

- Organize project data based on asset team workflows and business needs
- Find and access project items faster
- Improved performance on large project datasets

## Easy to Use

- Organize data in customizable folder hierarchy (like Windows Explorer)
- Search and filter
- Create subsets, drag and drop, share data between authors

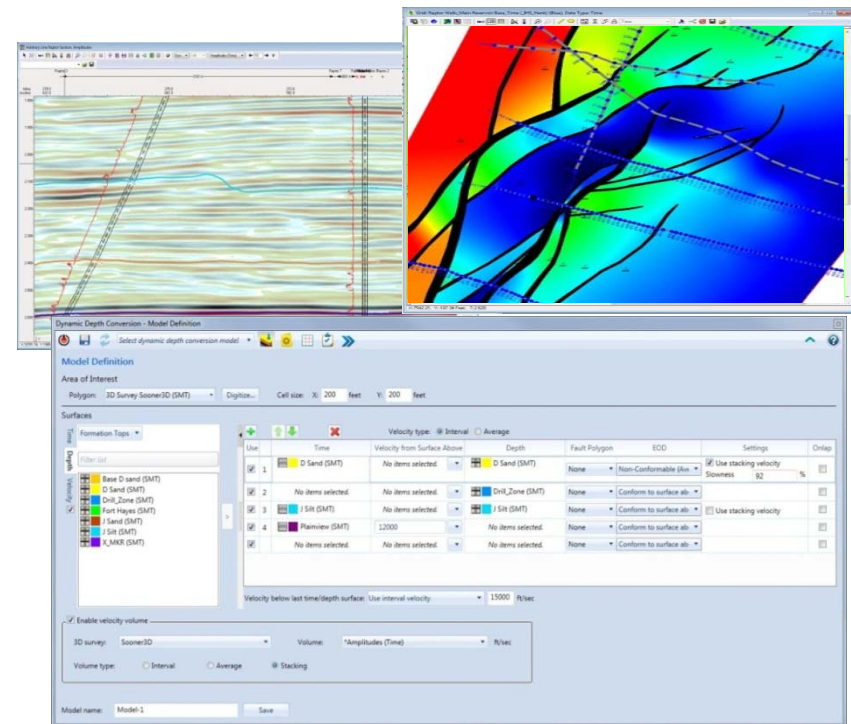




# Dynamic Depth Conversion – Stacking Velocities!

## Expanding to support more traditional Velocity Modeling workflows

- Load existing interval, average and stacking velocity data
- Use and incorporate stacking velocities to more accurately image in areas of sparse well control
- Use stacking velocities as a trend to grid sparse interval velocities
- Use Dix's equation to convert stacking velocities to interval velocities and QC against existing wells.





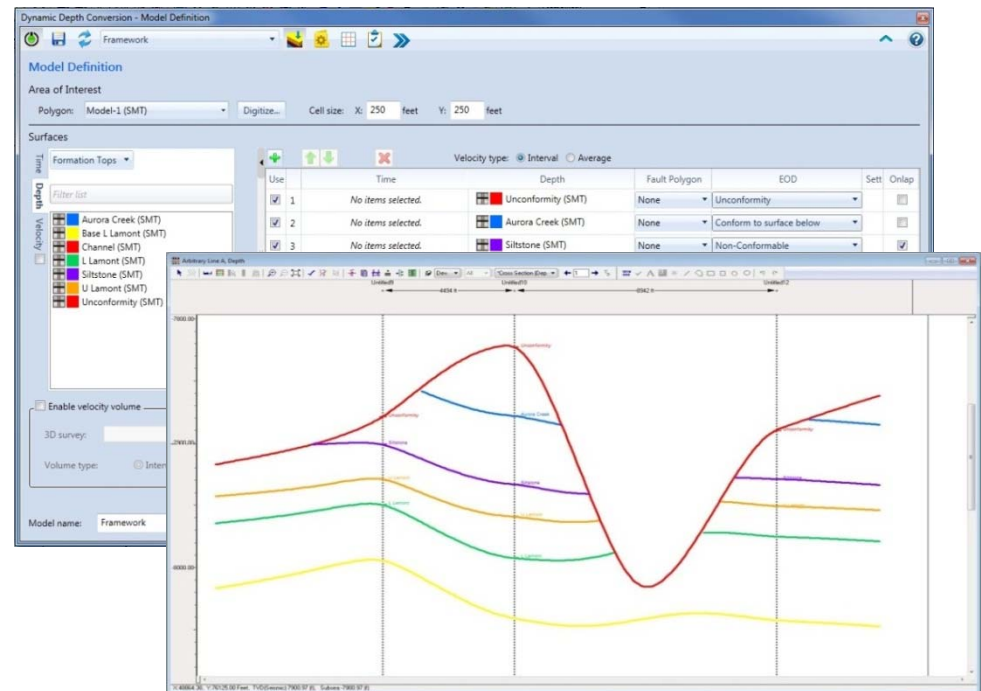
# Dynamic Map Update

## Streamline Mapping Workflows

- Save time by automating repetitive tasks to create and update maps
- As Well Tops are interpreted corresponding maps update providing immediate feedback

## More Accurate Interpretations

- Quickly define stratigraphic framework and geologic rules
- Easily incorporate geophysical and geological interpretations into a single consistent subsurface model
- Integrated into the interpretation environment to provide rapid updates
- Helps eliminate the need to perform multiple grid operations
- Automatically builds all of the Structural and Thickness maps

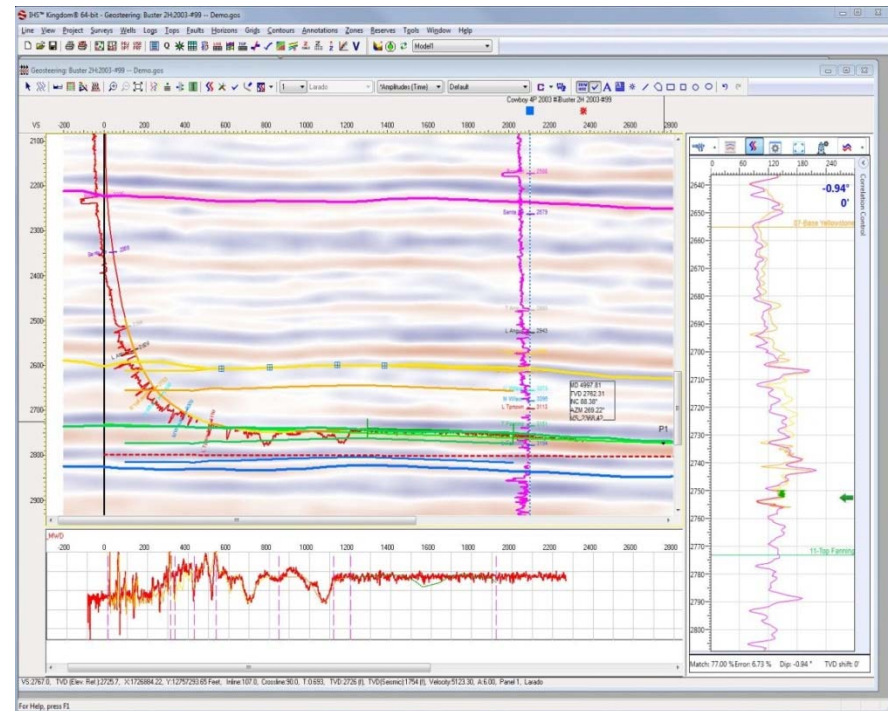




# Enhanced Geosteering

## Accurately and efficiently steer wells along a target of interest

- Fully integrated with Kingdom's interpretation environment reducing the need to duplicate data while providing a consistent view across the entire asset team
- Significant improvements to Correlation functions which enable accurate prediction of formation bedding orientations
- Efficiently incorporate time seismic data via Dynamic Depth Conversion with easy model updates as the geosteerer interprets
- Predictive structural model via Dynamic Map Update aids in understanding landing depths
- Create cases with the Planned, Drilling and Reference wells along vertical sections or along wellbore.
- Update the drilling well quickly as new data arrives – drag and drop





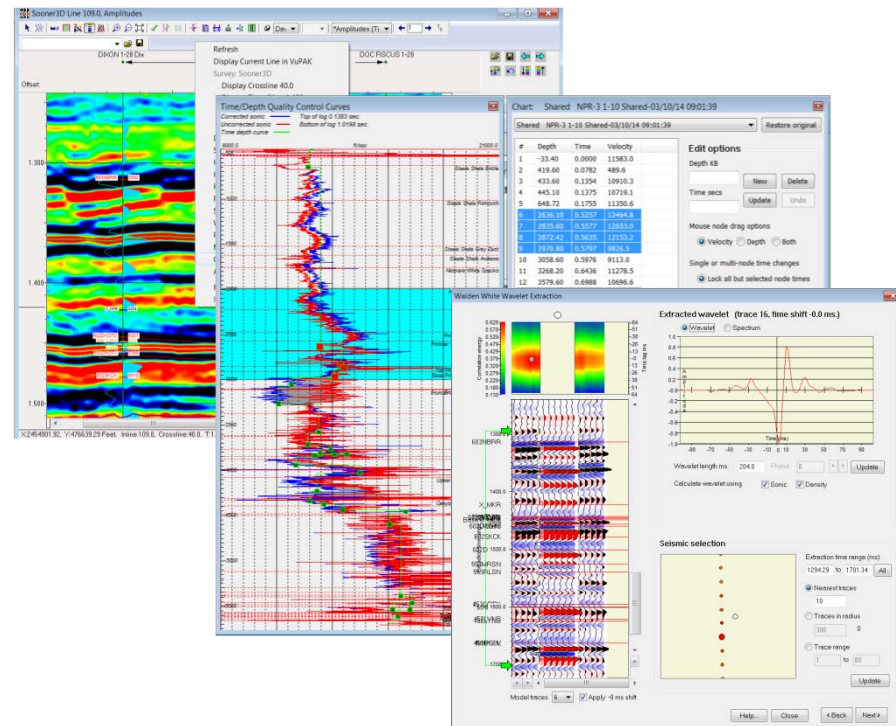
# GeoSyn

## GeoSyn 2D

- Launch GeoSyn 2D directly from Kingdom
- Use well list from arbitrary line (or any VSD) to create model.
- Kingdom Data Browser allows users to bring in additional wells into existing Models

## GeoSyn 1D & 2D

- Weiner Levinson wavelet extraction
- Walden-White wavelet extraction
- Multi author visible tops list honored
- Powerful TD chart editor and QA tool

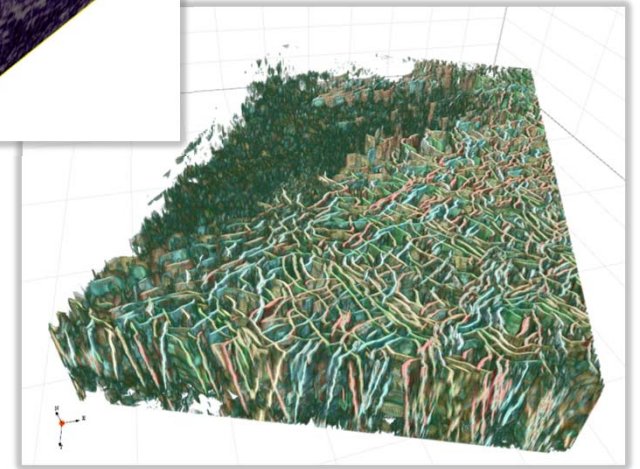
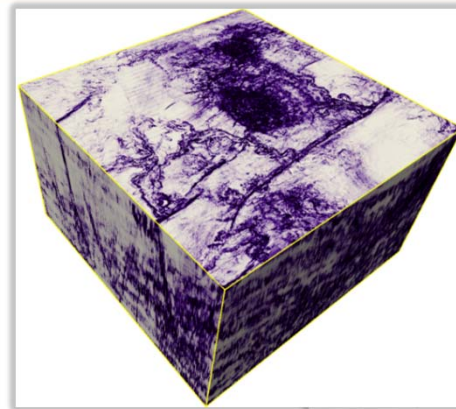




# Fault Attributes

## Interpret faults with increased level of detail

- New patent-pending algorithms allow creation of four seismic attributes tuned to identifying discontinuities in data:
  - Symmetry
  - I3D Energy
  - I3D Dip
  - I3D Azimuth
- Based on Illuminator(TM) technology
- Can be calculated using GPU for better performance

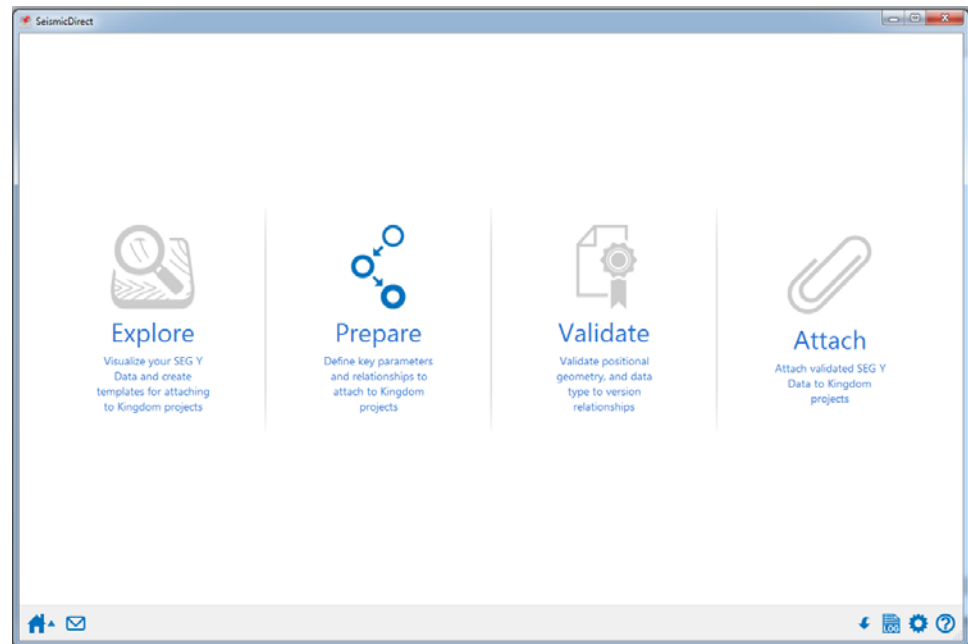




# SeismicDirect

## Attach 2D SEG Y Format Files Directly to Project

- Coordinate conversion and Datum correction on the fly
- Attach to multiple projects – Prepare once, use many times
- Allow extension of 2D seismic to both sides of attached lines
- Keep existing relationship of seismic line to multiple data types
- Allow different geometry (Versions) of the same line
- Full history logging
- Reduce months of loading effort down to hours for large multi-data type surveys
- Easy data management

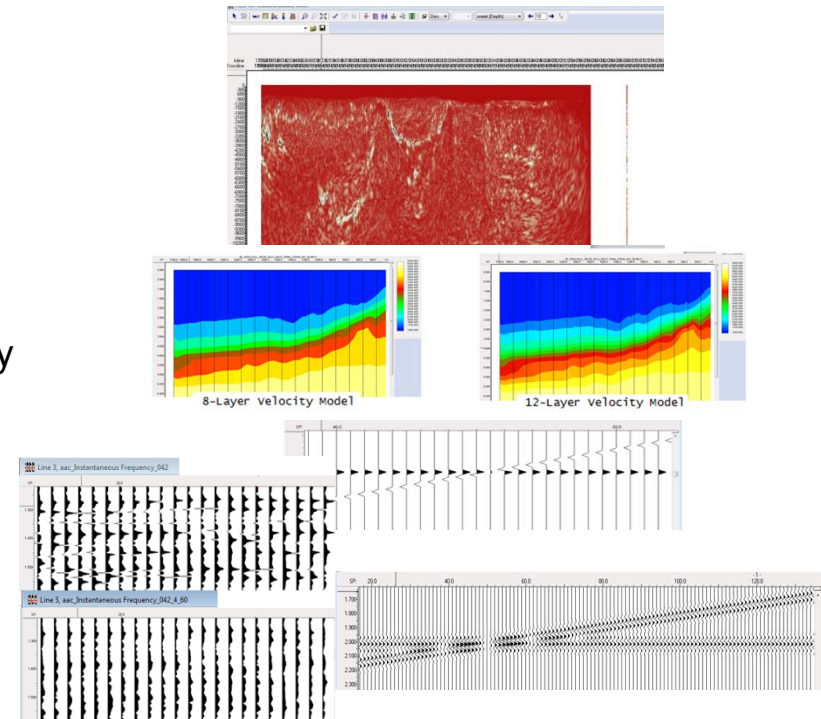




# Trace Calculator

## New Calculations Added

- Sweetness
  - Handles Frequency spikes
- Velocity Blocking
  - Simplify Velocity model to a user defined number of layers
  - Improves AVOPAK calculation time significantly
- GenSpike
  - Simple model trace generation (start time, dip rate, amplitude)
- Clip by interpolation
  - Detects spikes
  - Interpolates between value above and below

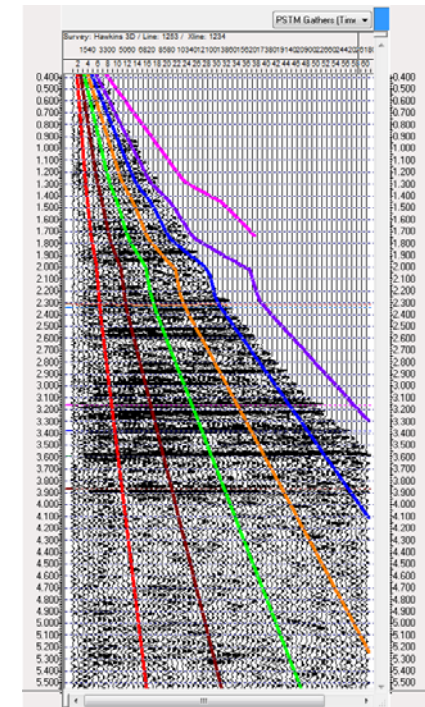
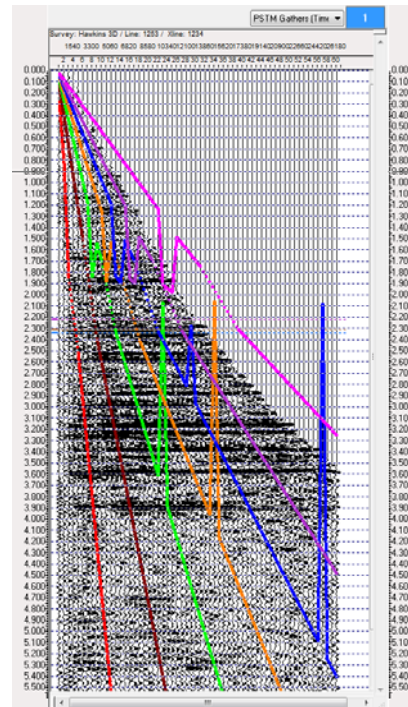




# AVOPAK

## New Algorithm for Angle of Incidence Calculation

- Ray path calculation is single ray - top down approach v.s. start at each velocity layer and go up
- Smoother Angle guides – no inversions
- Performance improved for display and attribute calculations

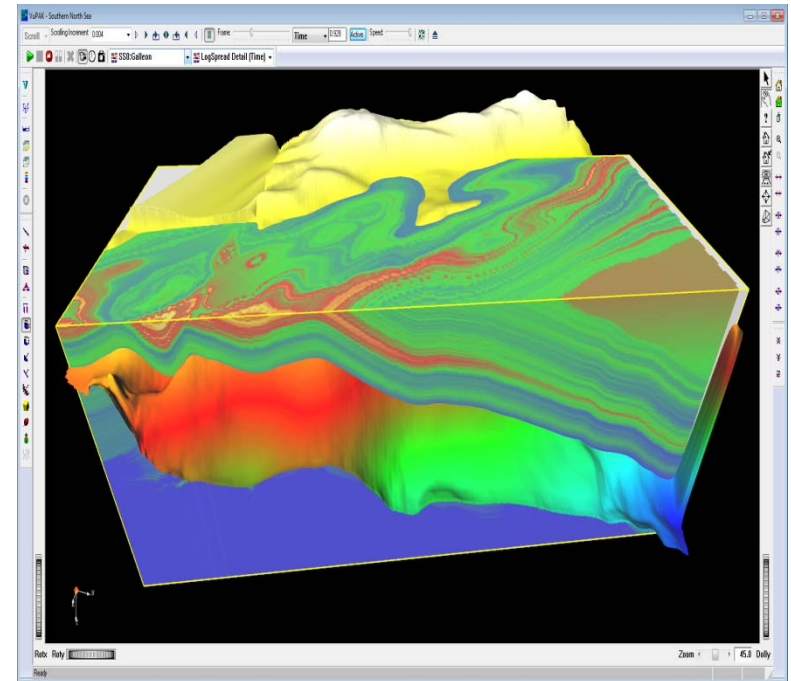




# VelPAK HiDef Module

## VelPAK HiDef Adds Detail

- Highly detailed velocity volumes from a background velocity model, well velocity logs and geological interpretation
- Propagates well log velocities in a volume consistent with geological and interval velocity constraints
- Ties the volume to well tops
- Generates a detailed instantaneous & average velocity volumes

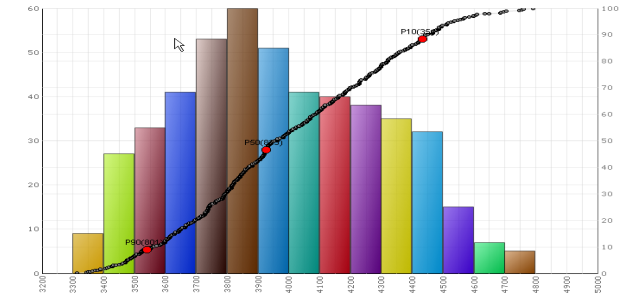
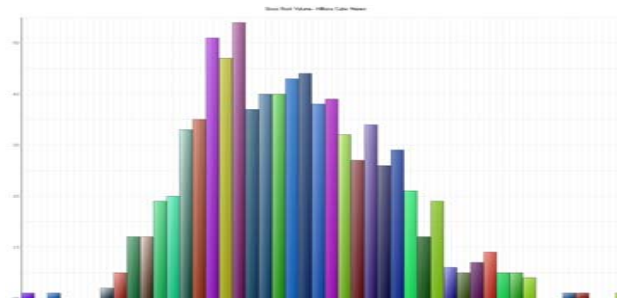
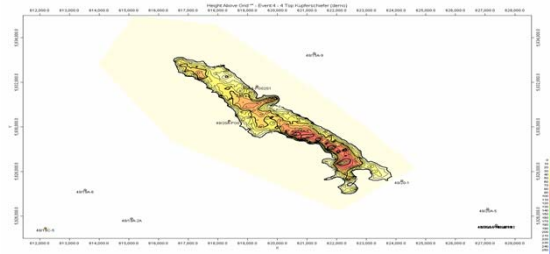




# VelPAK Asset Evaluation & Risk Reduction

## Multiple Realizations

- Typically generate 500 models to measure uncertainty
- Volumetrics – Gross Rock volume
- P10, P50, P90 maps & volumes
- Probability of closure and Standard Deviation maps
- Multiple CPU support



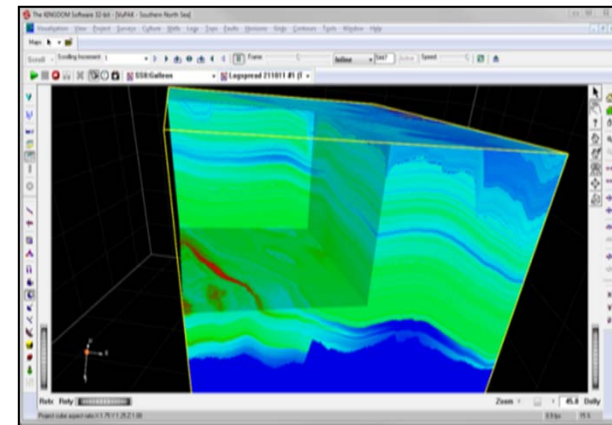
Histograms of GRV – 500 models



# Seismic Inversion – Formerly Colored Inversion

## Addition of Hi-Frequency Inversion to Colored Inversion

- SA Inversion functionality is now packaged with Colored Inversion
- Generates Absolute Acoustic Impedance
  - Equivalent to generating a well log that is Density\*Sonic log at every trace location
  - Improved interpretation confidence
  - Reservoir characterization
  - Ideal data for 4d analysis
- Simulated Annealing algorithm is very stable & proven, cannot produce values outside model ranges
- Existing Colored Inversion users get free upgrade, pay only increased maintenance

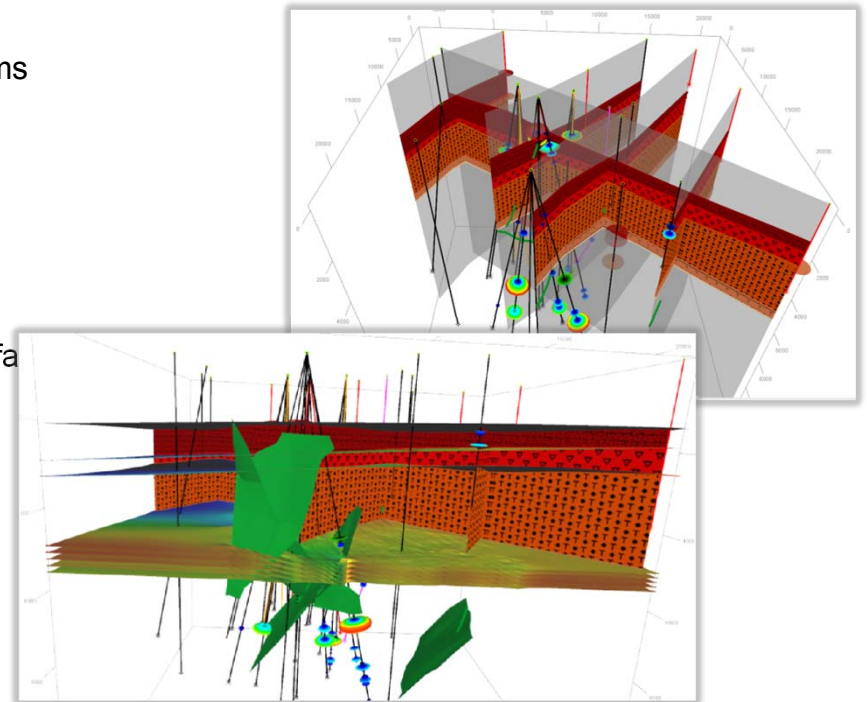




# VuPAK 3D Geology

## Delivering 3D Geologic Interpretation capabilities

- Create, display and manipulate cross sections and fence diagrams
- Geological models can be created with the help of Unit fill with patterns and transparency based on
  - Grids
  - Horizons
  - Faults
- Control Point editing to provide inter-well surface definition
- Integrated with the Dynamic Map Update capabilities for fast surface update
- Dynamic display update whenever cross sections are moving
- Shading for aliased logs is supported
- Fault cut throw can now be displayed in VuPAK
- Annotations for grids, horizons and faults are now supported
- Multiple usability enhancements

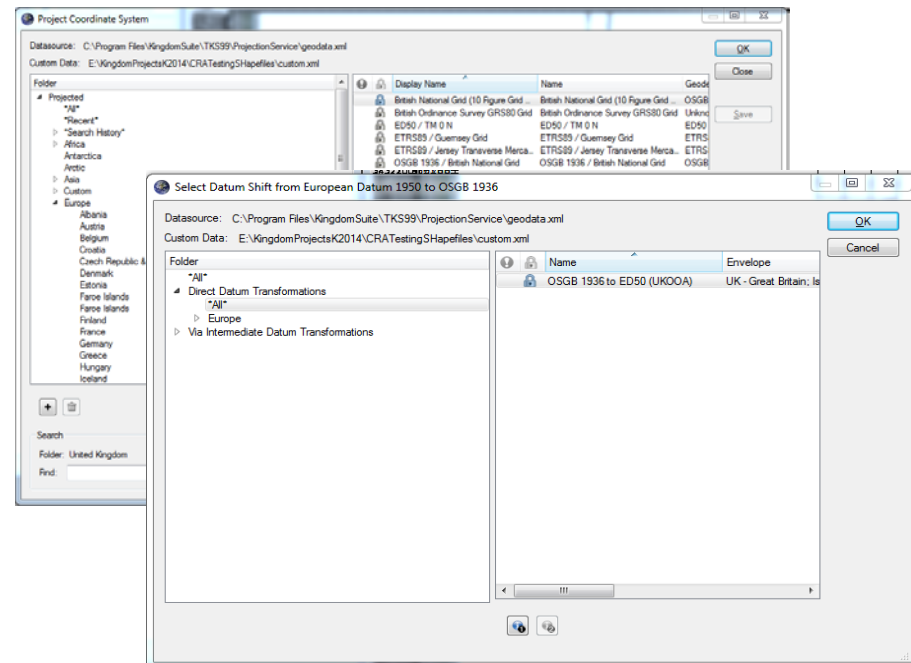




# Blue Marble Library Upgrade

## Bringing EPSG compliance to Kingdom

- Upgraded to latest Blue Marble Geocalc 6.6
- New standardized user interfaces
- Leverages the full EPSG library of coordinate systems to ensure consistency and accuracy
- Fully integrated transformations
- Simplified data import workflows
- Stored datum shifts for easy reuse





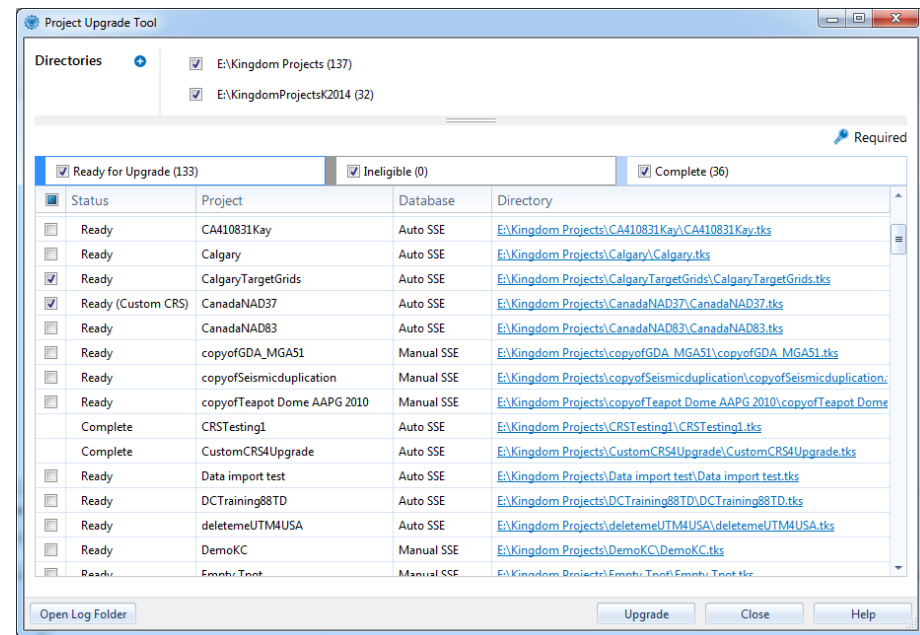
# Infrastructure Enhancements

## Multi-Project Upgrade

- Select one or more directories of projects to upgrade
- Choose individual projects within the list for upgrades
- Notification of upgrade readiness
- Full logging during project upgrade

## New .msi Installation

- Full .msi installations for Kingdom and Kingdom Data Management
- Provides the ability to script silent distributions of Kingdom
- New updating technologies
- Ability to uninstall updates without a full uninstall and reinstall of the entire product

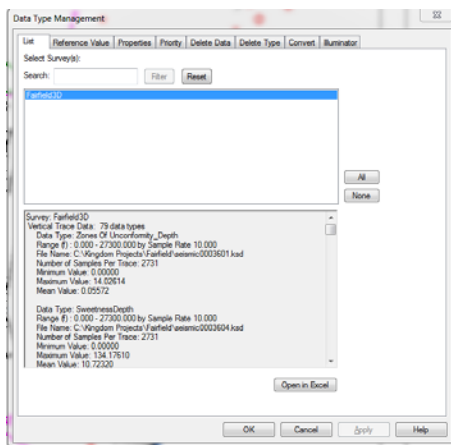




# Additional Enhancements

## Usability

- Horizon Attributes extraction dialog is now modeless, so that Kingdom is not locked during extraction process
- List of all seismic data types and the corresponding file locations can now be displayed in Excel spreadsheet



The screenshot shows an Excel spreadsheet with the following columns: Data Format, Data Type Name, Data Range, Data Units, Sample Rate, Number of Samples per Trace, Minimum Value, Maximum Value, Mean Value, and File Name. The data is organized into rows, with the first row being a header. The rows list various seismic data types and their corresponding file locations. The data is as follows:

Data Format	Data Type Name	Data Range	Data Units	Sample Rate	Number of Samples per Trace	Minimum Value	Maximum Value	Mean Value	File Name
Vertical Trace Data	Zones Of Unconformity_Depth	0 to 27300	(F)	10	2731	0	14.02614	0.05572	C:\Kingdom Projects\Fairfield\seismic\0003601.kxd
Vertical Trace Data	SweetnessDepth	0 to 27300	(F)	10	2731	0	134.1761	10.712	C:\Kingdom Projects\Fairfield\seismic\0003604.kxd
Vertical Trace Data	Instantaneous Dip_Depth	0 to 27300	(F)	10	2731	0	112.14291	10.09882	C:\Kingdom Projects\Fairfield\seismic\0004400.kxd
Vertical Trace Data	Dip Azimuth_Depth	0 to 27300	(F)	10	2731	-180	180	95.89058	C:\Kingdom Projects\Fairfield\seismic\0004401.kxd
Vertical Trace Data	Similarity_Depth	0 to 27300	(F)	10	2731	0	1.42489	1.18255	C:\Kingdom Projects\Fairfield\seismic\0004402.kxd
Vertical Trace Data	Instantaneous Dip	0 to 7.8	(N)	0.004	1951	0	111.64775	11.82941	C:\Kingdom Projects\Fairfield\seismic\0004403.kxd
Vertical Trace Data	Dip Azimuth	0 to 7.8	(N)	0.004	1951	-180	180	95.87407	C:\Kingdom Projects\Fairfield\seismic\0004404.kxd
Vertical Trace Data	Similarity Variance	0 to 7.8	(N)	0.004	1951	-1.16511	1.09448	0.06811	H:\DATA\Fairfield\Seismic\seismic\0004405.kxd
Vertical Trace Data	Smoothed Similarity	0 to 7.8	(N)	0.004	1951	0	1.41344	1.22486	H:\DATA\Fairfield\Seismic\seismic\0004406.kxd
Vertical Trace Data	Dip Of Maximum Similarity	0 to 7.8	(N)	0.004	1951	0	34.54387	1.46127	H:\DATA\Fairfield\Seismic\seismic\0004407.kxd
Vertical Trace Data	Smoothed Dip Of Max Similarity	0 to 7.8	(N)	0.004	1951	0	34.90012	3.11132	H:\DATA\Fairfield\Seismic\seismic\0004408.kxd
Vertical Trace Data	Similarity	0 to 7.8	(N)	0.004	1951	0	1.4888	1.19356	H:\DATA\Fairfield\Seismic\seismic\0004409.kxd
Vertical Trace Data	Curvature: Most Negative_Depth	0 to 27300	(F)	10	2731	-0.06532	0.04258	0.00986	C:\Kingdom Projects\Fairfield\seismic\0004410.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Energy_130_Energy	0 to 7.8	(N)	0.004	1951	0	1	0	C:\Kingdom Projects\Fairfield\seismic\seismic\0004411.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Energy_Inc_0_10	0 to 7.8	(N)	0.004	1951	0.00036	1	0.07497	C:\Kingdom Projects\Fairfield\seismic\seismic\0004412.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Azimuth_Inc_0_10	0 to 7.8	(N)	0.004	1951	0	350	180.83007	C:\Kingdom Projects\Fairfield\seismic\seismic\0004413.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Dip_Inc_0_10	0 to 7.8	(N)	0.004	1951	5.67128	999	76.09955	C:\Kingdom Projects\Fairfield\seismic\seismic\0004414.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Energy	0 to 7.8	(N)	0.004	1951	0	1	0.15124	H:\TKS_Projects\Fairfield_courses\seismic\seismic\0004415.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Azimuth	0 to 7.8	(N)	0.004	1951	2.006-05	350.00003	155.47	H:\TKS_Projects\Fairfield_courses\seismic\seismic\0004416.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Dip	0 to 7.8	(N)	0.004	1951	0.02	1	0.1781	H:\TKS_Projects\Fairfield_courses\seismic\seismic\0004417.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Energy_dip0.112	0 to 7.8	(N)	0.004	1951	0	1	0.18799	C:\Kingdom Projects\Fairfield\seismic\seismic\0004418.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Azimuth_dip0.112	0 to 7.8	(N)	0.004	1951	2.006-05	350.00003	143.12448	C:\Kingdom Projects\Fairfield\seismic\seismic\0004419.kxd
Vertical Trace Data	Amplitudes_Symmetry_130_Dip_dip0.112	0 to 7.8	(N)	0.004	1951	0.112	1	0.19773	C:\Kingdom Projects\Fairfield\seismic\seismic\0004420.kxd
Vertical Trace Data	Amplitudes_Symmetry	0 to 7.8	(N)	0.004	1951	0	0.97527	0.89135	H:\TKS_Projects\Fairfield_courses\seismic\seismic\0004421.kxd
Vertical Trace Data	AmplitudesDepth Symmetry 130 Energy	0 to 27300	(F)	10	2731	0.0096	0.7969	0.08248	H:\TKS_Projects\Fairfield_courses\seismic\seismic\0004422.kxd

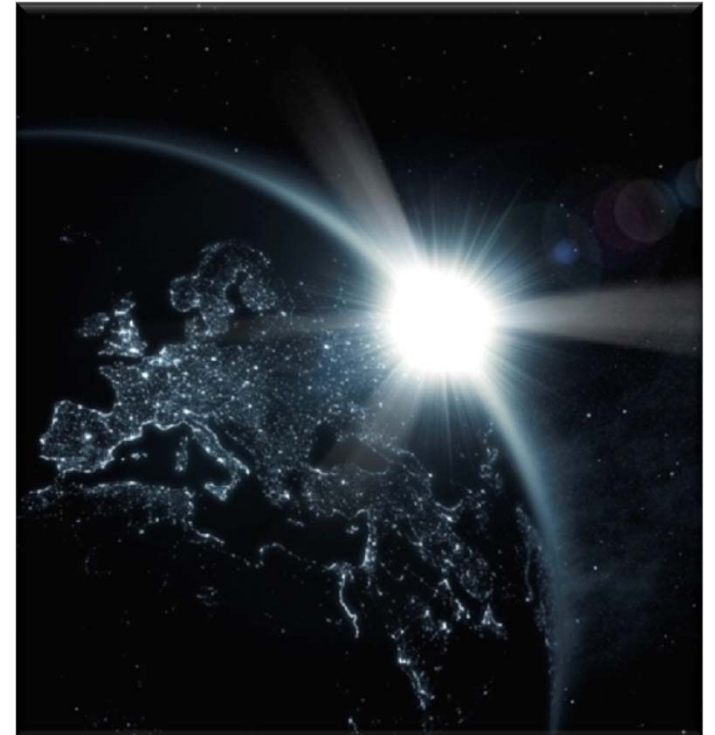


## Kingdom 2015 Summary

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### **Enhanced field development features provide**

- Unparalleled Interpretation
  - Leverage new workflows for better interpretations
  - Utilize the best attributes for improved accuracy
- Streamlined workflows
  - Automate your repeated workflow tasks
  - Highly dynamic
  - Truly interactive
- Optimized Usability
  - Intuitive user experience





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- Improved Project Performance and Usability

Kingdom 2015 Feature Pack 1





# Project Performance

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- Delayed loading for grids, horizons and faults helps to reduce project loading time:

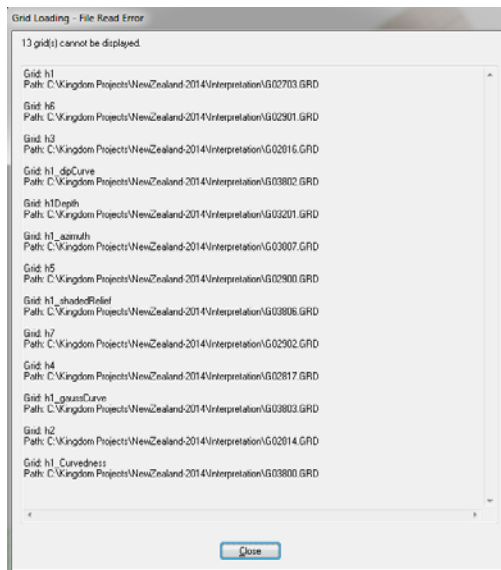
Project Loading Performance Gain per Interpretation Object	
Horizons only	Up to 54%
Grids only	Up to 92%
Faults only	Up to 85%

- Improved performance of fault polygons:
  - Base Map display of a horizon associated with a fault polygon up to 86% faster
  - Editing of a fault polygon on Base Map is now up to 96% faster
- Layer culture loading performance improvements up to 90%



# More Efficient Management of Missing Files

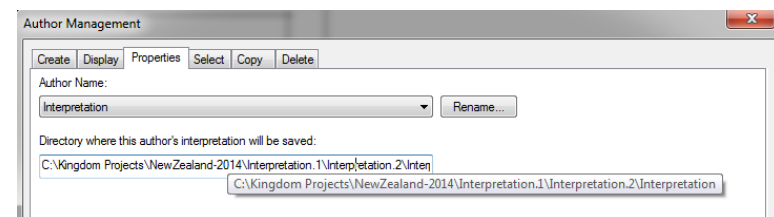
- Warnings about missing grid and fault files are consolidated into a single dialog



- Additional checks put in place for choosing a new author folder



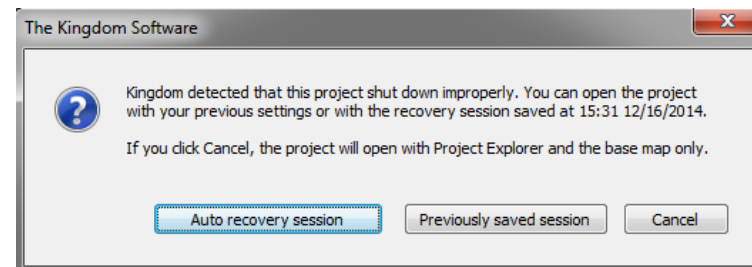
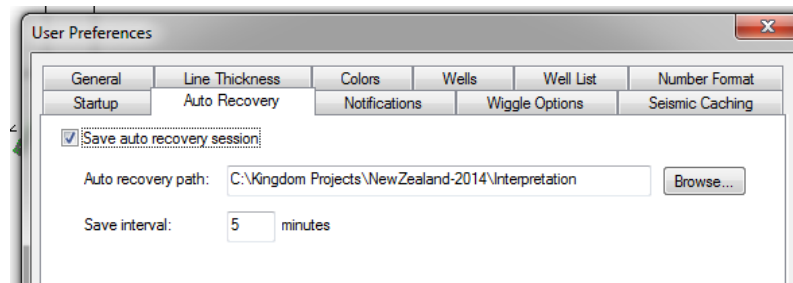
- Check the full path to the author folder (tooltip, select and copy functionality added):





# Project Auto Recovery

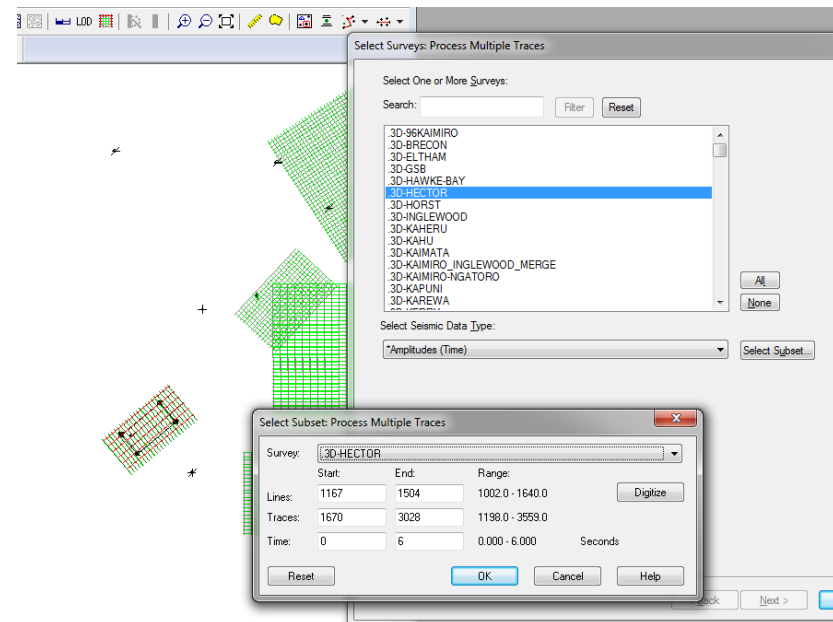
- Specify a time frame for your Kingdom session to be automatically saved
- Quickly recover your workflow if Kingdom was shut down unexpectedly





# More Effective Trace Calculations

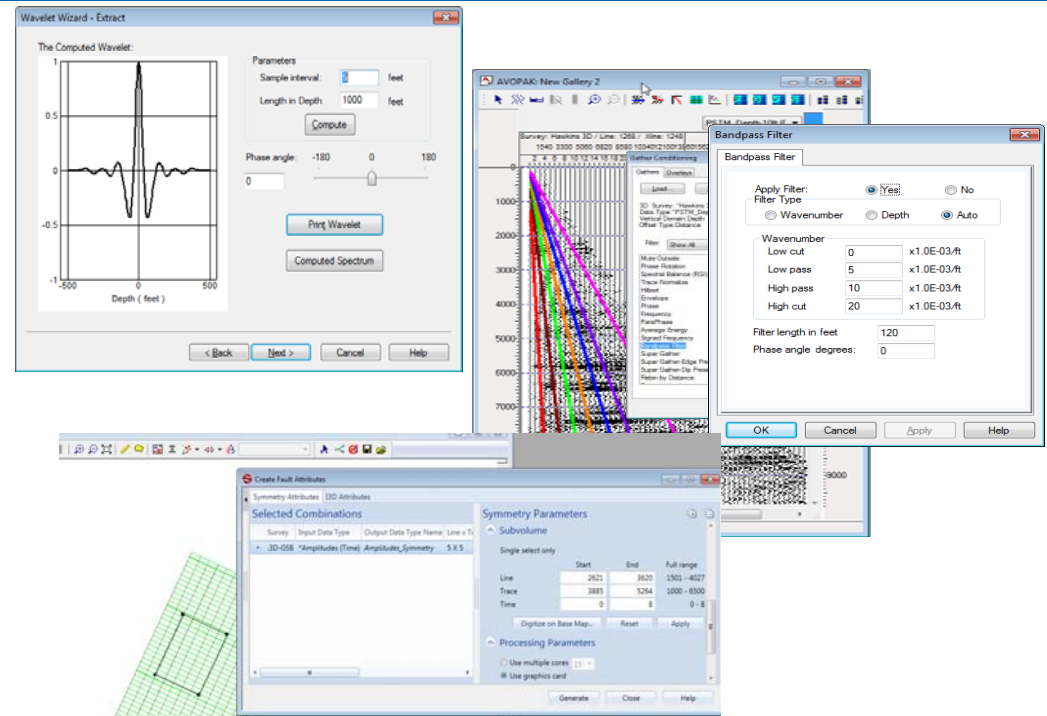
- Dialog boxes are now modeless so that you can continue with other work during calculations
- Define 3D survey subsets by digitizing a survey-aligned rectangle on the base map:
  - Selected survey is automatically brought to view and highlighted on the Base Map





# Other Minor Enhancements

- Additional Support for Depth Data:
  - Wavelets can now be generated from depth data
  - AVOPAK supports bandpass filter for depth gathers
- Manual horizon pick flag is now preserved for horizons processed by selected Math on Two Maps functions
- Fault Attributes: create subset by digitizing a rectangle on Base Map







**For more information: [www.kingdom.ihs.com](http://www.kingdom.ihs.com)**

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