Sarasota Bay Oyster Habitat Mapping, Monitoring and Restoration

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GTM NERR
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Three Topics to Cover Today

- Sarasota County Oyster Habitat Mapping (and Monitoring)
- SWFWMD Oyster Mapping from Aerial Photography (2014 – 2016)
- Sarasota Bay Estuary Program Oyster Habitat Restoration

Mapping Oyster Habitat in Sarasota County

Project conducted by Sarasota County Stormwater staff:

- Kathryn Meaux
- James Grimes
- Jon Perry
- Rene Janneman
- John Ryan

Objectives

- Locate and identify all types of oyster habitat in Sarasota County bays and creeks
- Develop detailed baseline maps of all oyster habitat types
- Document upstream extent of oyster habitat in coastal creeks
- Analyze the data to help identify potential habitat restoration needs and sites

Oyster Habitat Categories

Oyster Habitat Codes

- ***S – Shell***
- ***SS – Scattered Shell***
- ***C – Clumps***
- ***SC – Scattered Clumps***
- ***R – Reef***
- ***MA – Mangrove Apron***
- ***MRO – Mangrove Root Oysters***
- ***SW – Seawall***
- ***RR – Rip/Rap***
- ***P – Pilings***
- ***D – Docks (floating)***

- ***SW-1 ≤ 6”; 1 layer***
- ***SW-2 >6”≤12”; > 1 layer***
- ***SW-3 >12”≤18”; > 1 layer***
- ***SW-4 >18”; > 1 layer***
- ***RR-1 ≤ 6”; 1 layer***
- ***RR-2 >6”≤12”; > 1 layer***
- ***RR-3 >12”≤18”; > 1 layer***
- ***RR-4 >18”; > 1 layer***

Condition Codes

0 – Mostly Dead

1 – Live/Dead

2 – Mostly Live

SW-1 Oysters

SW-2 Oysters

SW-3 Oysters

SW -3 Oysters and Piling Oysters

SW-4 Oysters

Rip-Rap Oysters

Mangrove Root Oysters

R – Patch Reef

R – String Reef

MA – Mangrove Apron/Fringe

MA – Mangrove Apron/Fringe

SC/SS – Scattered Shell and Clumps

SS – Scattered Shell

Legend

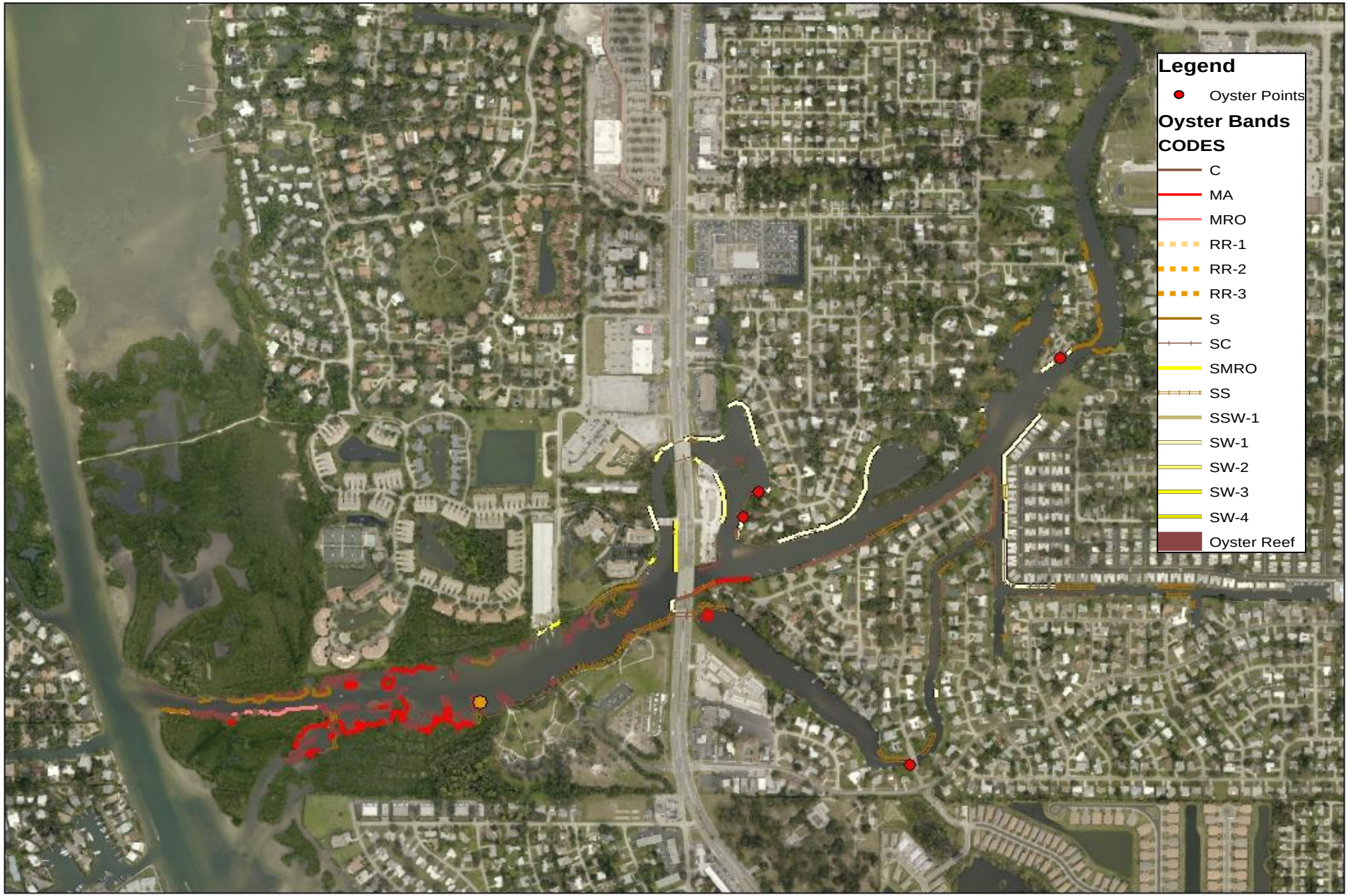
TCCI Oyster Site

Catfish Creek and North Creek Oysters

0 0.04 0.08 0.16 0.24

Miles

N



Legend

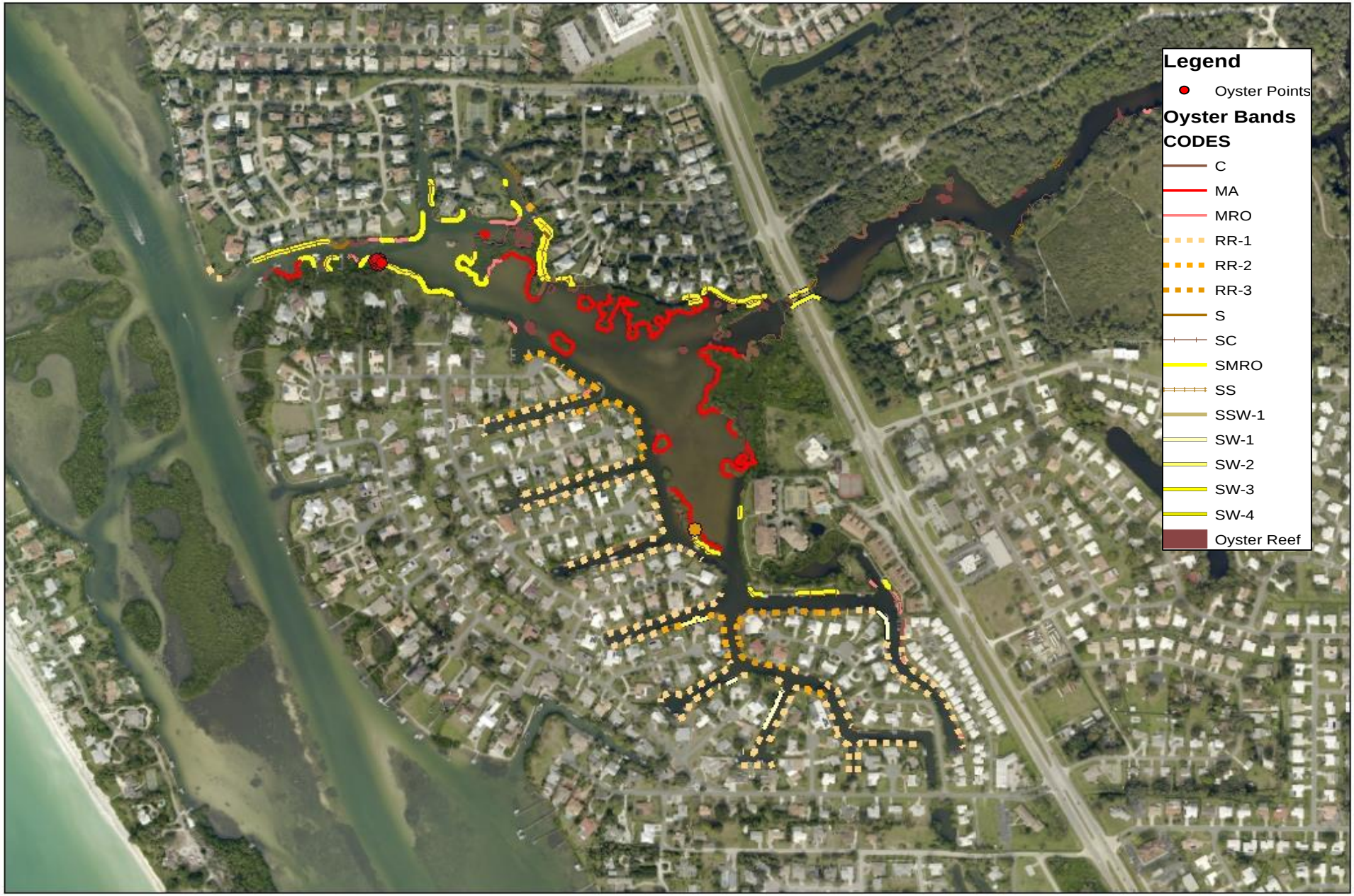
TCCI Oyster Site

Phillippi Creek Oysters

0 0.075 0.15 0.3 0.45

Miles

N



Legend

TCCI Oyster Site

South Creek Oysters

0 0.05 0.1 0.2 0.3

Miles

N

Sarasota County Oyster Monitoring Program

- Started in 2006
- Quarter-meter quadrats (collect all material to the sediment surface)
- Count live, dead and spat
- Measure five largest live oysters per quadrat
- General observations (parasites, drills, mussels, silt, etc.)

SWFWMD Oyster Mapping (2014 – 2016 Aerial Surveys)

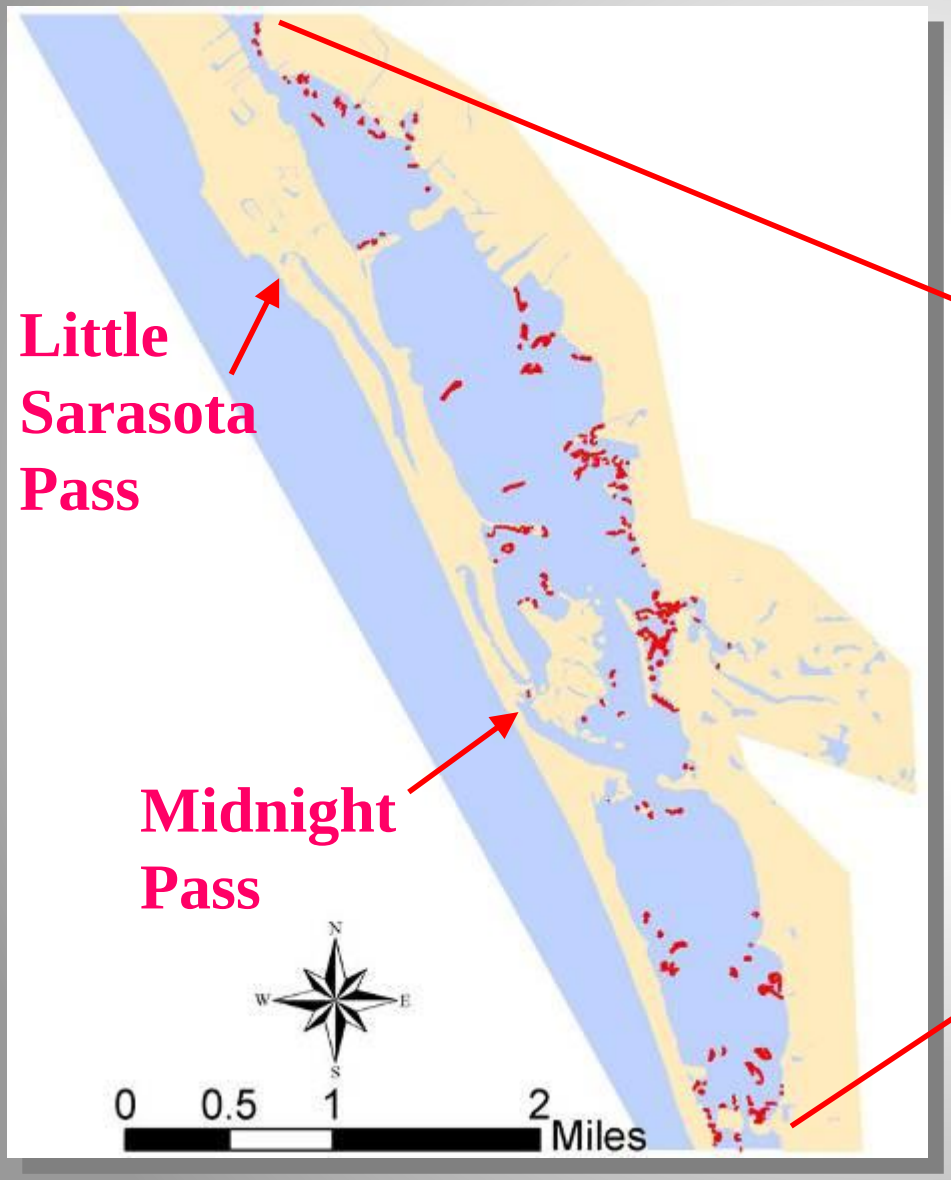
Sarasota Bay Segments	2014	2016	Oyster Acreage 2014 to 2016	% Change
Blackburn Bay	2.95	3.10	0.15	5.0%
Little Sarasota Bay	21.28	23.26	1.98	9.3%
Roberts Bay	20.09	21.32	1.23	6.1%
Upper Sarasota Bay N	25.41	28.89	3.48	13.7%
Upper Sarasota Bay S	0.99	1.09	0.10	10.1%
Sarasota Bay Total:	**70.73**	**77.67**	6.94	9.8%

Sarasota Bay Oyster Habitat Restoration/ Creation

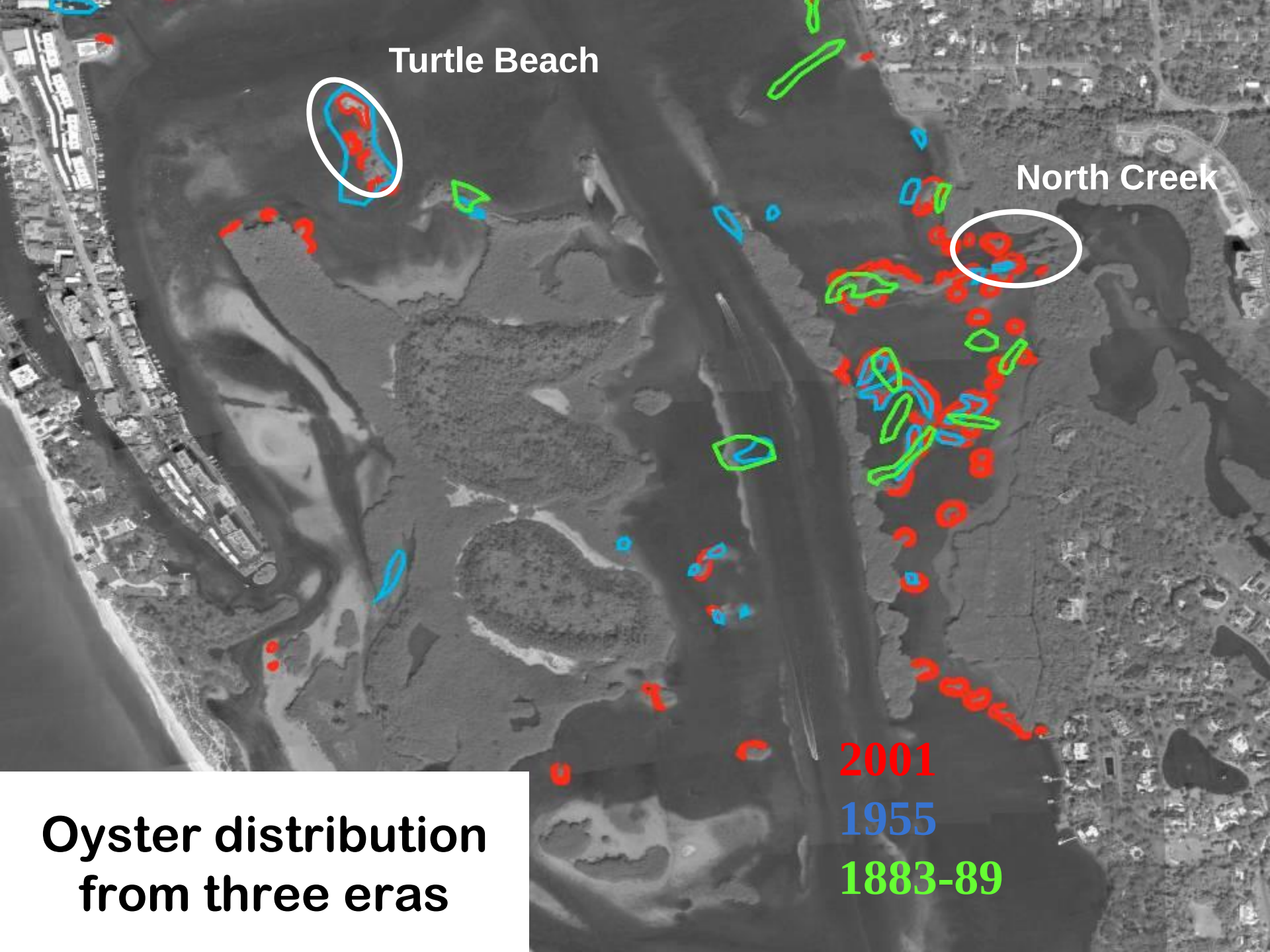
PRELIMINARY ASSESSMENT (Little Sarasota Bay)

- Map the historical distribution of oysters
- Survey the distribution of existing oyster habitats
- Review water quality data to determine oyster habitat suitability
- Assess current health and status of select oyster habitats
- Evaluate sites for their restoration potential

2005 Pilot Study Area

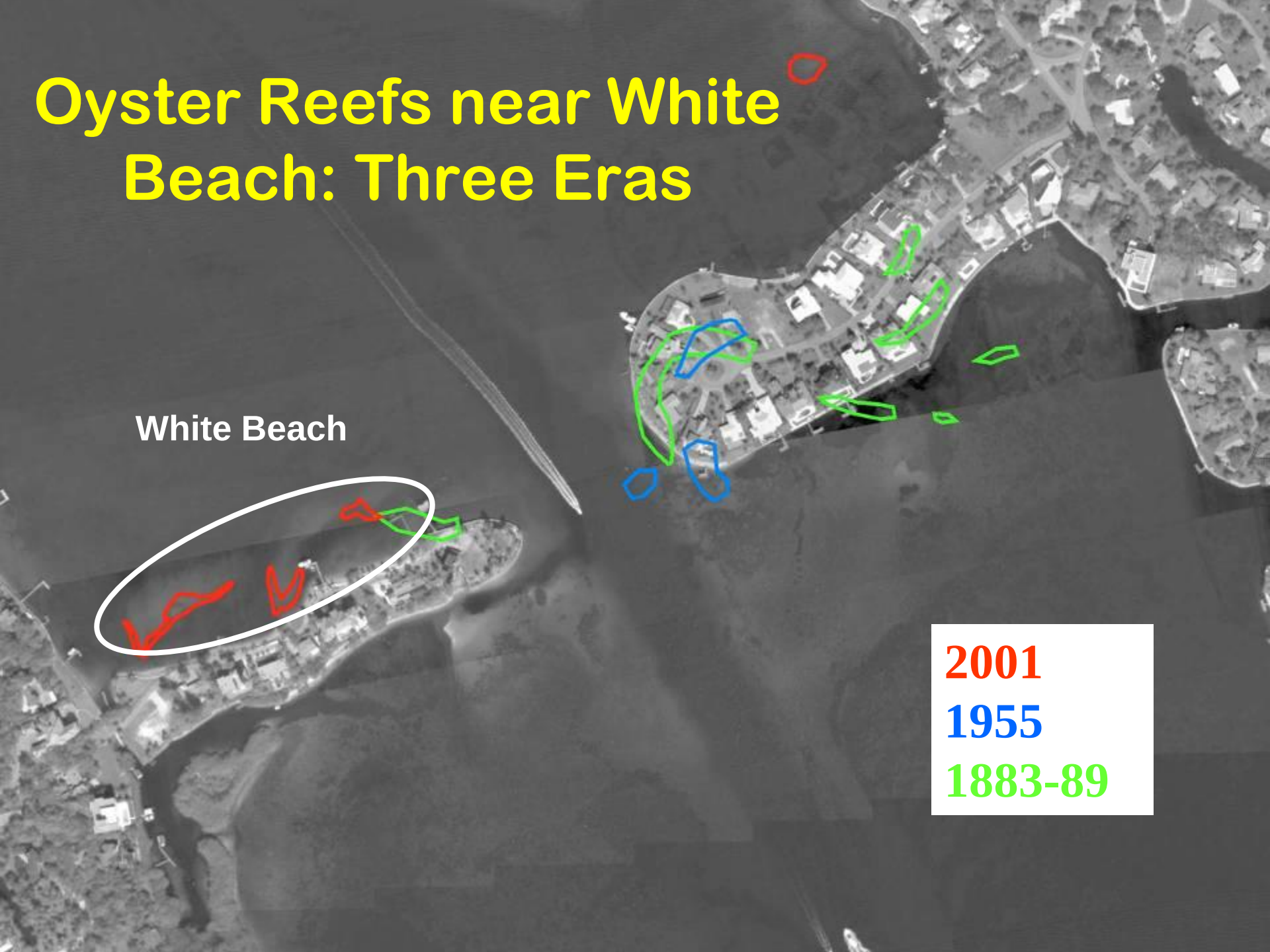


Little
Sarasota
Bay



Oyster distribution from three eras

Oyster Reefs near White Beach: Three Eras



Water Quality Data: Five year monthly means near Midnight Pass in Little Sarasota Bay

January	SAL	TEMP	DO
Mean	**30.8**	**17.8**	**7.6**
Min	26.9	12.8	5.9
Max	34.6	22.5	9.1

February	SAL	TEMP	DO
Mean	**30.1**	**20.1**	**6.6**
Min	15.8	17.1	5.4
Max	36.6	24.6	8.9

March	SAL	TEMP	DO
Mean	**31.7**	**21.1**	**7.5**
Min	23.1	18.0	7.2
Max	35.7	26.8	7.9

April	SAL	TEMP	DO
Mean	**32.1**	**24.6**	**7.2**
Min	24.5	21.4	6.1
Max	35.7	28.5	7.8

May	SAL	TEMP	DO
Mean	**34.9**	**27.0**	**8.4**
Min	28.8	25.1	6.3
Max	38.4	28.8	12.2

June	SAL	TEMP	DO
Mean	**36.9**	**30.3**	**6.7**
Min	33.5	29.6	5.6
Max	38.5	30.8	8.1

July	SAL	TEMP	DO
Mean	**28.6**	**30.4**	**7.4**
Min	21.4	28.3	4.7
Max	32.8	31.9	8.8

August	SAL	TEMP	DO
Mean	**27.3**	**30.0**	**8.1**
Min	21.4	28.3	5.9
Max	31.4	30.6	9.1

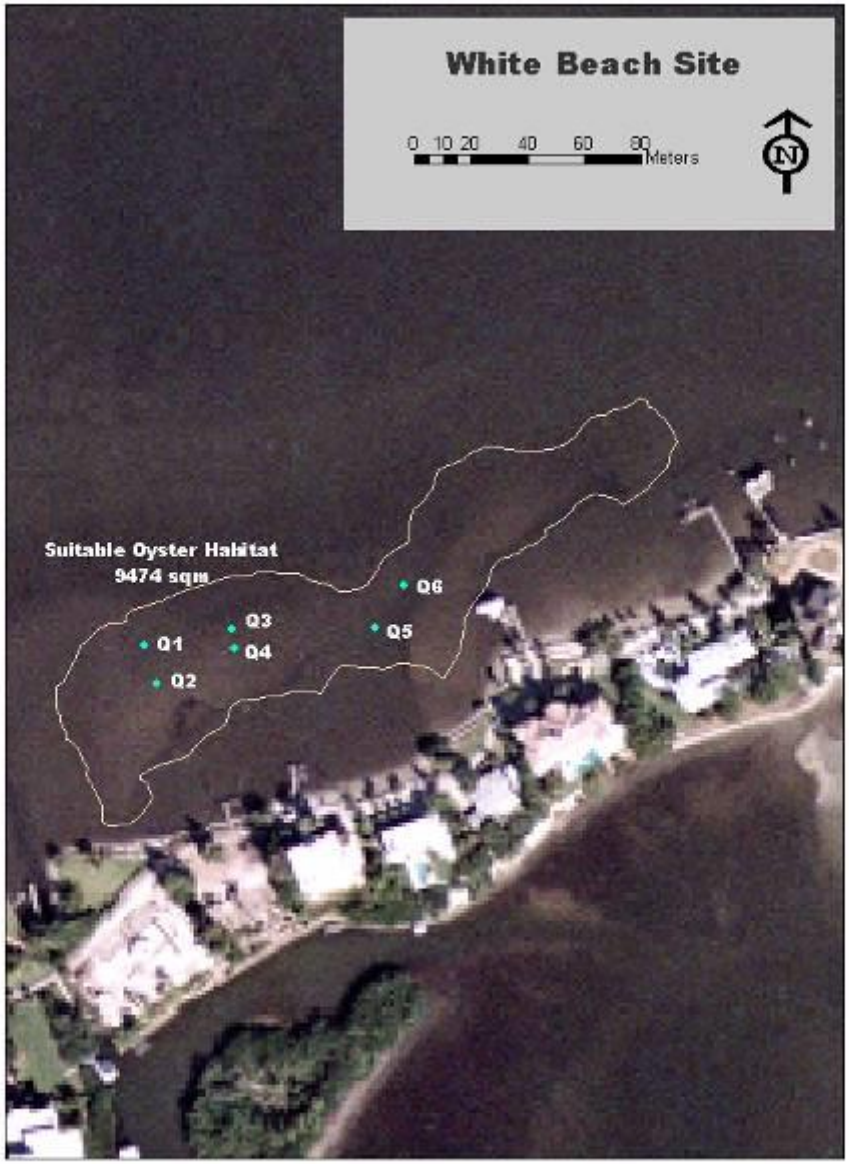
September	SAL	TEMP	DO
Mean	**22.6**	**27.8**	**5.6**
Min	14.7	26.3	0.3
Max	28.8	29.4	8.0

October	SAL	TEMP	DO
Mean	**28.3**	**26.7**	**5.5**
Min	25.4	23.2	4.5
Max	31.3	28.6	6.9

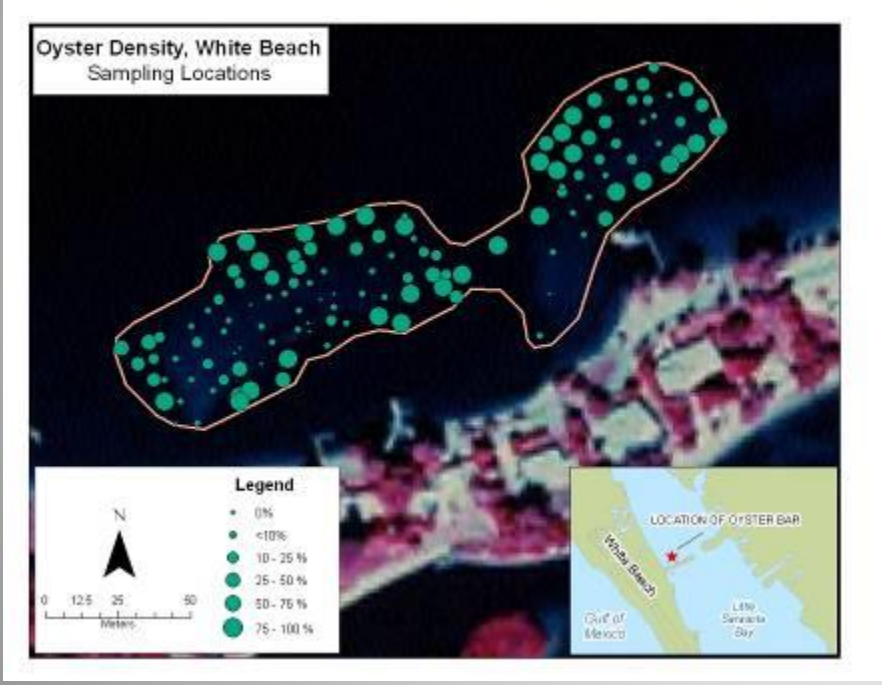
November	SAL	TEMP	DO
Mean	**30.4**	**22.7**	**6.4**
Min	27.4	21.0	5.1
Max	34.4	25.9	7.5

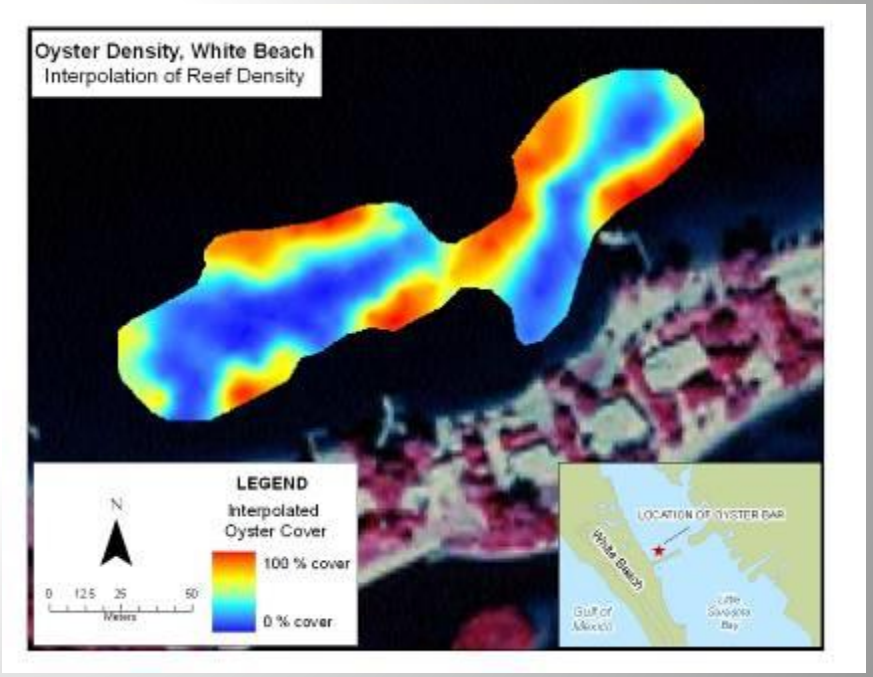
December	SAL	TEMP	DO
Mean	**32.2**	**20.8**	**5.6**
Min	29.4	15.4	4.7
Max	34.2	24.7	6.6

North Creek (Reference Site)


White Beach Site
0 10 20 40 60 80
Meters
N
Suitable Oyster Habitat
9474 sqm
Q1
Q2
Q3
Q4
Q5
Q6

White Beach Restoration Site: Preliminary Oyster Survey





Oyster density (#/0.25 m^2) and live:dead ratios in Little Sarasota Bay

	Adults		Spat	
North Creek	Live	Dead	Live	Dead
Mean	25.8	12.2	5.5	1.8
S.D.	11.73	5.77	3.70	2.36
Live/Dead Ratio	0.68		0.76	

Turtle Beach	Live	Dead	Live	Dead
Mean	12.8	5.0	2.7	1.1
S.D.	19.52	6.30	4.86	1.73
Live/Dead Ratio	0.72		0.71	

White Beach	Live	Dead	Live	Dead
Mean	14.8	3.3	8.8	26.8
S.D.	11.99	3.08	6.37	22.64
Live/Dead Ratio	0.82		0.25	

Analysis of *Perkinsus marinus* prevalence in oysters from Little Sarasota Bay (by Bruce Barber)

Sampling conducted during Winter, 2004

Site	Temperature (^{o}C)	Salinity (ppt)	Shell Ht. (mm)	Dry Wt. (g)	Condition Index	*P. marinus* prevalence
White Beach	15.2	30.7	67.22	0.67	6.17	4/25 = 16 %
North Creek	16.5	29.4	69.02	0.54	5.01	1/25 = 4 %
Turtle Beach	15.3	32.6	71.8	0.99	6.82	1/25 = 4 %

Oyster Deployment (August, 2005)

Oyster units constructed at Reef Innovations, Inc.

Oyster Deployment at White Beach

Year One Monitoring Results

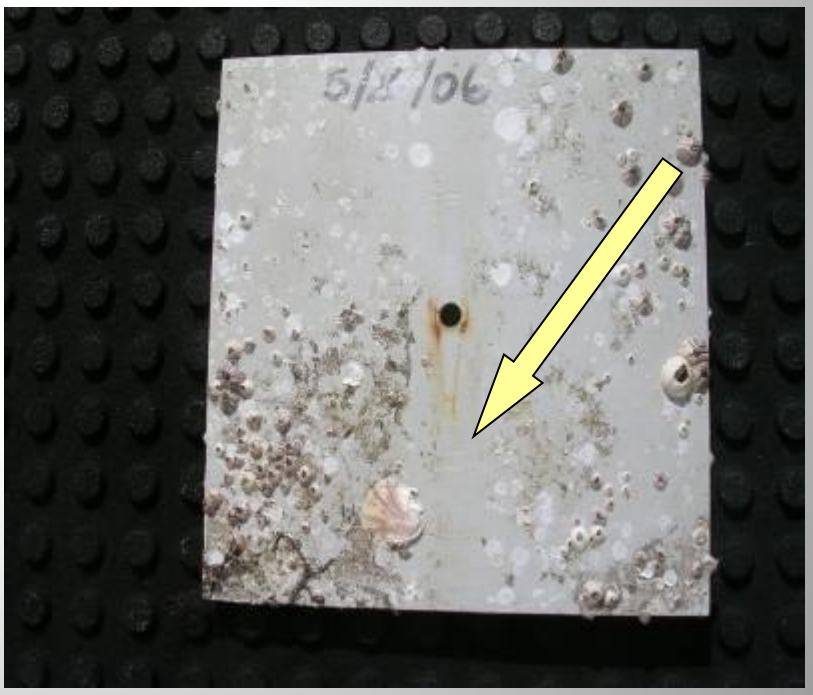
A) Recruitment to Shell in Bags

B) Recruitment to Settlement Plates

July, 2006
Settlement Plates

Turtle Beach

White Beach

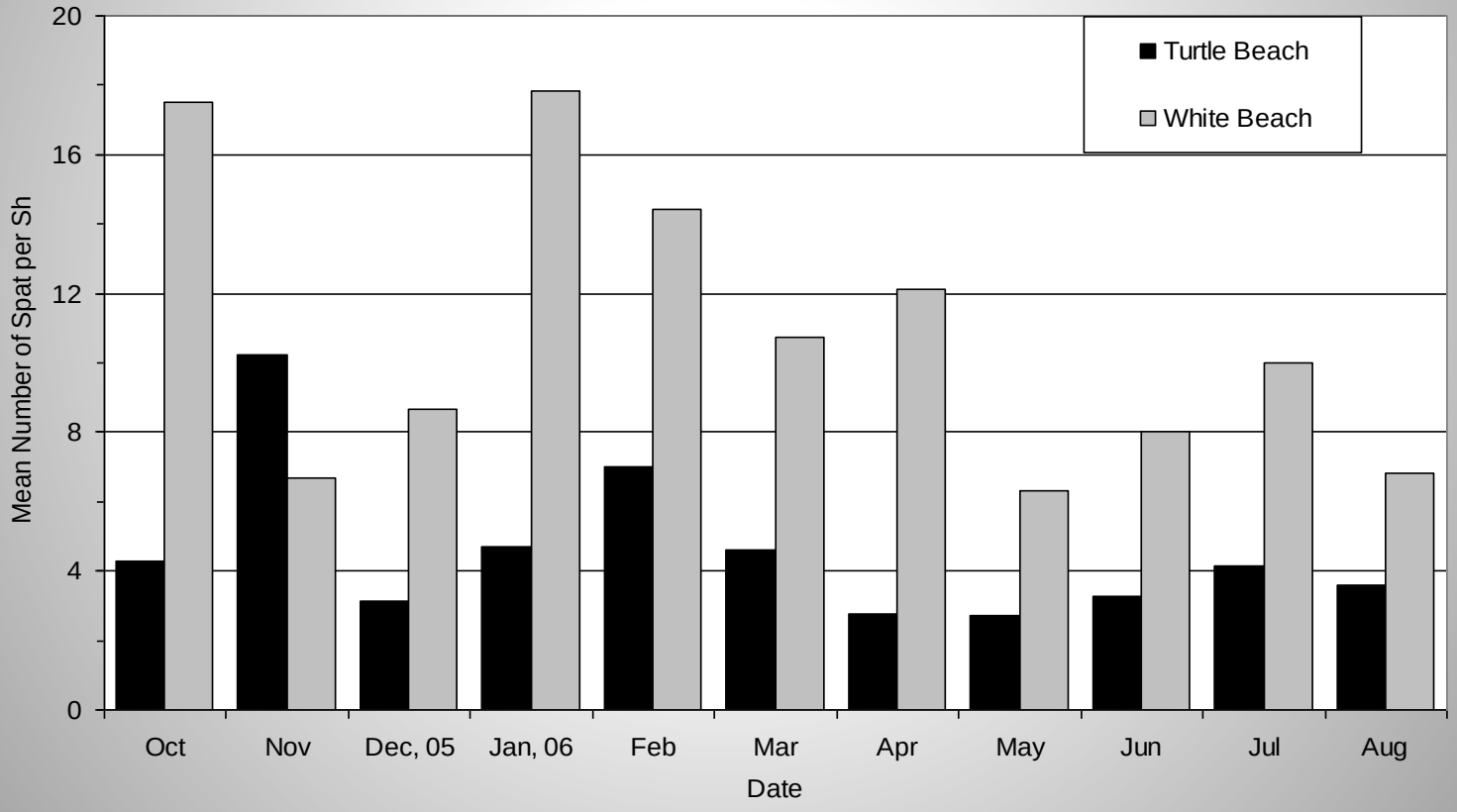


July, 2006
Colonized Shells

Turtle Beach

White Beach

Spat Settlement on Fossilized Oyster Shell (2005-06)

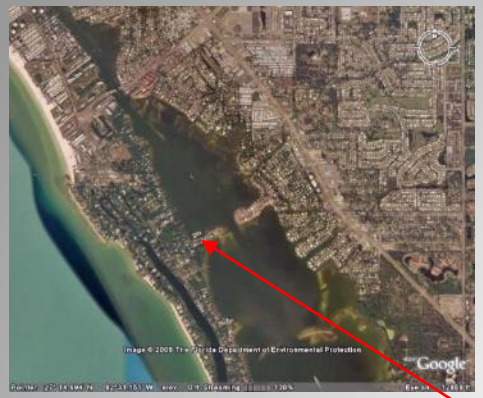


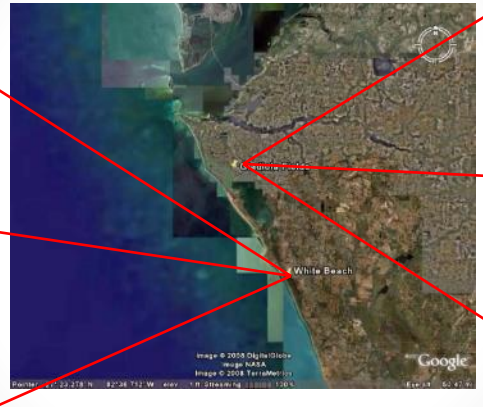
Future Plans (in 2005)

- Supplement each habitat with additional material
- Continue spat monitoring to determine temporal peaks in recruitment
- Initiate habitat utilization studies
- Prioritize additional sites throughout the entire SBEP area for oyster habitat creation

2010 Site Locations

Aerial images of White Beach (left) and Gladiola Fields (right) oyster habitat sites. The footprint of each site is outlined in white.





White Beach

Gladiola Fields

Aerial View of Both Sites

Gladiola Fields (Manatee County)

White Beach (Sarasota County)

Bagging Fossil Shell at Reef Innovations

Transportation Shell to Restoration Sites

Deployment

Gladiola Fields- One Month

Three years post-creation

Monitoring

- Two years (Required under NOAA grant conditions)
- Spat recruitment
- Oyster Growth
- Fisheries (after six months)
- Invertebrates

SCHEDA ECOLOGICAL ASSOCIATES
www.scheda.com

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

Figure 2 - Proposed Oyster Habitat Restoration Project Aerial Map

34th Street Canal
Manatee County, Florida

0 100 200 300 Feet

Data Source:
- Scheda Observations
Imagery Source:
- 2014 FDOT

N

Coordinate System:
WGS84 World
Geodetic System 1984

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