

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

Arnold H. Bouma, Louisiana State University, Baton Rouge, LA

Processes Governing Characteristics and Distribution of Deep-Water Sands: Tanqua Karoo and Mississippi Fan

Sediment transport from source to deep-water submarine fans is governed by the interaction of several physical and other processes, such as tectonics, climate, sediment, and sea-level fluctuations. The interactions dictate if the deposits form a coarse-grained—sand-rich fan, a fine-grained—mud-rich fan, or somewhere in between. Such determines the distribution of sand and its reservoir characteristics. Studies from the Permian Tanqua Karoo fans in South Africa and the modern Mississippi Fan reveal the effects of the processes on fine-grained fans.

The Tanqua Karoo is located in a foredeep setting. The active margin conditions were inactive during the “short” time of deposition of its five fans. The sediment source was the pre-Andes, located 500-800 km away, with the result that only fine-grained sand reached the outer shelf. Sea level lowering and a wide shelf were critical for transport to deep water. The Mississippi Fan is located on a passive margin and also has fine-grained sediment due to the long terrestrial transport. Global sea-level lowering enabled transport past the shelfbreak.

Calculations show sediment bypassing. The outer fan sheet sands (depositional lobes) of the Tanqua Karoo complex received 55-75% of all the sand that entered the deep-water system. For the Mississippi Fan between 75 and 95% of all the sand became stored in the sheet sands. We suggest that the terms active and passive margins, to indicate the type of submarine fan, should be replaced by fine-grained and coarse-grained fans.