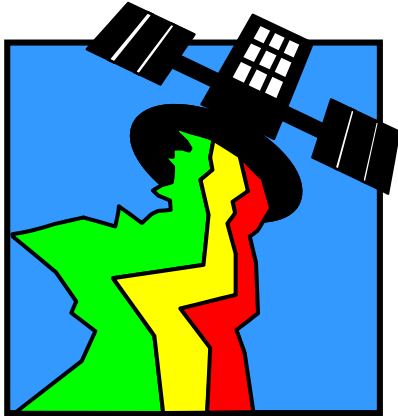


GEOGRAPHIC INFORMATION SYSTEMS (GIS) AT GERS LAB

Fernando Gilbes Santaella
GERS Lab-Department of Geology
University of Puerto Rico at Mayaguez
fernando.gilbes@upr.edu



de Historia

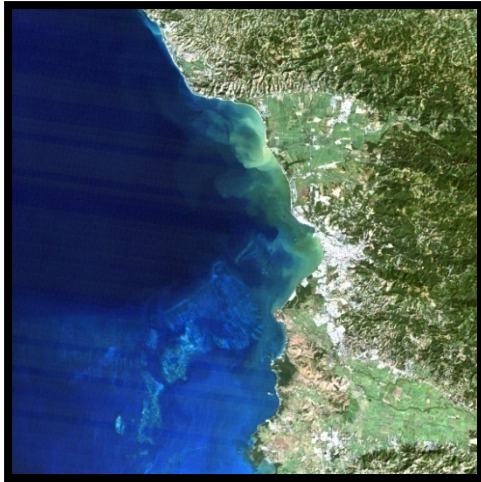


GERS

Geological and **E**nvironmental
Remote **S**ensing **L**aboratory

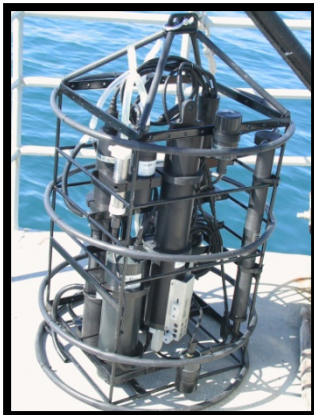
Department of Geology
University of Puerto Rico
at Mayaguez

gers.uprm.edu



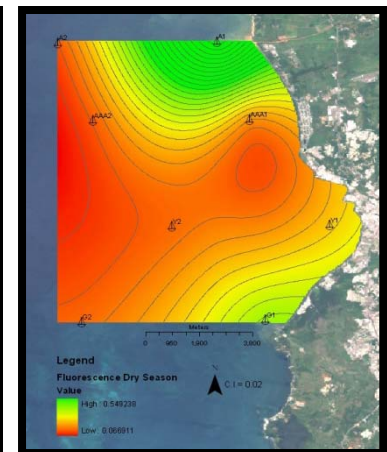
GERS Lab was founded in January 2002 with the mission of promoting and facilitating the education and research of the remote sensing tools applied to the Earth System Science.

Our vision is to become a prestigious laboratory in remote sensing of the Caribbean Region by generating innovative research and producing Earth Scientists well trained in remote sensing applications.

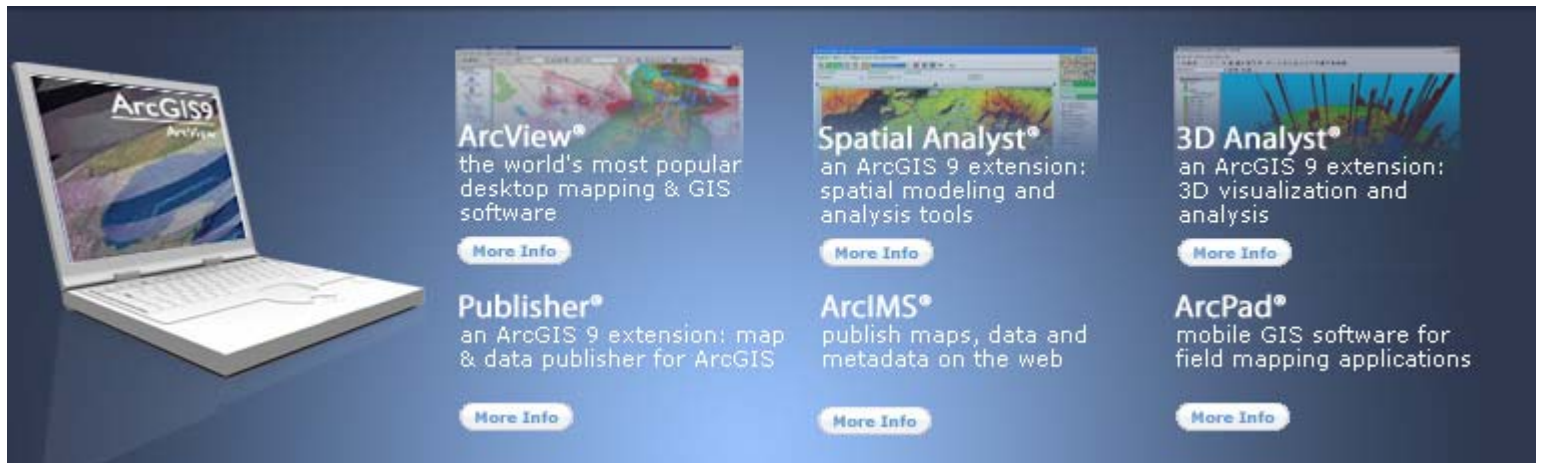




Current research is mainly focus on environmental monitoring using biogeo-optical properties, digital images, and Geographic Information Systems (GIS).



ArcGIS 9.3



ArcView®
the world's most popular desktop mapping & GIS software
[More Info](#)

Spatial Analyst®
an ArcGIS 9 extension: spatial modeling and analysis tools
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3D Analyst®
an ArcGIS 9 extension: 3D visualization and analysis
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mobile GIS software for field mapping applications
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ArcIMS – Publish Maps, Data, and Metadata on the Web

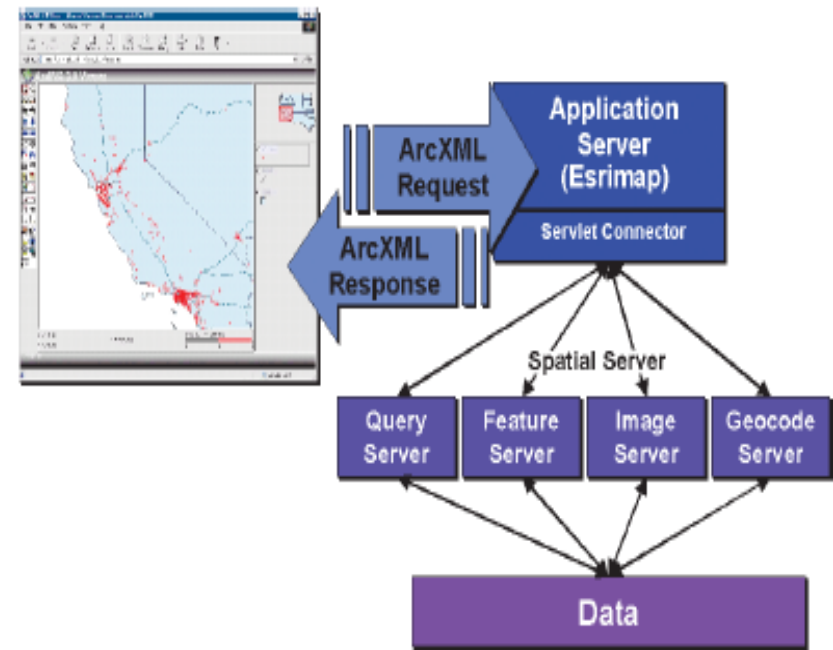


Environmental Systems
Research Institute, Inc.
(ESRI)



ArcIMS

- ArcIMS 9.1®
 - Scalable
 - Extendable
 - Organizational application
 - Map distribution and geographic information system (GIS) data on the Internet.
 - Create easy-to-use, task-focused applications that use geographic content.
 - Deliver dynamic maps and data via the Web.
 - Share data with others to accomplish tasks.
- Now working in ArcIMS 9.3



Configuration at GERS Lab

1

Configure
Server
Computer



Install and
Configure
Supporting
Software
(Java 2SDK,
Tomcat 5.028,
and ISS 6.0)



Install
ArcIMS

2

Create
Projects in
ArcView



Create and
Customize
ArcIMS Web
Application



Publish Map
Interface in
the Web

gersview.uprm.edu



**Geological and Environmental Remote Sensing Laboratory
Department of Geology
University of Puerto Rico at Mayagüez**

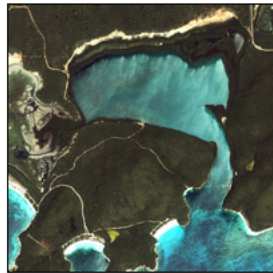
WELCOME TO GERSVIEW

GERS LAB DATABASE

The Geological and Environmental Remote Sensing Laboratory (GERS Lab) was founded in January 2002 as part of the Department of Geology in the University of Puerto Rico at Mayaguez. Our mission is to promote and facilitate the education and research of the Earth System Science using remote sensing. Current research is mainly focused on environmental monitoring with bio-optical properties and digital images. We are also interested in developing Geographic Information Systems. Our vision is to become a prestigious laboratory in remote sensing of the Caribbean by generating innovative research and producing Earth System scientists well trained in the application of these tools.

In 2007, the GERS Lab developed a new database via the internet, called GERSVIEW, in order to make all the research data available to the worldwide community. GERSVIEW uses the ArcIMS platform, which is very friendly. It is currently under development and it was started with funding provided by the Sea Grant College at UPRM. New databases are being incorporated with the current support of NOAA and NSF projects. We hope you can find it an useful tool and enjoy it.

Current Databases



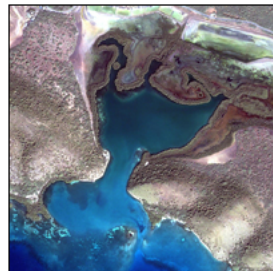
Mosquito Bioluminescence Bay

Sponsored by the Sea Grant College at UPRM

Prepared by William Hernandez

> [See more information of the project](#)

> [Go to the Database](#)



Parguera Bioluminescence Bay

Sponsored by the Sea Grant College at UPRM

Prepared by William Hernandez

> [See more information of the project](#)

> [Go to the Database](#)



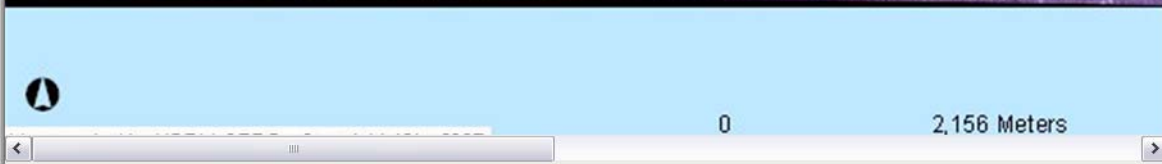
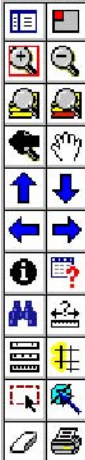
Database

GIS Data Layers used for Biobays Map Projects

Layers	Description	Source(s)	Location Used
Sampling Sites	From heavy metals study	GERS LAB	Mosquito Bay, Parguera Bay
Hydrology	Surface hydrology	USGS	Mosquito Bay, Parguera Bay
Roads	Major roads	JP, DTOP	Mosquito Bay, Parguera Bay
Topography	Elevation contours	USGS	Mosquito Bay, Parguera Bay
Drainage basin	Delimiting drainage basin	USGS, JP	Mosquito Bay, Parguera Bay
Benthic Habitats	Benthic community types	NOAA	Mosquito Bay, Parguera Bay
Geology	Major geological feaures	USGS	Mosquito Bay, Parguera Bay
Soil Types	Soil Types and Series	NRCS-USDA	Mosquito Bay, Parguera Bay
Wetlands	Wetland features distribution	USFWS	Mosquito Bay, Parguera Bay
Aerial Orthophotos	Aerial Photography (2004)	US-COI, NRCS-USDA	Mosquito Bay
IKONOS image	Satellite imagery (2007??)	UPRM-GERS	Parguera Bay
Municipality	Puerto Rico Municipality name	JP	Mosquito Bay, Parguera Bay
Labels	Important Places	UPRM-GERS	Mosquito Bay, Parguera Bay
Aerial Orthophotos	Aerial Photography (1999)	NOAA	Parguera Bay



Mosquito Bioluminescent Bay, Vieques, Puerto Rico



LAYERS

- All Layers
- Sampling Sites
- Hydrology
- Roads
- Topography
- Drainage Basin
- Benthic Habitats
- Geology
- Soil Types
- Wetlands
- Aerial Orthophoto
- Municipality
- Labels

Refresh Map

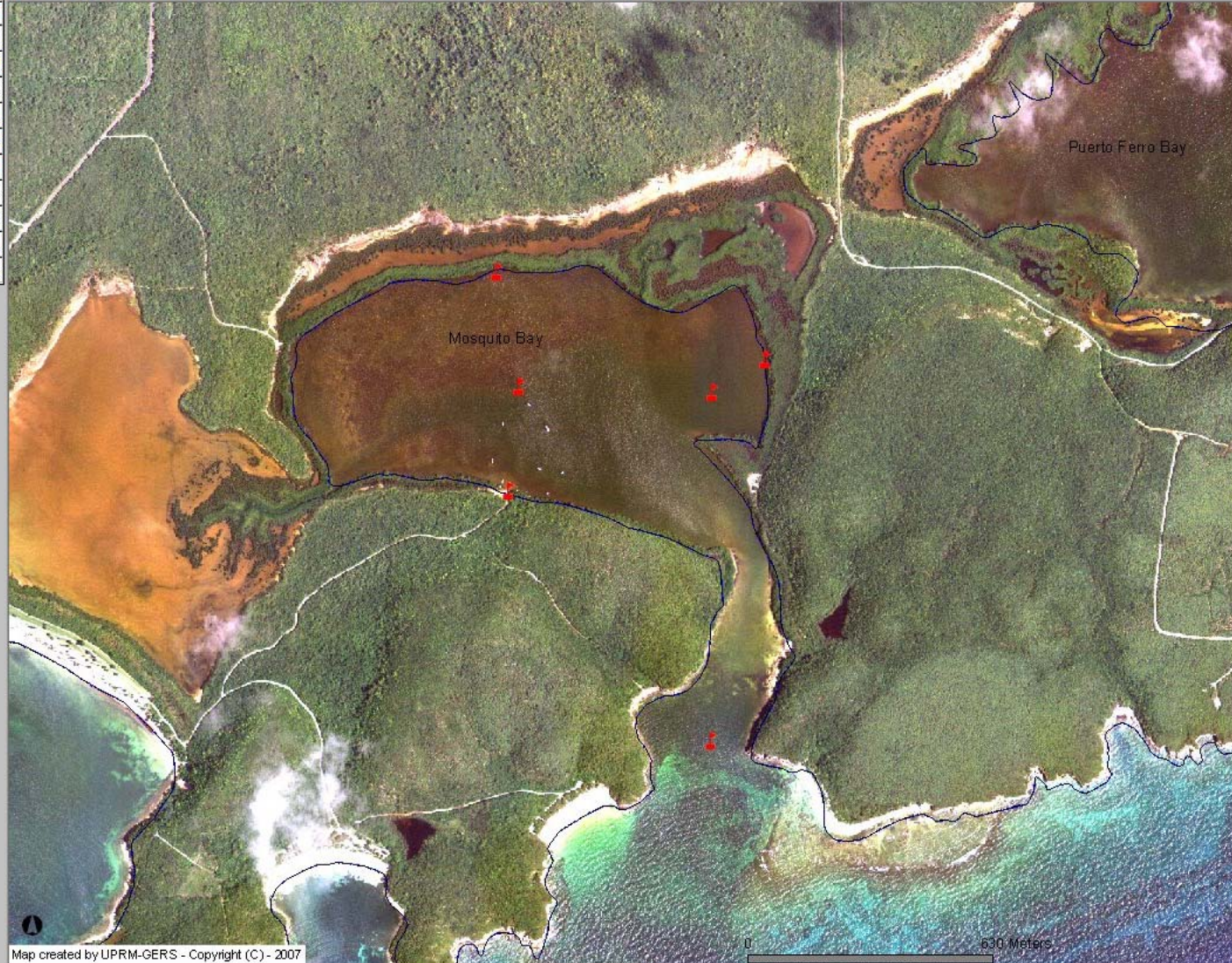
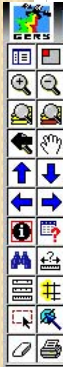
Auto Refresh

Help:

- A closed group, click to open.
- An open group, click to close.
- A map layer.
- A hidden group/layer, click to show.
- A visible group/layer, click to hide.
- A visible layer, but not at this scale.
- A partially visible group, click to show.
- An inactive layer, click to make active.
- The active layer.

Zoom In

Mosquito Bioluminescent Bay, Vieques, Puerto Rico



Map created by UPRM-GERS - Copyright (C) - 2007

- LAYERS**
- All Layers
 - Sampling Sites
 - Hydrology
 - Roads
 - Topography
 - Drainage Basin
 - Benthic Habitats
 - Geology
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 - Municipality
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Refresh Map

Auto Refresh

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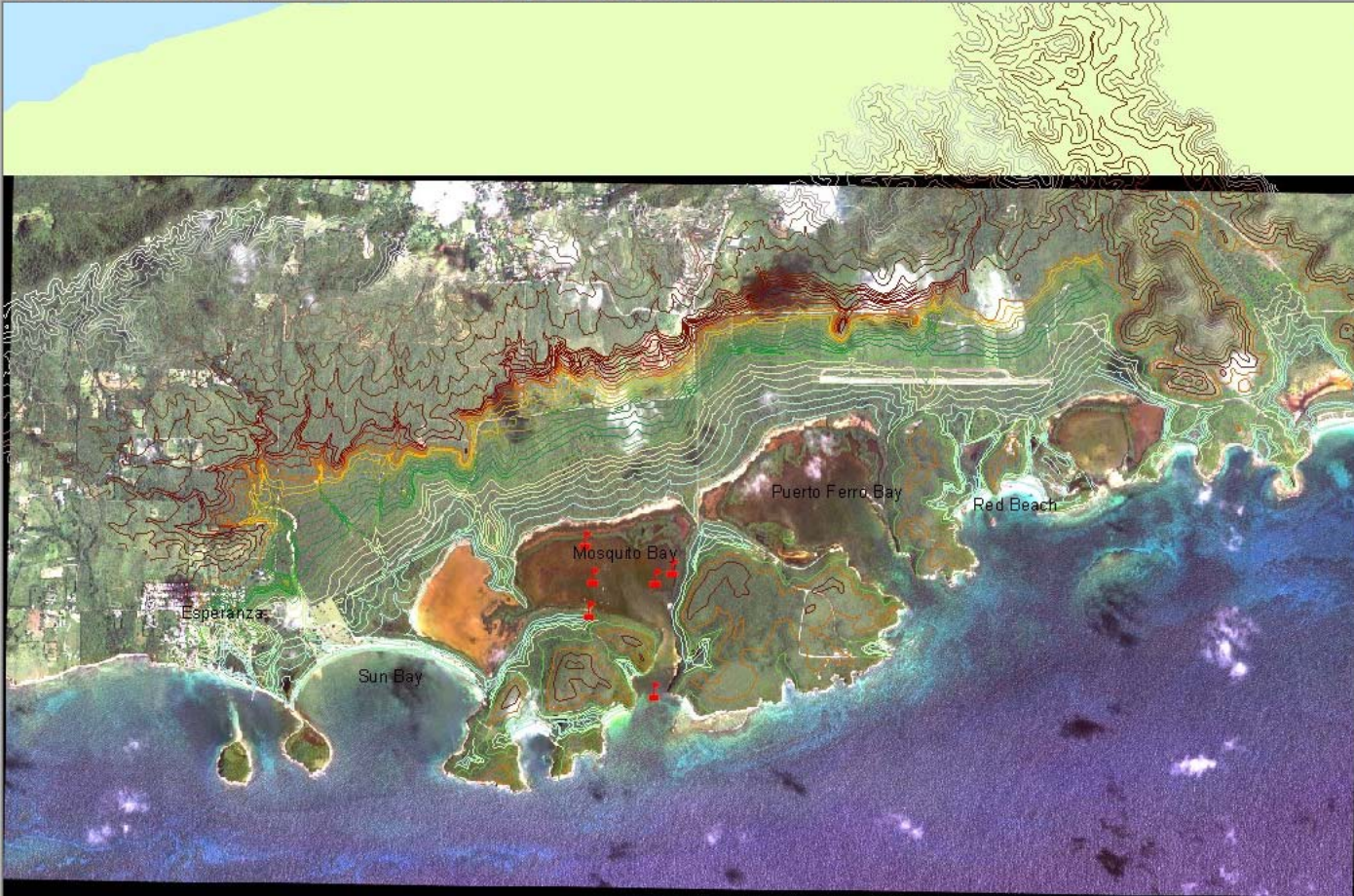
Sampling Sites

Rec	FID	#SHAPE#	IDENT	COMMENT	MODEL	X	Y	Location	StationID	Units	Environmen	Arsenic	Copper	Iron
1	2	[point]	V02CMS	21-OCT-06 9:52:53AM	GPSMap76CS	65.4461386	18.10480507	Puerto Mosquito Biobay	2	PPM	Mangrove Sediments	BDL	9.14	5975

Identify



Mosquito Bioluminescent Bay, Vieques, Puerto Rico



- LAYERS**
- All Layers
 - Sampling Sites
 - Hydrology
 - Roads
 - Topography
 - Drainage Basin
 - Benthic Habitats
 - Geology
 - Soil Types
 - Wetlands
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 - Municipality
 - Labels

Refresh Map
 Auto Refresh

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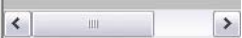


Map created by UPRM-GERS - Copyright (C) - 2007

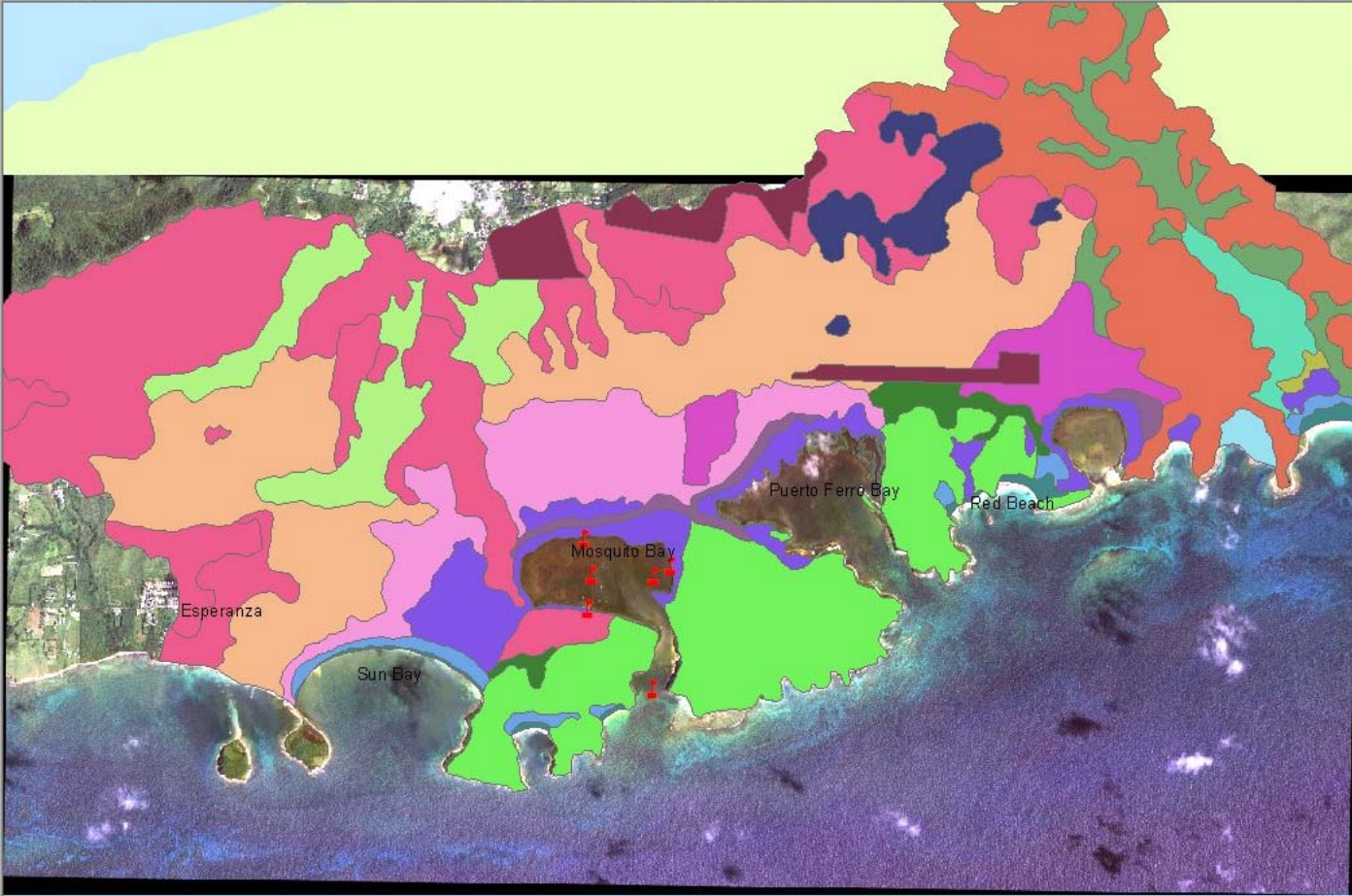
0 2,168 Meters

Topography is now the Active Layer

Zoom In



Mosquito Bioluminescent Bay, Vieques, Puerto Rico



- Legend**
- Location**
- 📍 Puerto Mosquito Biot
- Soil Types**
- NOMBRE**
- Amelia gravelly clay I
 - Cartagena clay
 - Catalina clay
 - Catano loamy sand
 - Coamo clay loam
 - Coastal beach
 - Descalabrado and G
 - Descalabrado clay lo
 - Fraternidad clay
 - Made land
 - Pandura-Very stony I
 - Paso seco clay
 - Poncena clay
 - Pozo Blanco clay loa
 - Rock land
 - Soil not surveyed
 - Tidal flats
 - Tidal swamp
 - Vieques loam
- Aerial Orthophoto**
- RGB**
- Red: Band_1
 - Green: Band_2
 - Blue: Band_3
 - Municipality
 - Labels

Map created by UPRM-GERS - Copyright (C) - 2007

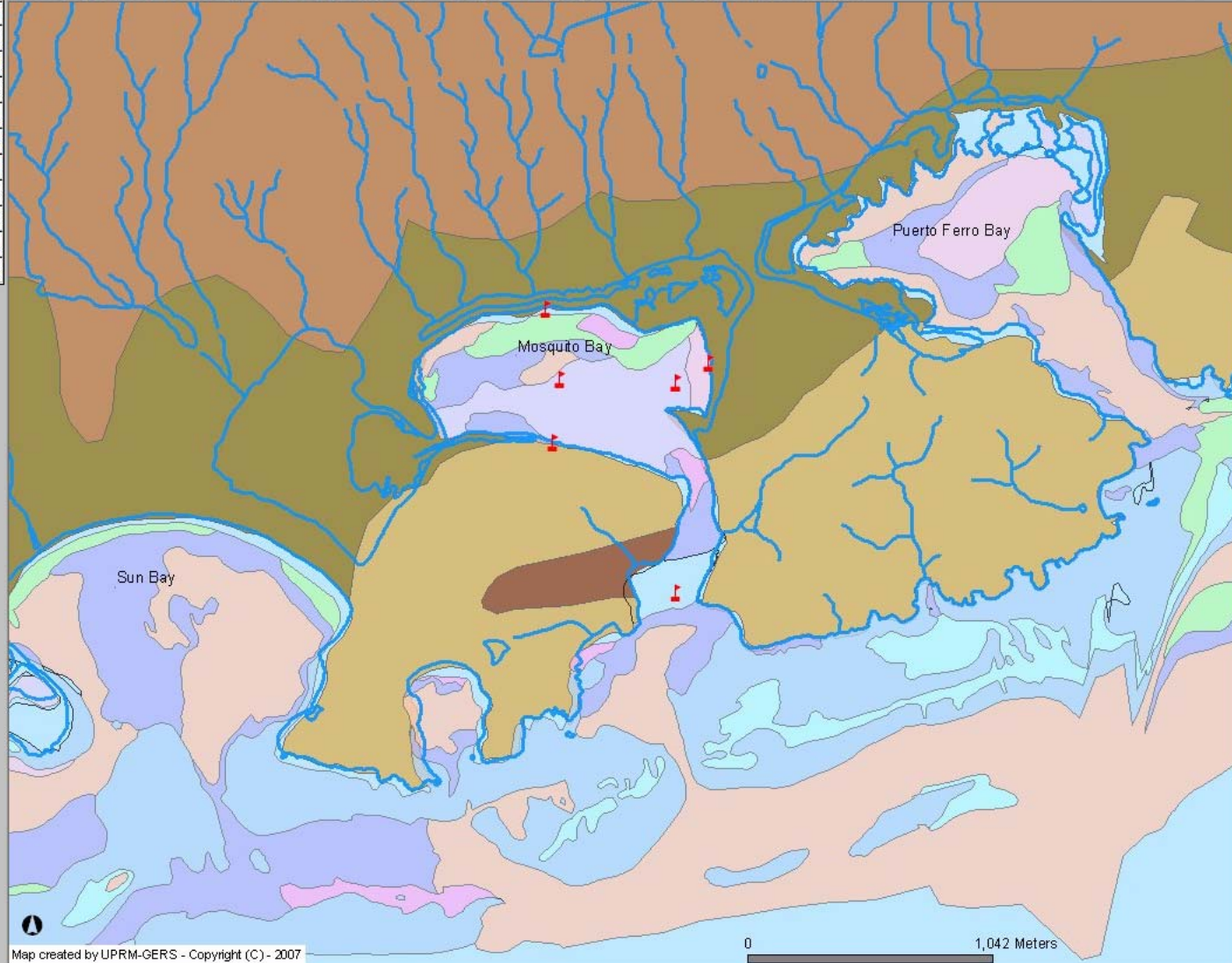
0 2,168 Meters

Soil Types is now the Active Layer

Zoom In



Mosquito Bioluminescent Bay, Vieques, Puerto Rico



- Legend**
- Location**
- Puerto Mosquito Biot
 - Hydrology
 - Unknown
 - Bare Sand
 - Dense continuous se
 - Hardbottom/coral
 - Land
 - Macroalgae with scat
 - Patchy or discontinu
 - Sand bottom with roc
 - Scattered seagrass p
 - Unknown
- Geology**
- TYPE**
- Ktd
 - Kv
 - Qa
 - Qb
 - Tu
 - Labels

Map created by UPRM-GERS - Copyright (C) - 2007

Sampling Sites

PE#	IDENT	COMMENT	MODEL	X	Y	Location	StationID	Units	Environmen	Arsenic	Copper	Iron	Lead	Mercury
	V02CMS	21-OCT-06 9:52:53AM	GPSMap76CS	65.4461386	18.10480507	Puerto Mosquito Biobay	2	PPM	Mangrove Sediments	BDL	9.14	5975	BDL	BDL

Identify



La Parquera Bioluminescent Bay, Lajas, Puerto Rico



- LAYERS**
- All Layers
 - Sampling Sites
 - Hydrology
 - Roads
 - Topography
 - Drainage Basin
 - Benthic Habitats
 - Geology
 - Soil Types
 - IKONOS
 - Municipality
 - Labels

Refresh Map

Auto Refresh

Help:

- A closed group, click to open
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Map created by UPRM-GERS - Copyright (C) - 2007

0 2,482 Meters

Zoom In



La Parquera Bioluminescent Bay, Lajas, Puerto Rico



Map created by UPRM-GERS - Copyright (C) - 2007

- LAYERS**
- All Layers
 - Sampling Sites
 - Hydrology
 - Roads
 - Topography
 - Drainage Basin
 - Benthic Habitats
 - Geology
 - Soil Types
 - IKONOS
 - Municipality
 - Labels

Refresh Map

Auto Refresh

Help:

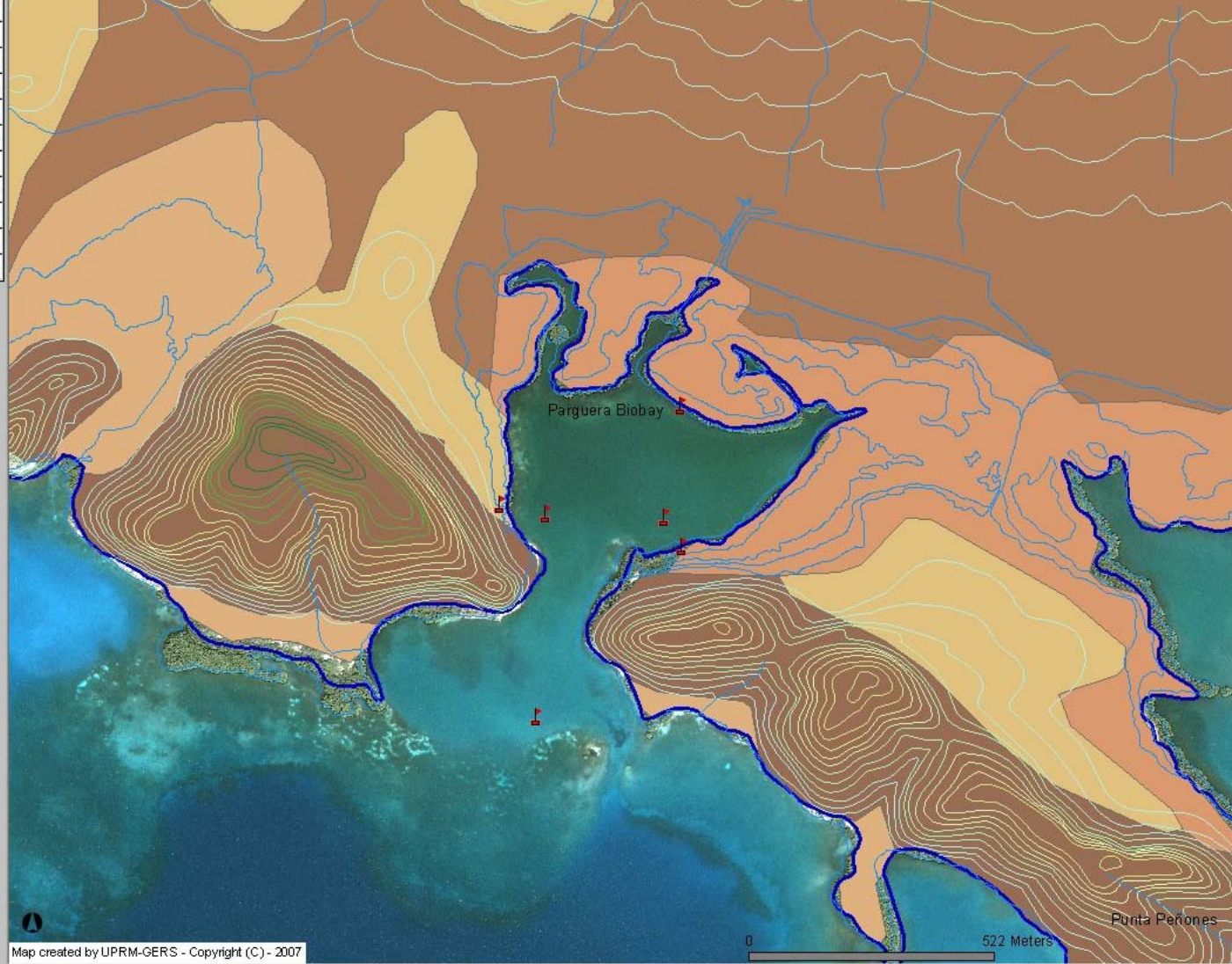
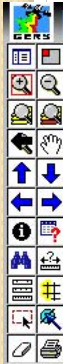
- A closed group, click to open
- An open group, click to close
- A map layer.
- A hidden group/layer, click to show
- A visible group/layer, click to hide
- A visible layer, but not at this scale
- A partially visible group, click to toggle
- An inactive layer, click to make active
- The active layer.

Sampling Sites

FID	#SHAPE#	IDENT	MODEL	X	Y	Location	StationID	Environmen	Arsenic	Copper	Iron	Lead	Mercury	Units	HYPERLINK
3	[point]	P01CM	GPSMap76CS	67.01317186	17.9733112	Parguera Biobay	2	Mangrove Sediments	BDL	5.95	3896	BDL	BDL	PPM	

Zoom In

La Parquera Bioluminescent Bay, Lajas, Puerto Rico



- LAYERS**
- All Layers
 - Sampling Sites
 - Hydrology
 - Roads
 - Topography
 - Drainage Basin
 - Benthic Habitats
 - Geology
 - Soil Types
 - IKONOS
 - Municipality
 - Labels

Refresh Map
 Auto Refresh

Help:

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- The active layer.

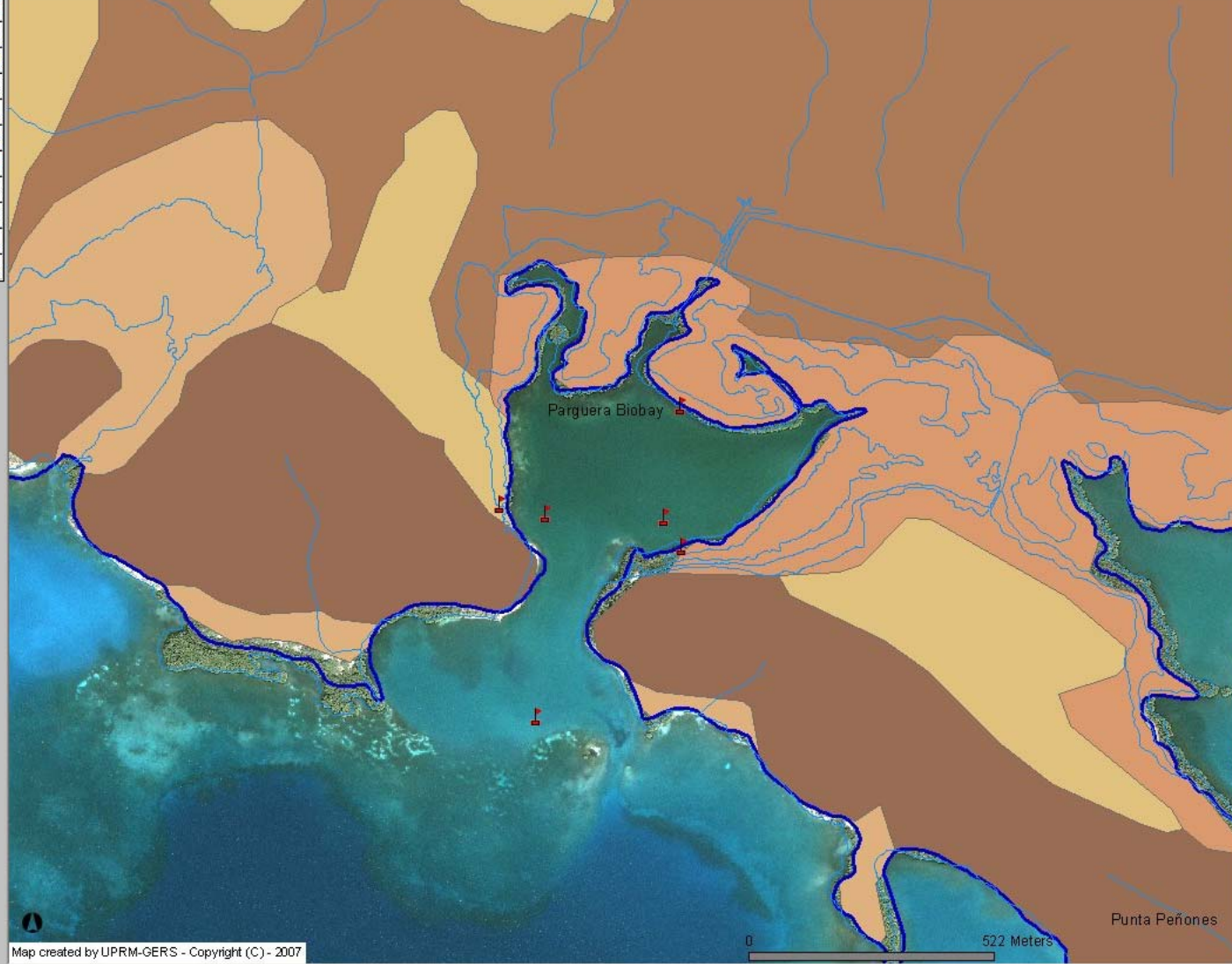
Map created by UPRM-GERS - Copyright (C) - 2007

Sampling Sites

FID	#SHAPE#	IDENT	MODEL	X	Y	Location	StationID	Environmen	Arsenic	Copper	Iron	Lead	Mercury	Units	HYPERLINK
3	[point]	P01CM	GPSMap76CS	67.01317186	17.9733112	Parguera Biobay	2	Mangrove Sediments	BDL	5.95	3896	BDL	BDL	PPM	

Zoom In

La Parquera Bioluminescent Bay, Lajas, Puerto Rico



- Legend**
- Location**
- Parguera Biobay
 - Hydrology
 - Drainage Basin
- Geology**
- HORNBLENDE**
- Alluvium
 - Amphibolite-Serpenti
 - Beach Deposits
 - Blanket sand deposit
 - Cajul Basalt
 - Dacite
 - Hornblende quartz-di
 - Juana Diaz Formatio
 - Maricao Formatio
 - Mariquita Chert
 - Melones Limestone
 - Parguera Limestone
 - Ponce Limestone
 - Swamp deposits
 - Two pyroxene olivine
 - Unknown
- IKONOS**
- RGB**
- Red: Band_1
 - Green: Band_2
 - Blue: Band_3
 - Municipality
 - Labels

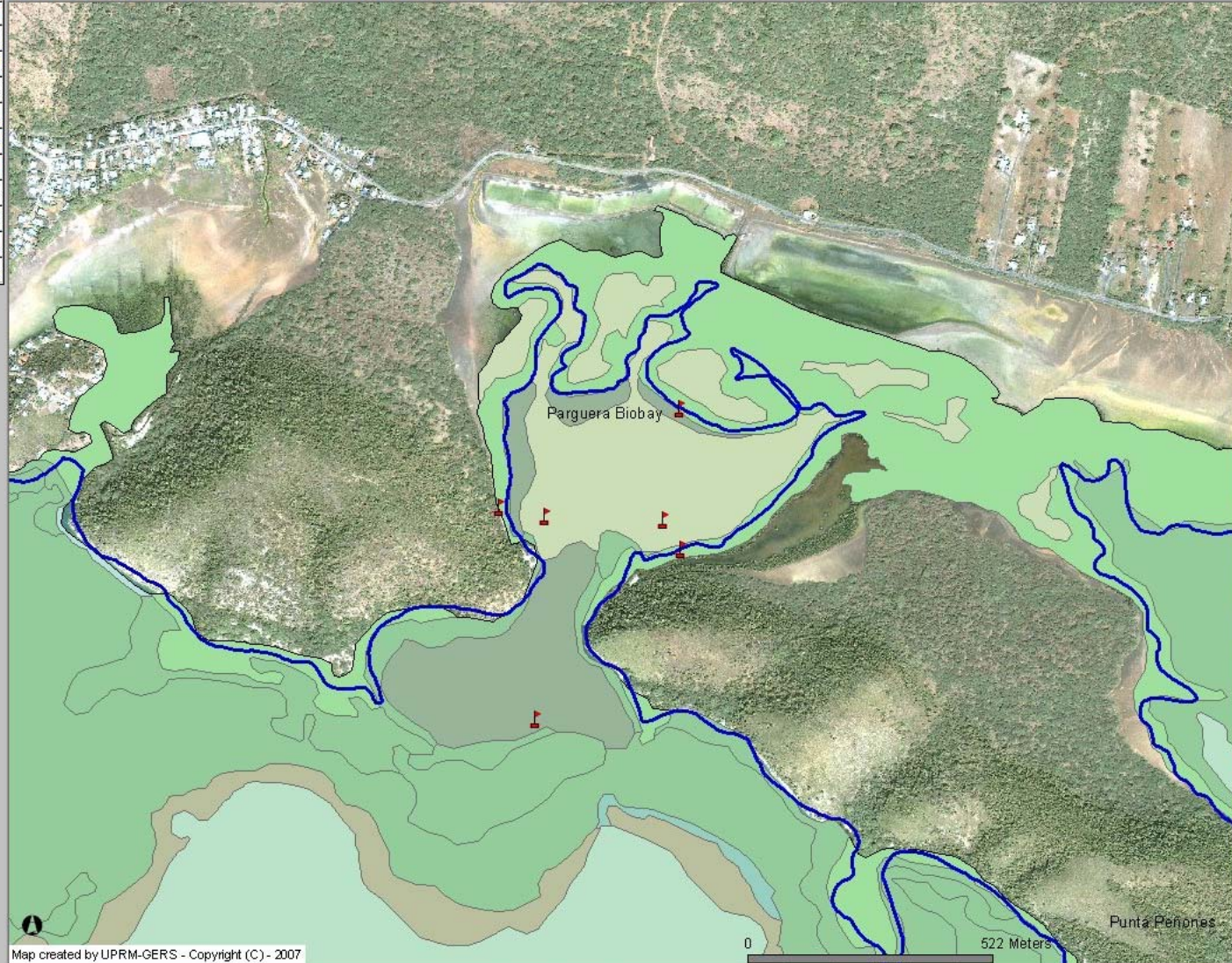
Map created by UPRM-GERS - Copyright (C) - 2007

Sampling Sites

FID	#SHAPE#	IDENT	MODEL	X	Y	Location	StationID	Environmen	Arsenic	Copper	Iron	Lead	Mercury	Units	HYPERLINK
3	[point]	P01CM	GPSMap76CS	67.01317186	17.9733112	Parguera Biobay	2	Mangrove Sediments	BDL	5.95	3896	BDL	BDL	PPM	

Zoom In

La Parquera Bioluminescent Bay, Lajas, Puerto Rico



Legend

Location

- Parguera Biobay
- Drainage Basin

Benthic Habitats

TYPE

- Artificial
- Colonized Bedrock
- Colonized Pavement
- Colonized Pavement
- Land
- Linear Reef
- Macroalgae
- Mangrove
- Mud
- Patch Reef (Aggregate)
- Patch Reef (Individual)
- Reef Rubble
- Sand
- Scattered Coral/Rock
- Seagrass
- Spur and Groove Reef
- Uncolonized Bedrock
- Unknown

IKONOS

RGB

- Red: Band_1
- Green: Band_2
- Blue: Band_3
- Municipality
- Labels

Map created by UPRM-GERS - Copyright (C) - 2007

0 522 Meters

Sampling Sites

FID	#SHAPE#	IDENT	MODEL	X	Y	Location	StationID	Environment	Arsenic	Copper	Iron	Lead	Mercury	Units	HYPERLINK
3	[point]	P01CM	GPSMap76CS	67.01317186	17.9733112	Parguera Biobay	2	Mangrove Sediments	BDL	5.95	3896	BDL	BDL	PPM	

Zoom In



Geological and Environmental Remote Sensing Laboratory
Department of Geology
University of Puerto Rico at Mayagüez

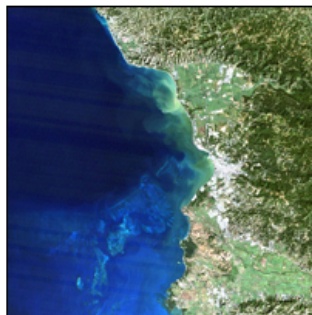
WELCOME TO GERSVIEW

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Current Databases



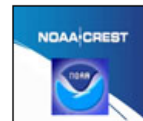
Mayaguez Bay

Sponsored by NOAA CREST

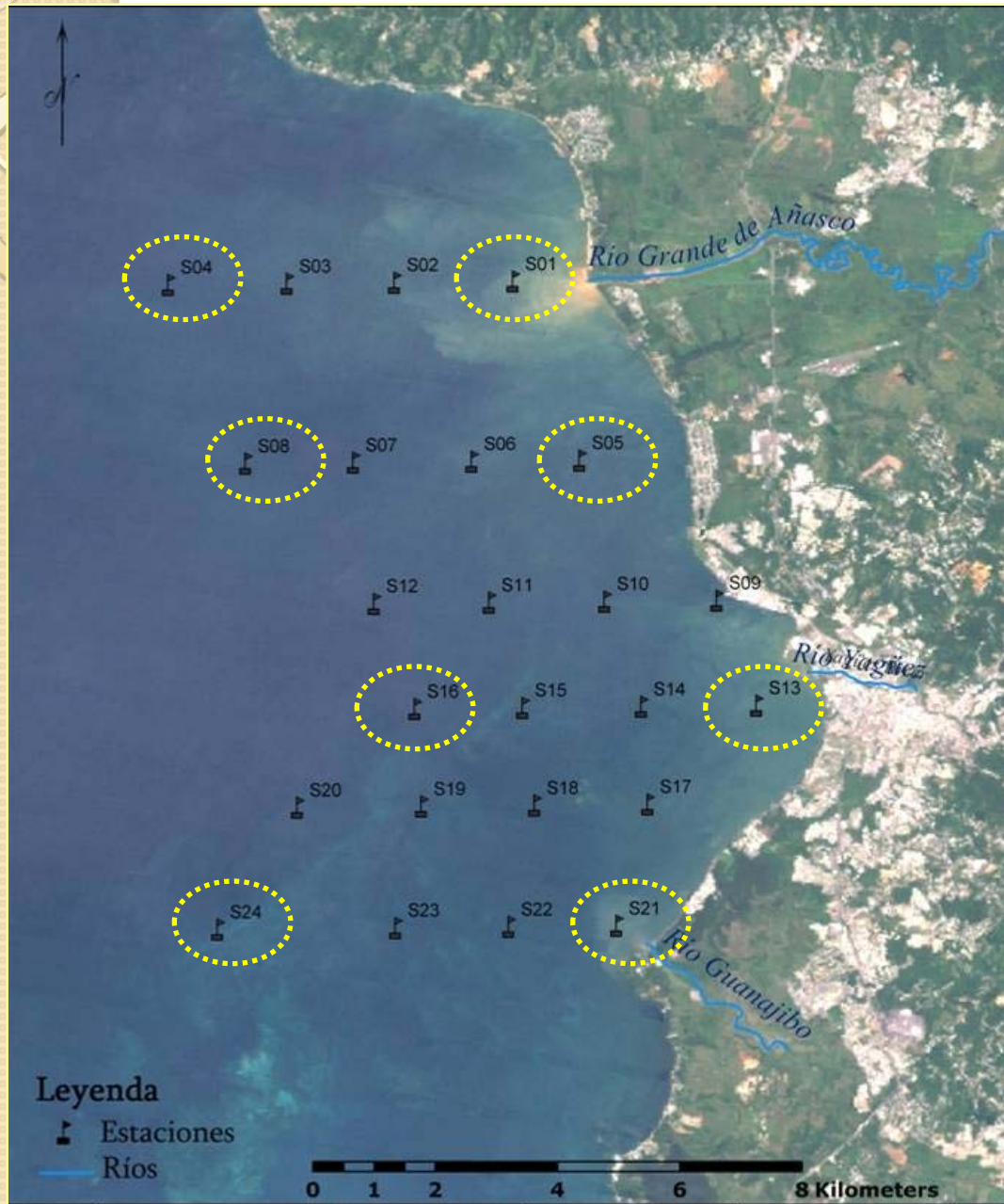
Prepared by Ramón López and Vilmaliz Rodriguez

> See more information of the project

> Go to the Database



Study Area



Study Period

Date	Stations	Days
Apr-2001	24	3
Oct-2001	24	3
Feb-2002	24	3
Aug-2002	24	3
Feb-2003	24	3
Oct-2003	24	3
Jan-2004	24	3
Feb-2004	9	1
Aug-2004	10	1
Mar-2005	8	1
Jul-2005	8	1
Aug-2005	8	1
Sept-2005	8	1
Oct-2005	8	1
Dec-2005	8	1
Mar-2006	8	1
Apr-2006	8	1
Sept-2006	8	1
Oct-2006	8	1
May-2007	21	2
Mar-2008	6	1

Microsoft Excel - Oct_19_2005

File Edit View Insert Format Tools Data Window Help Adobe PDF

Type a question for help

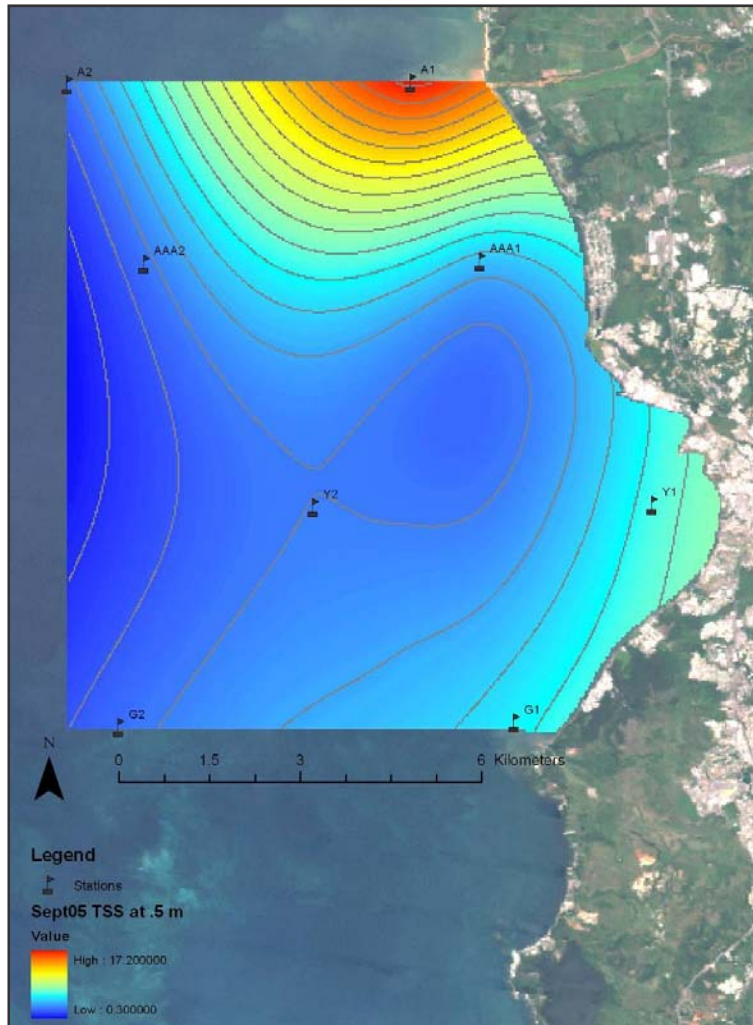
Arial 10 B I U

A1	Depth (m)															
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Depth (m)	Temperature (°C)	Salinity	SS (mg/l)	Fluorescence	Chl-a (mg/l)	Chl-a (mg/l) (GERS equation)	a412	a440	a488	a510	a532	a555	a650	a676	a715	c412
0.5	29.3368	34.3386	No Data	0.2377	No Data	0.67585916	0.794558	0.602194	0.399907	0.339682	0.267343	0.212625	0.060511	0.053332	0	4.401199
1	29.3298	34.5	5.125	0.238	0.518666667	0.6770504	0.313012	0.241423	0.151736	0.137409	0.103776	0.079261	0.021884	0.03005	0	1.505006
1.5	29.3047	34.6652	No Data	0.2429	No Data	0.69650732	0.224365	0.173262	0.104286	0.099695	0.073533	0.056319	0.010264	0.023027	0	0.952718
2	29.2723	34.7968	No Data	0.2416	No Data	0.69134528	0.218244	0.166632	0.102905	0.095931	0.072537	0.055404	0.009684	0.023909	0	0.874826
2.5	29.2406	34.8927	No Data	0.242	No Data	0.6929336	0.2055	0.160638	0.097489	0.093337	0.069478	0.052562	0.00838	0.023036	0	0.912708
3	29.2182	34.948	2.983333	0.2515	0.517333333	0.7306562	0.22002	0.165585	0.097743	0.096243	0.071524	0.056888	0.011735	0.028223	0	0.956248
3.5	29.2046	34.9756	No Data	0.2712	No Data	0.80888096	0.2192	0.175348	0.107964	0.103101	0.076156	0.059203	0.010827	0.026871	0	0.883546
4	29.1934	34.9934	No Data	0.2898	No Data	0.88273784	0.217156	0.174587	0.107599	0.104174	0.076637	0.059571	0.010428	0.027909	0	0.970444
4.5	29.1857	35.0048	No Data	0.2878	No Data	0.87479624	0.213988	0.164523	0.099035	0.097541	0.073814	0.053939	0.01035	0.026714	0	0.901403
5	29.178	35.0145	No Data	0.2882	No Data	0.87638456	0.215477	0.167829	0.102559	0.100357	0.074677	0.057055	0.010808	0.025507	0	0.90602
5.5	29.1688	35.0247	No Data	0.285	No Data	0.863678	0.21802	0.167947	0.105015	0.10202	0.078243	0.059408	0.014012	0.028831	0	0.925321
6	29.1574	35.0368	No Data	0.2774	No Data	0.83349992	0.221498	0.168223	0.106976	0.101778	0.078831	0.060008	0.011585	0.027803	0	0.944221
6.5	29.1479	35.0463	No Data	0.2749	No Data	0.82357292	0.226091	0.173678	0.107532	0.104308	0.08023	0.05992	0.012292	0.025521	0	0.993786
7	29.1416	35.0523	No Data	0.2792	No Data	0.84064736	0.225616	0.171202	0.107827	0.104588	0.078771	0.06059	0.011885	0.027489	0	1.030211
7.5	29.1377	35.0557	No Data	0.2826	No Data	0.85414808	0.227854	0.177323	0.10951	0.104285	0.07995	0.062633	0.01383	0.029487	0	1.012049
8	29.1347	35.0583	No Data	0.2824	No Data	0.85335392	0.222805	0.176067	0.108312	0.105183	0.079265	0.062536	0.012489	0.029385	0	0.983687
8.5	29.1326	35.0599	No Data	0.2806	No Data	0.84620648	0.230568	0.185775	0.114243	0.108344	0.077518	0.062578	0.008857	0.027862	0	0.981308
9	29.1314	35.0606	No Data	0.2815	No Data	0.8497802	0.220245	0.175031	0.105833	0.100636	0.076544	0.058176	0.010309	0.028085	0	1.001926
9.5	29.1305	35.0611	No Data	0.2844	No Data	0.86129552	0.228485	0.177697	0.109707	0.106681	0.077512	0.059964	0.013071	0.030116	0	0.954551
10	29.1291	35.0622	No Data	0.2913	No Data	0.88869404	0.219637	0.170119	0.103245	0.100263	0.075368	0.057182	0.011286	0.024548	0	0.962921
10.5	29.1269	35.0637	No Data	0.3	No Data	0.92324	0.225648	0.174286	0.106415	0.103694	0.078234	0.060197	0.011172	0.026965	0	0.985902
11	29.1212	35.0667	No Data	0.3261	No Data	1.02687788	0.235447	0.191306	0.115706	0.108201	0.08471	0.065477	0.011074	0.026461	0	1.002845
24																
25																
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32																

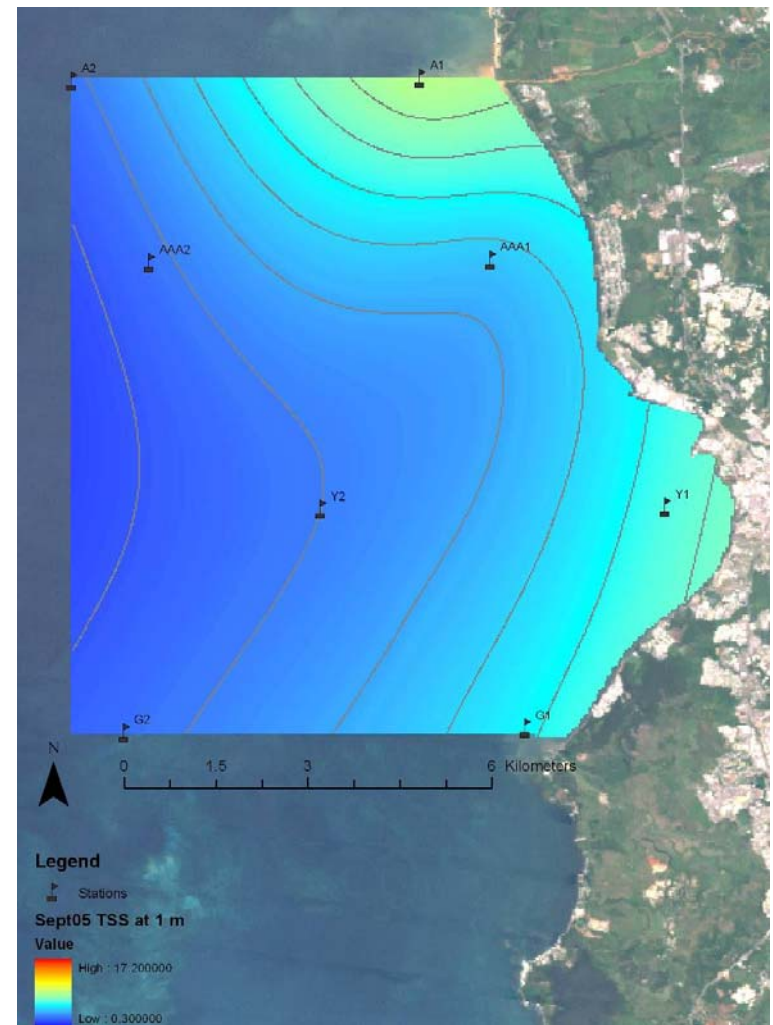
A1 A2 AAA1 AAA2 Y1 Y2 G1 G2 Rrs (Corrected) Ag CDOM Discrete Data Discrete ac-9 data Chl regression

After all necessary corrections data was summarized into databases

TOTAL SUSPENDED SEDIMENTS

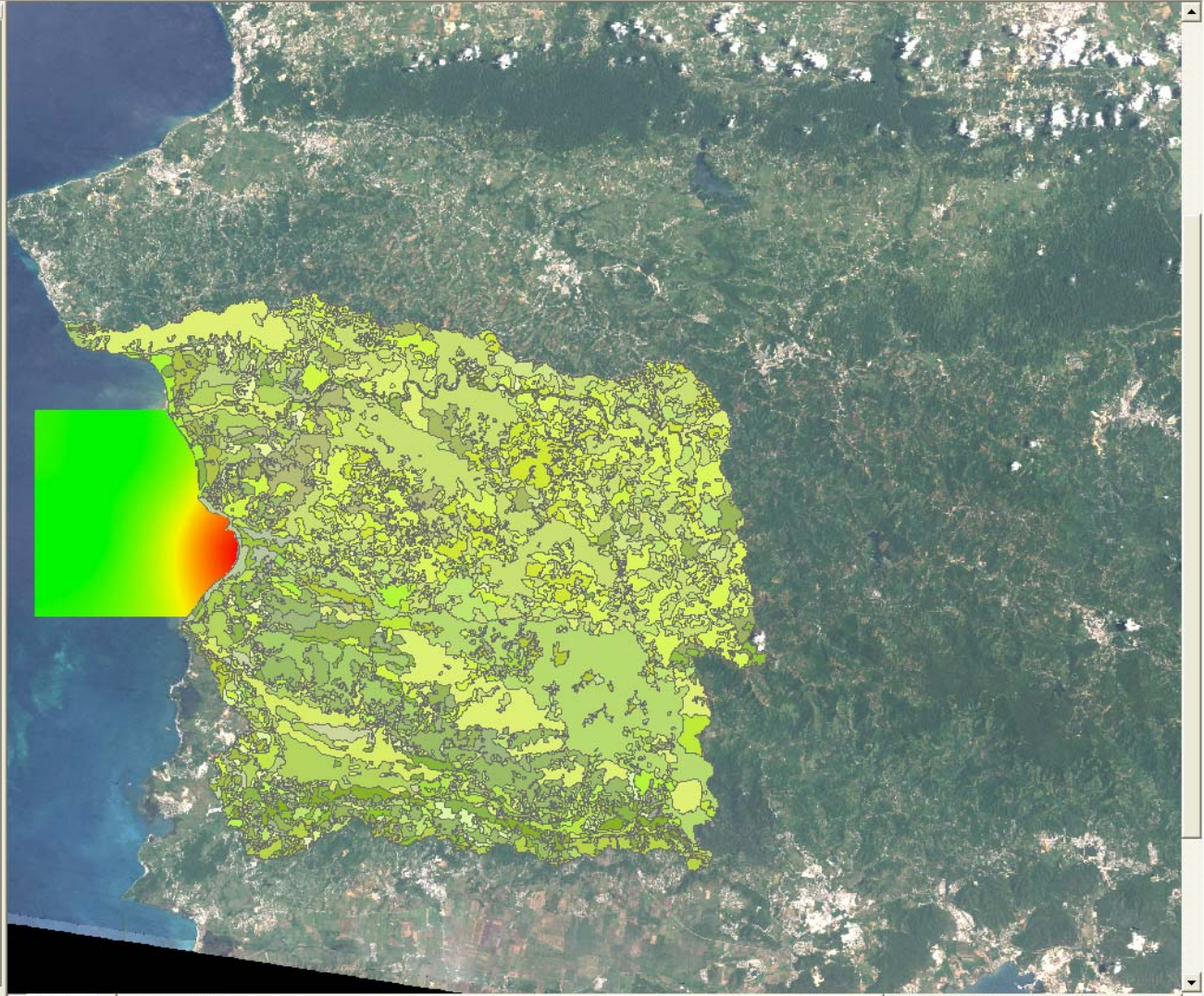


0.5 METERS



1.0 METERS

- April 2006
 - IOP
 - Absorption
 - a412 1m Value
 - High : 0.19468
 - Low : 0
 - a412 3m Value
 - High : 0.185349
 - Low : 0
 - a440 1m Value
 - High : 0.156421
 - Low : 0
 - a440 3m Value
 - High : 0.14878
 - Low : 0
 - a676 1m Value
 - High : 0.038618
 - Low : 0
 - a676 3m Value
 - High : 0.047769
 - Low : 0
 - Scattering
 - Backscattering
 - Attenuation
 - Chlorophyll
 - Salinity
 - sediments 1m
- September 2006
- October 2006
- Geology
- Soil Type
- Orthophotos 2007
- Landsat TM
 - RGB
 - Red: Band_3
 - Green: Band_2
 - Blue: Band_1





**Geological and Environmental Remote Sensing Laboratory
Department of Geology
University of Puerto Rico at Mayagüez**

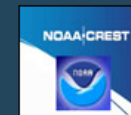
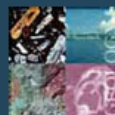
MAYAGÜEZ BAY DATABASE

Since the GERS Lab was founded an important effort has been done to better understand the dynamics of Mayaguez Bay. This open bay is located in the west coast of Puerto Rico and it is influenced by the discharge of the Añasco, Yaguez, and Guanajibo rivers. It has also been affected by anthropogenic activities produced by tuna factories (currently closed) and a sewage pipe (currently active). Oceanographic and bio-optical data have been collected along the bay during different seasons and years. We are posting here the processed data for your visualization and use. In case of any question please send an email to Fernando Gilbes Santaella at fgilbes@uprm.edu.

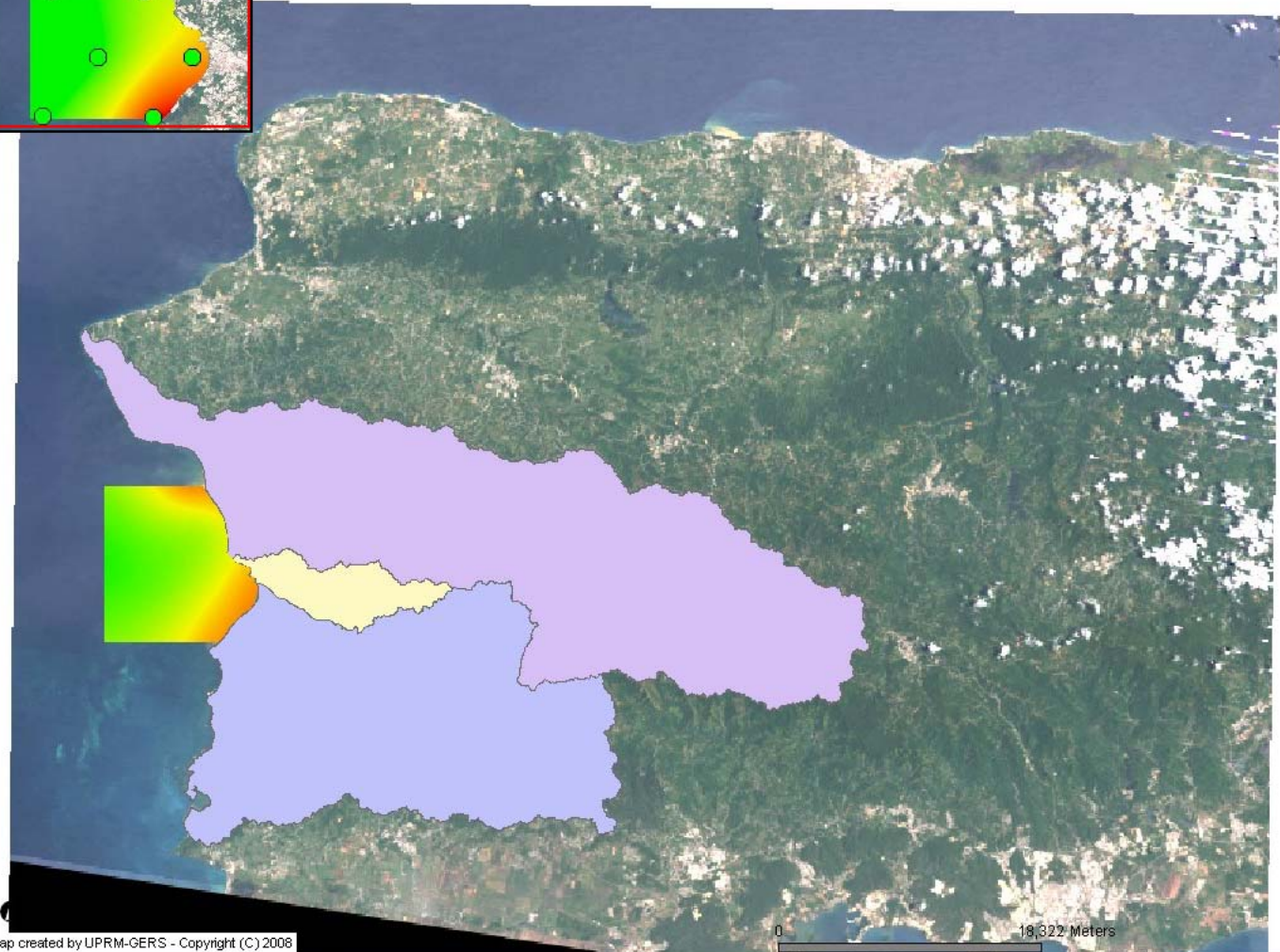
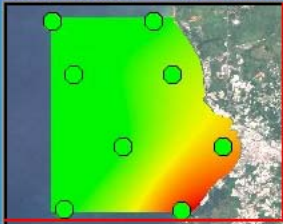
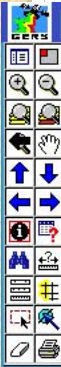
Click on the date to see the data collected during that day.

April 2001	February 2004	October 2005
October 2001	August 2004	December 2005
August 2002	March 2005	March 2006
February 2003	July 2005	April 2006
October 2003	August 2005	September 2006
January 2004	September 2005	October 2006

[> Go back to GERS Lab Database](#)



Remote Sensing of Coastal Waters: Mayaquez Bay - October 2006



- ### October 2006 Layers
- Layers
 - October 2006
 - Data
 - Absorption
 - Attenuation
 - Scattering
 - Backscattering
 - Chlorophyll
 - chla 1m
 - chla 3m
 - Salinity
 - Sediments
 - Ancillary Data
 - Elevations 30m
 - Rivers and Stre
 - Roads
 - Bathymetry co
 - Benthic Type
 - Yaguez waters
 - Guanajibo wate
 - Anasco waters
 - Subwatershed
 - Soil Type
 - Geology
 - Study Area
 - Landsat TM

Refresh Map
 Auto Refresh

- ### Help:
- A closed group, click to open
 - An open group, click to close
 - A map layer.
 - A hidden group/layer, click to show
 - A visible group/layer, click to hide
 - A visible layer, but not at this scale
 - A partially visible group, click to toggle
 - An inactive layer, click to make active
 - The active layer.

Map created by UPRM-GERS - Copyright (C) 2008

0 18,322 Meters

oct_06_1m

STATION	DEPTH	TEMPERATUR	SALINITY	SS	FLUORESCEN	CHLA	a412	a440	a488	a510	a532	a555	a650	a676	a715	c412	c440	c488	c510	c532	c555	
A1	1	28.4742	34.6222	7.95	0.2082	0.81909526	0	0	0	0	0	0	error value	error value	0	0	0	0	0	0	0	0

Identify

gersview.uprm.edu

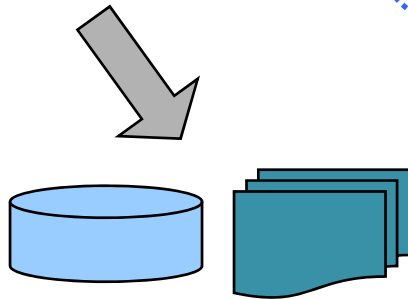


Current Projects

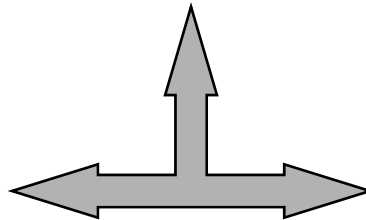
Bioluminescence Bays
Mayaguez Bay Watershed

Future Projects

Parguera Reefs
Jobos Bay (Pending)

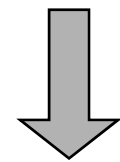


Database



ArcView
Info Projects

ArcIMS
Mapping Interface



Mapping Interface
(World-Wide Users,
Researchers)



Conclusions

- GIS is an excellent tool for better understanding the dynamics of coastal environments.
- An important database has been accomplished and it is now published in the web for public used.
- Other databases of coastal environments and marine habitats of PR could be published using a similar system.



Next Steps

- Continue working with Mayaguez Bay database.
- Start working in a database of Coral Reefs.
 - La Parguera Bio-optical database.
- Enhance HTML Viewer
 - Hierarchical Table of Contents
 - Hyperlinks, Graphics, etc.
 - Enable Java Viewer
- Purchase a New Server
 - Better storage and processing
- Upgrade to ArcIMS 9.3®
- Include RS imagery analysis products (ENVI).

Acknowledgements

- This work was sponsored by the University of Puerto Rico Sea Grant College Program and the NOAA Center for Cooperative Remote Sensing Science and Technology Center.
- The databases have been created by:
 - William Hernandez
 - Vilmaliz Rodriguez
 - Ramon Lopez
- ArcIMS configuration was made by William Hernandez and GMT technical support.

**THANK
YOU!**



Questions
are
guaranteed in
life;
Answers
aren't.