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Marylin P. Segall[1], Freyd K. Rad[2], Paul Wellman[2], Jacob Umbriaco[3] (1) University of Utah, Salt Lake City, UT (2) Kerr-McGee Oil & Gas Corporation, International Deepwater Exploration, Houston, TX (3) Energy & Geoscience Institute, The University of Utah, Salt Lake City, UT

# Geohazard Zonations in the Gulf of Guinea - Considerations for Offshore Exploration and Production

Near-surface sediments are characterized by unique physical properties that have potentially significant effects on prospect economics related to offshore concessions. Seabed morphology, methane concentrations, near-surface sediment properties and met-ocean dynamics all contribute to conditions that may pose constraints for exploration and development. These parameters affect initial exploration efforts, drilling capability, and eventual recovery.

Four offshore regions are evaluated for physical and environmental features that may have impacts on development: Ivory Coast, Ghana, Togo, and Benin. Each area is characterized by unique antecedent topography inherited during formation. Evaluation of met-ocean parameters is based on data from buoys, current meters, satellite imagery, phytoplankton biomass concentrations and temperatures/salinity profiles.

Prevailing and local currents are dominant erosional agents on the shelf edge and slope. Destructional processes occur at points of current divergence and upwelling. Reworked Holocene, Plio-Pleistocene and modern sediments dominate continental shelves and upper slopes of the basins. High-resolution seismic profiles of the few shelf-originating canyons indicate basinal deposits are derived from catastrophic failure on the slope through gravity flows, creep, undercutting and turbidity currents. Thick hemipelagic muds characterize intracanyon areas. Slope-originating canyons form where gradients are the steepest; turbidity-current deposits comprise the lower slope and basin seaward of these canyons and the intracanyon areas. Thickness of unconsolidated sediments within each region is variable; however, differences in lithology/degree of consolidation, migrating oceanic currents and displaced sediment packages result in sequences of foundation materials with non-uniform strength profiles. Integrated characterizations of environmental data and sediment properties are necessary components of a comprehensive basin evaluation.