

## HOLOCENE TRANSGRESSION AT DISCOVERY BAY, JAMAICA

**Martinez, J.A.**

Department of Geological Sciences, University of South Carolina, SC 29208

### ABSTRACT

Discovery Bay is the setting of a modern fringing reef which formed during the last Holocene transgression. It is a good place for studying the sedimentary signatures produced by sea level changes. The bottom profile of the fore reef exhibits a succession of morphological zones, characteristic of Jamaican northern reefs, that includes a deep fore reef, slope, escarpment, terrace and crest. Two former paleocrests exist formed by the relict framework of Acropora palmata which is the present day coral crest, and can be recognized along the north coast of Jamaica and other Caribbean reefs. It is proposed that fossilized frameworks occur on the slope and terrace, overlaying Pleistocene substratum, and representing former stillstand positions of relative sea level rise. The predicted vertical succession of layers on the slope, composed of fossilized coral frameworks of Acropora palmata and Acropora cervicornis, and overlain by the present day community dominated by Agaricia ssp., is repeated laterally up to the crest. The deeper environments were landward shifted, overlapping the previous shallower ones as sea level rose.

The structure of the reef is better explained in terms of oceanography than a proposed north-to-northeast normal fault, parallel to the ship channel. The horizontal offset between the East and West fore reefs is likely due to the tortuous path of a drowned river valley that was active during a pre-Holocene lowstand and which formed the Discovery Bay. Subsequently, the bay was deepened by karstic processes that developed a large sink hole. The 10-meter vertical offset of the East fore reef with respect to the West is due to refraction, which has historically produced more erosion in this part of the bay during tropical storms, as winds approach the coast preferentially from the east.