
Sequence Stratigraphy of the Shuaiba-Hawar(Biyadh) Tectonostratigraphic Sequence: Initiation, Development, and Demise of a Carbonate Platform in a Siliciclastic-Dominated Setting

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Well log and core data from Qatar and the Arabian Peninsula have been used to identify and evaluate the Lower Cretaceous Shuaiba-Hawar(Biyadh) Tectonostratigraphic Sequence. Consistent with tectonostratigraphic terminology, the Shuaiba-Hawar(Biyadh) Tectonostratigraphic Sequence is bounded by prominent, regional unconformities. Between these unconformities, the tectonostratigraphic sequence is a distinctive three-part succession of deposits that begins with siliciclastics and ends with carbonates.

The initial, siliciclastic lowstand phase of deposition is characterized by thick fluvial sandstones typical of the Biyadh. These deposits transition upward into marginal marine deposits, ultimately grading into marine shales that characterize the Hawar.

An abrupt shift from siliciclastic to carbonate deposition is recorded by transgressive carbonates that formed a relatively thin but laterally extensive ramp referred to as the Lower Shuaiba Platform. The subsequent highstand phase of carbonate deposition was strongly influenced by the development of intrashelf basins. Within the intrashelf basins, the highstand is marked by thin basinal carbonate, while discrete, relatively thick carbonate platforms referred to as the Upper Shuaiba Platform were developed along their margins.

Carbonate deposition was terminated by tectonic tilting that uplifted the northeastern part of the platform while generating subsidence in the southwestern part. Subsequently, much of the uplifted platform in the northeast was removed by erosion. The southwest was buried by the overlying, siliciclastic wedge that onlaps and thins onto the uplifted portion of the platform. This unconformity surface marks the upper extent of the Shuaiba-Hawar(Biyadh) Tectonostratigraphic Sequence.
