

Extensive SAV Data Collection of South Florida Beach Project Points to Value of Maintained Database for Longterm Analysis

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With special thanks to—

LG2 Senior Scientist and Project Manager Mark Howell

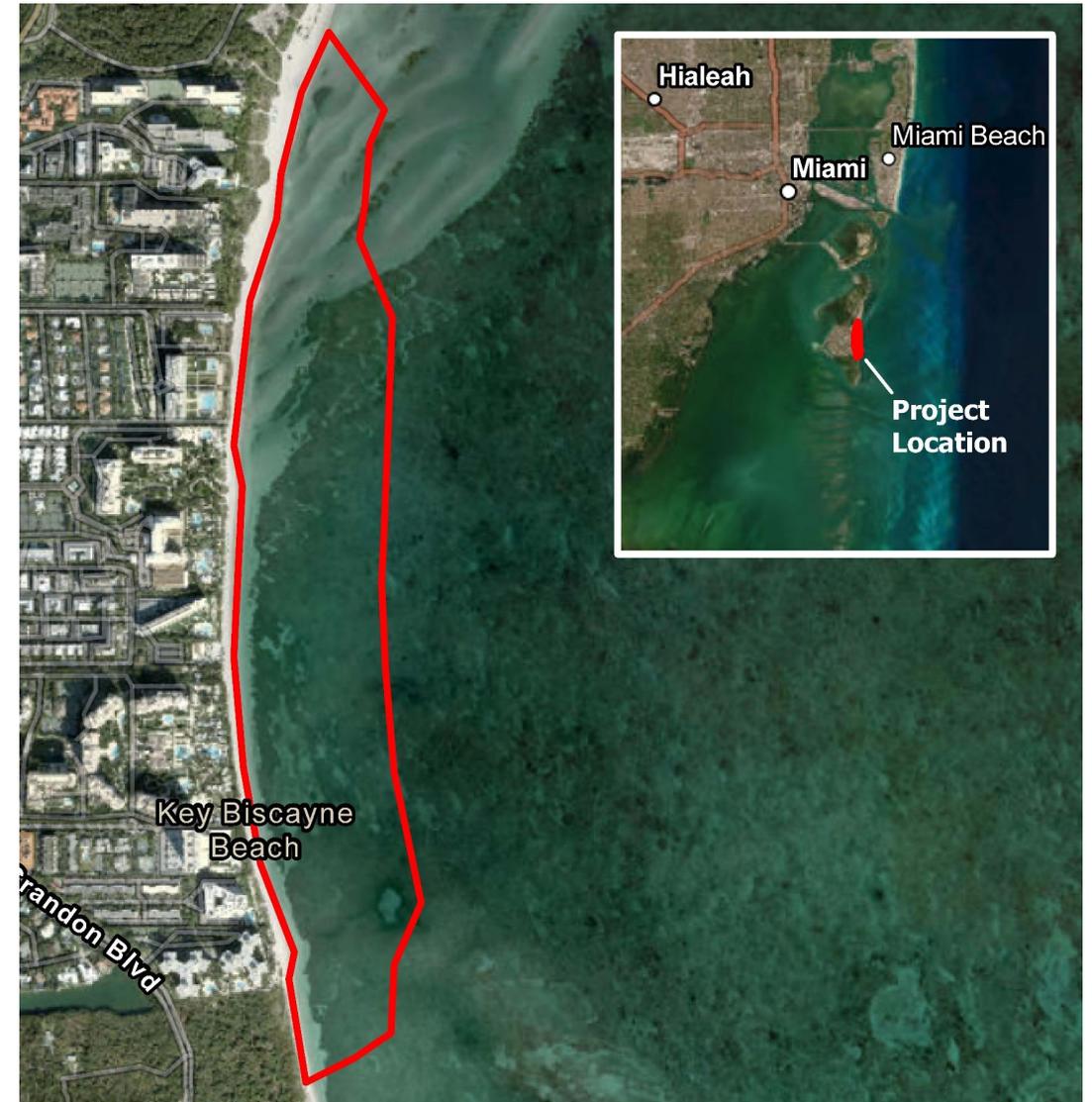
RES legacy SWC dive/technical team Randy Corbin, Natalie Bryce and Lauren Zitzman

EPA FKNMS Water Quality Steering Committee meeting, November 28, 2023



EXAMPLE PROJECT: Key Biscayne USACE SAV Study

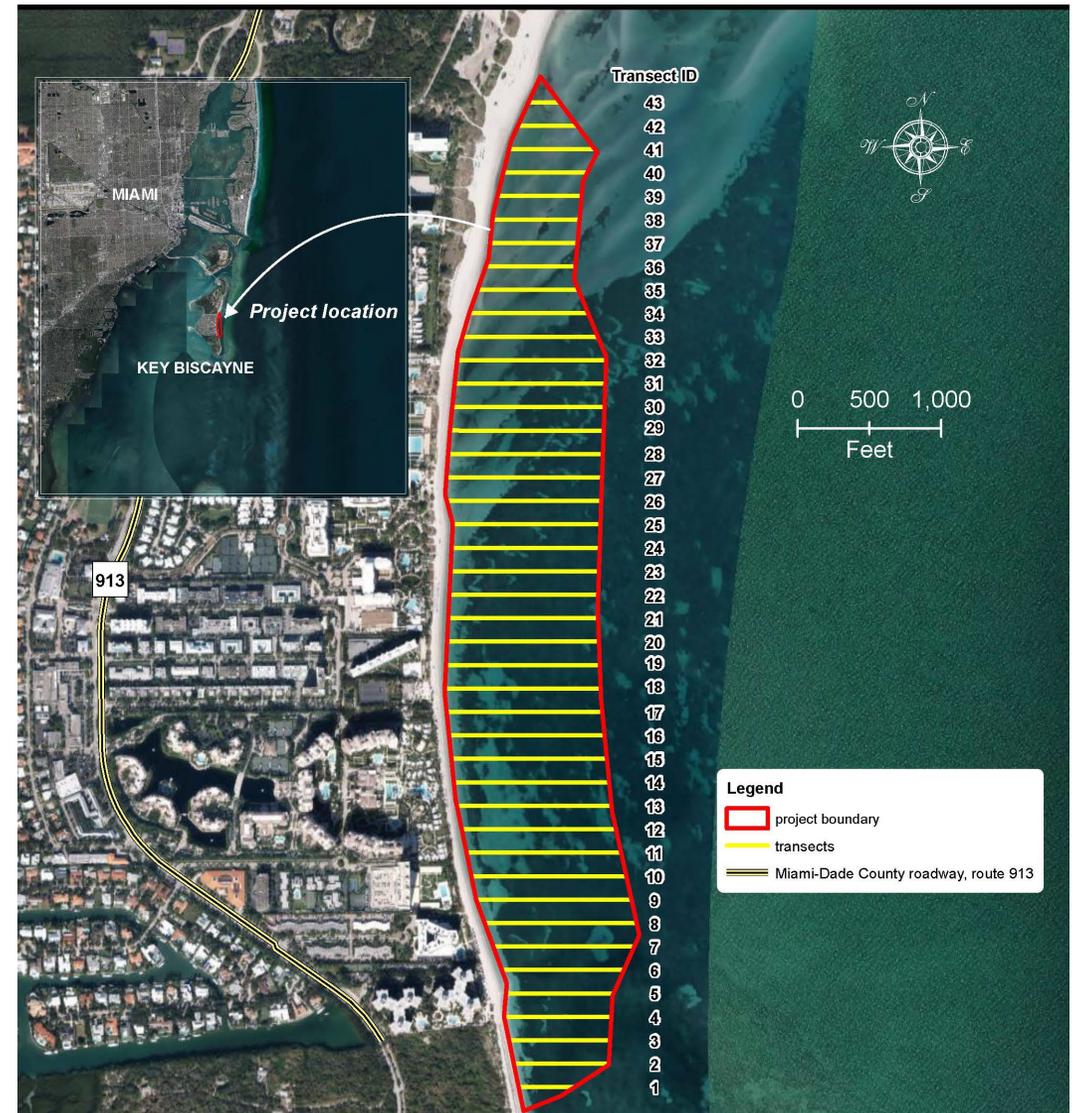
- Part of Miami-Dade CSRM Feasibility Study
- Required by SARBO as then-listed Johnson's seagrass was located near beach nourishment and offshore breakwaters planned for erosion control
- 145-acre project boundary
- Field work completed on June 22, 2021
- Two phases
 - Preliminary visual reconnaissance—first week of June, reviewed enough of project area to inform detailed survey design
 - Detailed SAV surveys and reports



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Scope of project

- Lines established at 50 m intervals creating 43 transects with ends defined by buoys
- Team of two divers laid out transect from start at shoreline, navigating by compass to end with occasional surfacing to confirm track, then started taking data from end toward start
- Second team of two divers collected data from start toward endpoint, with two teams completing one transect when meeting
- Qualitative and quantitative data collected
- Divers took data every 5 m with 1 m² quadrats divided into 100 sub-units, and photos



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- **Data collected**

- Total seagrass density (Braun Blanquet)
- Percent cover by species
- Three density short shoot counts for each species in each Braun-Blanquet category
- Macroalgae density
- Seagrass health
- Substrate conditions
- Epiphytic coverage
- Marine fauna
- Other notable conditions/observations



Quadrat showing dense Turtlegrass in Transect 1



Small Rose coral colony in Transect 10

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Basic Dive Data Taken

1	Dive Time										PSI			
2	Date	Transect Number	Start	End	Total Bottom Time	Weather	Visi- bility	Current Speed	Current Direction	Dive Team	Start	End	Max Depth (ft)	Length of Transect (m)
3	6/5/2021	1	9:25	10:57	1:32	partly cloudy	20	mild	NW	LZ	3000	1500	9	125
4	6/5/2021	1	9:25	10:57	1:32	partly cloudy	20	mild	NW	NB	3000	1200	9	125
5	6/5/2021	2	10:16	12:38	2:22	partly cloudy	20	mild	NW	RC	3100	500	7	185
6	6/5/2021	2	10:16	12:38	2:22	partly cloudy	20	mild	NW	JC	3000	600	7	185
7	6/5/2021	2	12:45	13:49	1:04	partly cloudy	20	mild	NW	RC	3100	1600	7	185
8	6/5/2021	2	12:45	13:49	1:04	partly cloudy	20	mild	NW	JC	3200	1700	7	185
9	6/5/2021	3	11:34	12:01	0:27	partly cloudy	20	mild	NW	NB	1200	500	8	220
10	6/5/2021	3	11:34	12:01	0:27	partly cloudy	20	mild	NW	LZ	1500	500	8	220
11	6/5/2021	4	14:19	16:23	2:04	partly cloudy	20	mild	NW	JC	1700	500	7	225
12	6/5/2021	4	14:19	15:48	1:29	partly cloudy	20	mild	NW	RC	1600	500	7	225
13	6/5/2021	4	14:51	16:23	1:32	partly cloudy	20	mild	NW	LZ	2000	500	7	225
14	6/5/2021	4	14:51	15:48	0:57	partly cloudy	20	mild	NW	NB	1000	500	7	225
15	6/6/2021	5	13:01	15:40	2:39	partly cloudy	10	mild	NW	LZ	3200	500	8	210
16	6/6/2021	5	13:01	15:40	2:39	partly cloudy	10	mild	NW	NB	3100	500	8	210
17	6/6/2021	6	13:10	15:12	2:02	partly cloudy	10	mild	NW	JC	3200	550	8	255
18	6/6/2021	6	13:10	15:12	2:02	partly cloudy	10	mild	NW	RC	2900	600	8	255
19	6/6/2021	6	15:58	16:25	0:27	partly cloudy	10	mild	NW	JC	3200	2100	8	255
20	6/6/2021	6	15:58	16:25	0:27	partly cloudy	10	mild	NW	RC	3100	2000	8	255
21	6/7/2021	6	9:29	10:44	1:15	partly cloudy	< 10	mild	NW	NB	3300	1800	12	255
22	6/7/2021	6	9:29	10:44	1:15	partly cloudy	< 10	mild	NW	LZ	3000	2000	12	255



Above: Team preparing for work. Below: Natalie rewinding 300 m transect tape.



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Seagrass Short Shoot Counts

Species	Transect Number	Distance along Transect (m)	Abundance level	Number of Shoots
S.f.	2	20	Medium	0
H.w.	5	0	Medium	23
S.f.	6	0	Medium	0
T.t.	8	50	Medium-high	5
S.f.	7	95	Medium-high	89
T.t.	8	305	Medium	9
S.f.	8	110	Low	0
T.t.	8	120	Medium	12
H.w.	8	135	Low	0
S.f.	11	105	High	0
S.f.	11	110	Low	2
S.f.	12	50	Low	6
S.f.	12	55	Medium	0
H.w.	12	65	Low	12

Species	Transect Number	Distance along Transect (m)	Abundance level	Number of Shoots
S.f.	12	305	Low	3
H.w.	12	305	Low	24
H.w.	38	40	Medium-high	19
H.w.	40	135	Medium-high	7
H.w.	40	140	Medium-high	0
H.w.	42	105	Low	0
T.t.	36	165	Medium-high	6
T.t.	23	25	Low	2
S.f.	23	25	High	6
T.t.	23	30	Low	6
S.f.	23	30	Medium-high	0
T.t.	23	60	Low	5
T.t.	23	260	Low	1
T.t.	13	210	High	4
T.t.	14	240	High	9
S.f.	15	20	Medium-high	12
T.t.	15	265	Medium	18
S.f.	15	310	Medium-high	3
T.t.	24	240	Medium	4
S.f.	31	120	High	3

EXAMPLE PROJECT: Key Biscayne USACE SAV Study

Frequency of Occurrence, Mean Seagrass Density, and Mean Seagrass Abundance by Transect

Transect Number	Frequency of Occurrence	Density		Abundance	
		Mean (%)	Standard Deviation (%)	Mean (%)	Standard Deviation (%)
1	19/26	61.27	39.78	83.84	14.15
2	34/38	58.58	27.44	65.47	19.47
3	42/45	83.33	22.96	89.29	4.63
4	40/46	72.72	29.81	83.63	9.47
5	41/43	79.67	22.57	83.56	14.21
6	52/52	71.15	13.85	71.15	13.85
7	54/60	51.33	23.47	57.04	16.78
8	61/65	59.00	21.22	62.87	15.26
9	59/64	56.41	26.93	61.19	22.13
10	63/63	48.83	21.94	48.83	21.94
11	58/63	51.29	24.73	55.71	20.36
12	62/62	42.11	22.60	42.11	22.60
13	61/66	36.79	24.39	39.80	22.85
14	63/67	45.93	20.32	48.84	17.17
15	63/67	44.93	21.02	47.78	18.22
16	65/67	47.01	16.58	48.46	14.57
17	63/67	45.16	22.38	48.03	19.83
18	56/67	40.75	26.15	48.75	20.58
19	60/66	47.73	21.72	52.50	16.27
20	58/65	41.71	20.86	46.74	15.79

Transect Number	Frequency of Occurrence	Density		Abundance	
		Mean (%)	Standard Deviation (%)	Mean (%)	Standard Deviation (%)
21	59/64	43.16	20.60	46.81	16.93
22	55/64	41.83	22.37	48.67	15.63
23	58/64	45.20	23.01	49.88	18.65
24	56/63	42.81	23.89	48.16	19.52
25	60/63	43.49	21.58	45.67	19.71
26	51/66	32.77	27.10	42.41	23.19
27	51/67	34.30	26.11	45.06	20.13
28	54/66	43.86	29.00	53.61	22.34
29	55/66	40.82	27.64	48.98	22.63
30	47/65	34.06	29.46	47.11	24.08
31	47/65	41.09	29.46	56.83	17.14
32	49/64	39.75	30.62	51.92	24.20
33	42/58	38.34	29.43	52.95	20.28
34	2/51	0.12	0.71	3.00	2.83
35	1/43	0.23	1.52	10.00	0.00
36	8/39	9.41	21.33	45.88	23.64
37	5/38	1.37	5.28	10.40	11.84
38	14/37	13.08	24.30	34.57	28.91
39	14/35	10.23	16.20	25.57	16.23
40	7/38	8.18	18.20	44.43	12.80
41	1/37	0.03	0.16	1.00	0.00
42	3/26	0.27	1.00	2.33	2.31
43	0/14	0.00	0.00	0.00	0.00

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Summary Statistics for Project Area

	Density		Abundance	
Frequency of Occurrence	Mean (%)	Standard Deviation (%)	Mean (%)	Standard Deviation (%)
1,813/2,352	40.75	29.71	52.86	22.47

Frequency of Occurrence: Number of quadrats with SAV/total number of quadrats

Density: Average cover in all quadrats (with and without SAV)

Abundance: Average cover in quadrats (with SAV)



Randy conducting seagrass short shoot count

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Braun-Blanquet Cover-Abundance Scores

Score	Coverage
0	not present
0.1	solitary specimen
0.5	few with small cover
1.0	numerous but less than 5% cover
2.0	5% to 25% cover
3.0	25% to 50% cover
4.0	50% to 75% cover
5.0	75% to 100% cover



Lauren taking Braun Blanquet data



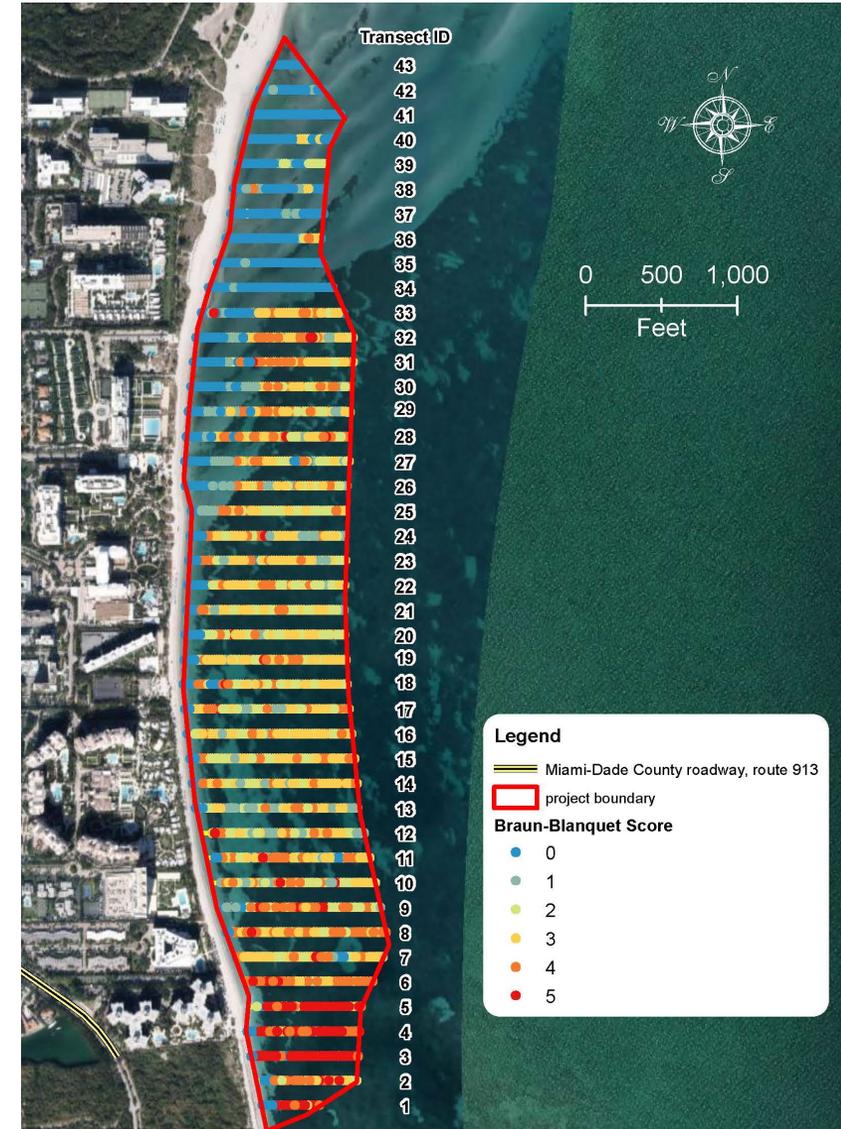
Natalie assessing seagrass bed health and composition

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Total seagrass coverage along transects

Braun-Blanquet Score

- 0
- 1
- 2
- 3
- 4
- 5

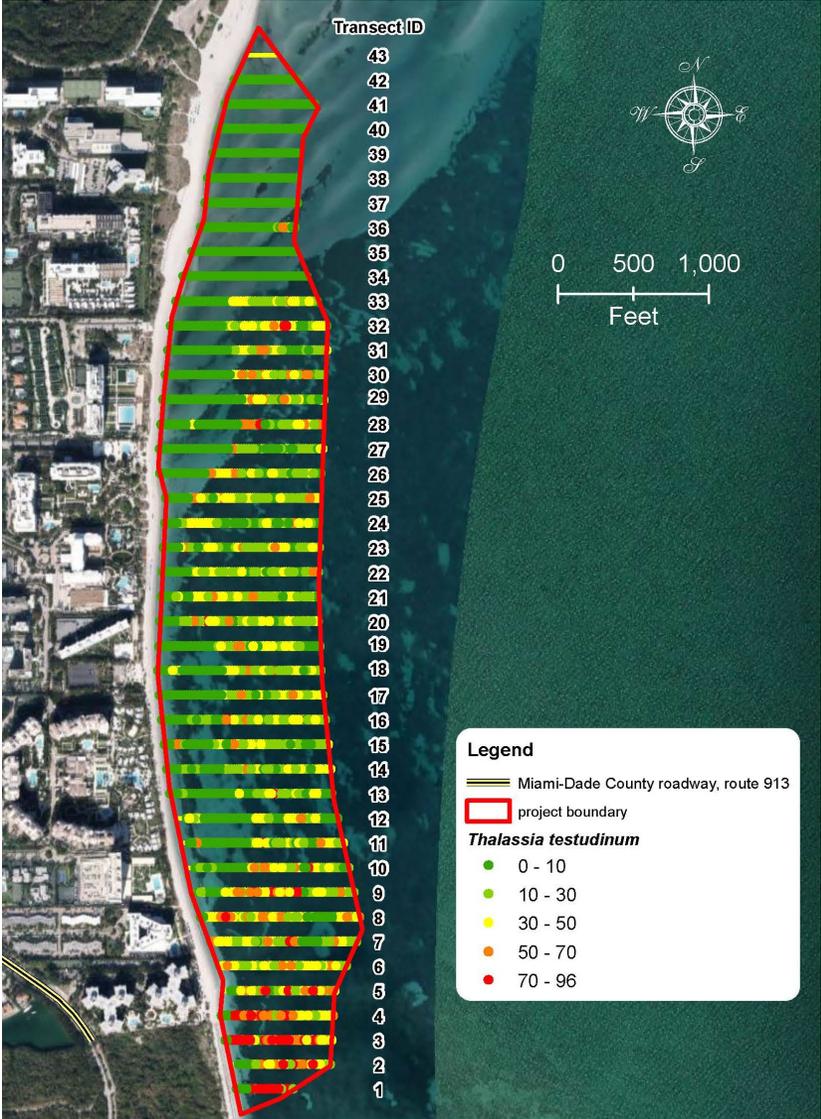


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Turtlegrass density and distribution along transects

Braun-Blanquet Score

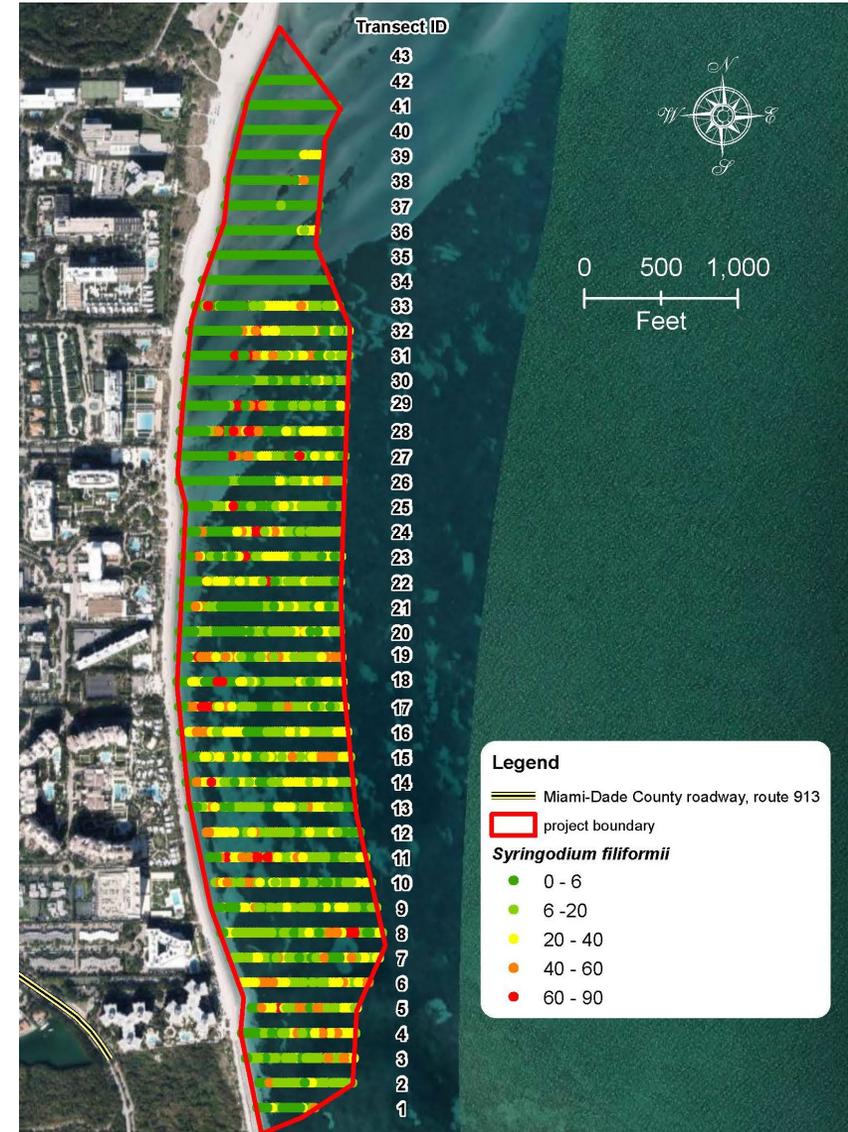
- 0
- 1
- 2
- 3
- 4
- 5



EXAMPLE PROJECT: Key Biscayne USACE SAV Study

Manatee grass density and distribution along transects

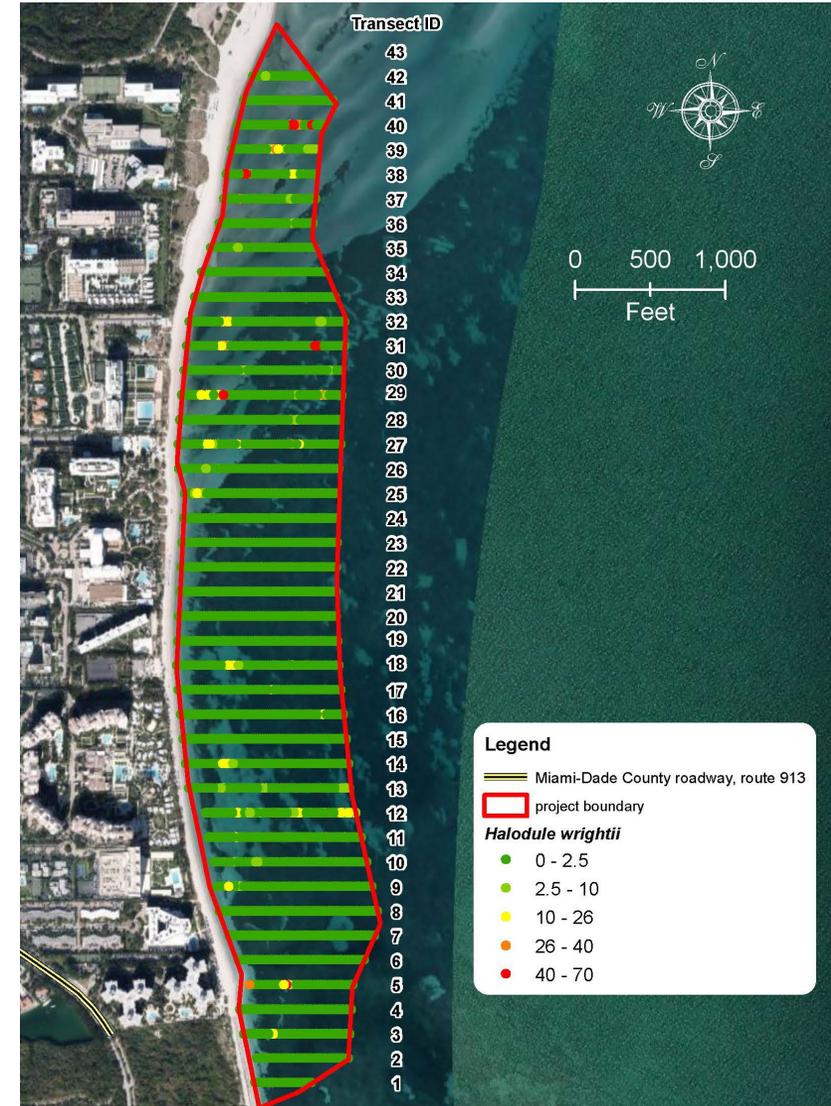
Braun-Blanquet Score



EXAMPLE PROJECT: Key Biscayne USACE SAV Study

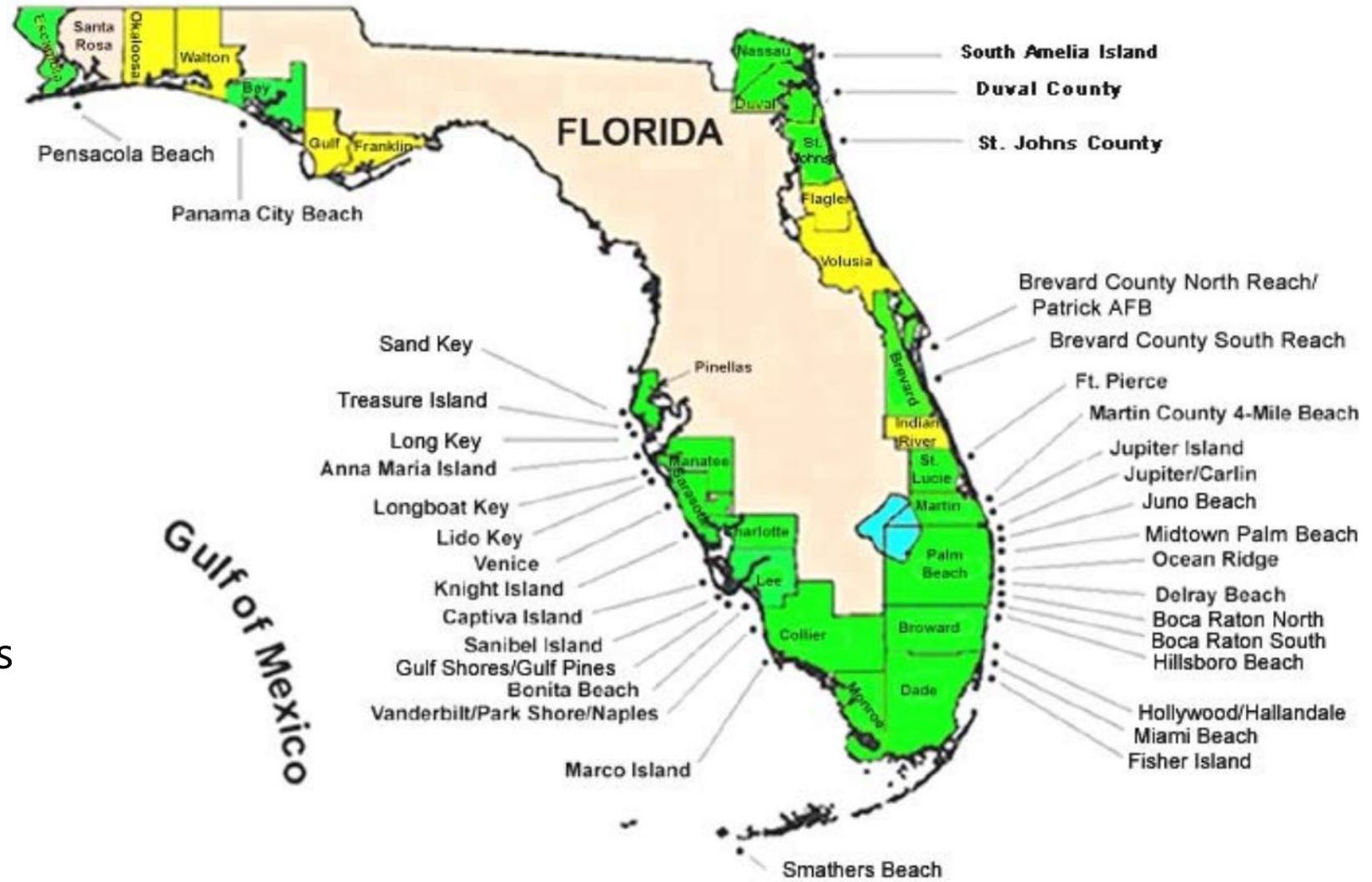
Shoalgrass density and distribution along transects

Braun-Blanquet Score



Beaches along Florida coast where this data could be compiled

- Figure from 1990s publication showing Florida beaches subject to renourishment
- Today would be more
- Maintenance of this data, collected with comparable methodology on regular basis, could allow cumulative and comparative studies to greatly further our understanding of Florida open shoreline seagrass resources and habitats



Full Smiles and Empty Tanks After Completing 145 Acres of Surveys!



- 22 days in the field for one project
- Hundreds of days for similar projects around the State
- This much work and outstanding data should be archived and available for cumulative study of benthic conditions and trends
- The outstanding 20+ year database established for the Florida Keys provides an ideal template for a Statewide system

Thoughts?