

**Poster Session  
North American Explorationists Dinner Meeting  
Monday, December 12, 1994**

---

**Carbonate Depositional Sequences and Systems  
Tracts - Responses of Carbonate Platforms  
to Relative Sea-Level Changes**

by C. Robertson Handford and Robert G. Loucks

Standard carbonate facies models are widely used to interpret paleoenvironments, but they do not address how carbonate platforms are affected by relative changes in sea level. An understanding of how the subtidal carbonate factory responds to relative sea-level changes (and the role played by other environmental factors) allows one to differentiate platform types. It also helps establish a basis for constructing depositional sequence and system-tract models. The combination of in-situ carbonate sedimentation (which is also subject to transport) and

local variations in depositional processes result in the formation of a wide variety of stratal patterns.

Fundamental carbonate depositional principles and geologic-based observations were used to construct depositional sequence and systems tract models for a variety of rimmed shelves and ramps. The models show how, for example, depositional sequences made up of 1) carbonate, 2) carbonate-siliciclastic, or 3) carbonate-evaporite-siliciclastic facies are produced by depositional systems responding to 1) lowstand, 2) transgres-

sive, and 3) highstand conditions.

Factors outlined for each of the depositional systems above must be integrated with established facies models in order to arrive at comprehensive sequence and system tract models. *Modification may be needed to accommodate each case.* Once deemed applicable, they can function as working hypothesis to help predict, when used in conjunction with seismic surveys, to identify depositional systems and to locate reservoir, seal, and source prone facies.

**Biographical Sketch**

Dr. C. Robertson Handford received his Ph.D. in geology from Louisiana State University in 1976. Since then he has spent most of his professional career in research chiefly within the field of sedimentology and stratigraphy. He has worked for the Texas

Bureau of Economic Geology, and the research laboratories of Unocal, Amoco, and Arco. He taught geology at the University of Arkansas for two years.

Although his primary interest is in carbonates, Dr. Handford has conducted research and published papers

on evaporites, eolianites, fluvial and deep-marine siliciclastics, and karst processes and facies. Dr. Handford has received the SEPM Excellence of Oral Presentation Award on two different occasions and the SEPM Excellence of Poster Presentation Award (for the work described above).