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**Integrated Exploration: Surface Geochemistry and Basin Modeling of the Eastern Gulf of Mexico, Sale 181**

Integrating the results of geochemical analysis of produced oils, seeps from piston coring, basin modeling and the regional picture developed from wells and seismic data enabled us to assess the probability of mature source rock and hydrocarbon charge. This gave us an enhanced understanding of the petroleum systems active in the Eastern Gulf Sale 181 Area.

Basin Modeling was used to predict maturity and expelled HC volumes from both the Jurassic and Cretaceous postulated source horizons. Migration of hydrocarbons from the source kitchens to the prospects and to known structural and stratigraphic accumulations west and north of the Sale Area was simulated. Thermal constraints on the models included corrected bottom hole temperatures and surface heat-flow-probe data.

Large variations in source-rock maturity were predicted across the study area for each source horizon, caused both by differences in depth of burial of the source rock and by significant variations in heat flow. Predicted transformation ratios ranged from near zero to almost 100% across the study area, with the regions north and west of the Sale Area showing the highest maturities. Migration modeling enabled us to calibrate the models with nearby accumulations. Although much of the actual sale area is underlain by immature source rock, lateral migration paths lead into the area of interest from source kitchens to the West.

In general, the predicted areas of oil and gas generation and accumulation from the basin modeling were in good agreement with the results of the geochemical analysis of seeps and piston cores.