

# **Cat Cay Shoals Revisited: Contrasting Morphologies in a Bank Margin System, Bahamas**

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The modern 1-3 km wide and 35 km long sand belt around Ocean Cay, western margin of Great Bahama Bank, includes considerable variability in sand body geometries and facies. The shoals north of Ocean Cay, commonly referred to as Cat Cay Shoals, and flood tidal deltas (south of Ocean Cay) are the only examples of shoal complexes on the leeward side of the Great Bahama Bank. Our observations indicate contrasting characteristics in shoal geometry and composition between the north and south areas.

We compared the two areas of Holocene deposits by examining about 220 bottom sediment samples, and bathymetry and tidal flow patterns from 60 acoustic Doppler current profiles. South of Ocean Cay, Pleistocene eolianite island ridges provide sufficient tidal flow restriction to promote stronger currents during flood tide. Elongate, narrow sand shoals consisting of moderately sorted, medium-sized skeletal grains abruptly pass laterally to bioturbated facies or to areas with rocky bottom and a thin sediment cover. Ebb flows, with lower velocities, shape morphology of sand bars creating small-scale bedforms. The size and type of sands of the Cat Cay shoal are less variable than southern areas.

These results illustrate that bedforms, constituents, grain size and sorting of the sand bodies are related to the tidal flow dynamics and are linked to the bathymetry and physiographic setting of each area. Heterogeneity within these deposits is similar to that expected in the ancient record. Sediment textures and information such as size, shape, orientation and lateral facies variation within these geobodies can be used in the construction of meaningful geologic models.