



Tools for **What's Next**

Industry Problem

Unconventional resource plays present many challenges in terms of obtaining meaningful results while controlling costs. In a shale play for example, it is extremely difficult to locate areas of sub-seismic fracture density or identify facies changes in order to facilitate well path planning. Often, the only way to identify the shale sweet spot is through logs from expensive and unproductive wells.

TerraSpark Solution

TerraSpark's Shale Resource Play Toolkit maps microseismic data together with seismic and well data to help interpreters locate the areas of enhanced fracture density/permeability, accurately interpret trends in injection and production, and reveal facies change boundaries, thus reducing drilling expense and maximizing production.

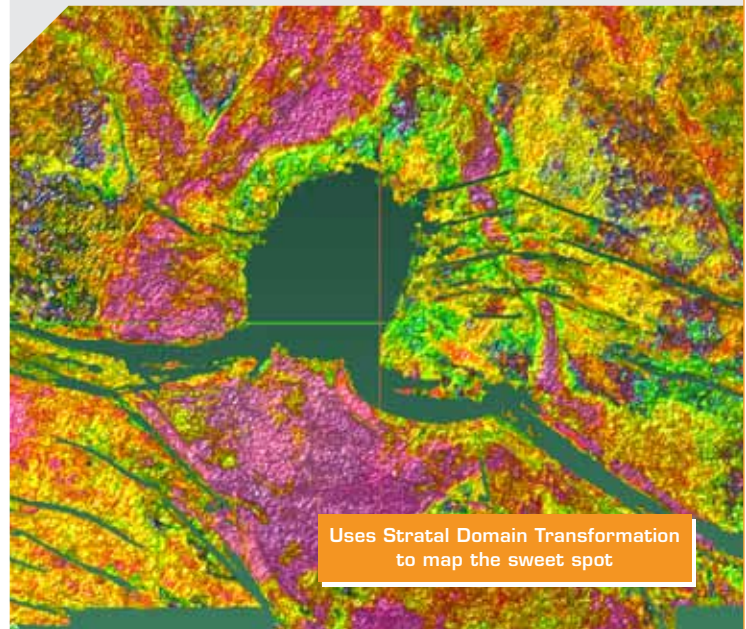
Unlike conventional packages, our Shale Resource Play Toolkit:

- Directly reveals areas of increased fracturing for enhanced production potential utilizing our Automated Fault Extraction™ tool with our Voxel Density Regional Highlighting
- More accurately interprets trends in injection and production using our attribute property calculator
- Unravels facies change boundaries using our patented Domain Transformation™ tool

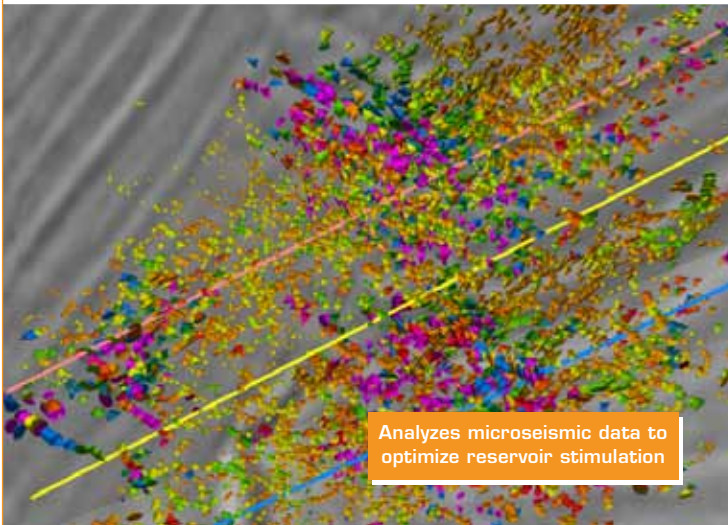
Shale Resource Play Toolkit

The Shale Resource Play Toolkit:

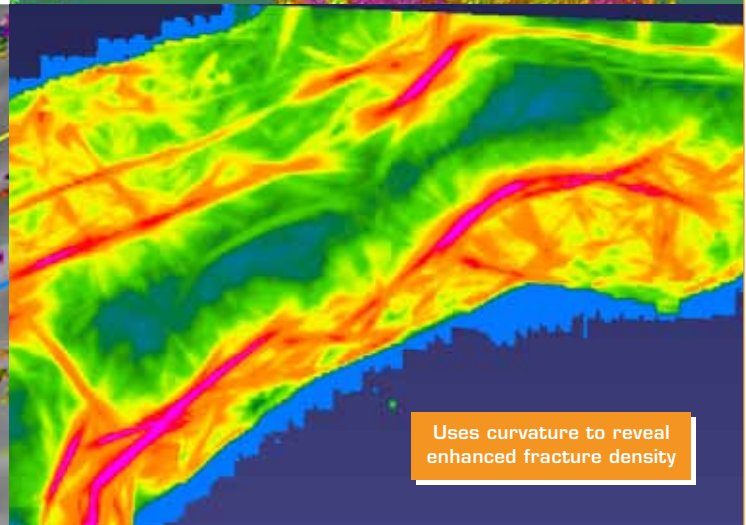
- Identifies areas of enhanced fracturing for optimal production potential
- Identify facies change boundaries
- Maps micro-seismic data to multi-dimensional symbols and view together with seismic and well data
- Optimizes well path planning and maximizes productivity



Uses Stratal Domain Transformation to map the sweet spot



Analyzes microseismic data to optimize reservoir stimulation



Uses curvature to reveal enhanced fracture density

... an Insight Earth® solution from TerraSpark®



Data Import and Conditioning

- Noise Removal

Horizon Orientation

- Horizon Dip and Strike Analysis

Fault Structure Branch

Fault Imaging

- Horizon Edge Stack
- Automated Fault Extraction™

Fault Surface Extraction (mapping)

Facies Change Branch

Horizon Autotracking

Close Structural Interpretation

- Trim and Seal

Stratal Domain Transformation™

Shale Reservoir Facies Isolation and Capture

- Surface Draping™
- Surface Wrapping™
- Voxel Processing
- Stratal Slice Horizon Generator

Microfracture Branch

Curvature Attributes

Microfracture Detection

- Horizon Edge Stack
- Automated Fault Extraction™

Enhanced Fracture Location

Microfracture Map Extraction

Microseismic Branch

Post-frac Analysis

- 3D Seismic
- Microseismic
- Hypocenters
- Frac Data
- Property Calculator

Discrete Fracture Network

- Planar Clustering
- Stimulated Reservoir Volume

Well Path Planning

For more information, contact our Houston office at:
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TerraSpark's Toolkits are specifically designed to address and solve the most pressing geophysical and geological interpretation problems and deliver the results interpreters need to gain a competitive advantage. Our current Toolkits include:

- Shale Resource Play Toolkit™
- Salt Velocity Modeling Toolkit™
- Complex Structure Toolkit™