



(CONTOUR INTERVAL IS 4 METERS TO A DEPTH OF 20 M.)

ND-NO DATA AVAILABLE
U.S. GEOLOGICAL SURVEY
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This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.

INTRODUCTION

The increasing population pressures on the margins of our land areas require us to obtain a comprehensive knowledge of the geologic processes in this environment. This report presents the results of a reconnaissance survey of the surficial sediment composition, textural and chemical, on the insular shelf and upper slope of southwestern and south central Puerto Rico. These data serve as a base for the subsequent studies on the rates of change, whether natural or man-made, and also as a base for investigations on the processes by which chemical elements are transported and concentrated in the marine environment.

METHODS

Two hundred and fifty nine stations were occupied during the course of two cruises; the first in March of 1968 in the eastern half of the study area, and the second in April 1970. Samples were taken with a Shipek grab sampler designed to take a sample of 1/25m² to a depth of 10 cm below the sediment-water interface. All samples were split for textural analyses, chemical analyses, and for storage. The splits for the textural analyses were washed and the percent of gravel (2.0 mm), sand (2.0-0.062 mm), and silt-clay (0.062 mm) determined by conventional settling techniques. The results were plotted on a triangular diagram (Fig. 1A) from which (Fig. 1B) classes were selected and their distribution mapped. The geochemical samples were air-dried to approximately 100 µ particle diameter and analyzed spectrographically for 30 elements by the six-step semi-quantitative procedure (Grimes and Marranzino, 1968). The precision

DISCUSSION

The textural composition of the shelf and upper slope sediment is shown in Figure 1. Of the 30 elements looked for, the 10 which are mapped are those elements which were detected in the majority of samples and had a distribution varied enough to offer some clues as to the geochemical process acting on the shelf. That variation seen in the mass of the elements reflects to a major degree the distribution of sediments. It can be seen that finer sediment is concentrated in the deeper water seaward of Guayanilla, landward of the ridge that extends from the area of Santa Isabel to Puerto Island and in small inlets adjacent to the coast. This fine sediment also contains the highest element content of iron, manganese, boron, chromium, nickel, titanium, vanadium, and zirconium. Calcium and strontium are highest in the shallow shelves; the region where reef development and carbonate sedimentation are dominant. One

salient feature in the distribution of the trace elements is the apparent indication by the distribution pattern that detrital sediment from the island is funneled along shore from both the east and the west to the Guayanilla Canyon area with negligible amounts moving directly across the shelf.

ACKNOWLEDGMENTS

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REFERENCE

Grimes, D. J., and Marranzino, A. P., 1968. Direct current arc and alternating spark emission spectrographic field methods for semi-quantitative analyses of geologic material: U.S. Geol. Survey Circ. 391, 6 p.

COMPOSITION OF THE SEDIMENT ON THE INSULAR SHELF AND UPPER SLOPE OF SOUTHWESTERN AND SOUTH CENTRAL PUERTO RICO

BY
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JANUARY, 1973

Puerto Rico (Coast, Southwest). Bottom deposits. 1:350,000. 1973.
Sheet 1,
cop. 2.

U.S. Geological Survey
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