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DESCRIPTION OF A SINGLE, NON-FAN TURBIDITE CHANNEL WITHIN THE MIOCENE CAPISTRANO FORMATION, SAN CLEMENTE STATE BEACH, CALIFORNIA

The outcrops at San Clemente State Beach have been used both as a training site and as an outcrop analog for hydrocarbon reservoirs in channelized turbidite systems. Outcrop relations from analogs provide architectural detail for stochastic and deterministic models of deep-water deposits. However, the accuracy of these models is greatly reduced by uncertainties in the actual geologic interpretation of the outcrops. We interpret the Miocene turbidite system at San Clemente State Beach to represent the fill of a single turbidite channel that was cut into fine-grained sediments deposited on a low-gradient continental slope (less than 1°), and filled by vertical aggradation. This interpretation is based on construction of a detailed photomosaic, mapping of three dimensional facies distributions, measuring of representative sections, and collection of new paleocurrent data. The channel had a minimum width of 1 km, and had a paleotransport direction toward the northwest. The multiple erosion surfaces within the channel represent the lateral shifting with time of the channel thalweg. The vertical facies changes along the sea cliffs at San Clemente are a result of interfingering between axial (coarse-grained deposits) and marginal facies (fine-grained deposits) within the turbidite channel. We interpret the turbidite channel to have been cut into a low-gradient continental slope, rather than representing a channel on a submarine fan. We propose that the Gollum Channel System is a modern analog of the turbidite system at San Clemente State Beach.