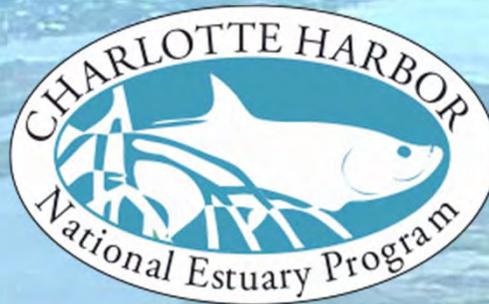


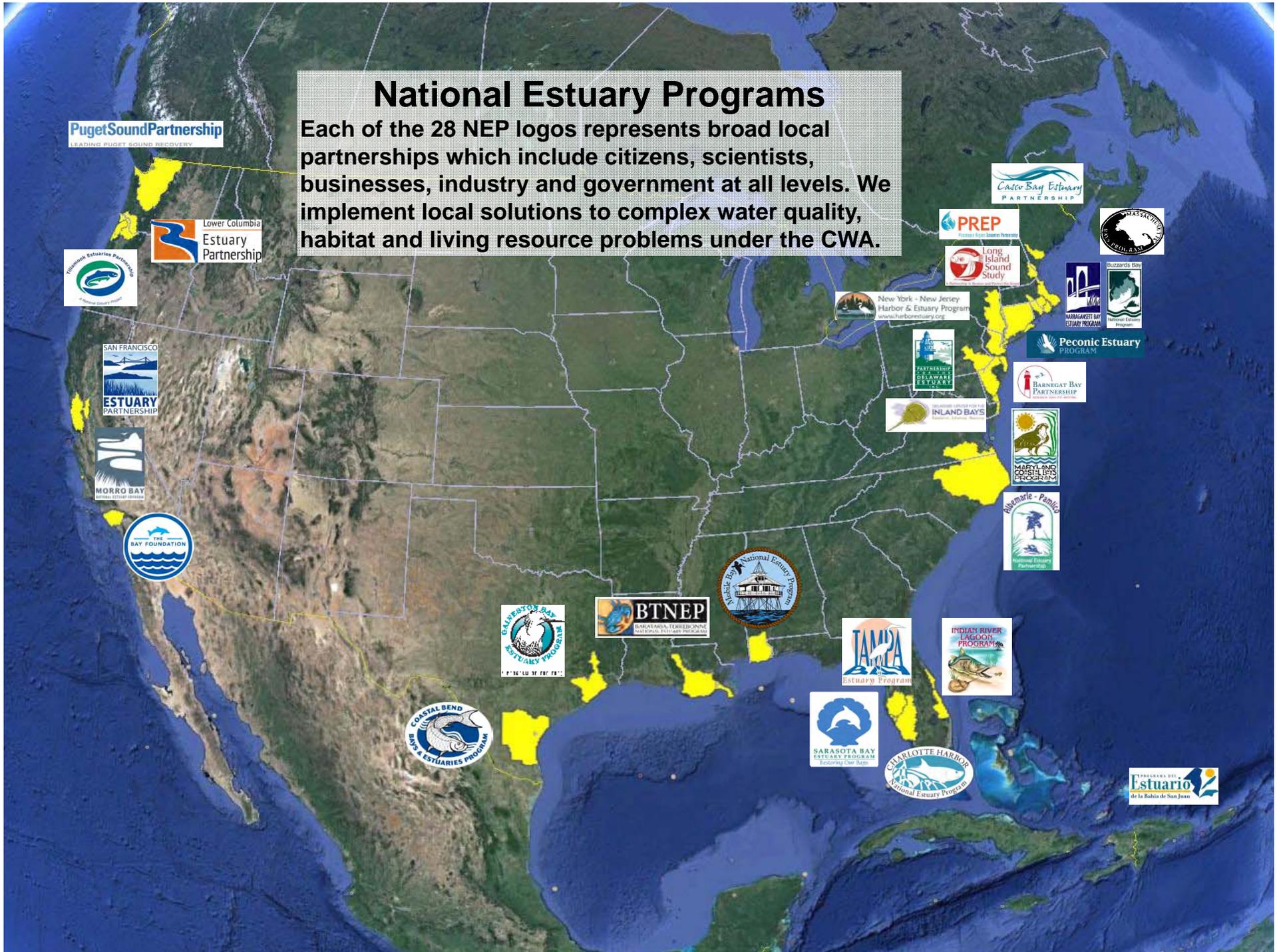
Charlotte Harbor National Estuary Program Update



Lisa B. Beever, PhD, AICP
Joint WG/SCG meeting
January 26, 2015

National Estuary Programs

Each of the 28 NEP logos represents broad local partnerships which include citizens, scientists, businesses, industry and government at all levels. We implement local solutions to complex water quality, habitat and living resource problems under the CWA.



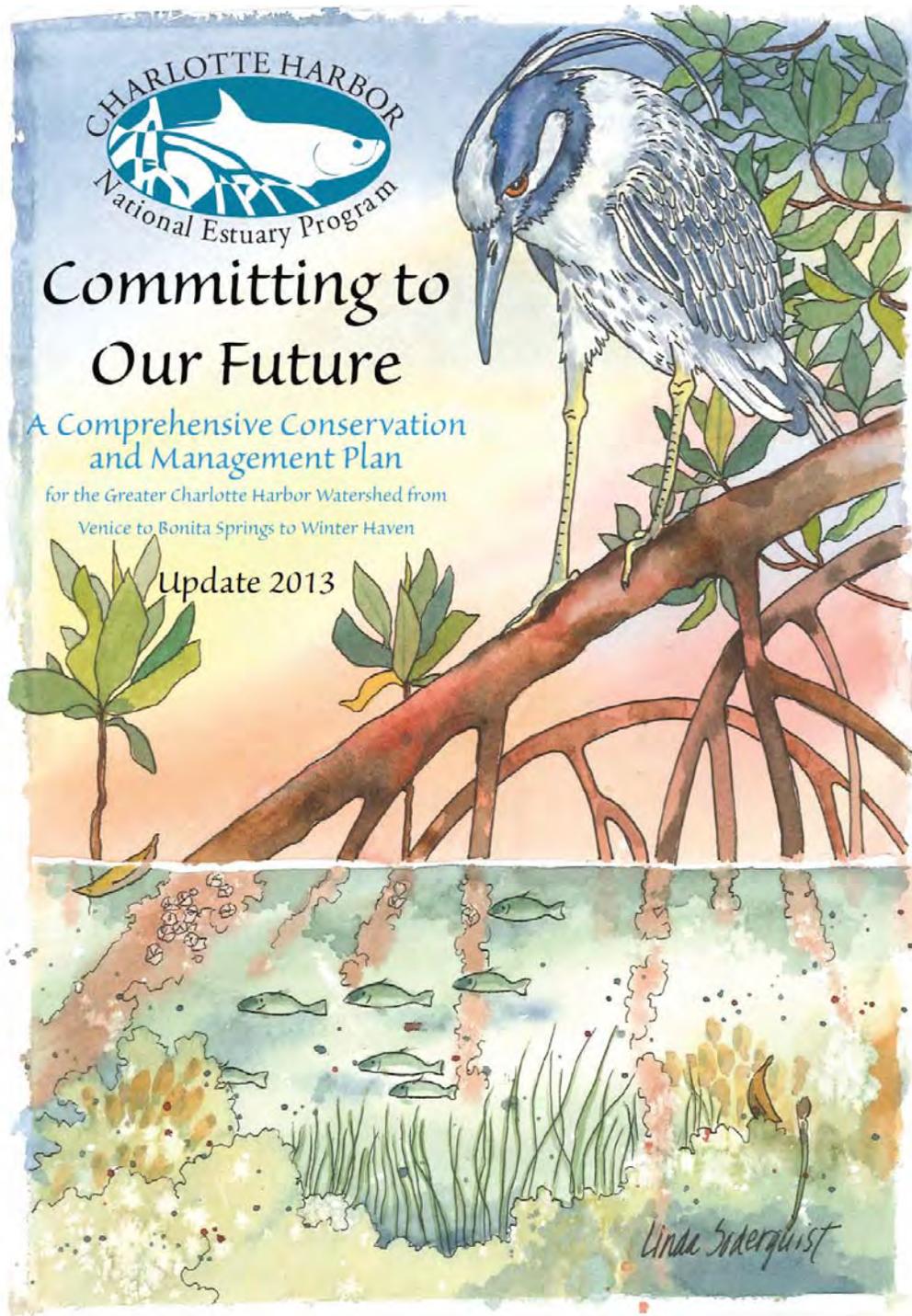
CHNEP Management Conference

Policy Committee
Elected Officials and Agency Policy Makers

Management Committee
Resource Managers

Technical Adv. Committee
Scientists, Engineers, and Planners

Citizen Adv. Committee
Citizens and agency Public Outreach Specialists



Comprehensive Conservation and Management Plan

Priority Problems:

HA: Hydrologic Alterations

WQ: Water Quality Degradation

FW: Fish & Wildlife Habitat Loss

SG: Stewardship Gaps

Project Updates

- RESTORE Act: Gulf of Mexico
- Oyster Habitat Restoration Plan
- Shoreline Survey
- Salt Marsh Mapping and Analysis
- Eco-System Services
- Alligator Creek Restoration and Monitoring
- Coastal Charlotte Harbor Monitoring Network
- Optical Model
- Numeric Nutrient Standards: Tidal Creeks
- Mangrove Heart Attack

Clean Water Act

RESTORE Act

**20% to
Oil Spill Liability
Trust Fund**

80% Gulf Coast Restoration Trust Fund

**Local Fund
35%**

**Federal Fund
30%
Gulf Coast
Restoration
Council**

**State Fund
30%
Florida
Consortium**

**Research,
Monitoring 5%**

**President's Task
Force Strategy**



**President's Task
Force Strategy**



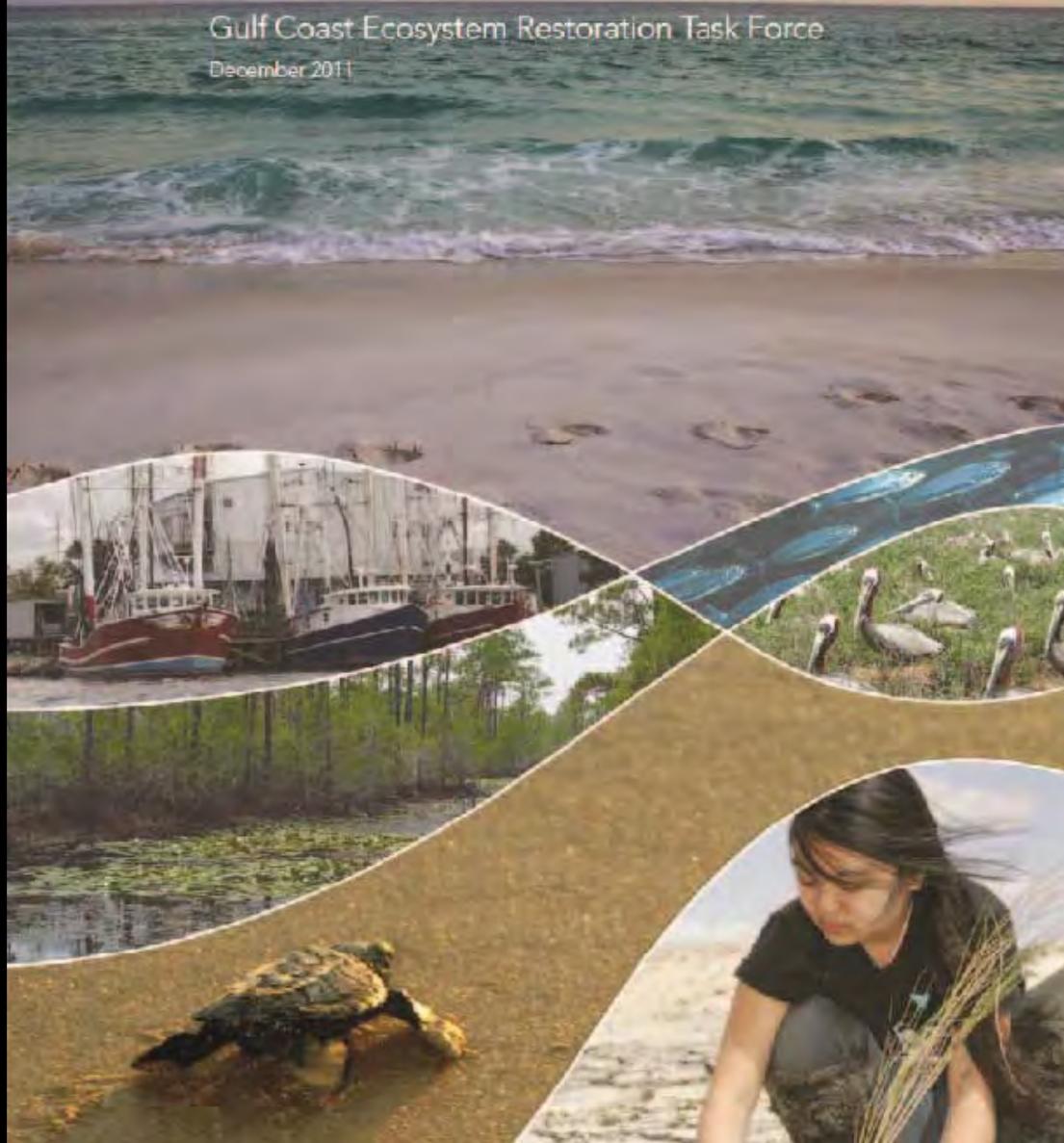
National Estuary Programs coordinated development of the plan



Gulf of Mexico Regional Ecosystem Restoration Strategy

Gulf Coast Ecosystem Restoration Task Force

December 2011

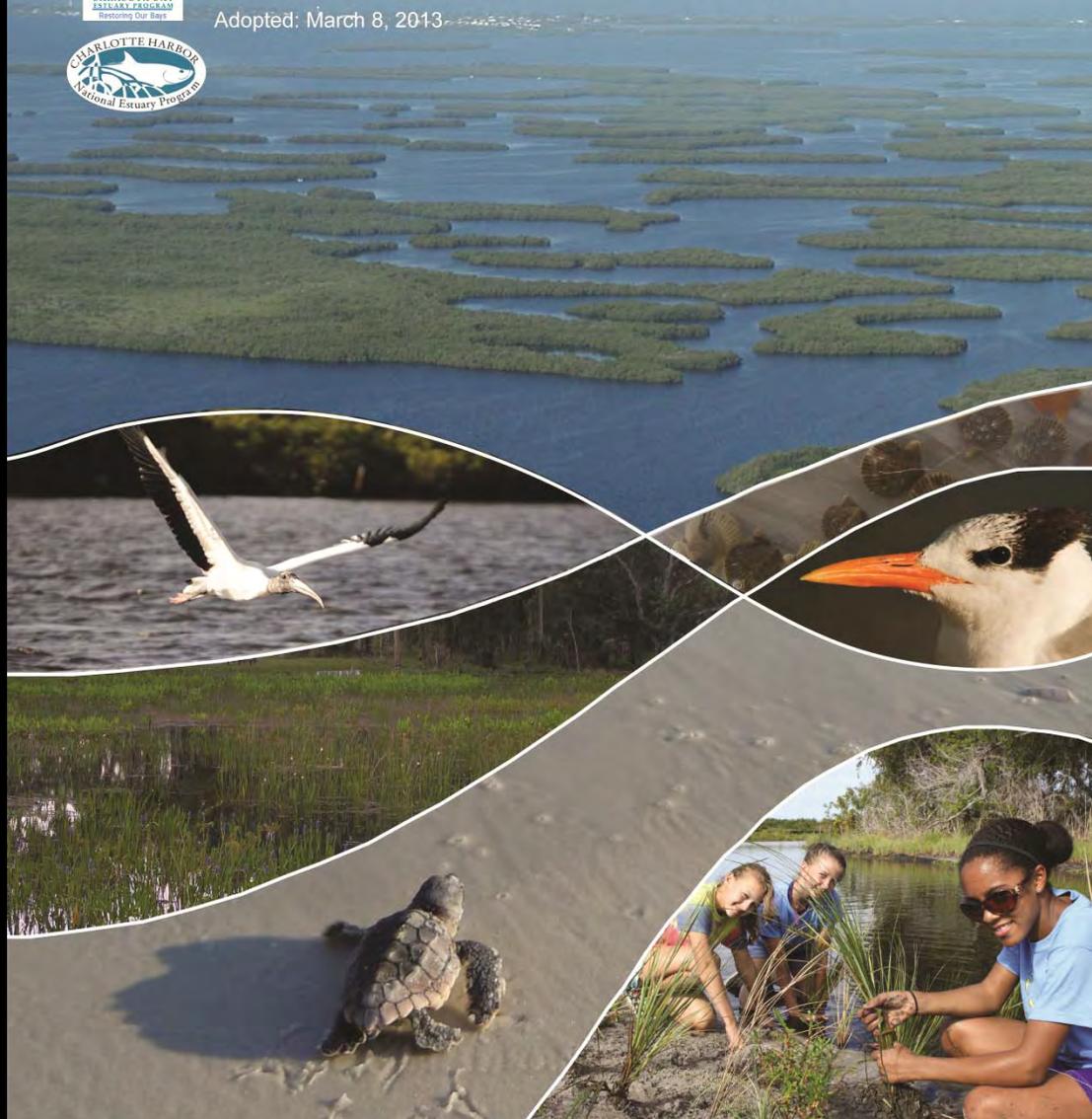


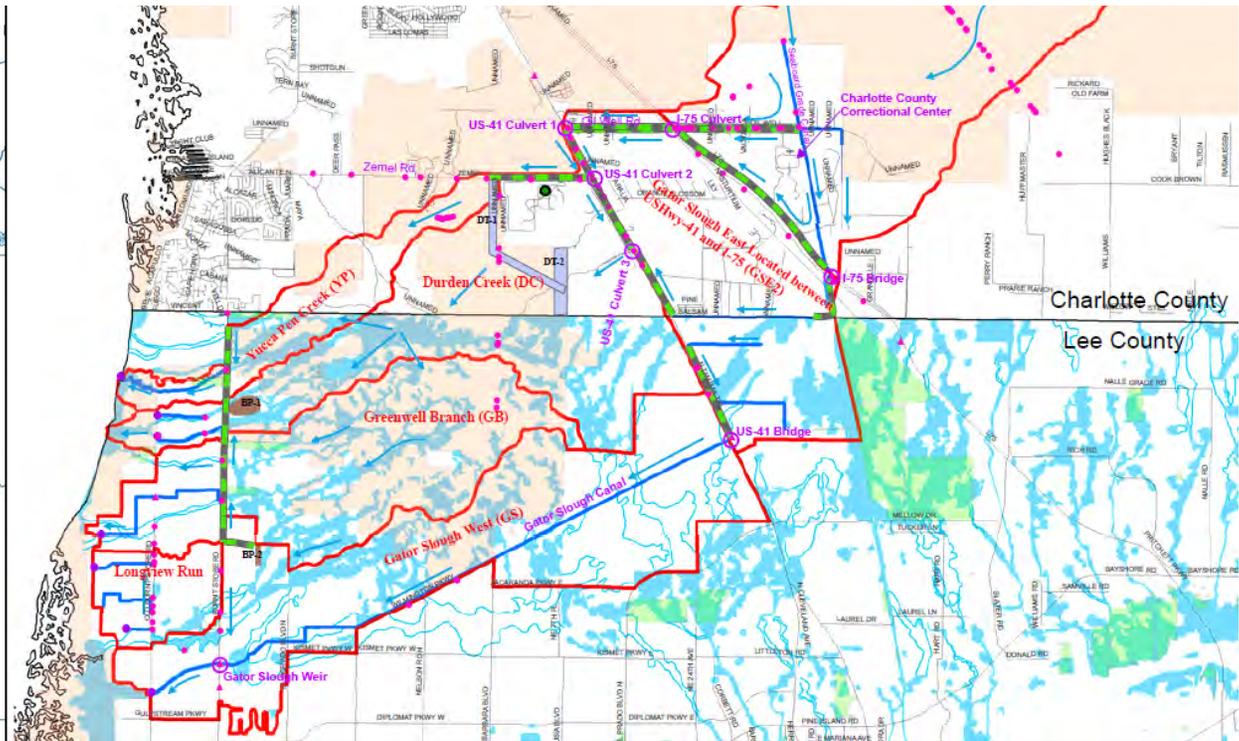
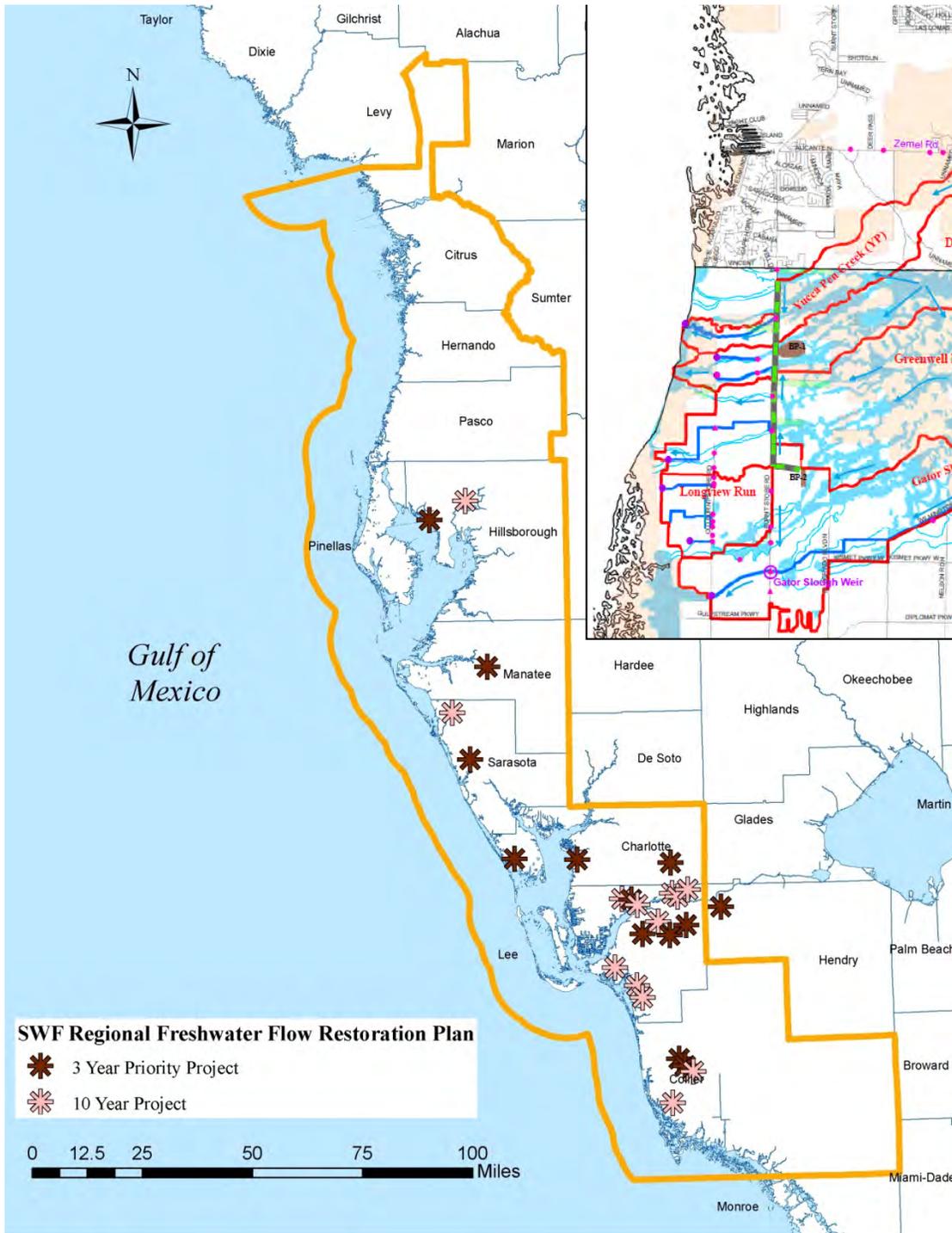


Southwest Florida Regional Ecosystem Restoration Plan

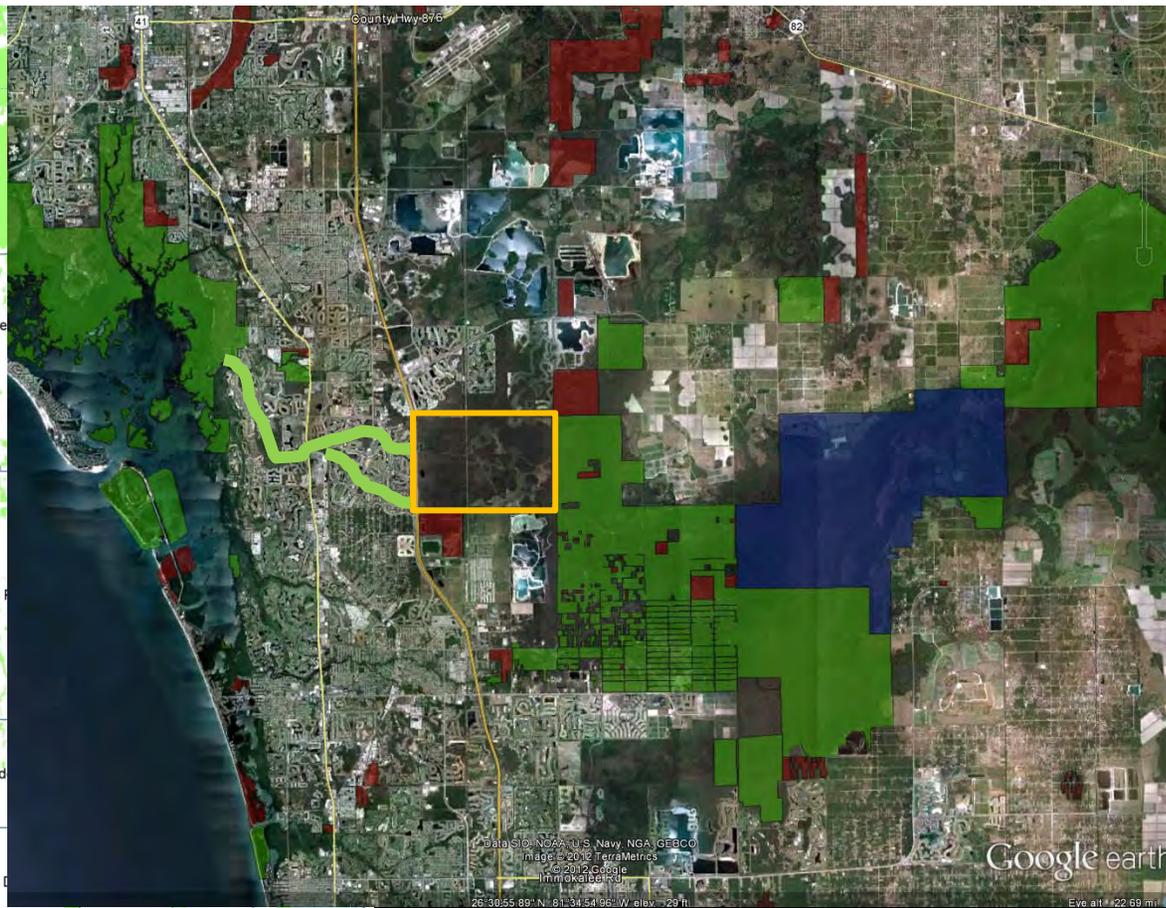
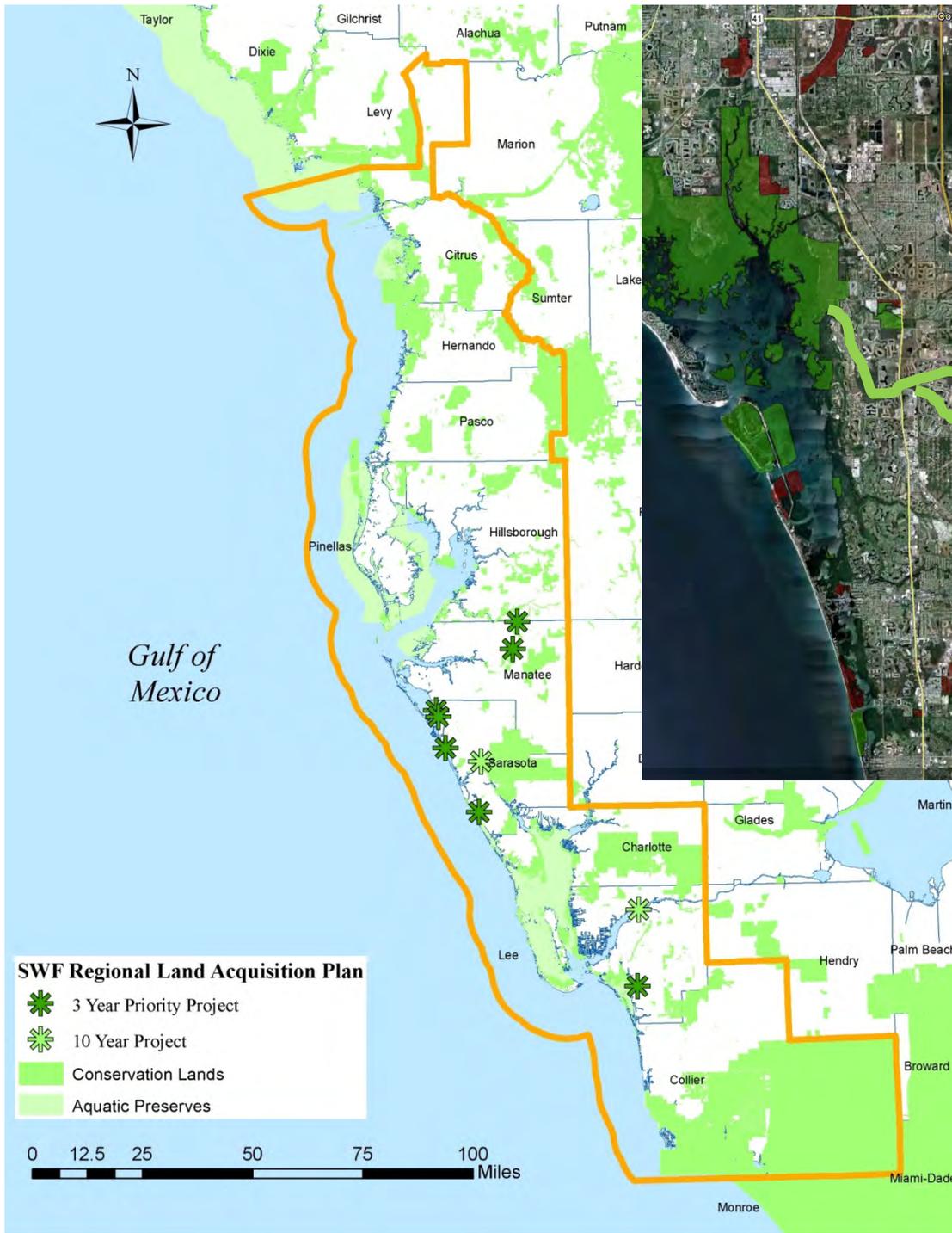
Joint Florida Gulf National Estuary Programs

Adopted: March 8, 2013

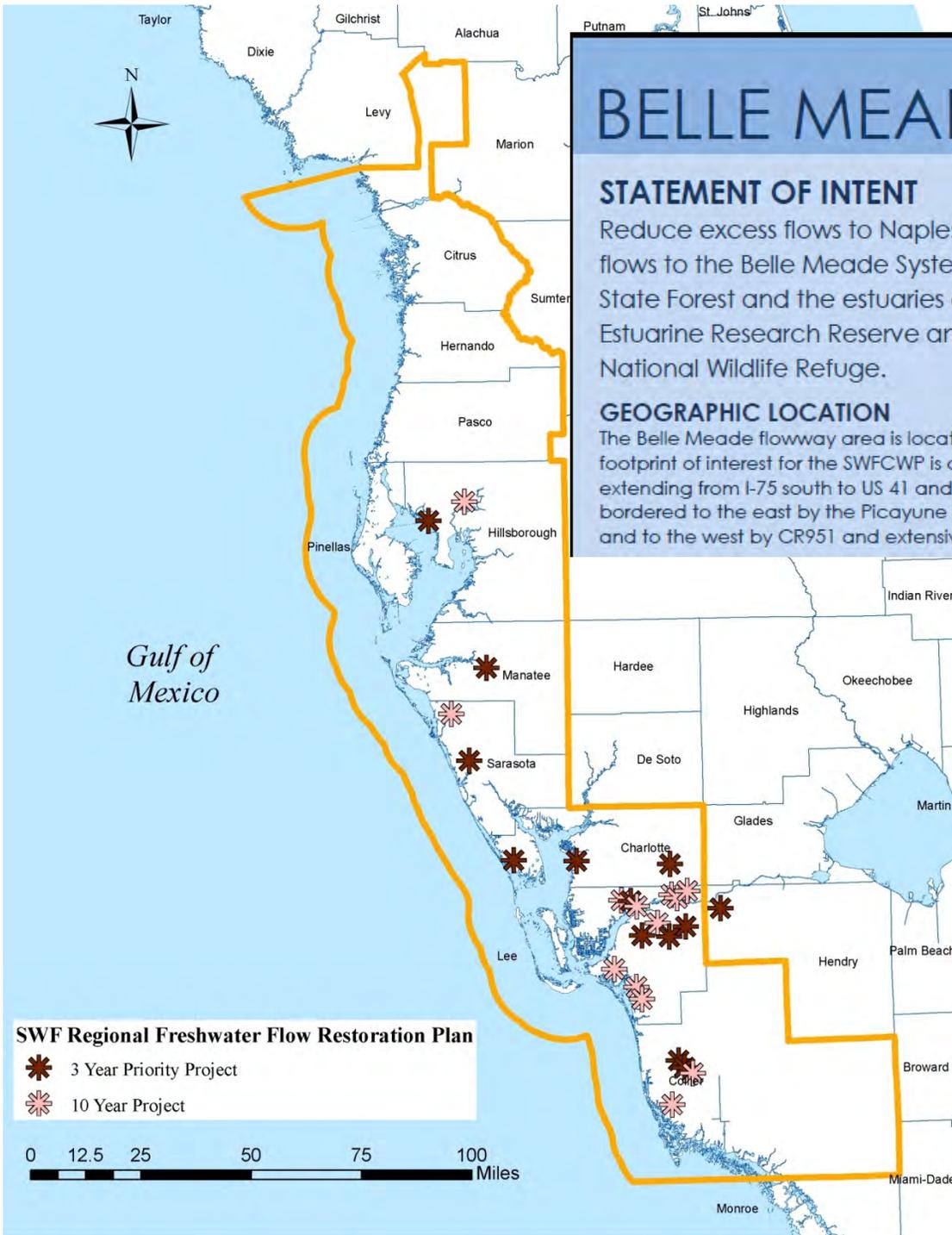




Charlotte Harbor Flatwoods Initiative



Edison Farms/Agripartners Acquisition



BELLE MEADE FLOWWAY

STATEMENT OF INTENT

Reduce excess flows to Naples Bay and redistribute these flows to the Belle Meade System including Picayune Strand State Forest and the estuaries of Rookery Bay National Estuarine Research Reserve and the Ten Thousand Islands National Wildlife Refuge.

GEOGRAPHIC LOCATION

The Belle Meade flowway area is located in central Collier County. The footprint of interest for the SWFCWP is composed of a large swath of land extending from I-75 south to US 41 and the 10,000 Islands. The area is bordered to the east by the Picayune Strand CERP Restoration Project and to the west by CR951 and extensive urban development.



Charlotte Harbor Flatwoods Initiative

Charlotte Harbor National Estuary Program Oyster Habitat Restoration Plan



Charlotte Harbor National Estuary Program Technical Report Final Draft: 10/3/2012



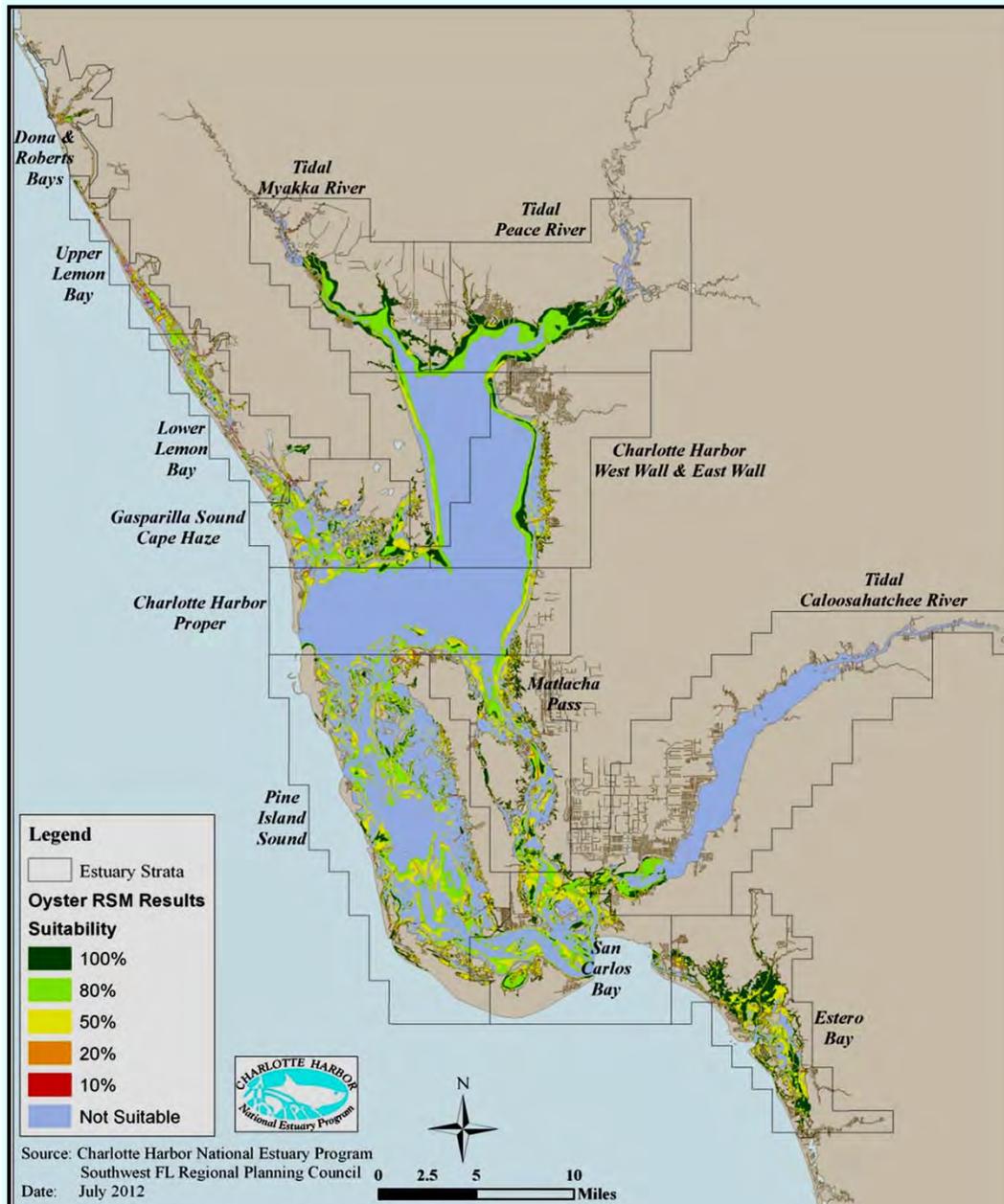
1926 Victoria Avenue, Fort Myers FL 33901
(239) 338-2556 www.CharlotteHarborNEP.org

Prepared by:

Jaime G. Boswell, Independent Contractor
Judy A. Ott, Charlotte Harbor National Estuary Program
Anne Birch, The Nature Conservancy



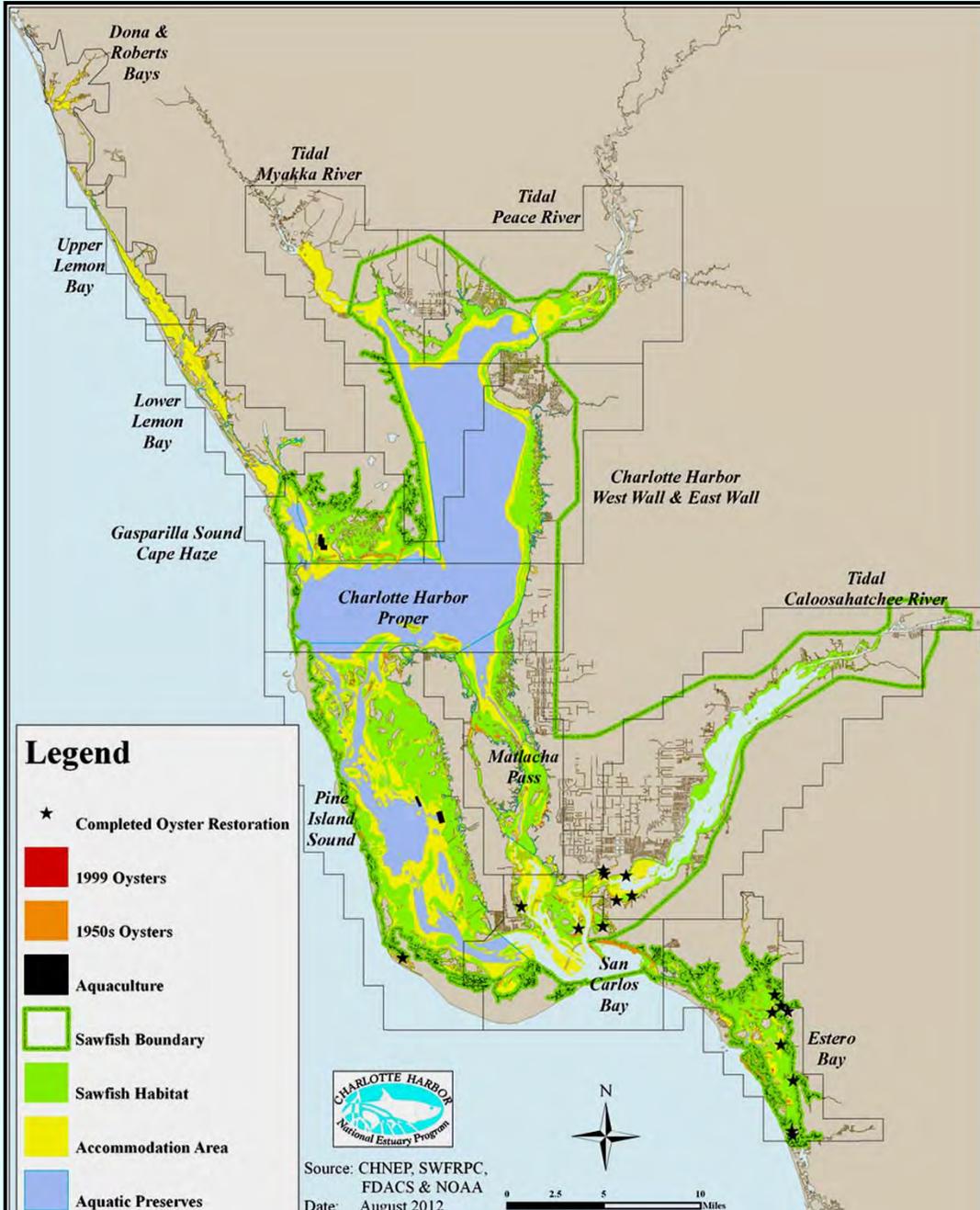
Restoration Suitability Model Results (Fig. 6):



- 100% suitable in CHNEP = 22,172 ac (10% of estuary area)
- 80% Suitable in CHNEP = 20,428 ac
- maps & acres included for each estuary

Additional Spatial Considerations

- Sawfish Habitat
- Accommodation Area
- Aquatic Preserves
- Shellfish Harvest Areas
- Aquaculture Leases
- Previously Mapped Oysters
- Completed O. Restoration
- Bird Rookery Islands
- Mangroves



You Can Help Protect Charlotte Harbor's Coast

Ongoing Volunteer Opportunities for Individuals or Groups

Charlotte Harbor | [Show Directions](#)



The Nature Conservancy is collaborating with Florida DEP- Charlotte Harbor Aquatic Preserves and the City of Punta Gorda to launch an oyster reef restoration project adjacent to the Trabue Harborwalk.

Volunteers are needed to help with deploying the materials in the water.

There's something for everyone! Civic groups, schools, clubs, boating

SHORELINE SURVEY

CHNEP Volunteer Tidal Shoreline Survey

The Charlotte Harbor National Estuary Program (CHNEP) asked volunteers to survey the tidal shoreline in Lee and Charlotte counties in 2007, 2010 and 2013, for thousands of urban parcels in each survey year. The surveys augment 2007 aerial photograph interpretation and provide condition trends information on the tidal shorelines most subject to human management. Shoreline condition is critical to the health of the estuary and habitat utilization by wildlife.

Citizen volunteers used kayaks and motorboats to identify mangrove condition, presence of invasive exotic plants and shoreline hardening. Volunteers were able to enter their own data through the Water Atlas.

The [2013 survey](#) was possible because of a tremendous group of volunteers and a grant from the [Florida Coastal Management Program](#), [Florida Department of Environmental Protection](#) and [National Oceanic and Atmospheric Administration](#). The grant funded the CHNEP to create GIS coverage that allows for presentation and analysis of the collected data and a special page of the water atlas so volunteers could input their data directly into the database. Online display of survey details and data was made possible by a grant from [The Mosaic Foundation](#).



REPORTS & DOCUMENTS

Survey reports provide shoreline vegetation condition information that helps inform resource managers in their efforts to restore and maintain estuary shorelines.

2013

- [2007-2010 Tidal Shoreline Surveys](#), PDF, 12.2MB
- [2013 Survey Report](#), PDF, 4.0MB
- [Harbor Happenings - Summer 2013](#), PDF, 3.4MB
- [Training Event Information](#), PDF, 332KB
- [Call for Volunteers Email](#), PDF, 373KB
- [Harbor Happenings - Winter 2013](#), PDF, 161KB
- [Harbor Happenings - Fall 2012](#), PDF, 72KB

2010

- [A Watershed Analysis of Permitted Coastal Wetland Impacts and Mitigation Methods within the Charlotte Harbor National Estuary Program Study Area](#), PDF, 15MB
- [2010 Shoreline Condition](#), PDF, 116KB

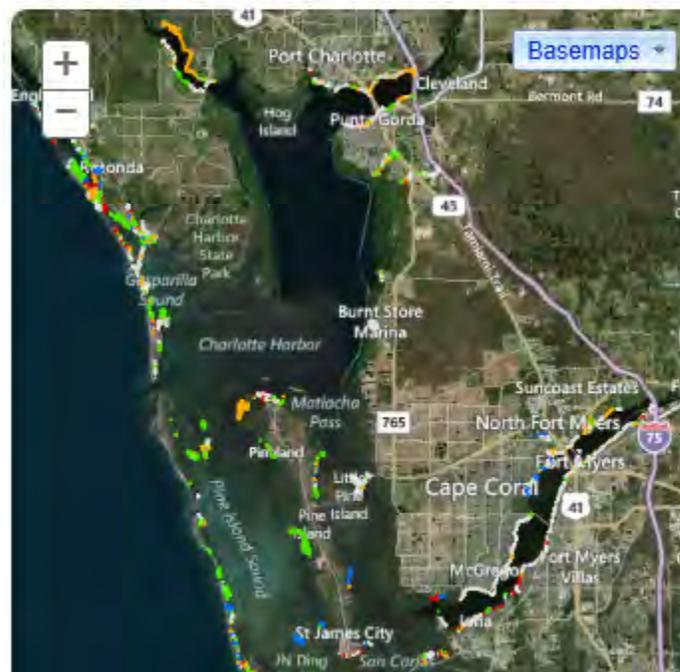
2007

- [2007 Survey Report](#), PDF, 1.1MB

DOWNLOAD SURVEY DATA

2013 SURVEY MAP

Shorelines have been color coded according to the height of the mangroves recorded during the 2013 survey.

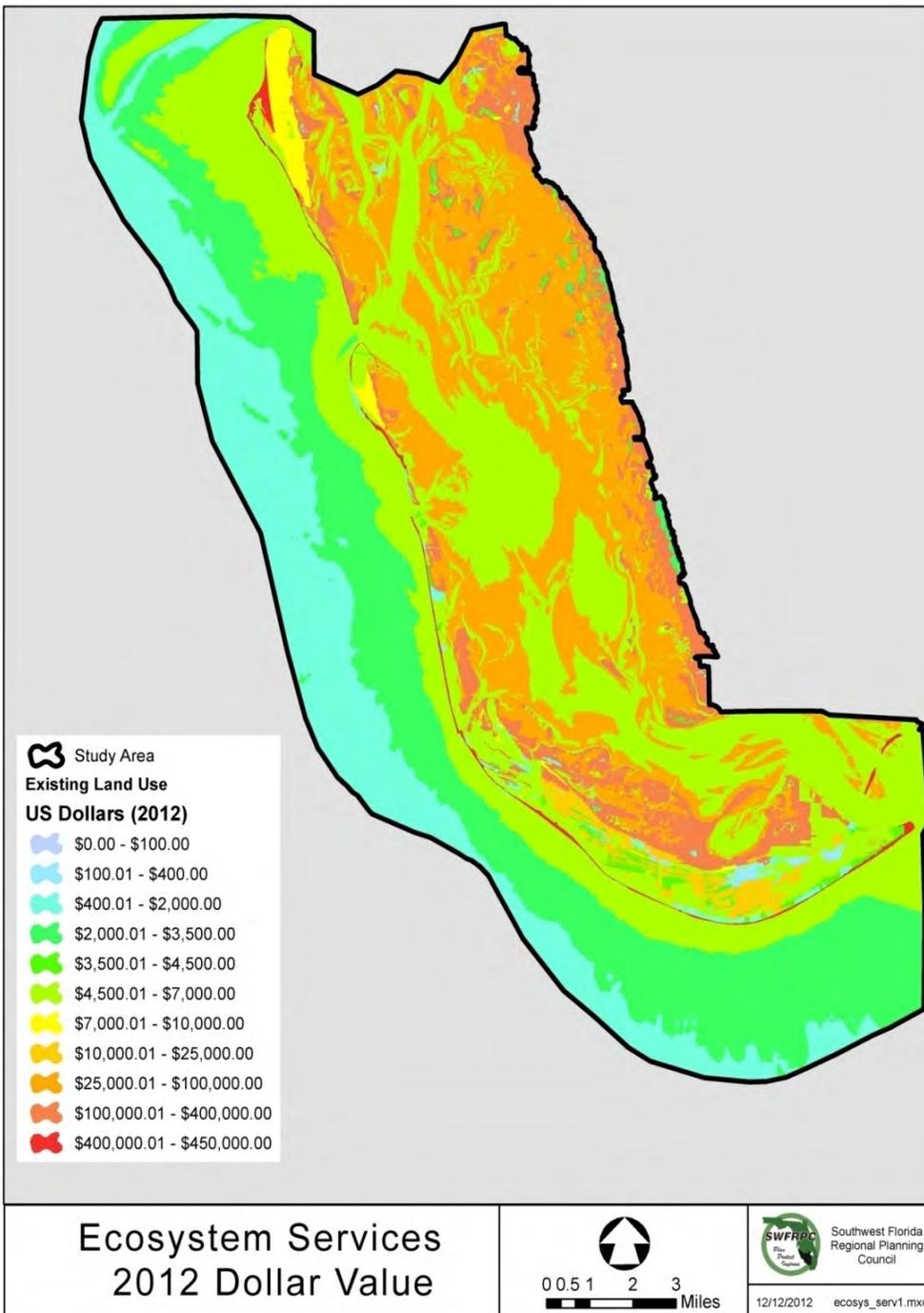


Findings

- Mangrove presence has increased on urban shorelines.
- Mangrove trimming appears to have increased between 2007 and 2010 and then dropped back to previous levels by 2013.
- Invasive exotic plant presence has increased on urban shorelines.
- Damage from Hurricane Charley is healing.
- 2013 Volunteer data benefited from assistance of professional database manager and direct volunteer data entry.

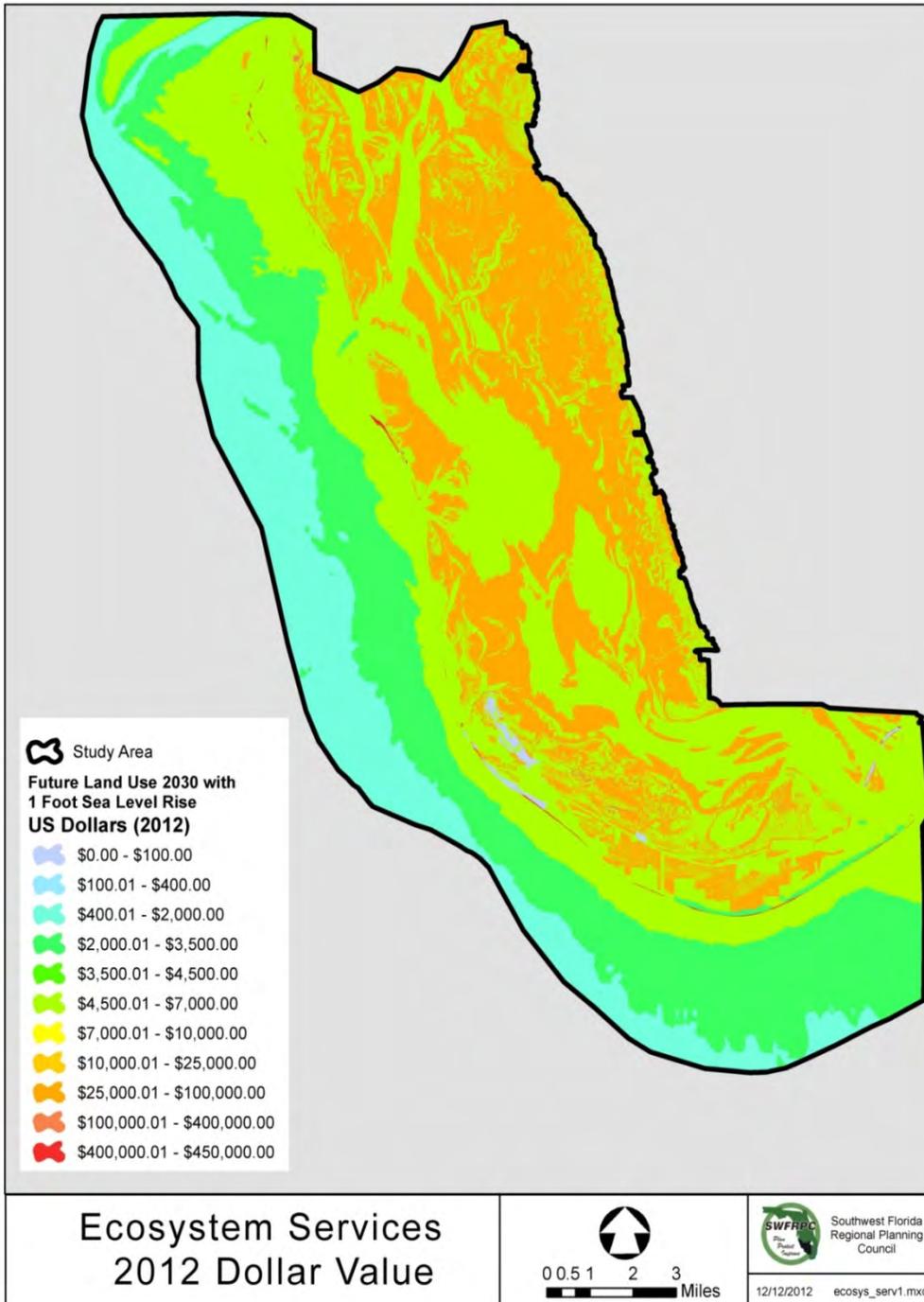
Ecosystem Services

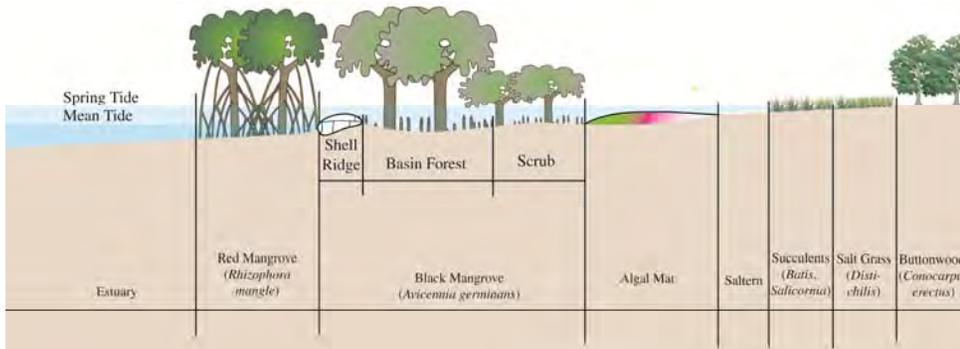
- Existing Land Use
- \$7 Trillion



Ecosystem Services

- 2020 Land Use
- 1 foot SLR
- \$4 Trillion
- 43% loss of value
- Tool for LU decisions, infrastructure investment, Land Acquisition

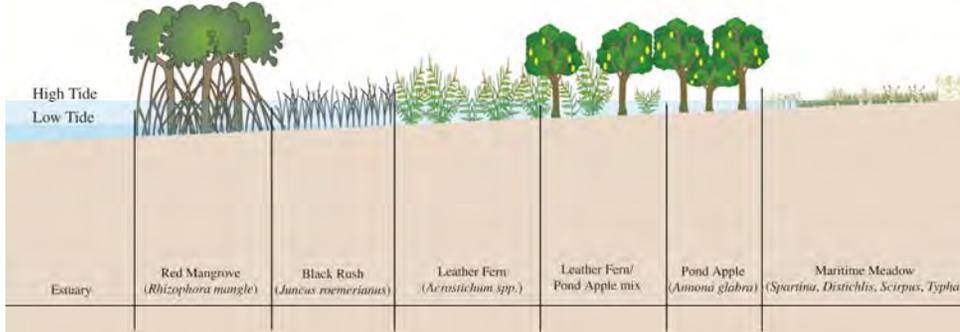




By: Lisa B. Beever, PhD, AICP
with assistance from James W. Beever III and Whitney Gray
Date: 7/29/11, revised 2/10/12
Charlotte Harbor National Estuary Program

Estero Bay Salt Marsh Structure
Charlotte Harbor National Estuary Program Region

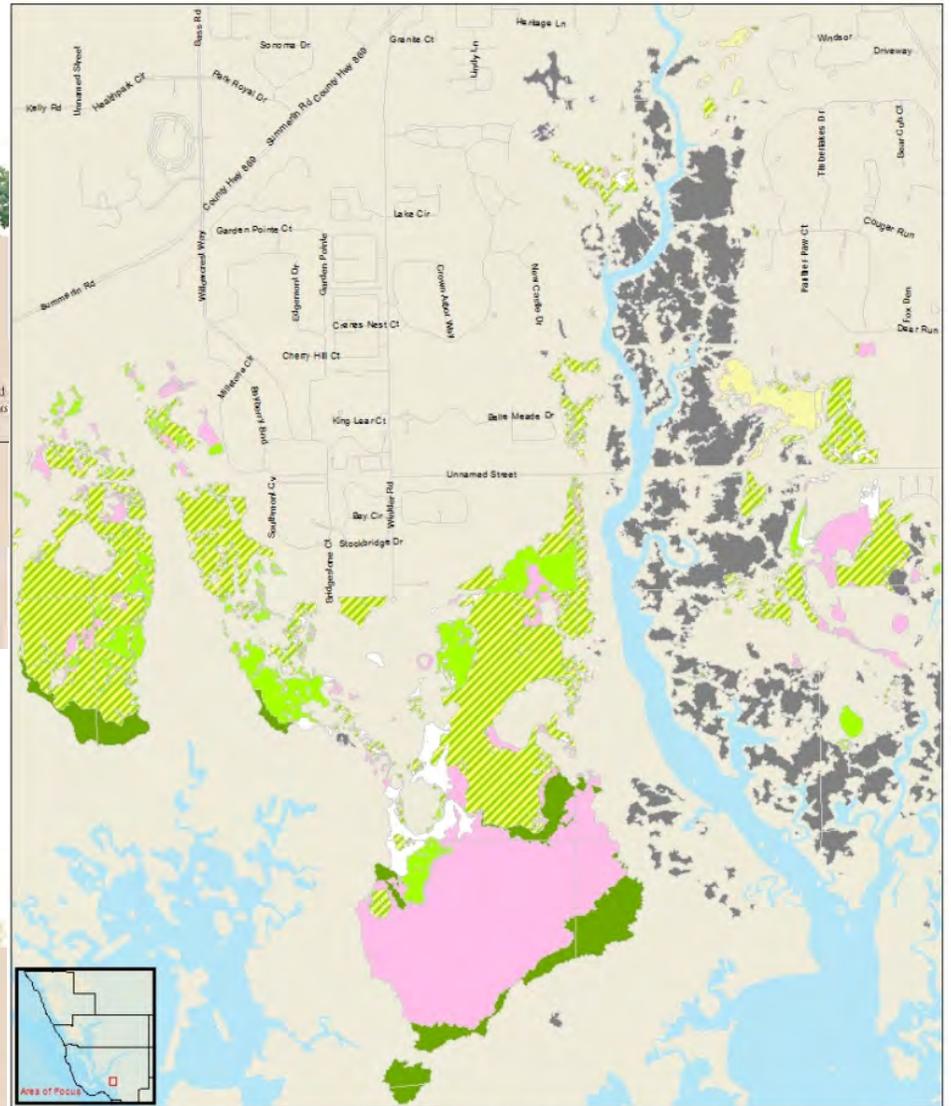
Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/),
University of Maryland Center for Environmental Science.



By: Lisa B. Beever, PhD, AICP
Date: 7/29/11
Charlotte Harbor National Estuary Program

Caloosahatchee Salt Marsh Structure
Charlotte Harbor National Estuary Program Region

Symbols courtesy of the Integration and Application Network (ian.umces.edu/symbols/),
University of Maryland Center for Environmental Science.



Hendry Creek Estero Bay Preserve

Updated 5/16/2012





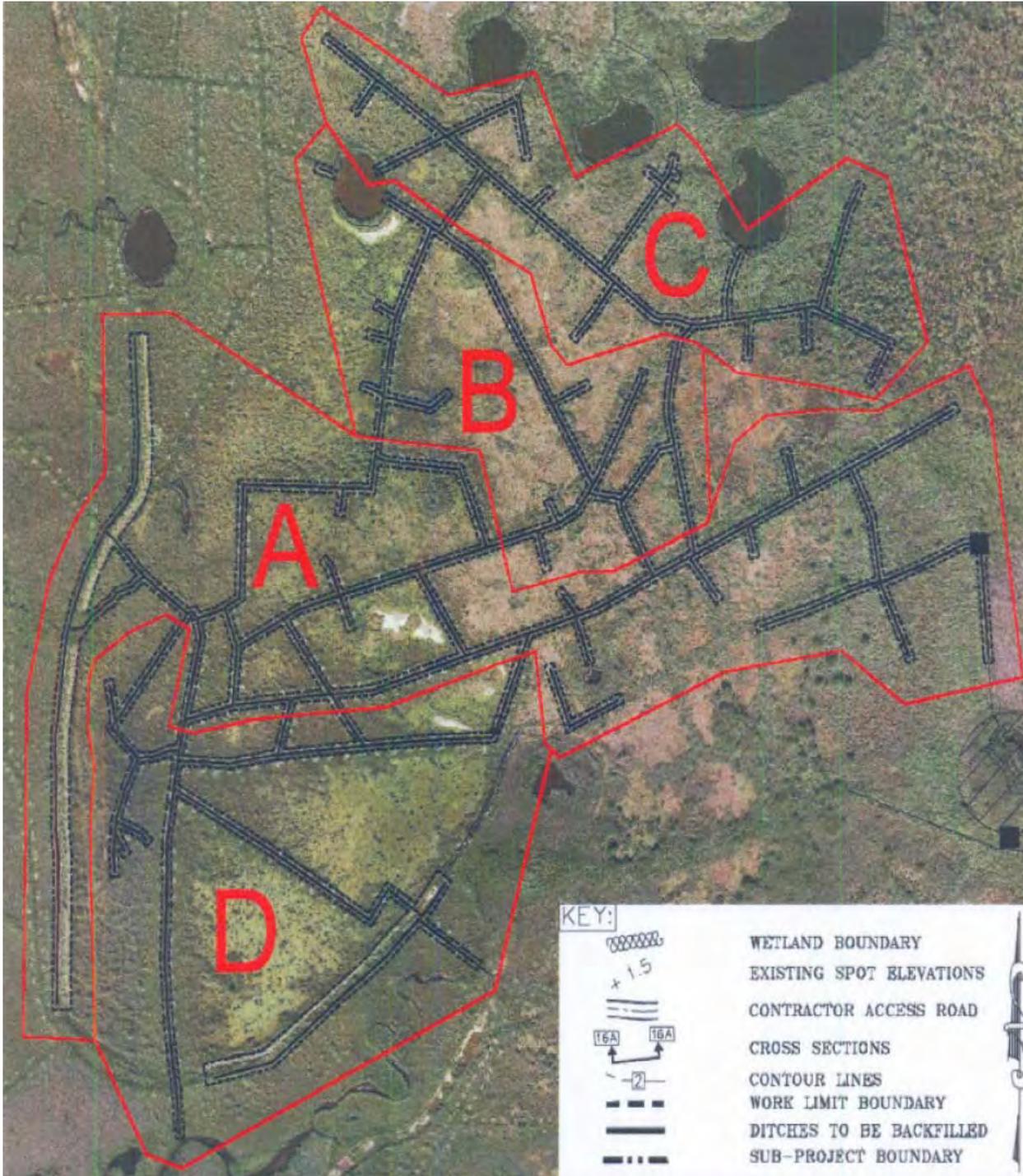
- Legend**
-  Salt Marsh 1953
 -  2010 Observed
 -  Migration Segment

Salt Marsh Migration

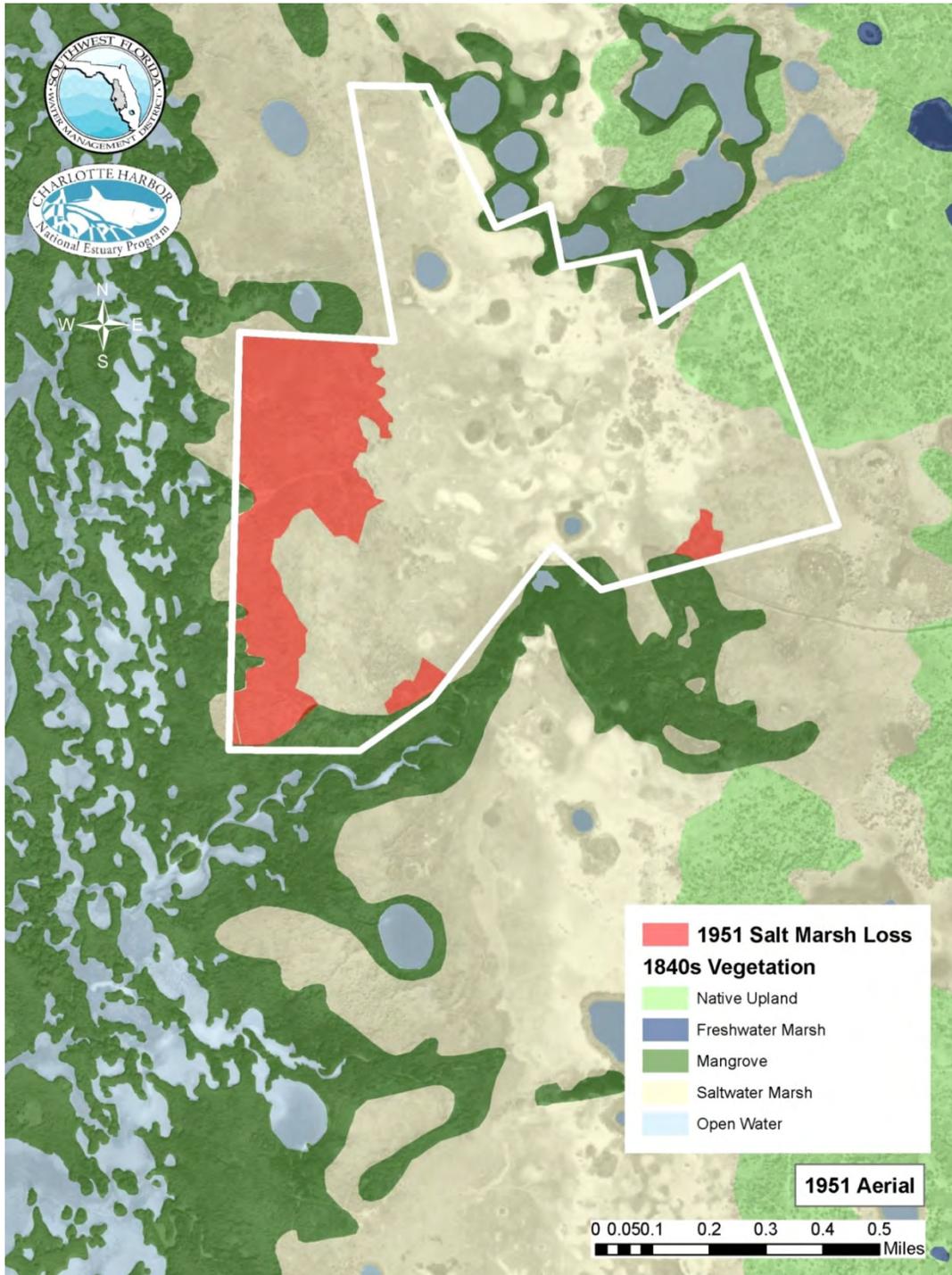
1953 Aerial Imagery Derived Delineation
2010 Field Collected Data Points
2011 Migration Measurement

The field collected and historical salt marsh delineation data is an ongoing process. Please contact the program scientist for current information.



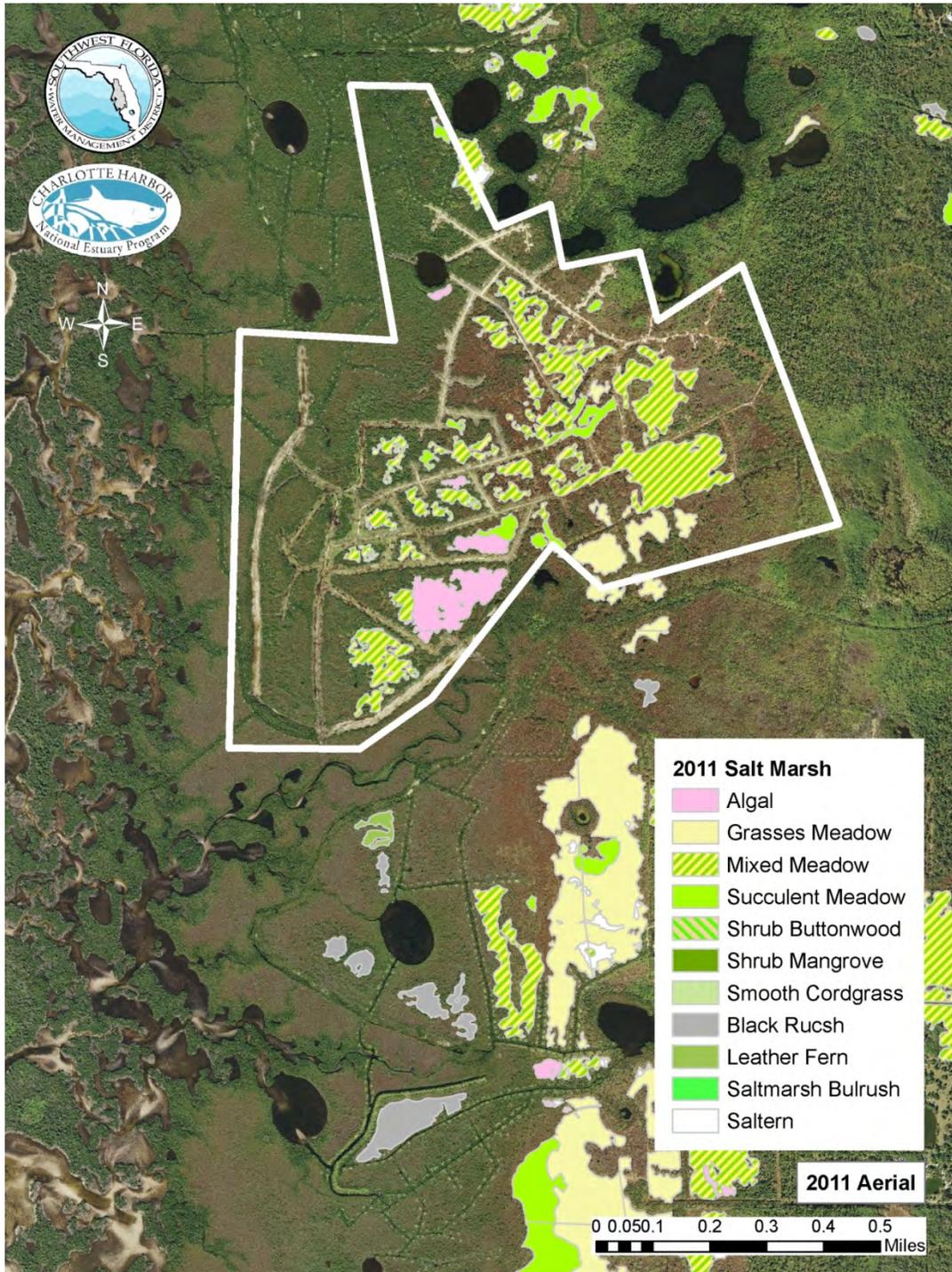


CHNEP submitted Alligator Creek Restoration Project for Estuary Restoration Act (ACOE) funding in 2003. Completed in 2008.



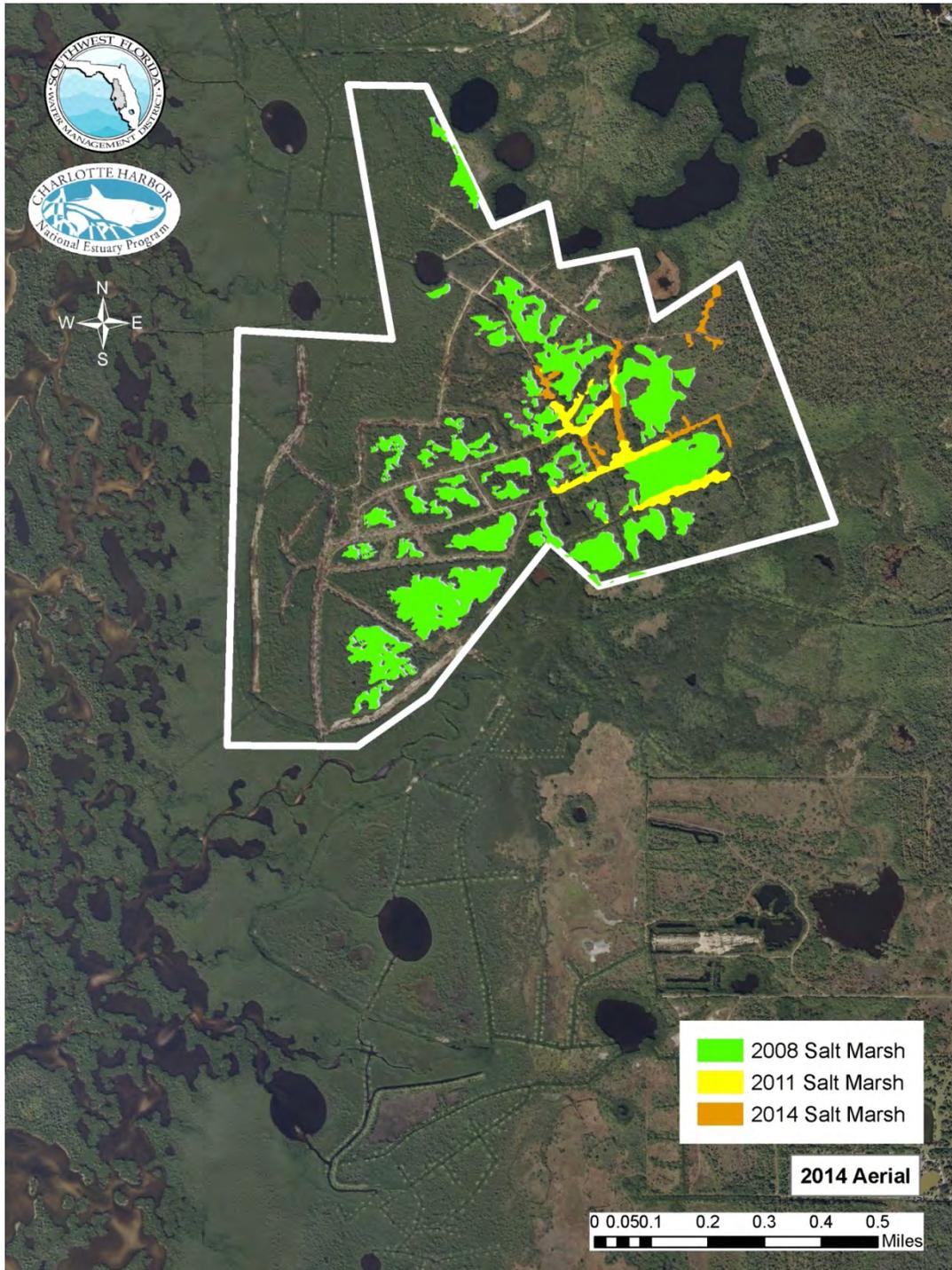
1951 Salt Marsh

- 1951 aerial photos suggest that over 79 of the 382 pre-dev salt marsh acres (20%) were lost. 303 acres of salt marsh remaining.



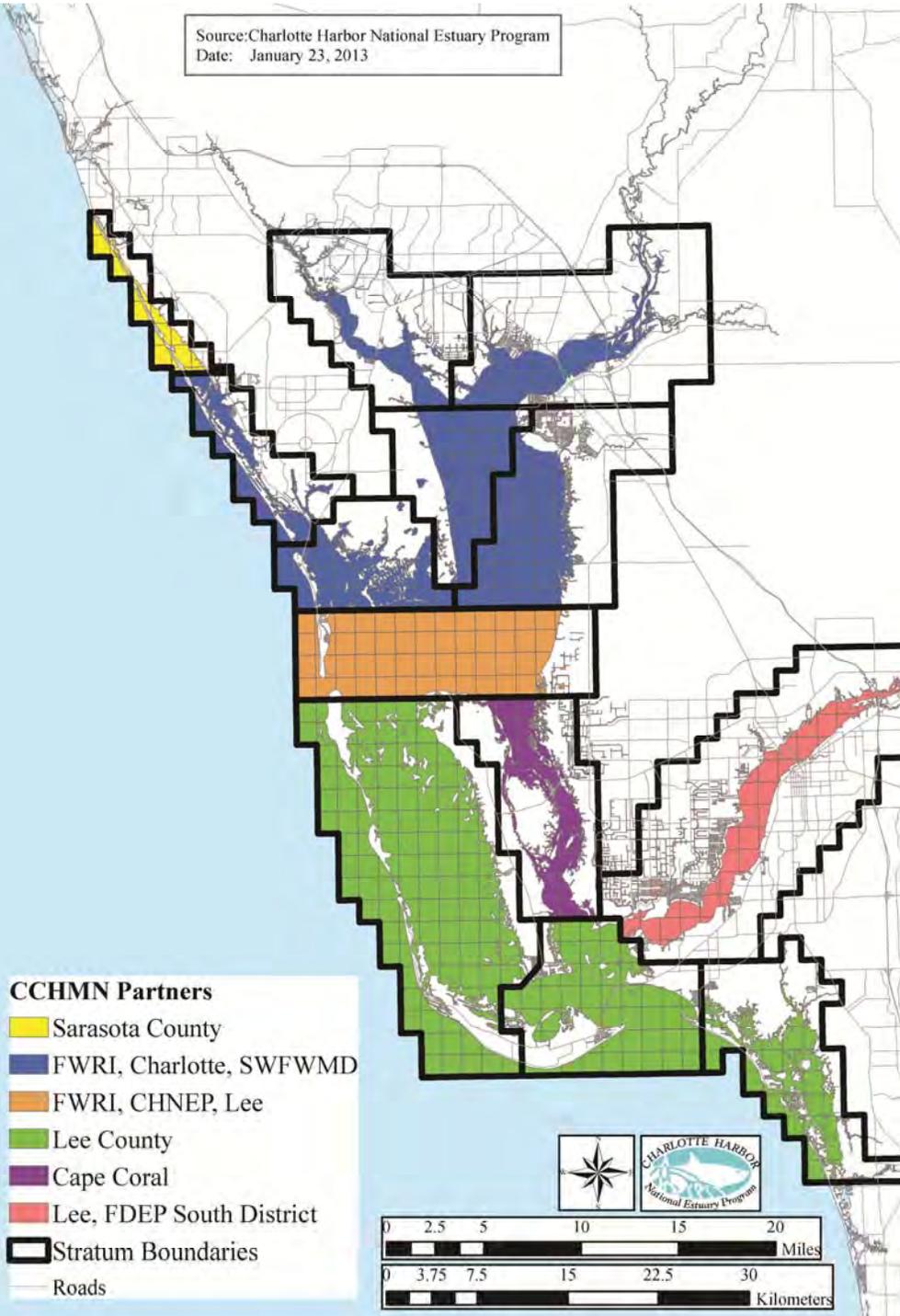
2011 Salt Marsh

- EPA WPDG grant to SWFRPC yielded finer salt marsh mapping.



Salt Marsh Change

Source: Charlotte Harbor National Estuary Program
Date: January 23, 2013



Optical Model Spectral Validation

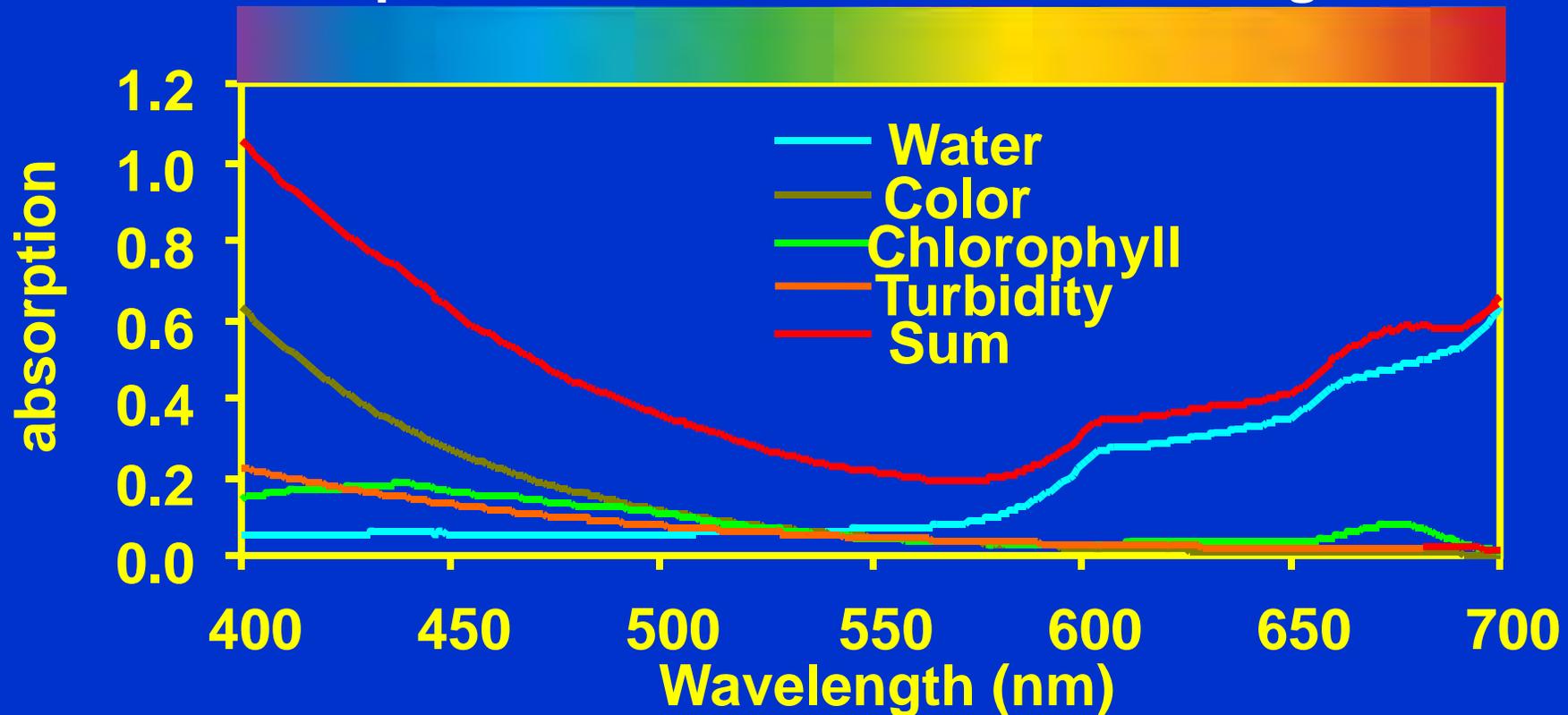
Visible spectrum of light, 400-700 nm

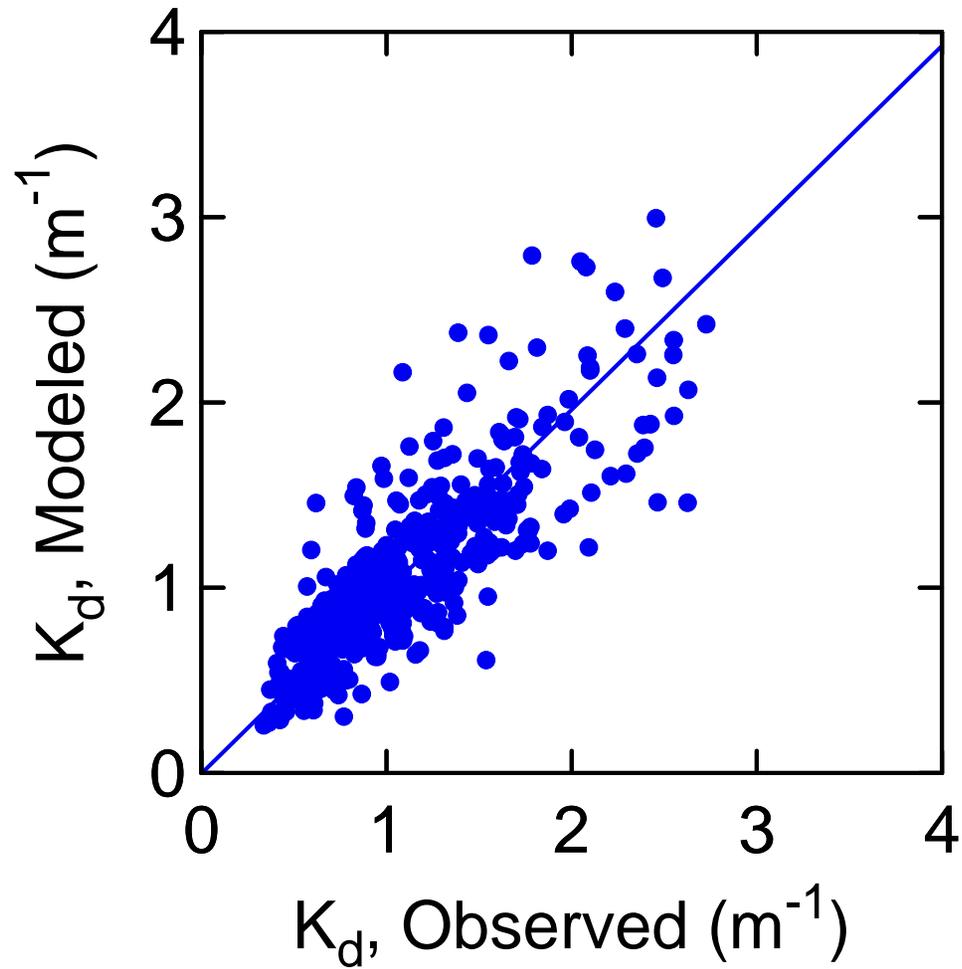
Photosynthetically Active Radiation (PAR)

Different samples, different “profiles”

Special data to compute absorption per unit WQ

Compute modeled K_d at each wavelength





12 segments using “Best” field data,
depth>1.5
Correlation line
Slope = 0.982, Intercept = -0.003

Table 4. Results of Water Clarity Estimating Tool applied to water quality data from CCHMN random stations for each CHNEP Estuary Strata. Strata with seagrass restoration targets are shown on the left, in blue and strata with seagrass protection targets are shown on right, in black (Janicki, 2009). Note that the tool grading system is different for restoration vs. protection strata, to allow for earlier detection of trends in strata with restoration goals.

Year	CHNEP Strata with Seagrass RESTORATION Targets								Strata with Seagrass PROTECTION Targets					
	Dona and Roberts Bays	Lower Lemon Bay	Tidal Peace River	West Wall	East Wall	Matlacha Pass	Tidal Caloosahatchee	Estero Bay	Upper Lemon Bay	Tidal Myakka River	Bokeelia	Cape Haze	Pine Island Sound	San Carlos Bay
1998									-2					
1999									-2					
2000									-1					
2001		-2	-2	-2	-2				0	-2	-2			
2002		-1	-1	-1	-2		-2		0	0	-2	-2		2
2003	-2	-1	-2	-2	-2		-2		-1	-2	-2	-2	0	1
2004	0	0	0	0	1	1	0	-1	0	0	0	0	0	2
2005	0	0	-1	-2	-2	-2	-2	0	0	-1	-1	0	-1	-1
2006	0	0	0	0	0	0	0	2	1	1	0	0	-1	-2
2007	2	1	2	2	2	2	2	2	1	2	2	1	2	2
2008	1	-1	0	1	1	0	1	-1	0	0	2	-1	2	0
2009	0		-1	-1	-1	0	0	0	1	0	1	-1	0	-1
2010	-2		-1	1	1	-2	1	-2	-1	0	0	0	0	-1
2011	-1		0	-1	0	-2	1	-1	-1	-1	1	-2	0	-1

Grading system for Restoration targets:	Improving	2
Green = score greater than 1	Caution	1
Yellow = score between -1 and 1	Caution	0
Red = score of less than -1	Caution	-1
	Declining	-2

Grading system for Protection targets:	Stable	2
Green = score greater than -1	Stable	1
Yellow = score of -1 or less	Stable	0
Red = score of less than -1 for consec. yrs	Caution	-1
	Caution / Declining	-2

Spring Creek Relative Bottom Hardness

- #### Tidal Creek Numeric Nutrient Standard Development
- Powell Creek
 - Yucca Pen Creek
 - Estero River
 - Spring Creek

- Vegetation Assessment
- Bottom hardness
- Bathymetry

Cooperative Effort of
3 Florida Gulf NEPs

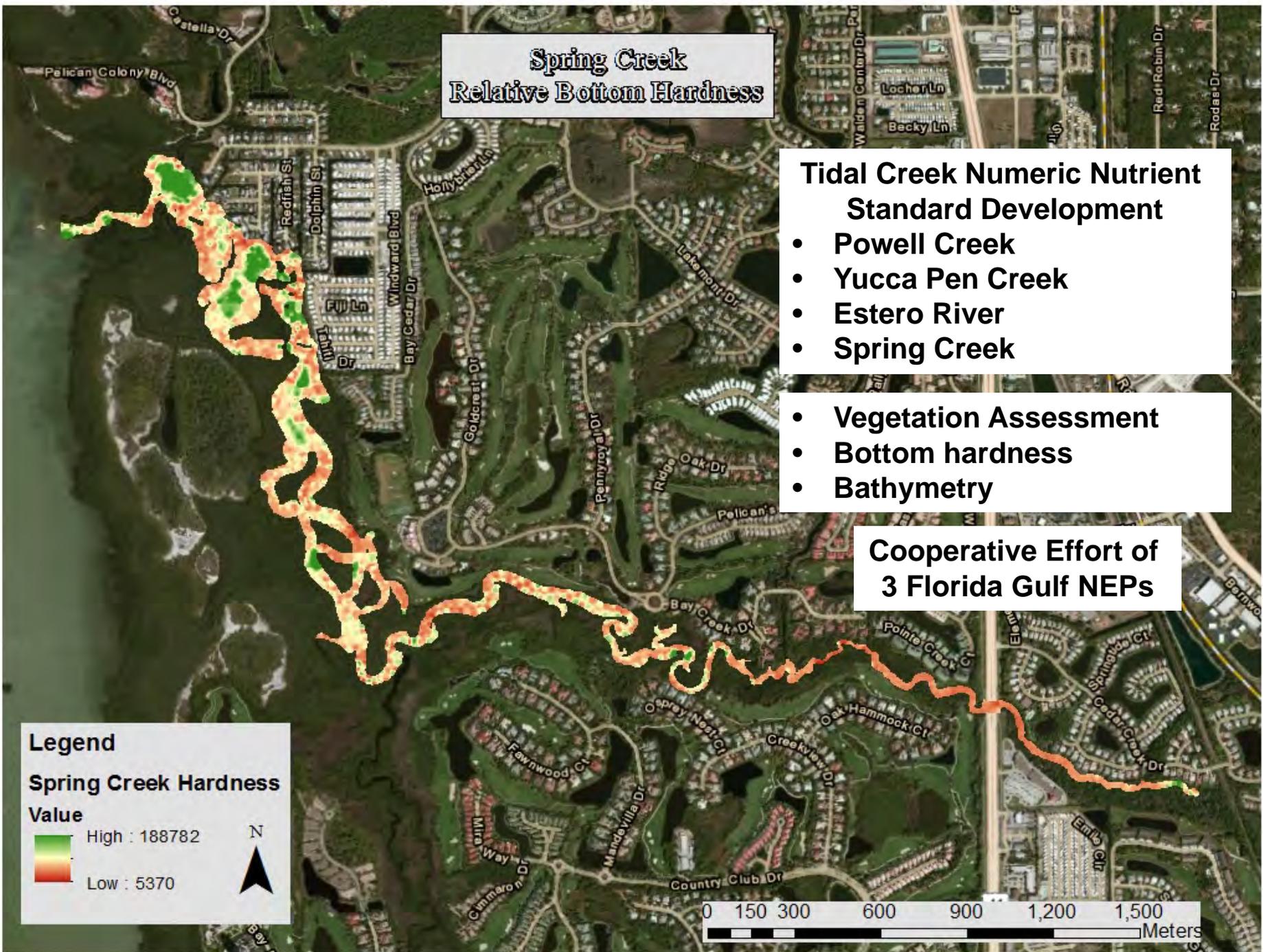
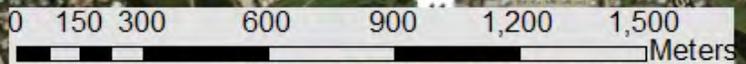
Legend

Spring Creek Hardness Value

High : 188782

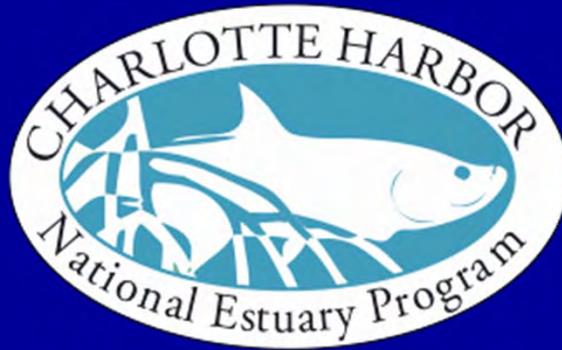
Low : 5370

N



Mangrove Heart Attack 2015-2016

- CHNEP
- SWFRPC- Jim Beever
- Coastal Resources Inc.: Robin Lewis
- Terry Tattar
- USGS: Jordan Long and Chandra Giri



Director: Lisa B. Beever, PhD, AICP

Deputy Director: Liz Donley, JD

Communications Manager: Maran Hilgendorf

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