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Quaternary Slope Development of the Western, Leeward Margin of Great Bahama Bank

The high-resolution seismic profiles along the western, leeward margin of Great Bahama Bank indicate that since the Plio-Pleistocene change in geometry continued steepening and subsequent progradation has typified slope development during the Quaternary, which is described as an accretionary slope.

Through detailed, high-resolution sequence stratigraphy of Great Bahama Banks, Quaternary leeward margin, obtained via ^{18}O isotope and mineralogical (XRD) analyses, confined by U/Th dating and nannofossil bioevents we developed a new model to show a four-stage slope development sequence. The leeward margin is only accretionary during the early to lower middle Pleistocene section (isotope stages 45-20) and the Holocene (isotope stage 1). This indicates that a degree of erosion and/or bypassing has occurred on the leeward margin since the lower middle Pleistocene (isotope stage 19). During the first part of this period (isotope stages 19-12) erosion and/or by passing occurred in the middle to lower slope regions and toe-of-slope. By the end of the upper middle to late Pleistocene (isotope stages 11 through 2) erosion also occurs on the upper slope. However, the rise in sea-level since the Last Glacial Maxima (LGM) to its present-day datum, which has allowed high productivity on the platform-top during the Holocene and the deposition of a thick sediment wedge on the slope, has lead to the redevelopment of an accretionary slope on Great Bahama Banks leeward margin.

These findings might stress the importance to re-evaluate the sequence stratigraphic interpretations of ancient deposits where lack of an accurate chronostratigraphic framework could mislead the interpretation.