INDUSTRY BIOSTRATIGRAPHY IN THE 21ST CENTURY: HOW WILL WE USE "BUGS" TO FIND OIL AND GAS?

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Biostratigraphy is rapidly becoming a "full partner" alongside wireline logs and seismic as a quantitative, fully-integratable data source that can help provide robust solutions to complex geologic problems encountered in the search for hydrocarbons.

By not adopting standards for taxonomic and stratigraphic concepts, specimen counting, digital data format, and paleobathymetry calculations, biostratigraphers have limited the effectiveness of their own data. A committee of the GCS-SEPM is addressing these issues; successful results will allow the merger of multiple-sourced biostratigraphic data into higher-quality, larger-volume, and more-useful data bases. Many companies have developed or are developing large, relational biostratigraphic data bases which permit rapid querying and mapping of geologic data within a chronostratigraphic framework. These data bases also permit rapid testing of the stratigraphic "fidelity" of biostratigraphic and log markers.

Digital capture of microfossil data from well and outcrop samples permits rapid computer analysis and plotting of biostratigraphic range charts, cross plots, and "curves". Integrating these biostratigraphic plots with log and seismic data indicates the microfossil record reliably characterizes the key stratal surfaces (flooding surfaces and sequence boundaries) which underpin the interpretation of sequence stratigraphic architecture. Field- to exploration-scale case studies illustrate the value of using biostratigraphic signatures to help solve geologic problems via an integrated, sequence-stratigraphic approach.

Detailed paleobathymetry curves covering various chronostratigraphic intervals from many Gulf locations provide the raw material for defining local to regional, relative sea-level events. In some cases, the vertical succession of paleobathymetry changes associated with higher-order sequences can produce unique stratigraphic signatures useful for detailed local correlation.

By bringing together oil company biostratigraphers, academicians, and vendors, the Technical Alliance for Computational Stratigraphy (TACS) at the University of Utah is developing a biostratigraphic workstation that will link existing software and embed intelligent systems for integrating log and seismic attributes. Biostratigraphic workstations that allow geoscientists - not just paleontological specialists - to retrieve, analyze, integrate, and plot paleontologic data, are the key to a vibrant biostratigraphy industry in the 21st Century.