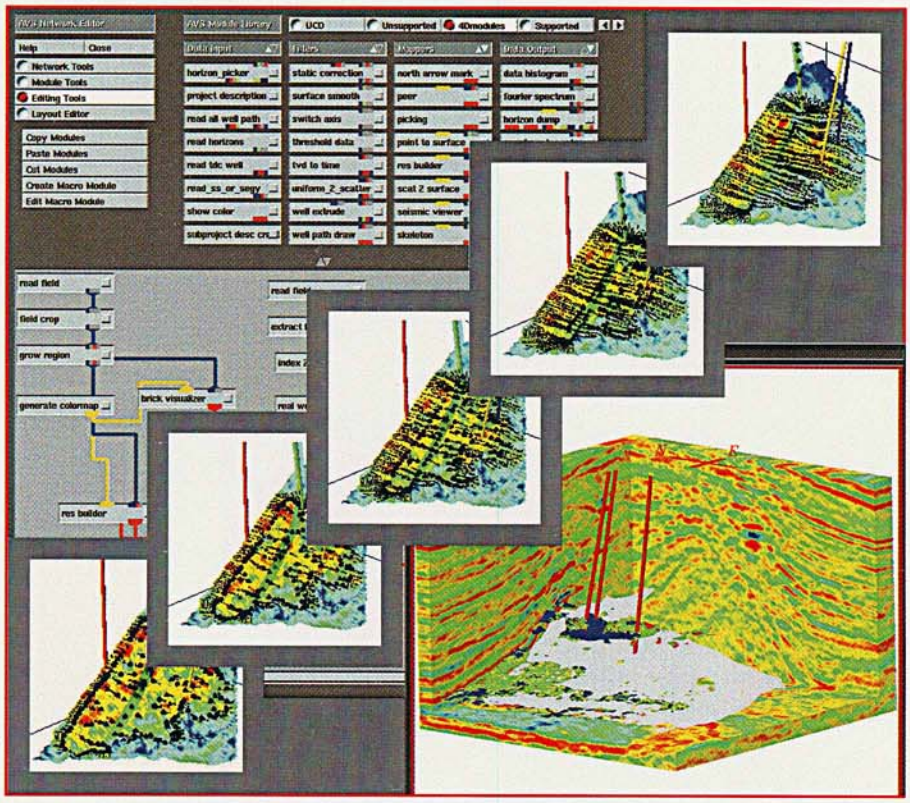
Now Available from Western Geophysical

Lamont 4-D Software for Enhanced Recovery

The industry's first 4-D software for increasing reservoir yields is now available from Western Geophysical as part of a service package or as a licensed software product. Developed by scientists at Columbia University's Lamont-Doherty Earth Observatory, the Lamont 4-D software allows you to evaluate the history of fluid movement in the reservoir, predict future movement, and calculate hydrocarbon volumes.

Two software products — Rapid Analysis and Inversion — provide the tools for interpreting multiple 3-D data sets, including legacy data, to describe time-lapse seismic differences and their relation to changes in the reservoir. The Lamont 4-D software has been proven in actual field studies and is currently being used to monitor fluid movement in almost half of the 4-D projects worldwide.



The series of reservoir models depict oil drainage into a simulated horizontal well over time. The Lamont 4-D software significantly reduces analysis time—An average reservoir study can be completed in only three days, allowing for the timely use of 4-D seismic data in production management.

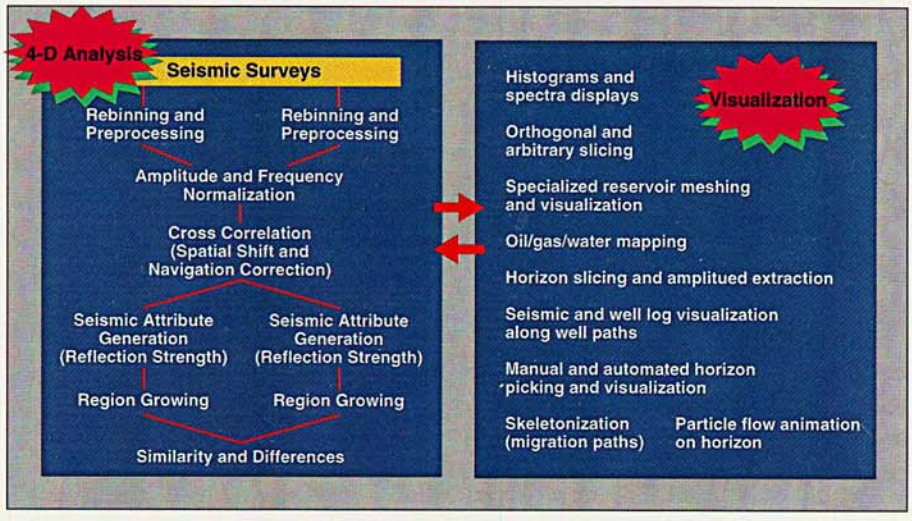
4-D Capabilities

The Lamont 4-D software allows you to:

- Track fluid movement
- Calculate seismic response to fluid changes
- Enhance the determination of:
  - Porosity
  - Lithology
  - Structure
  - Fluid saturation

Identify:

- Bypassed oil and gas
- Drainage patterns by compartments (fault blocks, etc.)
- Hydrocarbon volumes in place
- Potential new well locations



Processing flow of 4-D rapid analysis

Key Features

Rapid Analysis Product

Feature	*Benefit*
Survey rebinning	Quickly merges multiple surveys into the same grid volume
Spectral matching	Normalizes surveys by extracting seismic signals for comparison
Region growing	Intelligently selects and isolates oil and gas reservoir changes with time in a statistically meaningful manner
AVS™ graphics system	Enhanced 4-D capability through the use of a state-of-the-art visualization language

Inversion Product

Survey rebinning	Quickly merges multiple surveys into the same grid volume
Enhanced normalization	Models the differences to further refine the seismic signal similarities in multiple surveys
Enhanced region growing	Adds quantitative measurement to reservoir properties
Export of reservoir properties	Enhances predictive simulation capability to reservoir simulator
Quantitative interpretation of fluid changes over time	Allows volume calculations and aids decision making
Consistent inversion of multiple surveys	Increased accuracy of calculations
Integrated applications	Use as a stand-alone package or with the Rapid Analysis product. Can also be linked to proprietary products and techniques.

AVS is a trademark of the Advanced Visual Systems Corporation.

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