Edgewater resources

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18-47

Sarasota Bay Marine Resource Field Observation Report

Date: August 30, 2018
To: Sarasota Bayfront Planning Organization
From: Edgewater Resources
Subject: Marine Resource Survey Report

Inspectors: Christie Hurley, M.S.; Penny Cutt & Mike Kenny

1. BACKGROUND

On July 31 through August 1, 2018 Edgewater Resources (Edgewater) performed a marine resource survey along the submerged lands within Sarasota Bay in Sarasota County Florida (see Location Map in Figure 1). The survey area consisted of approximately 20 acres of submerged lands located along the east coast of Sarasota Bay immediately offshore of Centennial Park, the Van Wezel Performing Arts Hall and the Sarasota Institute of Lifetime Parcel.

The purpose of this study was to locate and identify any ecologically important marine resources including seagrass, hardbottom, coral, macroalgae and sponge communities in support of "The Bay" portion of the Sarasota Bayfront Master Plan. This report includes a site description, methodology, observed species list, habitat map, representative photographs and a summary.

2. METHODOLOGY

Edgewater conducted the marine resource survey on July 31 and August 1, 2018. The weather was sunny with temperatures around 88° F. Water teperature was 85°, with a slight north current and underwater visbility ranged between 4 inches and 5 feet.

Twenty (20) temporary transects were established to facilitate the survey of the submerged resources within the project area. Transects were generally shore perpendicular and spaced 100 feet apart, and extended between 135 and 315 feet waterward of the shoreline. The most current conceptual design was utilized to determine transect placement while in the office and transect placement was further modfied while in the field. Due to some of the design elements, Transect 1 was established at the north end of the survey area and Transect 20 at the south part of the project area. Transect 7 was established south to north across the mouth of the canal leading to the Centennial Boat Launch and The Canal Transect bisected the middle of the Centennial Boat Basin. A buoy was dropped at the west

(waterward) end of each transect to facilitate the deployment of the survey transect tape. One biologist secured the end of the survey tape onto the weight of the buoy (start point) and extended the tape to the shoreline (end point). Another biologist identified and recorded information regarding the marine resources and substrate observed along each transect. Data was collected on prepared data sheets printed on underwater paper. The biologist recorded the beginning and end of each change in the benthic community composition. Representative photographs of marine resources and bethic community types were also taken (Appendix D).

Table 1. GPS Coordinates for the Start of Each Transect (West End)

Transect Number	Latitude	Longitude
T1	27.3477	-82.5499
T2	27.3473	-82.5499
T3	27.347	-82.5501
T4	27.3466	-82.5503
T5	27.3462	-82.5503
T6	27.346	-82.5503
T7 (north)	27.3458	-82.5496
T7 (south)	27.3454	-82.5494
TCanal (west)	27.3456	-82.5497
TCanal (east)	27.3456	-82.5478
T8	27.3454	-82.5505
T9	27.3452	-82.5504
T10	27.3454	-82.5505
T11	27.3446	-82.5517
T12	27.3443	-82.5512
T13	27.3437	-82.5513
T14	27.3431	-82.5514
T15	27.3425	-82.5515
T16	27.342	-82.5516
T17	27.342	-82.5514
T18	27.3417	-82.5516
T19	27.3415	-82.5516
T20	27.6823	-82.5516

Three other areas labled Areas A, B and C in Figures 1-3 were selected for additional monitoring to identify the benthic marine resource communities in areas of possible future development. Biologists swam an "S" shapped pattern in each of these three areas and recorded the species and general distribution on data sheets.

Monitoring occured between July 31 and August 1, during the federally recognized seagrass growing season (June 1 through Spetember 30) to ensure seagrass was at its peak density and extent of growth for monitoring purposes. The data collected on the underwater data sheets (Appendix A) was

transferred into an Excel data table (Appendix B) that was used to create a basemap (See Figures 1 – 3 in Appendix C).

3. DESCRIPTION OF FINDINGS

The survey area, approximately 20 acres of submerged lands, is located along the eastern shoreline of Sarasota Bay offshore of Centennial Park, the Van Wezel Performing Arts Hall and the Sarasota Institute of Lifetime Parcel (See Figures in Appendix C). This area is listed by the Florida Department of Environmental Protection (FDEP) as Florida Outrstanding Waters (Sarasota Bay Estuarine System). Although the survey area is considered an Outstanding Florida Water, it is not part of an Aquatic Preserve. Sarasota Bay is partially enclosed from the Gulf of Mexico by the barrier islands of Lido Key, to the south, and by Longboat Key and Bradenton Beach, to the north. The barrier islands shield the Bay from wind and waves coming from the west over the Gulf of Mexico, while the three passes (Big Sarasota, New and Longboat Pass) provide good water flushing between the Bay and the Gulf of Mexico. All of these factors, combined with the shallow water depths (1 to 15 feet) within the survey area provided conditions condusive for seagrass and coral growth.

Most of the shoreline within the project area consists of hardened shoreline armored with riprap and/or bulkheads. There are three beach areas consisting of sandy sloped shoreline, two north of the Centennial Boat Basin and one in the south end of the project. In the south end of the project there is also a solid mangrove wetland leading into the uplands in a Y-shapped canal that bisects the Van Wezel Performing Arts Hall and the Sarasota Institute of Lifetime Parcel.

The shoreline north of the Project area, along the neighboring FPL property, consists of limestone riprap. The marine resources offshore of this area were a mix of macroalgae and seagrass (*Haladule wrightii, Syringodium filiforme and Thalassia testudinum*). No corals were observed along Transects 1 and 2 in the north region of the survey area (See Figure 1 in Appendix C).

The shoreline adjacent to Centennial Park, north of the entrance channel to the boat launch, varies between two adjacent coves. It consists of a sandy beach shoreline bordered on either side by a rocky shoreline, with large limestone riprap boulders and smaller rocks that comprise the riprap wall, groin and northern entrance channel jetty. Sparse seagrass was observed offshore of the northernmost cove. A mix of macroalgae and *Solenastrea* sp. corals were observed off of the groin with one shoot of *Thalassia testudinum*. Dense seagrass beds (*H. wrightii* and *S. filiforme*) were present off the sandy cove to the south with one occurance of *Thalassia testudinum* offshore of Transect 5 (See Transects 3-6 on Figure 1 Appendix C).

The shoreline within the Centennial Park Boat Launch Boat Basin is lined by a concrete bulkhead. The bulkhead continues for approximately 100 feet to the south, offshore of the U.S. Coast Guard Auxillary

Center, located on the southwest corner of the Centennial Basin. Limestone riprap abuts the concrete bulkhead along the west side. The Centennial Boat Basin appears to have acted as a sink for fine particulate matter, as the submerged lands within the basin consists of unconsolidated silty soft bottom. The sediment is very fine and easily disturbed. Other than the sparse *H. wrightti* observed at the entrance of the basin, no other marine resources were observed within the basin during the survey (See Transect 7 and Canal on Figure 1 & 2 in Appendix C).

Very sparse marine resources were observed offshore between the U.S. Coast Guard Auxillary Center and the Van Wezel Pier. This area supported mostly macroalgae with sparse *H. wrightii* seagrass and the typical fouling community found on the riprap (macroalgae, turf algae, tunicates and occasional hard corals). See Transects 8 through 10 on Figure 2 & 3 in Appendix C.

The remainder of the shoreline extending south of the Centennial Boat Basin to the Y shaped channel, between the Van Wezel Performing Arts Hall and Sarasota Institute of Lifetime Parcel, consists of limestone riprap. This area supported mostly macroalgae with sparse *H. wrightii* seagrass and the typical fouling community found on the riprap (macroalgae, turf algae, tunicates and occasional hard corals). Offshore the submerged lands between Transect 11 and 15 consisted of occasional sparse seagrass in the nearshore region, sparse macroalgae and occasional octocorals and stony corals (See Transects 11 through 15 on Figure 2 & 3 in Appendix C).

The thin enclosed Y-shapped channel, between the Van Wezel Performing Arts Hall and Sarasota Institute of Lifetime Property, is lined with limestone boulders at the entrance and then progresses to a natural sandy/mud shoreline populated with wetland vegetation (red and black mangroves). At the entrance and extending along the centerline of the canal *H. wrightii* was observed. The remainder of the canal consisted of silty unconsolidated substrate with decaying organic material which created anaerobic conditions where no resources were observed growing. See Transects 16 and 17 on Figure 3 in Appendix C.

The shoreline west of the Sarasota Institute of Lifetime Property consitsts of a sandy beach, which is protected offshore by a line of riprap boulders. The riprap has created a protected shallow water bay between it and the beach. This shallow bay area (Labeled Area C on Figure 3) consisted of a *H. wrightii* and *T. testudinum* seagrass bed. Offshore of the riprap was a bed of *H. wrightii*, macroalgae and a few stony and octocorals. The shoreline south of the Sarasota Institute of Lifetime's beach is protected by a bulkhead that extends approximately 80 feet south to the City of Sarasota's southern property line. The submerged lands offshore of the bulkhead consisted of riprap boulders. Offshore of this area, the submerged lands consisted of rock with occasional macroalgae, sponges, tunicates and sandy sediment with a bed of *H. wrightii (*See Transects 18 through 20 on Figure 3 in Appendix C).

No federal or state listed Threatened or Endangered species were observed during the survey. The survey area is not within the growing range for the federally protected corals in the Genus *Acropora* spp. or the seagrass species Johnson's seagrass (*Halophila johnsonii*). The survey area is not designated critical habitat for loggerhead sea turtle or smalltooth sawfish.

Table 2. List of Benthic Species Observed in the Survey Area.

Common Name	Scientific Name
Seagrass	
Manatee Grass	*Syringodium filiforme*
Shoal Grass	*Halodule wrightii*
Turtle Grass	*Thalassia testudinum*
Stony Corals	
Knobby Star Coral	*Solenastrea hyades*
Lesser Starlet Coral	*Siderastrea radians*
Robust Ivory Tree Coral	*Oculina robusta*
Smooth Star Coral	*Solenastrea bournoni*
Tube Coral	*Cladacora arbuscula*
Octocorals	
Colorful Sea Whip	*Leptogorgia virgulata*
Macroalgae	
Flat Green Feather Algae	*Caulerpa mexicana*
Green Feather Algae	*Caulerpa sertularioides*
Red Algae	*Bryothamnion triquetrum*
Invertebrates	
Black Solitary Tunicate	*Ascidia nigra*
Florida Horse Conch	*Pleuropioca gigantea*
Red Boring Sponge	*Cliona delitrix*
Spaghetti Worm	*Eupolymnia crassicornis*
Tunicate	*Pyura vittata*
Variagated Rock Urchin	*Lytechinus variegatus*
Fish	
Sheepshead	*Archosargus probatocephalus*
Striped Burrfish	*Chilomycterus schoepfi*

4. DISCUSSION

Seagrass and Macroalgae Communities

Seagrass comprises approximately 35% of the submerged lands within the bays of Sarasota (Sarasota Seagrass 2018). Five species of seagrass (*Thalassia testudinum, Syringodium filiforme, Halodule wrightii Halophila decipiens* and *Halophila engelmannii)* grow in Sarasota Bay. The most commonly observed segrass species in Sarasota Bay are *Thalassia testudinum, Syringodium filiforme* and *Halodule wrightii.*

The location and acreage of seagrass beds are mapped in Sarasota Bay every two years by the Southwest Florida Water Management District (SWFWMD) via digital aerial photography taken during the winter. The aerials are then converted to GIS maps and seagrass beds are field verified by staff. Historic data shows that both continuous and patchy seagrass beds have been present in the survey area since at least 2006 (See the 2006, 2008, 2014 and 2016 seagrass maps in Appendix E; Sarasota County 2018). The 2006 seagrass survey shows the nearshore region offshore of the project area to conisist of patchy seagrass, except for an area west of the entrance to the Centennial Boat Basin that was classified as continous seagrass. Two years later, in 2008, the submerged lands closest to shore, located in the north region of the project area, were depicted as having patchy seagrass resources with more continous seagrass beds further offshore, whereas the southern portion of the project area was described as having continous seagrass beds close to shore. More recently, in 2014, most of the nearshore region was depicted as having patchy segrass resources, with only one area of continuous seagrass beds located within the cove created by the two jetties that extend offshore of the shoreline, just north of the entrance channel to the Centennial Boat Basin. Two years later in 2016, the entire nearshore region offshore of the City owned Property was depicted as having patchy segrass resources.

During the seagrass survey conducted by Edgewater in July/August 2018, seagrass beds were the dominant form of submerged aquatic vegetation. Most of the seagrass observed was patchy, with only a few continous beds of grass. Seagrass density increased markedly close to shore, where shallow water depths and good light penetration are optimal for growth. Only the three most common species (*T. testudinum, S. filiforme* and *H. wrightii)* were observed in the nearshore waters off the project area. *H. wrightii w*as the most dominant species of seagrass observed within the survey area. The fresh water influx from the Whitaker Bayou located to the north of the project area may influence the dominant presence of *H. wrightii* , which tolerates less saline waters. *H. wrightii* was observed in the shallow areas close to shore, as well as in the deeper waters 200 feet to 315 feet offshore. *H. wrightii* was observed in both monolithic beds, as well as, mixed seagrass beds with *S. filiforme. S. filiforme* was also observed frequently within the project area, while *T. testudinum* was the least observed species of seagrass within the survey area. *T. testudinum* was obseserved within mixed seagrass beds or very sparse patchy areas within the survey area. Most of the seagrass beds had a moderate layer of epiphytic algal cover.

There were only a few species of macroalgae observed within the survey area, including *Bryothamnion triquetrum, Caulerpa sertularoides* and *Caulerpa mexicana*. *C. sertularoides* was the most dominant

macroalgae species observed. Macroalgae was observed growing within the sand on its own, amongst the seagrass beds and along the rocks and riprap boulders along the shoreline.

Hard and Soft Coral Communities

Five (5) species of stony corals (*C. arbuscular, O. robusta, S. bournoni, S. hyades*, and *S. radians*) and one species of octocoral (*L. vigulata*) were observed throughout the surveyed area (see Table 2). Solenastrea spp. were the most abundant corals observed. Colonies were The soft and hard corals were observed sporadically through the survey area. *L. vigulata* was most abundant offshore towards the west end of the transects growing on rocks or in the sand. Most of the hard corals were observed growing on rocks in deeper water, as well as, along the riprap surrounding the shoreline.

Hardbottom/Riprap Benthic Communities

The hard substrate observed within the survey area consisted mostly of rock, rubble and riprap boulders. Hardbottom/riprap habitats were predominantely observed along the shoreline, extending off of the nearshore groins, jetties and bulkheads. Occasionally rocks were located within the unconsolidated sandy bottom offshore. Organisms growing on the hard substrate were typical for the west coast of Florida and included macroalgae, turf algae, sponges, tunicates, stony corals, octocorals and occasional oysters (See photographs in Appendix C).

5. DISCUSSION

The submerged lands offshore of the project area consist of patchy seagrass beds, sparse macroalgae and occasional hard and soft corals. Should the City wish to move forward with redesign of the Bay waterfront as currently proposed, impacts to marine resources may result. Avoidance and minimization efforts in the form of design features that do not pass over, fill or directly impact seagrass and coral resources is recommended. Otherwise, appropriate compensatory mitigation for these impacts will be required by federal and state agencies.

REFERENCES

Sarasota Seagrass. 2018. Sarasota County Wateratlas.
http://www.sarasota.wateratlas.usf.edu/seagrass/#sarasota-seagrass

Sarasota County. 2018. Sarasota County Water Atlas Map. http://maps.wateratlas.usf.edu/sarasota/

APPENDIX A

Date: 7-31-18
Surveyor: CAH

SARASOTA
~~Bass Pro Marina~~
Benthic (non seagrass) Survey

	Location	Species	Size (cm)	Condition/Notes	Photo Y/N
T1	Shore line	concrete	rip rap	200 ~ (wetland)	
	rock + MA	Acanthophora	C	sertularopsis 200-145	
		scatterduster	worms		
145	-10' Sand +	shell + small	fist size	rock, starfish, Acanthophora	
	93 feet	18cm	Occulina robusta	, rock urchin	
	10' - 25'	HW to	South of TS	40-55%	
	Substrate	dark grey	silt	w/ shell	
T2	0 - 5	Hw	sparse clump	silty grey sediment w/shell	
	5 - 10			silt /shell	
	32			Pipe debris w/ 15 + Epipelagic 3 in sorted, found	
	45	Hw	very sparse		
	49	Hw	VS		
	54	Hw	VS		
	58 - 83	Bed Hw	4-5		
	83 - 95	Sf + Hw	5		
	95 - 122	Sf	2-3		
	122 - 137	Sf	25-50%		
	137 - 144	Sf C. Spp			
	144 - 157	Sf	50%		
	157 - 167	Sf + TT	25%		
	167 - 178	Hw TT Sf	25%		
	178 - 202	TT Hw Sf	75		
	202 - 212	Sf, Hw			
	212	Hw		Drift wood eat little acc. rock	
			Shore	line rip rap	

TRANSECT 5

0-82 Sandy - Silt clay w/ shell (occasional bottle/can debris)

@ 83-86 Sparse shoots of Hw

86-104 barren SL

105-110 Sparse > 10% Hw

110-165 barren SL

166-175 Hw 25%

175-209 Hw + Sf > 25%

210-221 Hw 1-10%

221-237 Barren

239-262 Hw 1-10%

262-270 Occ rock w/ Acanth

270-278 Hw - 10% w/ Acanth

End 12:40

T4 0-34 S/shell

34-106 Silt/shell/rock (small fist size) spaghetti worms

@ 61 1 shoot of TT

@ 98 25 cm leptopterogaigia

106-113 C. sert sponge, 15cm leptopt

@ 116 leptopt

@ 120 4 cm S. burn

106- Silt Shell occ rock rock urchin

@ 126 2 leptopt ~ 20cm

135-145 30cm lepto / C. sert 30cm lepto

145-200 HB w/ C. sert

8cm Occ. rob

25-35 leptopt

30cm S. burn @150

Sponge

S

35cm S. burn 154

S. burn 155

150. rob @154

Reef tunicates

S. radians feather dutchman

rock urchins

15 ends cut top of

Grain all sand

coral C. sert

habitat

Date: 7-31-15
Surveyor: CAH

Bass Pro Marina
Benthic (non seagrass) Survey

SARASOTA 90° 3'11.5 lines

Location	Species	Size (cm)	Condition/Notes	Photo Y/N
0 - 61			Shell + occ sponge	off
61 - 103	Tt sparse			
63 - 161			shell	
@ 157	Hw sparse clump			
162 - 230	Sf	75-100%	lots of epiphytic algae	
219	Hw			
231 - 236	Sf	sparse		
239	1 toon	5 cm		
236 - 257			shell leaf litter	1 foot
Sandy beach natural shoreline				
0 - 43			shell silt occasional clam & ft	
24 - 50	Sf - drift MA		stripped burr fish	
	c. ser* 1-25%			
50 - 67	Sf (25-50%) + drift MA			
67 - 79	Shell			
80	Sf 25-50%			
114 - 154	Hw 75%			
155 - 173	Hw+Sf 50%+25%			
174 - 179	Sf 50%			
180 - 188	Hw + Sf	10-25%		
189 - 220	Sf + occ Hw	0-25%		
220 - 249	Sf 75-100%			
250 - 255	Hw	10%		
255 - 280			Sand	
	DONE		1:44 pm	

Date: 1-31-2018

Surveyor: CAH

SARASOTA

Bass Pro Marina

Benthic (non seagrass) Survey

65° water temp

Location	Species	Size (cm)	Condition/Notes	Photo Y/N
Canal at entrance		6' - gets deeper	silt/mud bottom	
stability	3-6 inches		no rfs	
50' West of			HW sparse grass	
	C. serr			
30'	Sand/silt			
50-70	Sand/silt	~	6" to 1' VIS	
across the canal	S→N		5' water depth	
50 feet	from S. bank	HW	sparse 1-3'	
is				
105 - end of	TS	1-9'	HW	5% - 25% grass and
	C. serr			
Jetty	North side canal		- Oysters red turf algae	
red mangroves	on riprap			
			END 2,49 pm	

CANAL TS Facing →

SARASOTA

Date: 8

Surveyor: AH

Las Olas
Marine Resource Survey

Area A

Transect	Distance (ft)	**Description** ID & density of seagrass, MA, coral, ect. + substrate characteristics
		Shoreline is sandy with rock rubble from
		adjacent rock areas. Nearshore area is [illegible]
North		transitioning to TT bed sand - Hw + SF [illegible]
center		Sheepshead fish, crabs
South		Shoreline rock, [illegible] to sand [illegible]
End		
Center	Sand to Hw beds (dense) then to SF
Far N	end - leaf litter [illegible] move to [illegible] Hw intermixed
	with leaf litter [illegible] distribution
	Grass about 75-100 / [illegible]
		9:10 am
0 -	160	sand silt occ clams + shell
160 -	191	m. a/silt / shell + occ C. sert
	@ 191-197	sparse Hw + C. sert
197 -	223	C. sert silt + shell
223	227	Tt + C. sert
227 -		Rock w/ C. sert worms Reef tunicate
	@ 234	12 cm Sid rad sp / Solenastrea sp
		Rocks part of Rip Rap on shoreline
		covered in C. sert w/ tunicates
		worms, sheepshead gobies
		occurs, sponge
		END 9:30 am

ransect 9 Start 3:51 pm

0 — 114 SILT + shell — very silty 6" visibility max

114 — 180 occ. c. sert / silt

180 — 200 sandy / shell

@ 187 [illegible] shoot

@ 217 HH 1m² long patch

HILL AREA B East around TS9

Rocks w/ C. sert

sand / shell / small rocks / leaf litter

END 4:07pm

TRANSECT 8 ~~7ft~~ depth 4" VIS

0 SILT / MUD occ. snail Bad VIS / very silty

183 — 220 occ. c. sert

220 — 300 sandy / silty / occ c sert

END 4:25

TRANSECT 10

SOTA

85° water temp

Date: 7-31-18

Las Olas

Surveyor: CFH

Marine Resource Survey

9 feet depth

Transect	START Distance (ft)	3:11 pm **Description** 3 feet VIS ID & density of seagrass, MA, coral, ect. + substrate characteristics
0'	4	S. bourn 8 cm + various sponges on
		rock surrounded by silt + shell
4'		S. bourn w/ worms + 1 6 cm tall
		15cm tall sponge on rock snapping shrimp
9 ft		small sponge 15cm tall pale cm tall S. ...
		16
11-24		Hardbottom mixed w/silt sediment fish
@ feet		8cm S. bourn
@17-18 feet		O. robusta 1" org + S. bourn
		sponges worms S. bourn
27-65		SILT ... leptopi + shell
67	75	Silt / shell C. sert spagetti worms
@	70 feet	tire w/ leptos + S. bourn
96-100		HW sparse
100-130		SF rock urchins epiphytes occasional coral
131	150	hundreds baby snails sponges reef tunicate
		rock / shell C. sert cm S. bourn
		shrimp, worms Padina SC
		Shoreline - rip rap
		END DIVE 3:35 pm
0-100		Silt + shell C. sert ... 3:38 PM
@		Rock w/ sponge leptopi S. bourn
101	HW sparse	
102 -		+ IB C. sert shrimp turf algae sponges Reef ...
		shell sponges worms 4" S. bourn
		End at Rip Rap

12

9 feet depth

TS 11

Date: 8/1/12 Las Olas SARASOTA

Surveyor: CAF Marine Resource Survey

South end of project

Transect	Distance (ft)	Description ID & density of seagrass, MA, coral, ect. + substrate characteristics
23	m	Sand + shell 13cm leptopt
	0 - 15	Sand / shell occ [illegible] rch n
	75 - 107	Sand / shell occ sparse , sert
	@ [illegible]	82 1 handsize patch Hw
	107 - 116	Sand / Shell tube worms
	116 - 133	[illegible] sparse Hw + C sert
	136 - [illegible]	Hw [illegible] Sand / Shell Juv. fish 5-25% Hw Sheepshead
	159 - 173	Sand / shell
	174	Rock Acanthaphora , worms , C. sert
		large sheepshead Padina SC , sponges
		End @ Seawall 10'05cm
22	0 - 26	Sand + Shell
	26 - 50	Occ rock w/ sponge worms + Acanthaph + Big rock
		tunicates , rock urchin intermixed in sandy
		sand
	51 - 80	Sand / shell
	@ 78	S. barnoni 8cm on rock
	80 - 97	Hw bed 25% occ. [illegible] + C. sert
	97 - 125	Denser thicker Hw bed 50-75%
	1[illegible] - 1[illegible]	dense Hw area + sparse TT
	1[illegible] 150	Hw bed
	150 - 171	25% Hw - 50% Hw
	@ 171	TT
	174 - 184	Sparse Hw
		Shell sand
	184	Rock , occ sponge , worm Riprap protection
		small beach cove
South of RipRAP n Cove		
SOUTH END - All sand small rock + leaf litter up to light [illegible]		
CENTER Very Dense 75-100% Hw bed starts 15 f [illegible] short		
		w/ occ. C. sert stops to the north where riprap is
		submerged then sand + rip rap w/ C sert
		Shore line is red + black mangroves

+ Acanthaphora

Hickory Bounce

Date: 5/1/18 | Surveyor: [illegible]

Las Olas
Marine Resource Survey

Transect	Distance (ft)	Description ID & density of seagrass, MA, coral, ect. + substrate characteristics
16	0 - 10	Sand / shell occ. rock w/ sponges hydroids
	@ 0'	10cm S. rob } leptos 6-12cm
	@ 3'	11cm bleached & brown }
	@ 6'	12cm S.b.
	@ 8'	100cm long Sb growing on pipe 16cm tall!
	10 - 99'	Sand / silt / shell
	99 - 139	sponge 11w 1-5% patchy
(10.5)	139 - 151	Rock rip rap tun sponge MA pk
		END 11:55
PURPLE DICK 15	10.5	10 feet Deep at 0' Start TS @ 12pm
	0 - 68	Sand / shell + occ v. rare urchin
	@ 61	9cm lepto + sponge
	68 - 130	silty sand occ sponge hydroid loop tunicate
	@ 76	9cm + 7cm S.b. 21cm tall lepto
	@ 84	29cm lepto + 6cm Sb
	@ 90	4 sbs (6, 6, 7, 9cm) sponges + hydroid
	@ 96	9cm Sb
	@ 101	11cm Sb
	@ 106	20cm lepto
	@ 110	20cm lepto
	@ 113	7cm Sb

1:15 6ft 1 foot [illegible]

Date: 8 18
Surveyor: [illegible]

Las Oas Marina
Bulkhead Survey - Stony Corals

Location on Bulkhead	Species	Size (cm)	Condition/Notes	Photo Y/N
19	CANAL	TRANSECT		
0 - 36	sand / shell	occas rock + C. sert + V. uchn [illegible]		
@ 3'	Sb 7cm	16 to [illegible] w/ [illegible]	Helmit crab	
@ 9	lepto 32cm		Hydroids	
@ 14	4cm Sb	O. rub 4cm		
@ 16	10 cm Sb			
@ 19	22 cm Sb +	25cm Lepto	+ 4cm Sb	
@ 23	18cm Sb			
@ 26	40cm + 43 cm	lepto		
@ 29	36cm + 37	[illegible]		
@ 33	Sb 7cm			
37 - 47'	Hw dense	15%		
47 - 120	sand / shell			
120 - 206	Sand / shell	/ leaf litt		
206 - 257	Hw strip	dense grass	down center of channel to	
	none Sb			
257 - 330	Sand + leaf	litter / [illegible]	/ occ. C. sert	
330 -	much anoxic			

SARASOTA

Date: 2/1/18
Surveyor: CAH

Las Olas
Marine Resource Survey

Transcect	Distance (ft)	**Description** ID & density of seagrass, MA, coral, ect. + substrate characteristics
21	0-15	Sand / Shell 50' right of start
	15-47	Sand/shell leptopterogorgias 16cm - 32cm S
		rock w/ sponges C. sert, acanthoph 8cm bleached
		(yellow coral) reef tunicates S. bourn
	@25	S. bourn 20cm diseased white band around it
		shrimp, strawberry tunicate large pink/white
		hydroids, tunicate
		20cm S
	@29	PPO 30 cm 29cm
	@34	S. bourn 20cm numerous reef rock ok tunicates
		Variegated Rock urchin
	47-63	Sand / Shell occ. C. sert + V rock urchin
	63-71	Hw 15% + occ C. sert
	71-111	Hw bed 25-50 occ V. rock urchin w/ sand patches
	111-114	Sparse Hw
	114-133	Sand / Shell
	133-	Rocks from groin protecting small shallow bay
		covered in sponges, big tunicat, worms, C. sert
		turf algae,
	@ 134	2 S. bourn (8cm + 10cm)
	144-155	Dense C. sert up to groin
		END at 11:00 am
18 start	0-27	rocks / Sand/ Shell occ sponges + lepto 13cm 18cm
		Acantho, C. sert, Strawb tunicat, hydroids reef 8cm 25cm tunicate
	@ 12	O. rob 14cm bleached areas shrimp
	27-75	Sand / Shell / occ bare rock
	@ 50	2 leptos in sand (7+15 cm)
	54-69	C. sert 2 - 3 rock leptos 15cm @54
	@ 59	15cm S. bourn
	75-78	rock sand/shell
	79-87	Hw 25% bed Juv fish
	87-128	Hw Sf + TT 50% hundreds baby snails
	128-173	Sf + Hw bed 75 - 100%
	173-177	shell + sm rocks reef litter

177-181 Rocks to groin + sparse Hw
~ Acantha 4cm

TRANSECT 18

3-1-18

TS #17
11:30 am

0 - 14 Sand/Shell

14' - 26 Occ rock + sponge
Sand/shell

@ 20 6cm S. bour +
@ 21 25cm tall to
@ 23 12cm S.b.

26 - 35 Sand / Shell

35 - 45 HB/rocks nudibranch, shrimp leptos [8cm 27cm 20cm >5cm

@ 38 S.b (5cm : 5cm)

45 - 98 Sand w/ some shell

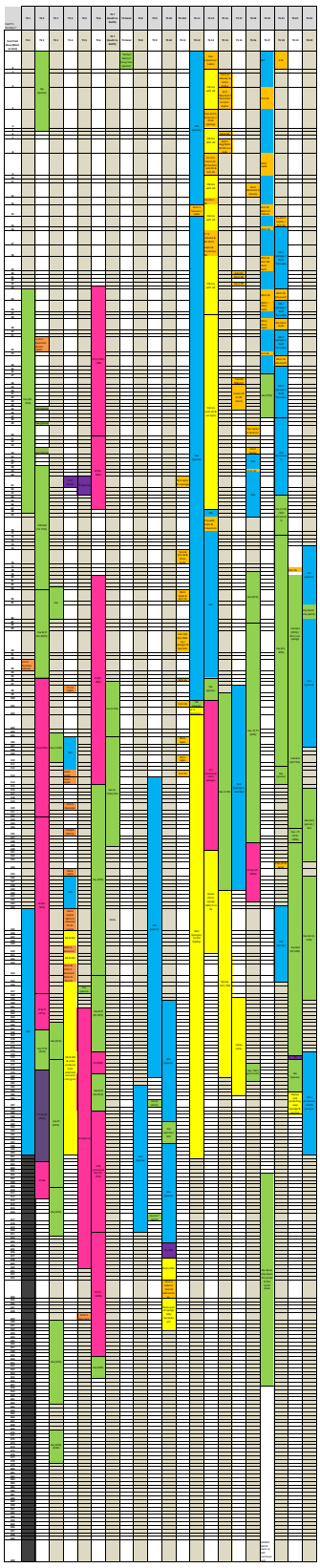
98 - 139 leaf litter w/ occ. c

140 - 159 Sand

159 - 185 cobble rip rap
R.V. Rap typical

=1" @ 11,110 cm

APPENDIX B



APPENDIX C

MAP KEY

- HARD BOTTOM/ ROCKS
- CORAL
- MACROALGAE
- SEAGRASS (Syringodium filiform)
- SEAGRASS (Haladule wrightii)
- SEAGRASS (Thalassia testudinum)
- TRANSECT BUOY

T1

T2

T3

T4

T5

T6

T7

T CANAL

ARMORED SHORELINE, ROCK REVETMENT (TYP.)

AREA A

MANGROVES

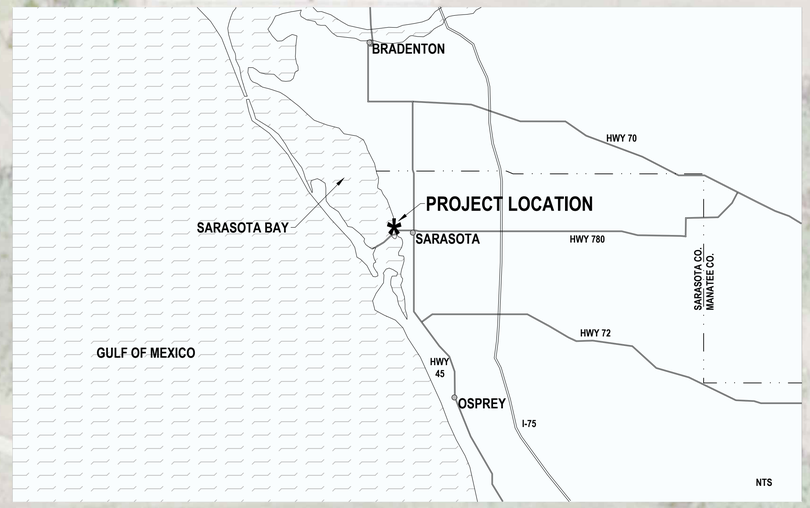
SARASOTA BAY

CENTENNIAL PARK AND BOAT LAUNCH

MATCH LINE - SHEET 1

MATCH LINE - SHEET 2

PROJECT LOCATION MAP



N

0 40 80

SCALE IN FEET 1" = 40'
@ 24" x 36"

Edgewater resources
2075 N Powerline Road, Suite 4
Pompano Beach, FL 33369
P: (954) 400.1401
F: (269) 932.3542
www.edgewaterresources.com

PROJECT TITLE:
BENTHIC RESOURCE SURVEY
SARASOTA, FLORIDA

SHEET TITLE:
BENTHIC RESOURCES EXHIBIT - NORTH

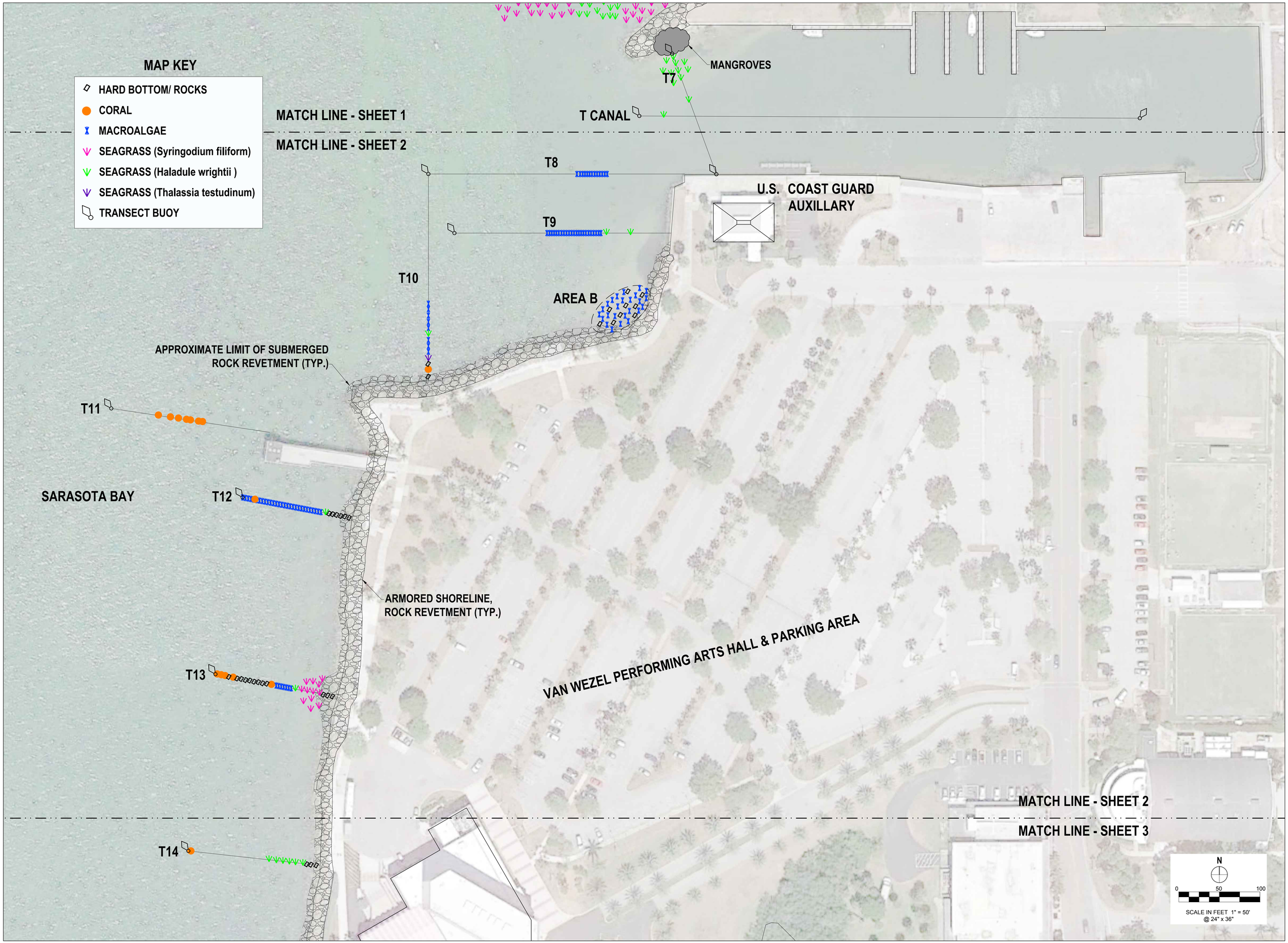
NO.	DATE	REVISION

ISSUED FOR:
REVIEW

SEAL:

DATE:	8/27/18
PROJ NO.:	18-47
SCALE:	VARIES
DESIGNED BY:	CAH
DRAWN BY:	MK
REVIEWED BY:	CAH

SHEET NUMBER:
1 of 3



Edgewater resources
2075 N Powerline Road, Suite 4
Pompano Beach, FL 33369
P: (954) 400.1401
F: (269) 932.3542
www.edgewaterresources.com

PROJECT TITLE:
BENTHIC RESOURCE SURVEY
SARASOTA, FLORIDA

SHEET TITLE:
BENTHIC RESOURCES EXHIBIT - CENTRAL

NO.	DATE	REVISION

ISSUED FOR:
REVIEW

SEAL:

DATE:	8/27/18
PROJ NO.:	18-47
SCALE:	VARIES
DESIGNED BY:	CAH
DRAWN BY:	MK
REVIEWED BY:	CAH

SHEET NUMBER:
2 of 3

MAP KEY

- HARD BOTTOM/ ROCKS
- CORAL
- MACROALGAE
- SEAGRASS (Syringodium filiform)
- SEAGRASS (Haladule wrightii)
- SEAGRASS (Thalassia testudinum)
- TRANSECT BUOY

MATCH LINE - SHEET 2

MATCH LINE - SHEET 3

T14

APPROXIMATE LIMIT OF SUBMERGED ROCK REVETMENT (TYP.)

VAN WEZEL PERFORMING ARTS HALL

T15

ARMORED SHORELINE, ROCK REVETMENT (TYP.)

SARASOTA BAY

MANGROVES

T16

T17

MANGROVES

T18

SARASOTA INSTITUTE OF LIFETIME

T19

AREA C

T20

N

0 40 80

SCALE IN FEET 1" = 40'
@ 24" x 36"

Edgewater resources
2075 N Powerline Road, Suite 4
Pompano Beach, FL 33369
P: (954) 400.1401
F: (269) 932.3542
www.edgewaterresources.com

PROJECT TITLE:
BENTHIC RESOURCE SURVEY
SARASOTA, FLORIDA

SHEET TITLE:
BENTHIC RESOURCES EXHIBIT - SOUTH

NO.	DATE	REVISION

ISSUED FOR:
REVIEW

SEAL:

DATE:	8/27/18
PROJ NO.:	18-47
SCALE:	VARIES
DESIGNED BY:	CAH
DRAWN BY:	MK
REVIEWED BY:	CAH

SHEET NUMBER:
3 of 3

APPENDIX D

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
1	7/31/18

Photo Location:
T2

Description:

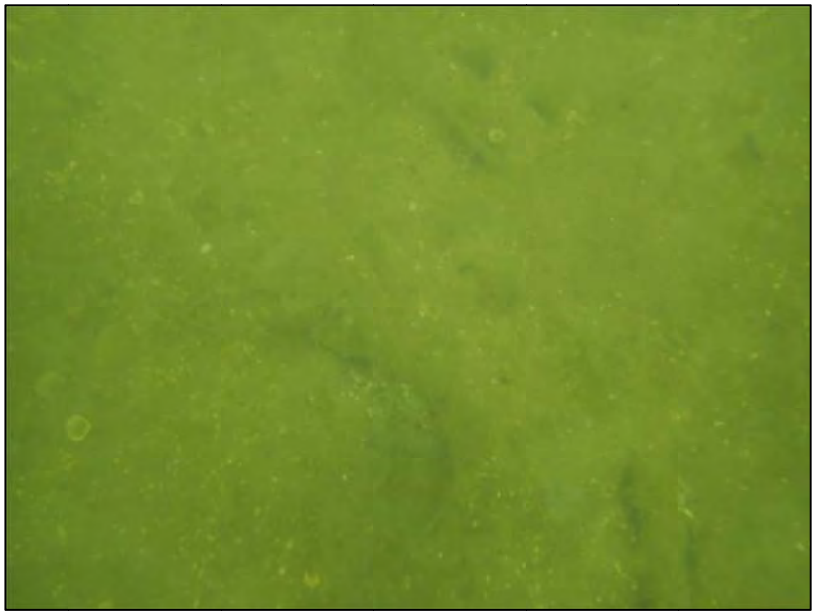
A *Haladule wrightii* seagrass bed located along Transect 2.

Photo No.	Date:
2	7/31/18

Photo Location:
T3

Description:

The submerged bottom within most of the survey area consisted of sand and silt.



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
3	7/31/18

Photo Location:
T4

Description:

Variegated Rock Urchins were observed throughout the survey area along the sandy substrate, seagrass beds and rocky shoreline.

Photo No.	Date:
4	7/31/18

Photo Location:
T4

Description:

Tunicates were observed growing along the riprap shoreline throughout the survey area.

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
5	7/31/18

Photo Location:
T4

Description:

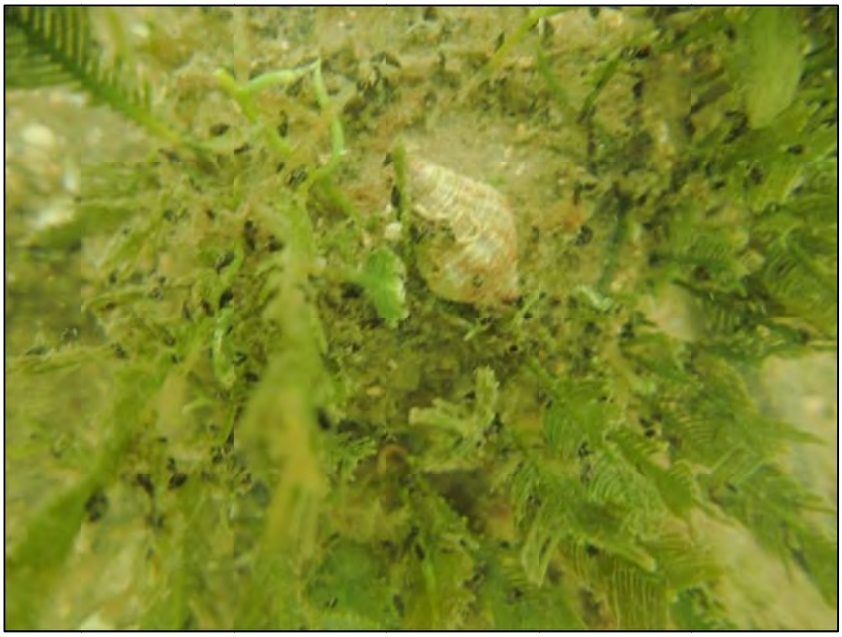
Solenastrea bournoni were the most commonly observed corals growing within the survey area.

Photo No.	Date:
6	7/31/18

Photo Location:
T4

Description:

Numerous species of snails including these young juveniles (small black dots) were observed in the seagrass and macroalgae habitats throughout the survey area.



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
7	7/31/18

Photo Location:
T4

Description:

A large *Solenastrea bournoni colony observed along Transect 4.*

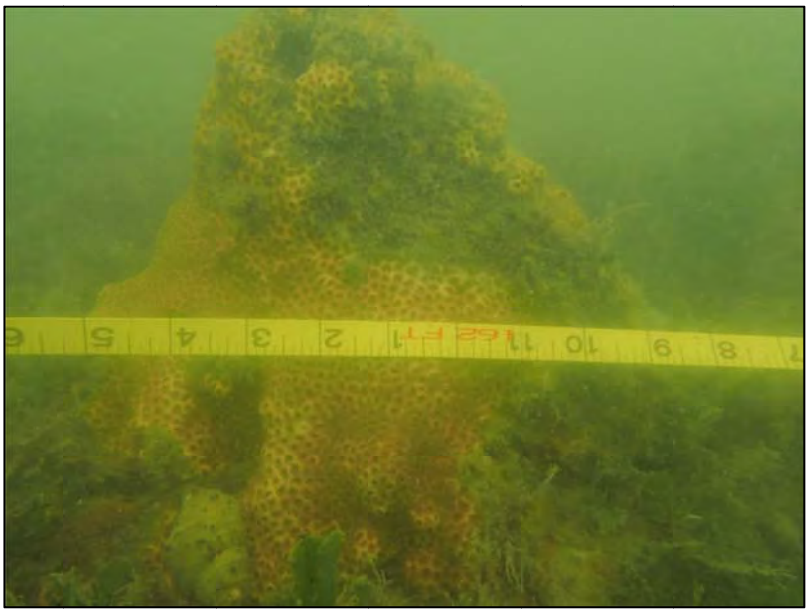


Photo No.	Date:
8	7/31/18

Photo Location:
T4

Description:

Occulina robusta corals were observed growing on rocks throughout the survey area.

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
9	7/31/18

Photo Location:
T5

Description:

A mixed seagrass bed of *Haladule wrightii* and *Syringodium filiforme* located along Transect 5.

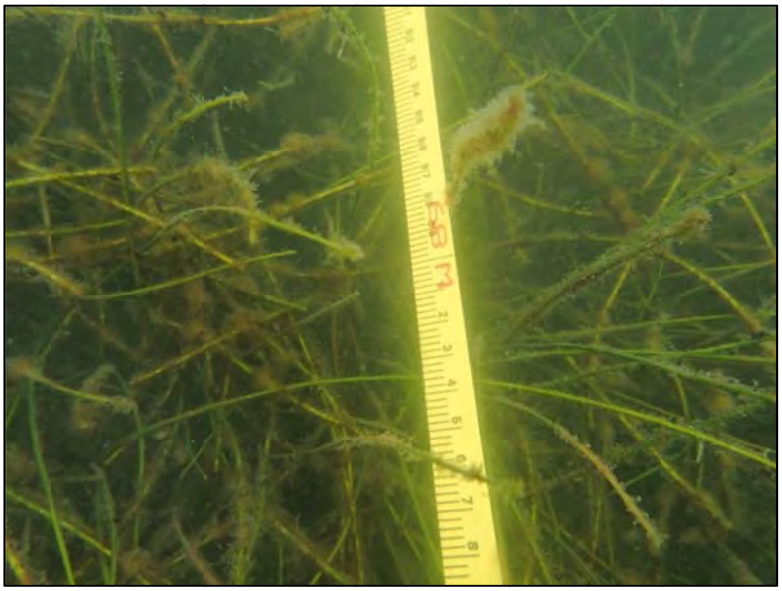
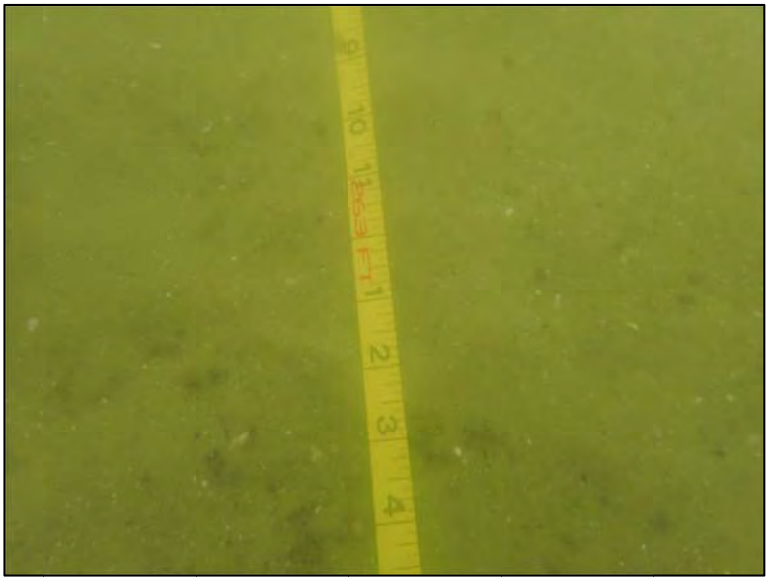


Photo No.	Date:
10	7/31/18

Photo Location:
T6

Description:

The submerged bottom within the survey area consisted of sand and silt as pictured here on Transect 6.



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
11	7/31/18

Photo Location:
T6

Description:

A mixed seagrass bed of *Haladule wrightii* and *Syringodium filiforme* located along Transect 6.

Photo No.	Date:
12	7/31/18

Photo Location:
T7

Description:

Oysters were occasionally observed along the limestone riprap boulders along the shoreline.

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
13	7/31/18

Photo Location:
T8

Description:

The macroalgae *Caulerpa sertularoides* was the most commonly observed macroalage within the survey area.

Photo No.	Date:
14	8/1/18

Photo Location:
T10

Description:

Sparse *Thalassia testudinum* located along Transect 10.

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
15	8/1/18

Photo Location:
T10

Description:

The typical fouling community (consisting of corals, sponges and macroalgae) was located along the riprap shoreline on Transect 10.

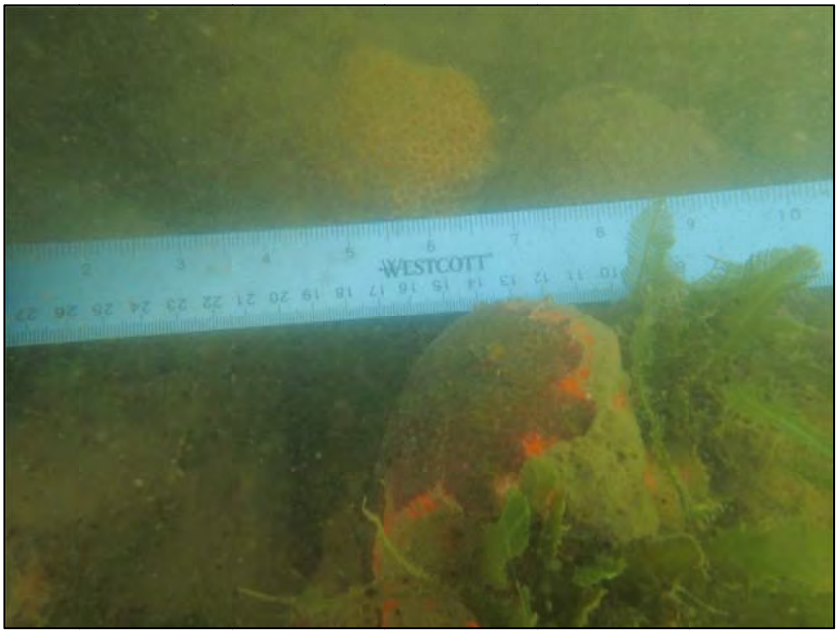
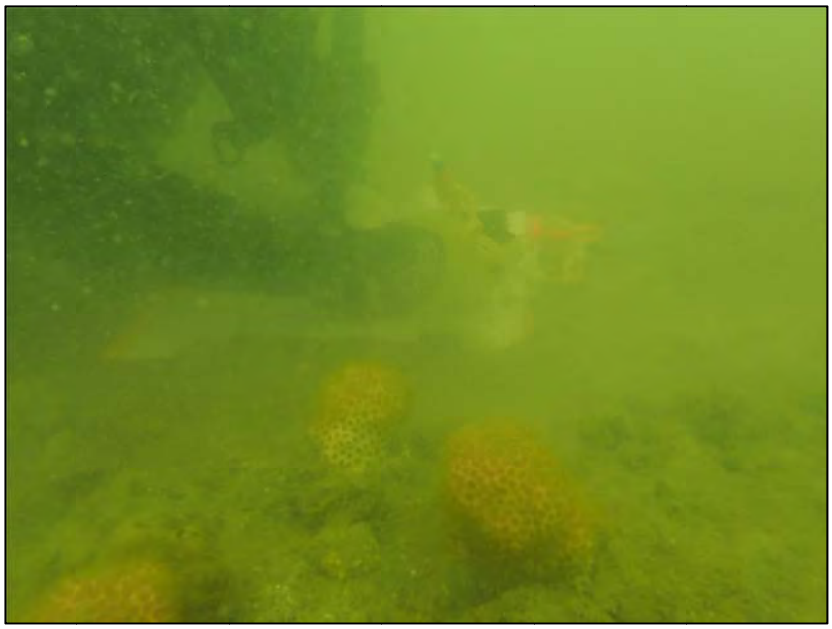


Photo No.	Date:
16	7/31/18

Photo Location:
T11

Description:

Several *Solenastrea bournoni* colonies growing along Transect 11.



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
17	7/31/18

Photo Location:
T11

Description:

Several Leptogorgia virgulata colonies and a Solenastrea bournoni growing on a rock along Transect 11.

Photo No.	Date:
18	7/31/18

Photo Location:
T11

Description:

Occulina robusta corals were observed growing on rocks throughout the survey area.

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
19	7/31/18

Photo Location:
T12

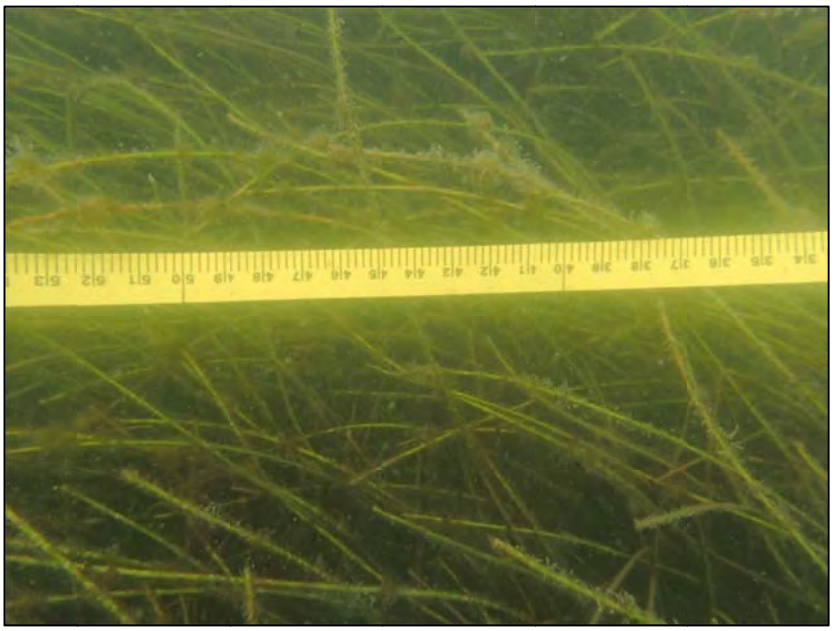
Description:
The typical fouling community (consisting of corals, sponges and macroalgae) was located along the riprap shoreline on Transect 12.

Photo No.	Date:
20	7/31/18

Photo Location:
T13

Description:

A dense bed of *Syringodium filiforme* located along Transect 13.



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
21	8/1/18

Photo Location:
T15

Description:

A large *Solenastrea* sp. colony growing along Transect 15.

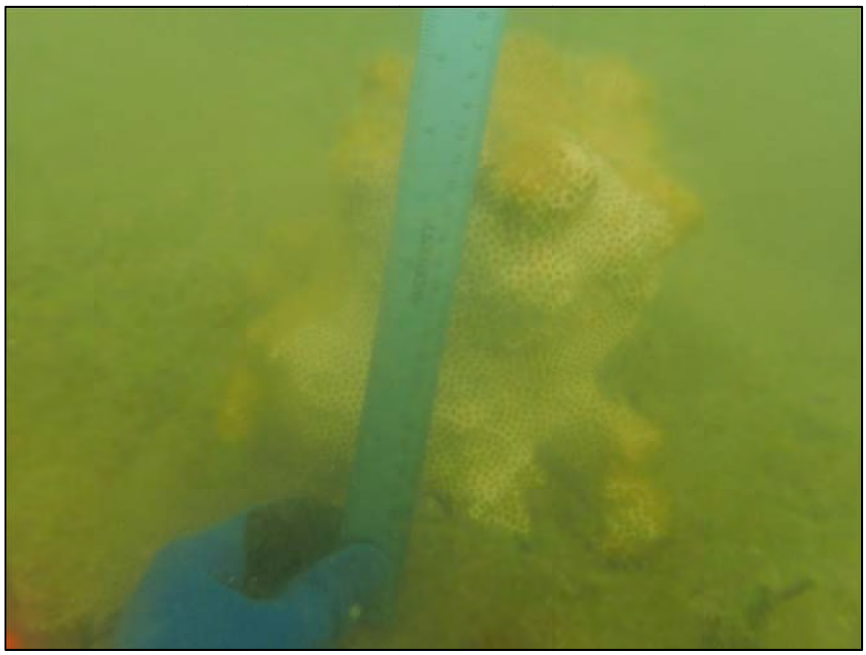


Photo No.	Date:
22	8/1/18

Photo Location:
T16

Description:

The octocoral Leptogorgia virgulata growing on a rock along Transect 16.

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
23	8/1/18

Photo Location:
T16

Description:

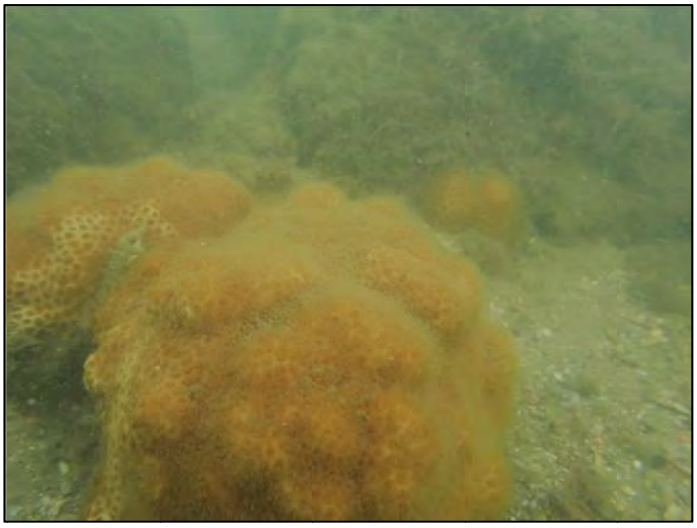
A dense bed of Syringodium filiforme located along Transect 16.

Photo No.	Date:
24	7/31/18

Photo Location:
T16

Description:

Several *Solenastrea bournoni* colonies growing in the nearshore region amongst the riprap.



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
25	8/1/18

Photo Location:
T17

Description:

Sheepshead fish were observed in the nearshore region of the survey area and within the Y shaped canal.

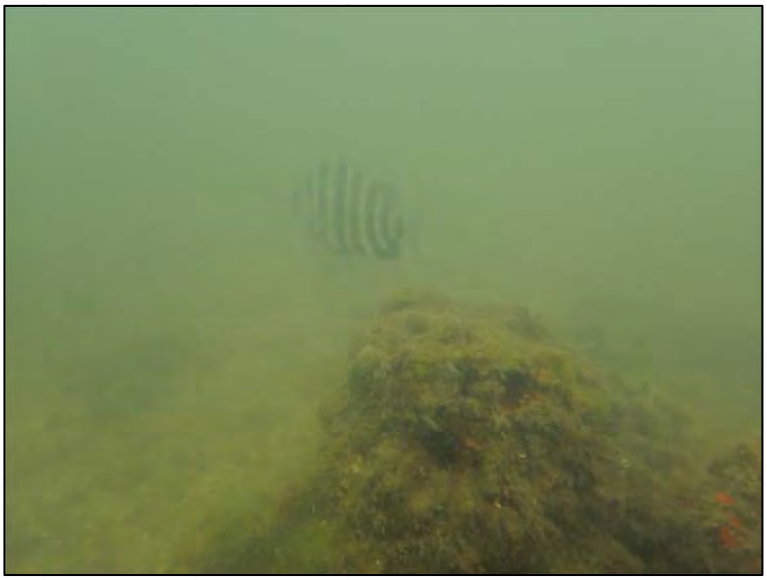


Photo No.	Date:
26	8/1/18

Photo Location:
T18

Description:

Encrusting sponges were observed growing on the riprap along the shoreline throughout the survey area.

Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
27	8/1/18

Photo Location:
T18

Description:

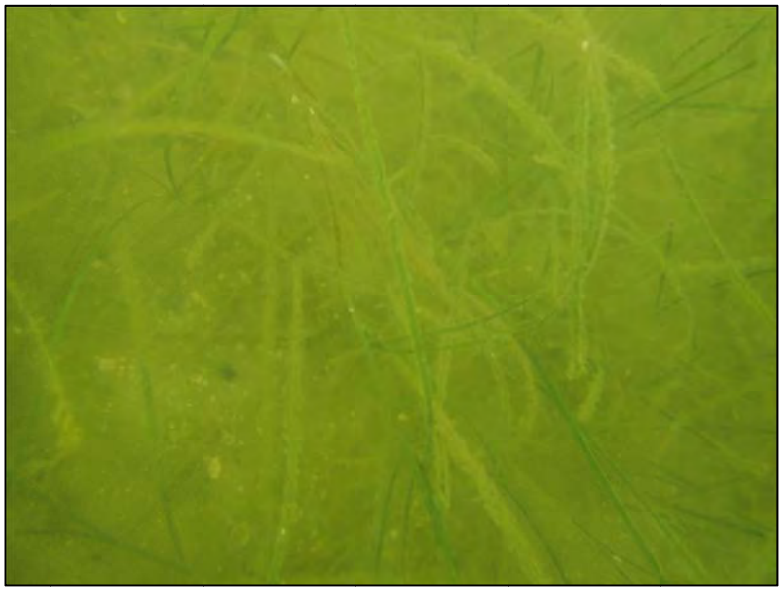
The octocoral Leptogorgia virgulata growing along Transect 18.

Photo No.	Date:
28	8/1/18

Photo Location:
T19

Description:

Seagrass throughout the survey area has a moderate amount of epiphytic growth.



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
29	8/1/18

Photo Location:
T20

Description:

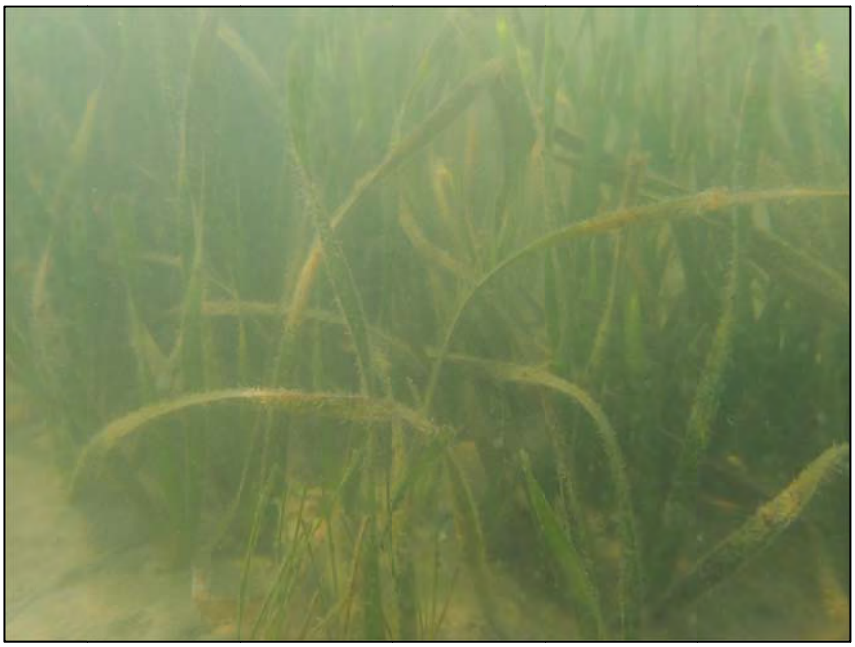
Sparse *Halodule wrightii* growing along Transect 20.

Photo No.	Date:
30	8/1/18

Photo Location:
Area A

Description:

Mixed seagrass bed in the shallow bay area was comprised of *Haladule wrightii* and *Thalassia testudinum.*



Edgewater resources

PHOTOGRAPHIC LOG

Client Name :	Site Location:	Project No.:
Sarasota Bayfront Planning Organization	Sarasota Bay, Sarasota Florida	18-47

Photo No.	Date:
31	8/1/18

Photo Location:
Area A

Description:

Mixed seagrass bed in the shallow bay area was comprised of *Haladule wrightii* and *Thalassia testudinum.*

Photo No.	Date:
32	8/1/18

Photo Location:
Area C

Description:

The Macroalage *Bryothamnion* was occasionally observed along the riprap in the survey area as shown here in Area C.

APPENDIX E

South Sarasota Bay (West)

Sarasota County

Legend

SWFWMD 2006 Seagrass

- Patchy
- Continuous

N
W E
S

0.3 0.15 0 0.3 Miles

South Sarasota Bay (East)

Sarasota County

0.3 0.15 0 0.3 Miles

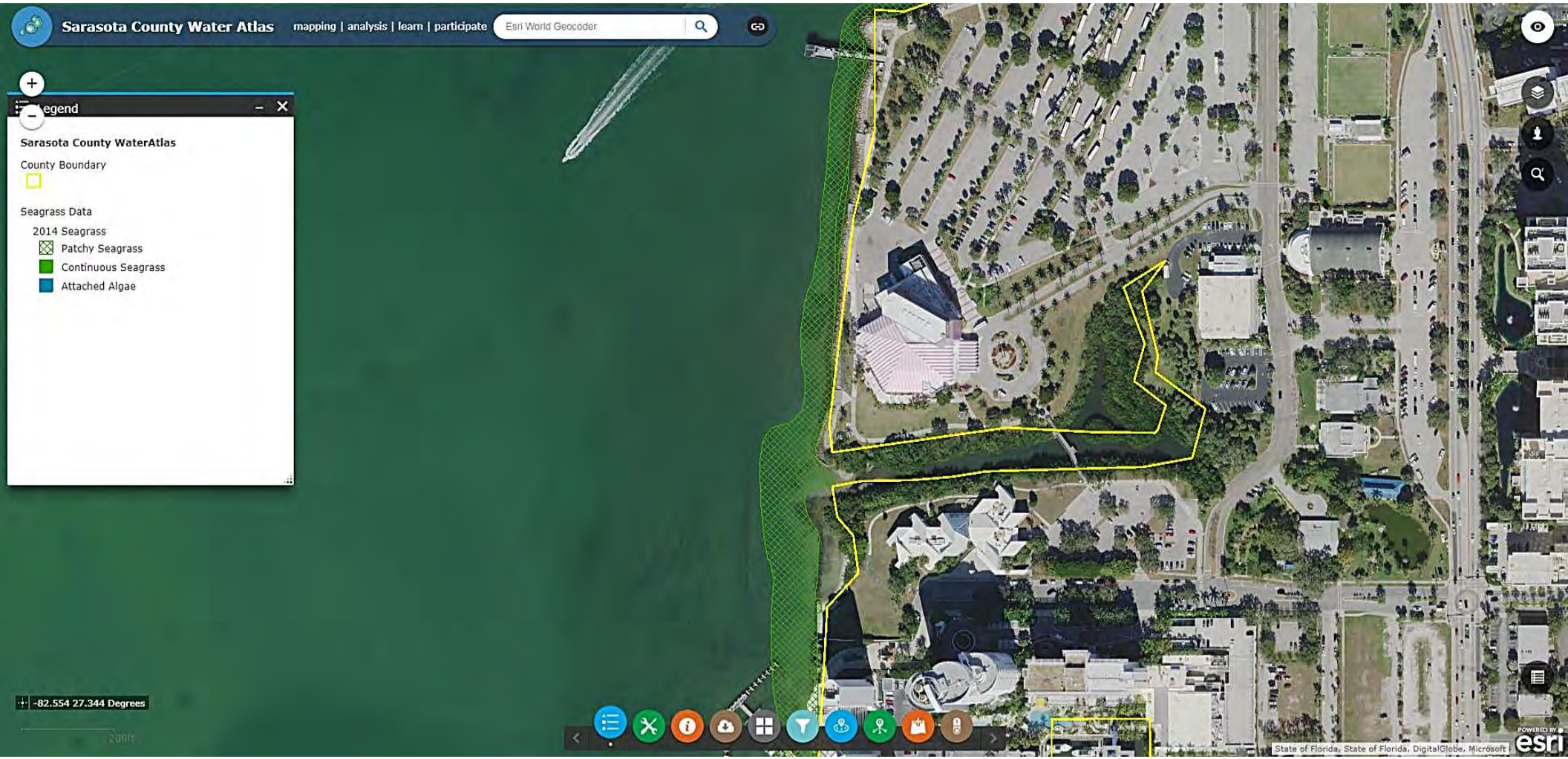
2008 SWFWMD Seagrass

- Patchy
- Continuous
- Rooted Algae

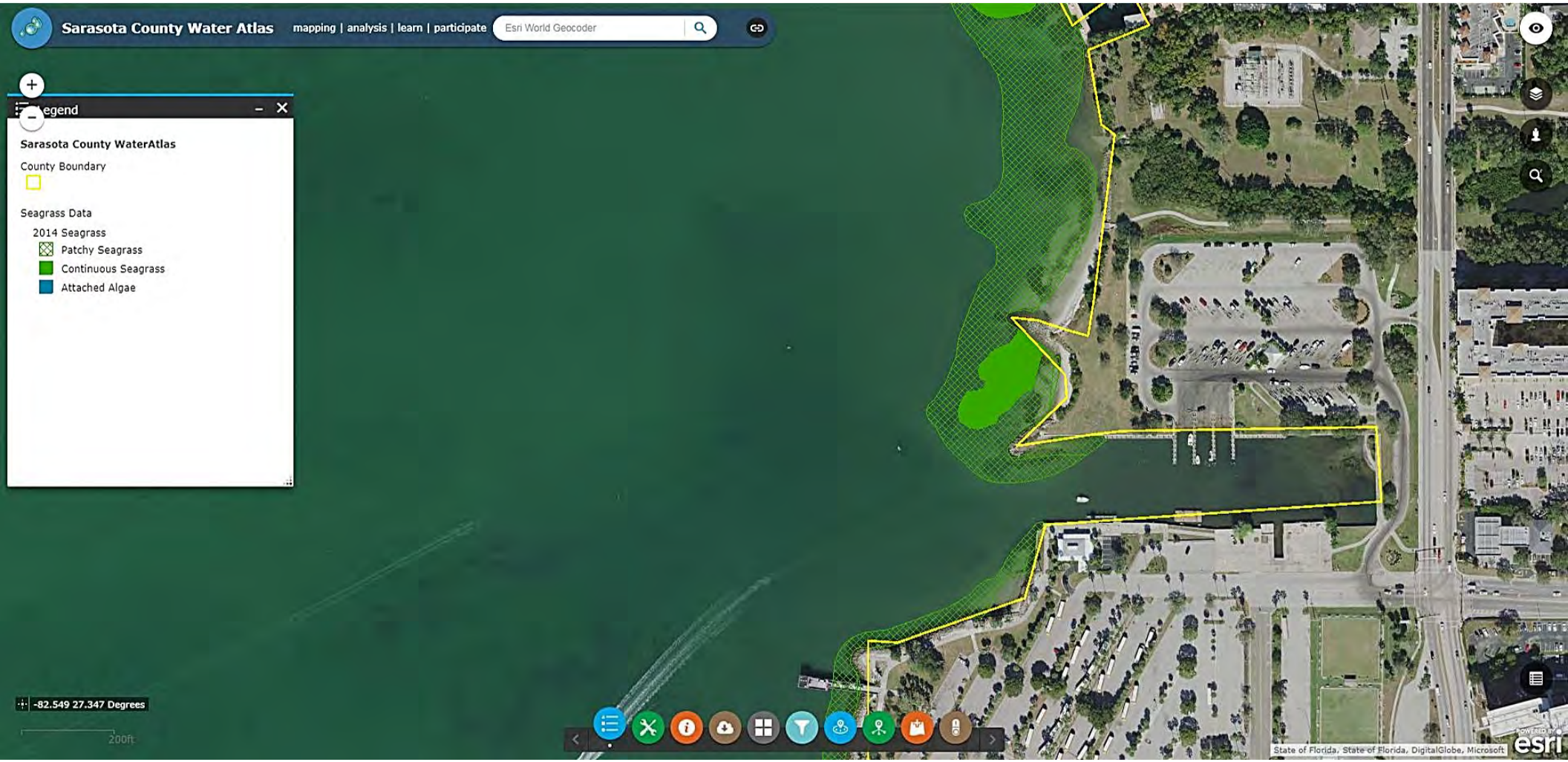
N
W E
S

Sarasota Environmental Aquatics Team
SEA Team

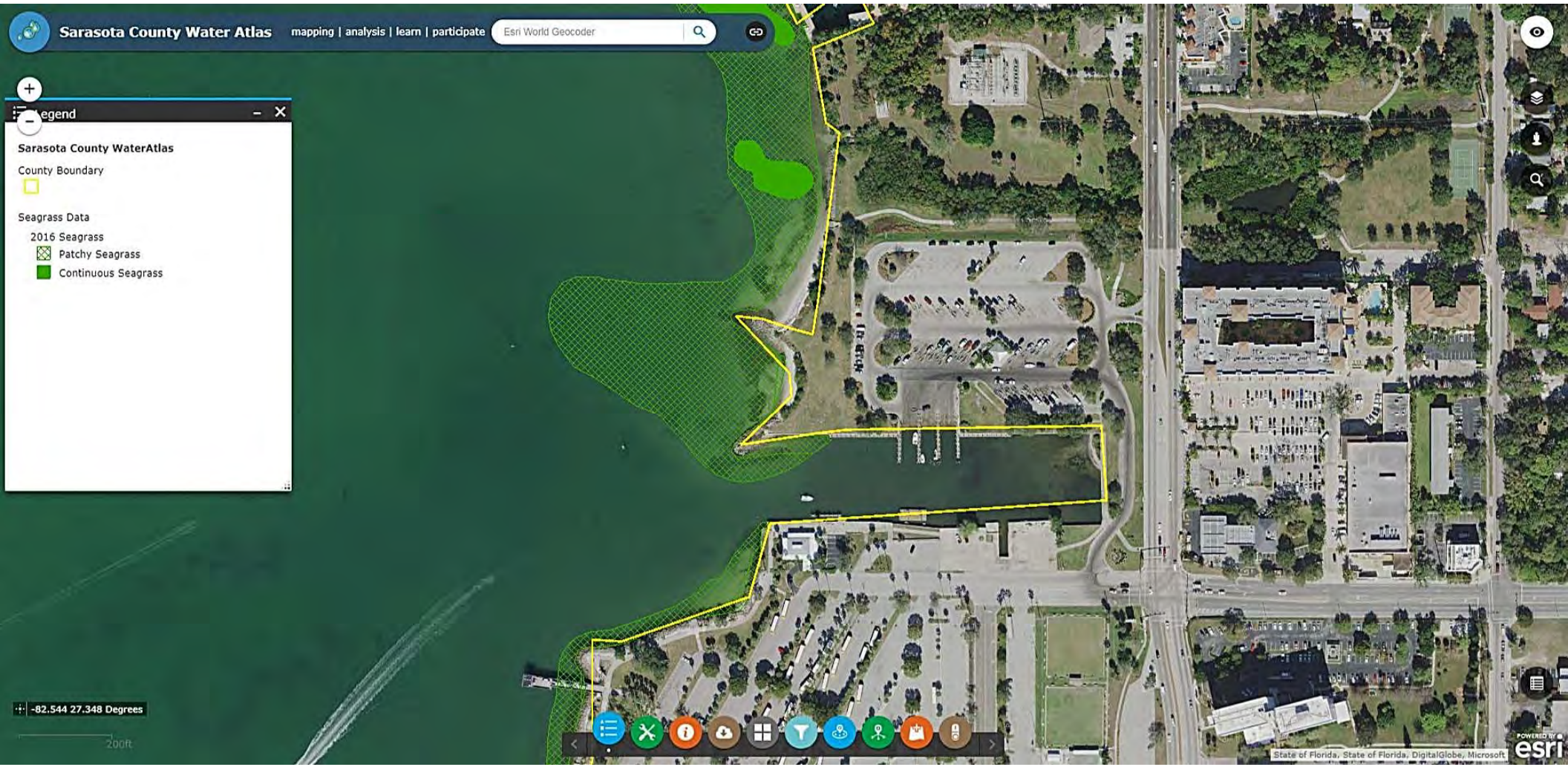
2014 Seagrass Map of the South Project Area



2014 Seagrass Map of the North Project Area



2016 Seagrass Map of the North Project Area



2016 Seagrass Map of the South Project Area