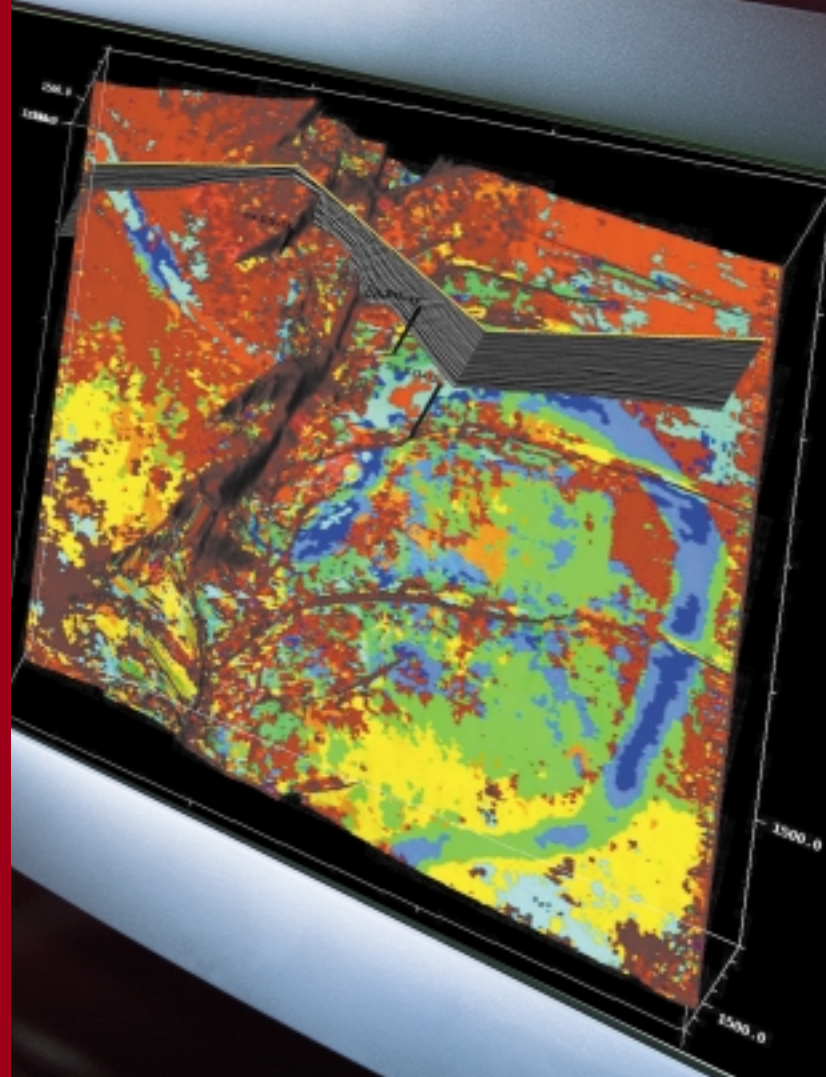


Stratimagic

Seismic Facies Classification and Analysis



Reservoir
Characterization and
Petrophysics Solutions
Putting your Reservoir into Perspective



Stratimagic

Advanced classification techniques, unique patented technology and ease of use make the Stratimagic facies classification and analysis system the leading commercial solution for seismic facies analysis in the oil and gas industry.

Making Reservoir Characterization Technologies Accessible to the Interpreter

Comprehensive classification workflows provide unparalleled insight into the reservoir

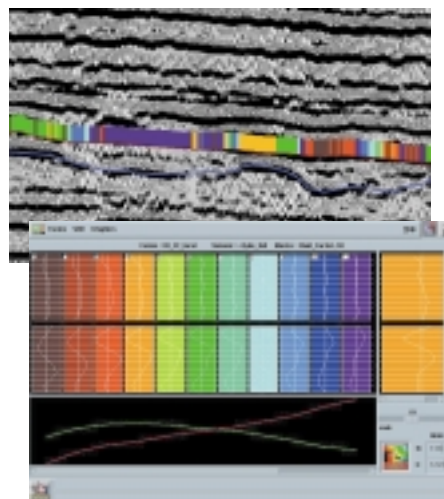
Seismic facies analysis and automated classification are playing an increasingly vital role in interpretation workflows within the oil and gas E&P industry. These methods have proven their tremendous value in the stratigraphic and structural interpretation of 3D seismic data. Facies analyses that previously took a specialist months to perform **can now be completed by an interpreter in less than a day**. These techniques have been particularly successful in stratigraphic plays, where conventional methods failed to characterize the spatial distribution of depositional units.

Stratimagic™, the pioneer of computer-aided seismic facies classification and the de facto standard in the market today, is designed to support the qualitative and quantitative assessment of the reservoir through seismic facies analysis. **Stratimagic**

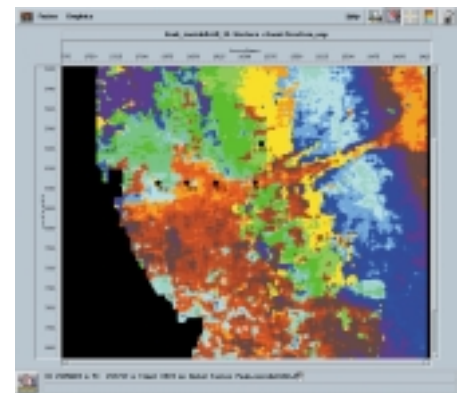
offers an innovative user interface to accelerate the learning process and maximize productivity.

Stratimagic continues to lead the industry with advanced classification techniques like the self-organizing map (SOM) **Neural Network Technology (NNT)** for trace-shape pattern recognition. Paradigm's patented NNT implementation reduces sensitivity to noise and enhances the identification of representative trace shapes over a targeted area, such as a reservoir.

Stratimagic's unique use of the neural network enables the detection and interpretation of subtle reservoir characteristics that had previously been hidden, and produces **geologically meaningful results that are easy to interpret, thus saving time and increasing confidence**.



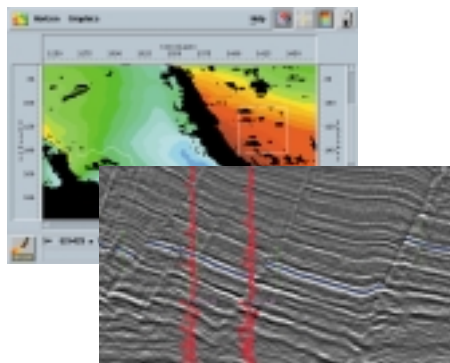
Stratimagic offers a fully integrated solution for multi-attribute classification applied to variable and constant time/depth intervals



Using the NNT, classification maps are computed from neurons to show the distribution of seismic facies

3D Propagator - unrivaled productivity and accuracy

Good classification starts with accurate horizon picking. **Stratimagic's 3D Propagator™**, a unique, waveform-based, 3D horizon auto-tracker, provides **unmatched accuracy**. Through interactive control of seed position, quality threshold and interval thickness, the **3D Propagator** **rapidly and accurately** selects the most reliable path to extend a horizon. The process is based on the correlation of trace shape and its propagation along the path of highest correlation. This makes the picking less susceptible to minor variations in amplitude and cycle skipping, as compared to amplitude-based auto-trackers. The resulting reference horizon is used to **accurately define the interval for classification**, which is critical for trace shape recognition.

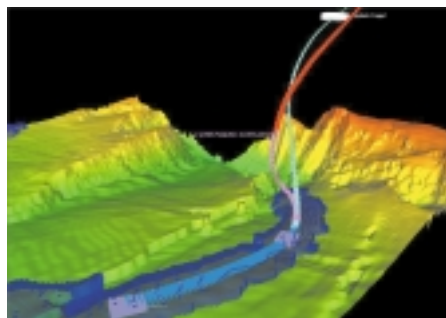


With the 3D Propagator, reliable horizon interpretations can be constructed from a few seed points

Stratimagic and VoxelGeo - a powerful solution for facies volume analysis

Through **Stratimagic's** integration with the industry-leading **VoxelGeo®** volume-based seismic interpretation system, data such as facies maps and volumes, well information

and attribute surfaces can be **easily viewed and analyzed in VoxelGeo, with no workflow disruptions**. Facies classes can be isolated and analyzed quickly and accurately in 3D space. Using **VoxelGeo's** unique sub-volume detection capability, prospective geobodies are identified based on facies classes, for **more precise well targeting**.



VoxelGeo enables the user to visualize and isolate selected facies classes

Direct access to third party databases eliminates data duplication

The robust CORBA technology for accessing remote databases has been expanded to enable direct write back of maps to designated third-party databases, eliminating the need for time-consuming data import/export. In addition, **Stratimagic** can access previously generated well groups from third-party databases, such as Landmark Graphics' OpenWorks®, and Schlumberger's GeoFrame®, with no need to copy data. This assures an **undisrupted and smooth workflow**, for maximum productivity.

Stratimagic supports both Sun® Solaris™ and SGI® IRIX® workstations.

Stratimagic results are easily understood across all disciplines, contributing to effective project management



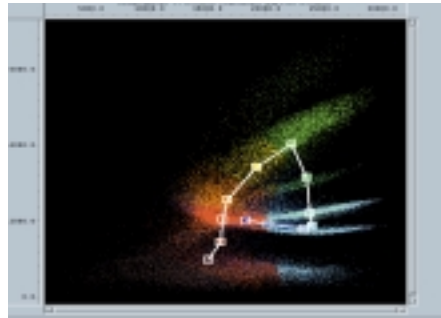
Stratimagic Success Stories

Intelligent attribute analysis at your fingertips

No single attribute can effectively describe a reservoir, and determining which combination of attributes offers the most complete picture is a random and time-consuming task. **Stratimagic** offers a **proven methodology** to both improve confidence in the results, and dramatically reduce turnaround time.

Dozens of attribute maps can be computed for any given surface or interval. These maps can then be analyzed independently or together, providing quick and accurate interpretation results.

The **unique mixed map tool** makes it possible to combine maps or seismic sections to visually compare different attribute values over the area of your survey. **Stratimagic's** dynamic color management tool lets you highlight areas of interest immediately. This powerful, fully integrated feature interacts with all data and displays in **Stratimagic**.

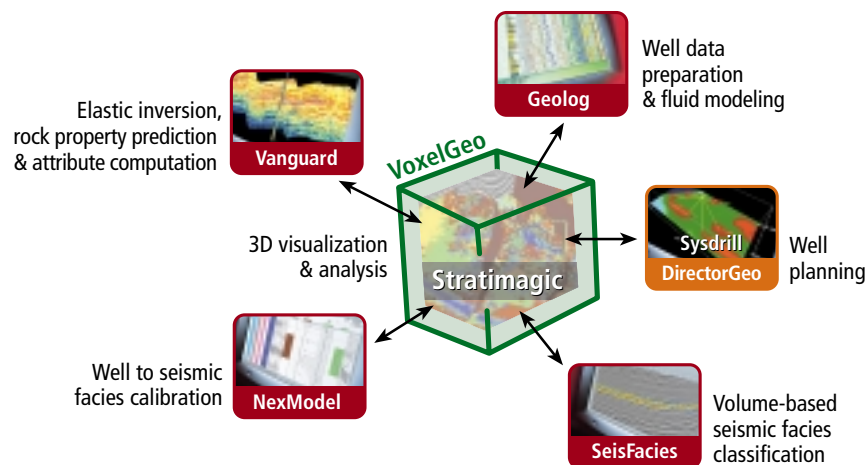


Classes defined by SOM represent the internal organization of multi-attribute data, producing geologically meaningful results that are easy to interpret

Robust mapping packages provide a clear picture of your prospect

The dynamic mapping operations, analysis tools and geostatistical capabilities of the interactive **StratQC™** integrated mapping module combine with **Stratimagic** to ensure an enhanced level of confidence in prospect and reservoir analysis. Paradigm's **iMap™** advanced geoscience map application can be used to grid and smooth horizon and fault interpretation.

The Integrated Seismic Facies Classification Workflow



*As an integrated component of Paradigm's reservoir characterization and petrophysics solutions group, **Stratimagic** helps understand the seismic response to complex geologic features and improves interpretation accuracy*

East Texas: A seismic stratigraphic analysis using **Stratimagic** was performed by a customer on a survey located in the prolific "reef trend" of East Texas. Seismic anomalies had been identified and drilled recently. Production characteristics of these individual reefs varied dramatically, indicating pervasive reservoir heterogeneity. Conventional seismic attribute analysis, while useful in delineating the distribution of reef buildups, was unable to characterize differences in reservoir performance.

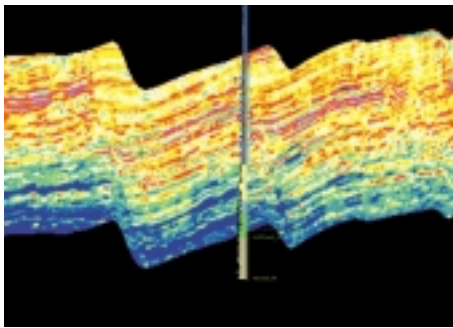
Stratimagic facies maps succeeded in differentiating the productive reefs from the poor performers.

Gulf of Mexico: Geohazards can significantly affect drilling programs. If while drilling, unanticipated non-consolidated sands are encountered, serious problems can result, and the well may need to be re-drilled. A proper examination of the shallow water zone, done prior to submitting drilling plans, is essential. **Stratimagic has proven extremely effective in locating geohazards.** A competitor to one of our customers incurred huge, unexpected losses due to geohazards when drilling in water depths exceeding 4,000 ft. **Using Stratimagic, our customer was able to detect and avoid these geohazards, thereby saving millions of dollars, maximizing safety, and enabling drilling to proceed as planned.**

Western Venezuela: A customer used **SeisFacies** to perform detailed stratigraphic interpretation and fluid prediction in a sand reservoir in Western Venezuela. The seismic classification results helped **enhance the geological model of the reservoir and enabled the identification of several previously undetected prospects.** The use of multi-attribute volumes in the classification, together with **VoxelGeo's** unique 3D volume-based visualization and volumetric analysis of the reservoirs, **resulted in the identification of several new prospective areas in the interval.** These prospects are now part of an active drilling campaign.

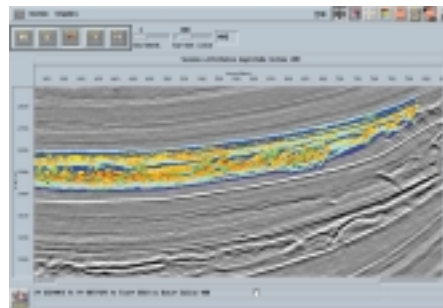
Tools for advanced reservoir characterization

The **Vanguard™** reservoir property generation system supports a comprehensive workflow for integrating seismic and well data to provide reservoir property volumes. **Vanguard** incorporates a broad range of technologies, including seismic-to-well calibration, geostatistics, Elastic Impedance inversions, neural network inversions, crossplot analysis, comprehensive attribute calculations, AVO modeling, fluid substitutions and rock physics. These technologies, together with **Stratimagic's** seismic facies classification capabilities, enable users to obtain **accurate predictions of reservoir properties from seismic data**.



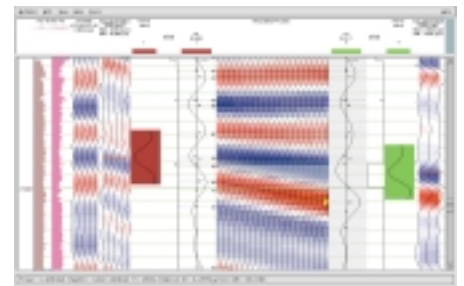
Vanguard generates rock properties from seismic data, enabling detailed reservoir characterization

The **SeisFacies™** volume-based seismic facies classification add-on module is a robust solution for multi-attribute classification and calibration of seismic data. Sharing the same intuitive interface and infrastructure as **Stratimagic**, **SeisFacies** makes it possible to classify individual seismic samples at the reservoir level, using multiple attributes in a seismic survey. This powerful solution **improves interpretation results while increasing productivity**, with workflows that combine Principal Component Analysis (PCA) with robust classification techniques. The resulting facies can be calibrated to well information for **more accurate prediction of lithology and fluid content**.



SeisFacies extends the applicability of Stratimagic by combining attributes to calculate facies volumes

The **NexModel™** seismic facies well log calibration tool is fully integrated with **Stratimagic** and is a key component of the seismic facies analysis solution. In **NexModel**, advanced modeling techniques are used to interactively and dynamically calibrate seismic facies maps to petrophysical properties, adding value to your interpretation results. What was originally a qualitative map of seismic character now becomes a quantitative map showing the spatial variability of selective petrophysical properties.

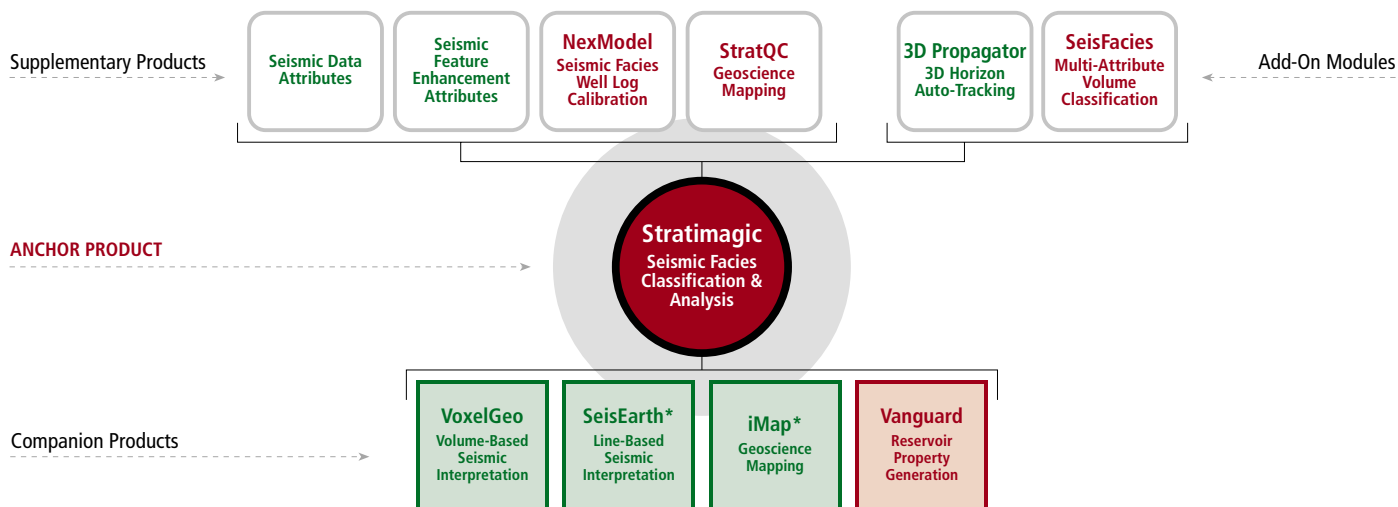


NexModel displays interactive modeling of petrophysical properties and their effect on the seismic response

How Stratimagic Benefits You

- **Stratimagic is a proven oil and gas finder that offers reliability and stability.**
- **Stratimagic makes reservoir characterization technologies accessible to the interpreter.**
- **Stratimagic's patented implementation of Neural Network Technology produces consistently meaningful results that are easier to interpret than other methods.**
- **The waveform-based 3D Propagator provides unprecedented speed and accuracy in horizon auto-tracking, for more precise classification results.**
- **The powerful VoxelGeo - Stratimagic combination makes it possible to analyze the results of the facies classification in 3D space, for better-informed well planning decisions.**

Enhanced Paradigm Solution for Stratimagic Users



* Available on Epos 3.0 integration framework

Paradigm Integrated Solutions

Paradigm provides information solutions to the leaders of the oil and gas industry worldwide. The company has a global network of sales, service and user support, with 22 offices in 19 countries, serving all major oil and gas producing provinces in the world. Paradigm's advanced set of **Software Solutions** and **Geophysical and Reservoir Study Services**, in the form of **Trace-to-Target** workflows, supports every stage in the oil and gas E&P process, from **Data Processing and Imaging**; through advanced **Visualization, Interpretation and Earth Modeling**; to **Reservoir Characterization and Petrophysics**; up to **Well Planning and Drilling** Operations. All of these solutions are supported by the **Epos Data Management and Interoperability** integration framework.

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