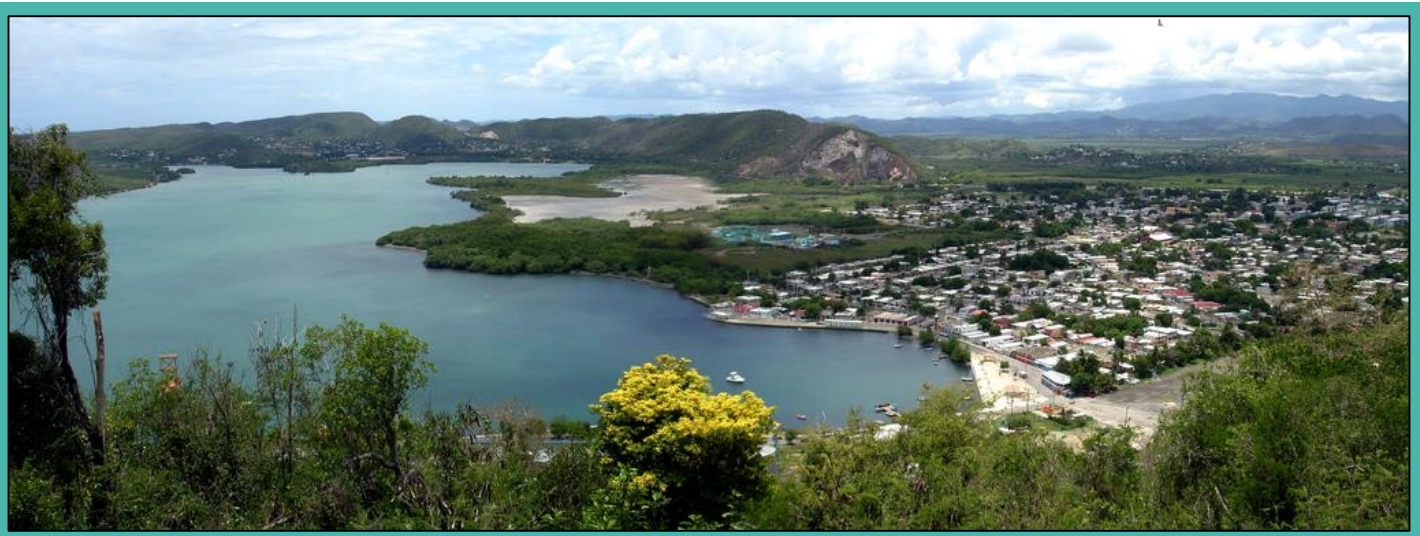
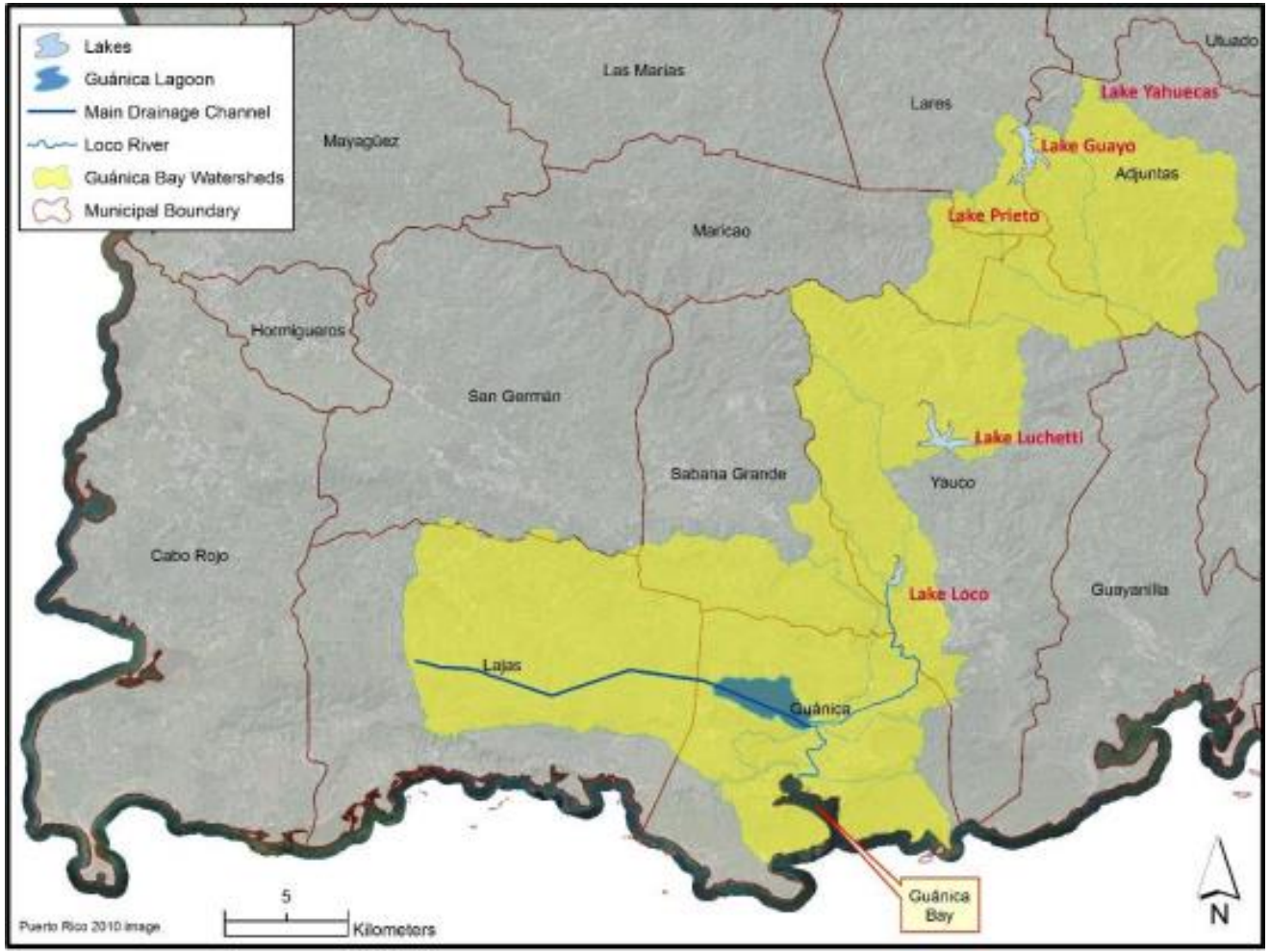
Guánica Bay/Rio Loco Agenda to Neutralize Detrimental Inputs (GRAND)

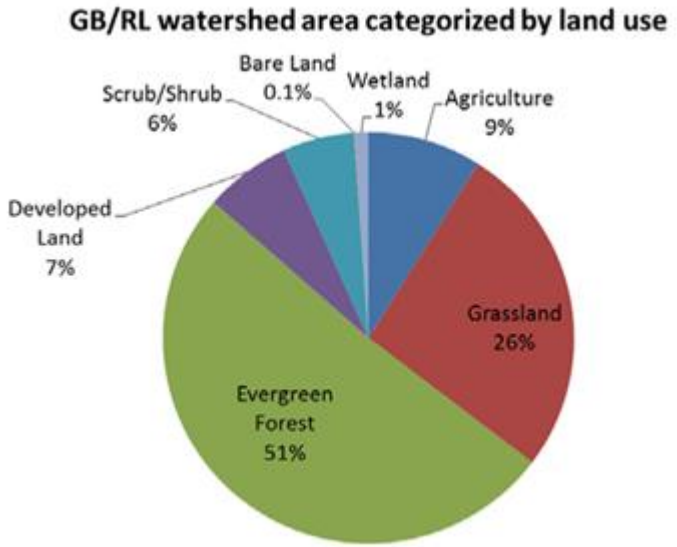
By: Justin Leary, Rebecca Schurr, Polly Ni, and Luke Stirparo




Lakes
Guánica Lagoon
Main Drainage Channel
Loco River
Guánica Bay Watersheds
Municipal Boundary
Las Marías
Mayagüez
Lares
Utuado
Lake Yahuecas
Lake Guayo
Adjuntas
Lake Prieto
Maricao
Hormigueros
San Germán
Lake Luchetti
Sabana Grande
Yauco
Cabo Rojo
Lake Loco
Guayanilla
Lajas
Guánica
Guánica Bay
N
5
Kilometers
Puerto Rico 2010 image

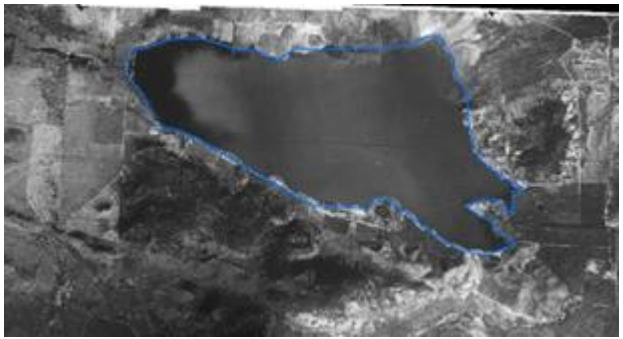
History and Background

- Founded on August 12, 1508, by Juan Ponce de León
- Named Guánica, a word derived from the Taíno indigenous culture
  - Means “here is a place with water”
- Was a part of the municipality of Yauco until 1914 when it became separate
- Watershed includes urbanized areas of Yauco, a portion of the Lajas Valley agricultural region, and the upper watershed where coffee farming and subsistence agriculture is practiced



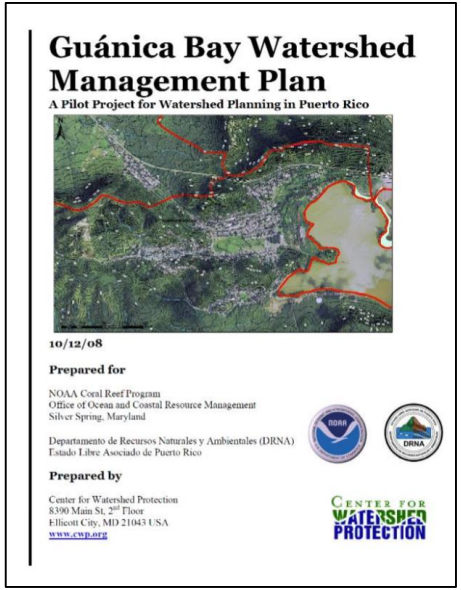
History and Background (cont.)

- Human alterations to increase drainage area included:
  - Series of inter basin or inter-watershed water transfers
  - Five reservoirs
  - Two hydroelectric plants (Yauco 1 and 2)
- High levels of deforestation due to sugarcane cultivation
- Ditching and draining of Guánica Lagoon, a large historical lagoon and adjacent wetland system, in the 1950s in addition to farmland clearing



History and Background (cont.)

- First watershed management plan created in 2008
  - Guánica Bay Watershed Management Plan
  - National Atmospheric and Oceanic Administration (NOAA)
  - The Puerto Rico Department of Natural and Environmental Resources
  - NOAA Coral Reef Management Fellow in Puerto Rico
  - In partnership with the Center for Watershed Protection
- Plan was updated in 2014
  - Protectores de Cuencas and their partners
  - Done to address the EPA's nine elements of a watershed management plan


Guánica Bay Watershed Management Plan

A Pilot Project for Watershed Planning in Puerto Rico

10/12/08

Prepared for

NOAA Coral Reef Program
Office of Ocean and Coastal Resource Management
Silver Spring, Maryland

Departamento de Recursos Naturales y Ambientales (DRNA)
Estado Libre Asociado de Puerto Rico

Prepared by

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Mission Statement

GRAND’s mission is to attain the classification of fishable water quality standards by the EPA in the Guánica Bay/Rio Loco Watershed in the Southwestern corner of Puerto Rico by the year 2040.

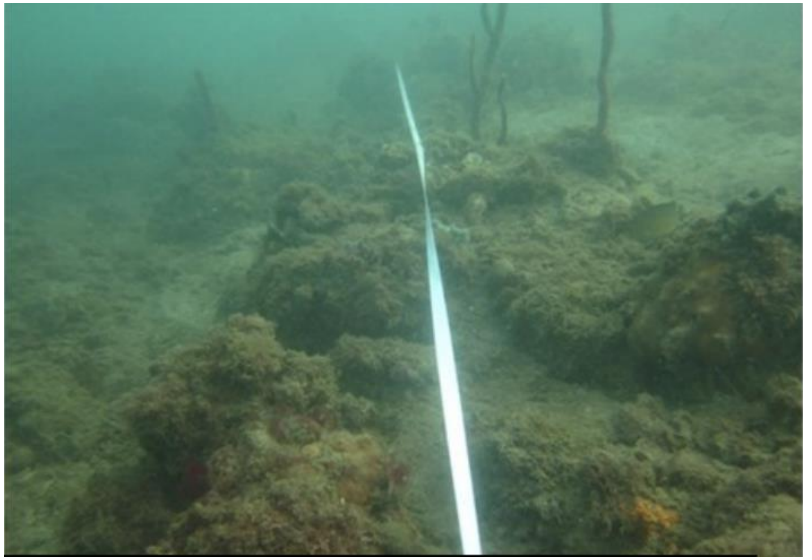
Problem 1: Coral Degradation

Issue:

- Coral degradation is an arising issue throughout the world, Guánica Bay is no exception.

Solution:

- Build basins/wetlands to contain the nutrients
- Introduce new agricultural methods such as hydroseeding
- Implement more farms to practice shade grown coffee




2001
2006

Problem 2: High Nitrate Levels

Issue:

- Hurricanes Irma and Maria amplified nitrate effluent.
- Sources of nitrates include fertilizers from local farms and waste from residential areas.
- Excess nitrate encourages algal blooms which cause low dissolved oxygen levels, killing aquatic wildlife.

Solution:

- Surround waterways and sources of nitrate with aquatic buffers:
  - Man-made wetlands
  - Shade grown coffee

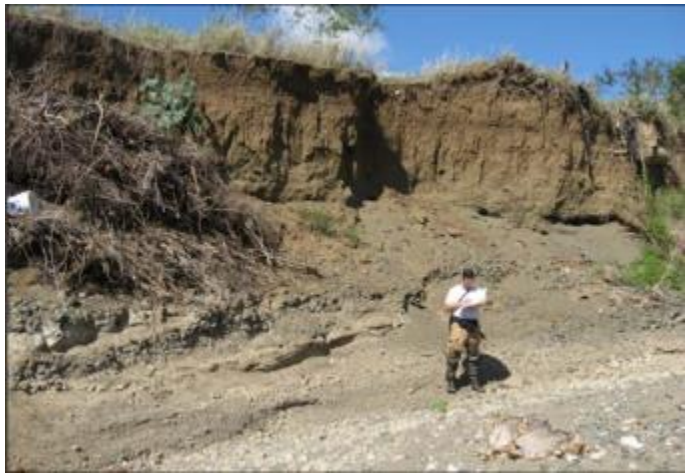

Fuig
332
116
116
325
Guanica
332
Pan American Fertilizer
Caña Gorda Beach
Google


PR-333
PR-333
PR-333
Pan American Fertilizer

Problem 3: Erosion and Sediment Transport

Issue:

- The Rio Loco has severe erosion problems
- Abandoned infrastructure and lack of mature trees in riparian zone cause instability of river banks
- Sediments are running into the river from exposed soils and dirt roads throughout agricultural areas
- Loss of reservoir capacity due to sediment build up
- Sediments traveling into the Guánica Bay are harming corals



Solutions for Erosion and Sediment Transport

Solution:

- Bank Stabilization project including removing old infrastructure and planting native trees
- Sediment transport reduction by stabilizing dirt roads and using hydro seeding techniques to protect bare soils.

GRAND Goals

- Build basins/wetlands to contain the nutrients
- Introduce new agricultural methods such as hydroseeding to limit sediment run off.
    - Currently, 20 acres of land was stabilized. By 2040, Grand proposes to stabilize more than 150 acres of land.
- Implement more farms to practice shade grown coffee
- Ensure nitrate-nitrogen levels are 10 ppm or below.
- Carry out bank stabilization projects along the Rio Loco