

ABSTRACT

Shelf geomorphology east of the Hellshire Hills, Jamaica, has resulted mainly from Pleistocene subaerial erosion which produced karst residuals upon which present day reefs and cays have developed.

Eight biogeological zones have been characterized on the basis of biota assemblages and type of substrate. These zones are:- A. Bioturbated Mud; B. Sand with Dense Seagrass; C. Sand with Sparse and Algae; D. Sand with Sparse Seagrass and Algae on Rocky Substrate; E. Sand with Algae and Coral on Rocky Substrate; F. Sand with Algae; G. Hardground; H. Reef Zone.

Textural analysis of sediments from within these zones has shown that major controls on sediment distribution are bathymetry, particularly as this relates to energy conditions, source material, and benthic communities. On the basis of the relative degree of admixture of different size fractions, four texturally distinct regions have been determined, and these broadly overlap the biogeological zonation.

Terrigenous sediments are confined to the northern region of the study area and are dominated by plutonic

rock fragments, quartz and plagioclase. Sediments of the central and southern regions are essentially pure carbonate. The major carbonate constituents are Halimeda plates, molluscs fragments, articulated coralline algae, crytocrystalline grains and intraclasts. Most carbonate grains show signs of early diagenetic alteration.

Mineralogy is one of the main controls on the distribution of the elements analysed, with strontium showing strong association with aragonite and magnesium content being influenced by calcitic organisms. Magnesium in the muds of the northern region appear to be also influenced by terrigenous sources.

A zone of mixed sediments lies just south of the Harbour entrance where sediments are derived mainly from local reefs and seagrass beds, infaunal and planktonic organisms. These sediments all mix with relict terrigenous material. Thus, sediment mixing is controlled mainly by *in situ* processes. The Palisadoes is not a major source of sediment into the study area.