

Report for 2003VI11B: Coral Bay Watershed: Development of Management Measures for Sediment and Pollution Reduction - Phase II

- Other Publications:
 - Coldron, S. and B. Devine. 2004. Coral Bay Community Council brochure and membership information. CBCC, 8-1 Estate Emmaus, Coral Bay, St. John, V.I.
- unclassified:
 - Devine, B. and S. Coldron. 2004. Coral Bay Watershed Resources and Issues. CBCC, 8-1 Estate Emmaus, Coral Bay, St. John, V.I.
 - Devine, B. et al. 2005. Guiding Principles of Sustainable Green building Design and Construction. Island Green Building Association. c/o Friends of the Virgin Islands National Park. P.O. Box 811, St John, V.I.
 - Myers, K., Devine, B., and S. Coldron. 2004. Outline for a Coral Bay Area of Particular Concern Marine Inventory. Coral Bay Community Council. 47pp.
 - Schwartz, L., and D. Honour. 2005. Conceptual Stormwater Management Plan: Coral Bay Watershed, Final Letter Report (May 2005). Eastern Caribbean Center, University of the Virgin Islands. 27pp.

Report Follows

Problem and Research Objectives

Non-point source pollution of coastal embayments resulting from runoff contamination, sediment deposition and the health hazards caused by dumping of unregulated human waste is a common problem in the Virgin Islands and in most small, mountainous, tropical islands throughout the Caribbean and Pacific regions.

The Coral Bay watershed, St. John, United States Virgin Islands, with the highest population growth rate in the Virgin Islands, is typical of many watersheds throughout the Virgin Islands and the Caribbean, having a large watershed to bay area ratio. Many miles of unpaved roads and inappropriate land uses cause runoff and sedimentation, leading to poor water quality and deterioration of marine resources in waters extending well offshore and into the benthic zone.

A Phase I study within this watershed and the surrounding marine waters, funded by the Non-Point Source Pollution Program at the Virgin Islands Government - Department of Planning and Natural Resources, has investigated sediment deposition rate, sediment deposition history and the impact on water quality, fisheries diversity and coral reef health. The proposed study will complete Phase II of this project by developing and demonstrating management procedures applicable to many small, mountainous tropical islands trying to preserve the natural environment as well as gathering natural resource data and putting these data into a GIS watershed atlas.

The primary objective of this project is to use the previously collected data to educate and organize the critical audience of residents, businesses and visitors to non-point source issues affecting water quality in their watershed and to assist them in organizing a Watershed Residents Association with a primary objective of educating and encouraging the larger general population and visitors to use best management practices for water resource protection. The methodology of a watershed focus, where residents have a common identifiable interest in quality of life, has a high impact and transferability within small watershed communities typical of many Caribbean and Pacific locations.

Methodology

A variety of methodologies will be used to meet the objectives of this project. Several of the objectives are associated with organizing people in the community, developing educational information and providing educational meetings to share this information. Other objectives for this project will require more specific methods to gather information.

Coral Bay Watershed Residents Association - Previous projects have demonstrated the need for a community organization to respond to non-point source water quality threats. Using standard methods of community communication (flyers, brochures, newspapers, radio ads and word of mouth) a residents association was organized to meet and discuss activities to protect water quality of Coral Bay. Stakeholders were organized to form committees to address specific issues. The Coral Bay Community Council formed and

elected a board of directors, began a membership drive, held monthly information and educational meetings and focuses on community issues.

Island Green Building Association – Using a model developed by the National Green Building Association, a group of concerned residents, both professional and lay persons, formed, elected a Board and began the effort to develop Green Building Standards for use in the USVI as well as on nearby islands. Methods for this organization included development of membership, local advertising, Sustainable Green Building standards and educational events to inform the public and private organizations about the impact of inappropriate land use on coastal water quality.

Coral Reef and Natural Resource Assessment – This effort will use the Coral Reef Video Transect Sampling methodology currently in use by U.S. Geological Survey, National Park Service and the University of the Virgin Islands to survey the natural resources of the inner harbor and greater bay area and develop a map of these resource locations for use in planning and management of bay waters.

Conceptual Stormwater Management Plan , Coral Bay Watershed - A professional Engineering Firm was hired to complete the task of gathering, modeling and evaluating hydraulic studies of the watershed using the TR55 methodology and physical data supplied by the University's Conservation Data Center's Geographic Information System data layers. From these data, preliminary sediment retention and detention ponds and end-of pipe structures were sized sited and proposed for reducing inputs to bay water quality. Drainage computations once completed, and preliminary calculations will determine the stormwater alternatives available to address the sedimentation and runoff problems using standard and new, innovative approaches to protecting water quality in steep, tropical watersheds.

Watershed Atlas – Using existing GIS methodology, all data layers useful for watershed planning will be gathered into a hardcopy and digital atlas of the Coral Bay watershed. This will include data layers for topography, vegetation, marine communities, slope analysis, watershed bounds, National Park bounds, Coral Reef National Monument bounds, Area of Particular Concern bounds, soils, bathymetry, flood hazard, existing and proposed zoning and land use changes.

Coral Bay Roads Mapping and Rescue Locator System

Using Geographic Information System technology, road types (primary, secondary, paved and unpaved) were mapped throughout the watershed to understand the extent of pervious and impervious surfaces and their potential impact on water resources.

Principal Findings and Significance

This project commenced on February 1, 2004. Activities and efforts conducted to date have completed the following:

1. Watershed Residents Community Organization- A Residents Association, *the Coral Bay Community Council* was organized in February 2004 and membership to date is over 185 of 700 residents. Four committees have been formed, *Land Use and Watershed Protection, Ocean Use and Protection, Infrastructure and Services, and Watershed History and Preservation*. All committees are active in educating, informing and organizing residents, making choices and implementing Best Management Practices (BMPs). Monthly meetings are held to provide educational programs for residents, Coastal Zone Management and Planning and Natural Resource issues are reviewed and recommendations made, and the group organizes data gathering efforts to provide water quality and natural resource strategies. A website (www.coralbaycommunitycouncil.org) provides current information on the group's activities.
2. Island Green Building Association (IGBA) – A Best Management Practices (BMP) organization was formed in August 2004. This group developed a publication, “Guiding Principles of Sustainable Green Building Design and Construction” for educating residents, contractors, and government staff in the best management practices. In addition, a website (www.igba-stjohn.org) was developed to provide current and innovative methods to protect the landscape and water quality around the island. The organization while new, has met monthly, gotten numerous articles published in several local newspapers and provided more than a dozen presentations to local businesses and groups.
3. Watershed Brochure – A watershed brochure has been completed. This publication has been made available to all residents and describes the resources and issues prevalent in Coral Bay watershed. Contact information for the community organization is also provided.
4. GIS Watershed Atlas – Strategic planning to protect water quality resources requires the latest information in a digital and printable hardcopy format. The initial data layers for the atlas were gathered and developed into a work-in progress atlas of physical, geographic and biological information. These include layers and maps of topography, vegetation, marine communities, slope analysis, watershed bounds, soils, bathymetry, flood hazard, existing and proposed zoning and land use changes, National Park bounds (VINP), Coral Reef National Monument (VICRNM) bounds, and Area of Particular Concern bounds (APC).
5. Preliminary Stormwater Management Plan – Final delivery of the “*Conceptual Stormwater Management Plan – Coral Bay Watershed, Final Letter Report (May 2005)*” has been received from Camp, Dresser, McKee Inc. This detailed report includes, background, data collection, preliminary engineering analysis, hydrologic model, conceptual design alternatives analysis and recommendations for addressing stormwater management from a watershed perspective.
6. Natural Resource Inventory and Reef Assessment – A preliminary report “Outline for a Coral Bay Area of Particular Concern Marine Inventory” was

completed. GIS maps were generated of all existing marine resources will be used to assist in long term planning for the bay and to provide the necessary data for addressing CZM applications within the watershed.

7. Coral Bay Road and Home Maps – The location, size and type of roads in the watershed are critical factors for determining problematic sediment locations. The GIS road and residence data layers have been completed. These data will be incorporated into the Atlas, but the data will also be used to identify problem areas within the watershed for priority restoration. This information was developed into a GIS database and hardcopy mapping of problem areas, guts, home locations, drainage structures took place. The information is used to assist in determining priorities for development of the stormwater management plan. In addition, as the island has no mapping for rescue due to lack of maps and street names, the system is being adapted by St. John Rescue, emergency medical technicians, fire and police as a means of locating and reaching residents in medical emergencies.