CORRELATION EFFICIENCY AS A TOOL TO ESTABLISH DEPOSITIONAL SUBENVIRONMENTS IN SUBMARINE FANS

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ABSTRACT

Depositional units in submarine fan systems commonly are too large to be entirely or sufficiently exposed in an outcrop in order to make proper identifications. Channel fills can be massive, bedded or any combination thereof. The layering can be horizontal or inclined. Typical bedded series can be thick or thin bedded, or a combination with or within a certain cyclicity. Occurrence of sedimentary structures is not yet a decisive interpretation characteristic.

At the present, the lower Permian Skoorsteenberg Formation of the SW Karoo in South Africa may be the best example of long, non-titled, outcrops where entire subenvironments can be observed. Using that knowledge, outcrop information from several areas, and ideas from the literature, correlations were attempted in two spillways in the Jackfork Group in Arkansas. A layer by layer correlation failed even after small layer packages could be established using an occasional thick shade break, a major slump, or a very thick, massive sandstone layer for dividing both sides of the spillway. A "semi-logarithmic" display of measured thickness provided patterns of variations in layer thickness that normally are sufficiently typical to use as a correlation tool between both sides.

This is not a foolproof system and additional parameters, such as location within the entire fan systems, should be considered. However, the degree of correlatibility helps to identify or suggest depositional environments.