

Guánica Bay Watershed Restoration Project

Guánica, Puerto Rico



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Guánica Watershed Coordinator
US Coral Reefs Task Force Meeting

Fajardo Puerto Rico
October 26 – 30, 2015



Partners



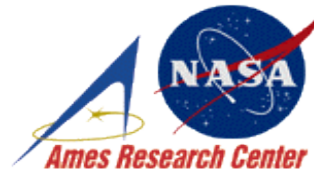
Guánica



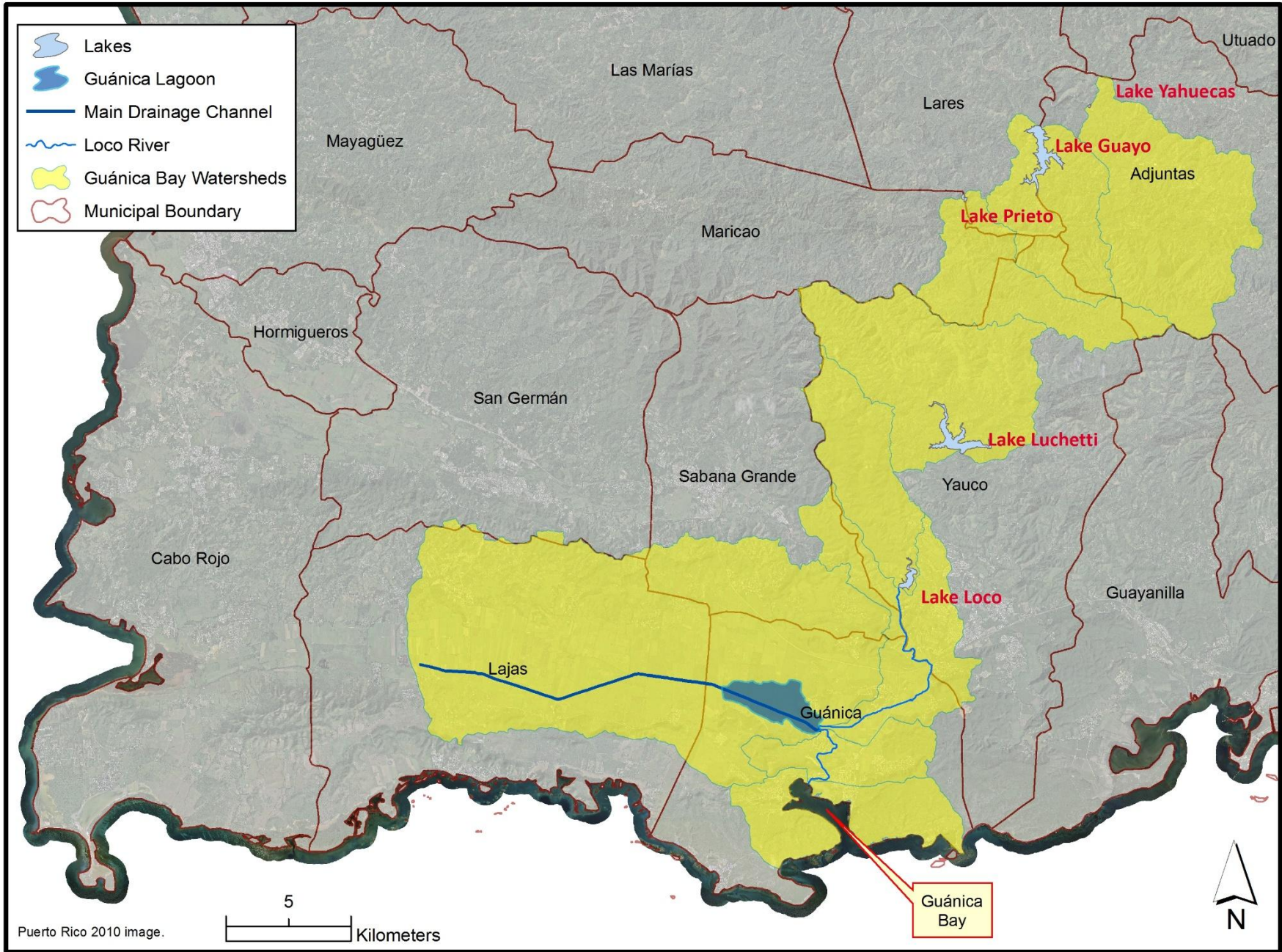
Yauco



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Guánica Bay Watersheds and Subwatersheds



Principal Recommendations of the Guánica 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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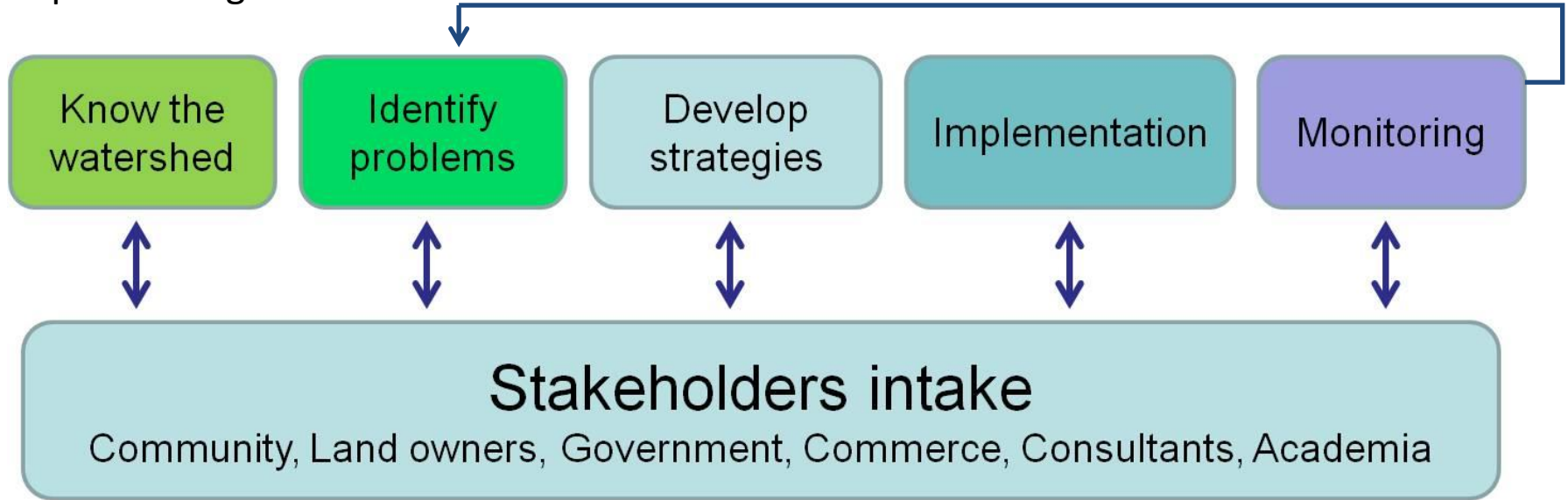


CENTER FOR
WATERSHED
PROTECTION

- Restoration of Guanica Lagoon (Studies and 85% engineering design funded NOAA)
- Rio Loco River Restoration efforts (funded NRCS, PRDA)
- Stabilization of High Mountain Soils
 - Control of sediment transport from Coffee Farms Erosion control and conversion to shade coffee (funded NRCS, FWS)
 - Control of sediment transport from bare soils - road sides, urban areas (construction) etc. (funded NOAA and NFWF)
- Sewage treatment wetlands at the Guanica sewage treatment plan (funded NFWF)
- Investigate and address other sources of pollution (NOAA Coord)

Watershed plan implementation Process

Implementing since 2010



Guánica Bay Watershed Management Plan Update

- Revised estimates for pollutant load reductions associated with BMPs
- Will meet EPA's A thru I criteria for watershed planning
- Summary of special studies
- Identify smaller water quality critical project sites
- 25% completed
- Draft in the next 6 months



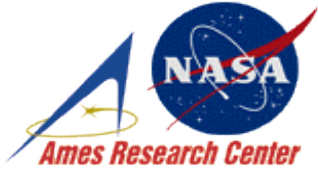
Programmatic Checklist	n/a	No	IP	Yes
Committed Federal (2) and local (1) partners				✓
Full time watershed coordinator				✓
Finalized WMP w/ EPA's 9 elements (% completed)			✓ (25%)	
Stakeholder input included in WMP				✓
WMP institutionalized as official policy		✗		
Implementation agreement		✗		
NPDES general permit active		✗		
NPDES MS-4 stormwater program active		✗		
Enforcement action taken at problem sites			≈	
Centralized wastewater collection/treatment			✓	
Agriculture BMPs implemented				✓
Ecological monitoring program				✓
Adaptive WMP evaluation process				✓

Metrics

More formal metrics may be established as part of the update of the Guánica Watershed Plan. Our metrics mainly consist of numerical measures to address pollutant loads and major sources of pollution

- Reductions in:
 - suspended sediment loads associated with soil stabilization (hydroseeding)
 - sediment and nutrients from conversion of sun coffee to shade coffee
 - nutrients from the creation of wetlands at the sewage treatment plan
 - nutrients, sediment and stormwater pollutants by addressing stormwater runoff
 - illicit discharges from urbanized and developed catchments
- Social Metrics
 - Engagement of:
 - students and residents in marine debris and cleanup projects and increased stewardship at beaches
 - residents, businesses and others in efforts to engage the community in restoring Guánica Lagoon
 - coffee farmers and processors in creating shade coffee criteria
- New Monitoring Projects in the Watershed
 - NASA-UPRRP
 - Villa Nova University
 - UPRM

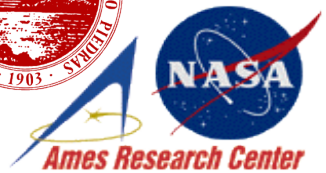
Installation of Permanent Monitoring Stations Across the Watershed



Studying Erosion and Sedimentation Rates on Different Land Covers in Coffee Farms

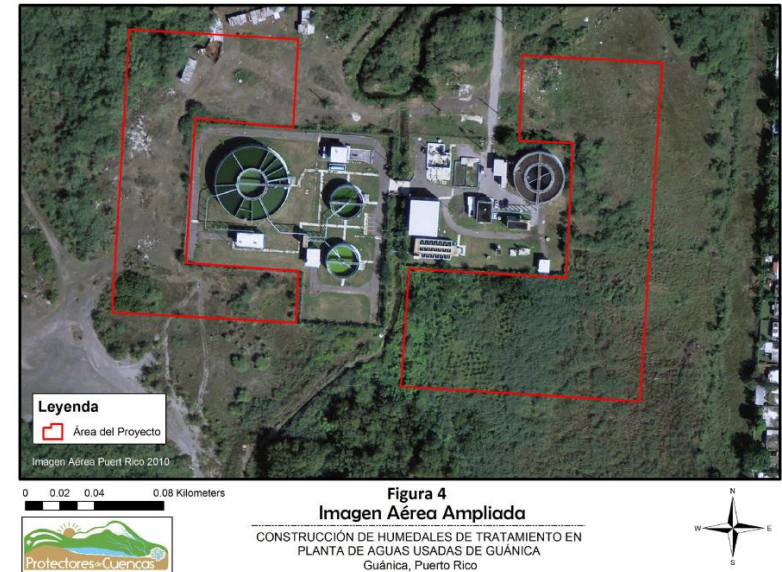
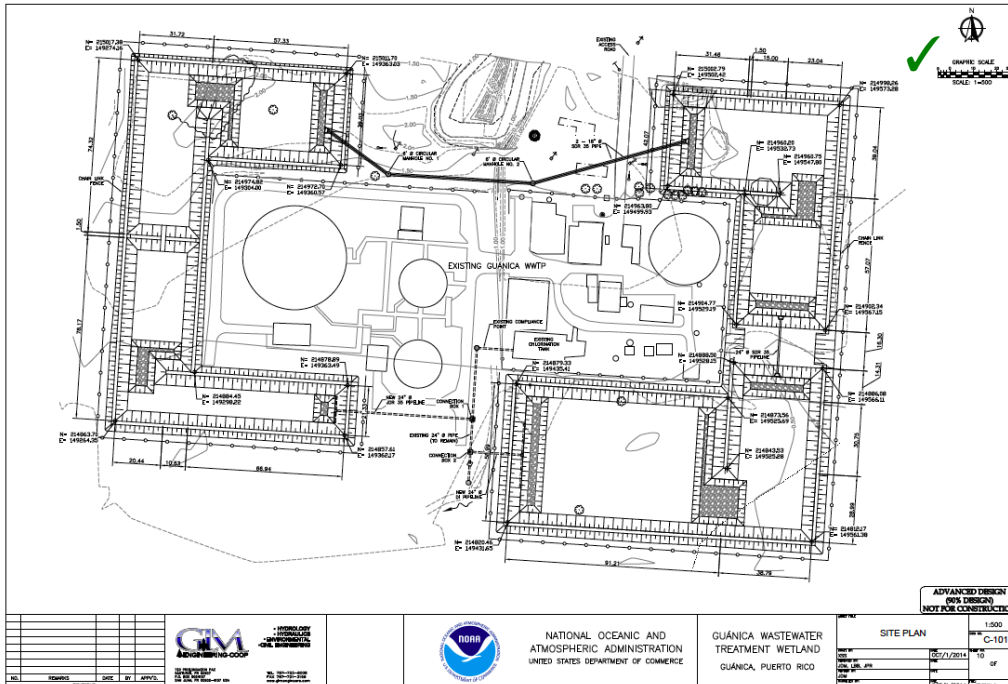


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Guánica Treatment Wetlands

- 100% engineering designed
- 95% of permit process completed
- Close to final MOU with PRASA
- Estimates of reducing nitrogen loads to Guánica Bay by over 25,000 pounds annually



Shade Coffee Round Table Initiative

Objectives

- Develop criteria for shade coffee certification to Puerto Rico
- Identify incentives for motivating coffee producers continue to use agricultural practices that are sustainable and environmentally friendly.
- Helping create economic niches for the coffee produced in the shade can be marketed separately and will bring greater remuneration for producers.
- Enrollment of farmers in the voluntary programs from NRCS and USFWS to convert to shade coffee.

Update

- Approved certification document farms/producers
- Final design of a certification label
- Recent Funds approved from NFWF to:
 - Continue efforts
 - Enroll farmers in the certification process



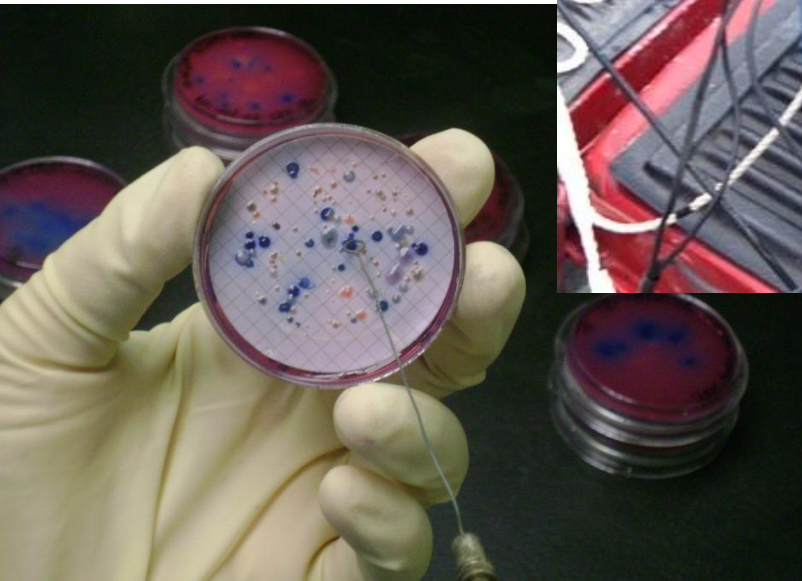
Soil Stabilization with Hydroseeding

- Funding from NFWF and NOAA
- 15 acres completed
- 5 more approved to enroll NRCS for coffee farms in priority areas
- Over \$100K in match contributions
- Expand to other priority watersheds
- Test plots in forest fire burn sites
- Test plots with native vegetation
- 3-4 acres more to be completed in the upcoming months
- 3-4 acres in the Cabo Rojo Watersheds



Illicit Discharge Identification and Elimination

- Constant monitoring problem sites
- Excellent communication with PRASA for fixing problems
- Help from the community



Guanica Lagoon

- Continuous support from DNER
- Study of the socio economic impacts of the restoration; DNER
- 85% engineering design completed
- Hydrologic modeling
- Strengthening of community NGO
- PRLA-EPA-DNER negotiations about the CWA violations
- Periodic overflights
- PR Senate approved new resolution in June 2015 supporting the restoration of the Guanica Lagoon



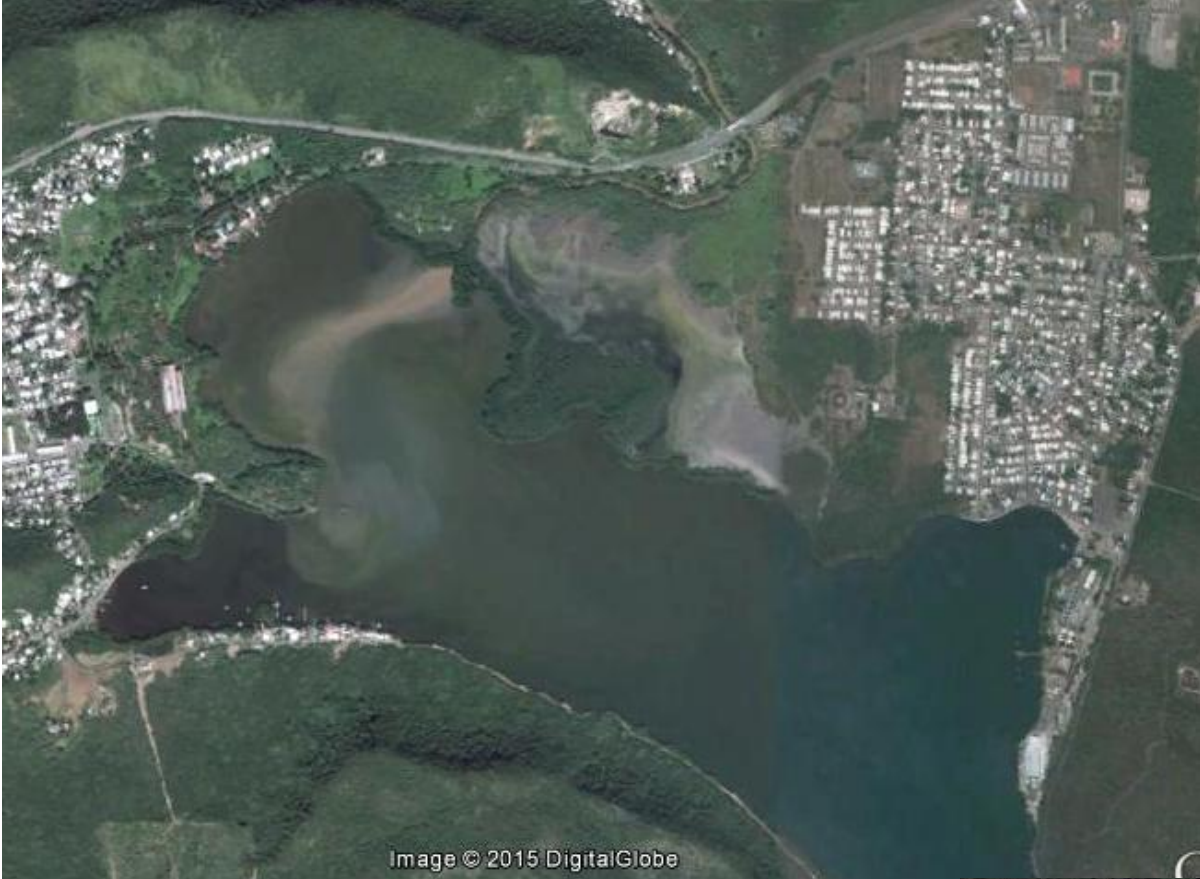


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Fechas de imágenes: 6/28/2015 17°58'01.95" N 66°55'10.58"



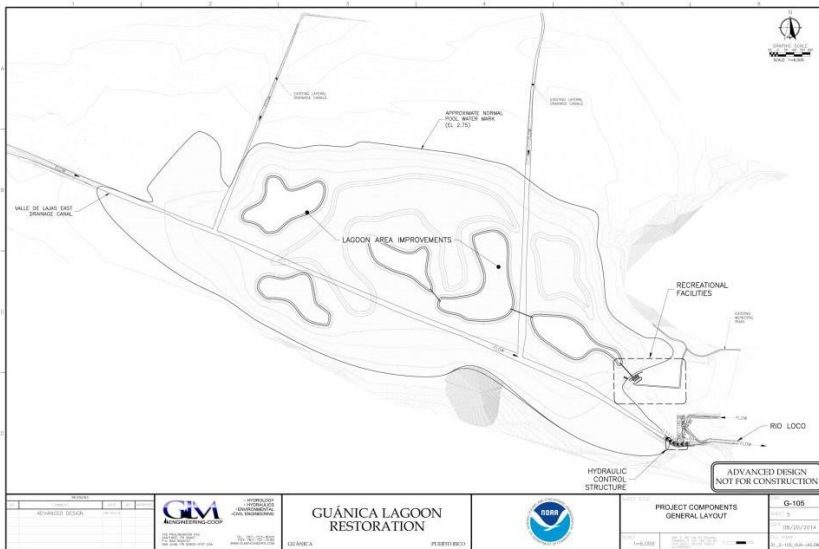
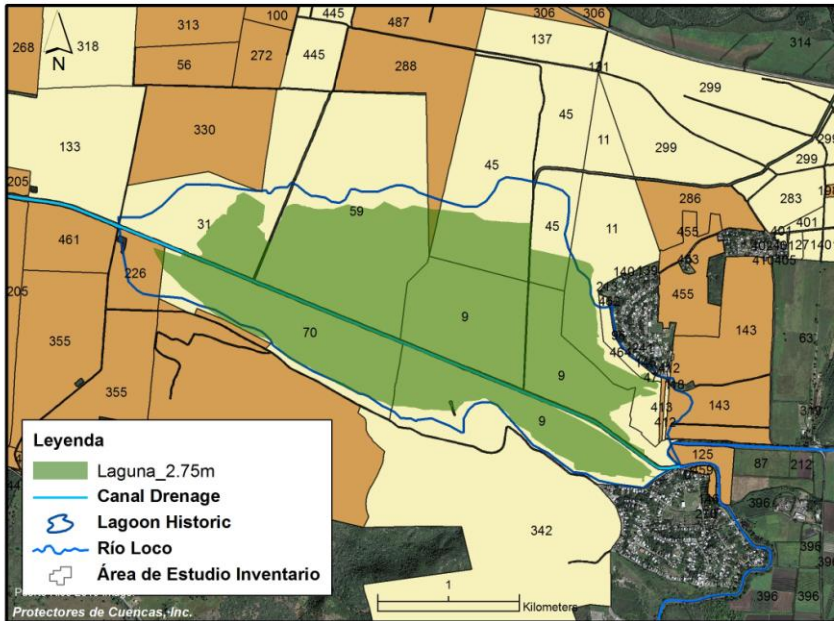
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Google earth

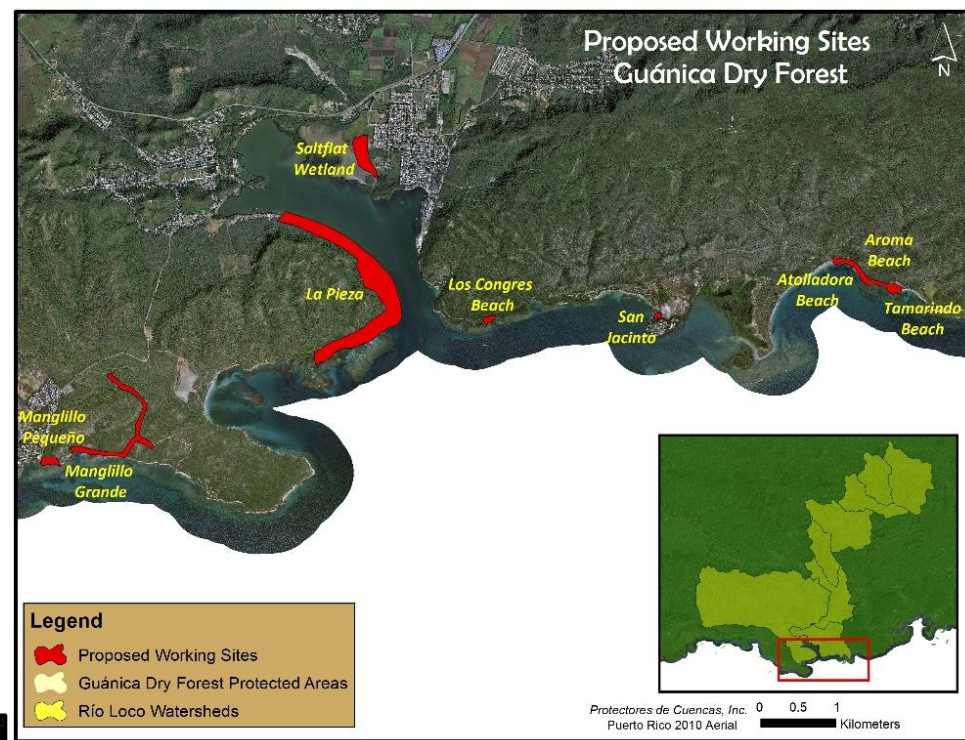
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Next Steps

- DNER is currently identifying funds for the EIS
- Final design is dependent on lagoon alternative selected after environmental impact statement (EIS) is prepared
- Negotiations DNER-PRDA



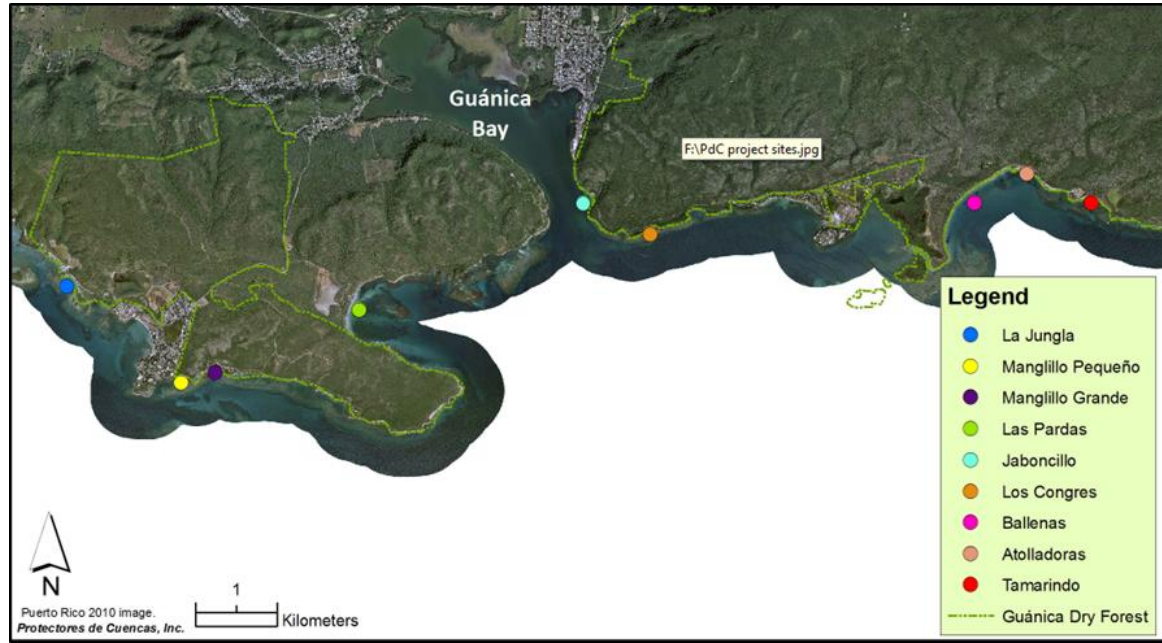
New initiatives



Pilot Project to Implement BMP on Dirt Roads on Coffee Farms



"Think before you drop it": A Research based Litter Reduction Campaign in Nine Beaches of Guánica, Puerto Rico.



Innovative Approach to Reduce Marine Debris

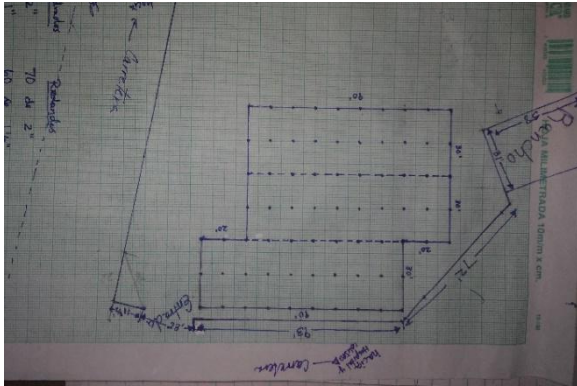


- Understand the behavior. (Research)
- Design a campaign.
- Test the campaign with a pilot group.
- Implement the campaign.
- Measure success.

Erosion and Sediment Control Workshops to Municipal Workers; Cabo Rojo, Lajas, Guánica, Yauco



Acceleration of Watershed Restoration Efforts in Puerto Rico



Restoration Equipment



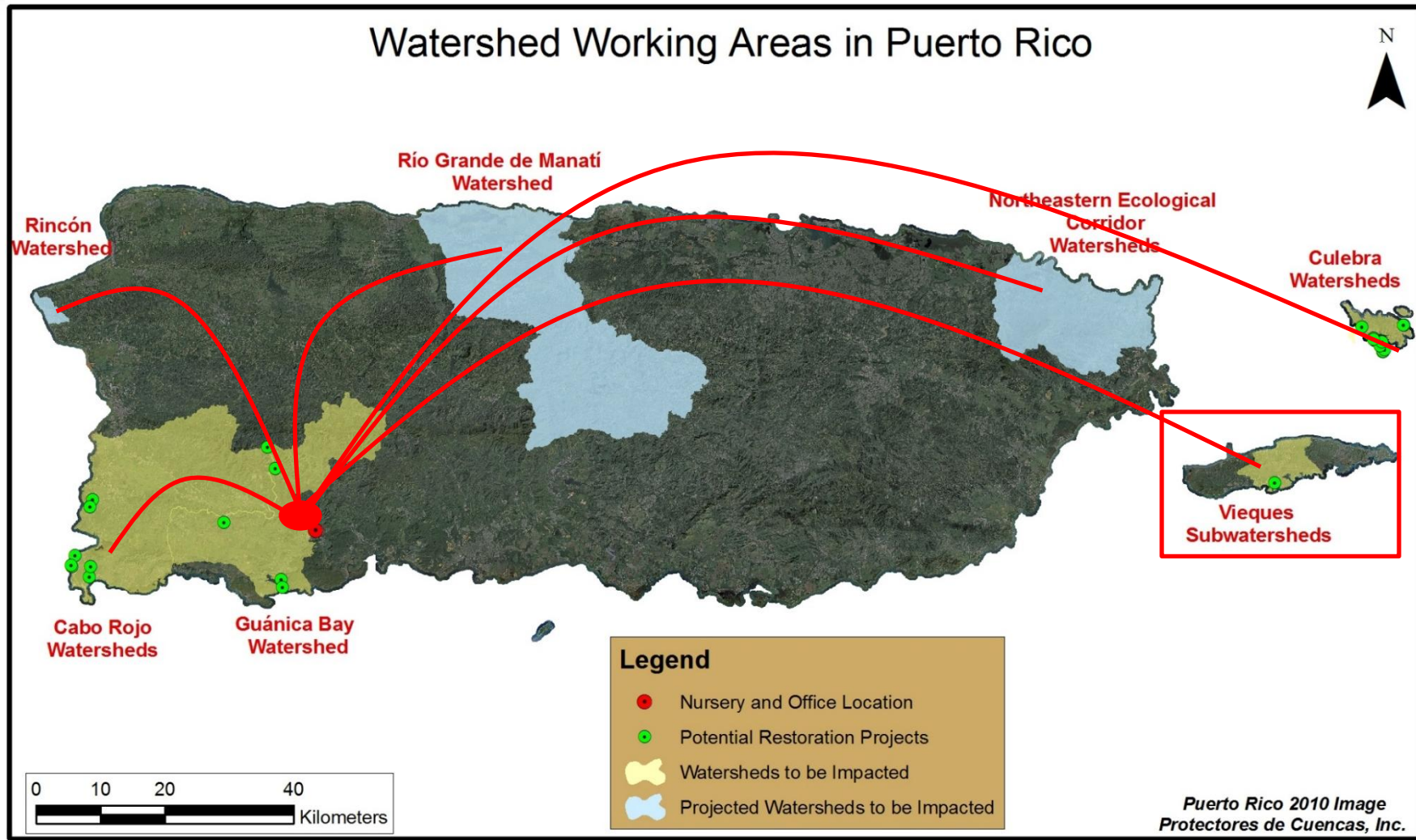
Challenges

- Permitting process for Restoration projects
- Different perspectives in terms of public policy
- Clean Water Act violations
- Clearings from Municipalities across Puerto Rico during storm season
- Finding stable sources of funding to continue projects
- Access to data



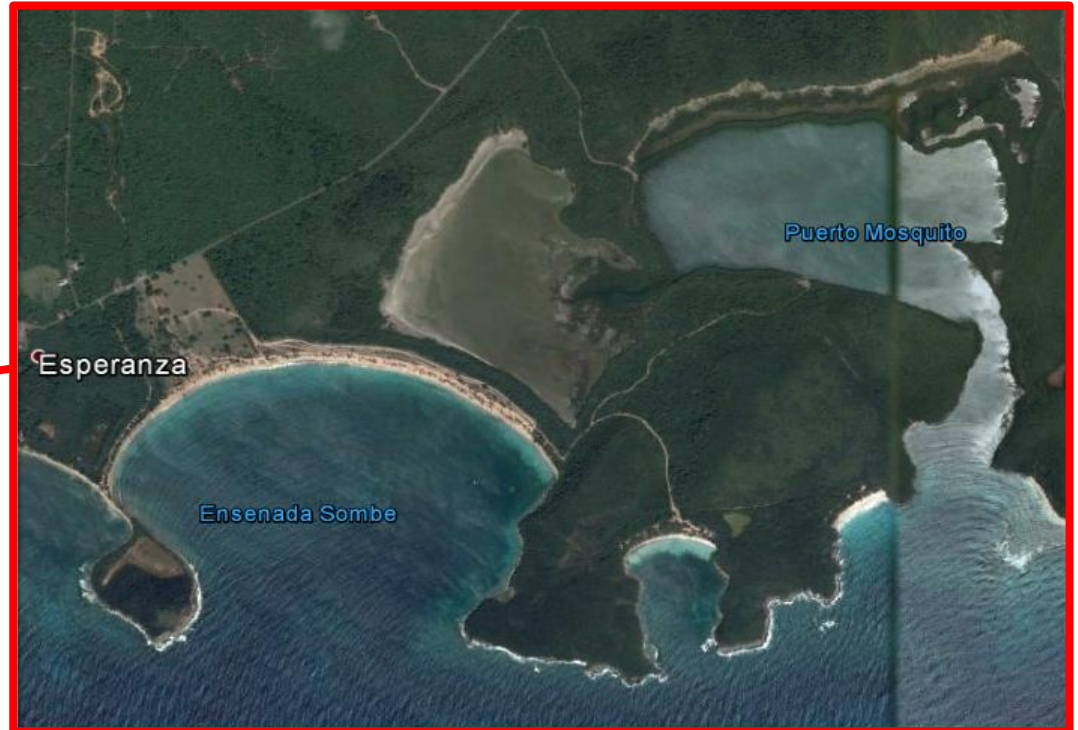


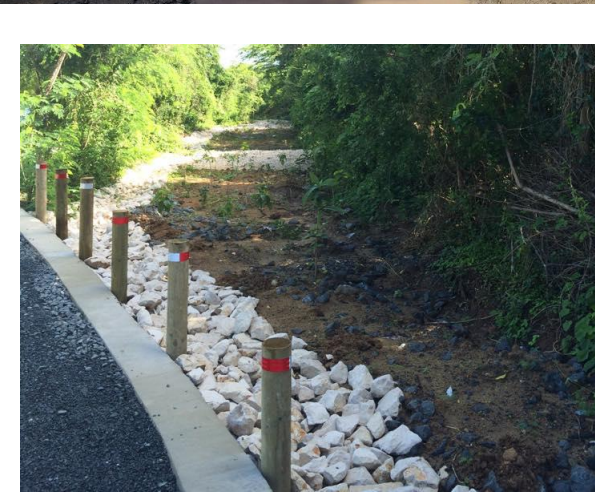
Expanding our model



Vieques

- Bahia Mosquito (Bio Bay) Fase 1:





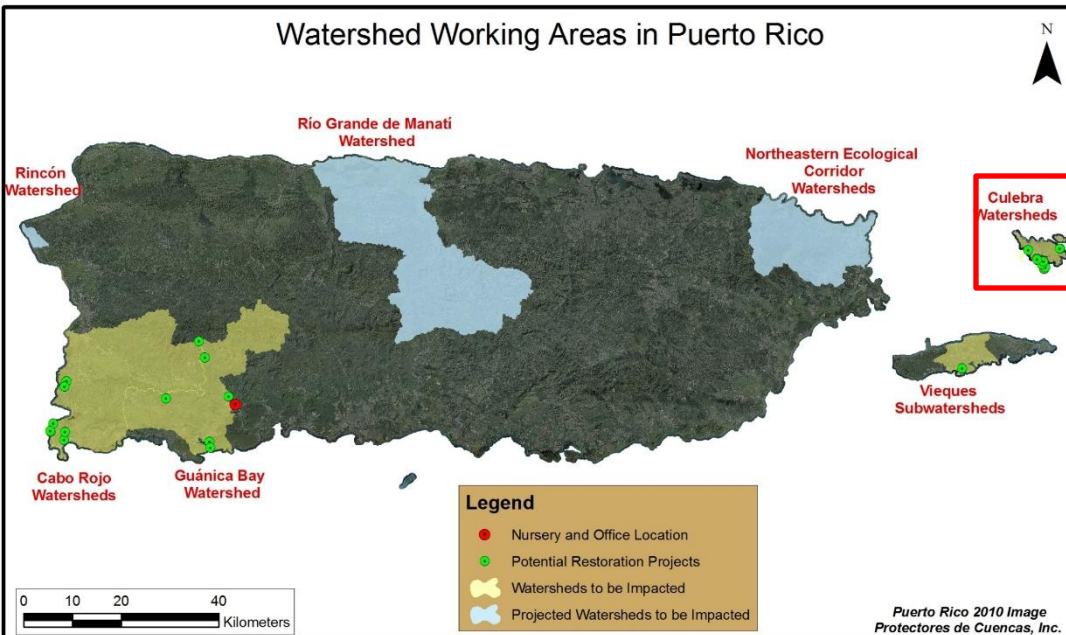
THE VIEQUES
CONSERVATION
HISTORICAL
TRUST




FIDEICOMISO
DE CONSERVACIÓN
E HISTORIA
DE VIEQUES



Culebra




CULEBRA
COMMUNITY WATERSHED ACTION PLAN FOR
WATER QUALITY AND CORAL REEFS



NOAA
CORAL REEF
CONSERVATION PROGRAM


PREPARED FOR
NOAA CORAL REEF CONSERVATION PROGRAM
PUERTO RICO DRNA
CULEBRA OFFICE OF THE MAYOR




DRNA

PREPARED BY

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Roberto Viqueira -Rios
Louis Meyer-Comas
Protectores de Cuencas



ridge to reefs



Protectores de Cuencas

FEBRUARY, 2014

Culebra

Zoni Beach:

Before



Culebra

Zoni Beach (after)



Culebra

Zoni Beach (after)

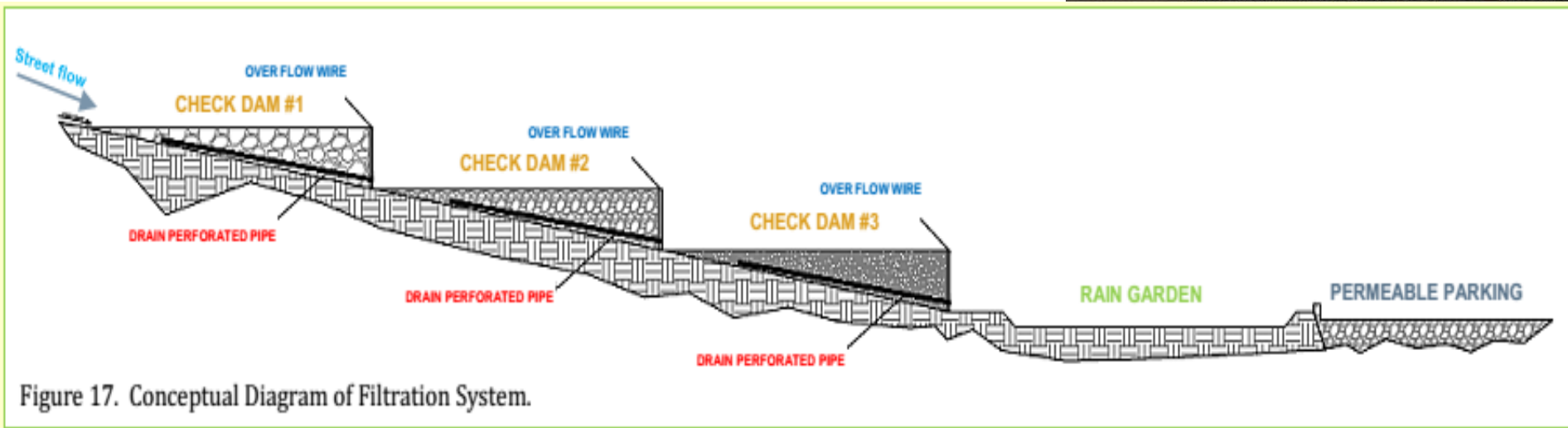
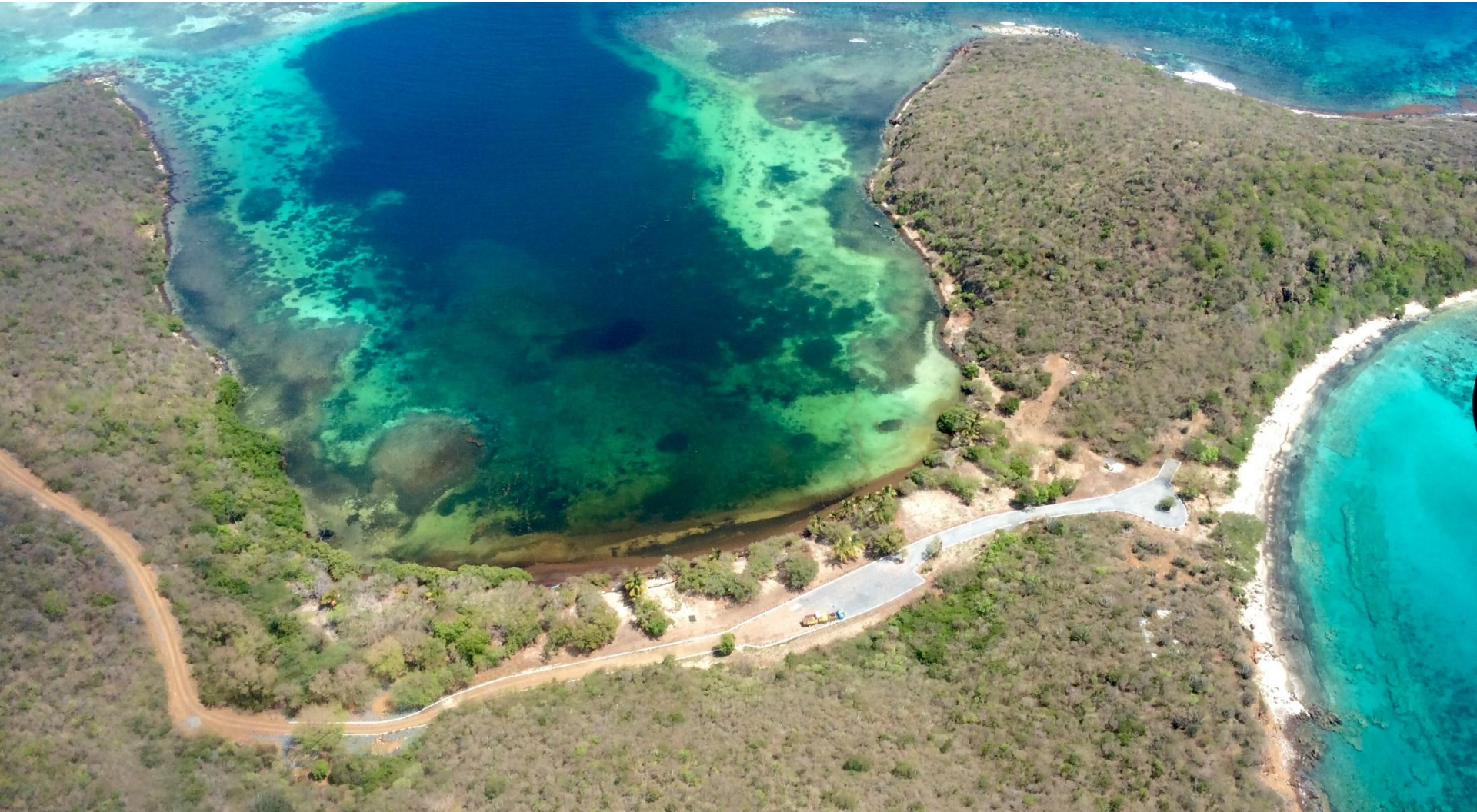


Figure 17. Conceptual Diagram of Filtration System.

Culebra Punta Soldado



Punta Soldado Sediment Traps



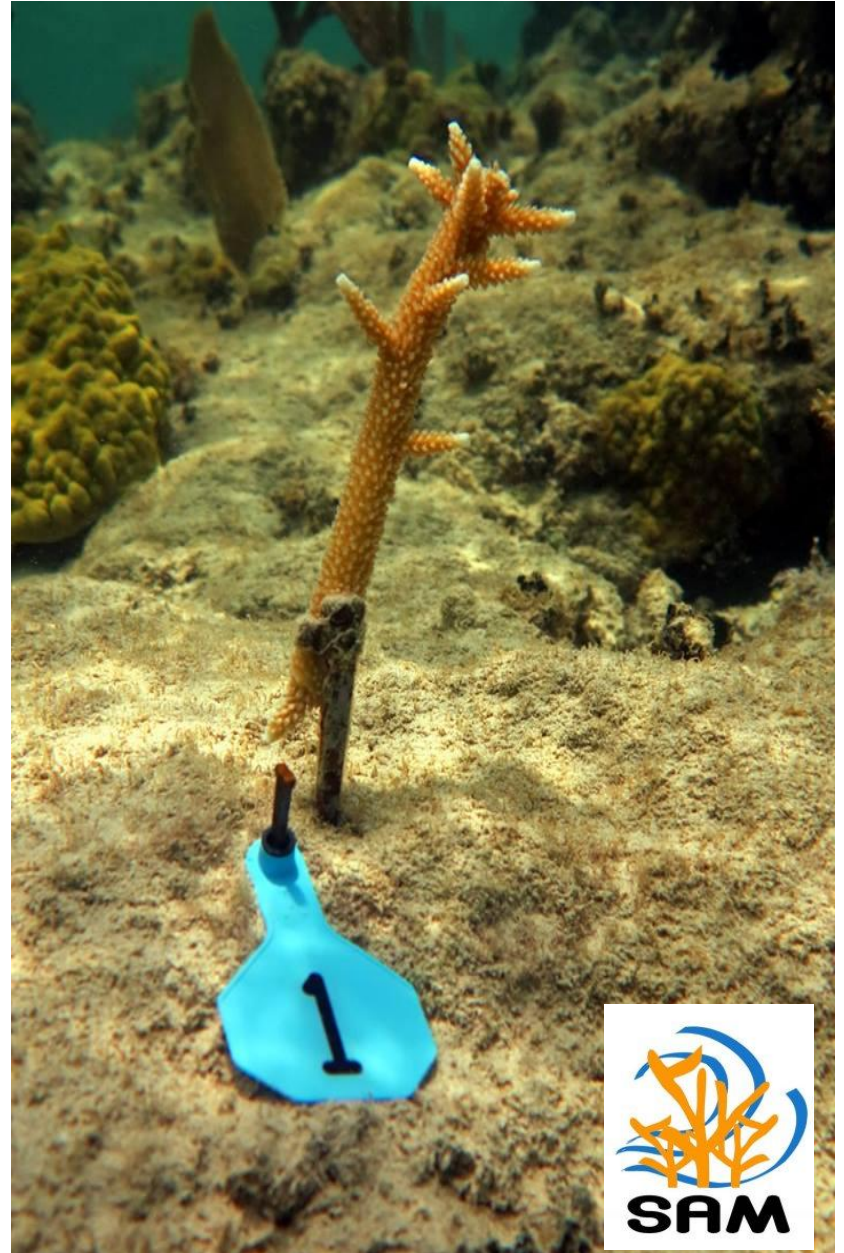
Runoff Management Pond



Sediment Stabilization



Coral Farming in Punta Soldado



Thank you!!!!

Collaboration, Implementation, Education





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