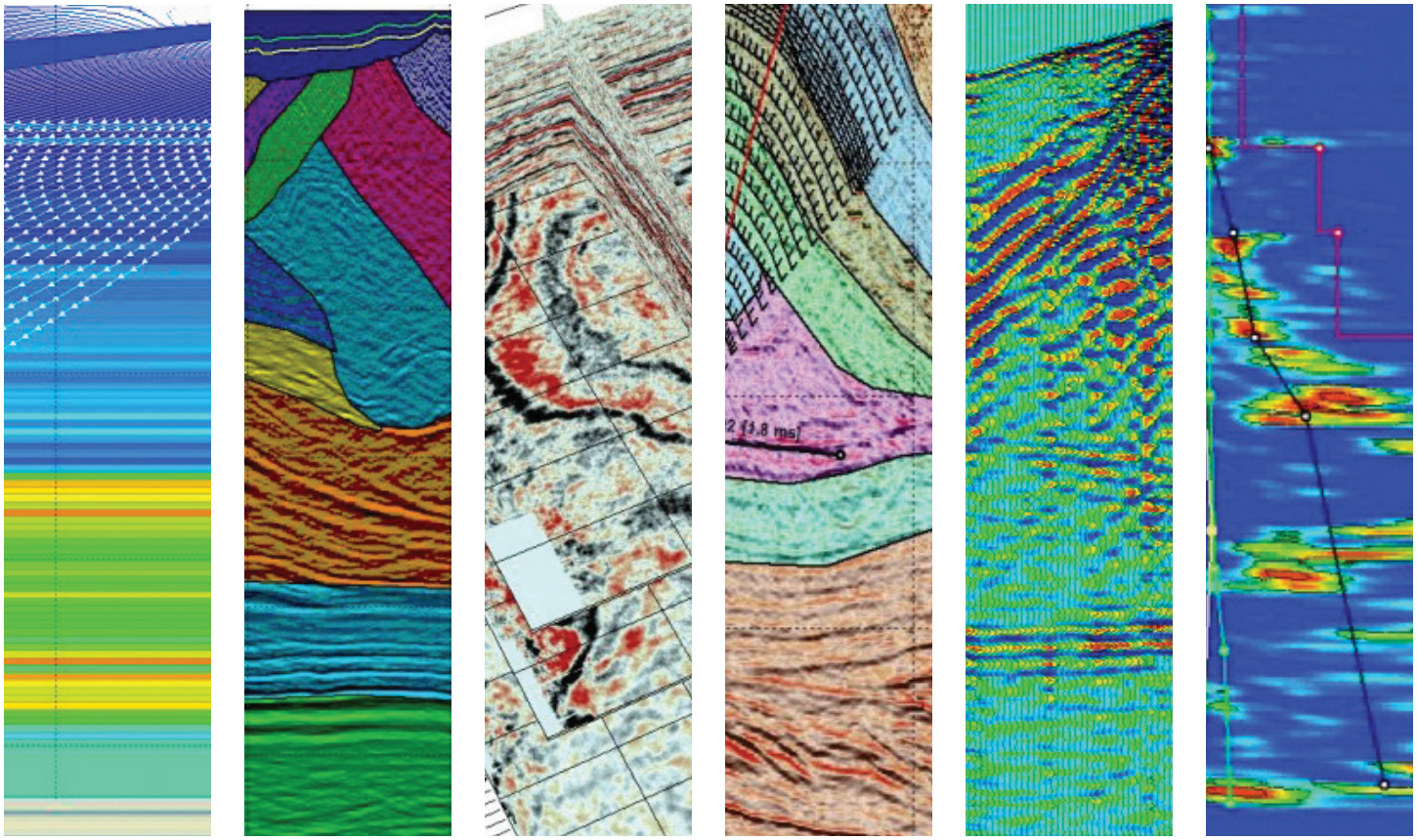
Schlumberger



VISTA

Desktop seismic data processing software

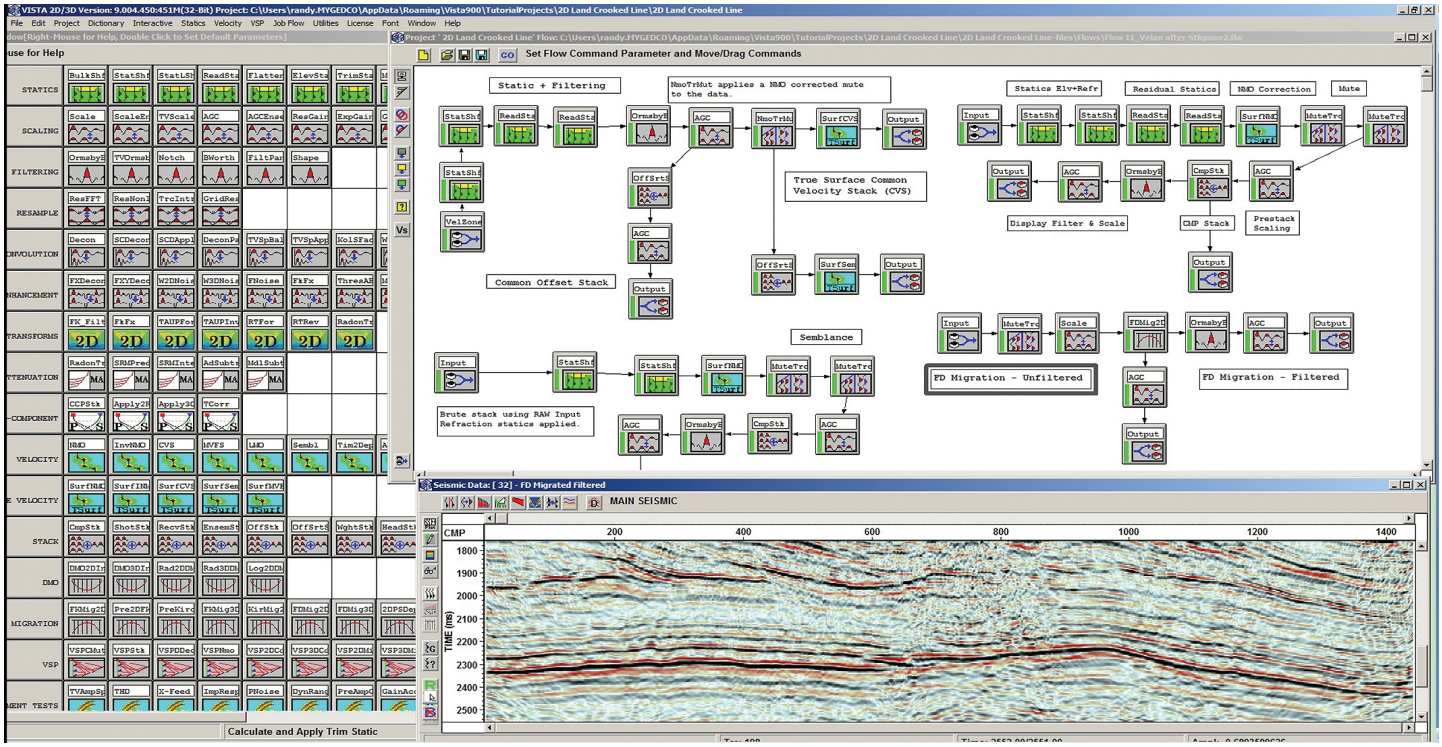
VERSION 2015

VISTA

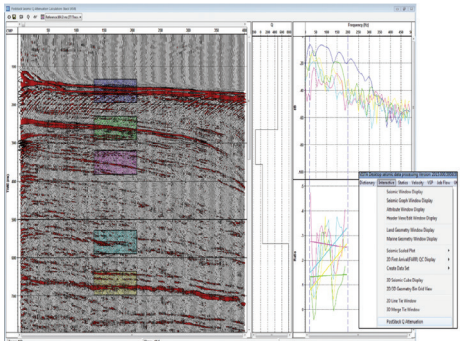
Desktop seismic data processing software

Comprehensive seismic processing and QC software

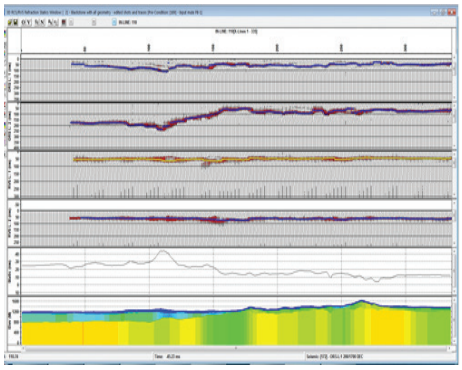
VISTA* desktop seismic data processing software is a Windows® application built on proven algorithms for optimal quality control from field acquisition to final processing and interpretation, eliminating the need for specialized Linux® hardware platforms and support personnel. In today's time-compressed environment, VISTA software provides users complete control over their assets with flexibility, reliability, ease of use, and compatibility with all industry and manufacturer data formats.



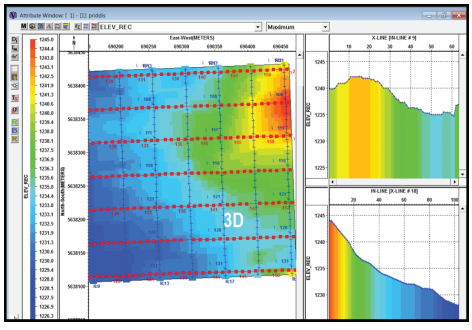
Processing flowchart.



Interactive Q attenuation window.



3D interferometric refraction statics.



Attribute and header visualization.

Multiple applications

Cover a wide variety of applications and seismic survey data types

- Land
- Marine
- Ocean-bottom cable (OBC)
- Transition zones
- Vertical seismic profile (VSP)
- Multicomponent

Compatible for both land and marine operations.

Yields optimal quality control from field acquisition.

Dependable

Aggressive product development cycle
- Annual software release
- Regular product updates
- User development surveys
- University consortium research membership

Worldwide software training program
- Public and private courses
- Technical- and theory-based courses

Arsenal of DVD and web-based user resources
- Tutorials
- Videos
- New product features manuals
- Case studies and technical reports
- Industry articles

Practical

Operating systems
- 32-bit and 64-bit Microsoft® Windows operating systems

Minimum system requirements
- Standard off-the-shelf hardware
- Optimized for multicore hardware

Data compatibility
- All common file formats

Licensing options

Versatile licensing options for individual or shared usage
- Portable USB license key
- Networked USB license key

Flexible license purchase or rental plans
- Flexible purchase options and annual maintenance
- Annual lease
- Short-term rental
- University consortium partnerships available

VISTA software is available in four sophisticated packages to meet your specific needs.

Component	VISTA Software Field QC	VISTA Software Field Pro	VISTA Software Full Pro	VISTA Software VSP
SCSI tape input and output	X	X	X	X
Full-geometry QC	X	X	X	X
Scale, filter, and deconvolution	X	X	X	X
Brute stack	X	X	X	X
Elevation and refraction statistics	X	X	X	
Surface-consistent scale, deconvolution, and statics		X	X	
Residual statics		X	X	
Advanced noise removal prestack and poststack		X	X	
Radial trace, radon, and tau-p transforms		X	X	
Signal enhancement		X	X	
Dip moveout (DMO) processing		X	X	
Amplitude variation with offset (AVO) and amplitude variation with angle of incidence (AVA) analysis		X	X	
Multiple attenuation		X	X	X
Converted-wave and multicomponent processing		X	X	X
Poststack migration		X	X	
Prestack migration			X	
VSP migration				X
Prestack and poststack depth migration			X	
Time and depth image analysis			X	X

Efficient

User-oriented design

- Enhance usability with easy-to-learn functionality and icon-driven interface

Multiple QC tools

- Plot multiple header values on the same display or plot combined header values, mathematical operations, or results from seismic processes
- Create header values from mathematical operations and seismic processes, such as static or signal-to-noise ratio computations
- Display files in a similar fashion (e.g., statics, mute functions, velocities, or any value computed from the data)

Interlinked attribute and seismic display window

- Integrate all phases of processing—survey geometry, velocity picking, refraction and residual statics, surface-consistent attributes, migration imaging picking
- Identify anomalies and display the relevant data for inspection using the data attribute window

Data loading

- Merge poststack 2D and 3D surveys and repair SEG Y files using flexible tools
- Easily overwrite incorrect or missing headers with powerful operation flows

Production bottlenecks removed

- Save and apply processing flows to different input datasets
- Interactively queue and control batch jobs on the network or local machines for those operations that take a long time to execute

Seismic interpretation

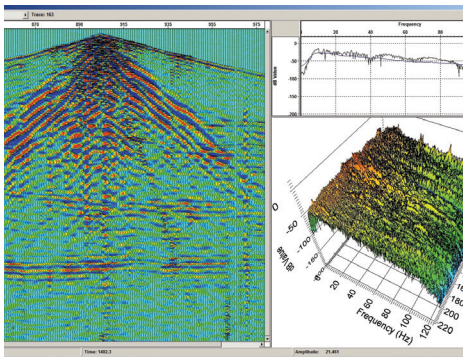
- Use VISTA software to apply processes such as velocity analysis, residual moveout correction, residual statics, trim statics, noise attenuation, AVO angle decomposition, muting, and more

Poststack seismic interpretation

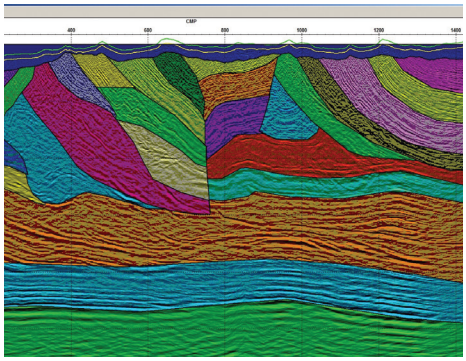
- Test various poststack processes to enhance the seismic data prior to and during the interpretation process. VISTA software offers many poststack processes that are not included in most seismic interpretation packages, including deconvolution, noise attenuation, 2D and 3D poststack migration, and a powerful principal component decomposition signal enhancement program

Open system

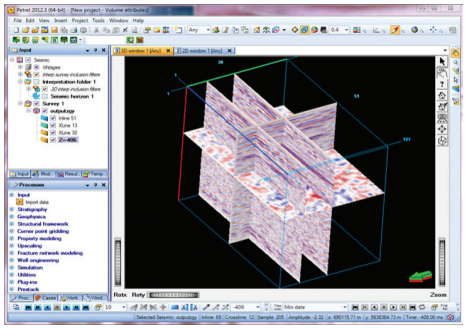
- Add your own algorithms to the existing suite of software using the MATLAB® programming development interface
- Create ASCII files that you can edit with standard word processing or spreadsheet software. Industry standard formats are used wherever they exist



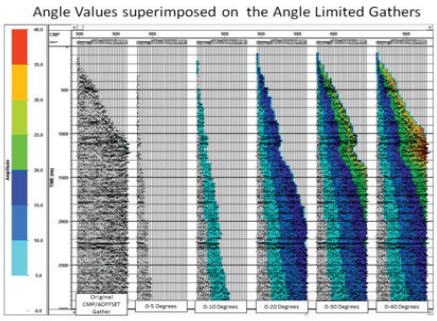
Data frequency analysis.



Model building for prestack and poststack depth migration.



VISTA software dataset in the Petrel E&P software platform.*



Angle-limited gathers.

Effective

Automatic data editing using threshold criteria

- Apply thresholds for omitting traces from the processing sequence and edit thresholds to exclude a different set of traces

QC station positions

- Use interactive tools for station geometry prediction, verification, and QC
- Automatically detect geometry errors

Multiple input and output processing flows

- Leverage the ability to have multiple inputs and outputs within processing flows
- Enable simultaneous generation of alternative products that aid in process testing
- Manipulate fractions of the data according to a particular key (e.g., matching vibroseis data with dynamite data)

Statistical analysis

- Indicate signal-to-noise ratio, filter panels, amplitude spectra, and frequency-wavenumber (*f-k*) analysis
- Use for trace editing, polarity reversals, and noise and dead-trace detection

Flexible trace sorting

- Achieve versatility in trace sorting with range selection on any trace header and sorting up to three keys deep

Project history

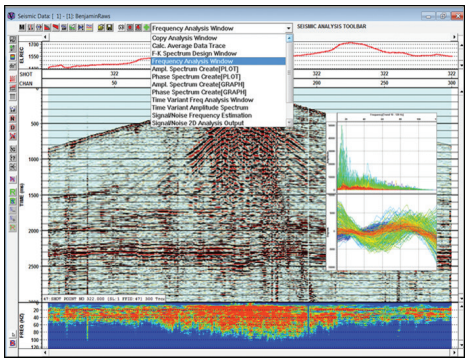
- Track history of input data, processing workflows, and the parameters used

Montage plotting

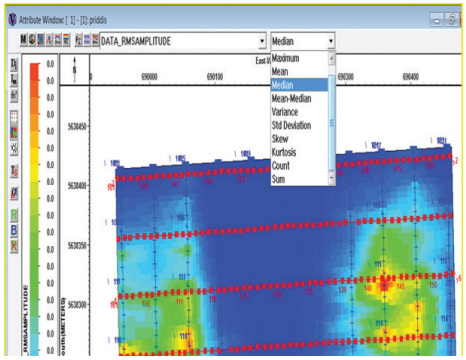
- Create sophisticated scaled plots that include side labels, seismic data, attributes, and log displays

Documentation and help

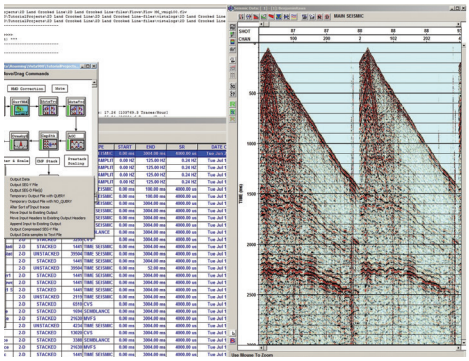
- Get online help for all VISTA software interactive windows and modules
- Read step-by-step instructions and tutorials on the various data types (2D, 3D, and VSP) and the necessary files for processing the data. The online instructions include example screenshots and plots
- Watch instructional videos to learn more



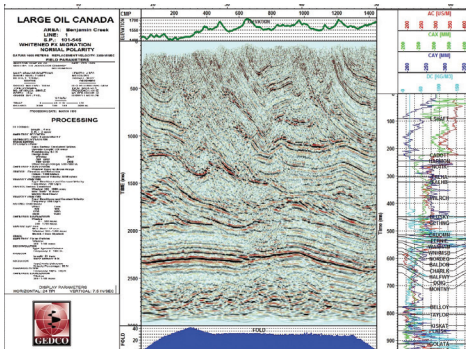
Interactive calculations.



Statistical analysis.



Graphical interface.



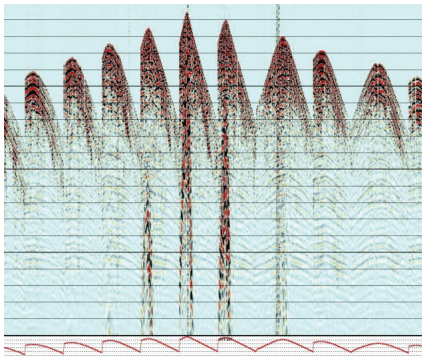
Plot montage.

VISTA Software Field QC

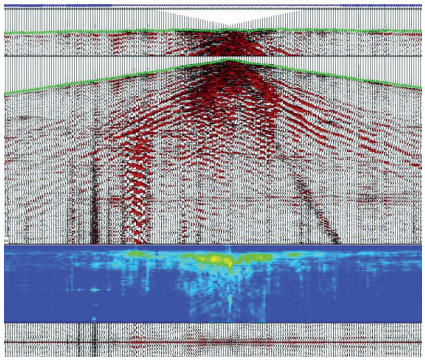
Premier tool for in-field processing and QC

- Disk and tape input from industry-standard formats supported
- Wide variety of SCSI devices supported
- Instrumentation tests, recording parameter QC, and vibroseis testing
- Verification of position information using seismic data
  - Energy decay versus offset
  - First arrivals—actual versus predicted
  - Field stacks
  - Time slices
  - Use of inline and crossline displays
  - Interactive shot and receiver location prediction
- Quality control indicators
  - Filter panels
  - Amplitude spectra
  - *f-k* spectra analysis
  - Deconvolution testing
  - Signal-to-noise indicators—build and display by shot, receiver, common midpoint (CMP), or offset
- Trace editing for automatic and semiautomatic detection of noise, dead traces, reverse polarity, and more
- Standard processing sequences
  - Scaling, filtering, and deconvolution
  - Multilayer and static analysis
  - Elevation and refraction statics
- Helpful user functionality and QC functions
  - Linear moveout velocity picking
  - Noise attenuation and signal enhancement techniques
  - User-expandable headers to handle multicomponent passive seismic and other data
  - Automatic building of sort indexes for field QC (e.g., common shot, receiver, CMP, offset, and component)
  - Interactive velocity analysis and velocity field QC
  - Client deliverables with full project history
  - Interactive monitoring window for creating sophisticated output plots
  - No limitations on channel count or record length
  - Includes software developer's kit supplied through MATLAB interface

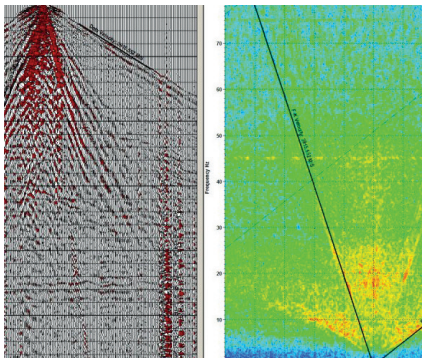
SCSI tape input.



Seismic display.



Combined QC displays.



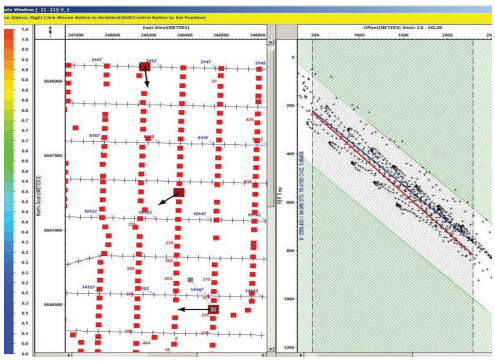
Window for f-k *analysis window.*

VISTA Software Field Processing

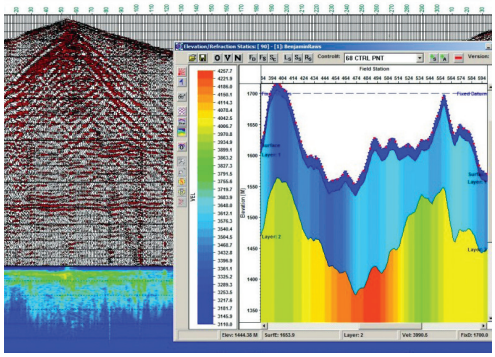
Advanced field package for full-geometry QC to poststack migration

Includes all VISTA Software Field QC capabilities

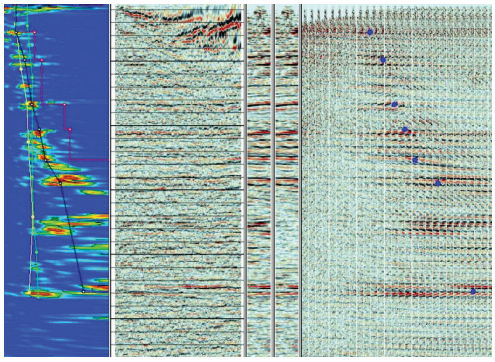
- Field QC plus DMO processing through 2D and 3D poststack migration
- Standard processing sequences
  - Surface-consistent scaling and deconvolution
  - Time-variant spectral balancing
  - Residual statics
  - DMO processing
  - Velocity analysis, including constant velocity stacks (CVSs) and mean velocity feedback strategy (MVFS) as well as semblance, continuous or semiautomatic
  - Normal moveout (NMO)—second or fourth order—from fixed or floating datum or from true surface topography (proprietary algorithm to separate NMO correction into shot and receiver portions)
- Several noise attenuation algorithms
  - *f/Kx-Ky*
  - *f-x/f-xy*
  - *fx-fk*
- Customized *f-x* prediction and projection algorithm
  - Tau-p, radon, and radial trace transforms
  - THOR proprietary burst noise attenuation (e.g., swell noise and spikes)
  - 4D and 5D-DEC proprietary noise estimator for stacks, including effects of structure, statics, coherence, etc.
  - Rank reduction noise attenuation (e.g., Cadzow)
  - Adaptive subtraction proprietary algorithm to remove modeled noise (e.g., linear noise and random noise) from 4D and 5D-DEC, multiples, etc.
- True amplitude processing sequence
- AVO and AVA processing capabilities
  - Poststack time migration
  - *f-k*
  - Kirchhoff migration
  - Finite difference
- Interactive Q analysis
- Forward and inverse Q analysis



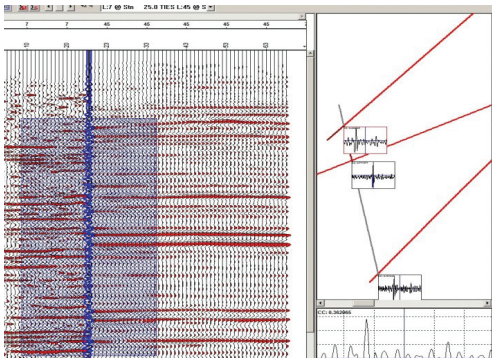
Station prediction window.



Refraction statics.



Interactive velocity analysis.



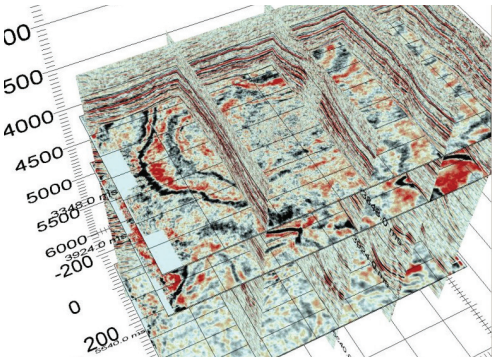
Line tow window in 2D.

VISTA Software Full Pro

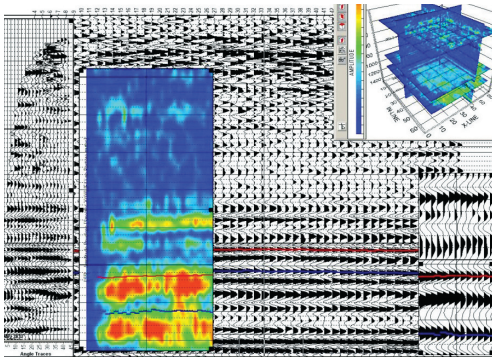
The complete solution from QC to prestack migration and time-depth image analysis

Includes all VISTA Software Field QC and VISTA Software Field Pro capabilities

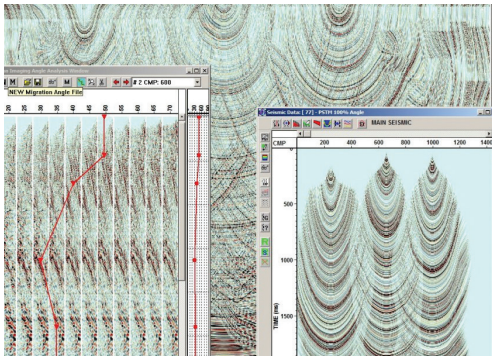
- Full processing from demultiplex to prestack time or 2D depth migrations
- Land, OBC, and marine processing
- Batch processing using any network node (and multiple CPUs) for true parallel processing
- Multiple attenuation by *f-k*, radon transform, or surface-related multiple elimination (SRME)
- Interactive 2D multiline tie and 3D multiline survey merge
- 2D and 3D automatic velocity estimation
- 3D trace interpolation for 2D data
- 5D trace interpolation for 3D data
- Prestack and poststack time migrations
- Interactive prestack time migration velocity analysis
- Interactive velocity model building for depth migration
- Prestack and poststack depth migrations (2D PSDM)
- Multicomponent and converted-wave QC and processing
  - Tilt correction and Alford rotations
  - True-surface NMO with converted-wave velocity (V_c)
  - Converted-wave receiver statics for stack power maximization
  - Conversions between primary wave velocity (V_p), V_c, and shear wave velocity (V_s)
  - Conversion between the P-wave (PP) and S-wave (PS) two-way times—stretching and squeezing of stack sections
  - Asymptotic conversion-point (ACP) and true common conversion-point (CCP) stacking



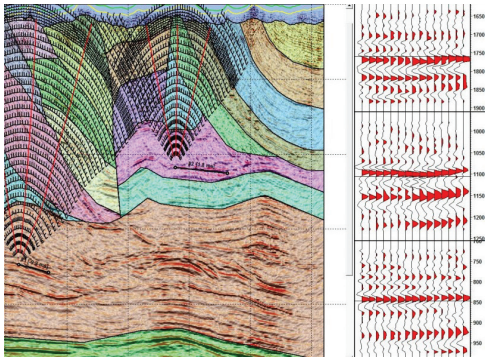
Interactive 3D display.



Multiple-attribute display.



Migration analysis.



Depth imaging.

VISTA Software VSP

Complete VSP QC and processing for 2D and 3D data

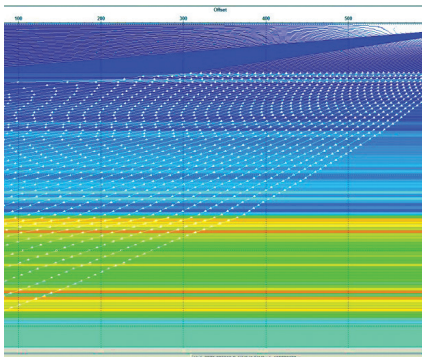
2D VISTA Software VSP module available as standalone or add-on to other modules

- 2D VSP from field to final image
- Full 2D VSP geometry QC
- Zero-offset and walkaway processing algorithms
- Single or multicomponent processing
- Automatic and interactive VSP first-break picking
- Noise attenuation and signal enhancement techniques
- Interactive hodogram analysis
- Automatic 3C rotation
- Vertical rotation for deviated wells
- Multiple wavefield separation techniques
- Multicomponent wavefield separation
- LAS log viewing and editing
- Synthetic generation using sonic and optional density log curves
- Sonic calibration and velocity profile analysis
- VSP Q analysis
- Forward and inverse Q filtering
- 2D VSP common-depth point (CDP) mapping or modeling and straight ray
- 2D VSP anisotropic model building and inversion
- 2D Kirchhoff depth migration

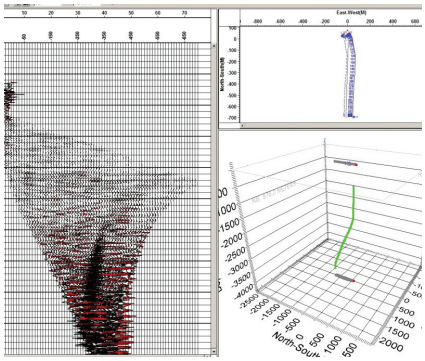
3D VISTA Software VSP module available as add-on to VISTA Software Full Pro

Includes all 2D VISTA Software VSP capabilities plus

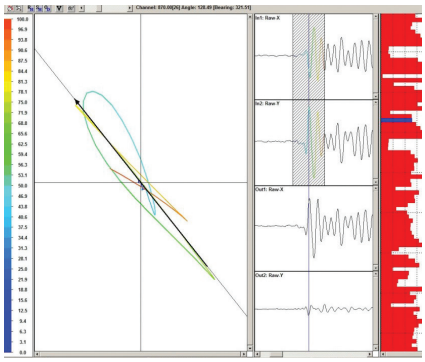
- Process 3D VSPs from field to final image
- Full 3D VSP geometry QC
- 3C–3D VSP first-break picking window
- 3D VSP CDP mapping or modeling and straight ray
- 3D VSP anisotropic model building and inversion
- 3D Kirchhoff depth migration



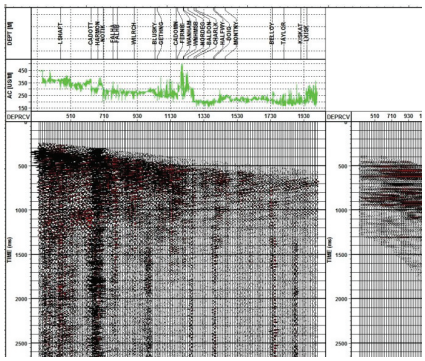
VSP ray tracing.



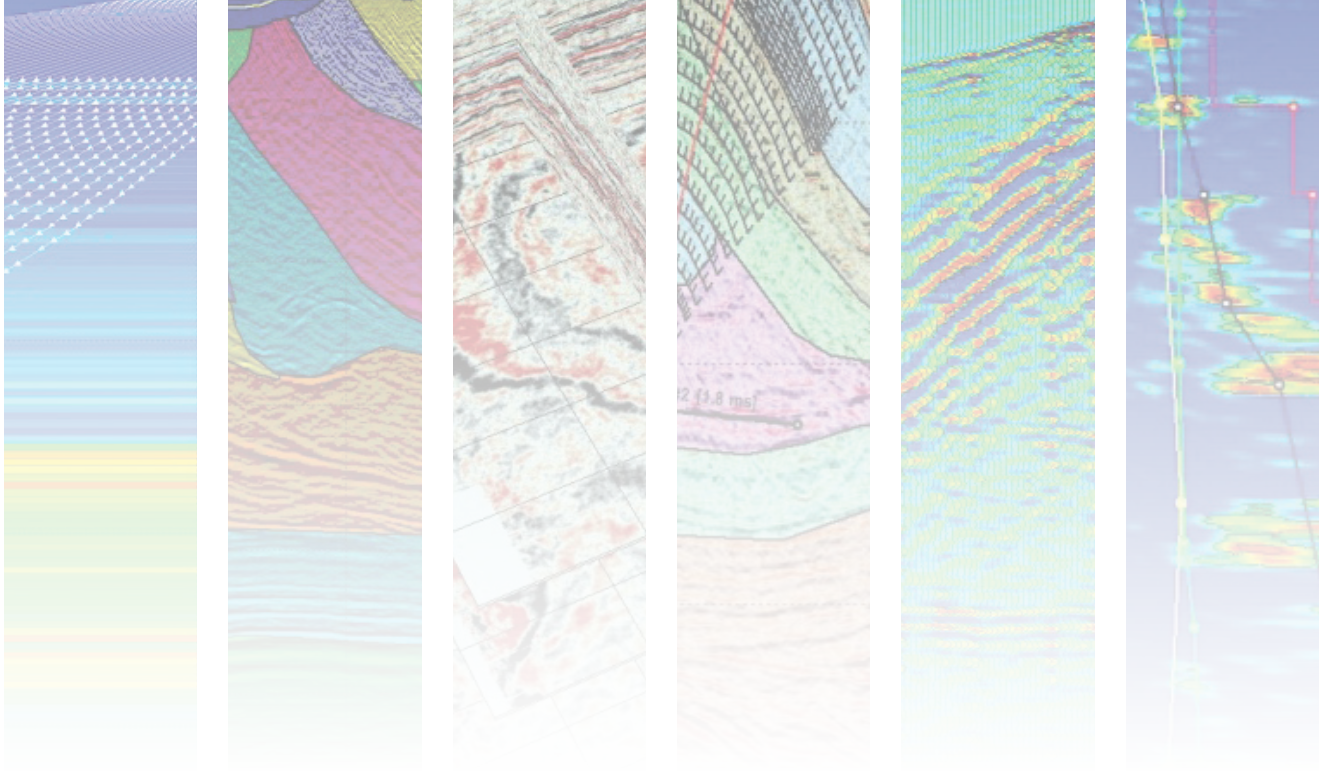
VSP CDP mapping.

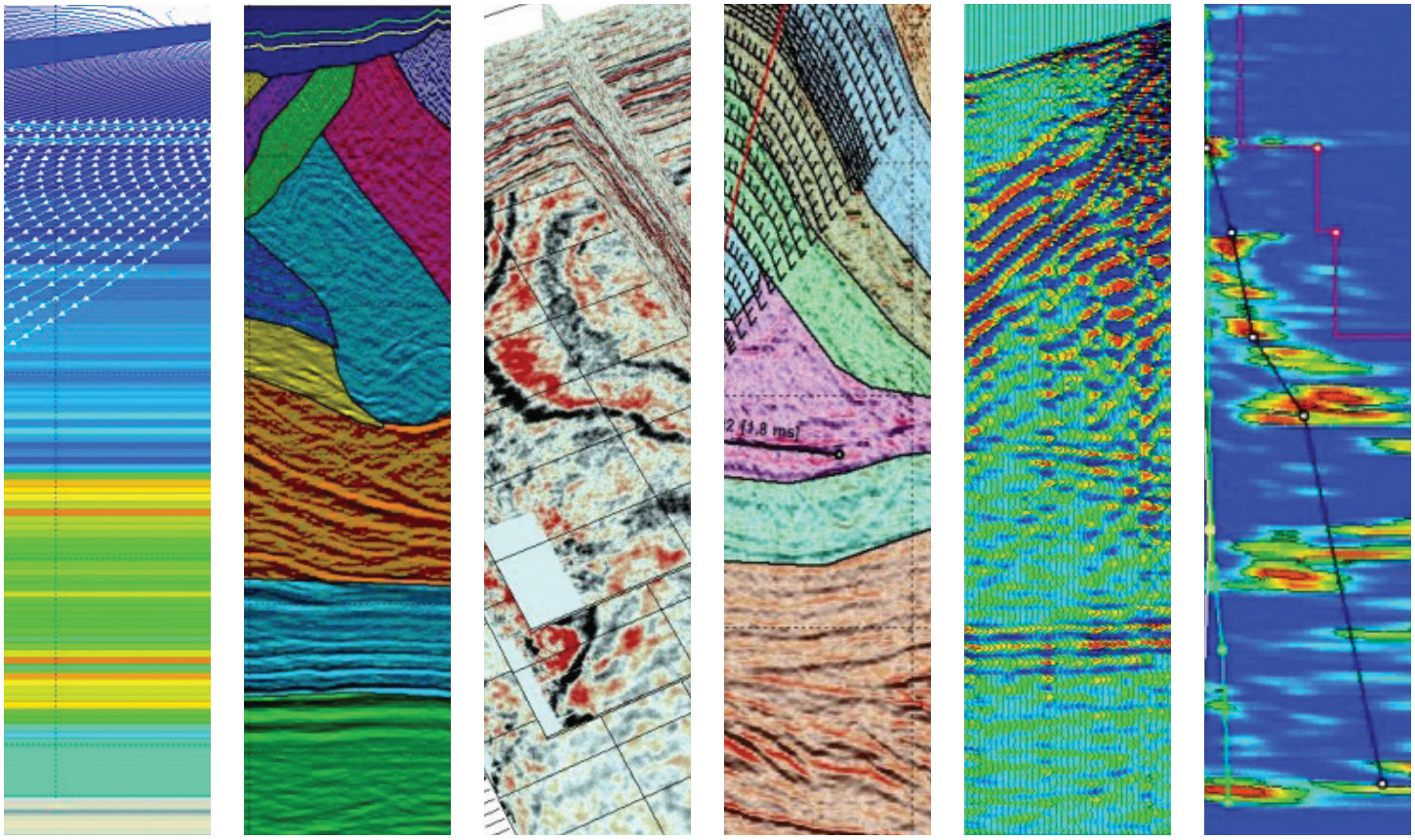


Hodogram analysis.



Log display with VSP.





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