FILLON, RICHARD H., Earth Studies Associates, 3730 Rue Nichole, New Orleans, Louisiana 70131,

Multiple Overlapping Foraminiferal Litho-Biofacies: Applications to Deep-Water Sedimentology and Reservoir Properties of Turbidites

Foraminiferal assemblages in deep-water sediments contain: (1) indigenous benthic taxa that represent combined bottom-water/bottom-sediment subenvironments; (2) planktonic taxa that settle from near-surface habitats into benthic environments after death; and, (3) allochthonous benthic shelf taxa that are transported downslope into deep-water biotopes as empty tests or as displaced living populations. Developing a better understanding of the succession and dominance of subenvironments within a complex deposystem is the ultimate goal of litho-biofacies analysis. While a robust turbidite litho-biofacies model can easily be constructed for deep-water turbidite sections, in practice, because of the nature of well cuttings its application in detailed reservoir analysis is more complicated. Sample by sample comparison of taxonomic data with a litho-biofacies model requires an understanding of how the mixing of cuttings in the returning stream of drilling mud can cause litho-biofacies that were mutually exclusive *in situ* to appear to overlap in the biostratigraphic record. Because even the most detailed paleontologic analyses of cuttings record taxa representing several distinct turbidite subenvironments in each sample, in assessing deep-water subenvironments it is necessary to use a qualitative or quantitative strategy to help unscramble the litho-biofacies signal. A graphical partial signal deconvolution approach has been used successfully to distinguish multiple overlapping litho-biofacies in a variety of deep-water environments. It is more important to un-mix turbiditic litho-biofacies than bathymetric biofacies. Turbidite systems are typically deposited within a single paleobathymetric zone, but contain many depositional subenvironments, which are key to understanding their reservoir potential.