AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003

Kirt Campion[1], Anthony Sprague[1], Morgan Sullivan[2] (1) ExxonMobil Upstream Research Company, Houston, TX
(2) California State University, Chico, Chico, CA

San Clemente State Beach, California: A Classic Example for Stratal Hierarchy and Prediction Within Deep Water Channels

The Capistrano Formation consists of laterally amalgamated channels typical of channels and channel complexes that form the building blocks of high-frequency sequences in slope and basin floor settings. The Capistrano is a sand-dominated complex that is about 20m thick and 1.2km wide, forming an excellent analog for seismically defined, single-cycle reservoirs. Architectural elements within the Capistrano fit into a hierarchical framework and include, from smallest to largest, lamina, bed, bedset, storey, channel, channel complex, and channel complex set. At least three channel complexes, which consist of genetically related stacks of channel remnants, comprise the Capistrano. These channel complexes are made of laterally amalgamated channels; within each complex the channels exhibit a lateral change of lithofacies from channel-complex margin to axis. Remnants of individual channels exhibit a systematic change in sand fraction, facies preservation, and bed architecture from the margin to axis of each channel fill.

Channels are broken down further into storeys. Storeys are bounded by erosional/non-depositional surfaces that are contained within a channel, exhibit facies changes from channel axis to channel margin, and typically evolve through steps of erosion, bypass and channel-plugging. In the channel margin setting, the storey base is mud-draped, whereas in the channel axis, erosion and deposition of tractive sands mark the storey base. Whereas most deepwater channel remnants examined in outcrop are 10-50 m thick, usually, storeys are less than 5 m thick. Storeys are considered a fundamental building block of deepwater channels and are likely misinterpreted as channels in core and well log data.