

TOWARD A HIGHER RESOLUTION UNDERSTANDING OF FLUVIAL TO SHALLOW MARINE CLASTIC RESERVOIR ANALOGUES AS RESOLVED BY GPR

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ABSTRACT

Fluvial to shallow marine deposition exhibit abrupt lateral and vertical discontinuities in facies that juxtapose porous and permeable units with impermeable ones. The complex depositional architecture of these preserved depositional systems represents a significant obstacle to correctly applying many of the conceptual models utilized in exploration. Examination of modern deposits of reservoir quality sand can assist in predicting their reservoir quality. GPR data will be acquired in the coastal plain of South Carolina to investigate the internal structure and stratigraphy of a variety of fluvial to shallow marine sand deposits, as well as to serve as an experiment in the application of GPR to sedimentological and stratigraphic research. Strike and dip oriented reflection lines, as well as common midpoint surveys will be collected in 100 and 200 MHz on fluvial point bars, overbank sand bodies, flood tidal deltas, barrier islands, and estuarine channel bars. The resulting data will be processed, depth converted, and interpreted. The processed and interpreted radar sections should resolve a variety of bedform types and scales, as well as internal surfaces corresponding to unconformity, flooding, and accretionary surfaces. Bedding packages can be well imaged and can be used to predict the scale of reservoir units using empirical relationships. The results should establish the suitability of the imaged deposits as reservoir analogues for ancient continental to near shore equivalents. The high resolution imaging made possible by GPR investigations of modern deposits will assist in locating and predicting the scale and reservoir quality of ancient equivalents in the subsurface.