



Models and Parameters Controlling Carbonate Slopes and Associated Gravity Flow Deposits

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ABSTRACT

Slope and basin-floor resedimented carbonates can form significant volumes in carbonate sedimentary systems. In several cases, resedimented carbonate accumulations have proven to contain hydrocarbon reserves, such as in the North Caspian Basin (along the flanks of carbonate buildups), or in the Gulf of Mexico and the U.S. Permian Basin (in basin-floor redeposited carbonates). If recent scientific efforts have focused mostly on the characterization of steep reef-rimmed carbonate slope architecture and processes, the wide spectrum of carbonate slope systems is far from being fully covered.

We present a comprehensive study of depositional/stratigraphic models of carbonate slopes and associated sediment gravity flow deposits based on the analysis of more than 500 case studies representing well-documented outcrops and subsurface examples, all corresponding to Phanerozoic marine depositional systems. The data is mostly derived from peer-reviewed scientific publications (>1500 documents). For each case study, about 50 quantitative and qualitative parameters have been extracted and compiled in a database. These parameters refer to age, location, geological context, carbonate platform type, platform margin facies and architecture, slope physiography, type of gravity flow deposits, and reservoir attributes.

We will discuss the distribution of the dataset in space and time and its meaning in terms of geological signal and/or non-geological bias. In addition, we will focus on the main types of carbonate slopes and associated resedimented carbonate deposits. Particular attention will be paid to (1) the variations of sediment types and processes induced by the carbonate producing biota and the slope geometry, and (2) the presence or absence of a physical link between the gravity flow deposits and the source (attached vs detached accumulations). Finally, we will examine to what ex-

tent the database can be utilized to extract predictive information concerning the potential of export/transfer of sediments in carbonate sedimentary systems and the system inherent variations in sequence stratigraphy.