# Lag Time in the Sedimentary Record at Bar Al Hikman: Part 1 – Predominance of Reworked Material in the Modern Carbonate System

***Peter Homewood***, *Centre for Carbonate Studies, Sultan Qaboos University, PO Box 36 PC 123 Al Khod, Present address Oman Geo-Consultants, PO Box 194, P.C. 134, Shatti Al Qurm, Oman, phone: 0033559216588, fax: 0033559216588, pwhomewood@yahoo.fr, Monique Mettraux, consultant, Gan, 64290, France, Ken Collerson, University of Queensland, ACQUIRE, Brisbane, Q 4072, Australia, and Andy Kwarteng, Remote Sensing Center, Sultan Qaboos University, Oman.*

This system is developed in shallow water, and under high energy, arid, South West monsoonal climate conditions. The “Carbonate factory” is dominated by coral carpets as opposed to reefs, with a large component of molluscan and foraminiferal shell debris.

Heavy micritisation and abrasion of grains, strong obliteration of primary grain morphologies, and reworking of composite, early cemented grains within the modern sediment dominates assemblages, compared to the amount of fresh coral, molluscan or foraminiferal material. This indicates prolonged, perhaps multiphase reworking of modern sediment, and admixture of older grains to the present day carbonate production. Surprisingly, in spite of the strong abrasion, only extremely minor amounts of carbonate mud have been found.

High resolution satellite images clearly show the patterns and distribution of older geomorphic features such as beach ridges, lagoons, and littoral bars that have accreted seawards. These older features are truncated by the present-day coast, with its array of littoral environments. Uranium series dating of coral fragments from both older and younger features gives ages ranging between 600 and 1200 years with error margins of less than 100 years. The modern carbonate system is thus seen to be at a pause in the seaward progression of littoral deposits through accretion, while undergoing a phase of reworking of slightly older deposits. This trend may have been caused by a slight downward shift in relative sea-level. Further age-dating should reveal whether the accretion of previous deposits was possibly linked with higher sedimentation rates, during a slightly higher stand of sea-level.