

OUTER DEEP-SEA FAN DEPOSITIONAL LOBE SEQUENCE FROM THE JACKFORK GROUP OF SOUTHERN ARKANSAS

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ABSTRACT

Sediments accumulating on the lower parts of the continental slope and the adjacent rise have been shown to contain significant organic materials and are regarded as important prospective hydrocarbon source beds. It is likely that future technological developments will result in important production from these environments. A search for stratigraphic traps will require an understanding of depositional processes on deep-sea fans, gained partly from study of ancient examples exposed on land. The Carboniferous sequences of the Ouachitas of Oklahoma and Arkansas provide an outstanding opportunity for examination of sediments from these environments.

The outcrops of upper Jackfork Group turbidites (Pennsylvanian) exposed in the walls of the spillway at De Gray Dam, Arkansas, have been described by R.C. Morris (1977). This sequence shows a rhythmic alternation between turbidite units with high sand/shale ratios (facies C of Multi and Ricci-Lucchi, 1975) and units with low sand/shale ratios (facies D). Facies C is interpreted as material deposited on active fan lobes, while facies D consists of lobe-fringe and inter-lobe sediments. A pattern of frequent lobe shifting can be recognized analogous to the way the main distributary system switches from side to side of a delta. Individual lobes range in thickness from 3 to 70 m, with a mean of about 25 m. This association is characteristic of the outer fan environment of Bouma and Nilson (1978).

The upper part of the De Gray section contains massive sandstones and pebbly sandstones interpreted as deposits of a major distributary channel. It is possible that build-up of the fan sediments had brought the area into the middle fan environment by this time.

Many of the critical characteristics of these sediments would be recognizable on well logs, and the De Gray section is a good example of one association which might be encountered in continental rise drilling.

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