



Figure 1: Seismic Visualization of Multiple Sections

## Seismic Visualization of Multiple Sections

Seismic TMI-08 is a new way of displaying seismic data developed by Dr. Tracy Stark at Stark Research. Figure 1 shows, going from left to right, Miocene, Frio, and Yegua point bars, a Yegua channel and clinofolds, multiple Cook Mountain overlapping channels, and a Wilcox truncation, all from one small onshore Texas 3-D seismic survey. Data visualization techniques allow interpreters to integrate more types of data and extract more useful and pertinent information in significantly less time. This approach requires the application of special hardware, software, and display solutions, coupled with experience and proper training. The ultimate goal is to recognize and convey the maximum amount of geologic information in a minimum amount of time. TMI-08 is an optimization of these goals for exploring for gas filled stratigraphic traps.

The seismic visualization approach creating these images is referred to as ColorStack. Combinations of three spectral decomposition bands and adjacent time-slice sections are assigned to red, green, and blue video channels, and when they are combined the resulting image highlights “bright spots” and shows depth and dip. These new visualization techniques show geologically significant events. Point bars, channels, truncations, and other geological events which are invisible on standard time-slices become obvious. When this visualization approach is applied to geologic age seismic volumes, entire channels and their associated point bars become obvious. Time-slices or depth slices do not cut all along a channel, and so it is hard to interpret the geology accurately. Horizon amplitude extraction has been used for the last couple of decades to look at amplitude anomalies associated with a common depositional time frame, like a channel. Of course, parallel horizon extractions can be calculated, along with spectral decomposition of horizon extractions, to create the same type of displays shown in Figure 1 in order to convey the maximum amount of geologic information in a minimum amount of time without creating a seismic age volume.

DRC proposes an investment of \$200,000 as an advance against building TMI-08 visualization examples from Investor specified seismic surveys at 10 cents per trace. To purchase the right to work the 30+ 3-D surveys this test was done on costs an additional investment of \$250,000 plus a 25% Back-In. To lease and drill the example which have been mapped so far in the Gulf Coast requires an investment of at least \$10 million. Dr. Tracy Stark is the DRC team leader for TMI-08 and Roice Nelson is managing exploration using the visualization technologies.