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## Lag Time in the Sedimentary Record at Bar Al Hikman: Part 2 – Constraints on Modern Analogs for Carbonate Geobodies in Cretaceous Reservoir Models

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Carbonate sediment of Bar Al Hikman indicates considerable reworking over long periods of time. Present day geomorphic features are shown to be predominantly built by material cannibalised from earlier geobodies at least several hundred, and up to more than 1000 years old.

The modern geomorphic features such as beach ridges, lagoons, dune fields, and sand bars cannibalise older geomorphic features and are composed of sediments with strongly micritised, abraded grain populations, which have lost many primary biological or morphological features. Such admixtures and redistribution of older and younger grain assemblages, would not normally be expected among component grains from carbonate high energy environments, where pristine skeletal grains are considered more to be the norm.

Geometrical attributes of carbonate geobodies for reservoir models are derived from the sedimentary textures and structures from cores, as well as from modern and ancient analogs. The "marginal" coral environments of Bar Al Hikman, with coral carpets as opposed to reefs, may provide a reasonable analog for carpets of Cretaceous rudists and the depositional environments of carbonate sands around them.

Geobodies that compose Cretaceous reservoirs in the subsurface, identified from grain populations, may be misidentified if such admixing, reworking and redistribution of older grain populations into younger geomorphic features is not taken into account. Geobodies laid down as geomorphic features such as channels, beach spits, and lagoons, may be recognised with difficulty when relying on classic analogs characterised by pristine skeletal and non-skeletal grains such as the Bahamas, Belize, and the Great Barrier Reef.

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