

BARRIER ISLAND, TIDAL INLET AND FLOOD  
TIDAL DELTA DEPOSITS OF THE UPPER  
CRETACEOUS SPRING CANYON MEMBER,  
BLACKHAWK FORMATION

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Beach-to-offshore sequences in the Spring Canyon Member of the Upper Cretaceous Blackhawk Formation have previously been identified as mainland beach or wave-dominated deltaic deposits. The identification of flood tidal deltas and tidal inlets in the Helper, Utah area suggest these marine sequences are actually barrier island deposits.

An erosional contact, marking the removal of the foreshore and part of the upper shoreface, exists between flood tidal delta and beach deposits. Truncated trough crossbeds of the upper shoreface are overlain by thin, landward-dipping, imbricated sheets of the flood tidal delta. These sheets, each burrowed and/or rooted, indicate episodic pulses of sand entering a lagoonal system. Lateral to the flood tidal delta, burrowed siltstones, interpreted as lagoonal deposits, overlie burrowed tops of trough crossbedded upper shoreface sandstone.

A sheet-sand deposit of channel-fill, trough crossbedded sandstone, interpreted as tidal inlet facies, replaces the foreshore and part of the upper shoreface of the corresponding beach sequence. This sandstone separates coastal plain and shoreface deposits. Current ripples, convolute bedding, reactivation surfaces, and intensely bioturbated beds are common in the tidal inlet facies. Trough crossbeds vary from a predominantly NW (landward) orientation, to a combination of NW, SW and NE orientations. Trace fossils include *Ophiomorpha*, *Teredolites*, and ?ray-hole structures. Landward-imbricated sandstone sheets of the flood tidal delta occur updip from the tidal inlet facies.

Smaller, tidally influenced channel-fill deposits (15-20', 5 - 6 m thick), landward of the tidal inlet facies, are characterized by landward oriented (flood dominated) paleocurrent directions, brackish-water bivalves, *Ophiomorpha*, *Thalassinoides*, and *Teredolites*. Collectively, this indicates a flood dominated, marginal marine environment landward of the barriers.

No major distributary channel system exists landward of the tidal inlet facies. Because of this, the tidal inlet cannot be mis-identified as a distributary channel deposit.