Delineating and Quantifying Depositional Facies Patterns of Modern Carbonate Sand Deposits on Great Bahama Bank

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Description
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Delineating and Quantifying Depositional Facies Patterns. Processed satellite images, derived bathymetry (Digital Elevation Models), and sand body interpretation maps of three key areas of modern carbonate sand deposition on Great Bahama Bank (GBB) are organized into a GIS to develop morphometric data. The results of the sand body and sandbar interrogation imply that certain architectural properties of high-energy sand deposits are generic. We think such results broaden our perspective of the types of information that can be derived from studies of the modern and hopefully will stimulate further studies. Collectively, the sand deposits show a range of depositional facies patterns. Rimming the southern end of Tongue of the Ocean (TOTO) is the broadest expanse of “high-energy” sands found in the Bahamas characterized by narrow sandbars separated by wide, deep channels and a lack of islands. A variation of the tidal bar motif with broader and more irregular sandbars, relatively narrow channels, and few small islands occurs at the northern end of Exuma Sound (Schooners). Sands associated with tidal channels and the numerous islands of the Exumas chain along the western edge of Exuma Sound occur primarily as flood tidal deltas.

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Great Bahama Bank (GBB) stands behind many of the models used to illustrate depositional-facies variation across flat-topped, isolated carbonate platforms, which have long served as subsurface analogs at a variety of scales. We have used Landsat TM imagery, a refined bathymetric digital elevation model, and seafloor sample data compiled into ArcGIS and analyzed with eCognition to develop a depositional facies map (Figure 1) that is more robust than previous versions. For the portion of the GBB lying west of Andros Island, the facies map was generated by pairing an extensive set of GPS-constrained...