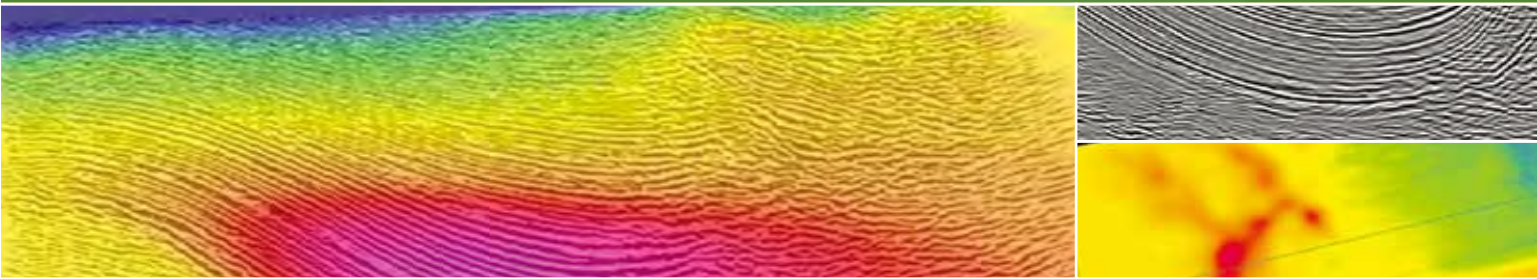


# GeoThrust

2D & 3D Seismic Data Processing System

EASY | FAST | ADVANCED



ThrustLine & Thrust3D have now been combined into one complete 2D and 3D seismic data processing system.



[www.geotomo.com](http://www.geotomo.com)



## FEATURES

- Workflow driven architecture
- Tomography derived near-surface model
- Time and depth prestack Kirchhoff and wave equation migration from topography
- Interactive QC tools
- Cluster management

## BENEFITS

- Short learning curve
- Faster turnaround time
- Uncompromised accuracy and fidelity
- Focus on geological & geophysical aspects

## DELIVERABLES

- Complete processing and analysis system
- 2D & 3D near-surface model
- 2D & 3D RMS velocity field
- 2D & 3D prestack time migration image
- 2D & 3D interval velocity field
- 2D & 3D prestack depth migration image

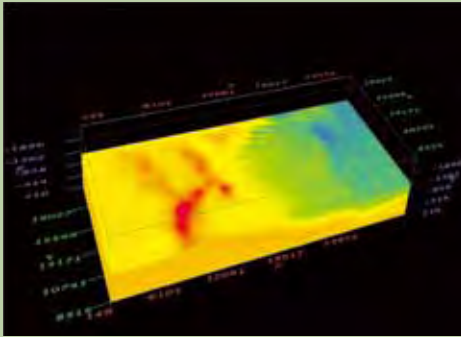
## GeoTomo's 2D & 3D Land Seismic Data Analysis Workflow

Designed to obtain an accurate earth model and image in time and depth from data recorded with irregular geometry in areas with rough topography, complex near-surface, and complex subsurface with uncompromisingly high technical specifications for data analysis and quality control, but easy to learn and easy to use.

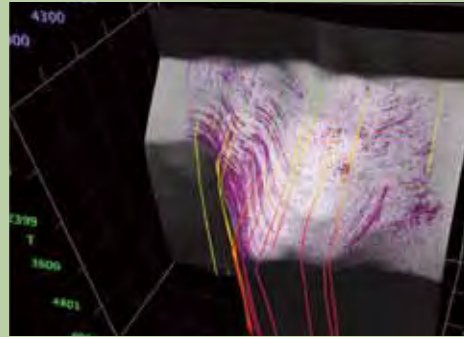
## Distinctively Unique Features

- The near-surface model is estimated by nonlinear tomography applied to first arrival times that accounts for topography, and resolves lateral and vertical variations.
- GeoThrust performs subsurface velocity estimations, modeling, and imaging from topography, not from a flat datum, based on RMS and interval velocities estimated at reflector positions, not at reflection positions.
- GeoThrust near-surface modeling workflow allows to derive imaged-based statics without first-break picks and with the capability in handling the velocity inversion.
- GeoThrust imaging in time and depth are both performed by prestack Kirchhoff and wave equation migration algorithms with uncompromising accuracy and fidelity.
- GeoThrust 3D workflow scans both RMS velocities and the anisotropy parameter for enhanced 3D prestack time imaging of the  $v(z)$  media.
- The system provides the analyst with powerful interactive tools to perform quality control of geometry and for appropriate specification of signal processing parameters, and picking RMS and interval velocities.
- The system is based on a workflow architecture that manages the project for the analyst and allows the analyst to focus on the geological and geophysical aspects of the project.

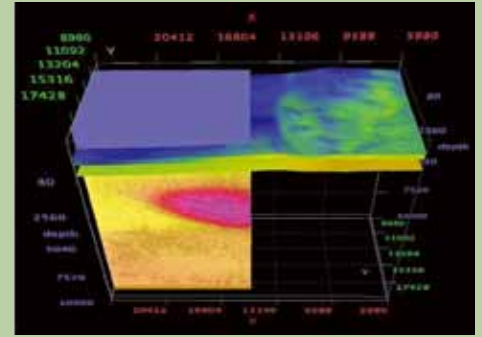
# 3D PSDM Case Study



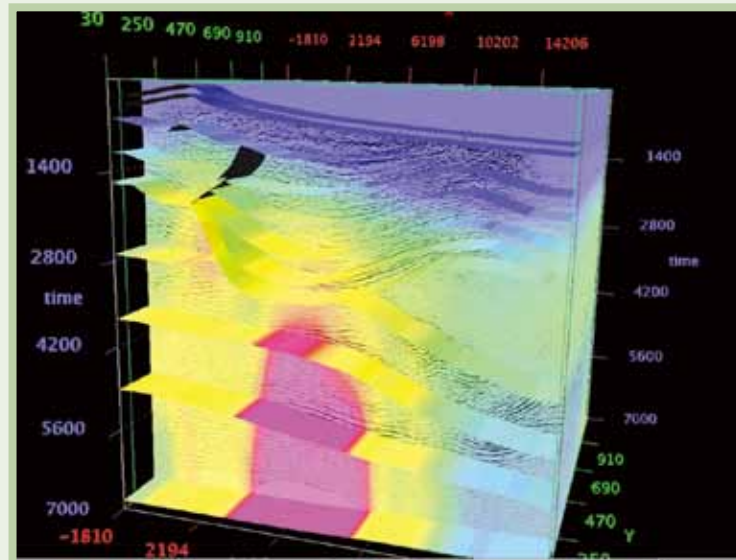
Near-Surface Velocity Model



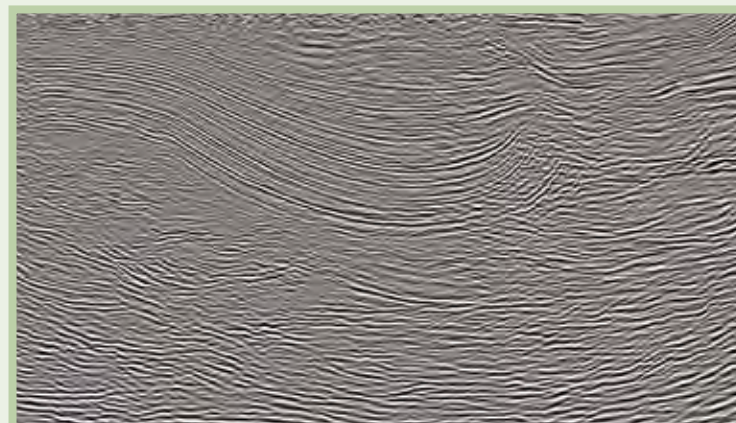
RMS Velocity Field Estimation



Velocity-Depth Model Building



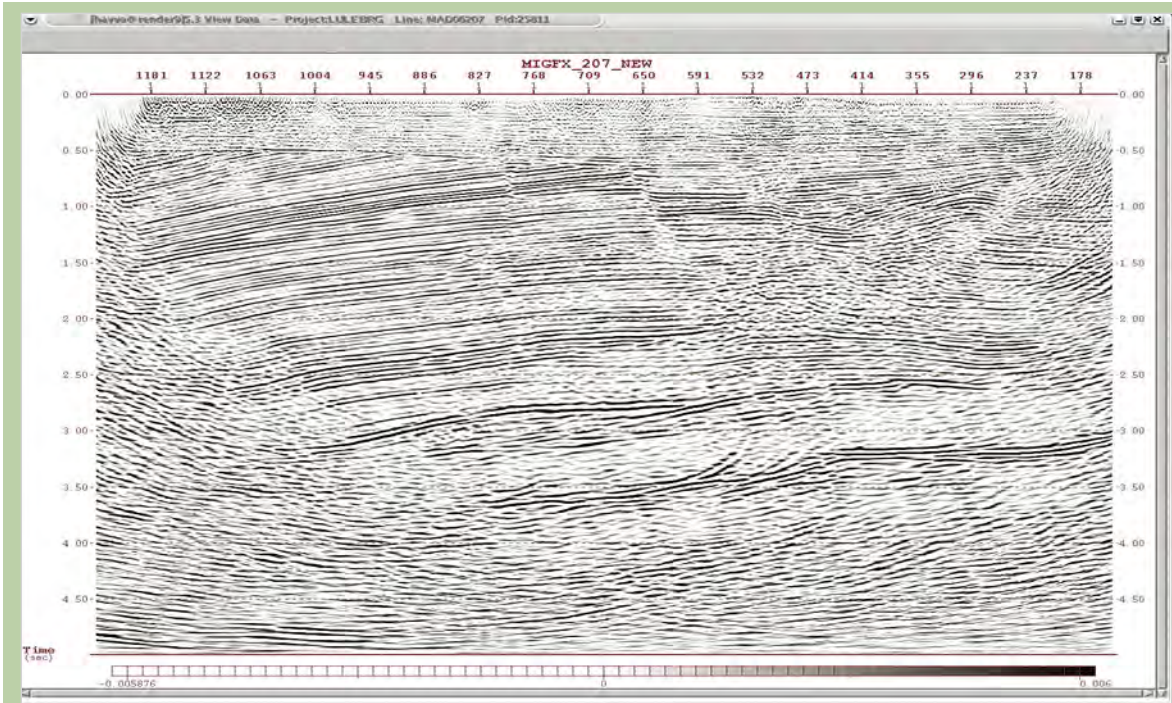
Velocity-Depth Model



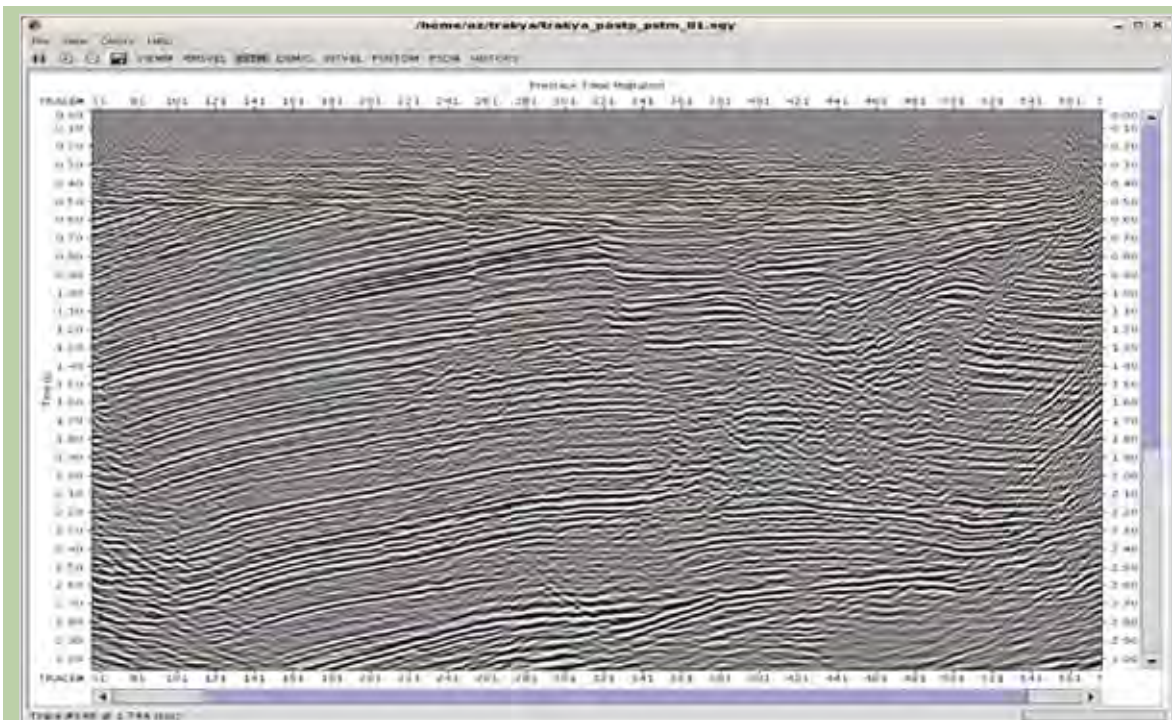
GeoThrust Image



Through reflection residual statics analysis with stacking cube, GeoThrust PSTM produces more details in faults than the vintage image.



Vintage PSTM



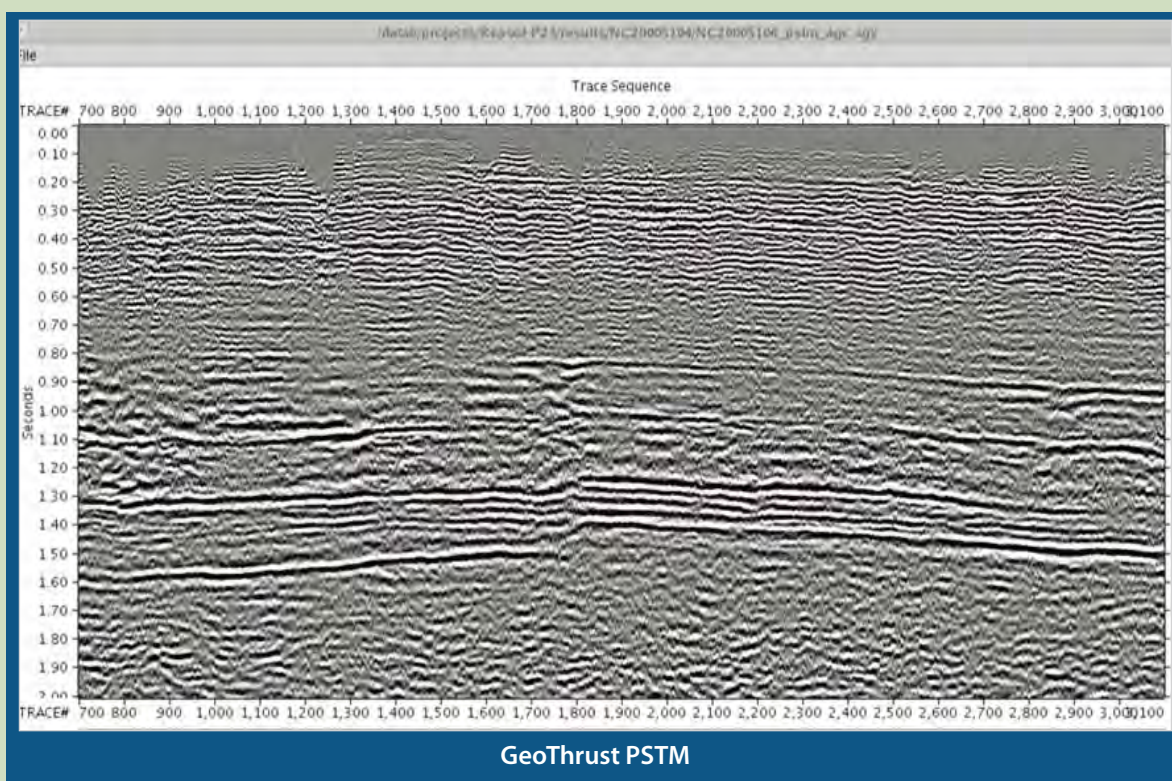
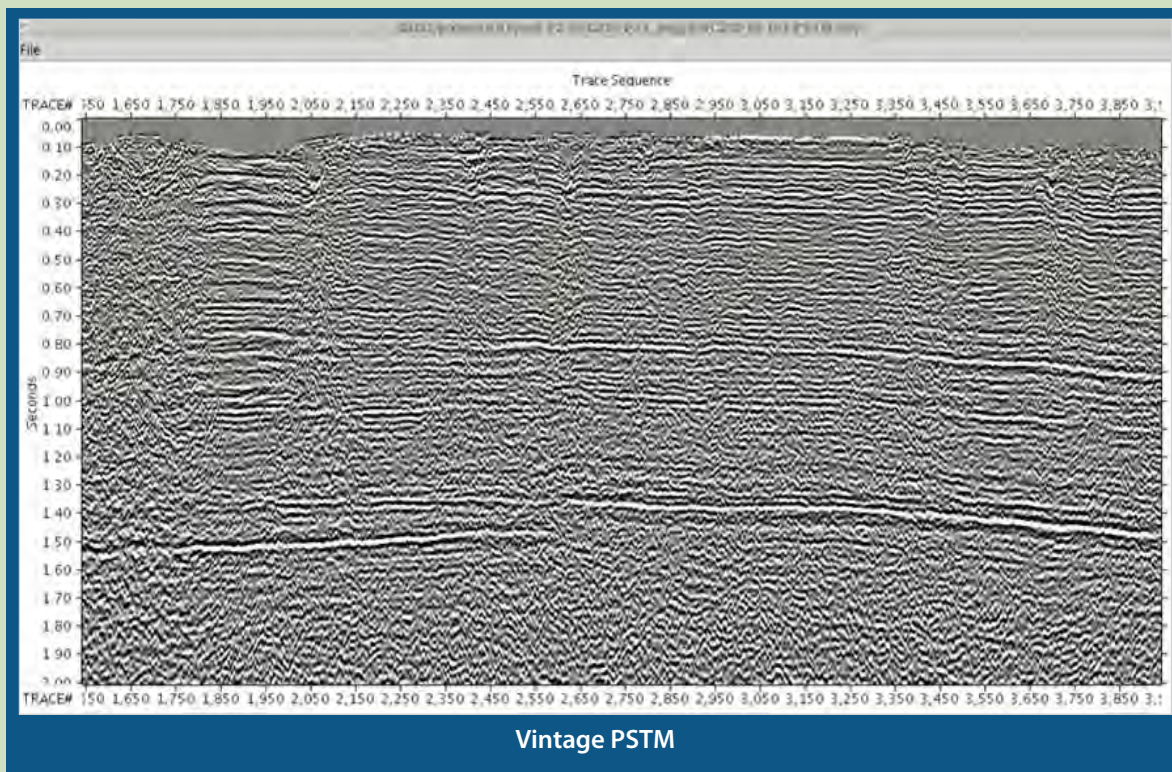
GeoThrust PSTM



# Land Case for Imaging Faults in Libya

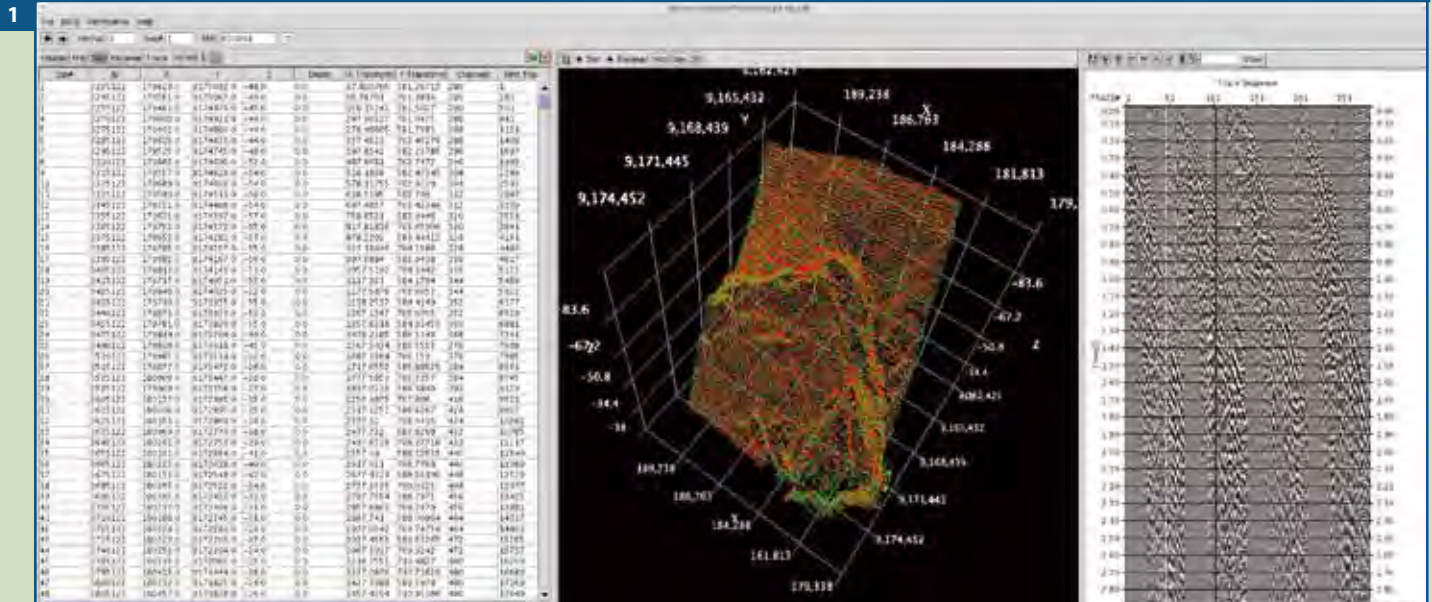
(Courtesy of REMSA)

Vintage image is unable to show faults and the top of shale, while GeoThrust offers interpreters more details in such areas.



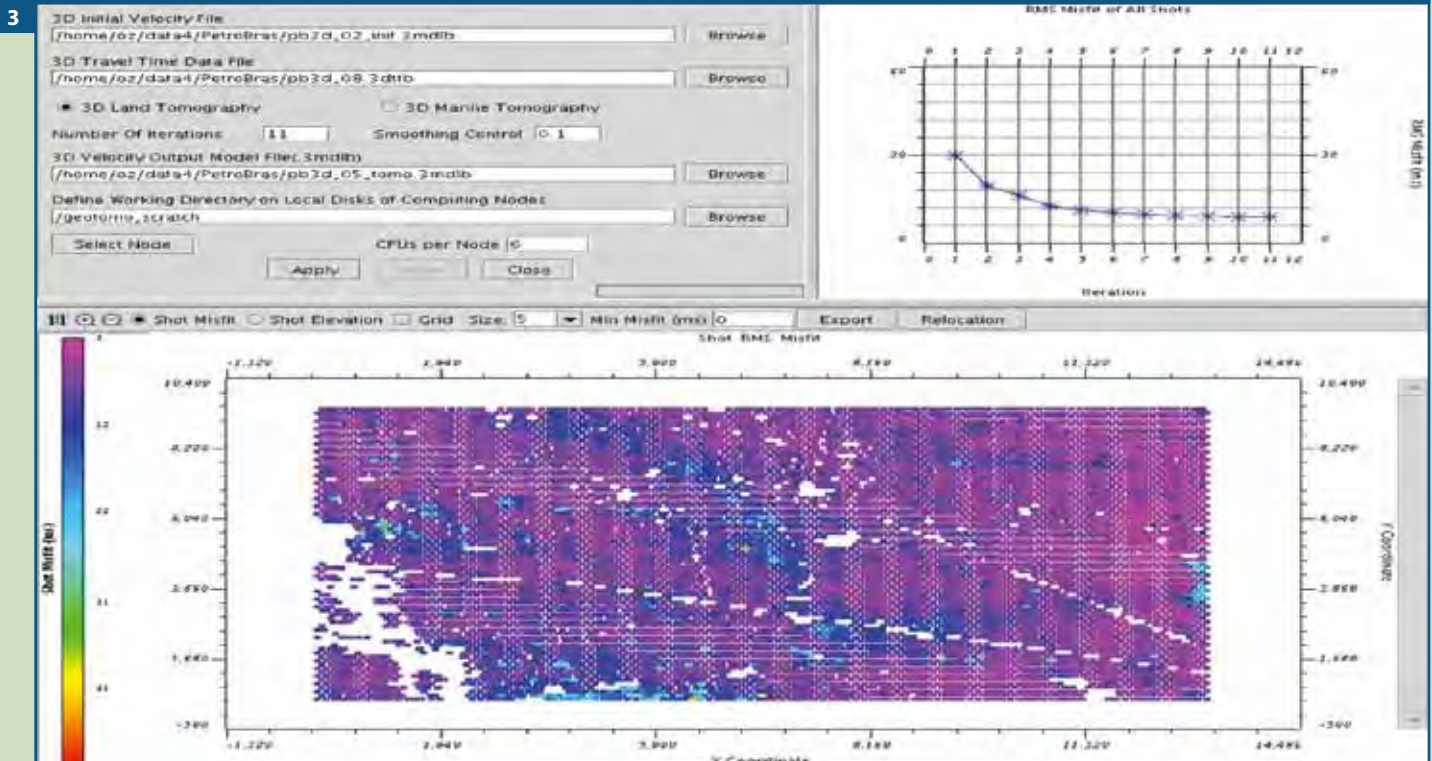
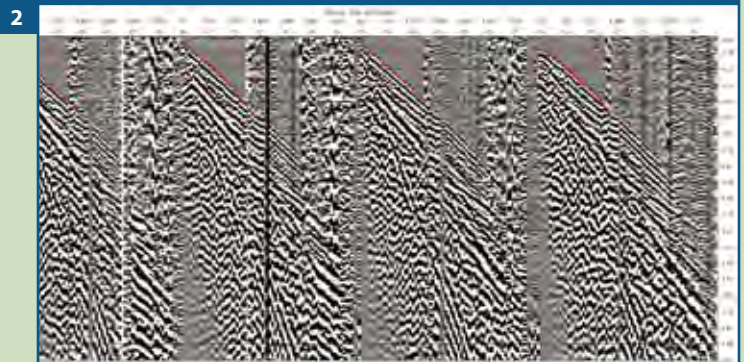


# Workflow Driven Architecture



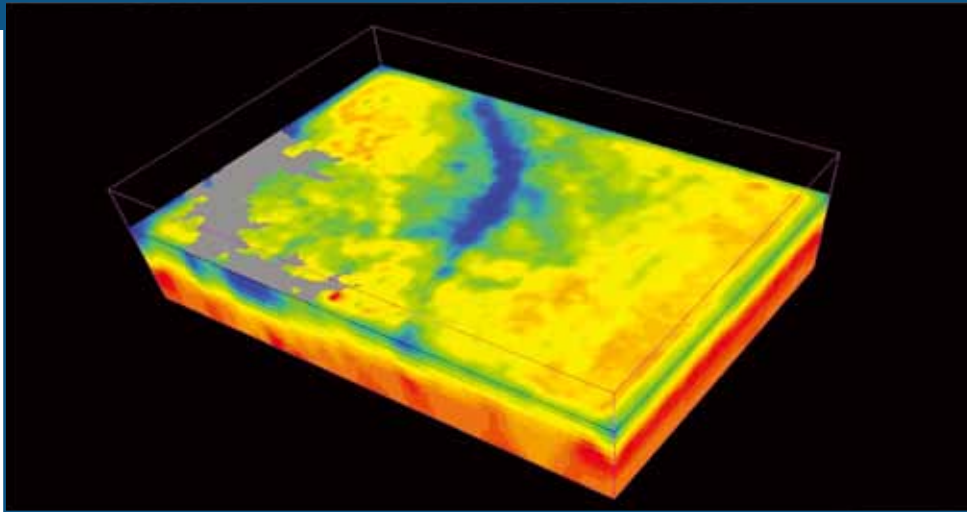
## Phase I

- 1) Build geometry
- 2) Pick first breaks, edit traces, edit picks
- 3) Estimate near-surface model by nonlinear traveltime tomography
- 4) Obtain a 3D near surface velocity model
- 5) Define floating datum and intermediate datum
- 6) Calculate TomoStatics and residual statics

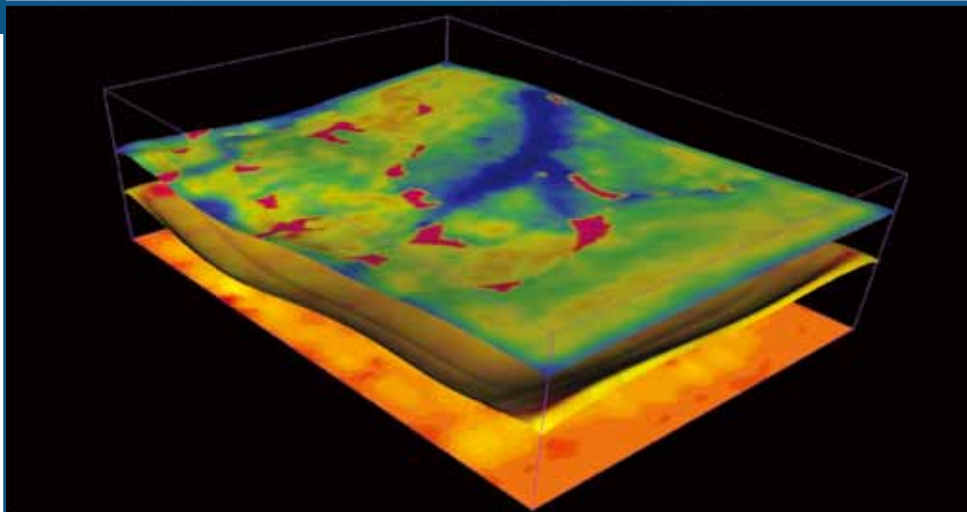


# Workflow Driven Architecture

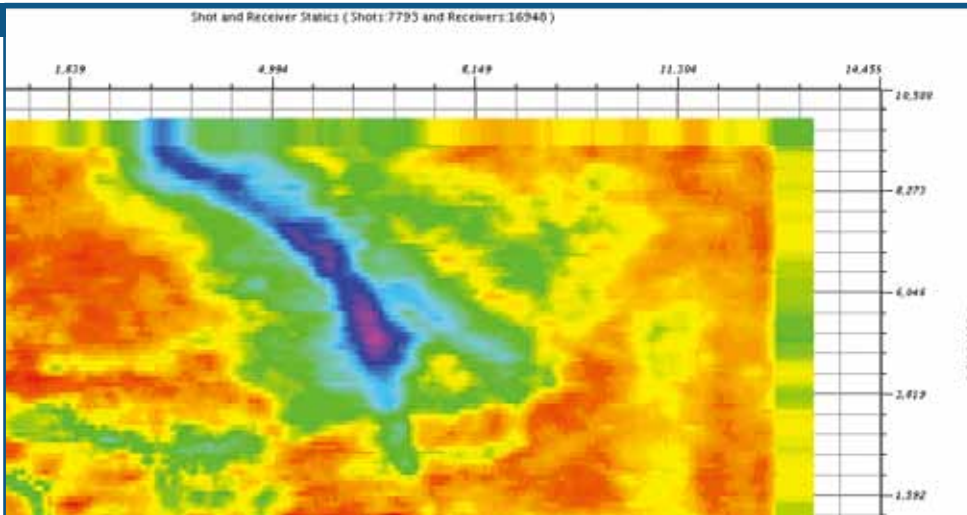
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# Workflow Driven Architecture

## Phase II

7) Prestack signal processing

## Phase III

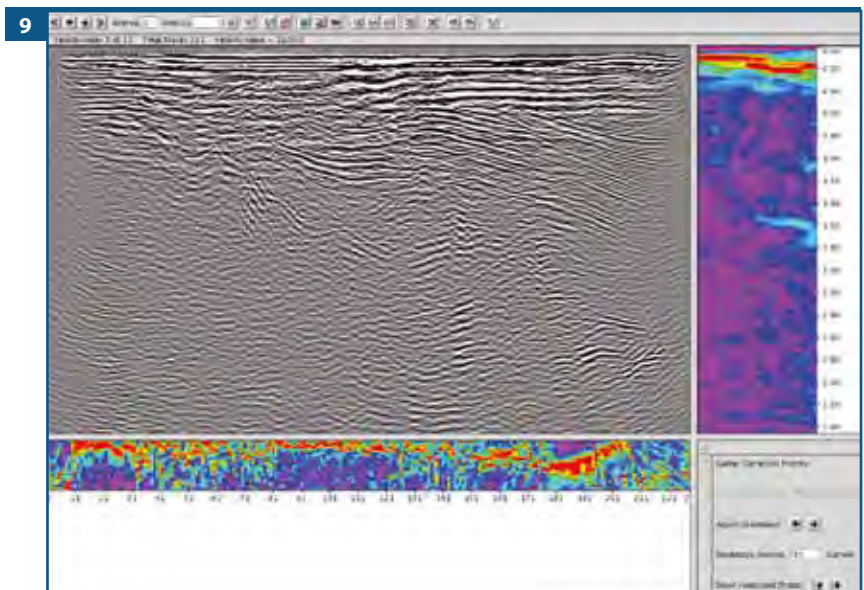
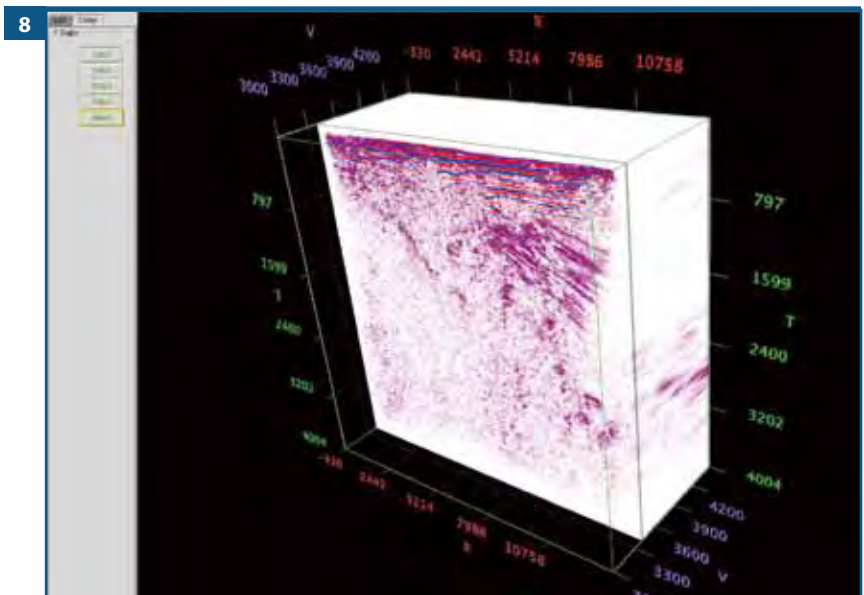
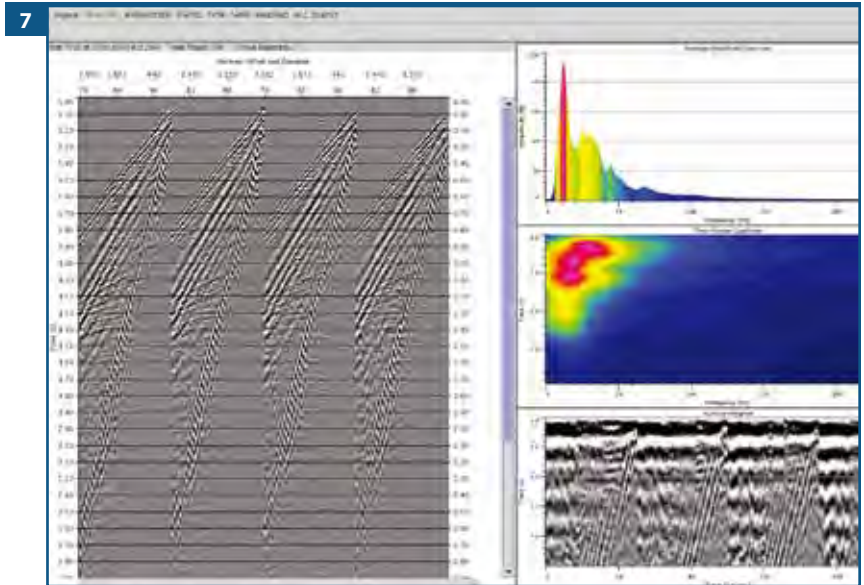
8) Build the RMS velocity cube

9) Pick the RMS velocity and build the RMS velocity field

10) Perform prestack time migration

11) Update the RMS velocities

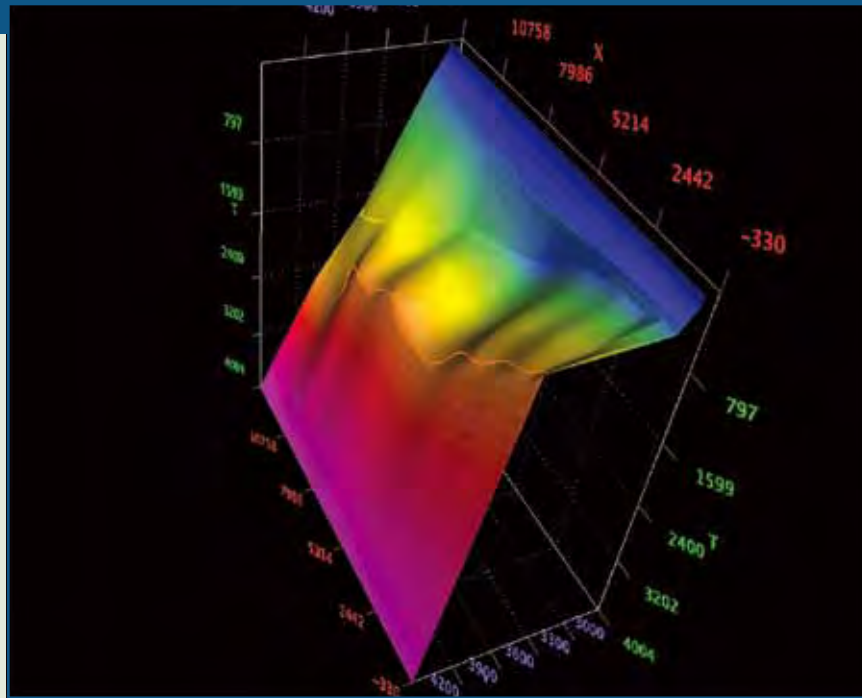
12) Perform demigration



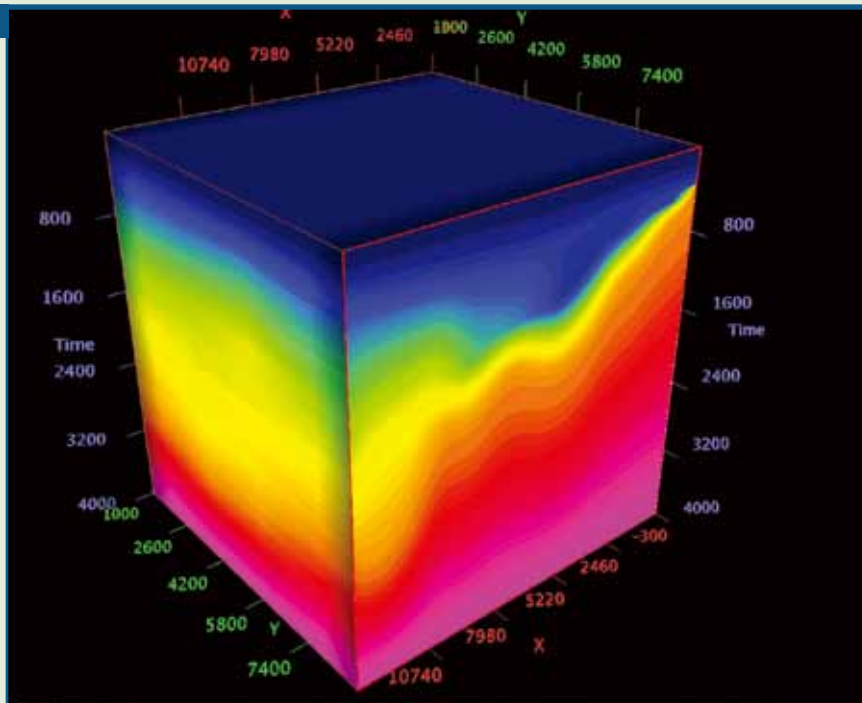


# Workflow Driven Architecture

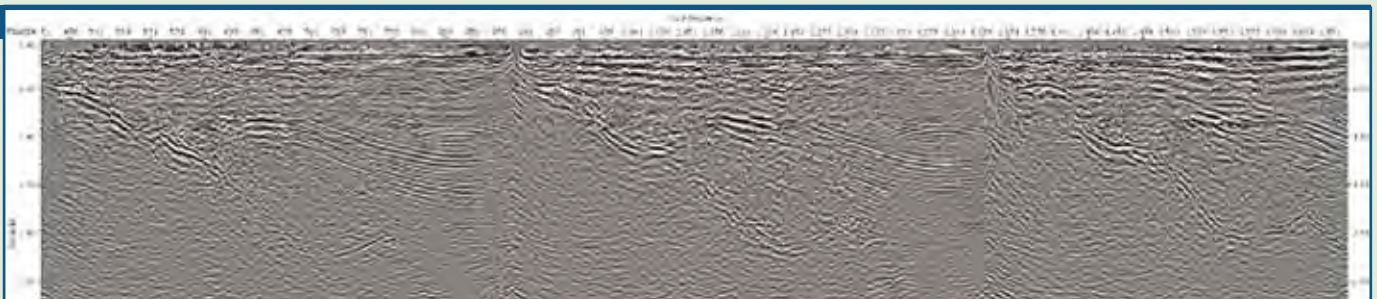
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# Workflow Driven Architecture

## Phase IV

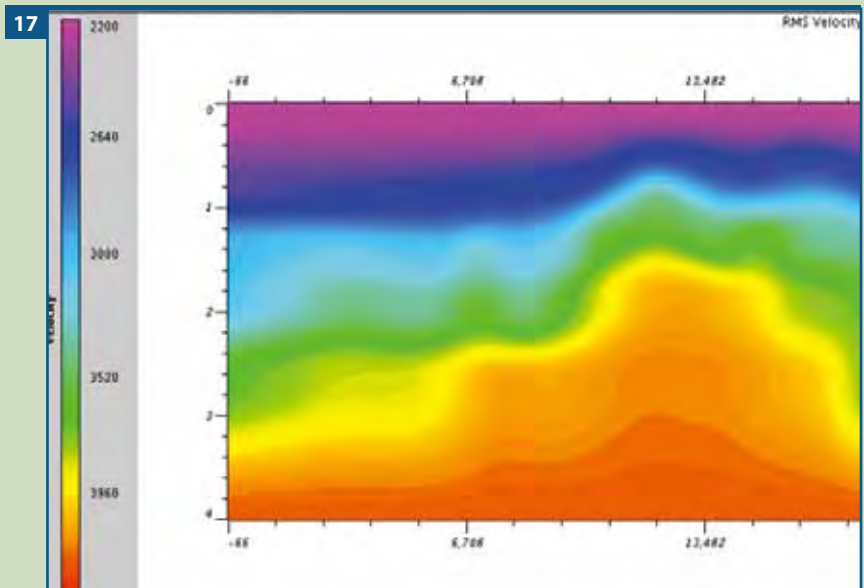
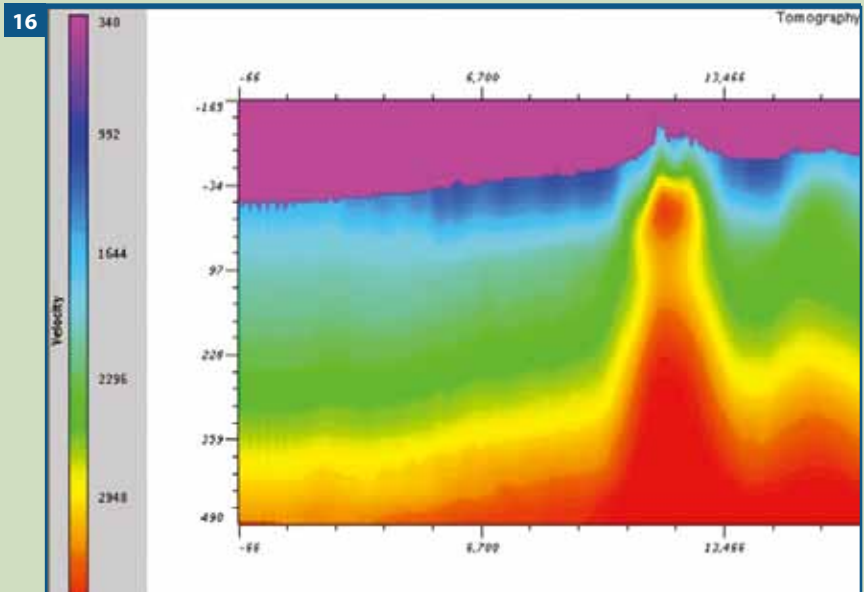
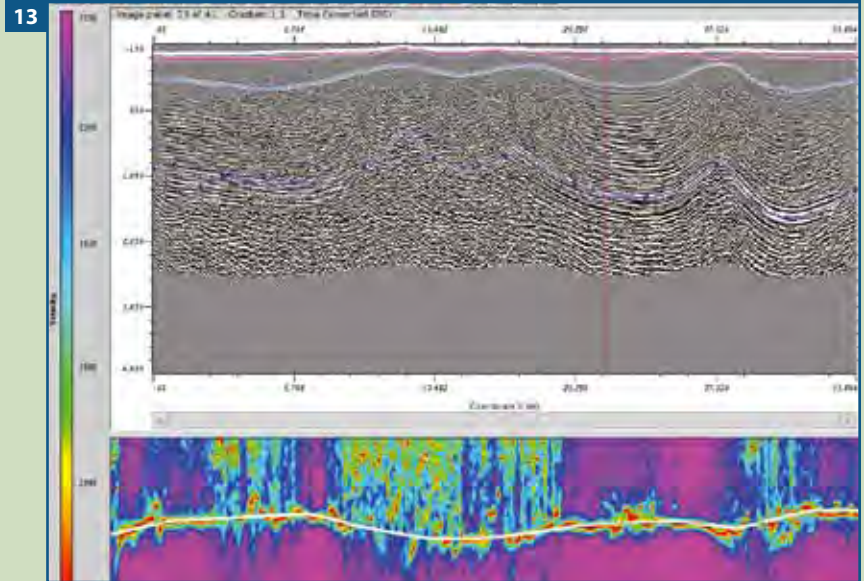
- 13) Build velocity depth model
- 14) Perform prestack depth migration

## Phase V

- 15) Post migration signal processing

## Deliverables

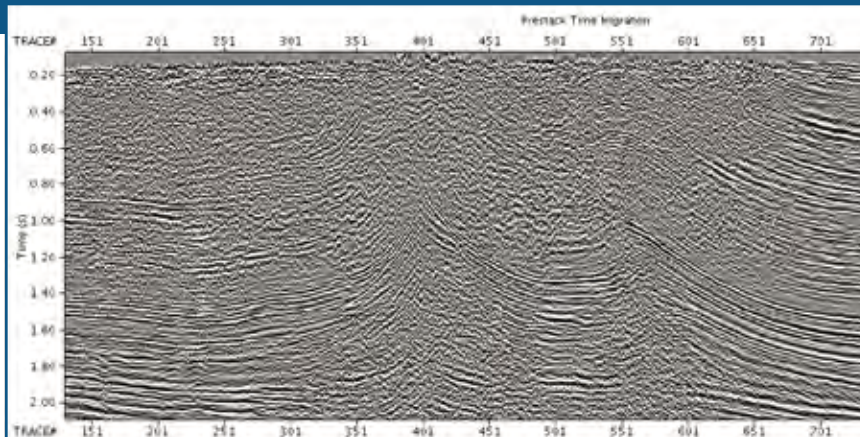
- 16) Near-Surface model
- 17) RMS velocity field
- 18) PSTM image
- 19) Demigration
- 20) Interval velocity field
- 21) PSDM image



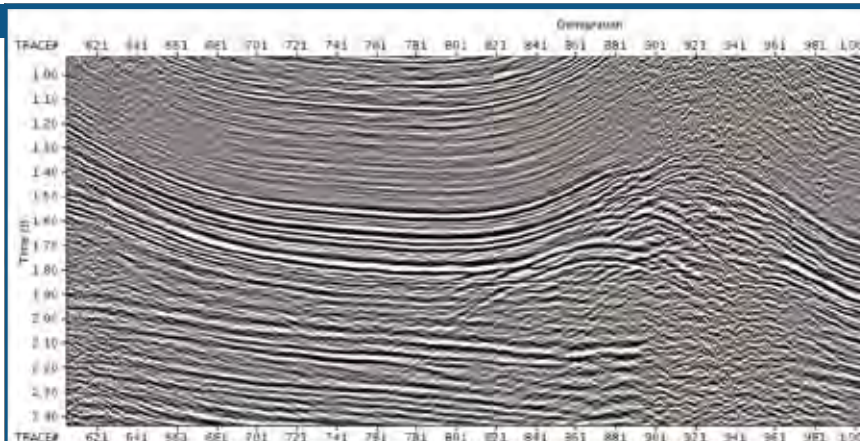


# Workflow Driven Architecture

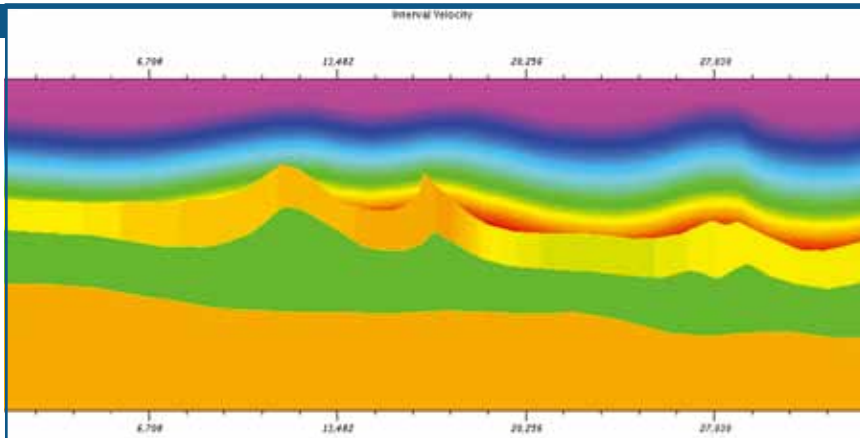
18



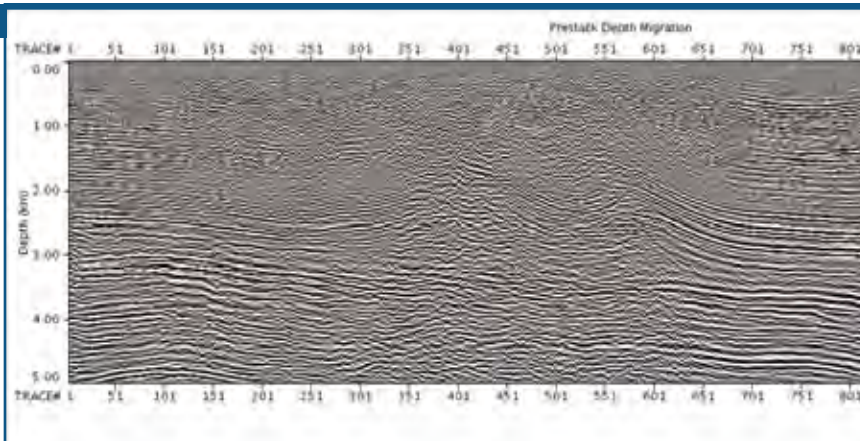
19



20



21



### **Surface Seismic Software Products**

|                  |                            |
|------------------|----------------------------|
| <b>TomoPlus</b>  | TomoStatics Solution       |
| <b>GeoThrust</b> | 2D & 3D Data Processing    |
| <b>WaveMAP</b>   | 3D Wave-Equation Migration |

### **Downhole Seismic Software Products**

|                 |                            |
|-----------------|----------------------------|
| <b>VECON</b>    | Survey Design and Modeling |
| <b>VISUS</b>    | 3D Seismic Visualization   |
| <b>TomoxPro</b> | Crosshole Imaging          |

### **Geophysical Engineering Software Products**

|                |                                |
|----------------|--------------------------------|
| <b>GeoCTI</b>  | Field QC refraction tomography |
| <b>GeoCTII</b> | Full 2D tomography             |
| <b>Tomo3D</b>  | Full 3D tomography             |

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Tel: 281-597-1429

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