THE GUANICA BAY / RIO LOCO WATERSHED: LINKING HISTORICAL LAND USES WITH WATER AND SEDIMENT FLUXES AND HUMAN PERSPECTIVES OF THEIR IMPACTS TO COASTAL ECOSYSTEMS




https://www.facebook.com/papayo.divers/

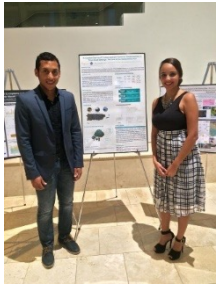
Meléndez-Diaz, J., & Ortíz-Zayas, J.

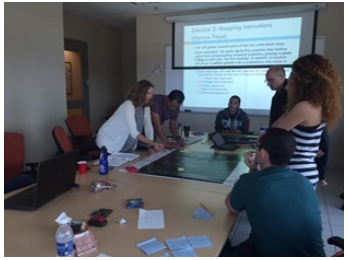
Tropical Limnology Laboratory – UPRRP

SOME INFO

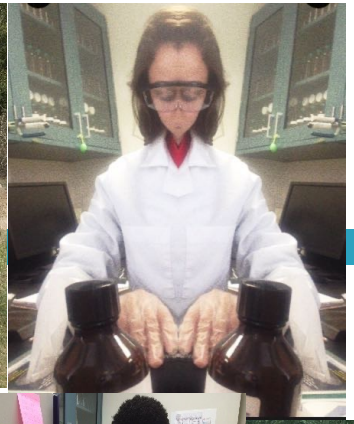
Human Impacts to Coastal Ecosystems in Puerto Rico (HICE-PR)

HICE-PR TEAM WORK

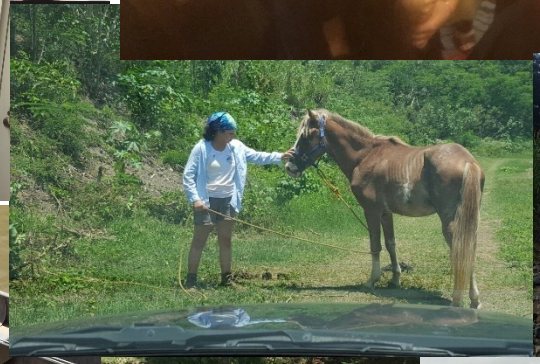


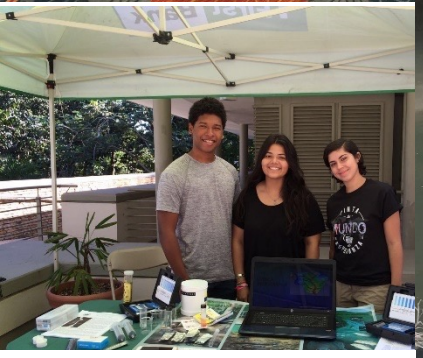












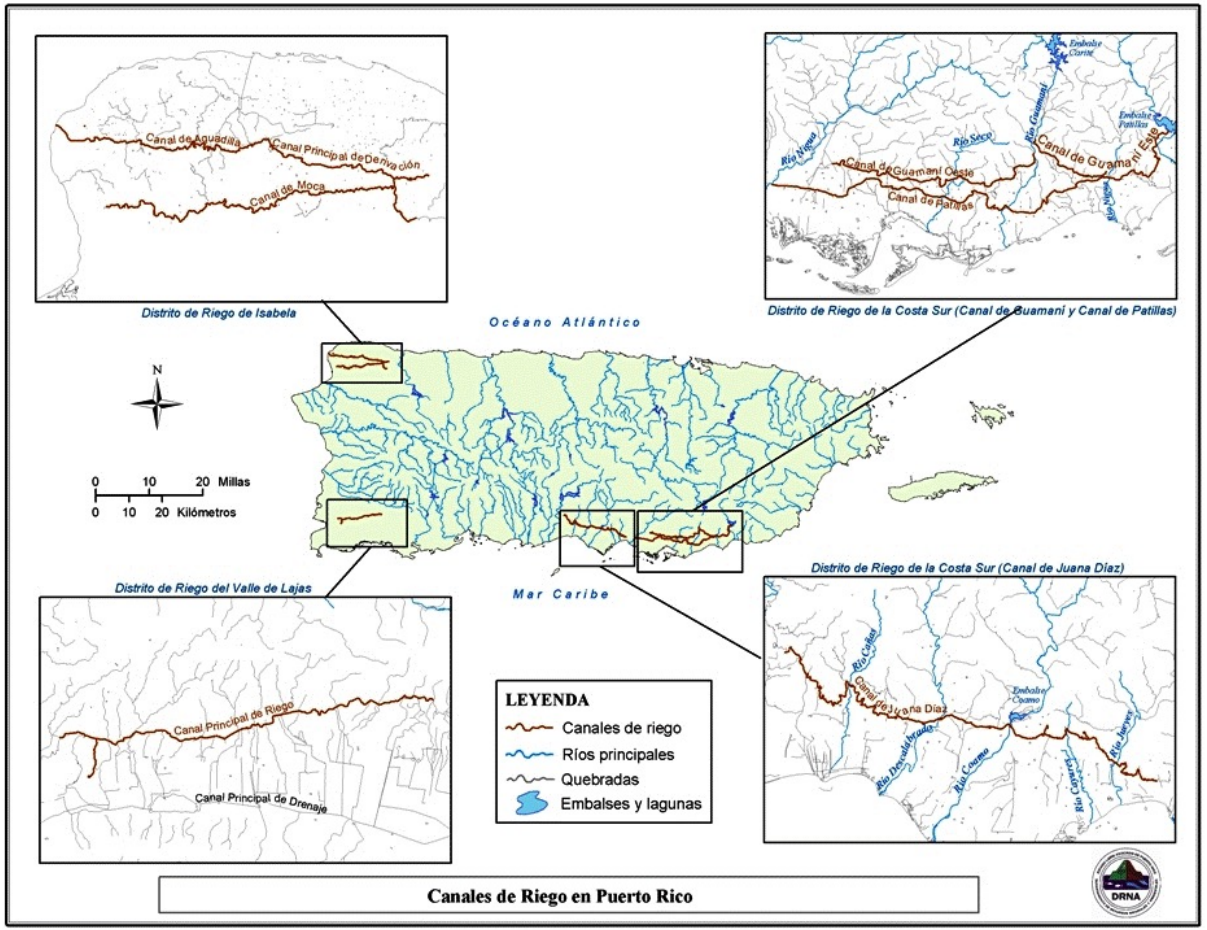


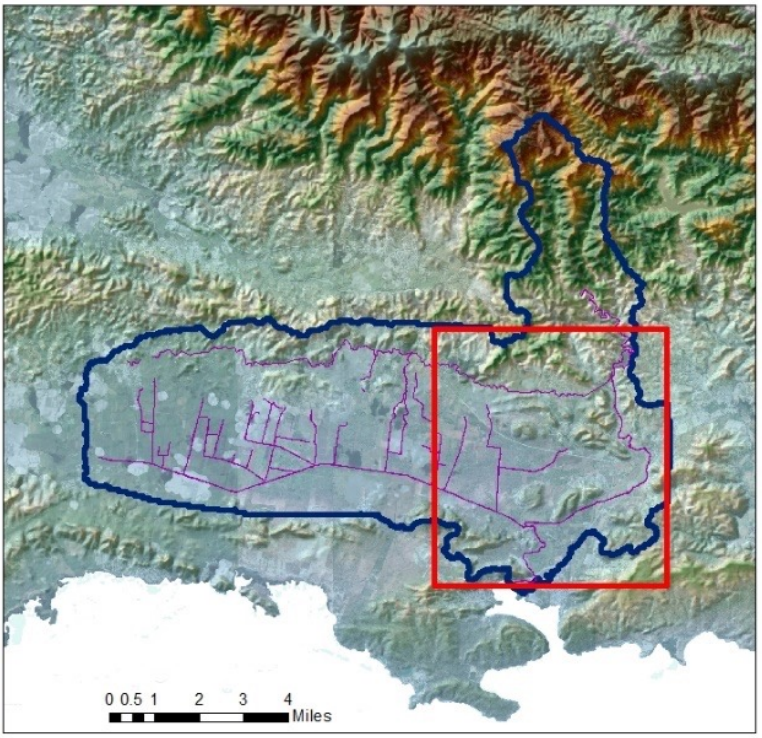
together everyone
TEAM
achieves more

STUDY AREA

Ortiz-Zayas JR, JJ Terrasa-Soler, and J Villarubia-Cruz. 2001. Allocating water resources for public supply within a complex hydroelectric system: the case study of Yauco, Puerto Rico. WEFTEC Latin America

Southwest Project / Lajas Valley Irrigation District





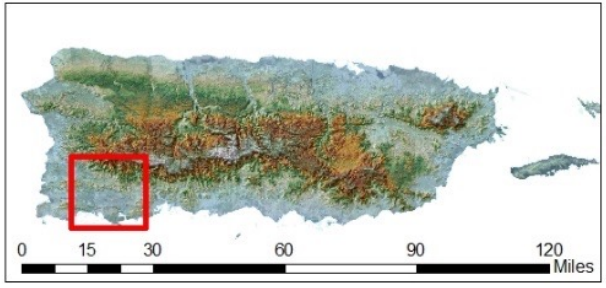


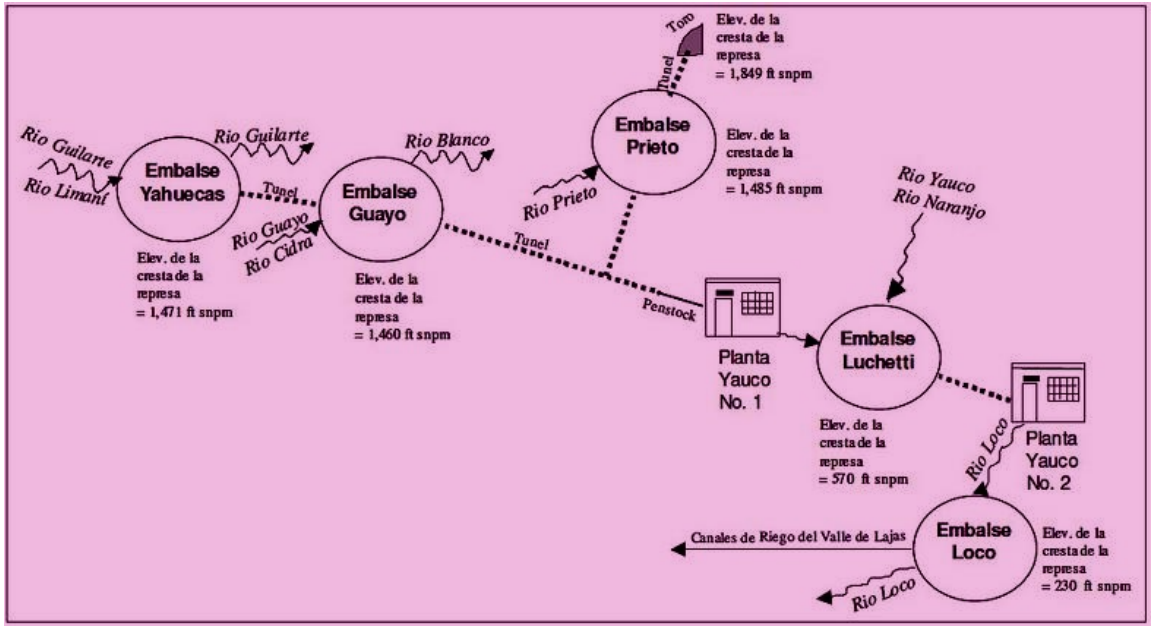
Figure 1. Major hydrologic components considered in the study

Area: 24.7 mi^2

Population: 27,680

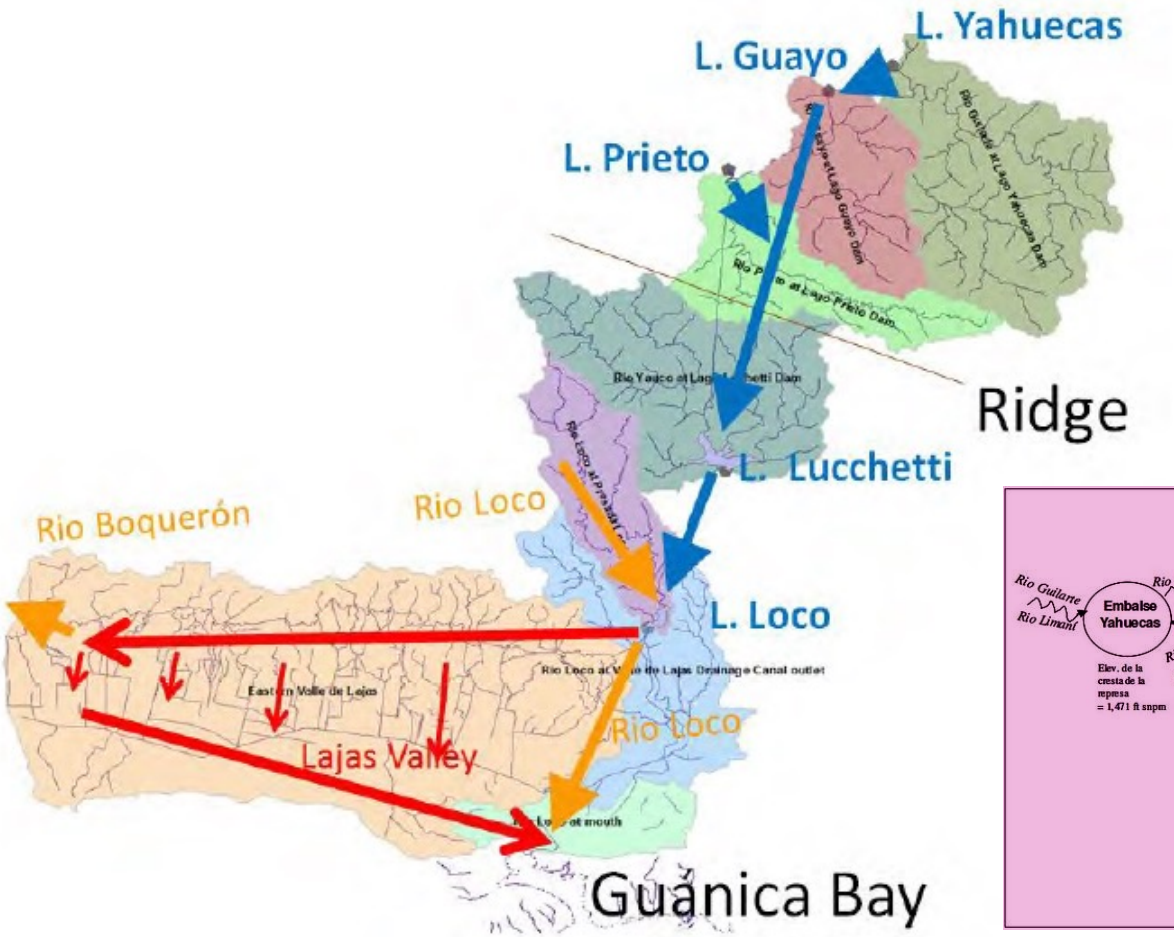
SOUTHWEST PROJECT / LAJAS IRRIGATION DISTRICT & THE WATERSHED

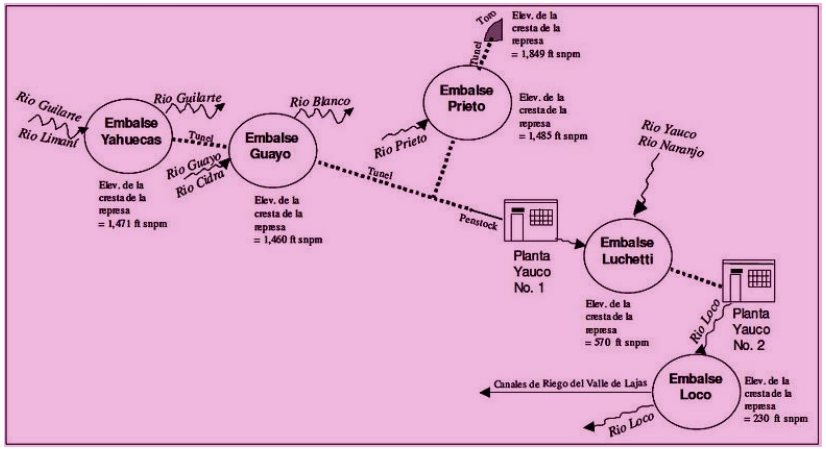
Southwest Project



http://www.recursosaguapuertorico.com/Hidrologia-Valle-Lajas-P2.html

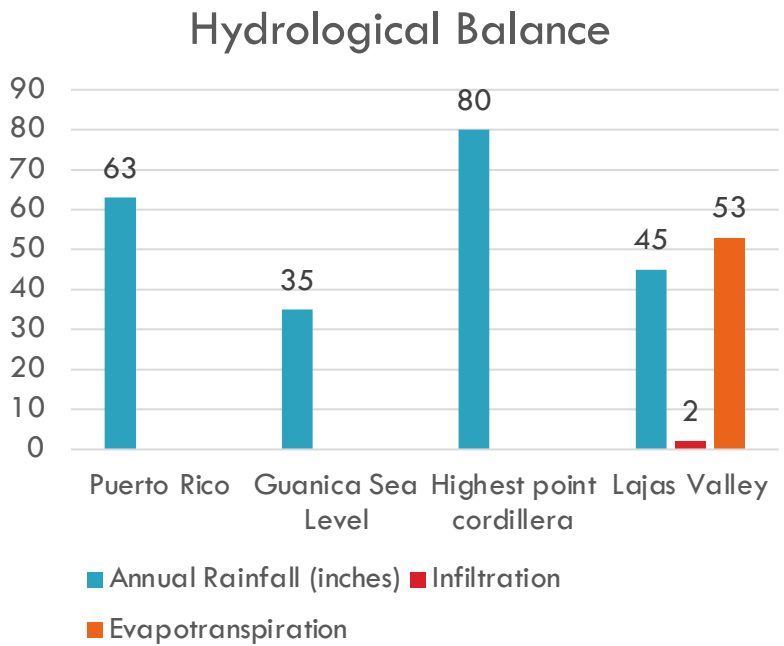
Justin Bousquin[1], William S. Fisher[2], John Carriger[2] and Evelyn Huertas[3], 2014

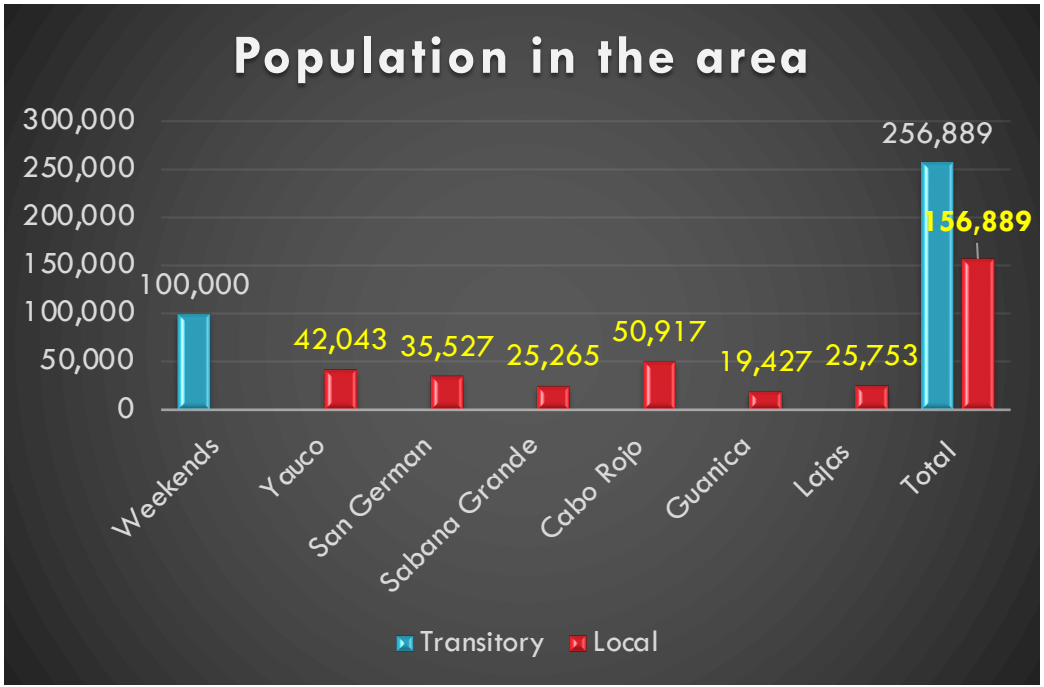




The Real Management - Infrastructure /Water / Energy

Diaz et al., 2001 Warne et al., 2005 Quiñones, 2014

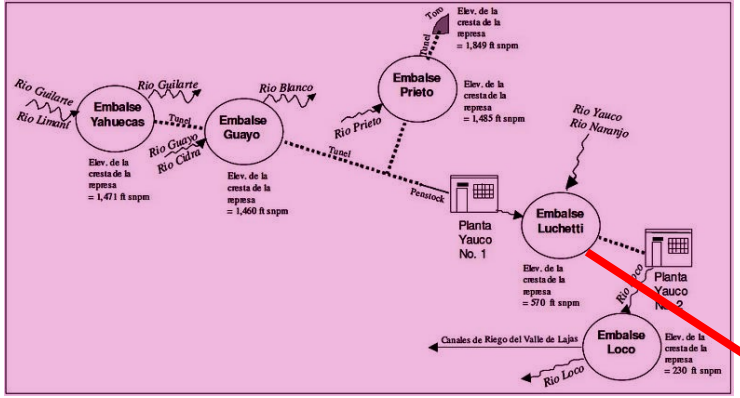




http://www.recursosaguapuertorico.com/Hidrologia-Valle-Lajas-P2.html - Ferdinan Quiñonez

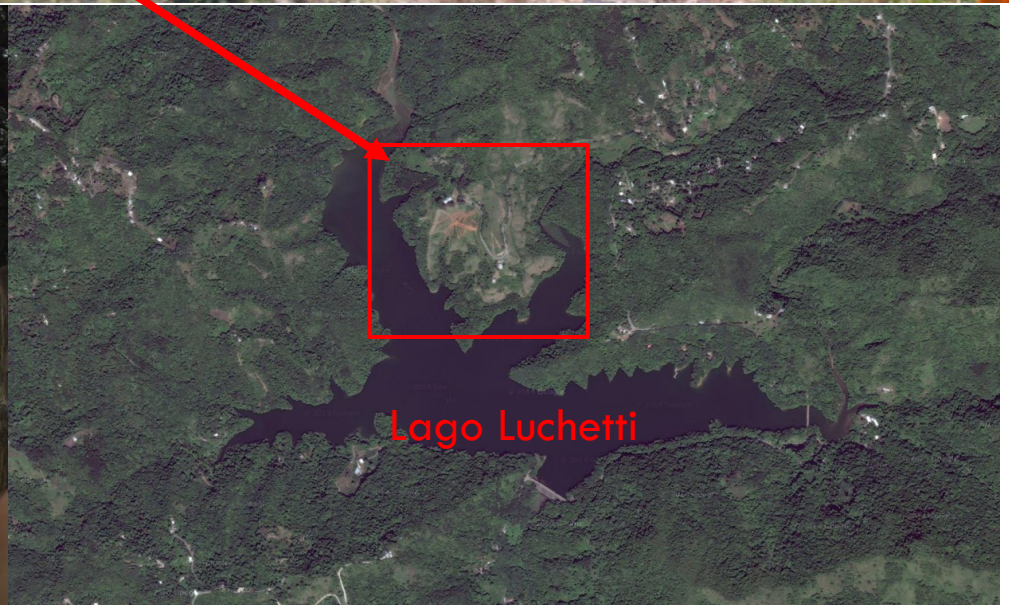
www.census.gov


L. Guayo
L. Prieto
L. Lucch
Rio Loco
L. Loco
Rio Loco
jas Valley
Guánica Ba
Coffee farm at Rio Loco headwaters

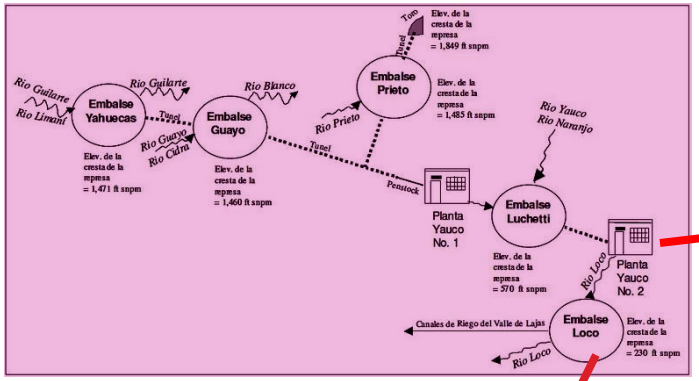


http://www.callejeandopr.com/callejea/paseo-extremo-por-el-lago-yauco

3 Octubre 2015



Lago Luchetti



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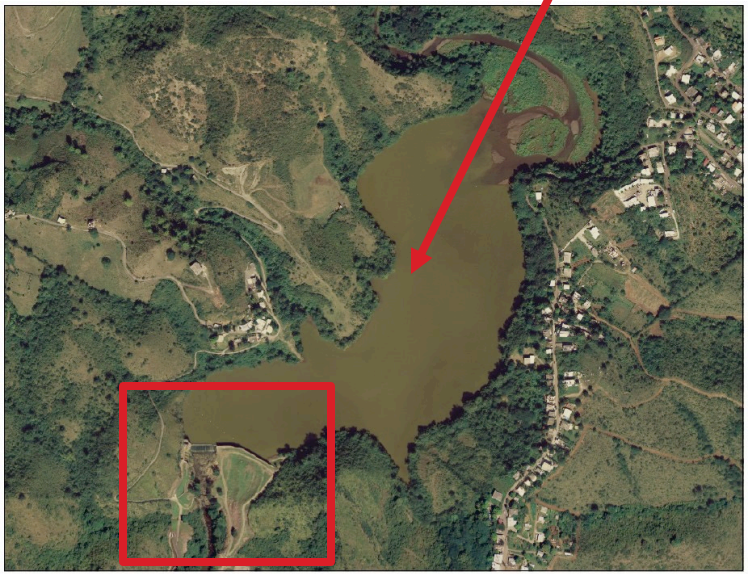
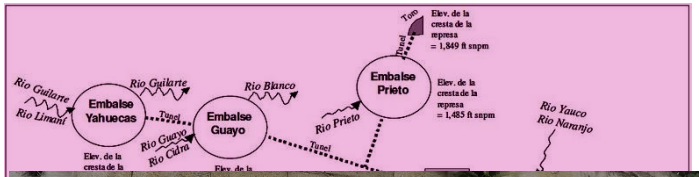


Center for Watershed Protection. 2008. Guánica Bay Watershed Management Plan; A Pilot Project for Watershed Planning in Puerto Rico. NOAA Coral Reef Program.

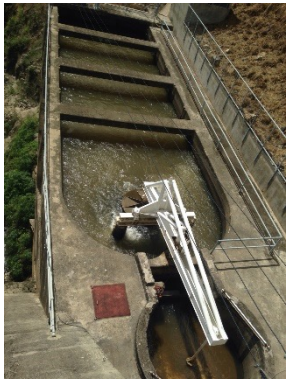
Sturm, P., Viqueira, R., Ferguson, R. & Moore, T. 2012. Addressing land based sources of pollution in Guánica, Puerto Rico. Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia.

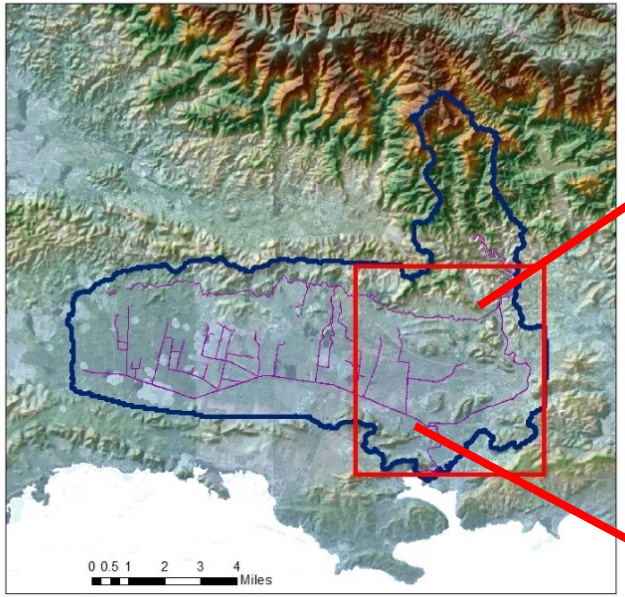


rces of
Symposium,
Cairns, Australia.

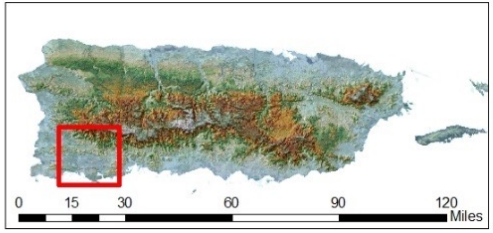
Center for Watershed Protection. 2008. Guánica Bay Watershed Management Plan; A Pilot Project for Watershed Planning in Puerto Rico. NOAA Coral Reef Program.

Fotos: Beatrice García




0 0.5 1 2 3 4
Miles


Ridge
L. Lucchetti
Rio Boquerón
Rio Loco
L. Loco
Eastern Valle de Lajas
Lajas Valley
Rio Loco
Guánica Bay


0 15 30 60 90 120
Miles


Río Loco
Drainage Channel
Photo credit: Joel Meléndez


25 Agosto 2015


15 Septiembre 2015

Estacion B


10 Noviembre 2015

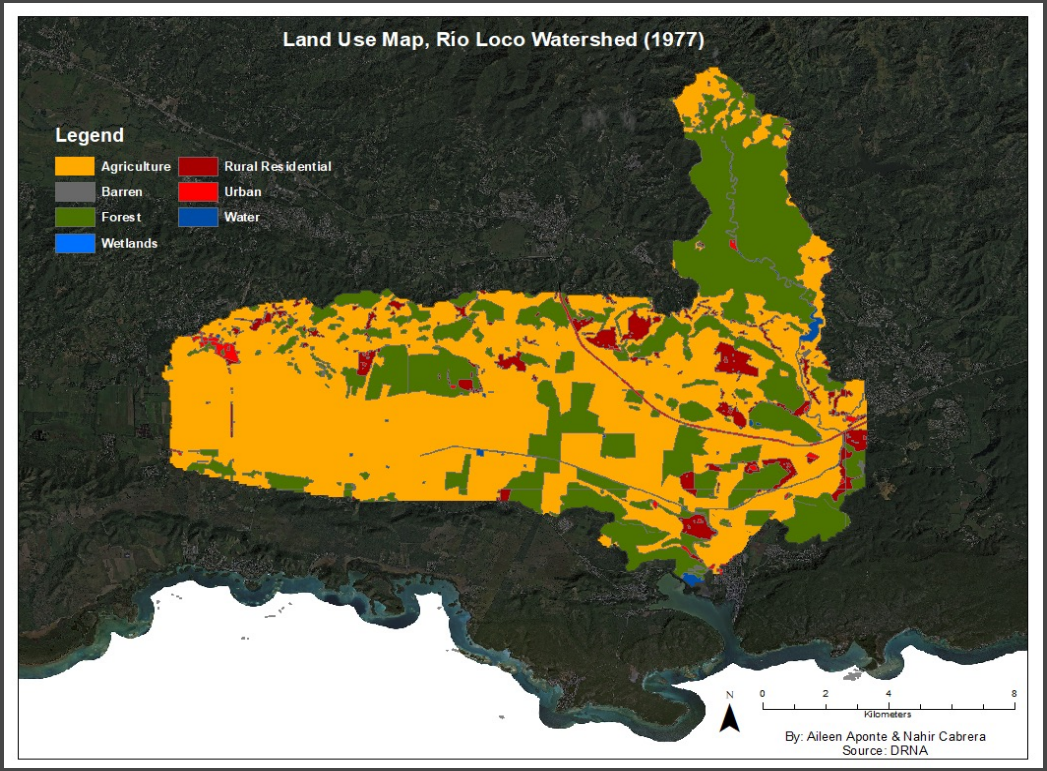

Estación B
Salida Canal de
Riego
Bahía Guanica

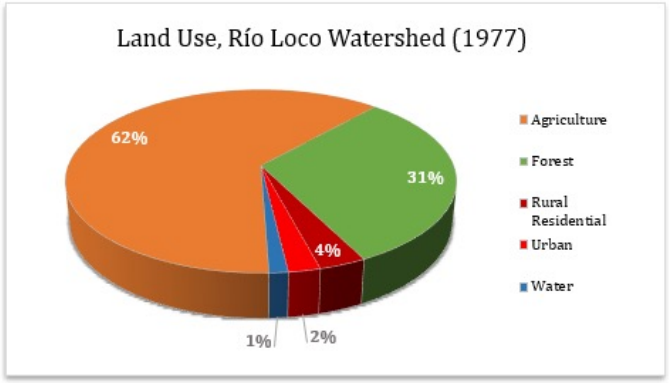
http://www.mtbcultura.com/2015/03/18/opcion-para-correr-en-familia/

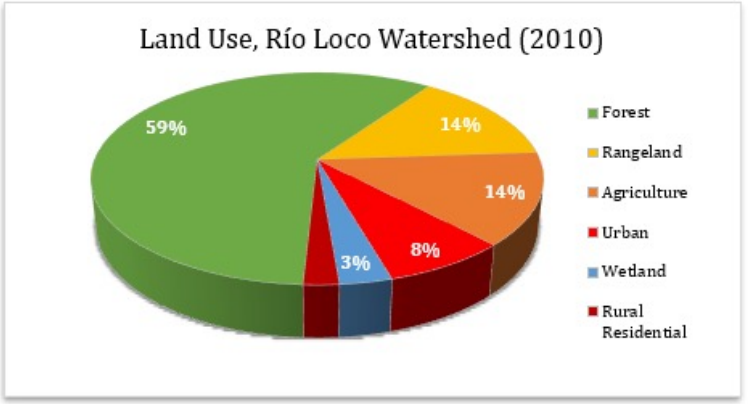

AVISO
Nombre del Proyecto: Estabilización de las Riberas del Rio Loco
Núm. De Solicitud: Caso # 2014-307560-PCO-32651
Tipo de Solicitud: Permiso de Construcción Certificado
Dueño y Proponente: Autoridad de Tierras de Puerto Rico
Dirección: Oficina de Gerencia de Permisos (OGPe)
P.O. BOX 41118 SAN JUAN, PR 00940
Email: ruperte_s@ogpe.pr.gov

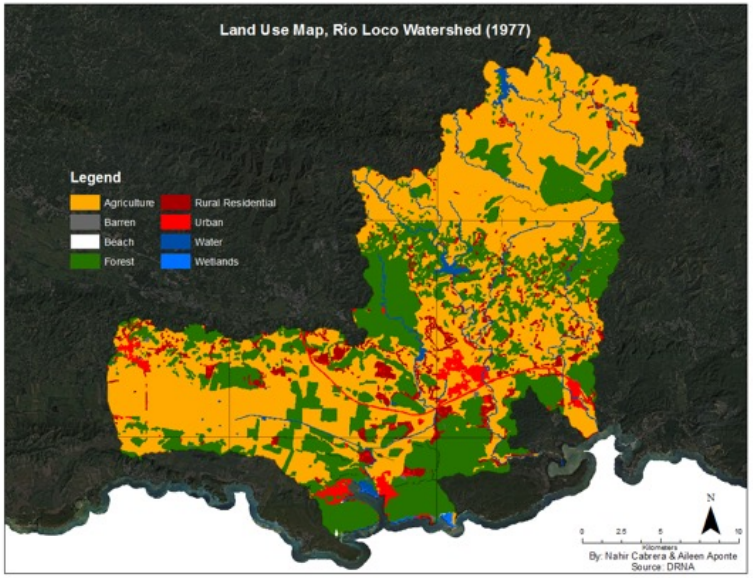

Ridge
L. Lucchetti
Rio Boquerón
Rio Loco
L. Loco
Lajas Valley
Rio Loco
Guánica Bay

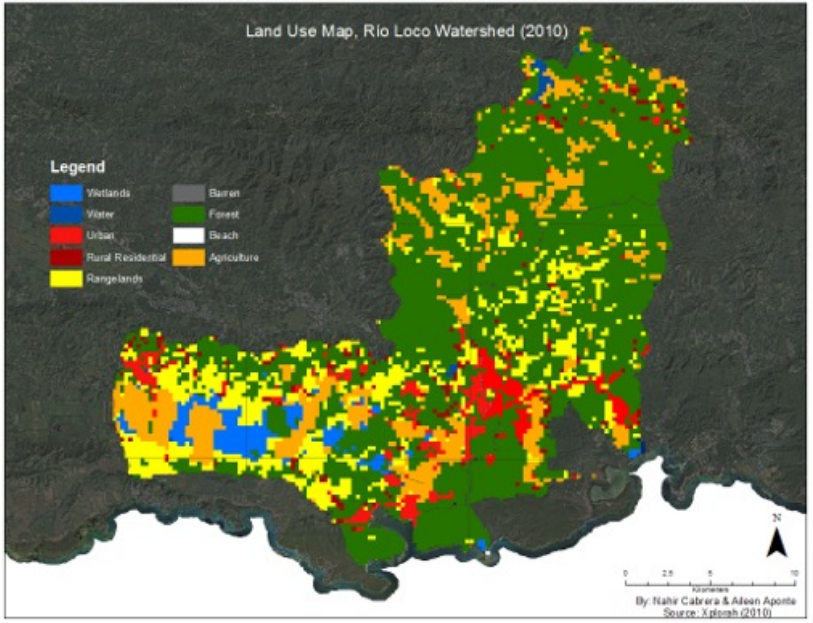
LAND USE CHANGE



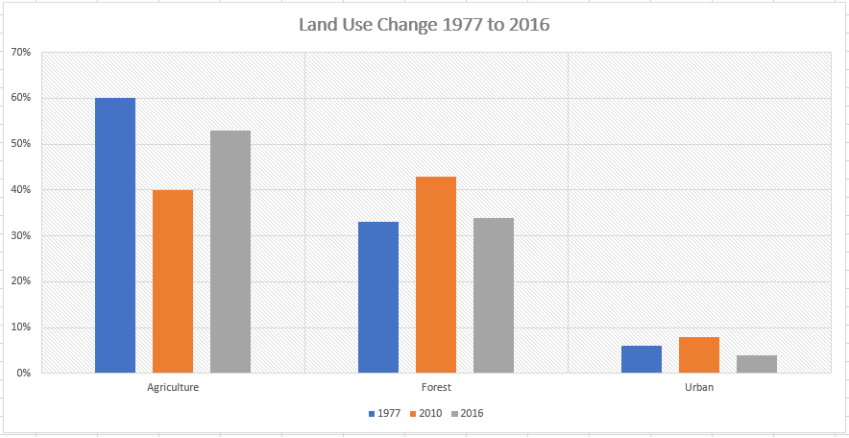


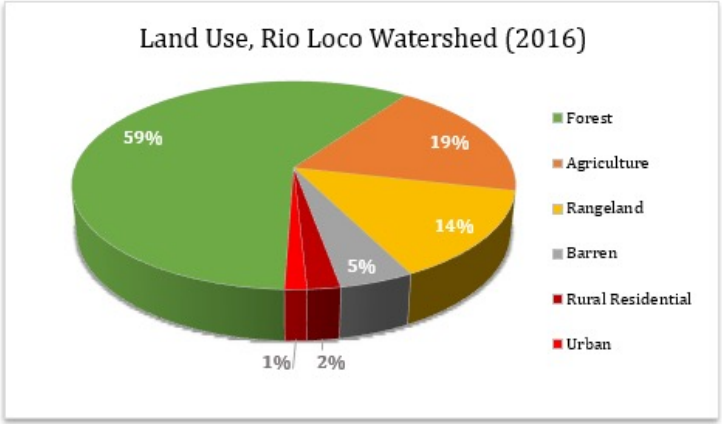


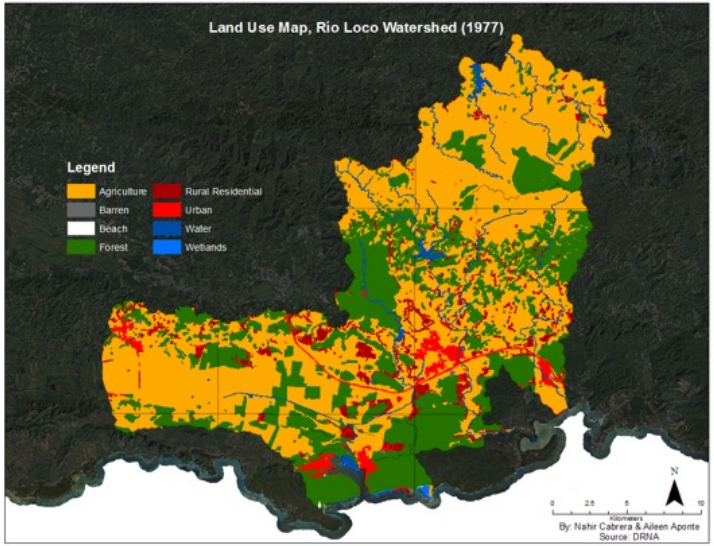


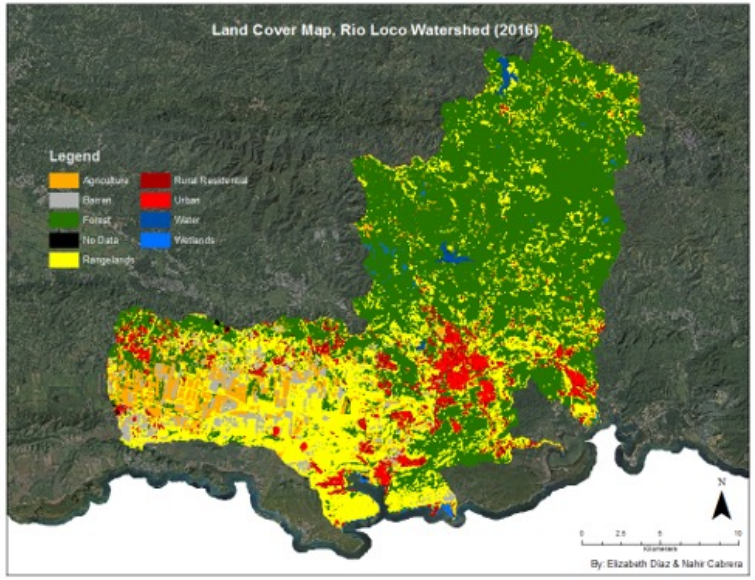


By Nahir Cabrera & Arleen Apponge Source DRNA

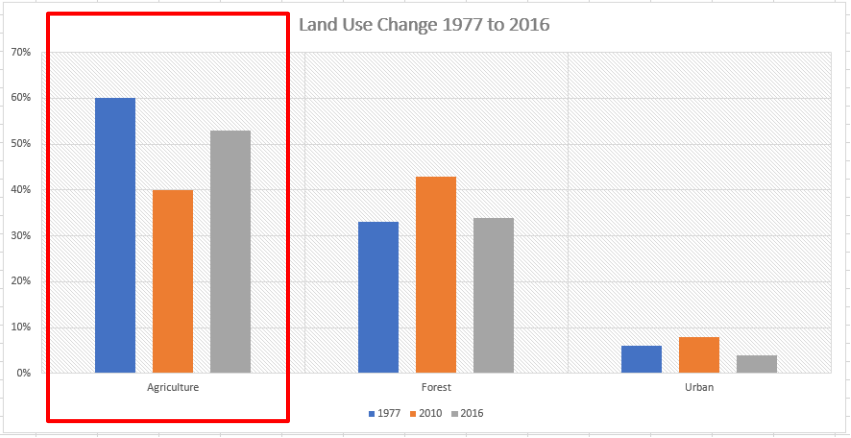


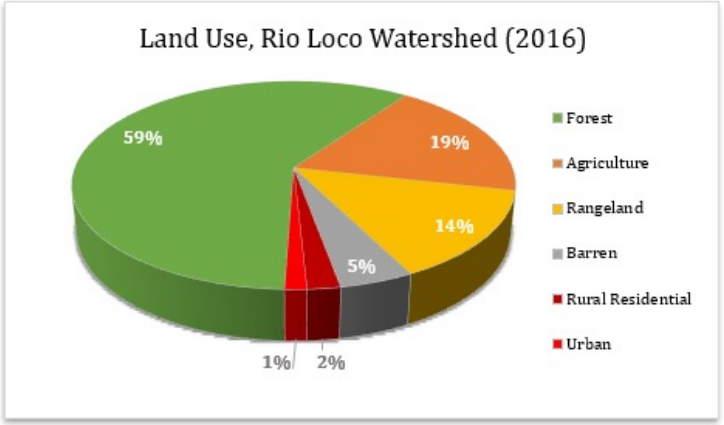


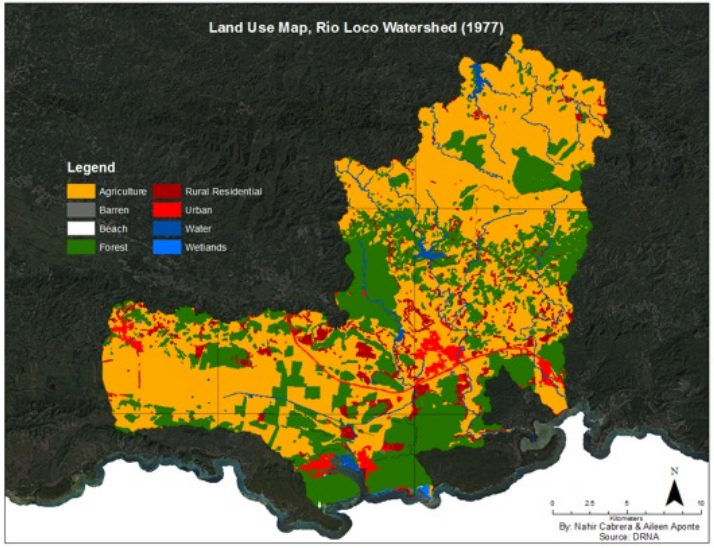


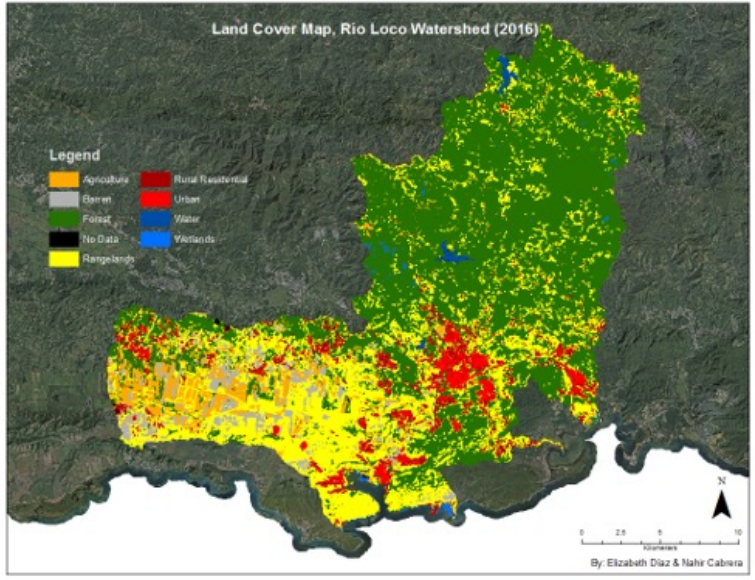


By Nahir Cabrera & Arleen Apponge Source DRNA



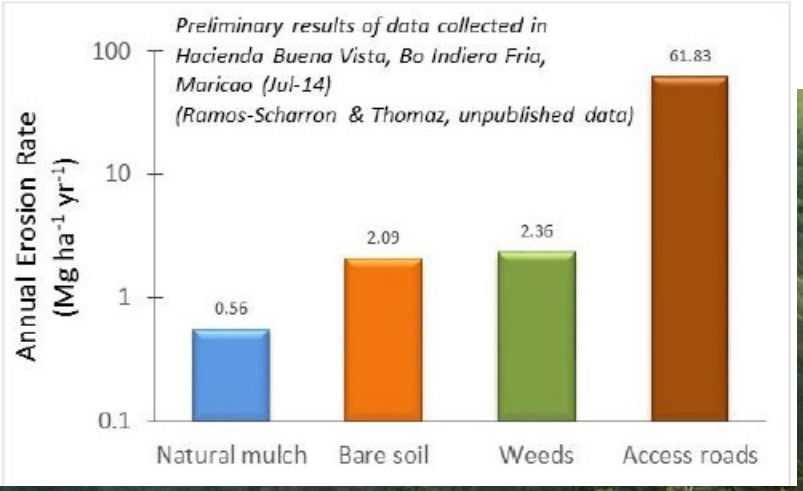






By Nahir Cabrera & Arleen Apponge Source DRNA

The Coffee Farm Landscape

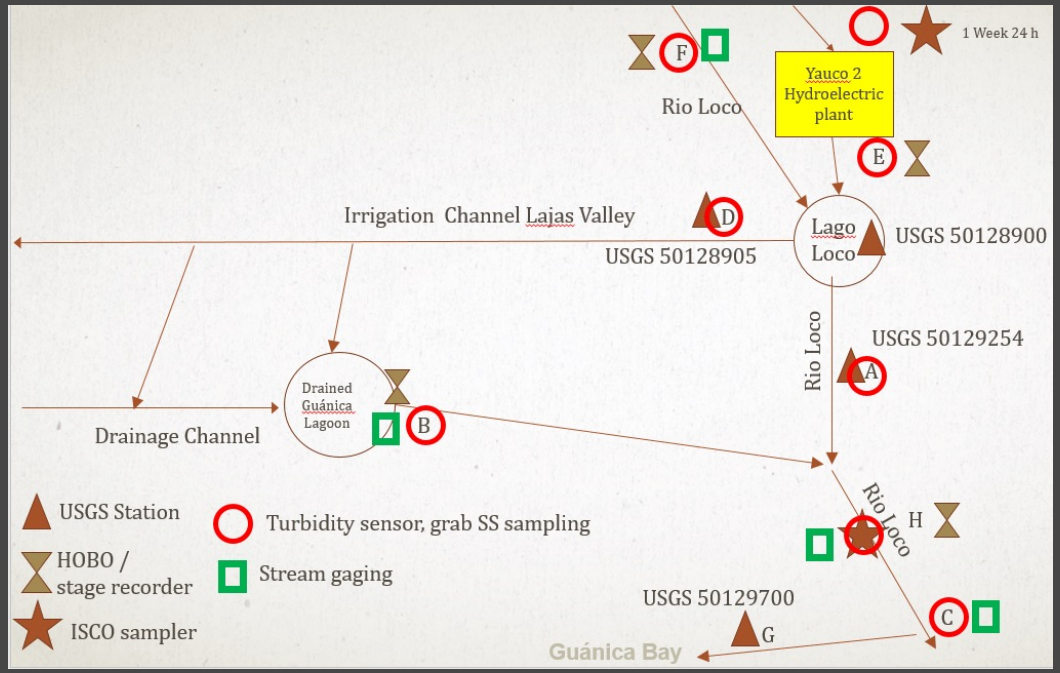


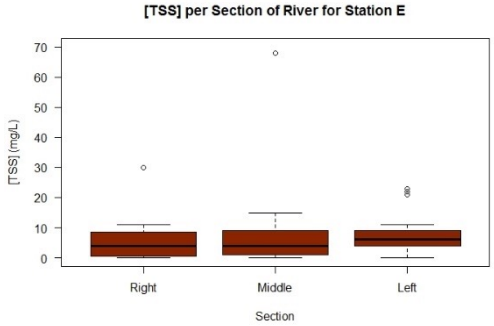
Yasiel A. Figueroa Sánchez & Carlos Ramos Sharron

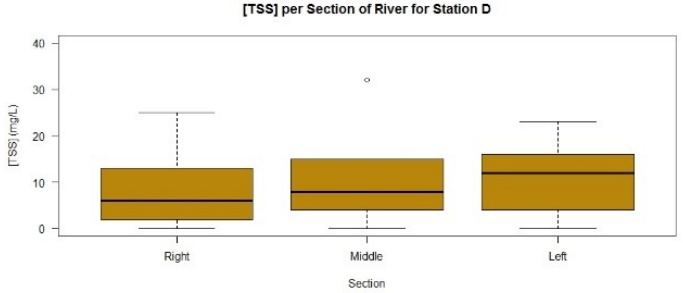

Ridge
L. Lucchetti
Rio Boquerón
Rio Loco
L. Loco
Rio Loco
Lajas Valley
Guánica Bay

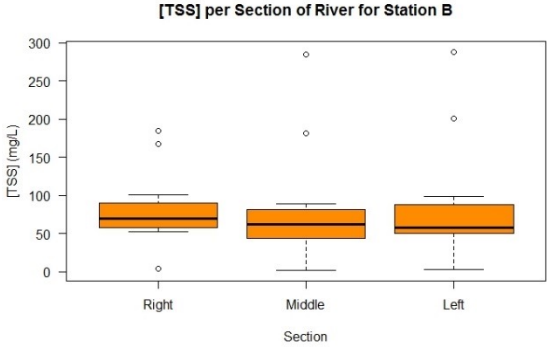

Río Loco
Drainage Channel
Photo credit: Joel Meléndez

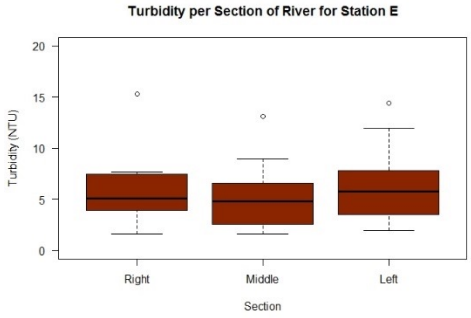
STUDY RESULTS

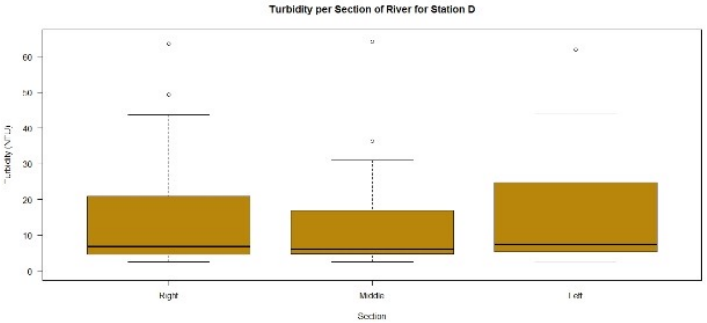


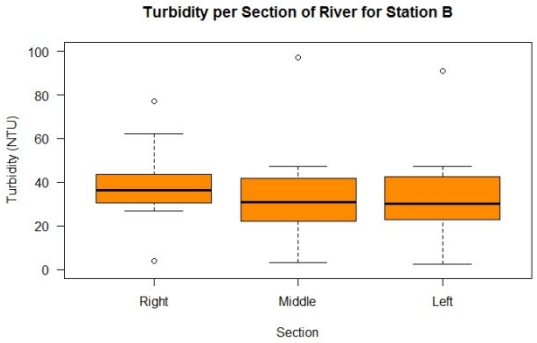

[TSS] per Section of River for Station E
[TSS] (mg/L)
0
10
20
30
40
50
60
70
Right
Middle
Left
Section


[TSS] per Section of River for Station D
[TSS] (mg/L)
0
10
20
30
40
Right
Middle
Left
Section

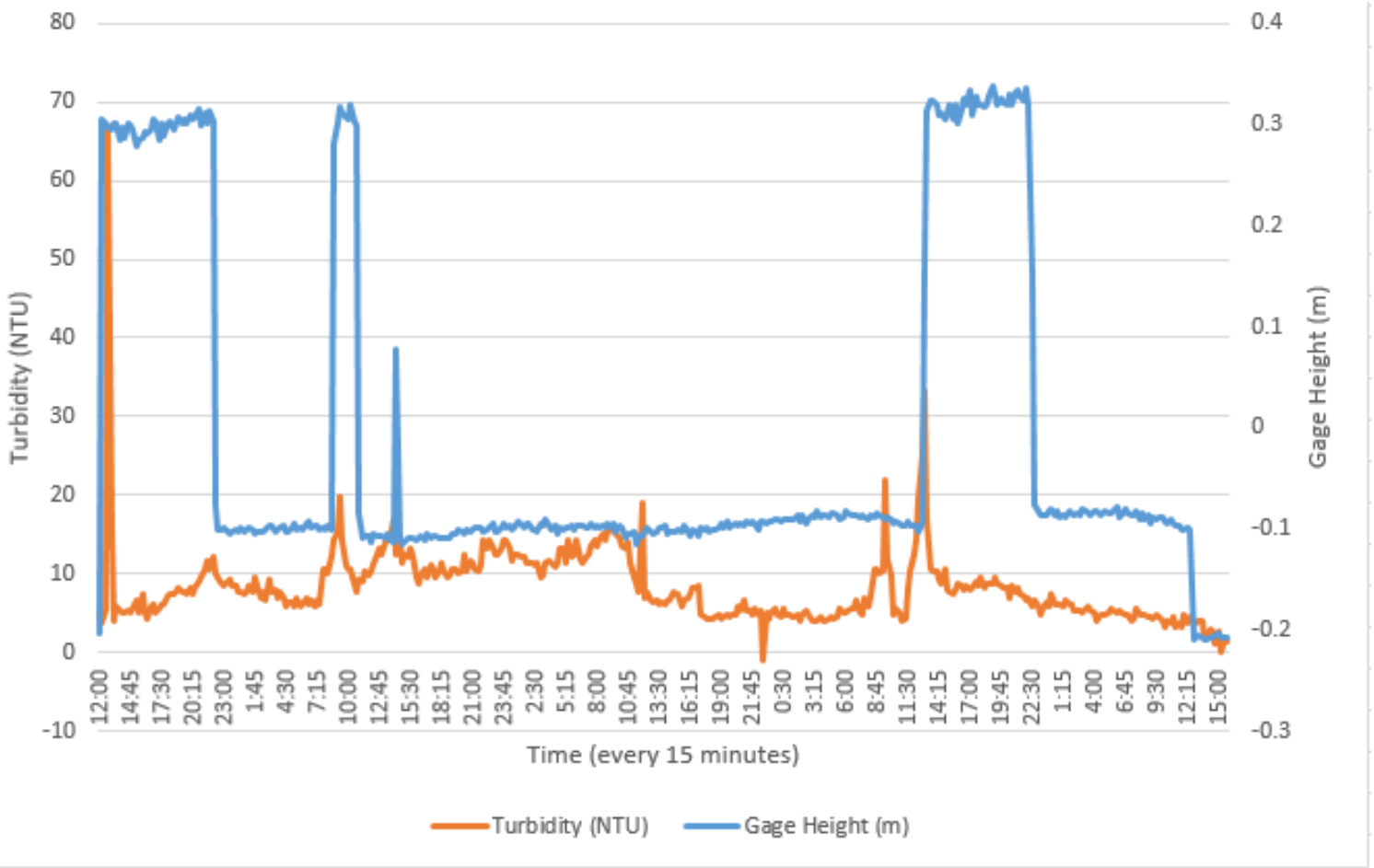

[TSS] per Section of River for Station B
[TSS] (mg/L)
0
50
100
150
200
250
300
Right
Middle
Left
Section

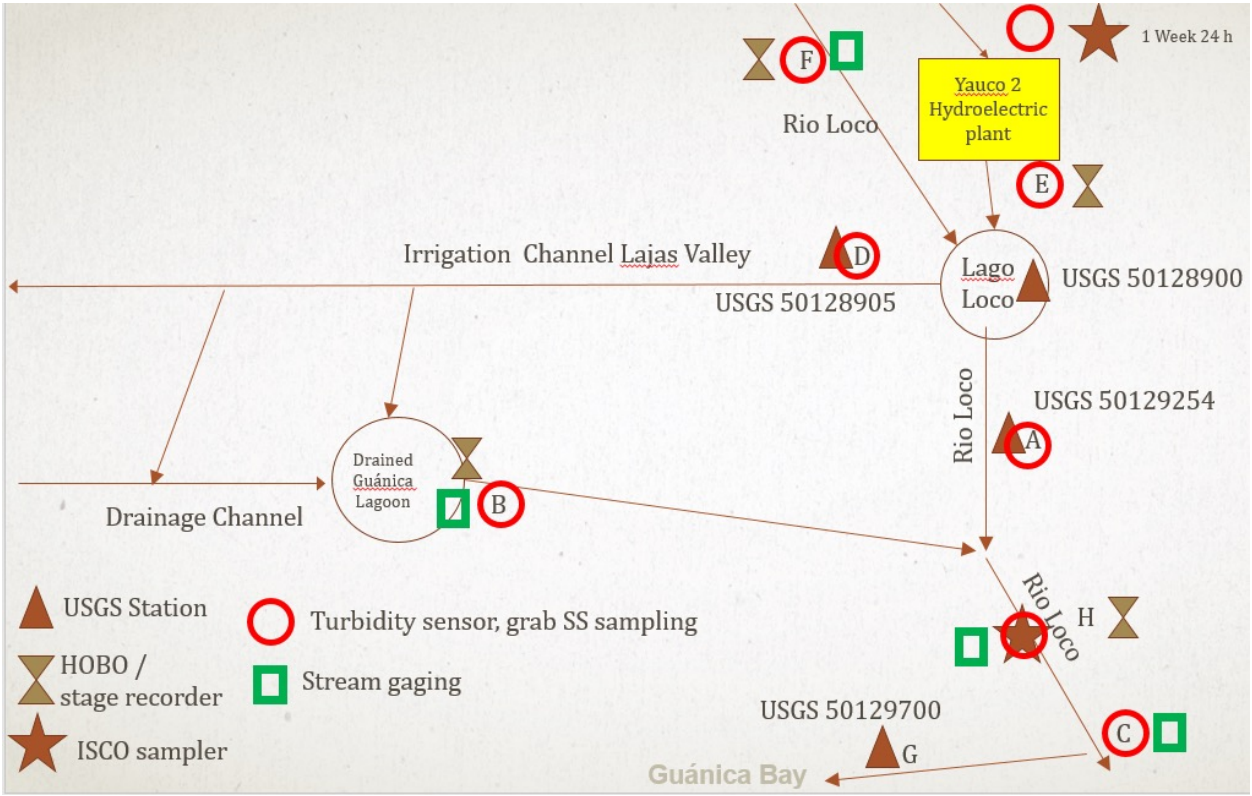

Turbidity per Section of River for Station E
Turbidity (NTU)
0
5
10
15
20
Right
Middle
Left
Section

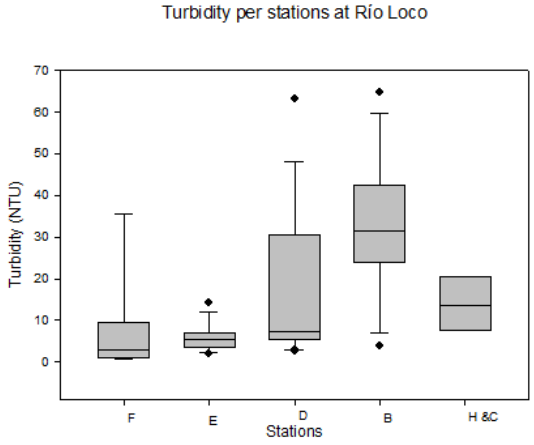

Turbidity per Section of River for Station D
Right
Middle
Left
Section

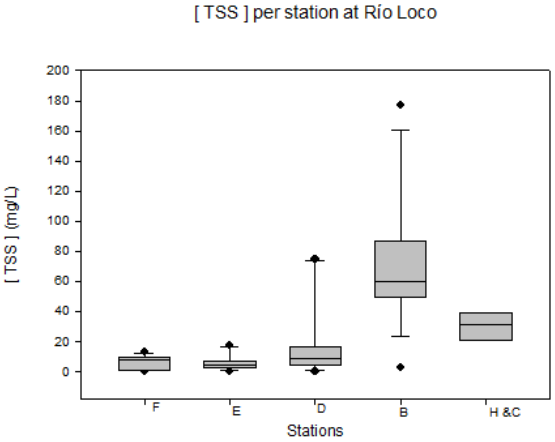

Turbidity per Section of River for Station B
Turbidity (NTU)
0
20
40
60
80
100
Right
Middle
Left
Section

Relación entre la altura del agua a la salida de Yauco 2 y la turbidez. 22-25 marzo 2016

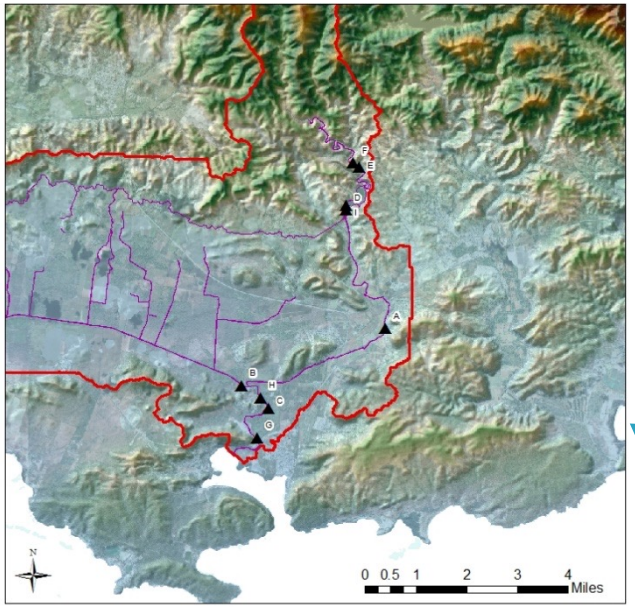


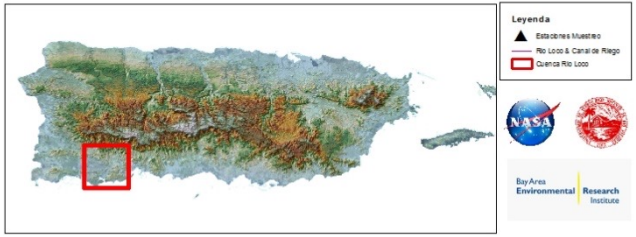

1 Week 24 h
F
Rio Loco
Yauco 2 Hydroelectric plant
E
Irrigation Channel Lajas Valley
D
USGS 50128905
Lago Loco
USGS 50128900
Rio Loco
USGS 50129254
A
Drained Guánica Lagoon
B
Drainage Channel
Rio Loco
H
C
USGS 50129700
G
Guánica Bay
USGS Station
Turbidity sensor, grab SS sampling
HOBO / stage recorder
Stream gaging
ISCO sampler

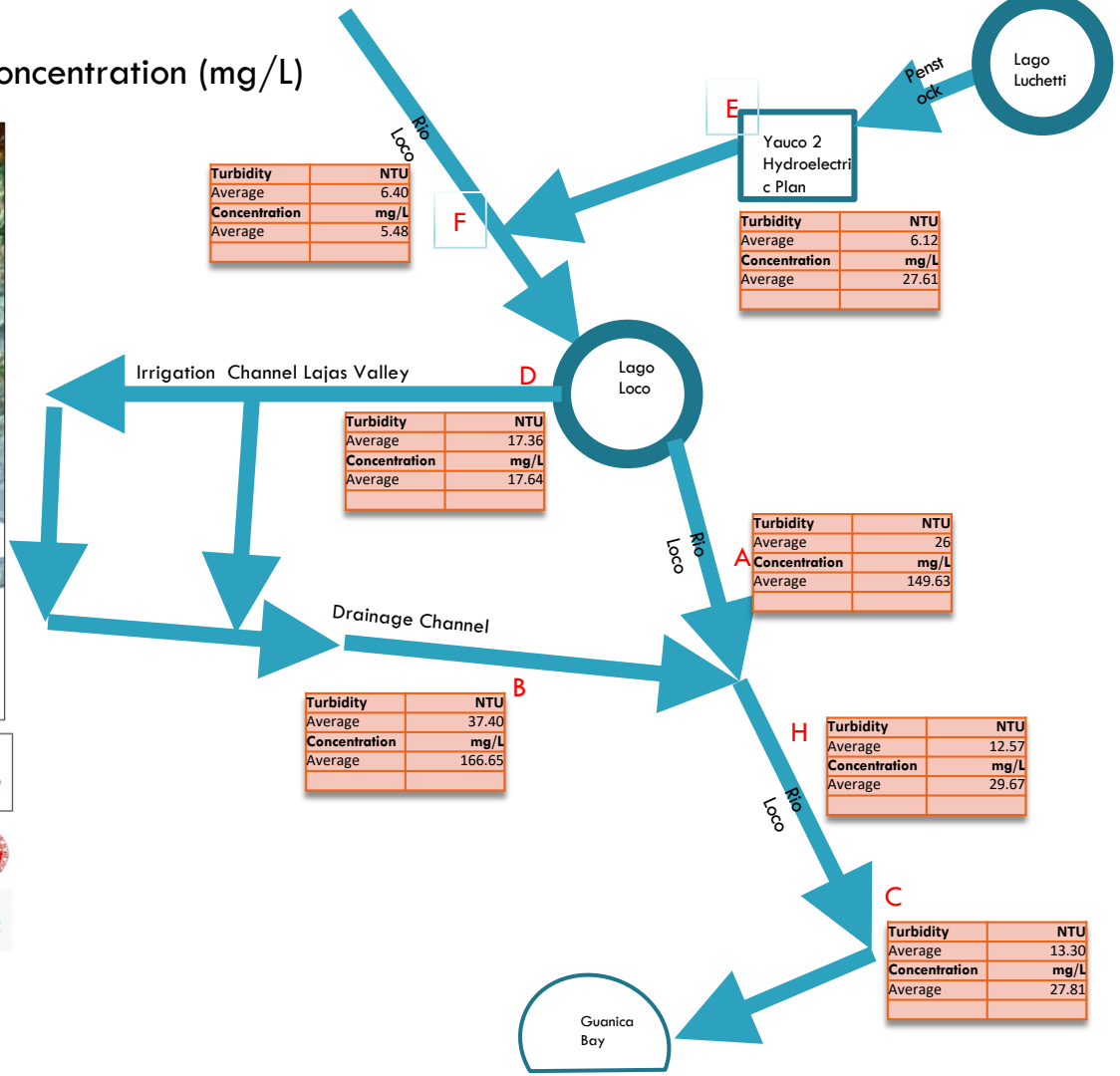

Turbidity per stations at Río Loco
Turbidity (NTU)
70
60
50
40
30
20
10
0
F
E
D
B
H &C
Stations


[TSS] per station at Río Loco
[TSS] (mg/L)
200
180
160
140
120
100
80
60
40
20
0
F
E
D
B
H &C
Stations

Sediment samples: Turbidity (ntu) & Concentration (mg/L)







Turbidity	NTU
Average	6.40
Concentration	mg/L
Average	5.48

Turbidity	NTU
Average	6.12
Concentration	mg/L
Average	27.61

Turbidity	NTU
Average	17.36
Concentration	mg/L
Average	17.64

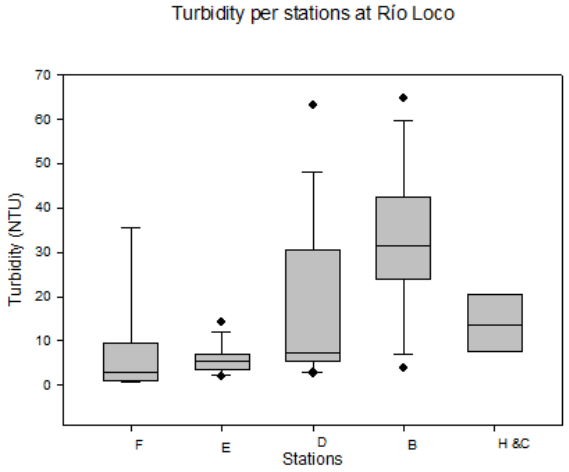
Turbidity	NTU
Average	26
Concentration	mg/L
Average	149.63

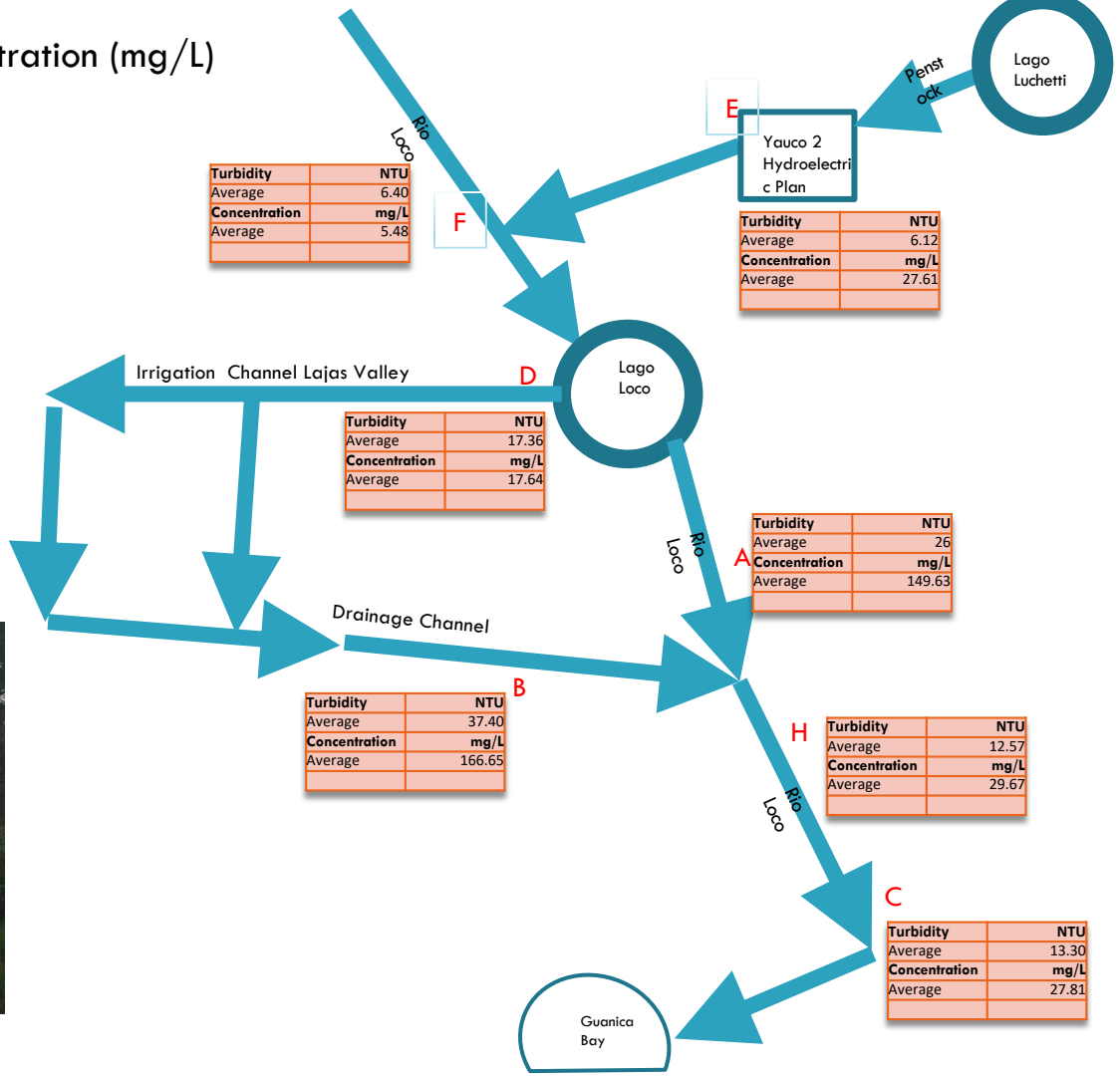
Turbidity	NTU
Average	37.40
Concentration	mg/L
Average	166.65

Turbidity	NTU
Average	12.57
Concentration	mg/L
Average	29.67

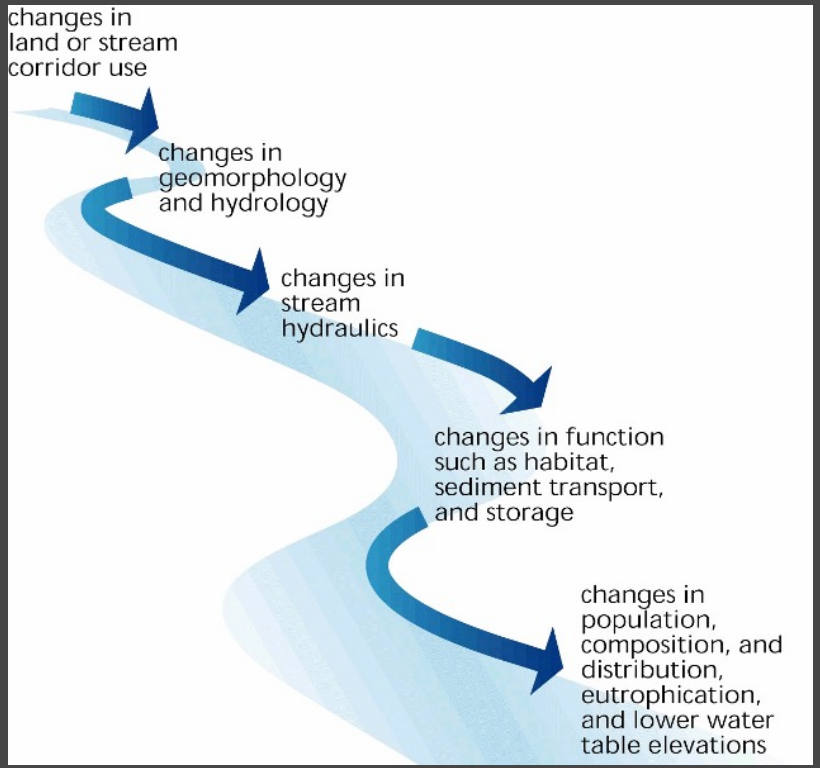
Turbidity	NTU
Average	13.30
Concentration	mg/L
Average	27.81

Sediment samples: Turbidity (ntu) & Concentration (mg/L)



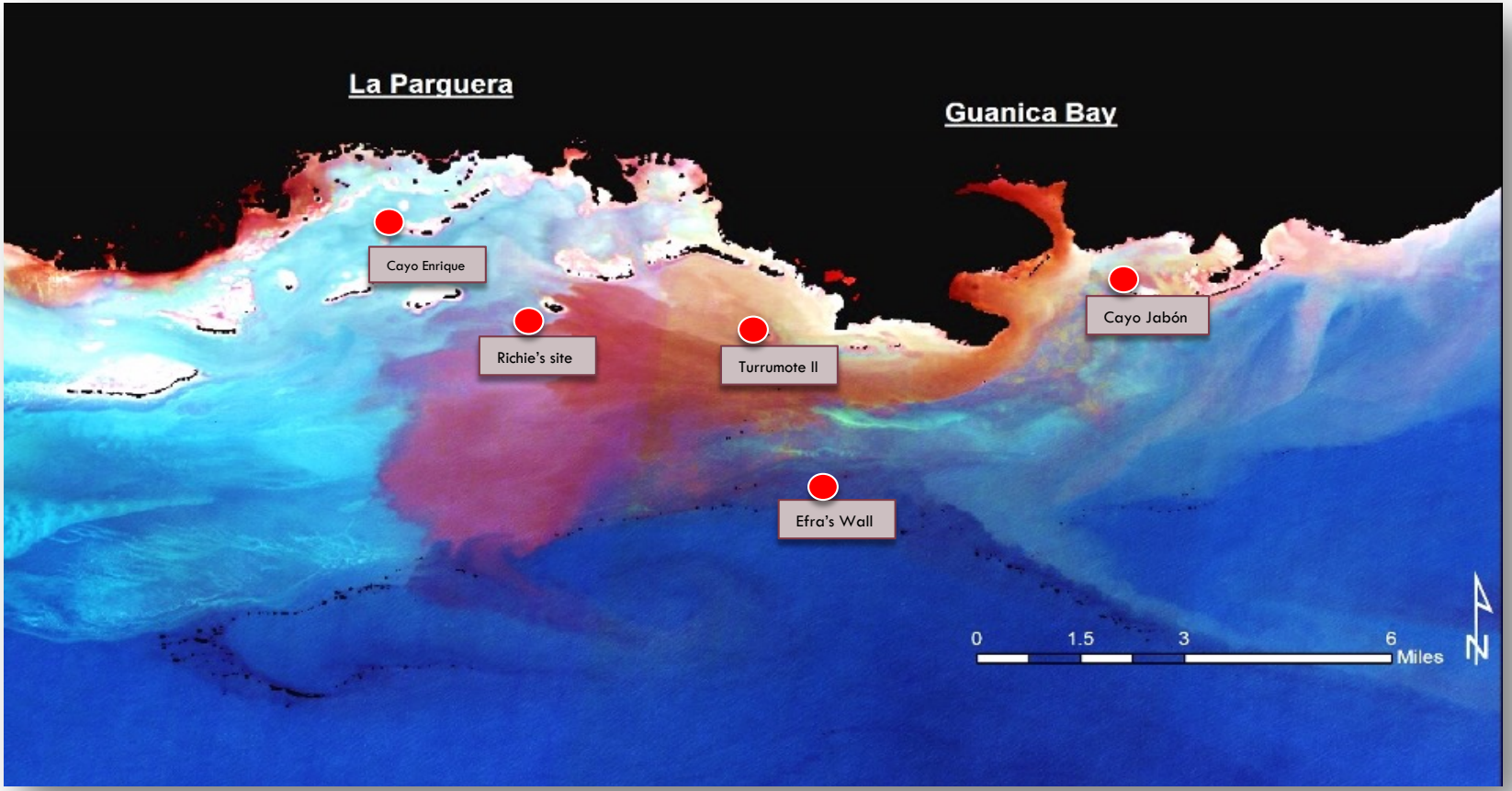


NEXT STEPS


changes in
land or stream
corridor use
changes in
geomorphology
and hydrology
changes in
stream
hydraulics
changes in function
such as habitat,
sediment transport,
and storage
changes in
population,
composition, and
distribution,
eutrophication,
and lower water
table elevations

Coral Bleaching Assessment through remote Sensing and Integrated Citizen Science (CoralBASICS): Engaging Dive Instructors on Reef Characterization in Southwest, PR Coupled with the Analysis of Water Quality Using NASA Earth Observations

Juan L. Torres-Pérez[1], Roy A. Armstrong[2], Yasmín Detrés[2], Carolina Aragonés-Fred[2], and Joel Meléndez[3]



Landsat-8 OLI image showing the extent of sediment plume from Guánica Bay to La Parguera. Image courtesy of NOAA/NESDIS/STAR/CRW Ocean Color.

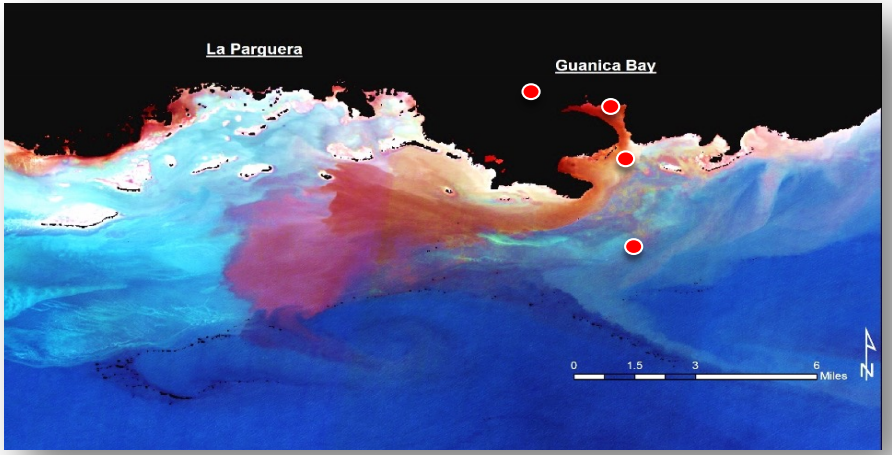
2. Relationship between discharge, sediments and water transparency.

SQL Queries = Periods of dates

Yauco II

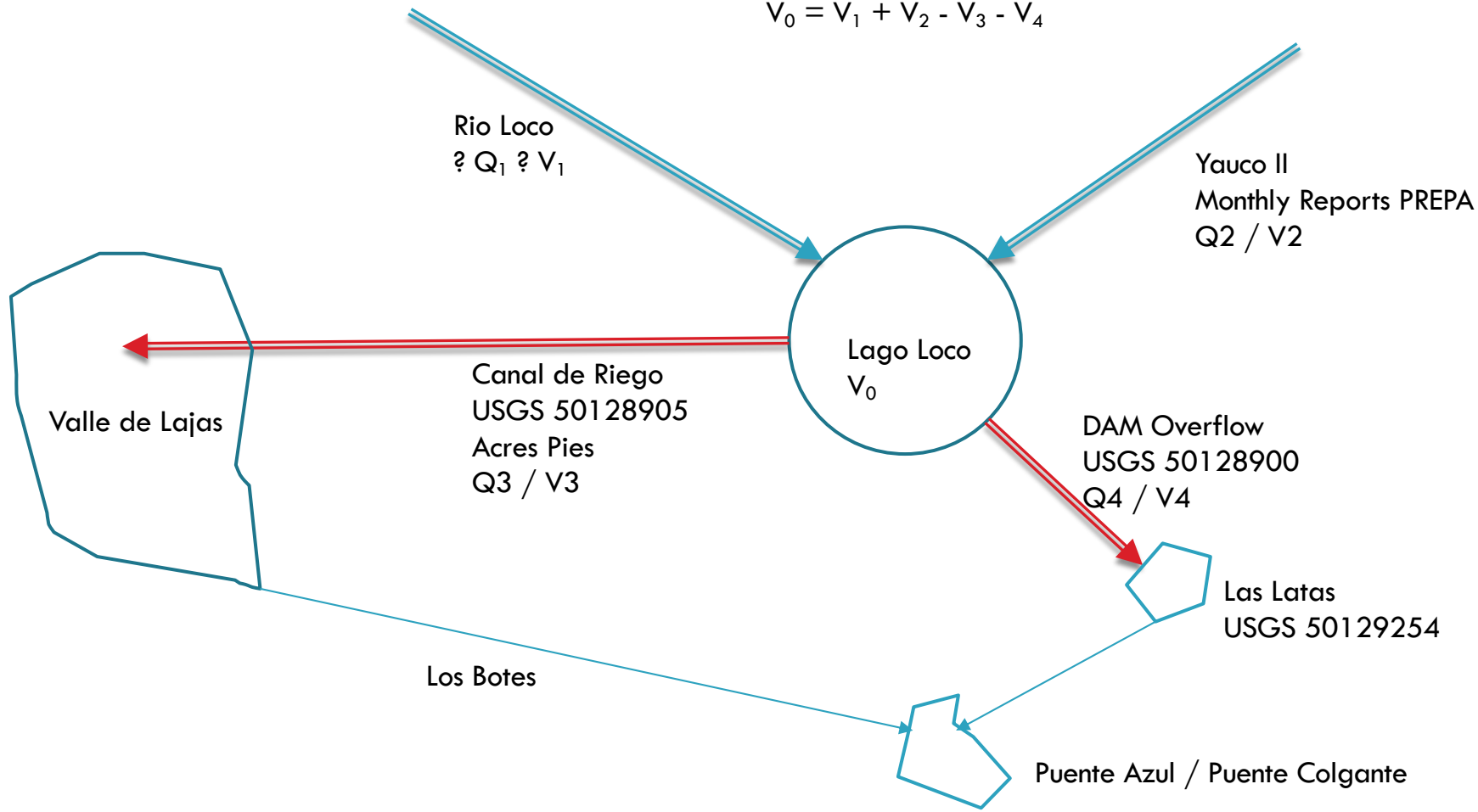
DAM & USGS Stations

Drainage Channel

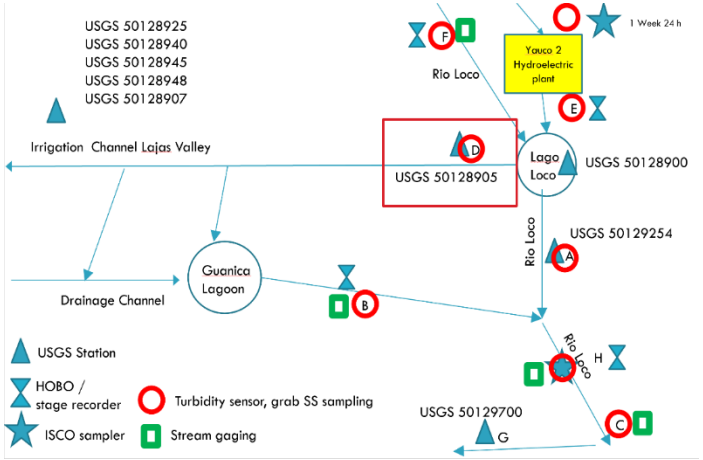


1. Calculate the contribution of Rio Loco

$V_0 = V_1 + V_2 - V_3 - V_4$



- Calculate the contribution of each of the zones



Questions?

Or Suggestions