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## FISH BAY REFLECTIONS

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### **Erosion Study to Identify Critical Areas of Concern**

Carlos Ramos is on St. John conducting an erosion study as part of his graduate work for Colorado State University's Department of Earth Resources. His work will expand on previous erosion research by Colorado State University scientists documenting runoff patterns and measuring sedimentation.

Erosion is one of the most serious environmental problems affecting St. John. Roads and driveways cut into steep hillsides create channels for rapid runoff of rainwater. Even small amounts of rainfall can move tons of sediment downhill. Guts and runoff streams leading into bays carry large amounts of soil from hillsides into the water, smothering coral reefs and destroying fish habitats.

Last year, a report by World Resources Institute warned that over-development and poor building procedures threaten to turn reef-rich Caribbean waters into dead zones. The consequences of uncontrolled erosion will seriously affect the islands' tourism and fishing industries, but so far little has been done to address this growing threat.

According to Ramos, erosion problems in St. John are spread out over most of the island. In order to define the extent of the problems more clearly, he has installed sediment traps in about 50 places around the island to measure the amounts and rates of sediment movements. The traps capture sediment from a variety of landscape areas: roadways, cut slopes adjacent to roads, filled slopes, natural hillsides and stream beds. The trapped soil is then shoveled out and weighed. Samples are sent to a lab for analysis of their water content and particle size.

Ramos has also installed runoff measuring stations in the Fish Bay and Lameshur Guts. The equipment collects samples of the water flowing by at predetermined intervals. These samples are then tested for particle sizes and concentrations of suspended solids. The information from Ramos' field studies will allow him to map the movement of sediments through the St. John landscape.

He is looking at entire watershed areas, since much of the runoff in guts and bays originates in upland areas. For example, unpaved driveways in the Catherineberg area along Centerline Road drain into the Fish Bay Gut, and land recently cleared next to the clinic is creating sediment flows down the Gibney Gut into Hawksnest Bay. According to Ramos, some of the worst problems stem from long stretches of unpaved roads on steep hillsides where the runoff connects up to streams emptying directly into a bay. If a main gut is open to a bay, with no wetland or

pond to filter the sediment, plumes of muddy water will shoot out into the bay during heavy rain events.

By identifying the areas and types of land-change activities that generate the worst erosion effects, Ramos' study can help planners and developers avoid the creation of damaging situations, or remedy existing hazards. Ramos has observed that in many cases the silt fences required to control erosion on construction sites are inadequate to begin with and are quickly overwhelmed by the amount of sediment released. Moreover, lack of enforcement by government officials means that there is little incentive for builders to comply with existing environmental protection requirements.

In order to preserve St. John's bays, residents and local business people will need to work together with government agencies and environmental organizations to prevent further erosion damage. There are a number of local organizations supporting Ramos' erosion work, including the University of the Virgin Islands' Water Resources Research Institute, the Department of Planning and Natural Resources and the Natural Resources Conservation Service in St. Croix, and the Water Resources Division of the National Park Service.

The Island Resources Foundation, a non-profit environmental management organization based on St. Thomas, has been the primary sponsor of the current erosion study and of prior erosion research which focused primarily on Fish Bay. Island Resources Foundation holds about 50 acres of conservation land in Fish Bay, including the gut, the salt marsh and a green belt area around the bay. Fish Bay has a serious erosion situation due to land development activities. In the most critical areas,

Ramos recommends erosion control measures that include road paving, insertion cross-drains, culverts and retaining walls, replanting of vegetation, and installation of matting on cut slopes that are too steep for re-vegetation. Strategic targeted interventions in the worst areas will be more effective in reducing sedimentation levels in the bay than widespread paving projects that are not adequately thought out and monitored.