OVERVIEW

There are unique challenges to interpreting and modeling the complex geology encountered in fold and thrust belts, extensional, strike-slip, and salt deformation regions, as well as unconventional reservoirs. Lack of well data or poor seismic image quality can compound the challenges.

LithoTect® software delivers advanced tools for structural interpretation and reservoir property modeling, including map, profile, well, and seismic interpretation methods. Leveraging geometry reconstruction, structural restoration, and balancing techniques, LithoTect software can help validate complex structural interpretations. These technologies help geoscientists quantify fracture densities and distributions, analyze fault sealing characteristics, and model burial history, hydrocarbon migration pathways, and accumulations zones. Results can be particularly valuable in lowering the risk and cost of complex plays in deepwater, sub-salt, and unconventional resources.

BENEFITS

**Improved Understanding of Complex Subsurface Environments**
The application builds statistically meaningful, scientifically constrained geologic models from the reservoir to basin scale. Advanced techniques are applicable to contractional, extensional, strike-slip, and salt deformation regions. They include vertical/oblique slip, flexural slip, slip line, and complex kinematic models.

**Validation of Complex Structural Models**
Geometry reconstruction, structural restoration, and balancing techniques help construct detailed structural and stratigraphic frameworks for complicated geology, as well as verifying that structural interpretations are physically possible.

**Reduced Risk and Improved Reservoir Development Decisions**
The LithoTect software aids the individual specialist and the asset team in transforming raw data into the geological knowledge from which reasonable reservoir risk can be derived.

FEATURES

**Interpretation**
LithoTect software includes a suite of dip-constrained and general map, cross section, well, and seismic interpretation methods. Depth conversion techniques operate on interpretations, seismic, and wells. The software also includes well monitoring and projection capabilities.

Basic interpretation functionality includes and supports:

- Arbitrary profile lines, including doglegs, dipping sections, seismic navigation file import, latitude/longitude support
- 2D and 3D SEG-Y seismic trace loading
• JPEG, GIF, BMP, TIF, GEOTIF, and PNG image loading and calibration, map image rectification
• USGS Digital Elevation (DEM/NED), Canadian Digital Elevation Data (CDED), and generic XYZ surface file loading, display, and elevation extraction tools
• Supports wells with multiple boreholes, picks, deviations, dips, logs (LAS); survey coordinate calculations - tangent, radius of curvature, balanced tangent methods; survey and interpolated nodes; direct copy and paste from spreadsheet applications
• Outcrop and sample data with picks and dips
• Dip eigenanalysis - well and outcrop data best fit fold axis and plane calculations, filtering, stereonet, TST, and SCAT displays
• Well and outcrop data projection with apparent dip and deviation calculation - normal, azimuth, and vector (downplunge) options
• Multiple geologic columns with name, color, thickness, lithological pattern, solidity and velocity functions
• Complete interpretation drawing and editing tools - line type and naming, point and stream mode entry, seismic trace autotacking, interactive parallel (concentric and angular bend) and similar geometry projection, splice, trim, divide, extend, copy and paste, translate, scale, rotate, line dip and curvature (interactive wavelength) display
• Stratigraphic interpretation tools including onlap, downlap, toplap, erosional, parallel, and structural interpretations
• Automatic region construction, typing, and naming
• Geometry reconstruction/conformance: parallel (concentric and angular bend) and similar
• Ribbon mapping and contouring
• 3D viewer with complete rotate, pan, zoom control
• CGM and raster print file creation

LithoTect® software for structural interpretation and reservoir property modeling includes map, profile, well, and seismic interpretation methods.
**Geometry Reconstruction**

Conformance tools establish a geologically accurate representation of subsurface rock structure. These geometries define dip and curvature attributes that influence reservoir properties variations; for example fractures, permeability, and porosity.

Subsurface reconstruction comprises three distinct interpretation elements: interpolation, projection and extrapolation, each using conformance models appropriate for the rock type and tectonic setting.

**Restoration and Balancing**

LithoTect software helps establish physically possible interpretations through structural restoration and forward modeling techniques, including decompaction, isostacy, and rift subsidence analysis. These leverage knowledge of the processes that control sediment deposition, structural evolution, and hydrocarbon systems. The software operates on interpretations and seismic data, generating a range of possible outcomes consistent with data constraints.

**Depth Conversion**

The LithoTect depth conversion capability allows robust conversion of interpretations, seismic traces, and images. Interval velocity functions can be assigned to any combination of interpreted units. These interval functions can be used in conjunction with a background velocity field, itself defined by velocity functions at any number of horizontal locations. All velocity functions can be defined as either $\text{Velocity} = f(\text{depth})$ or $\text{Velocity} = f(\text{time})$. Velocity functions can originate from a datum value or datum horizon (e.g., sea-floor or ground surface).
LithoTect® advanced structural modeling software provides structural analysis and modeling for the most complex geologic environments.

Landmark offers solutions to help you deliver on your business strategies. For questions or to contact your Landmark representative, visit us at landmarksoftware.com.