

SEDIMENT BUDGETS FOR THE RIO GRANDE WATERSHED AND ST. MARGARET'S BAY, PORTLAND PARISH

A Marine Geology Unit Project
Funded by USAID and NEPA



The Rio Grande



St. Margaret's Bay

A one-year study, funded by USAID and NEPA as part of the Ridge to Reef Project, is being carried out by members of the Department of Geography and Geology, UWI, managed from the Marine Geology Unit of the Department.

The purpose of the study is to investigate the various natural processes that are occurring within the Rio Grande watershed in order to estimate the rate of sediment production in the watershed and to measure the rate at which it moves through the system to the sea. Complementary to this is a study of the beach and inshore processes occurring at the mouth of the Rio Grande, at St. Margaret's Bay, to ascertain to what extent the sediment processes in the river are affecting the coastal changes, particularly erosion, already documented there.



Erosion along the St. Margaret's Bay Coast

WHAT IS A SEDIMENT BUDGET?

In the same way that a financial budget presents balanced expected inflows and outflows of cash, a sediment budget attempts to quantify the inflows and outflows of sediment in a natural system. Such a system may be part or whole of a drainage basin, or a beach, or similar natural system in which sediments are in a state of intermittent or continuous movement.

If the gains to the system exceed the losses then the amount of sediment stored within the system will increase. If the losses exceed the gains then the storage will decrease.

The results of the assessments can be applied to improving the management policy for the watershed, in particular in setting out limits for the removal of sand and gravel from the watershed

area, and in the Bay, enabling decisions to be made regarding the feasibility of such procedures as using beach nourishment versus hard protection of the shoreline to combat erosion.



Erosion placing homes at risk in St. Margaret's Bay

PROGRESS OF THE STUDY

Estimates are being made of the amount and kind of sediment being generated in the watershed through weathering and downslope processes, through the preparation of a landslide inventory, by measuring rates of road erosion so on. The quantities of sediment being lost to the sea and bay area are being estimated by measuring the suspended and bedload characteristics of sediment entrained in the river. Storage of sediments within the system is being evaluated through measured cross-sections of the river bed and adjacent floodplain.



The Back Rio Grande confluence after waning.
Line indicates traverse of cross-section #3.

At St. Margaret's Bay sediment gains and losses to the beach system are being monitored through the repeated surveys of beach profiles at selected stations along the shore. The bathymetry of the nearshore region to a depth of 40 metres has been mapped, and the composition of the nearshore sediments has been characterized.

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