Land –based agricultural practices & coral reef health

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Poorly managed land-use practices increase the load of sediments, nutrients and contaminants reaching the ocean trough runoff or riverine discharge (Fig. 1 & 2). Increased turbidity affects photosynthesis, growth rates and survival of coral reefs. Higher nutrient loads result in eutrophication, phytoplankton blooms and extreme damage to these vulnerable coastal marine resources.

Fig. 1. Runoff and sediment plume observed at La Parguera Natural Reserve during a rain episode on September 5, 2009.

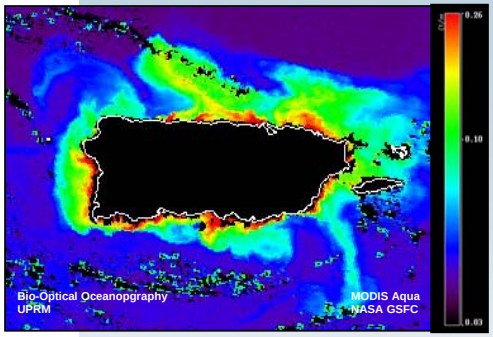

Fig. 2. MODIS Aqua L2 diffuse attenuation coefficient (K490) image after an episodic rain event in November 2003. K490 indicates the turbidity of the water column and is directly related to the presence of particles in the water.

Fig. 3. Potential study sites located in southwestern Puerto Rico and in the vicinity of Guánica and Jobos Bay. Images source: Aerial Ortho Photo 2007, PR Planning Board.

- There is a need to survey the natural vegetation species composition in undisturbed salt flats to increase general understanding about spatial distribution and importance of salt flat vegetation in Puerto Rico and the Caribbean.

- This project is designed to identify halophyte species, vegetation attributes (percentages of foliar and basal cover), and soil characteristics (electrical conductivity and pH) in three salt flats in the south coast of the Island.

- Findings of this project will be used to assist Caribbean NRCS in the development of technical information needed to supplement existing USDA conservation programs. An additional project outcome will be the development of a protocol for field observation of salt flat vegetation.

This project will use CarICOOS web page and products to document connectivity and threats pose by upland activities to coastal marine ecosystems.

Vegetation buffers are natural filters used to slow water movement and trap nutrients, sediments, and other contaminants generated from upland agricultural activities. This conservation practice can remove at least 50% of nutrients, pesticides, pathogens and sediments that eventually reach coral reefs. Effectiveness of these buffers depends on appropriate selection of plant species, site characteristics, plant adaptability and plant attributes.