

# **OIMMP**

## **Oyster Mapping**

**Thomas Ries**

**SCHEDA ECOLOGICAL ASSOCIATES, INC.**

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# Florida Oyster Mapping Experience

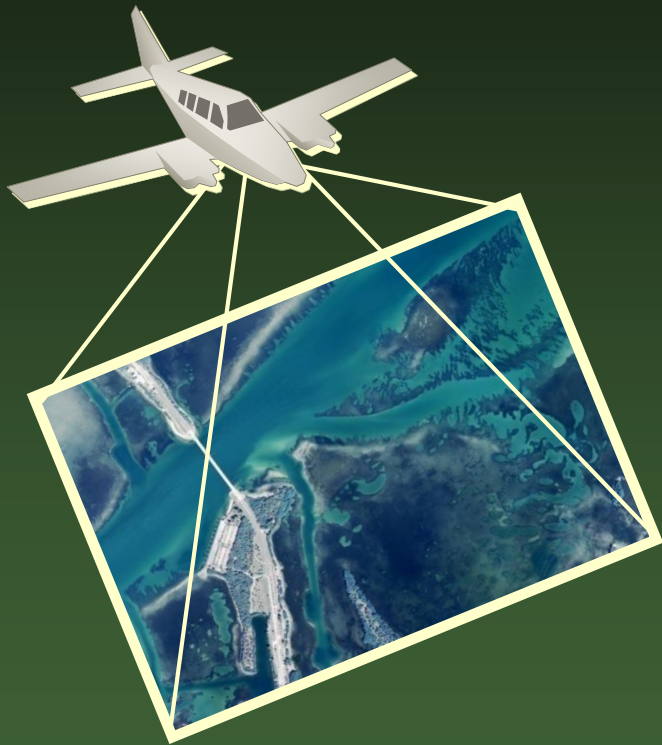
2001 Suwannee River WMD

2014 & 2016 SWFWMD

2014 Rookery Bay NERR

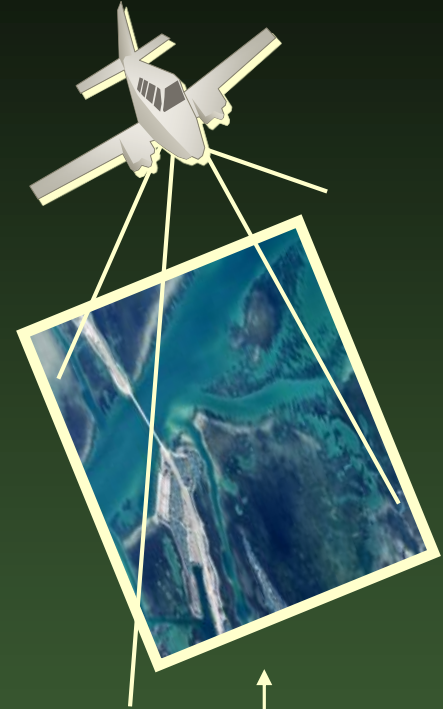


# Aerial Mapping



- Acquire 1 ft. Resolution Digital Aerial Photography
- Photo-Interpretation:
  - ◆ Delineate Benthic Features
  - ◆ Classify Benthic Features
- Signature Identification

# Environmental & WQ Conditions



Growing Season April - Sep

December



# Imagery Processing

- Color balancing process
- 2 Step color balancing process
  - ◆ Land and water features enhanced separately
- Mosaics of imagery



# Required Weather Conditions

- **Tidal Condition** : within +/- 2 hrs of low tide, special attention to outgoing slack tides for inlets/passes
- **Wave Height** : less than 2 ft.
- **Water Clarity** : 2 m or greater (locations poor clarity)
- **Preceding Weather** : wait 72 hr. after a rainfall >1"
- **Cloud Cover** : 0% (over water)

# Suwannee River WMD Oyster Results



# Suwannee River WMD

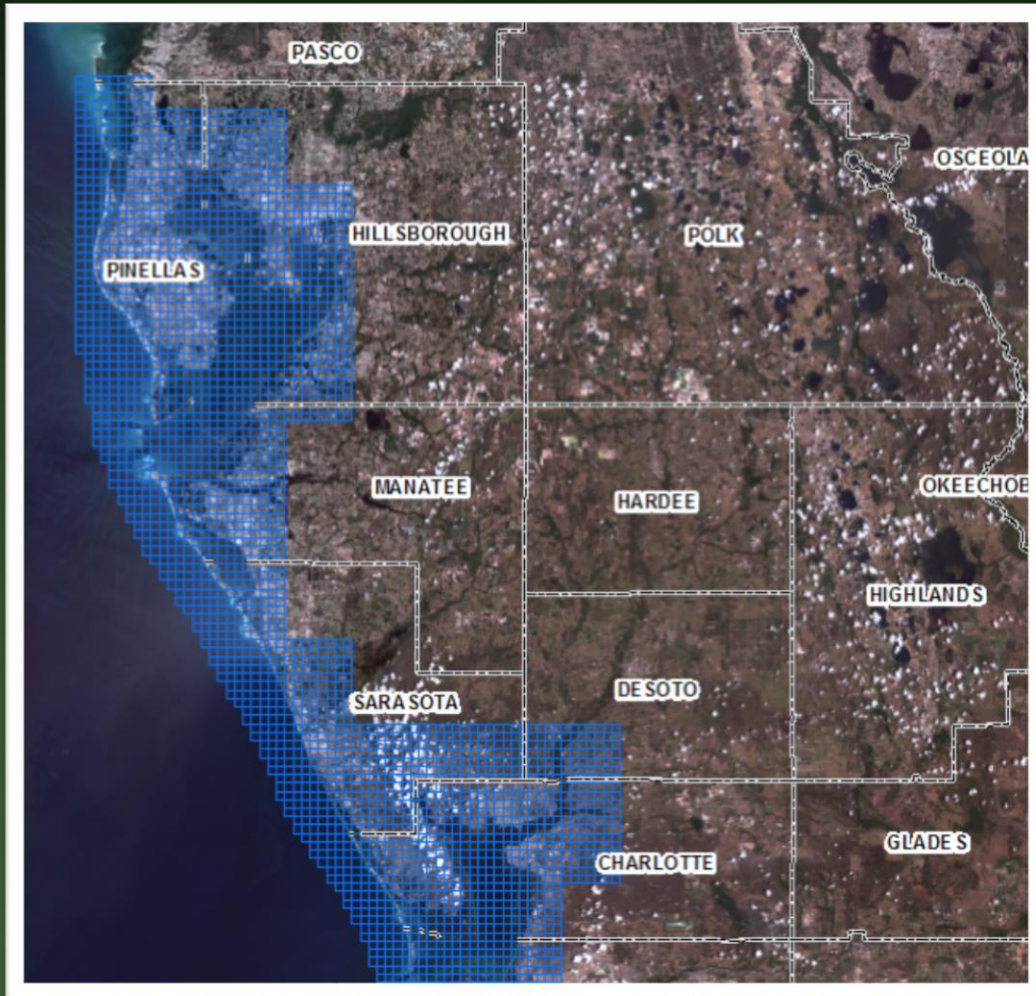
## 2001 Oyster Mapping

CODE	CLASS NAME
6540	Oysters
6541	Oysters — Patchy
6542	Remnant Oyster

Habitat	Acres	% Total Acres
6540	536.04	79%
6541	131.82	19%
6542	11.97	2%
Total Acres	680.07	100%



# Program Boundaries



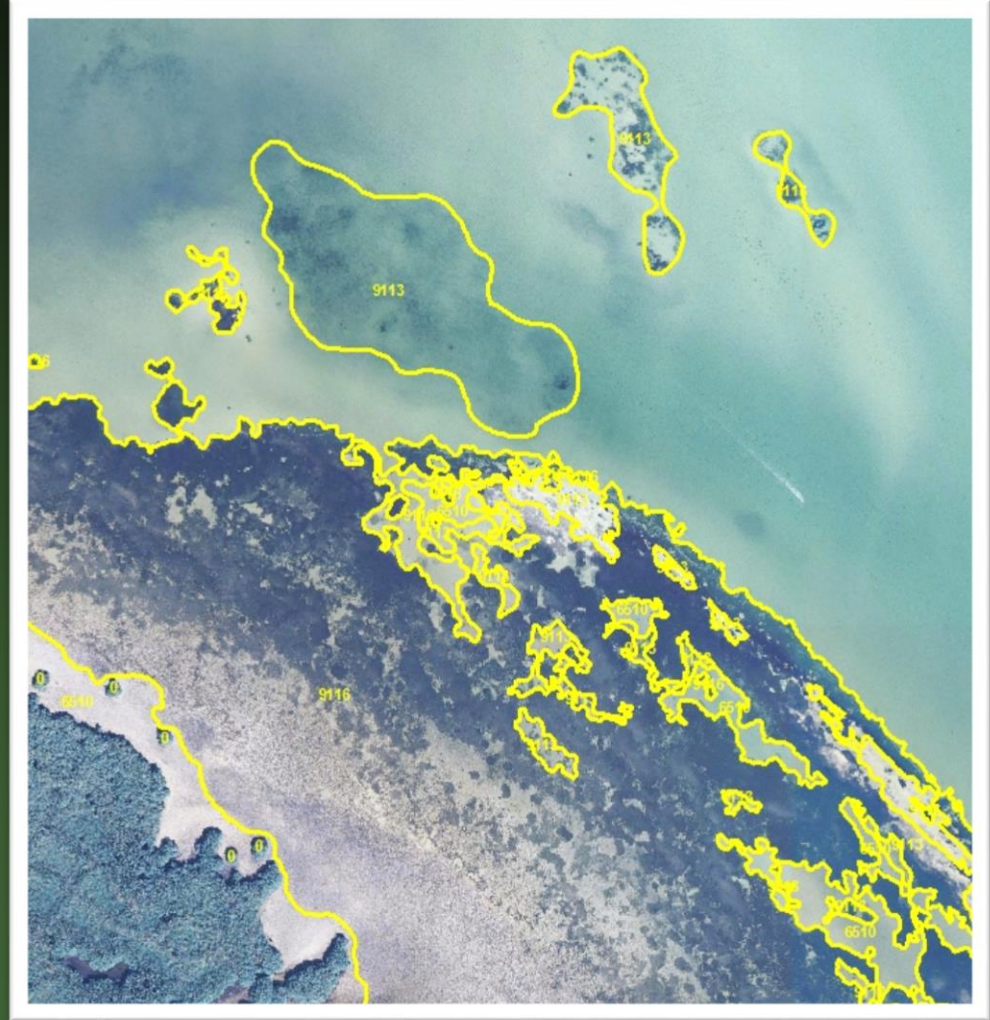
SWFWMD

Approximately  
2,539 mi<sup>2</sup>



# 2016 Aerial Mapping

- ◆ Acquire Imagery :
  - ★ Dec '15 – Feb '16
  - ★ 1 ft. digital natural color imagery
  - ★ Leica ADS80 –push-broom digital camera
- ◆ Photo-Interpretation :
  - ★ Classify & delineate underwater features
- ◆ Field Verification :
  - ★ 1,000+ locations visited
- ◆ Accuracy Assessment :
  - ★ Achieved 90% or greater

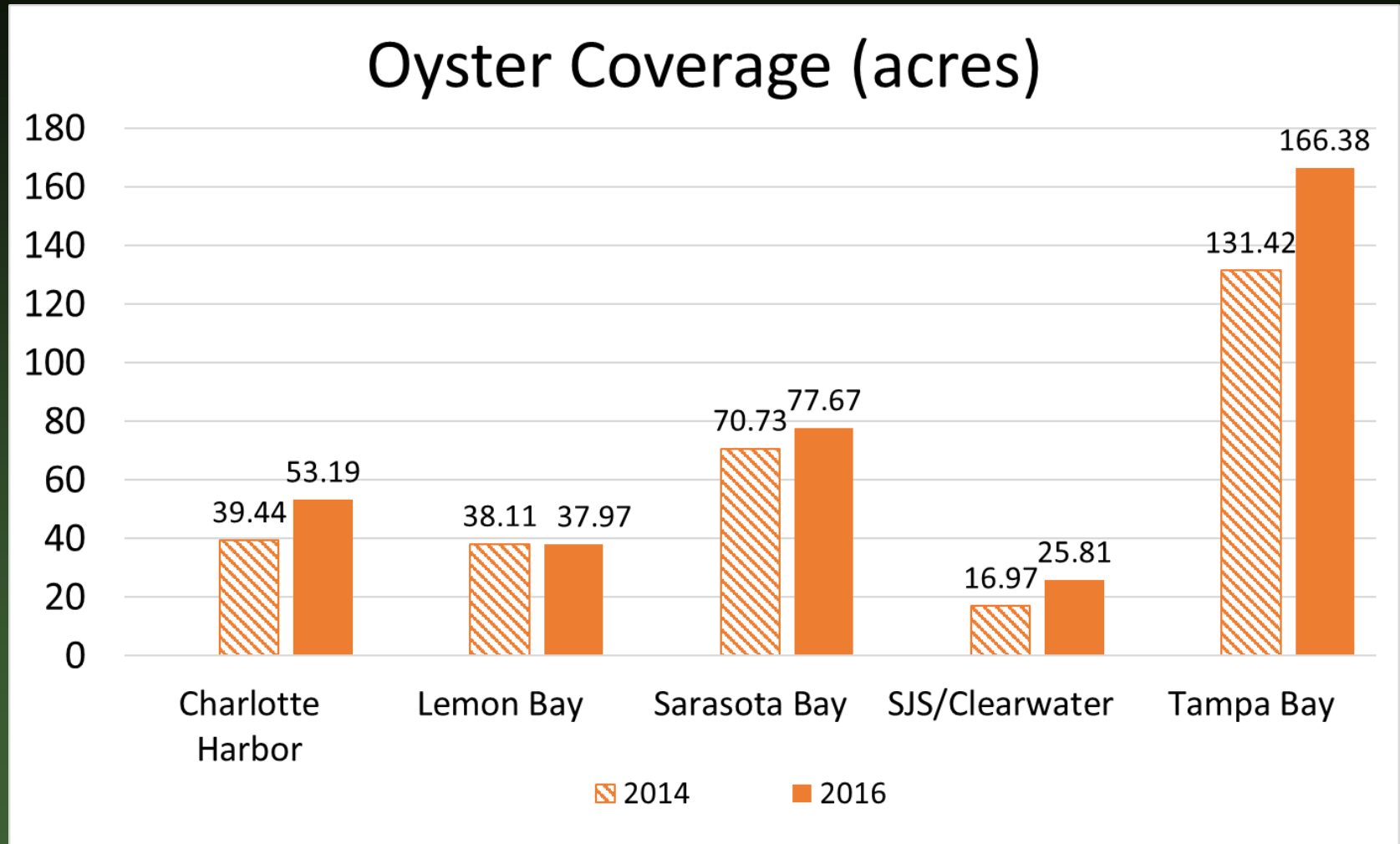


# Thematic Accuracy Assessment Results

Authoritative Data Comparison to Map Polygons - Did they agree?					
Water Body	Bay Segment	No - Misclassified	Yes	Total Field Stations Reported	% Correct
Charlotte Harbor		5	145	150	96.7%
	EASTERN CHARLOTTE NO	1	24	25	96.0%
	MYAKKA RIVER		25	25	100.0%
	PEACE RIVER	1	24	25	96.0%
	PLACIDA	2	23	25	92.0%
	TURTLE BAY BULL BAY	1	24	25	96.0%
	WESTERN CHARLOTTE		25	25	100.0%
Lemon Bay	LEMON BAY	1	24	25	96.0%
Sarasota Bay		4	120	124	96.8%
	BLACKBURN BAY	2	23	25	92.0%
	LITTLE SARASOTA BAY	1	24	25	96.0%
	ROBERTS BAY		24	24	100.0%
	UPPER SARASOTA BAY-M	1	24	25	96.0%
	UPPER SARASOTA BAY-S		25	25	100.0%
SJS/CWH		3	65	68	95.6%
	CLEARWATER NORTH	2	16	18	88.9%
	CLEARWATER SOUTH	1	24	25	96.0%
	ST JOSEPH SOUND		25	25	100.0%
Tampa Bay		10	139	149	93.3%
	HILLSBOROUGH BAY	2	23	25	92.0%
	LOWER TAMPA BAY	2	23	25	92.0%
	MANATEE RIVER	3	22	25	88.0%
	MIDDLE TAMPA BAY	1	24	25	96.0%
	OLD TAMPA BAY	1	24	25	96.0%
	TERRA CIEA BAY	1	23	24	95.8%
	BOCA CIEGA BAY	2	22	24	91.7%
Overall Map		25	515	540	95.4%



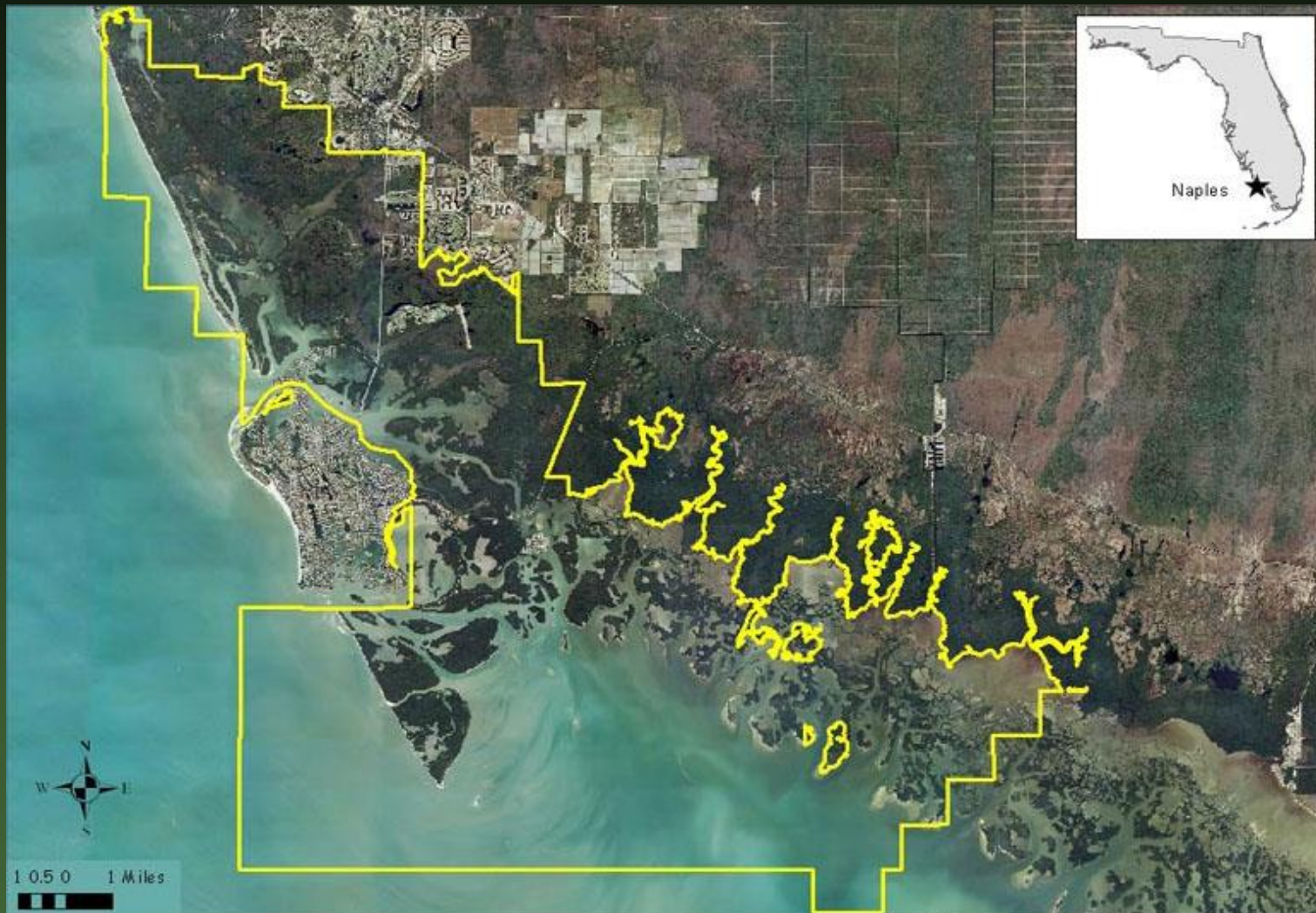
# Oyster Cover (6540)



Hypothesize increases likely due to:

- ◆ Additional effort interpreting
- ◆ Additional fieldwork
- ◆ Clarity of images and different tide stages in 2016 data capture

# Rookery Bay NERR SAV/Oyster Mapping

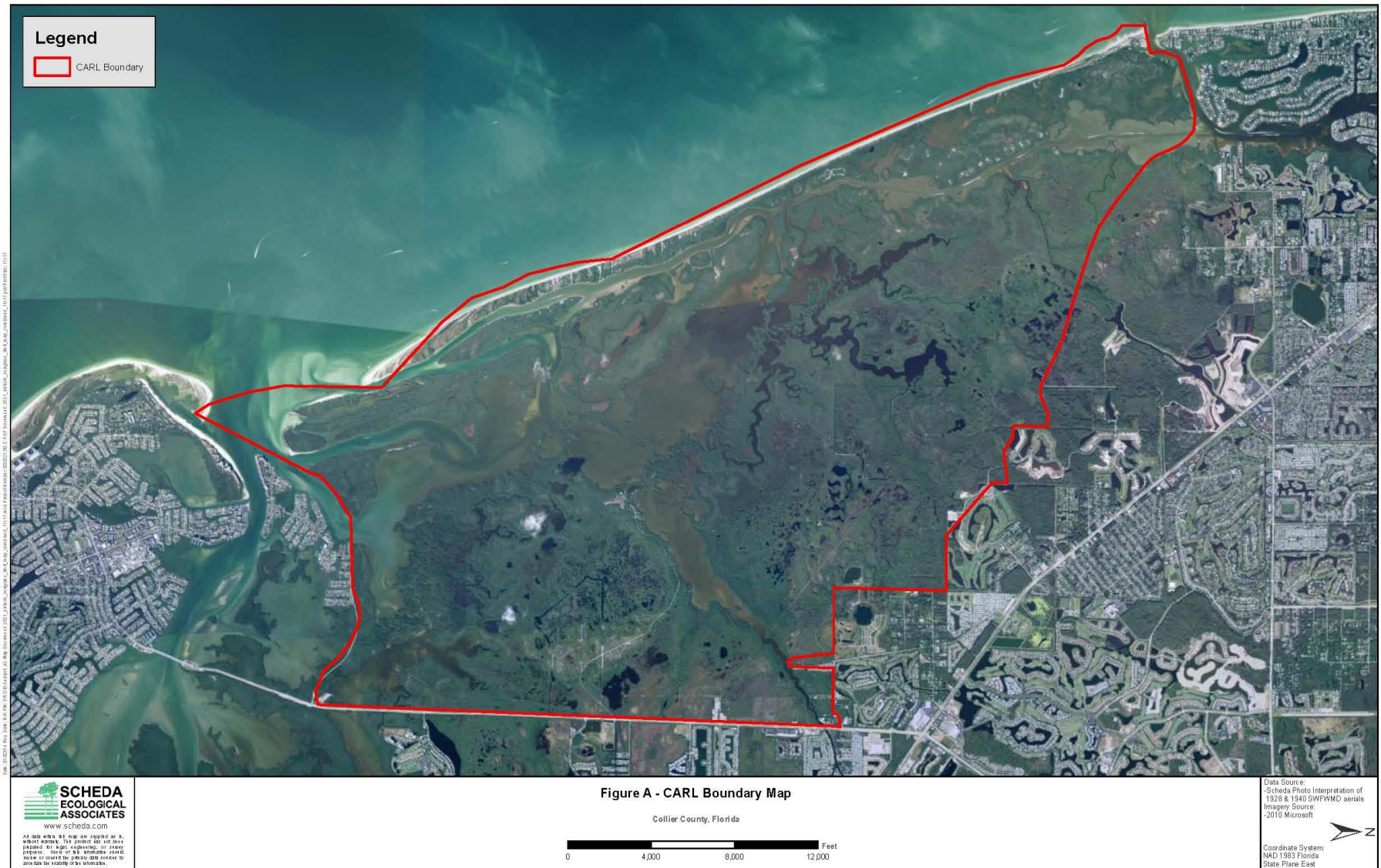


2009 Imagery Provided By Collier County Property Appraiser  
Map Produced By Rookery Bay NERR  
For Illustrative Purposes Only





# CARL Boundary



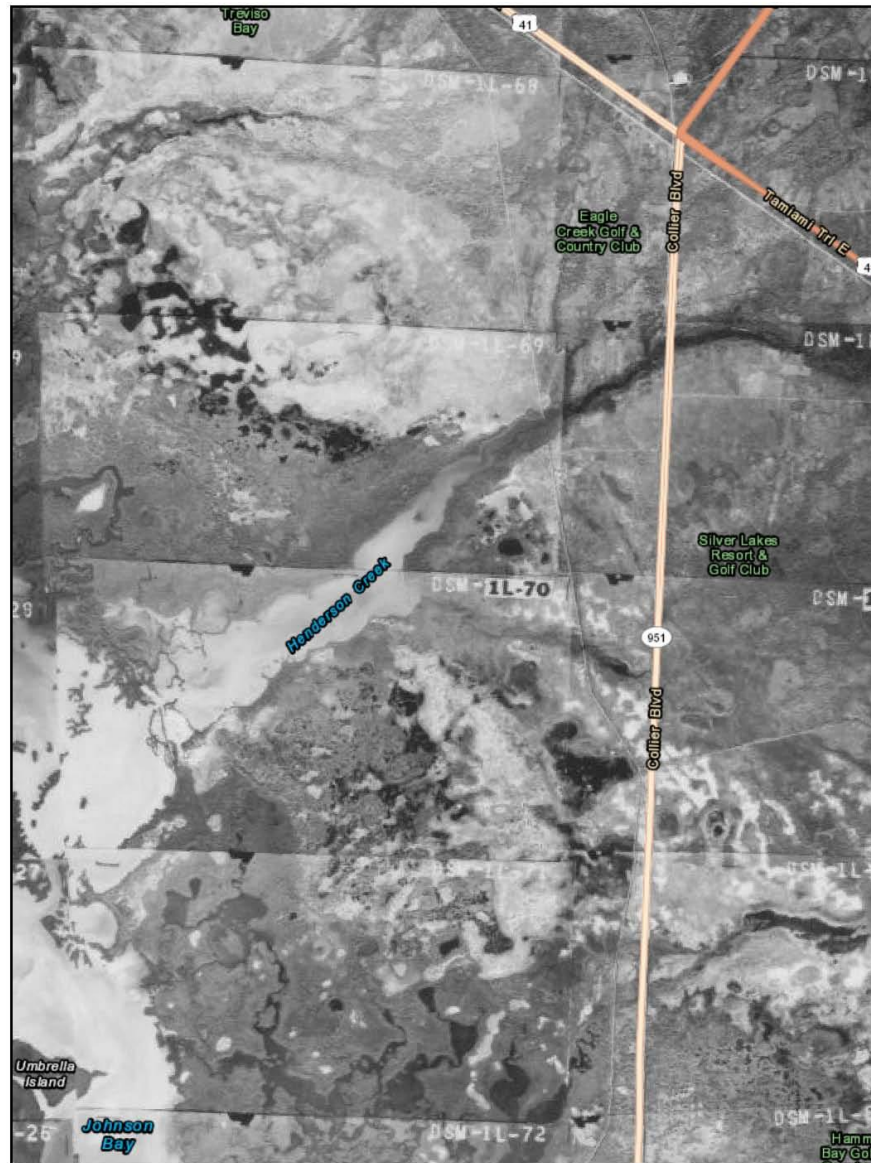


This is a black and white aerial photograph of a coastal region, likely a delta or estuary. The image is overlaid with a grid of labels, each identifying a specific DSM (Digital Surface Model) tile. The labels are arranged in a roughly rectangular pattern, with some tiles missing or obscured by the coastline. The labels include:

- DSM-1L-11
- DSM-1L-12
- DSM-1L-13
- DSM-1L-14
- DSM-1L-15
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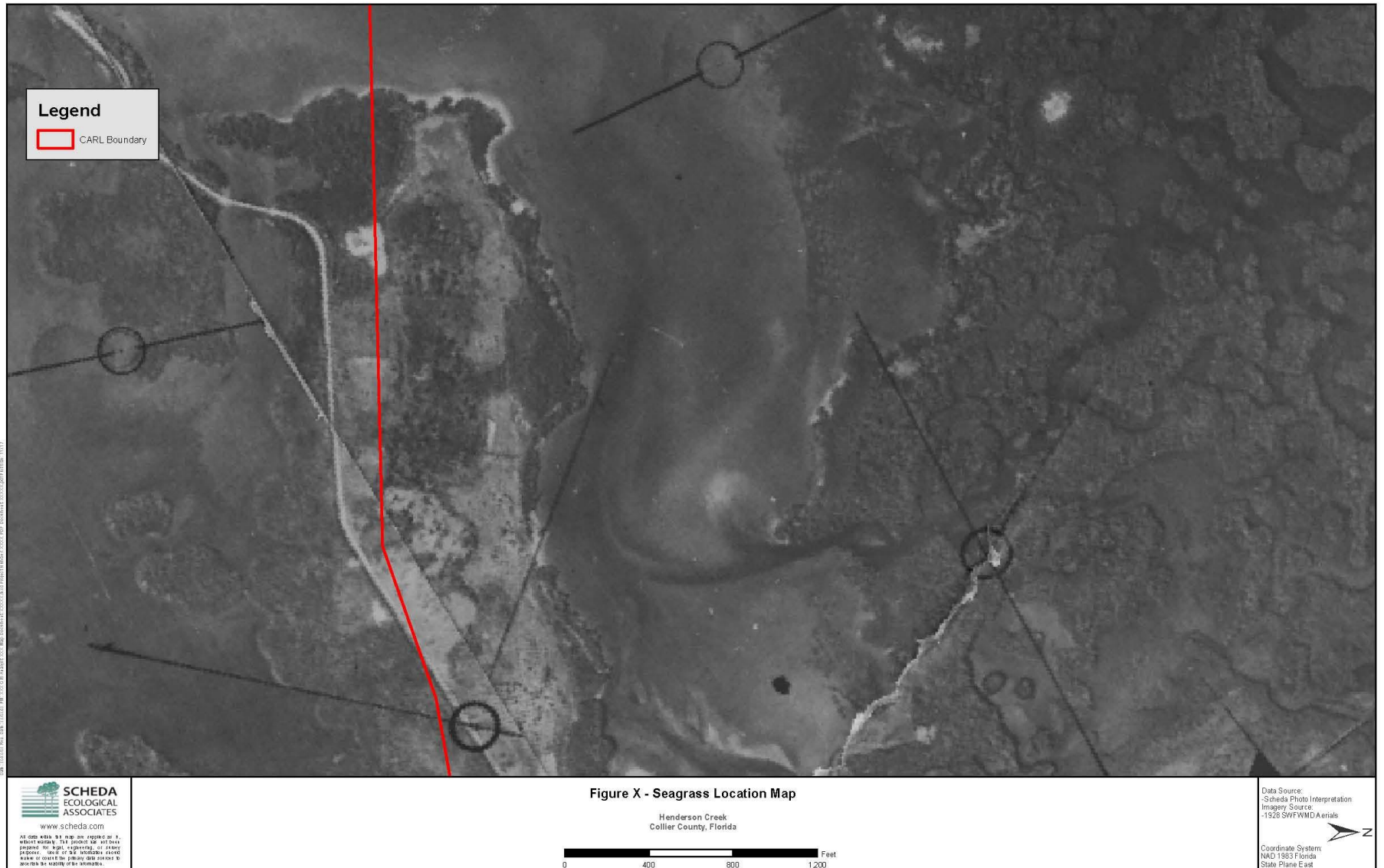
At the bottom of the image, there is a graphic scale of index, showing distances in miles from 0 to 5. The scale is marked with 0, 1, 2, 3, 4, and 5 miles.

# Data Sources





# 1928 Imagery

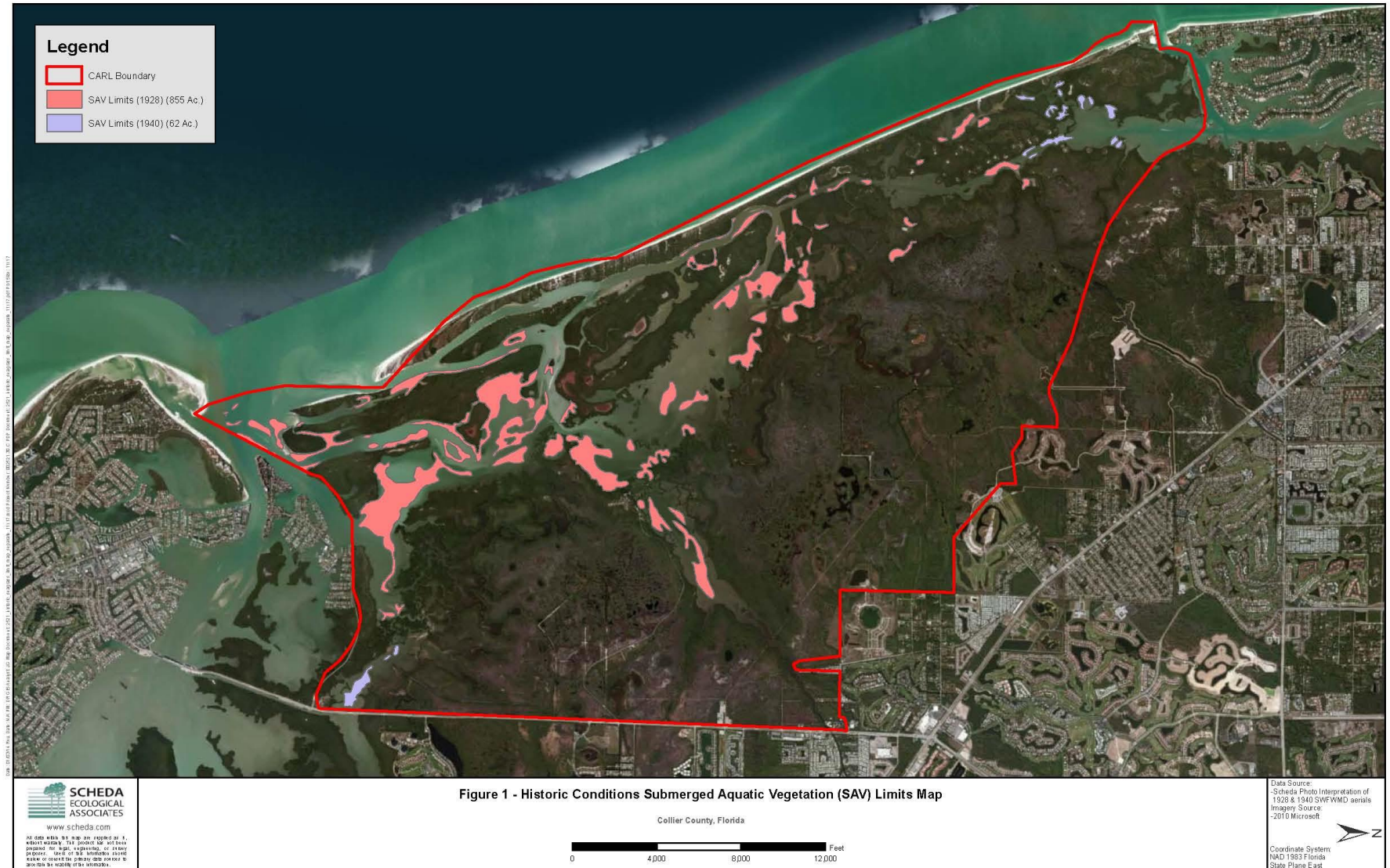


# Actual Imagery (1928)





# SAV – 1928





# Historic Conditions – 1928/40

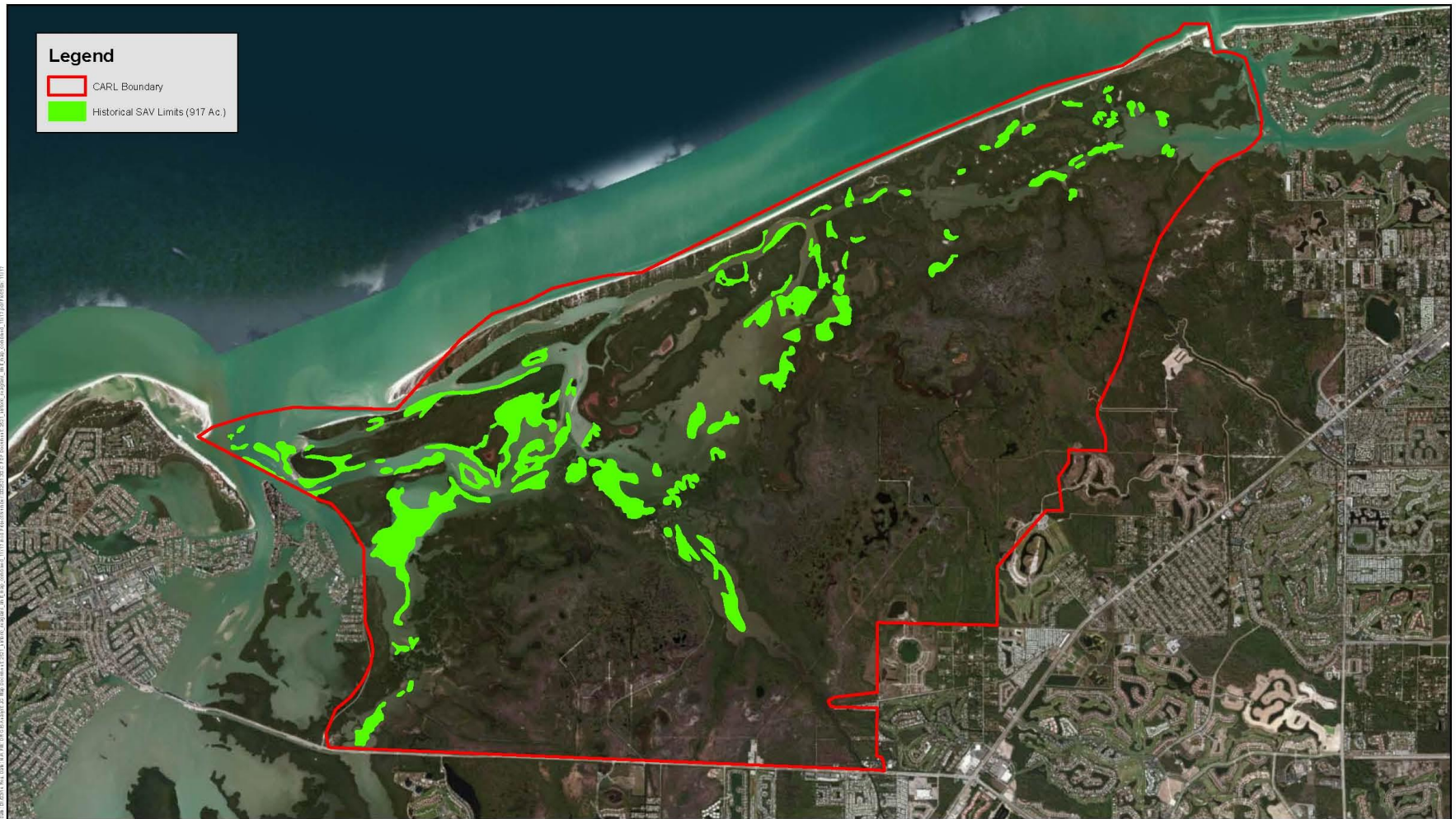


Figure 2 - Historical Conditions SAV Limits Map

Collier County, Florida

0 4,000 8,000 12,000 Feet



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All data were used as provided. The product is not a warranty, representation, or promise. Scheda Ecological Associates, Inc. is not responsible for any errors or omissions in the data or for any consequences arising from the use of the data.

Data Source:  
-Scheda Photo Interpretation of  
1928 & 1940 SWFWMD aerials  
Imagery Source:  
-2010 Microsoft

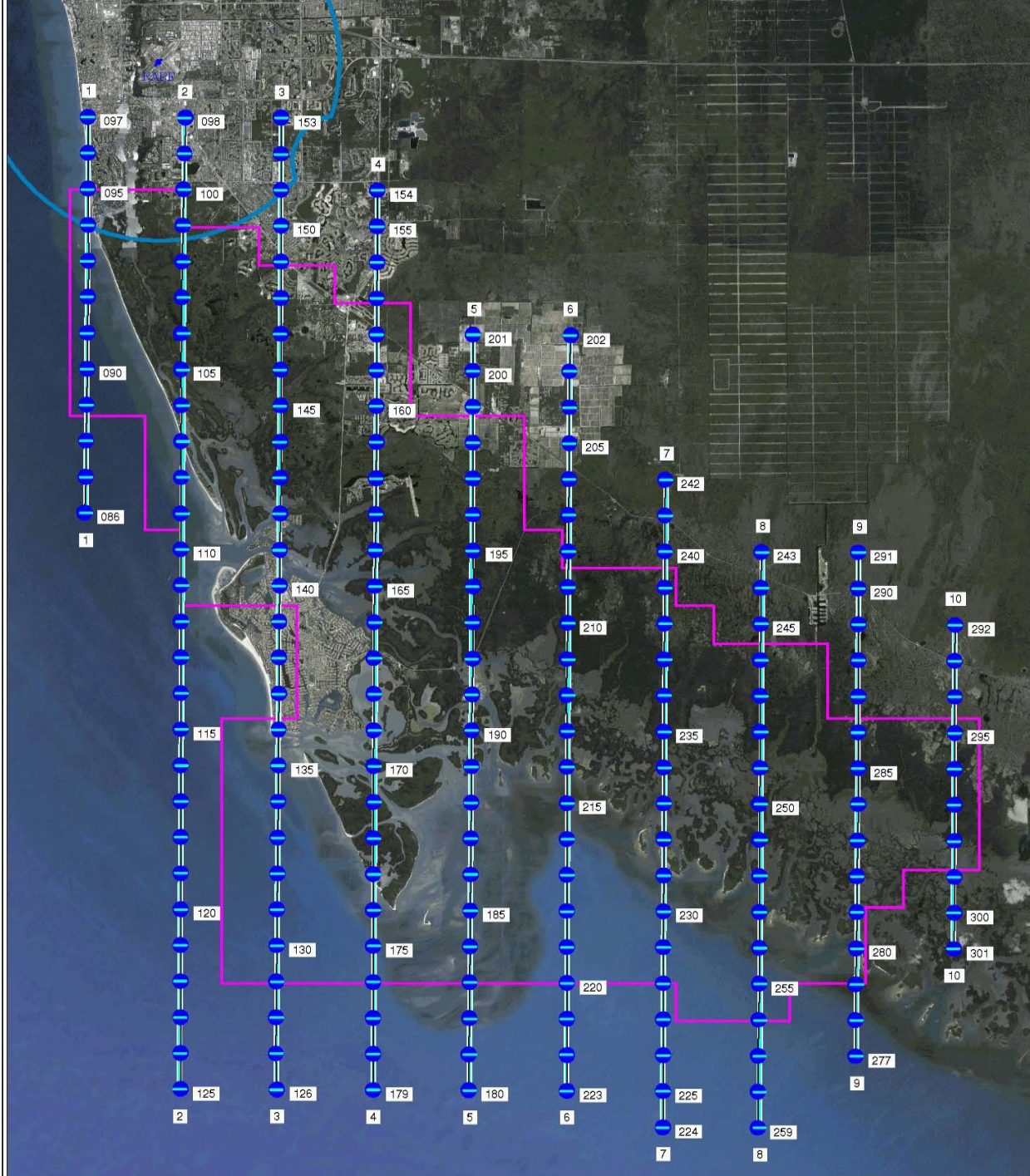
Coordinate System:  
NAD 1983 Florida  
State Plane East

# CARL Boundary – SAV Results

1928	855 acres
1940	<u>62 acres</u>
Historic	917 acres







# Photo-Interpretation

Update Shoreline

Mapping Unit = 0.5 acre SAV/Seagrass

Modified FDOT - FLUCCS

- 6510 Submerged Un-vegetated Bottom
- 6540 Oyster Beds = 0.25 acre
- 6560 Hard Bottom = 0.25 acre
- 9100 Submerged Aquatic Vegetation (SAV)
- 9113 Discontinuous Seagrass
- 9116 Continuous Seagrass

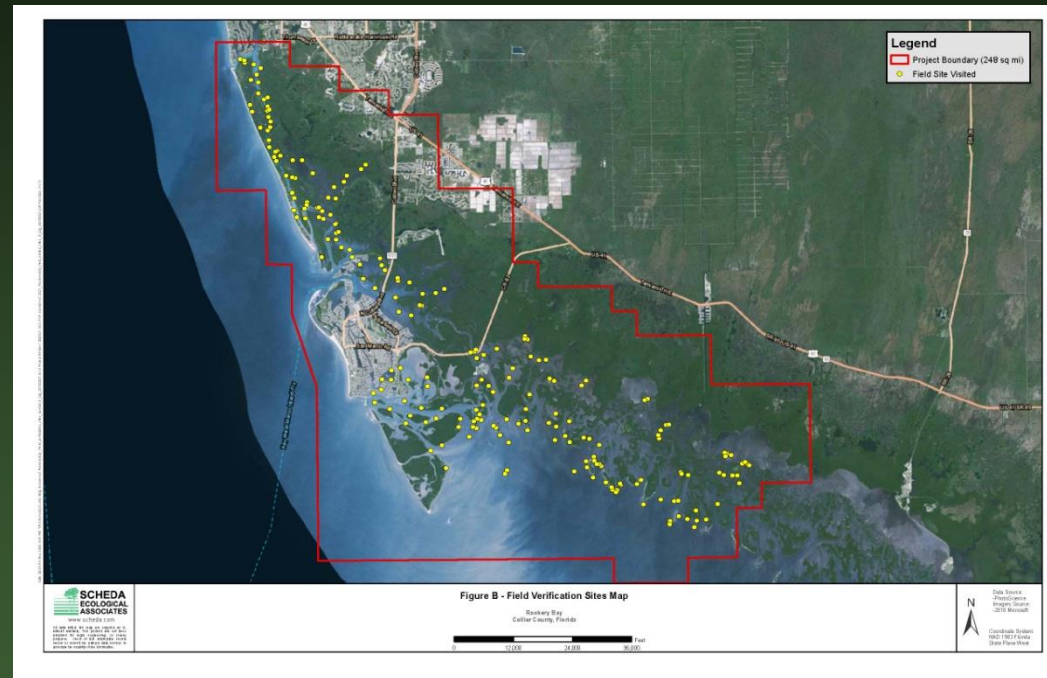
# Signature Verification WC-FL

## West Central FL

- 2,539 sq miles
  - ◆ 530 sites
  - 1 site/4.8 sq miles

## Rookery Bay

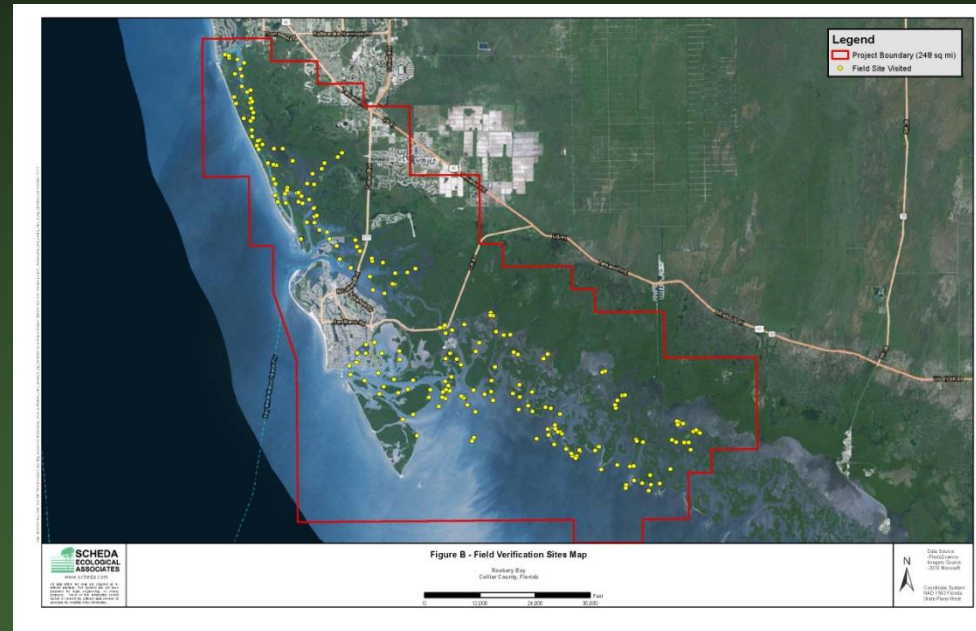
- 248 sq miles
  - ◆ 51 Sites
  - ◆ 160 Sites Contracted
  - ◆ 218 Sites Field Verified
  - 1 site/1.1 sq miles





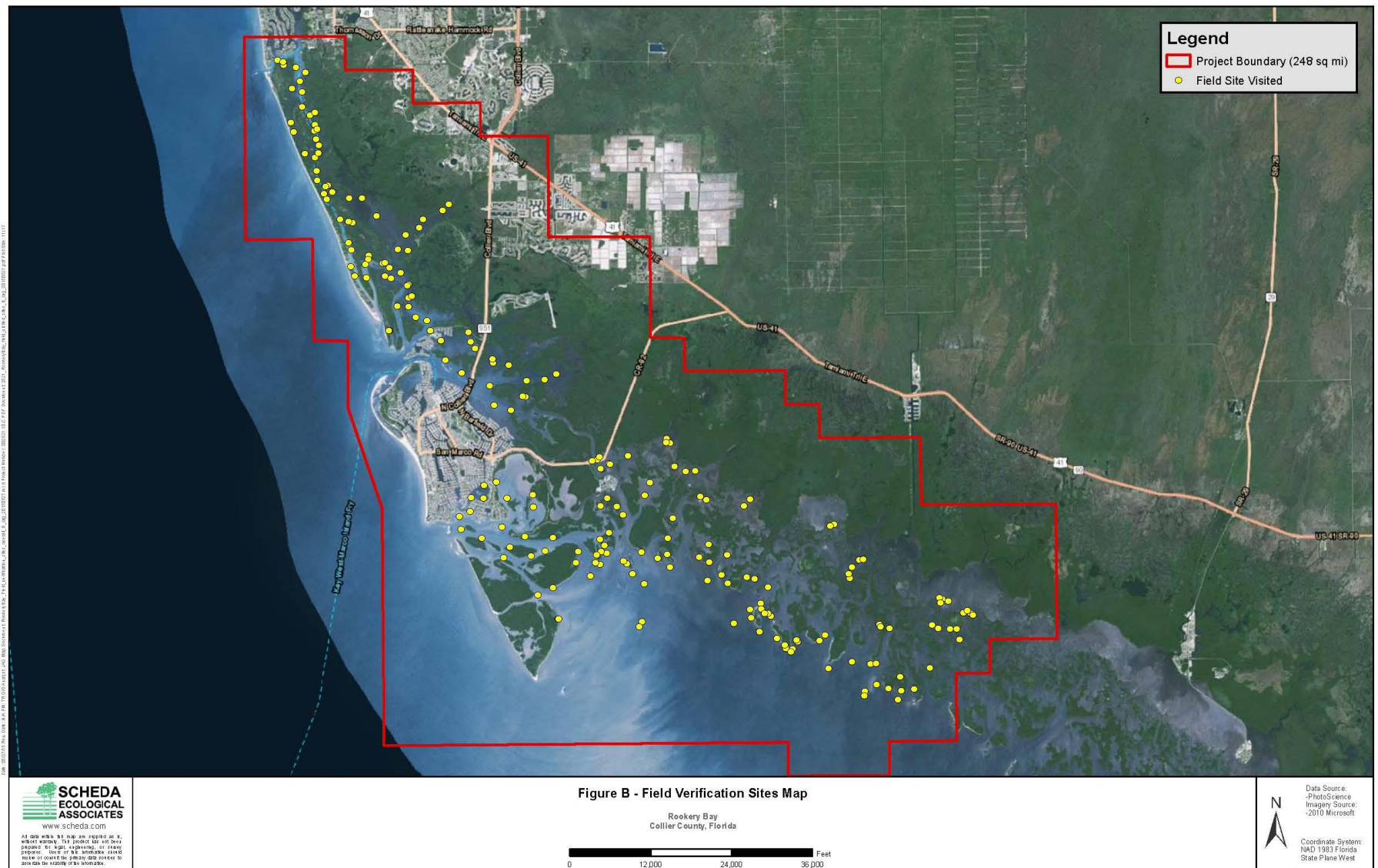
# Signature Verification RB-NEER

- Field Verified 218 sites
- Photo-interpreter key areas of interest:
  - ◆ Henderson Creek
  - ◆ CARL Boundaries
  - ◆ 10,000 Islands
- Difficult to access:
  - ◆ 10,000 Isles
  - ◆ Extremely Shallow Areas



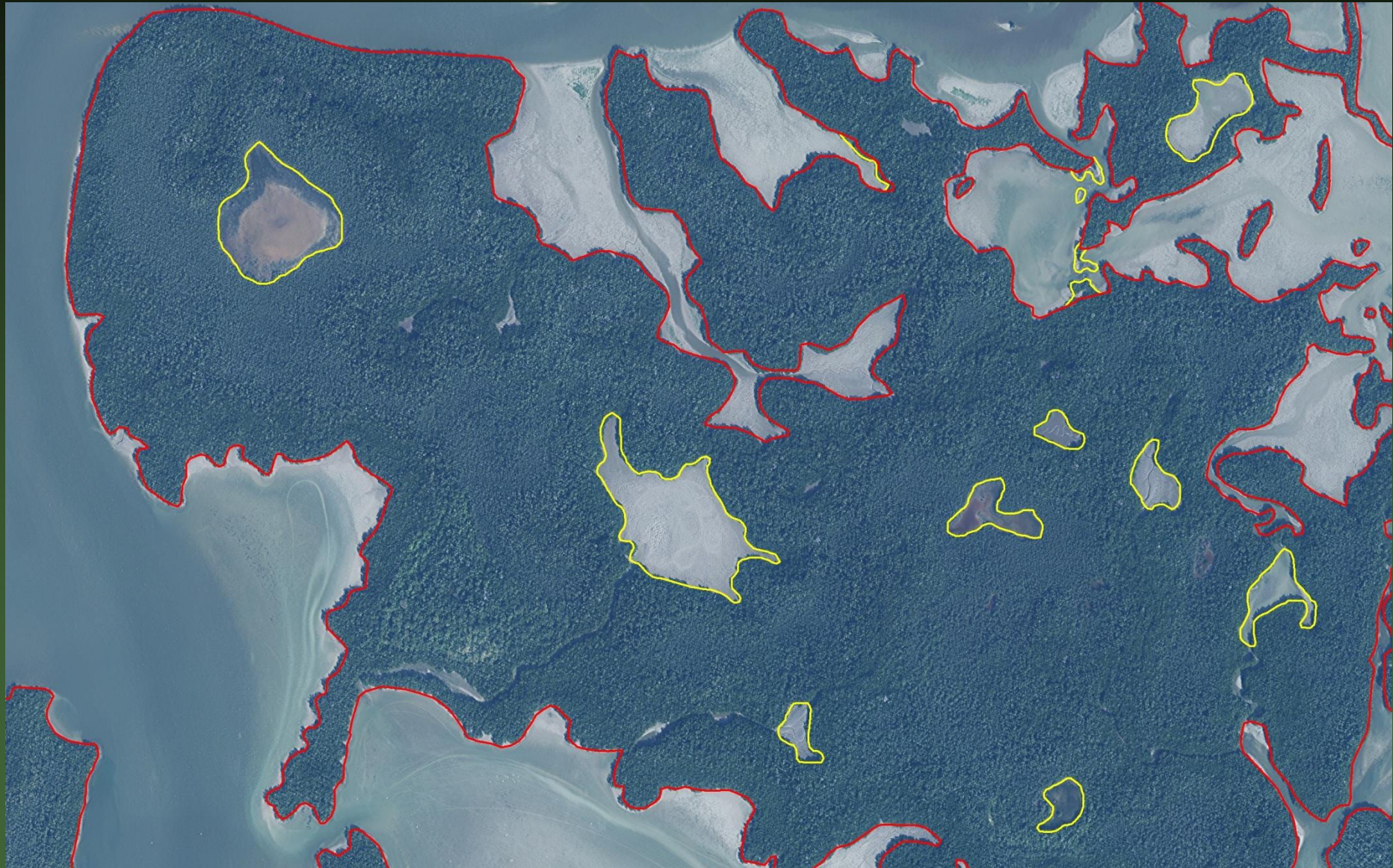


# Field Verification Points



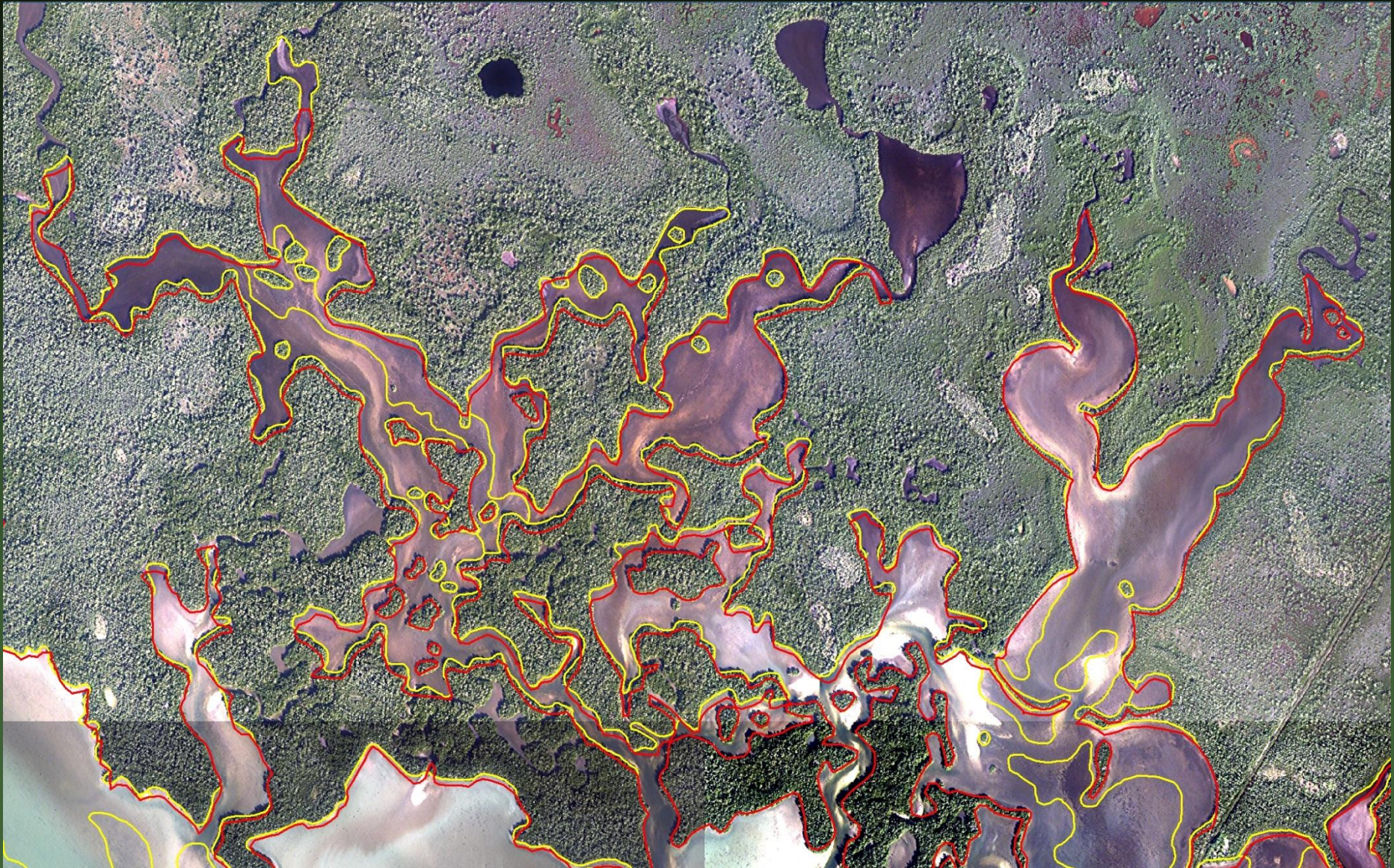


# Shoreline Edits



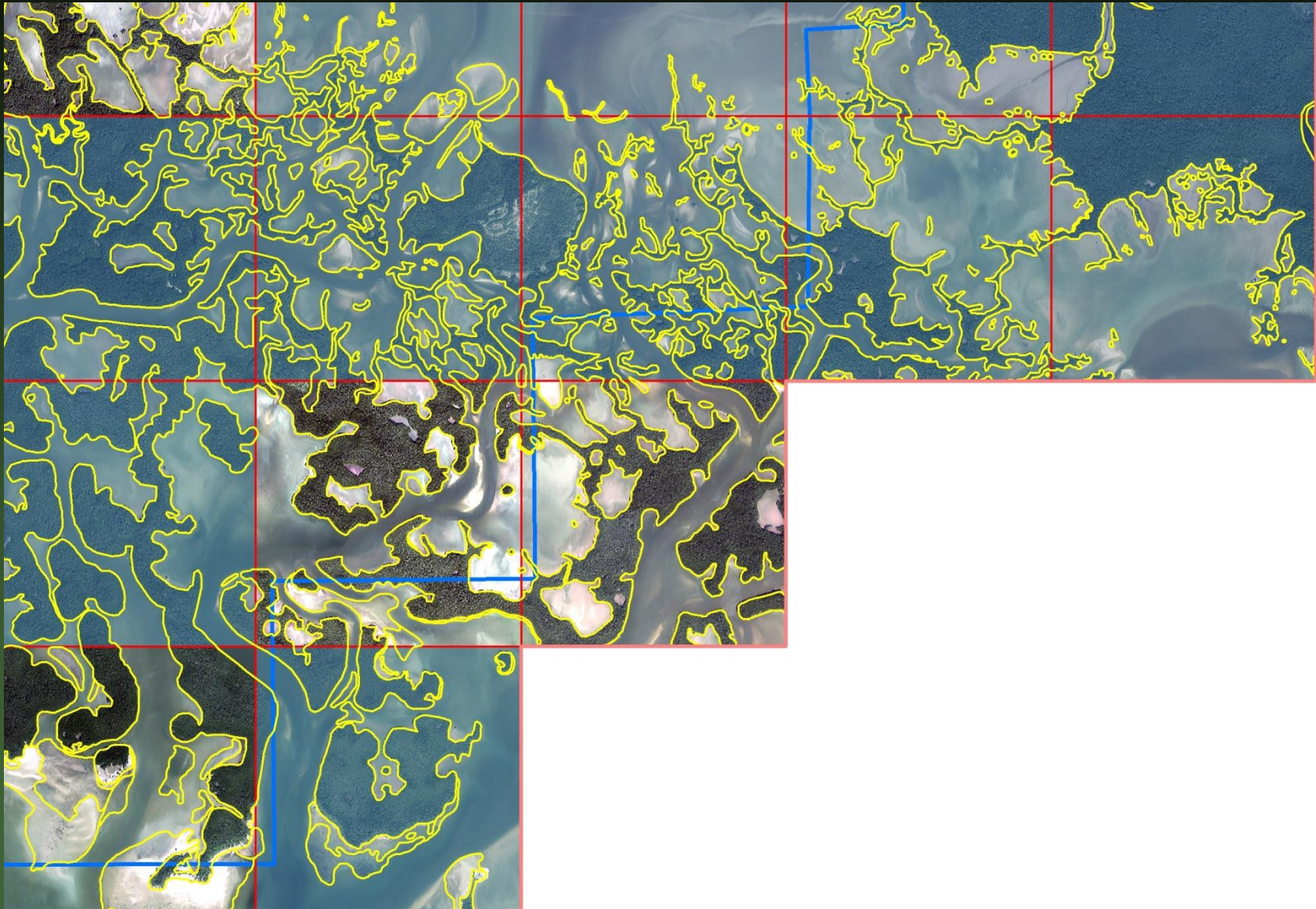


# Shoreline Updates

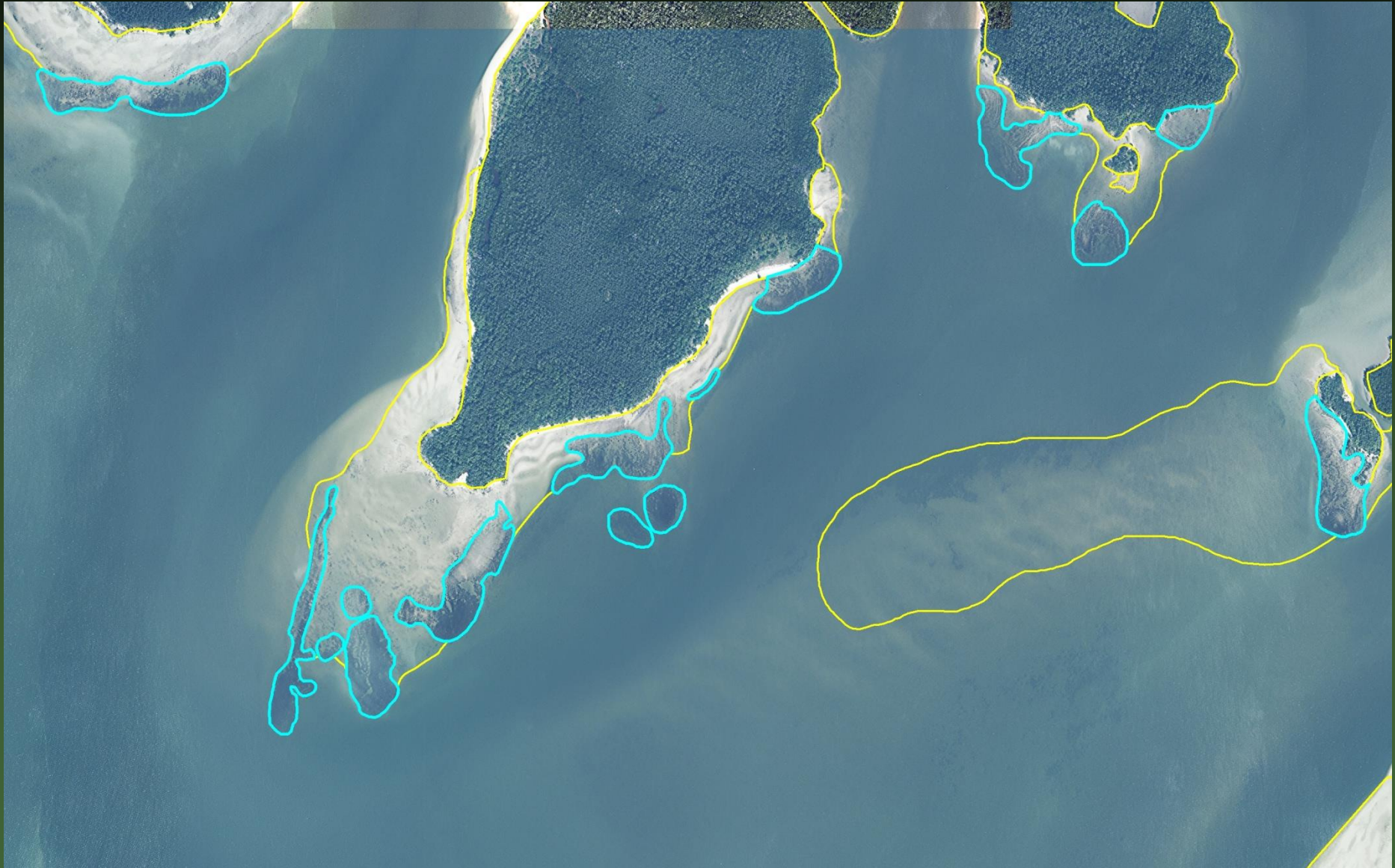




# Beyond Boundary

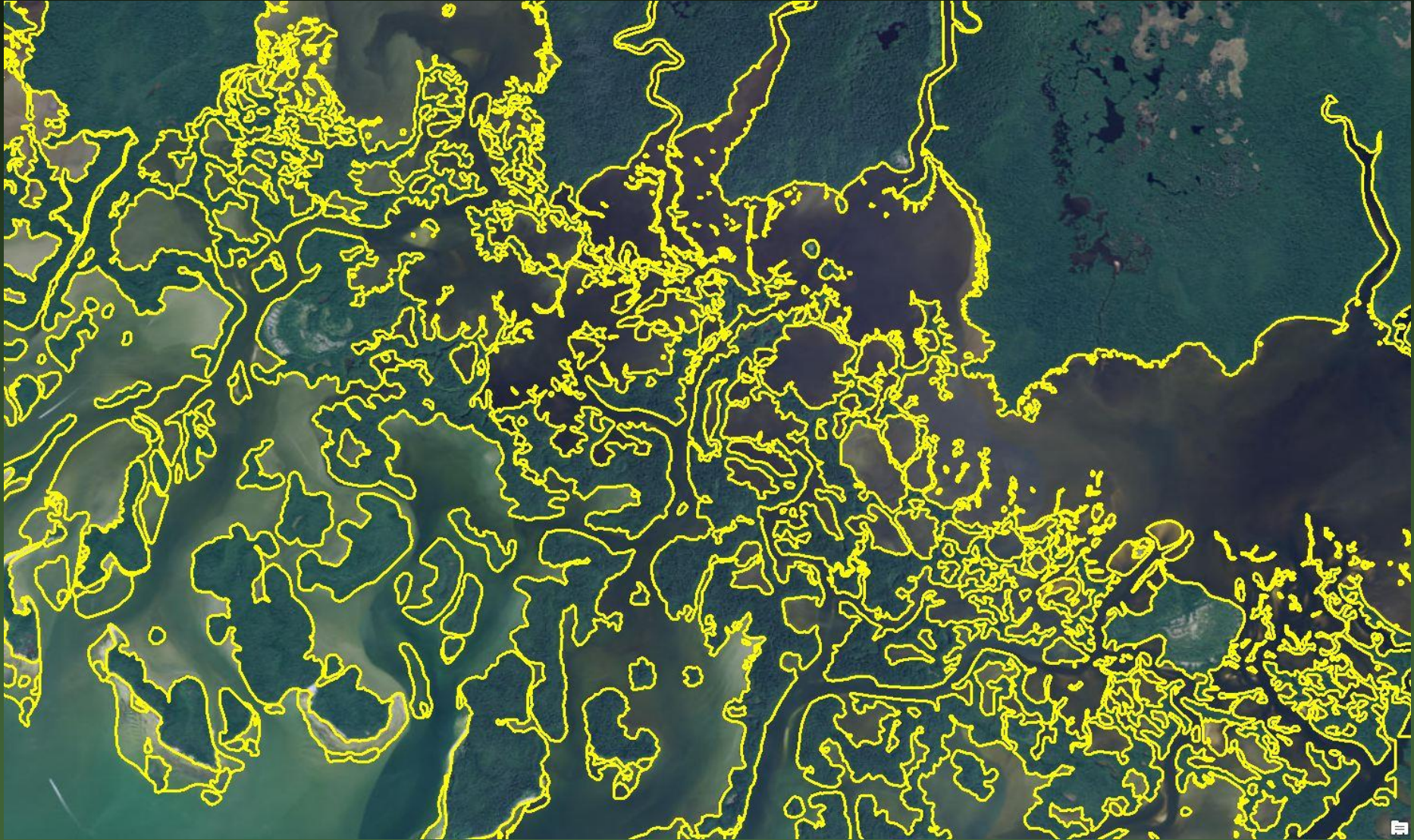






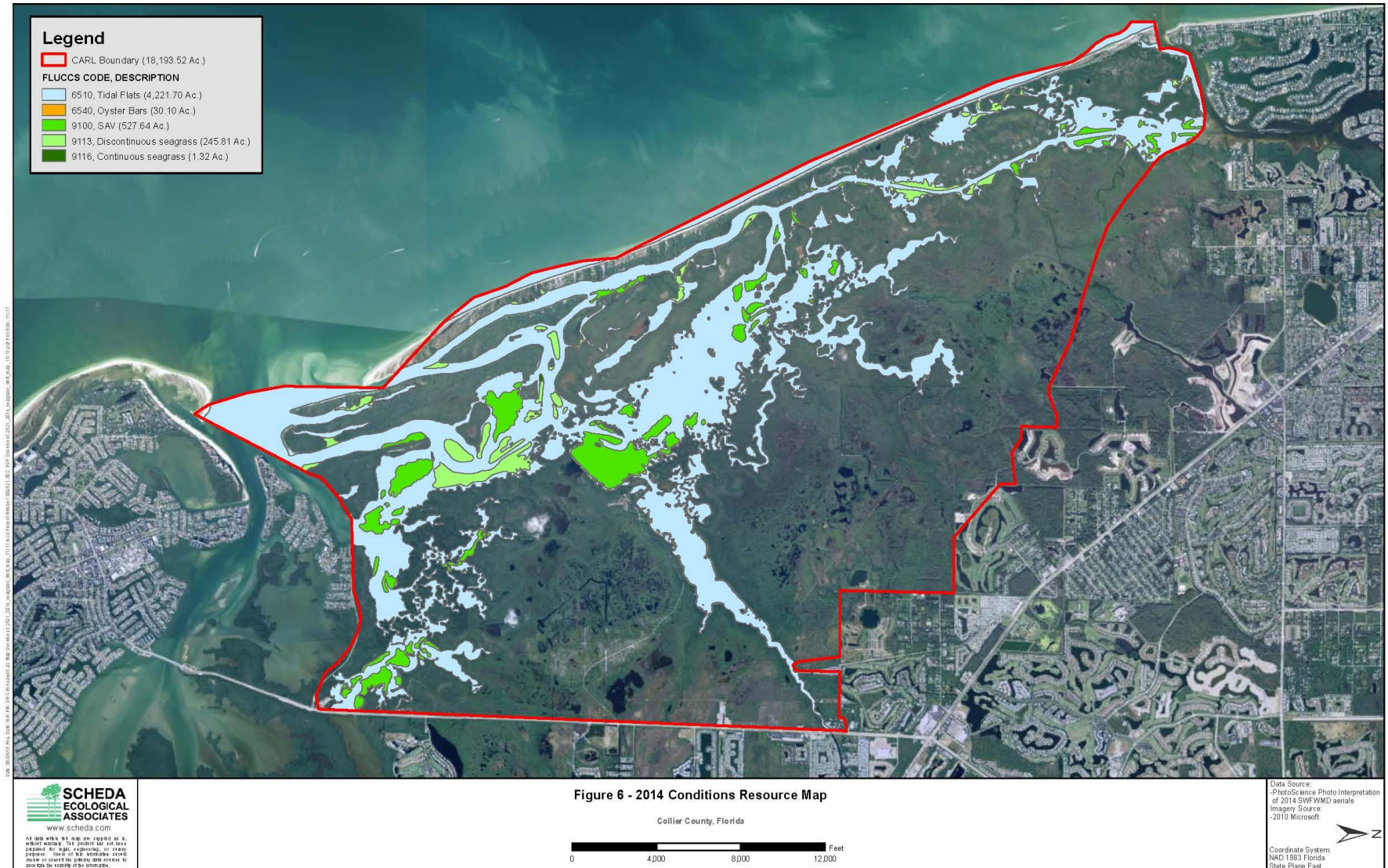


# Example Line Work - SAV Map





# 2014 Resource Conditions





# 2014 SAV Map

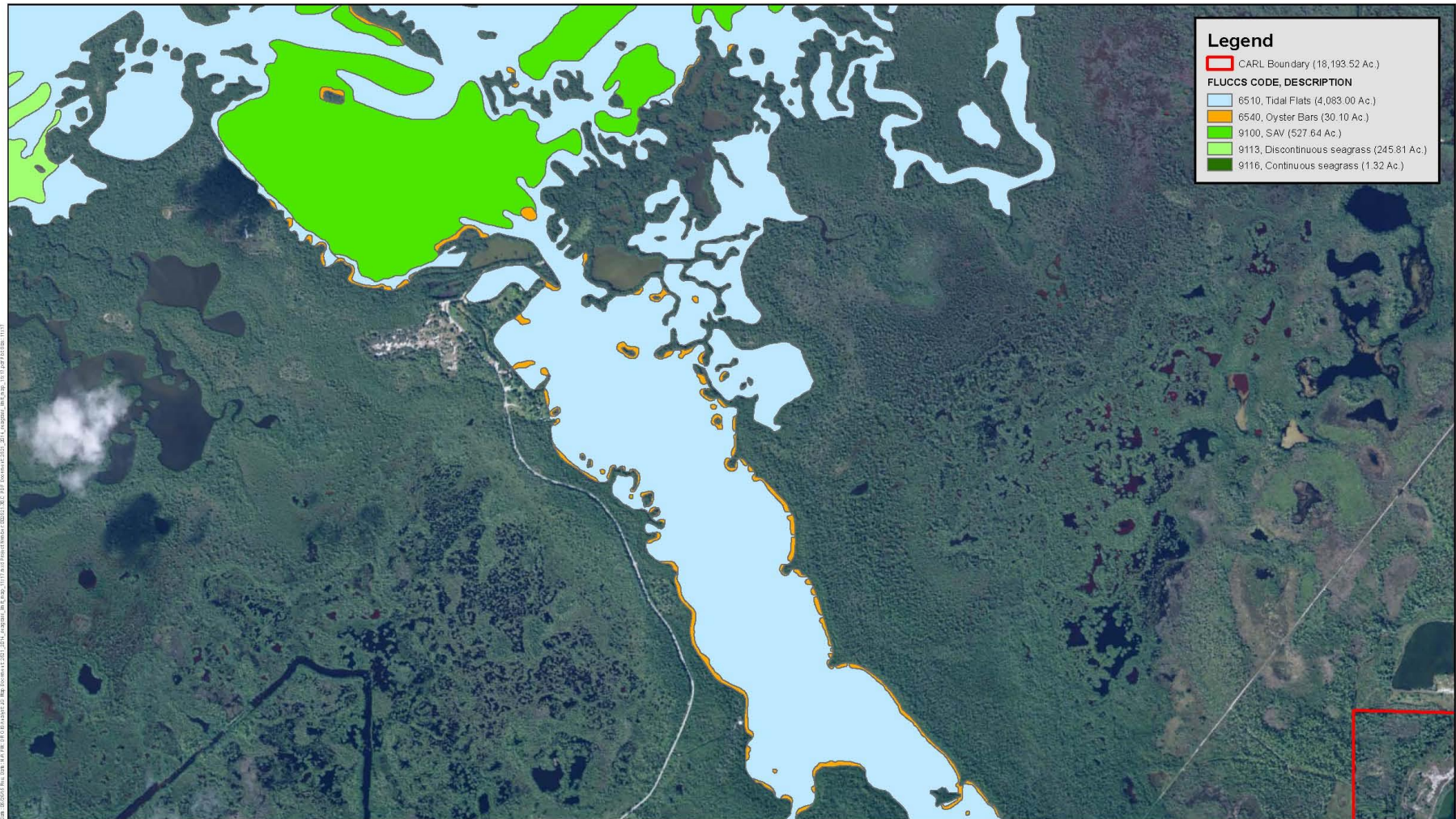


Figure 7 - Henderson Creek Resource Map

Collier County, Florida

0 1,000 2,000 3,000 Feet

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Data Source:  
PhotoScience Photo Interpretation  
of 2014 SWFWMD aerials  
Imagery Source:  
2010 Microsoft



Coordinate System:  
NAD 1983 Florida  
State Plane East

# Carl Boundary 2014 Results

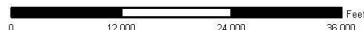
• 6510	Tidal Flats	4,221.7
• 6540	Oyster Beds	30.1
• 6560	Hard Bottom	0
• 9100	SAV	527.6
• 9113/6	Seagrass	247.1





All data within this map are supplied as is, without warranty. The product has not been prepared for legal engineering, or survey purposes. Users of the information should make or consult the primary data sources to assess the stability of the information.

Rookery Bay  
Collier County, Florida

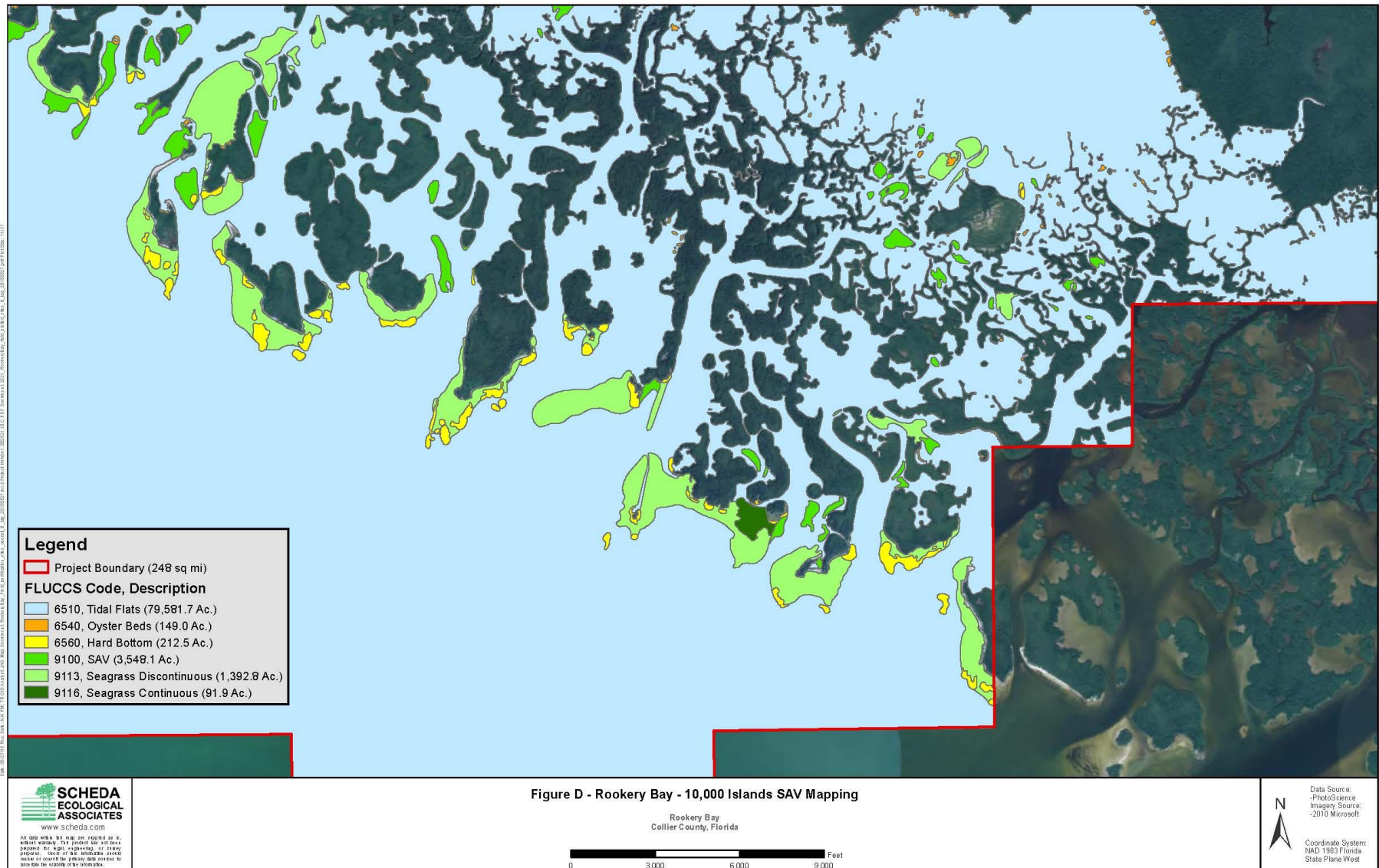


Data Source:  
-PhotoScience  
Imagery Source:  
-2010 Microsoft

Coordinate System  
NAD 1983 Florida  
State Plane West



# 2014 Natural Resource Map - 10,000 Islands



[illegible]

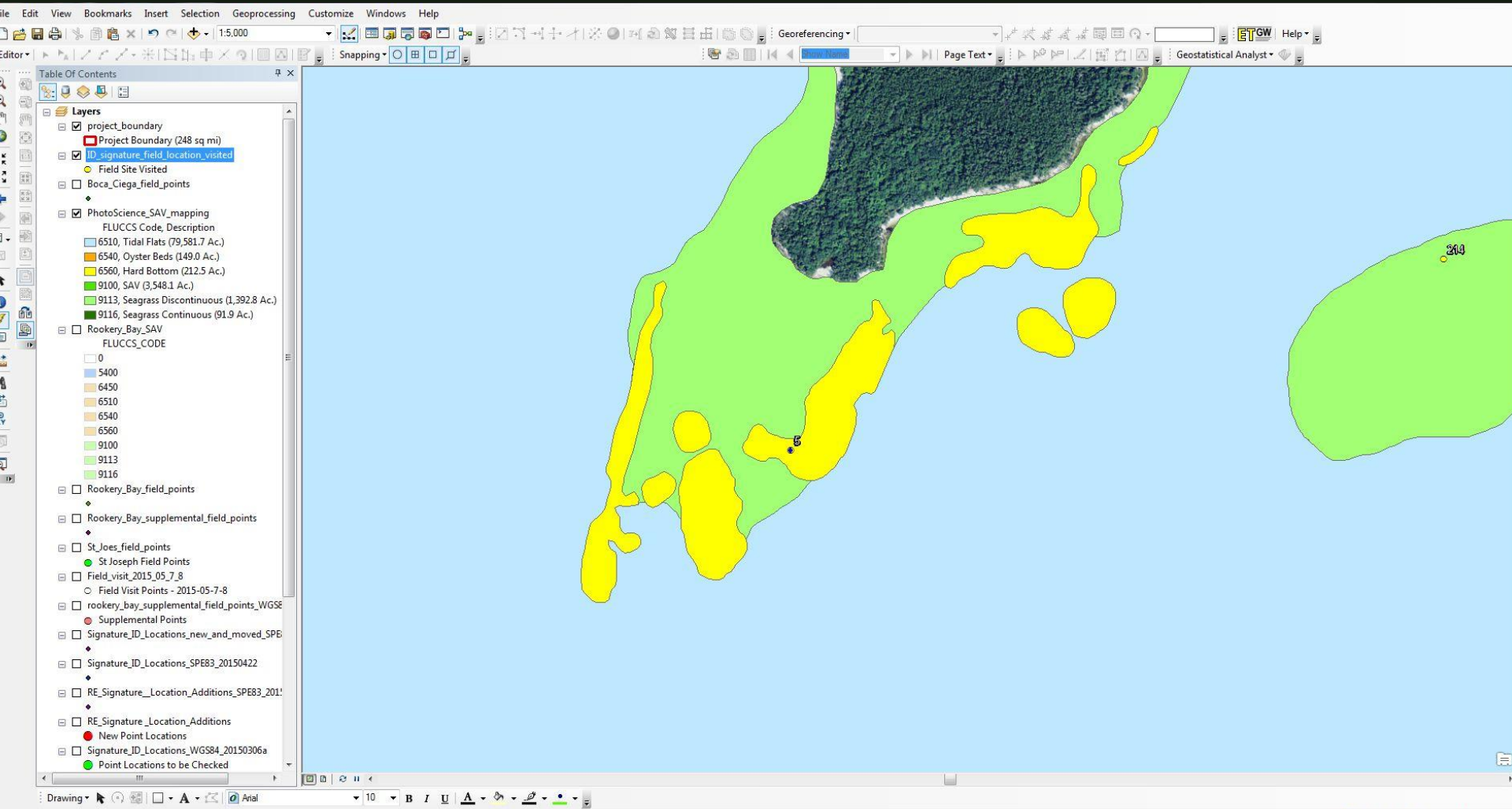
# Rookery Bay Overall Results

• 6510	Tidal Flats	79,581.7
• 6540	Oyster Beds	149.0
• 6560	Hard Bottom	212.5
• 9100	SAV	3,548.1
• 9113	Seagrass Discontinuous	1,392.8
• 9116	Seagrass Continuous	91.9

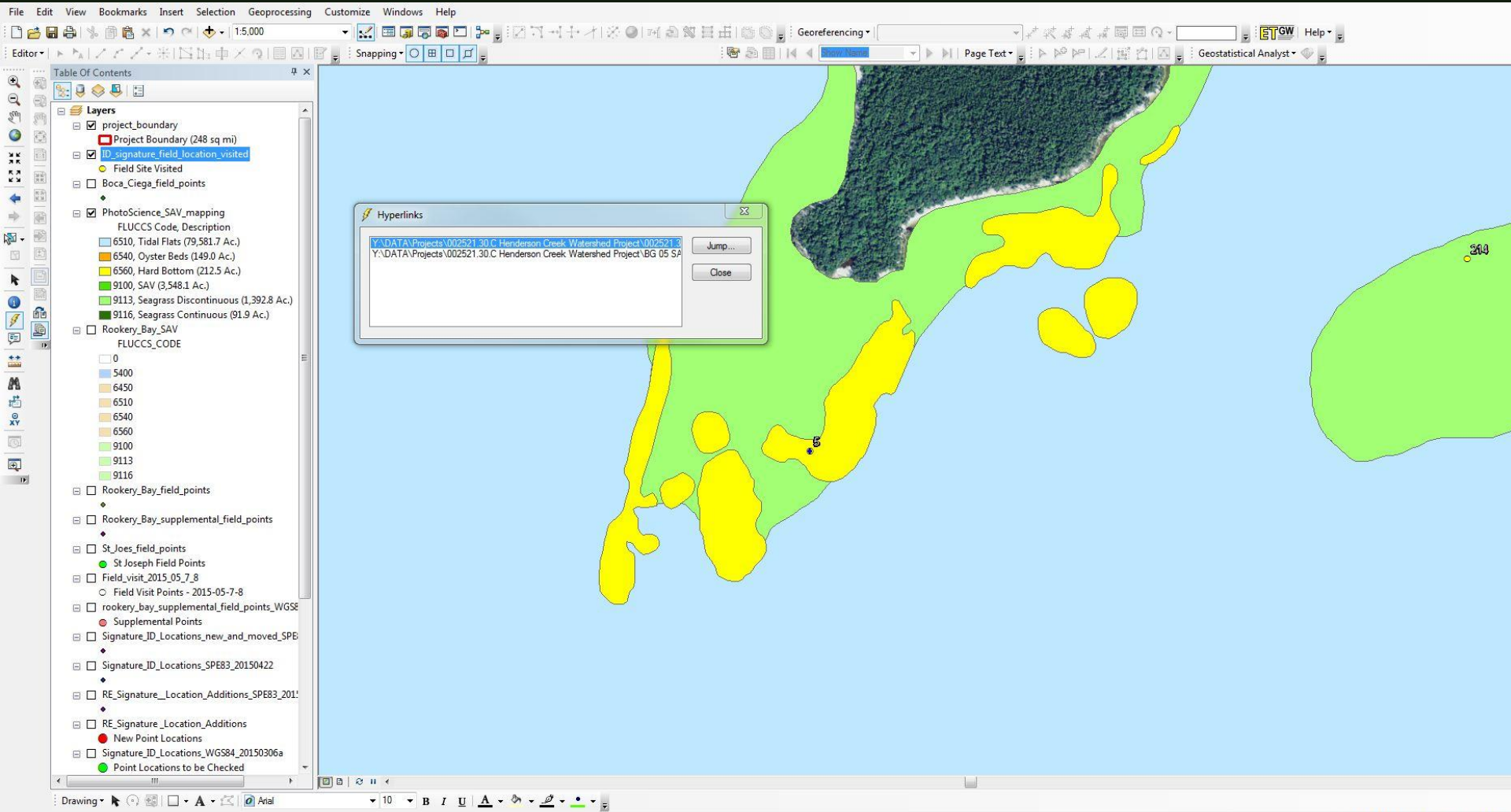
2,187 polygons



# Map with Hyperlinks



# Hyperlinked Dialog Options



# Hyperlinked Field Data Sheet

Station5.xlsx - Microsoft Excel

Home

Insert

Page Layout

Formulas

Data

Review

View

Autodesk Vault

Acrobat

Clipboard

Font

Alignment

Number

Styles

Cells

Editing

General

Conditional Formatting

Format as Table

Normal

Bad

Good

Neutral

Calculation

Check Cell

AutoSum

Fill

Clear

Sort & Filter

Find & Select

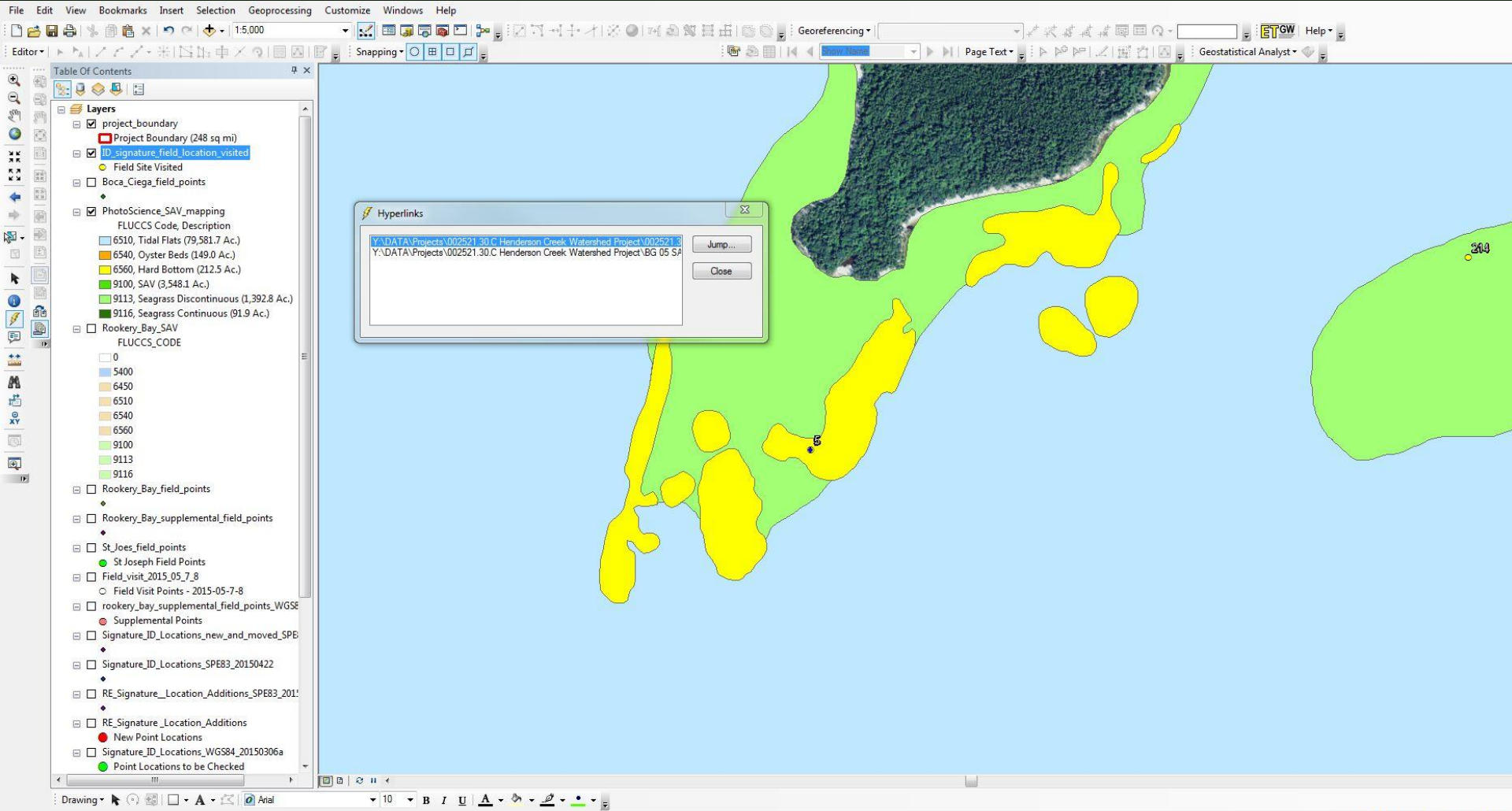
H7

sponges dominant; Caleurpa feathergrass; Thal in sand; tunicates

A	B	C	D	E	F	G	H
DATE:	2/12/2015		GPS Model:	Hummingbird 797c	DOM_SG_SPC	dominant seagrass species at site	
					LES_DOM_SG_SPC	any other species at the site	
Principle Investigator:	B. Young, Pat O'Donnell				EPIPHYTES (0-3)	0 is clean, 1 is light, 2 is moderate, 3 is heavy	
					SG = Seagrass		
STATION	NAME		DEPTH (m)	SEAGRASS (P/A)	ALGAE (P/A)	IF NO SG, DOM_COVER	NOTES
	5 Gomez Point		1	P A	Drift Algae	Oyster	sponges dominant; Caleurpa feathergrass; Thal in sand; tunicates
				DOM_SG_SPC	SPC:	Hard Bottom	
				H.w Thal Syr Rup H.d H.e	Rooted MacroAlgae	Dark Seds	
ALTERNATE COORDINATES VISITED? Y N				LES_DOM_SG_SPC	P A	SAND	
				H.w Thal Syr Rup H.d H.e	SPC: brown, red, Caleurpa	Other: worm rock	
				EPIPHYTES (0-3)			
				1			
					H.w = Halodule wrightii		
					H.d = Halophila decipens		
					H.e = Halophila engelmannii		



# Hyperlinked Dialog Options



# Site Specific Underwater Video





# QUESTIONS?

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# Only SAV Survey

