



Keaton Beach Urchin Survey updates

Keaton Beach
Updates from March 7&9 2023
Big Bend Seagrasses Aquatic Preserves
Contact: Kate Suchanec
katherine.suchanec@floridadep.gov

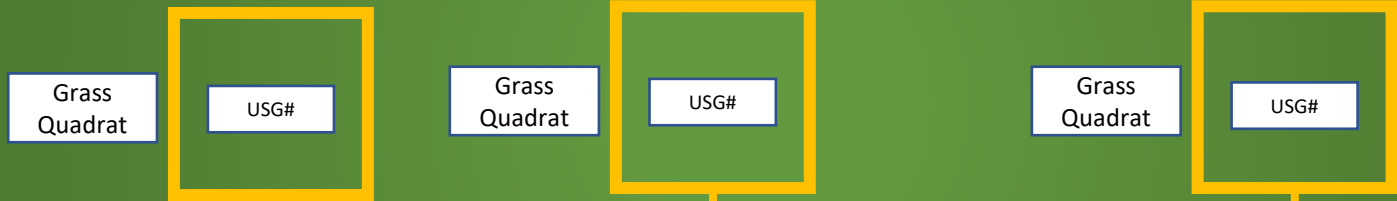


GPS coordinates taken while following the urchin line on 8 February 2023. The line extends from each end, staff had limited time to follow the full length. Aerial mapping is proposed to obtain better imagery. Urchin line is orange, green markers are continuous seagrass monitoring stations used yearly by BBSAP. Marked path is approximately 4 kilometers. Line was not tracked in March, we are hoping for some aerial footage/ imagery.

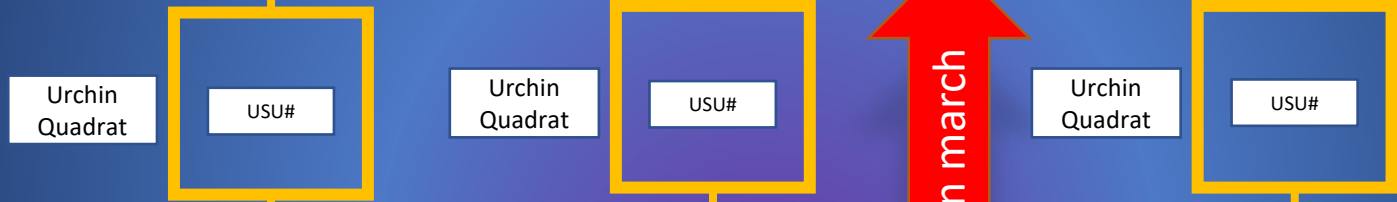
Original Survey Design

“tri-mix” method

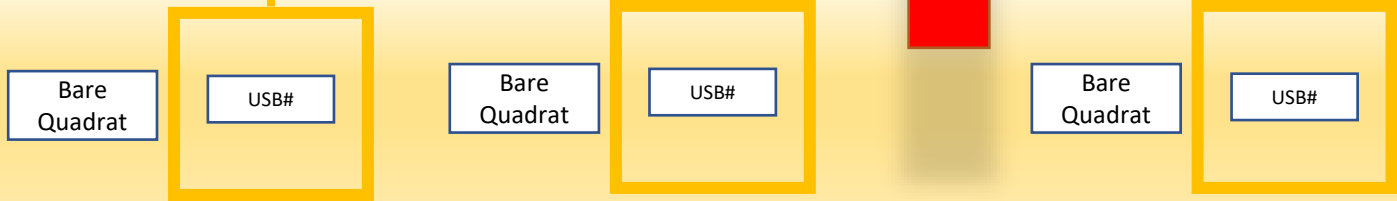
Grass Area



Urchin Line



Grazed Area



Urchin march

February Survey Sites Length

Survey site 1 total transect length:
21.35m.

USU1 placed at 10.5m mark

Survey site 2 total transect length:
23.0m.

USU1 placed at 11.5m mark

Survey site 3 total transect length:
13.0m.

USU1 placed at 6.5m mark

March Survey Sites Length

Survey site 4 total transect length:
14.0m.

USU4 placed at 7.0m mark

Survey site 5 total transect length:
22.0m.

USU5 placed at 11.0m mark

Survey site 6 total transect length:
26.0m.

USU6 placed at 13.0m mark



Urchin survey sites labeled over mapped line. Yellow lines not to scale, represent February transect. Solid, orange line is March tri-mix transects. Solid green is the established transect 1. Purple icons are tri-mix method at each site. GPS coordinates accurate within 3m.



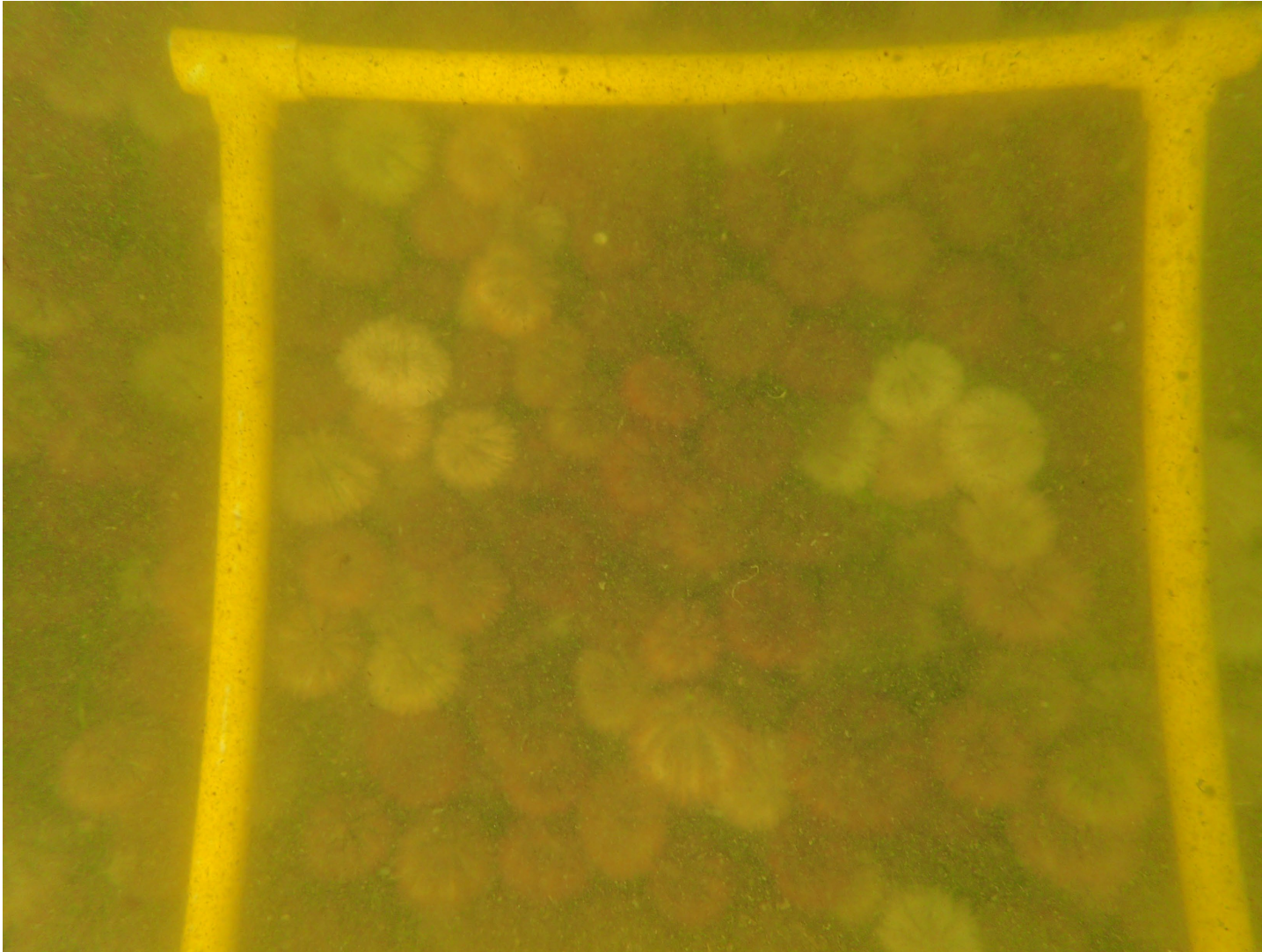
Urchin survey sites labeled over mapped line. Yellow lines not to scale, represent February transect. Solid, orange line is March tri-mix transects. Solid green is the established transect 1. Purple icons are tri-mix method at each site. GPS coordinates accurate within 3m.

Same picture from last slide just closer so you can see the line seems to have shifted. The front has passed the three February stations. Rough estimates are that the line has moved around 0.3 miles east-south, shown best in red circle.

Urchin Survey Quad 4

USU4

GPS:29.80446 -83.6268



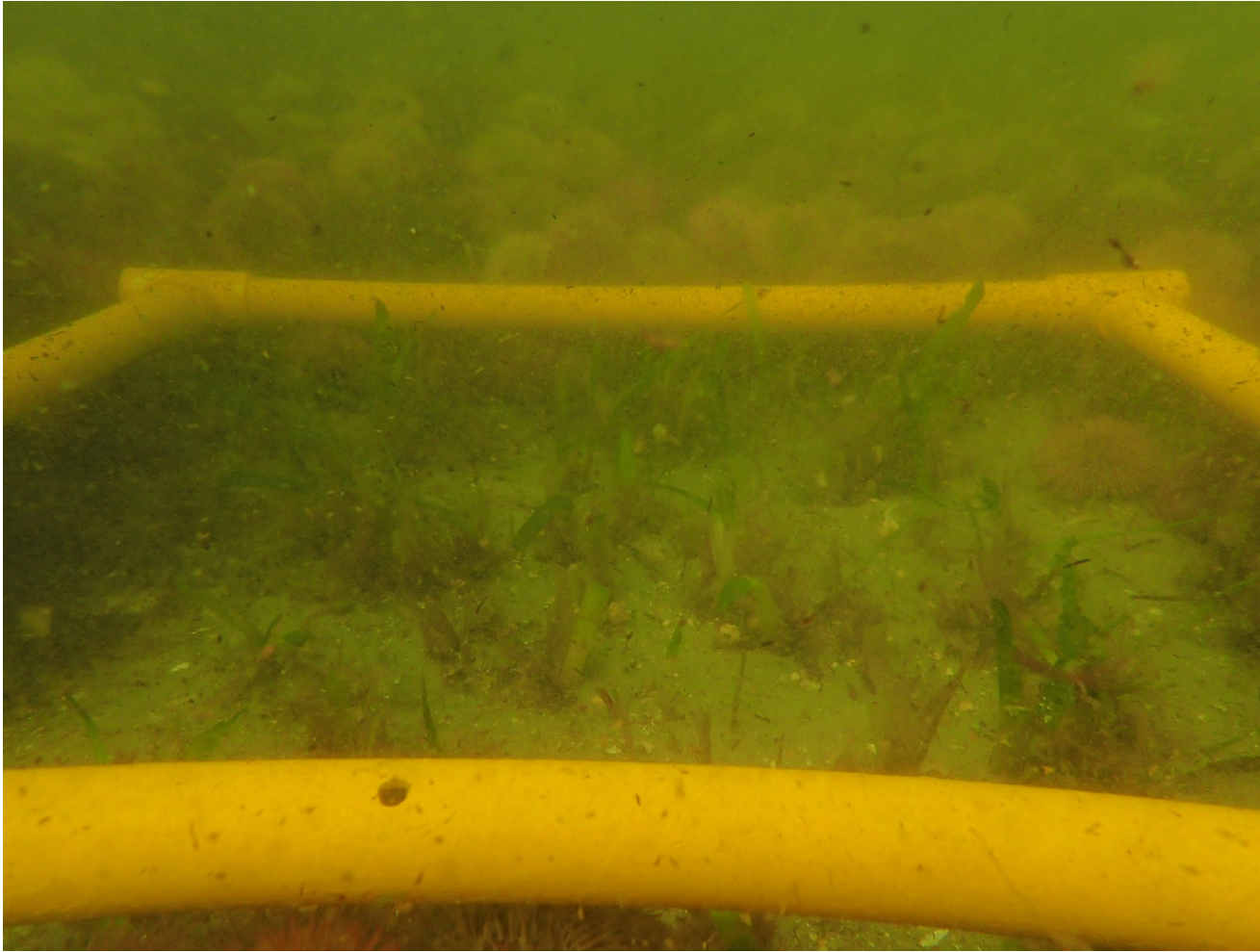
Full quad (0.25m²)

Important note: the turbidity this day, 03-07-2023, was high, something to watch. Could potentially be a result of this mass grazing event. We will be taking some turbidity readings in the future, but unfortunately there is no established datalogger station in the area. Sites 4 and 5 were completed this day. We returned to do site 6 on 03-09-2023 for better visibility

Urchin Survey Quad 4

USU4

GPS:29.80446 -83.6268



Full quad (0.25m²)



Urchin density in
area around USU4

Urchin Survey Quad 4

USU4
GPS:29.80446 -83.6268

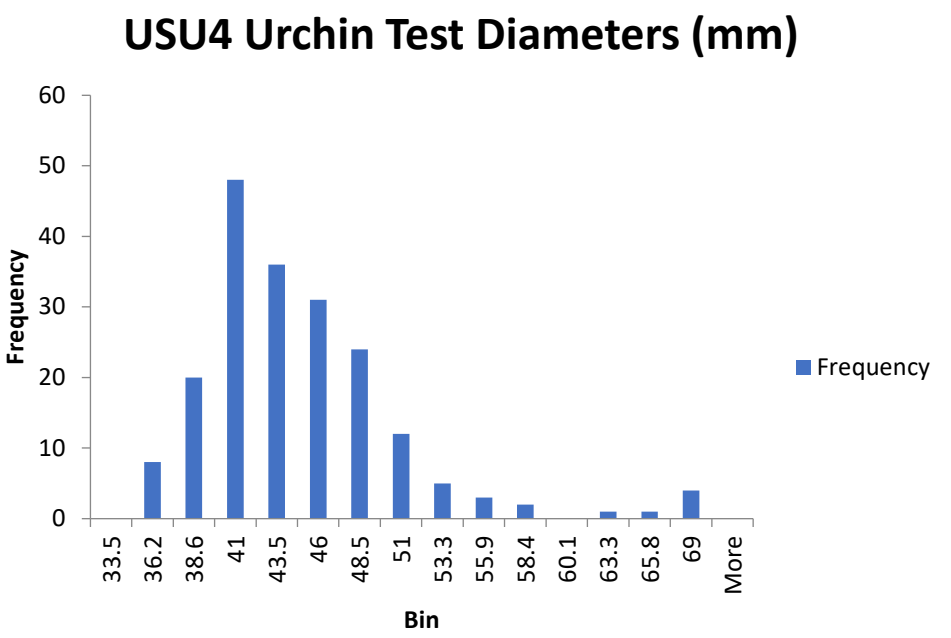
Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHIN S	SCALLOPS	GRASS_ALGAE	TOTAL_SAV_PERCENT_OVER	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYT E_DENSITY	SEDIMENT_TYPE	Rhizomes
															Sand Mud Shell	
3/7/2023	USU04	Urchin	TTES	8	14	11	7	196		0Grass	12	12	0	Clean		Yes
3/7/2023	USU04	Urchin	SFIL	3	13	4	7			Grass						
3/7/2023	USU04	Urchin	HWRI	1	8	-	-			Grass						

Temp	DO (mg/L/)	Salinity	pH
23.3	6.11	31.05	7.72

Note: urchin diameter measured transversally, test to test

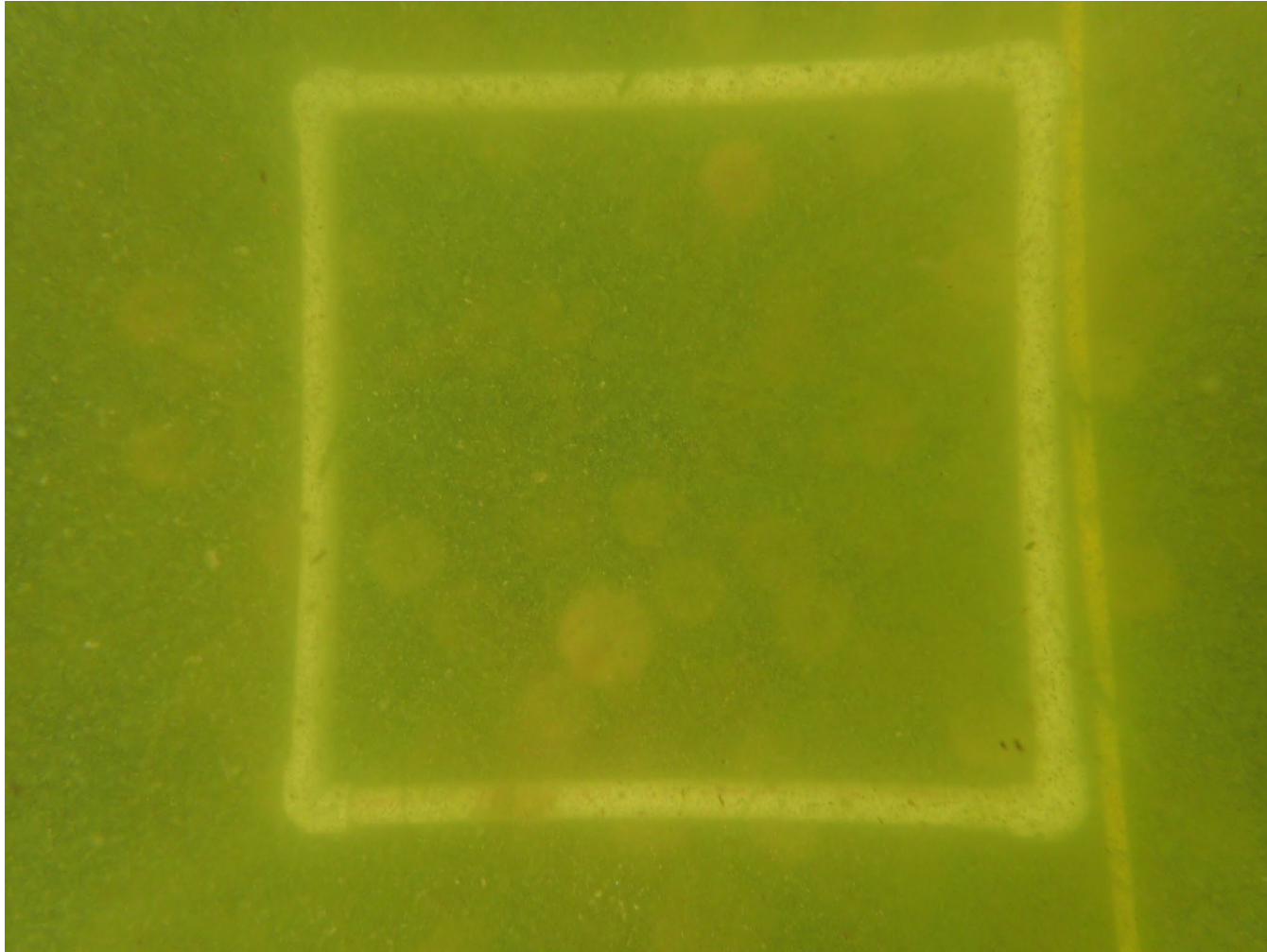
Mean diameter (mm)	43.60826
Standard Deviation	5.959452
Range	34.56
Minimum Diameter (mm)	33.69
Maximum Diameter (mm)	68.25
Total Urchin Count	196

Only 195 urchins were used in the statistics, 195 were measured by test and one was measured spine-spine and not included.

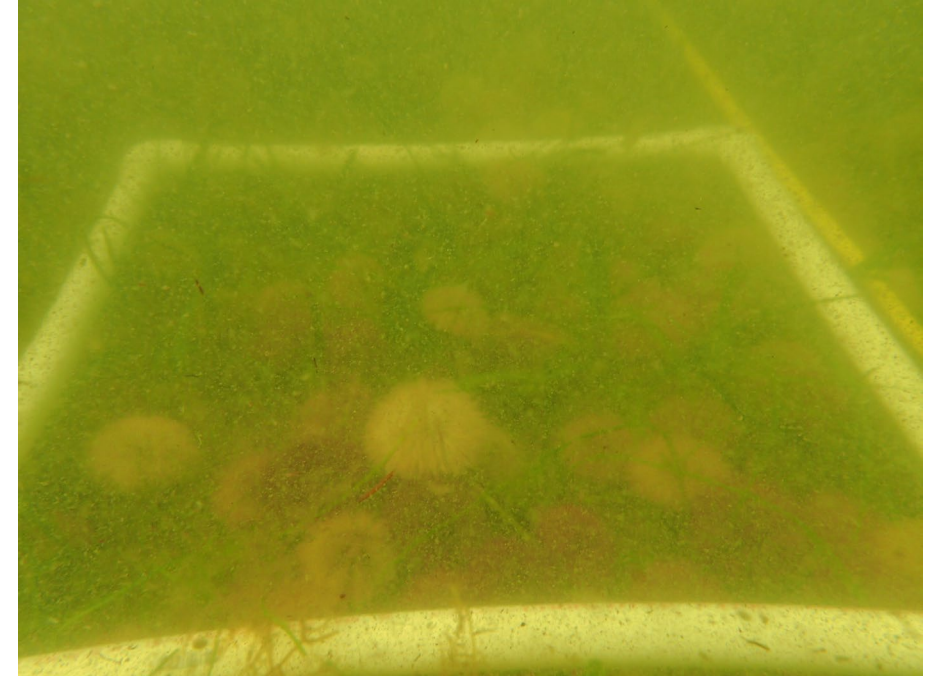


Urchin Survey Quad 5

USU5
GPS:29.8063 -83.6221



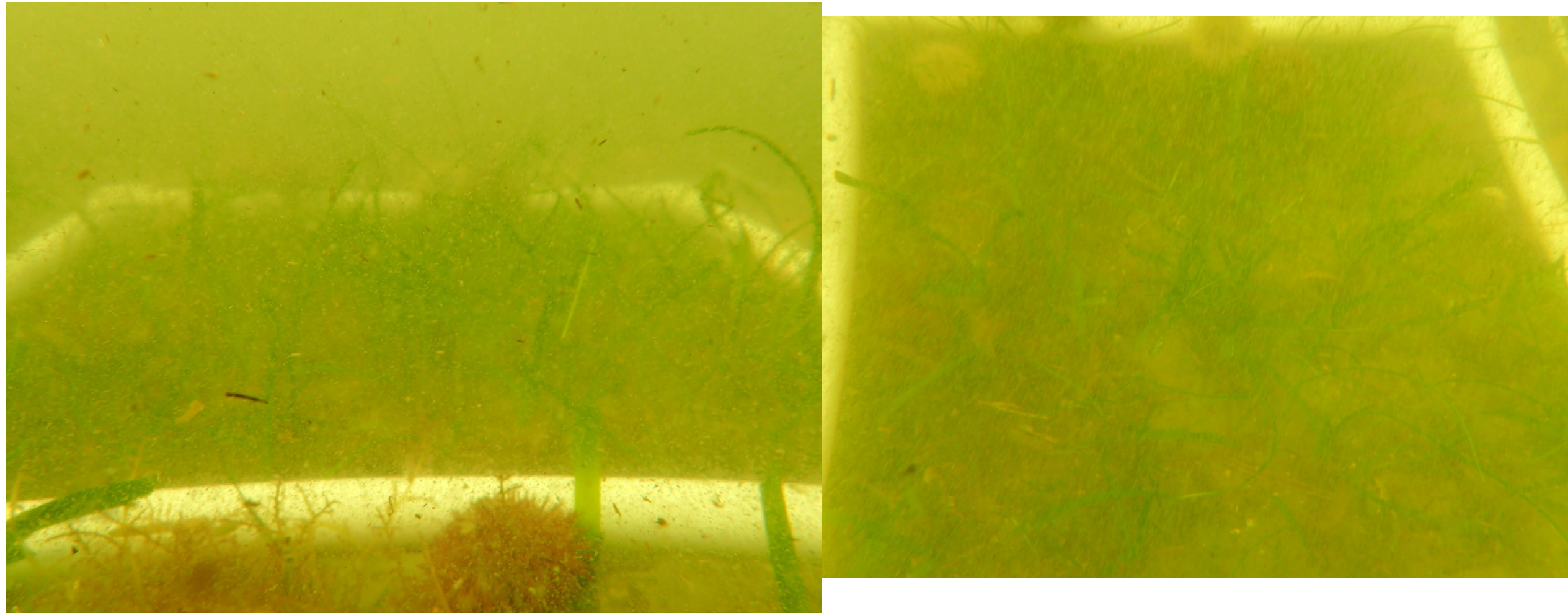
Full quad (0.25m²)



Urchin Survey Quad 5

USU5

GPS:29.8063 -83.6221



Full quad (0.25m²)

Urchin Survey Quad 5

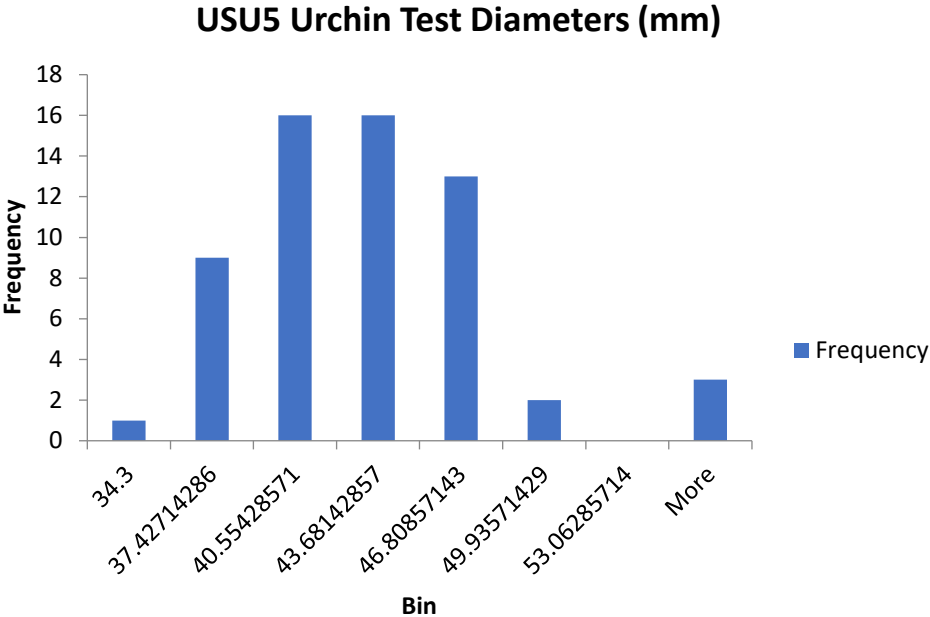
USU5
GPS:29.8063 -83.6221

Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHIN S	SCALLOP S	GRASS_ALGAE	TOTAL_SAV_PERCENT_OVER	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYT E_DENSITY	SEDIMENT_TYPE	Rhizomes
3/7/2023	USU05	Urchin	TTES	10	17	14	14	60	0	Grass	23	23	0	Clean	Sand Mud Shell	Yes
3/7/2023	USU05	Urchin	SFIL	10	22	21	16			Grass						
3/7/2023	USU05	Urchin	HWRI	3	7	6	14			Grass						

Temp	DO (mg/L/)	Salinity	pH
23.7	6.2	31.18	7.71

Mean Test Diameter (mm)	41.7335
Standard Deviation	4.501674
Range	21.89
Minimum Diameter (mm)	34.3
Maximum Diameter (mm)	56.19
Total Urchin Count	60

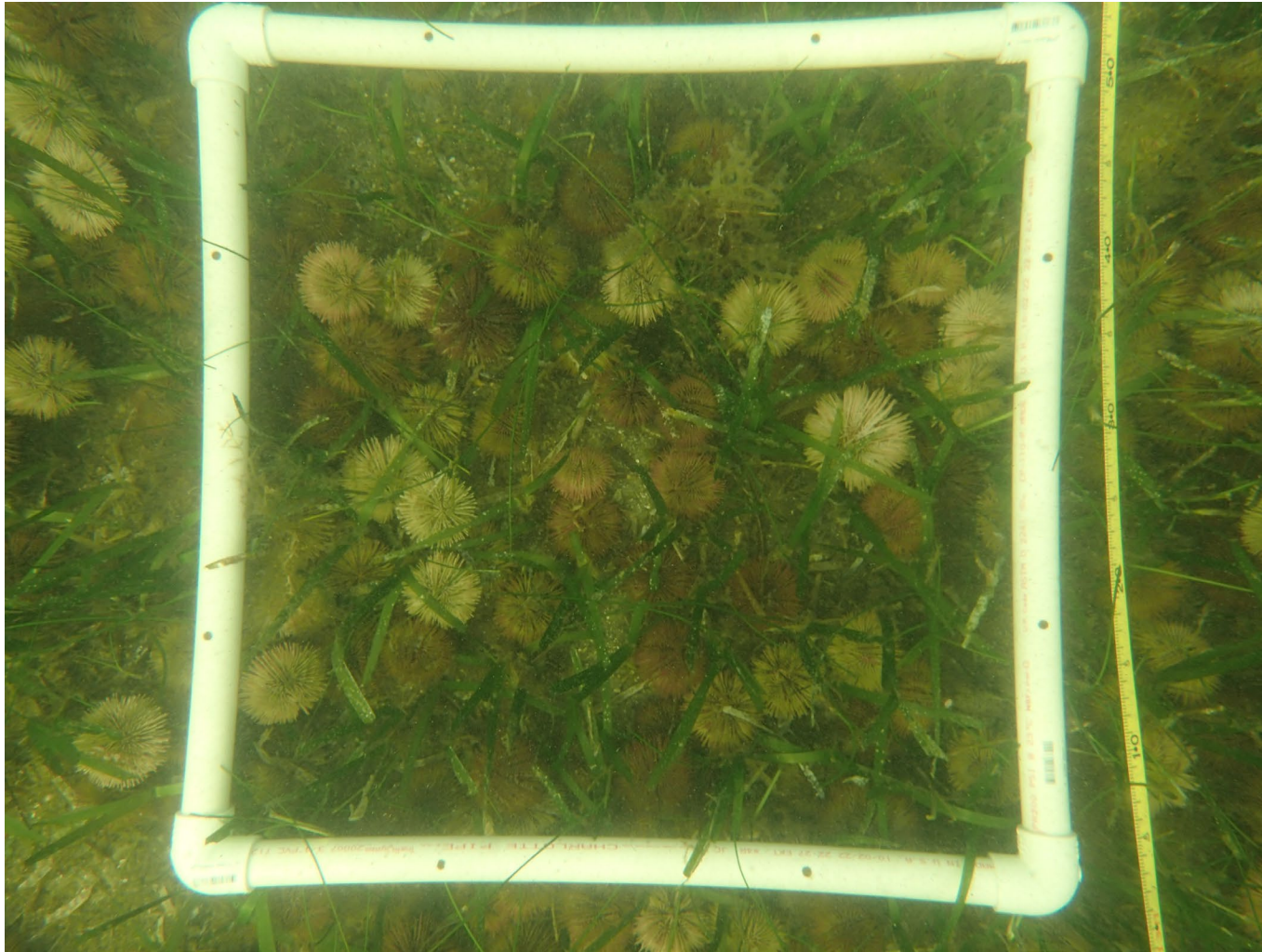
Note: urchin diameter measured transversally, test to test



Urchin Survey Quad 6

USU6

GPS:29.80694 -83.6215



Full quad (0.25m²)

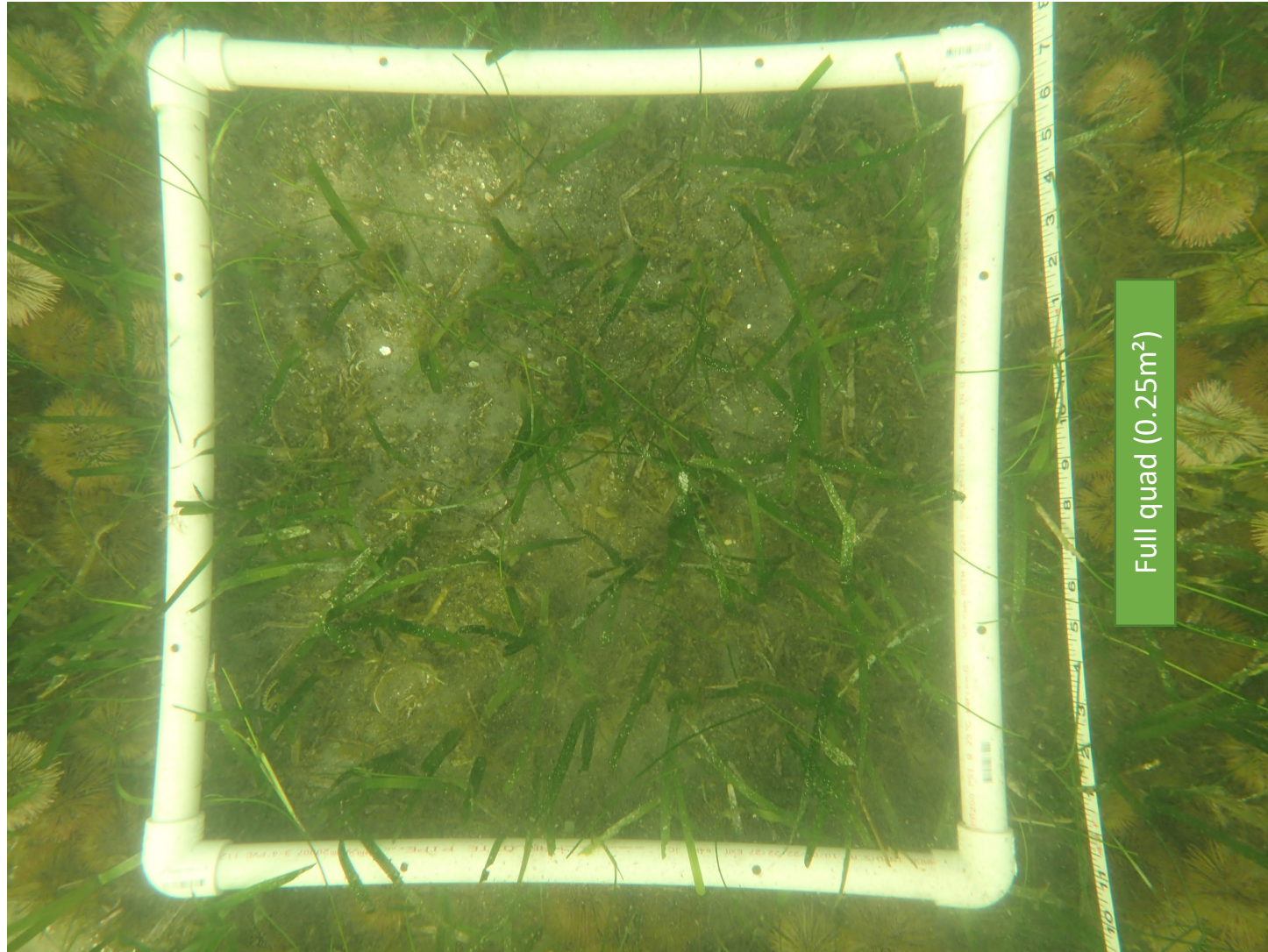


Closeup

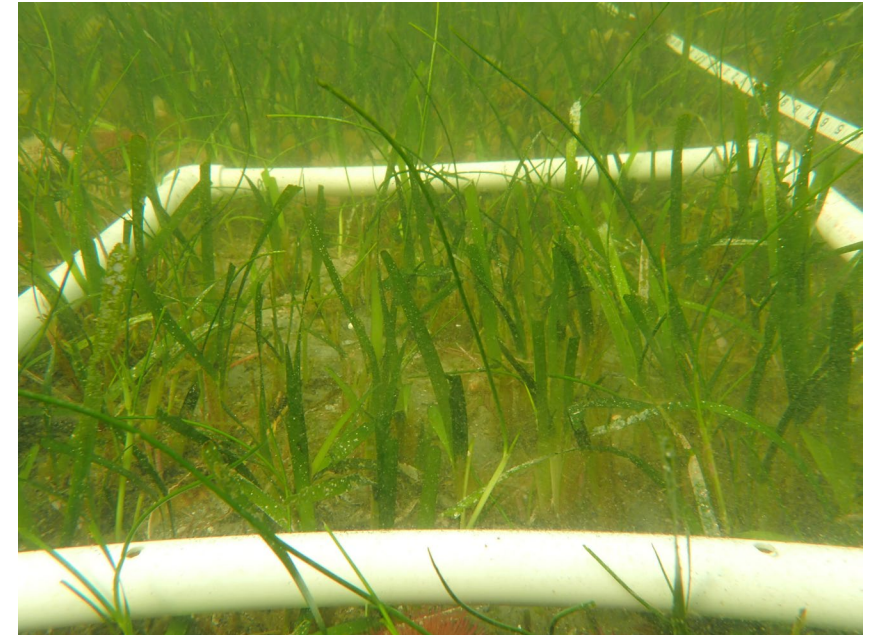
Urchin Survey Quad 6

USU6

GPS:29.80694 -83.6215



Full quad (0.25m²)



Closeup

Urchin Survey Quad 6

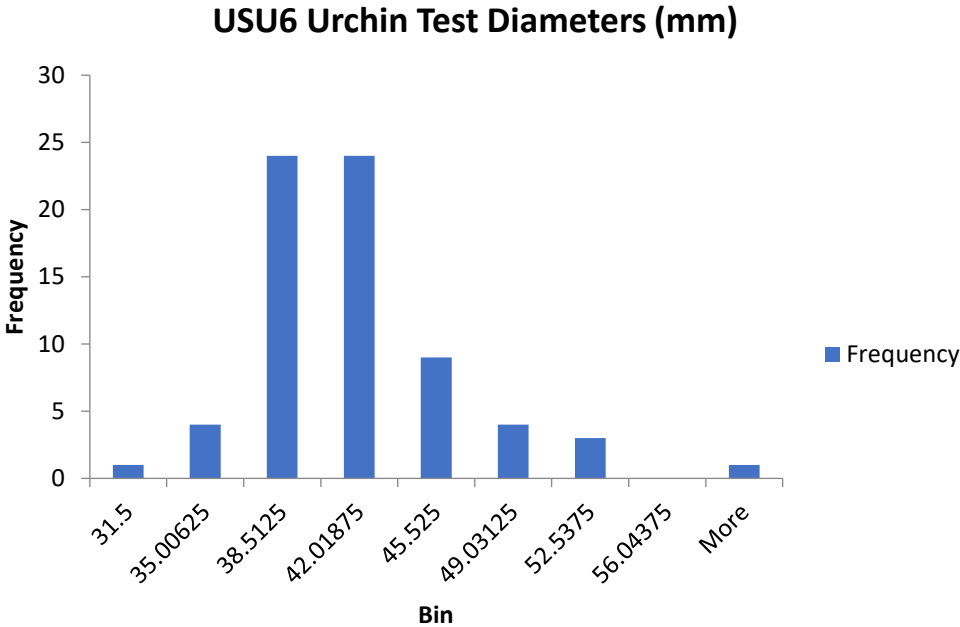
USU6
GPS:29.80694 -83.6215

Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHIN S	SCALLOPS	GRASS_ALGAE	TOTAL_SAV_PE_RCENT_COVER	TOTAL_GRASS_PERCENT	TOTAL_MACRO_ALGAE_PERCENT	EPIPHYTE_DENSITY	SEDIMENT_TYPE	Rhizomes
															Sand Mud Shell	
3/9/2023	USU06	Urchin	TTES	20	17	16.5	17	70		0Grass	30	30		0Light		Yes
3/9/2023	USU06	Urchin	SFIL	9	13	20	11			Grass						
3/9/2023	USU06	Urchin	HWRI	1	14	13	11			Grass						

Temp	DO (mg/L/)	Salinity	pH
20.573	6.19	31.95	7.6

Mean Diameter (mm)	40.01729
Standard Deviation	4.669982
Range	28.05
Minimum Diameter (mm)	31.5
Maximum Diameter (mm)	59.55
Total Urchin Count	70

Note: urchin diameter measured transversally, test to test



Urchin quads by the numbers

	Measured Test-Test	
	survey site	data
most urchins	USU4	196 urchins
widest range	USU4	34.56
smallest standard deviation	USU5	4.501674
largest average diameter (mm)	USU4	43.60826
smallest average diameter (mm)	USU6	40.01729
largest maximum diameter (mm)	USU4	68.25
smallest minimum diameter (mm)	USU6	31.5

	Measured spine-spine	
	survey site	data
widest range	USU2	42.68
smallest standard deviation	USU1	4.946864523
largest average diameter (mm)	USU3	66.64226415
smallest average diameter (mm)	USU2	55.82704403
largest maximum diameter (mm)	USU3	86.55
smallest minimum diameter (mm)	USU2	43.85

Test-test vs Spine-spine measurements

Location	Urchin_spine (mm)	Urchin_test (mm)	difference
USU4	57.95	40.01	17.94
USU4	74.15	54.36	19.79
USU4	62.11	48.06	14.05
USU4	67.29	48.81	18.48
USU4	65.86	45.61	20.25
USU4	65.5	49.42	16.08
USU4	64.71	49.08	15.63
USU4	64.57	45.59	18.98
USU4	65.68	47.61	18.07
USU4	60.25	46.01	14.24

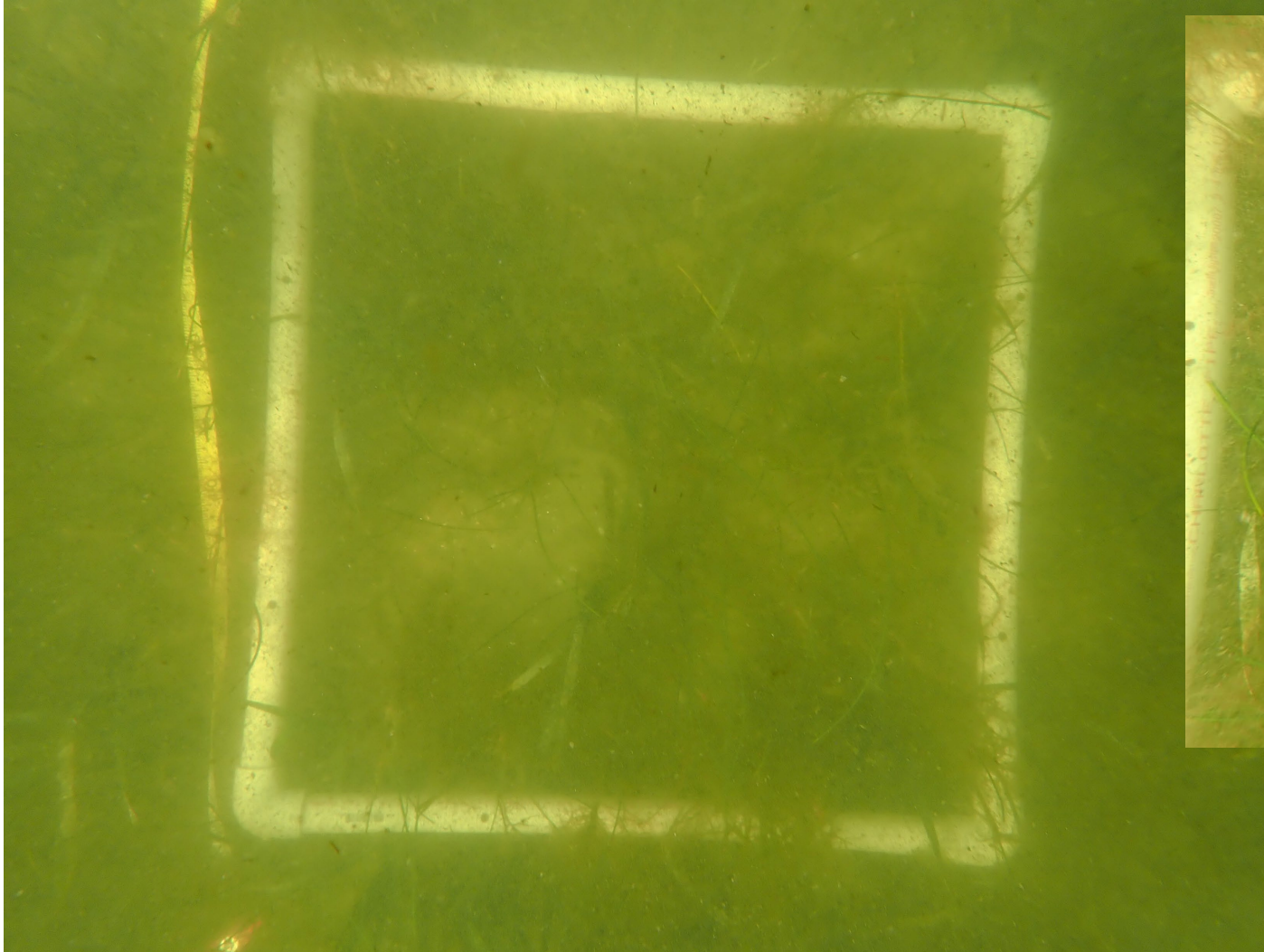
Average	17.351
St.Dev	2.104692
ST.err	0.701564
Av.Dev	1.8808

During the February surveys, urchins were measured spine to spine. For best science practices this was changed to test-test measurements in march. We measured 10 urchins both ways to see if we could figure out a way to adjust the February urchin measurements. The difference was found between the two measurements and descriptive statistics performed. They were similar in ranges, so individual spine size was estimated by halving the difference. The sample size is small and the urchins recorded at USU4 were similar in size so this method was not utilized since it would not be representative. Including it here if anyone is interested. Will try to collect more spine measurements in the future.

difference	estimated spine
17.94	8.97
19.79	9.895
14.05	7.025
18.48	9.24
20.25	10.125
16.08	8.04
15.63	7.815
18.98	9.49
18.07	9.035
14.24	7.12
Average	8.6755
St.Dev	1.052346
ST.err	0.350782
Av.Dev	0.9404

Urchin Survey Grass Quad

USG4:
GPS:29.80444 -83.6268



Urchin Survey Grass Quad

USG4:
GPS:29.80444 -83.6268

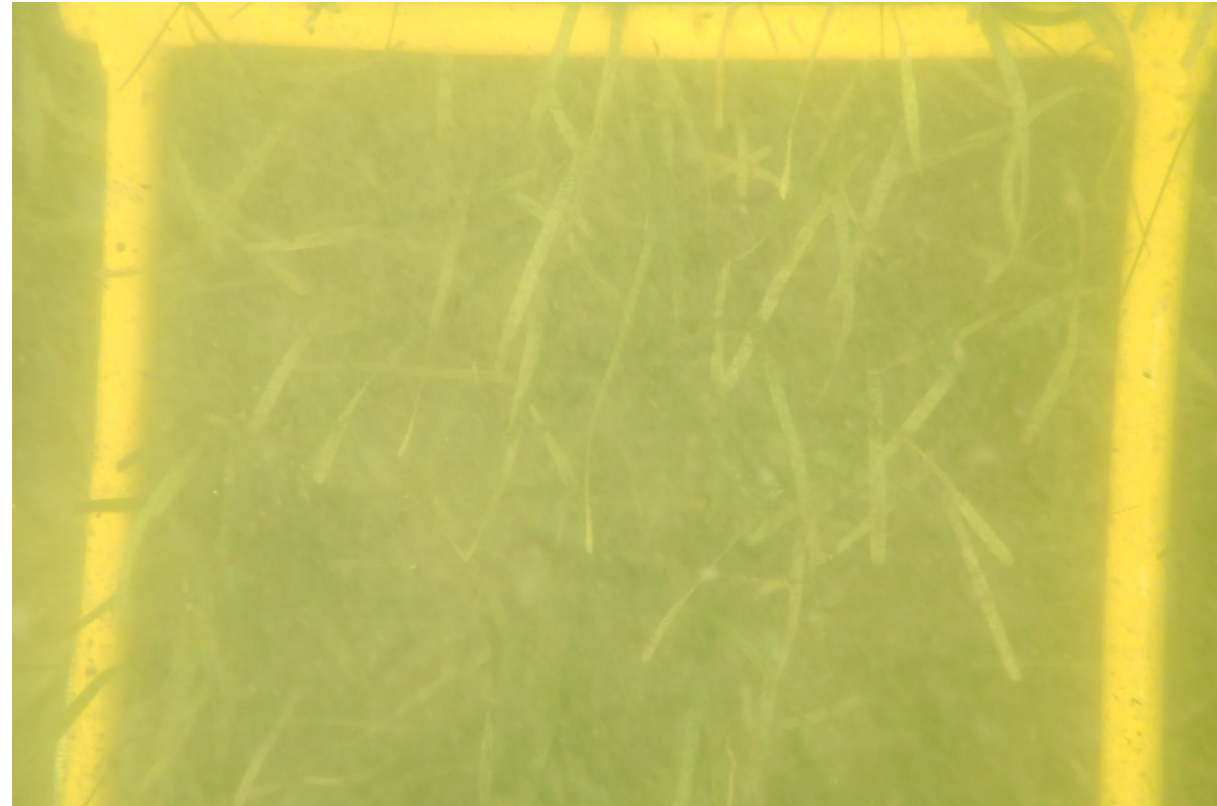
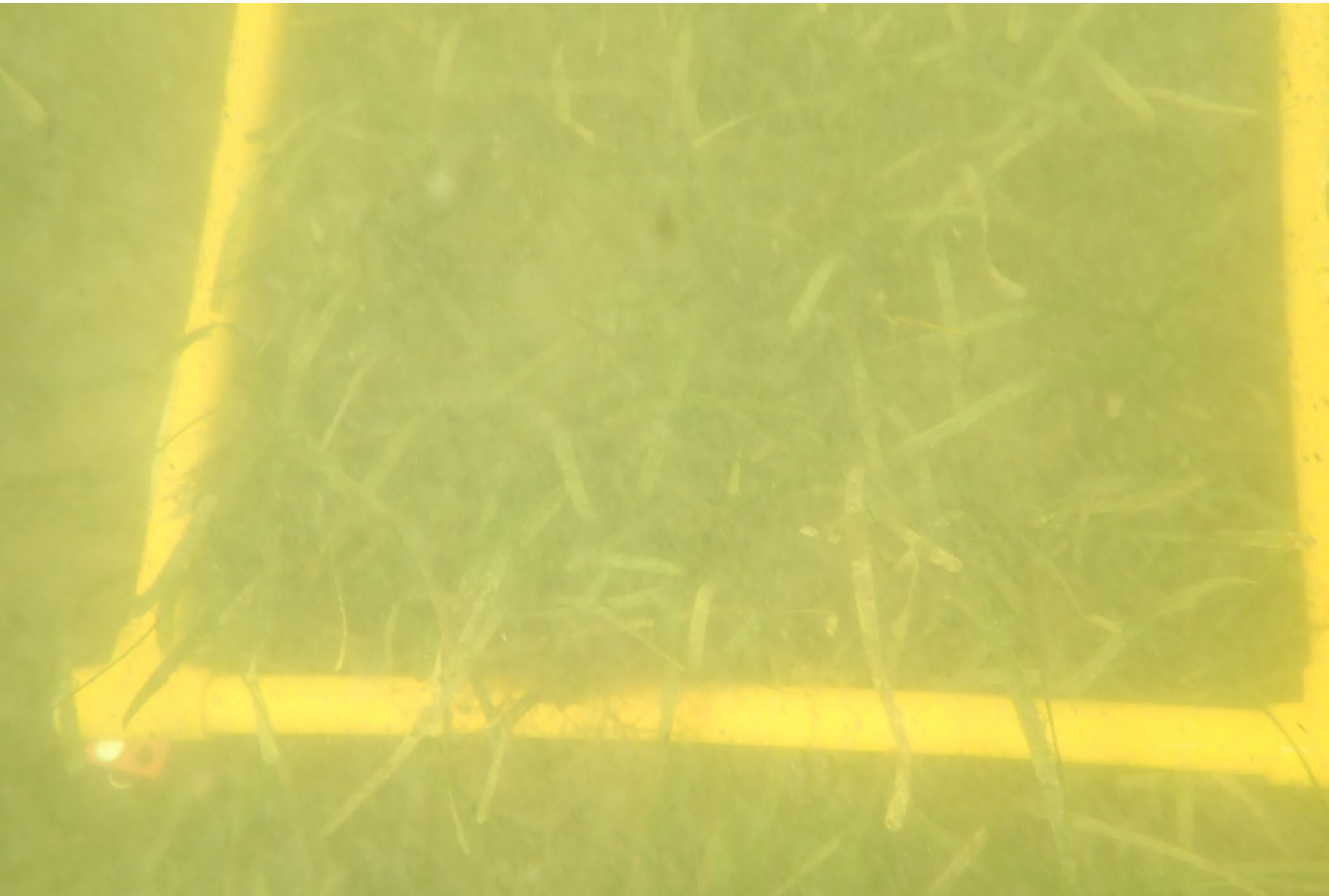
Data

Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHINS	SCALLOPS	GRASS_ALGAE	TOTAL_STAV_PERCENT_OVER	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYTETYPE	SEDIMENTTYPE	Rhizomes
3/7/2023	USG04	Grass	TTES	5	11.5	22	21.5	0	0	Grass	20	20	0	Heavy	Sand Mud Shell	Yes
3/7/2023	USG04	Grass	SFIL	15	24	21	29			Grass						
3/7/2023	USG04	Grass	Drift	10												

Temp	DO (mg/L/)	Salinity	pH
23.3	6.11	31.05	7.72

Urchin Survey Grass Quad

USG5:
GPS:29.80638 -83.622



Urchin Survey Grass Quad

USG5:
GPS:29.80638 -83.622

Data

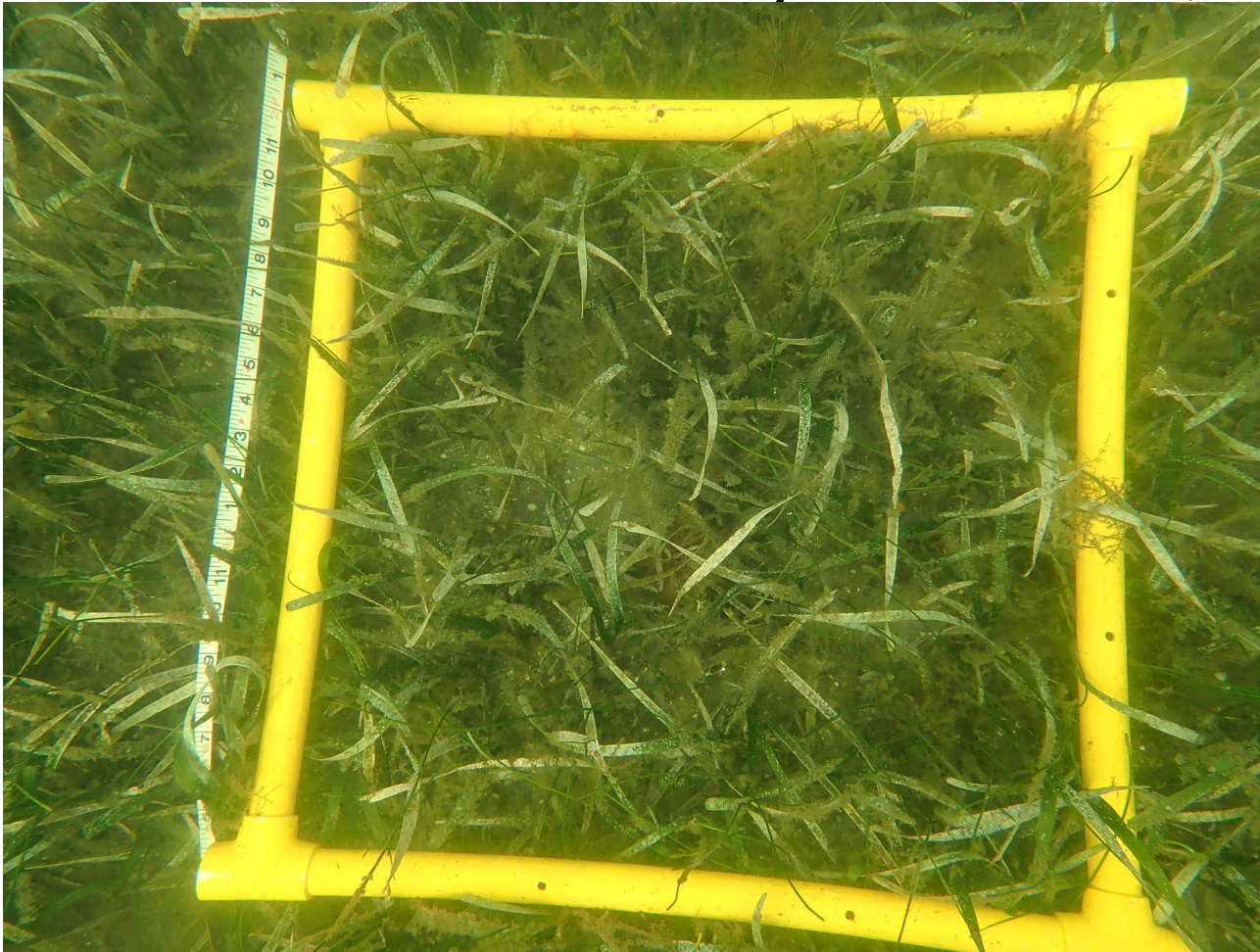
Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHINS	SCALLOPS	GRASS_ALGAE	TOTAL_SAV_PERCENT_OVER	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYTTE_DENSITY	SEDIMENT_TYPE	Rhizomes
3/7/2023	USG05	Grass	TTES	27	17.5	26.5	19	0	0	Grass	30	30	0	Heavy	Sand Mud Shell	Yes
3/7/2023	USG05	Grass	SFIL	3	28	24	19.6			Grass						

Temp	DO (mg/L/)	Salinity	pH
23.7	6.2	31.18	7.71

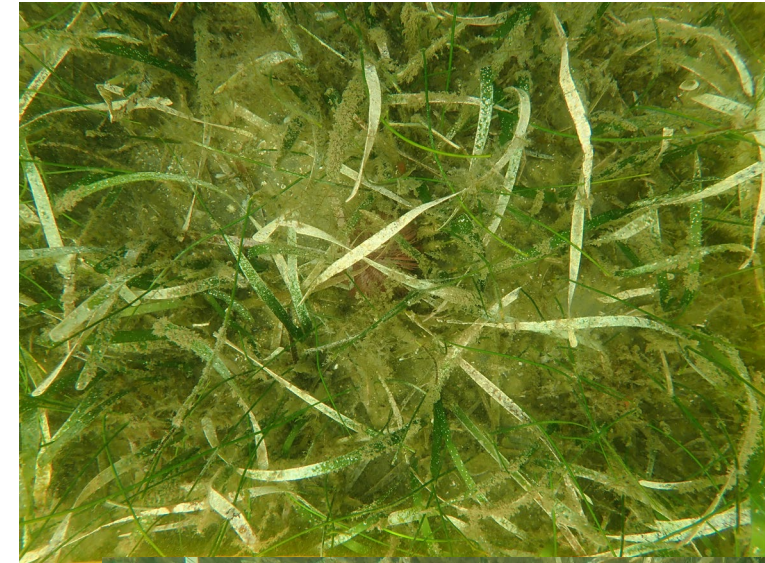
Urchin Survey Grass Quad

USG6

GPS:29.80698 -83.6213



Note- the urchin front is about 1.5m away from this grass



Urchins outside quad

Urchin Survey Grass Quad

USG6
GPS:29.80698 -83.6213

Data

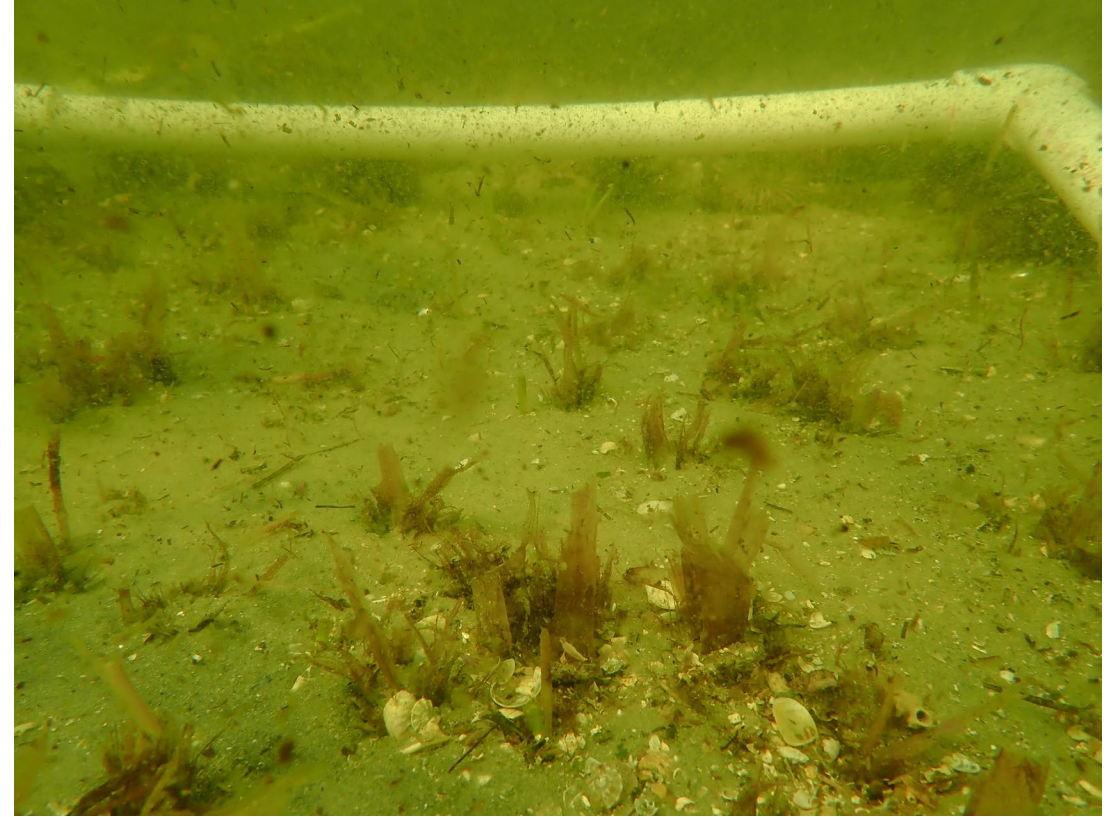
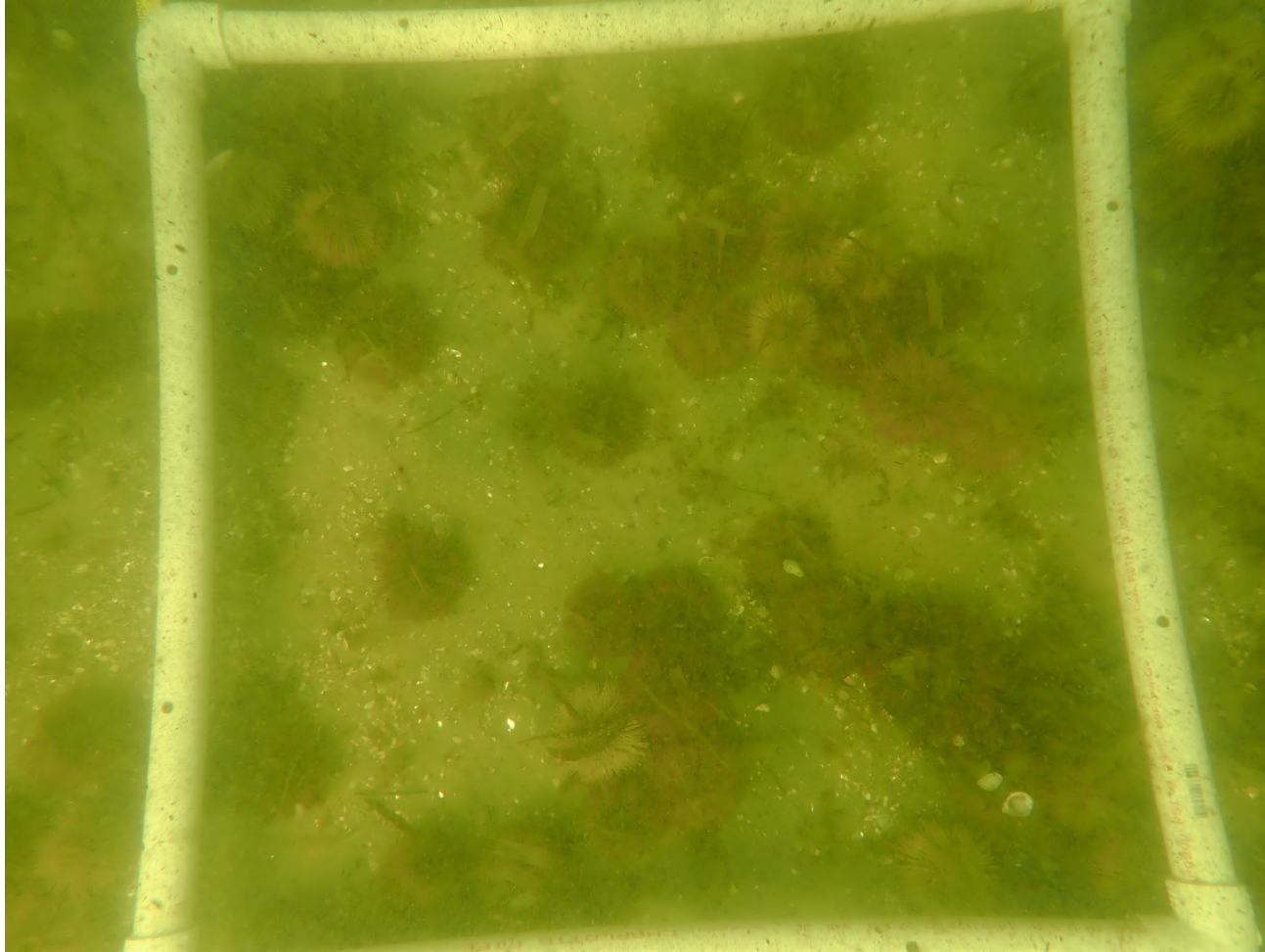
Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHINS	SCALLOPS	GRASS_ALGAE	TOTAL_STAV_PERCENT_C	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYTETYPE	SEDIMENT_TYPE	Rhizomes
3/9/2023	USG06	Grass	TTES	30	26	23.7	22.1	1	0	Grass	40	40	0	Heavy	Sand Mud Shell	Yes
3/9/2023	USG06	Grass	SFIL	10	21.5	30	29.7			Grass						
3/9/2023	USG06	Grass	Drift	5												

Temp	DO (mg/L)	Salinity	pH
20.573	6.19	31.95	7.6

Urchin Survey Bare Quad

USB4

GPS:29.80446 -83.6269



Urchin Survey Bare Quad

USB4
GPS:29.80446 -83.6269

Data

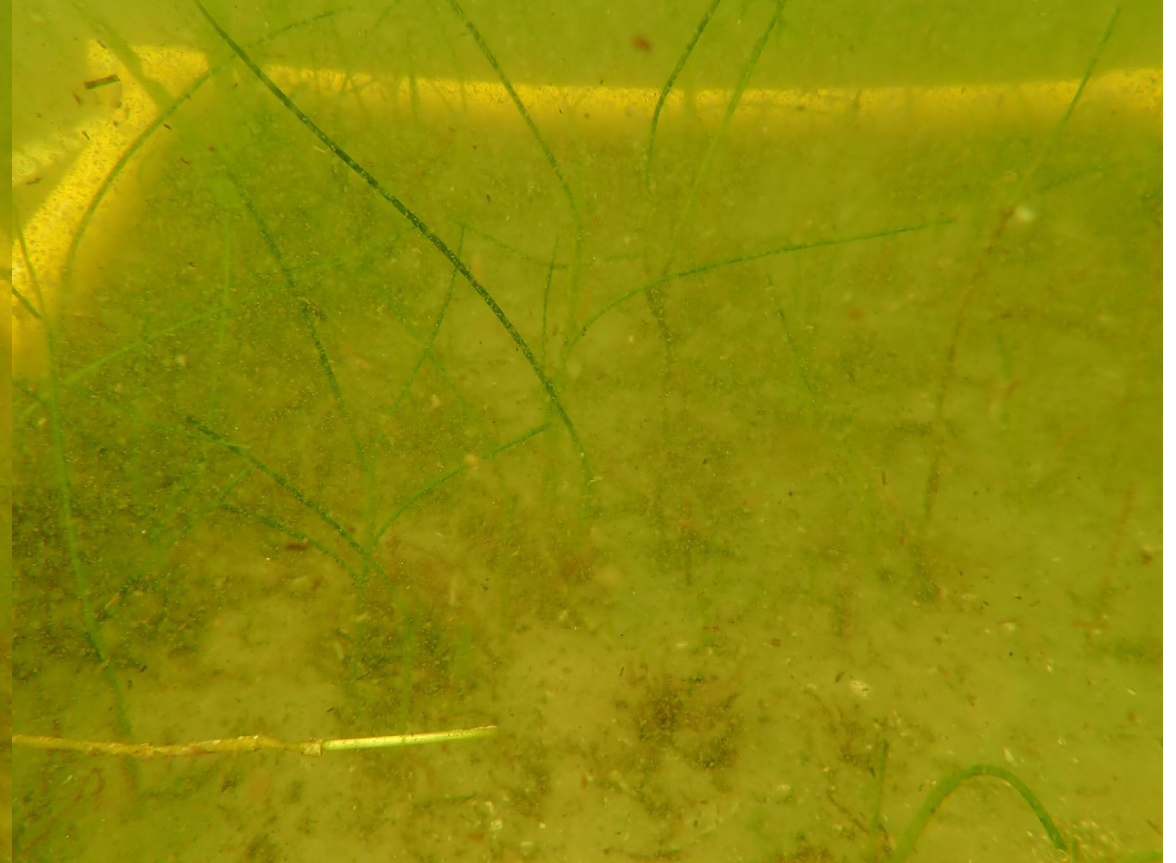
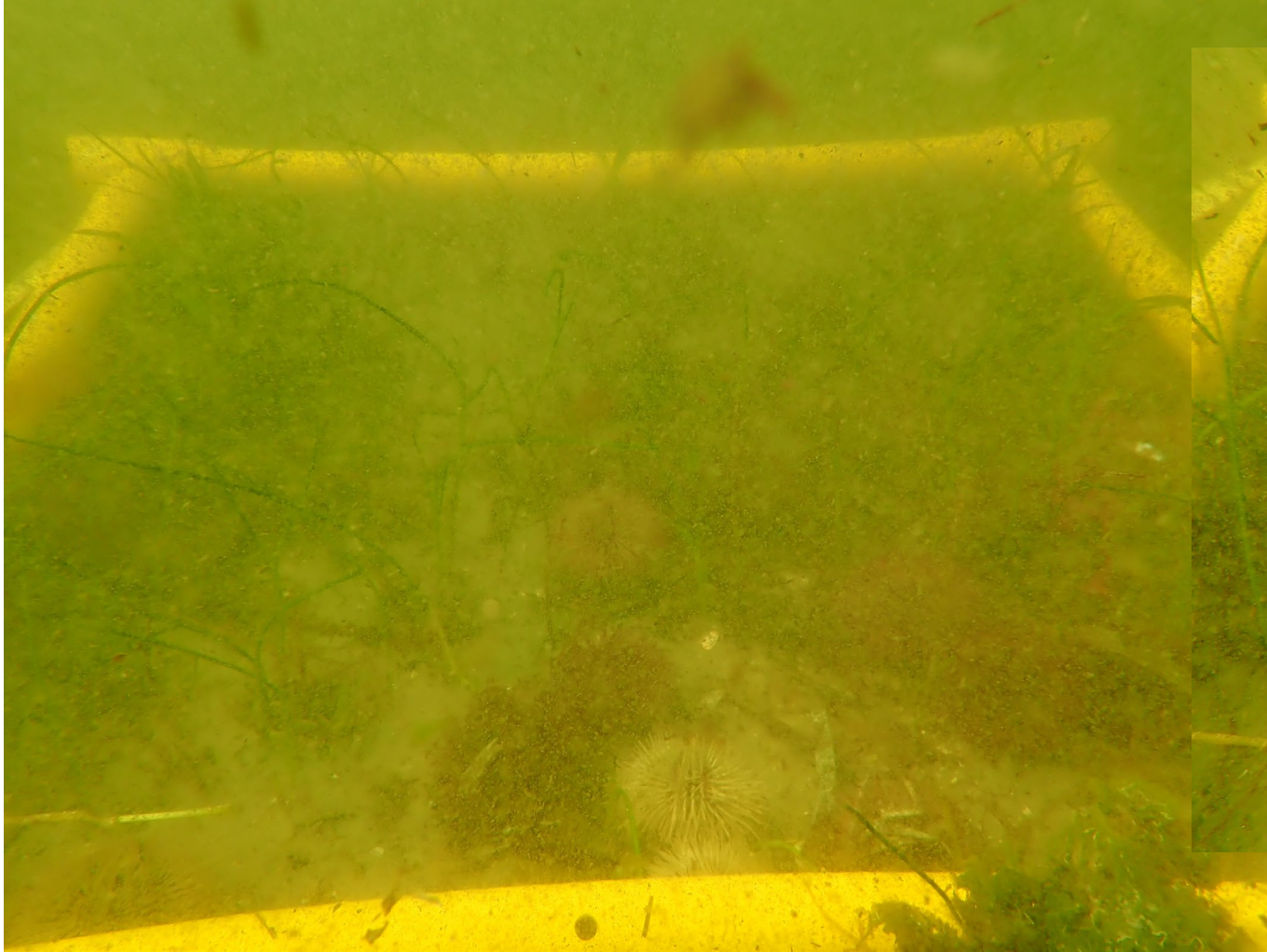
Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHINS	SCALLOPS	GRASS_ALGAE	TOTAL_SAV_PERCENT_COVER	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYT_DENSITY	SEDIMENT_TYPE	Rhizomes
3/7/2023	USB04	Bare	TTES	6	2	0.5	1.2	41	0	Grass	10	10	0	Light	Sand Mud Shell	Yes
3/7/2023	USB04	Bare	SFIL	4	4	8	1			Grass						

Temp	DO (mg/L/)	Salinity	pH
23.3	6.11	31.05	7.72

Urchin Survey Bare Quad

USB5

GPS:29.80634 -83.6222



Urchin Survey Bare Quad

USB5
GPS:29.80634 -83.6222

Data

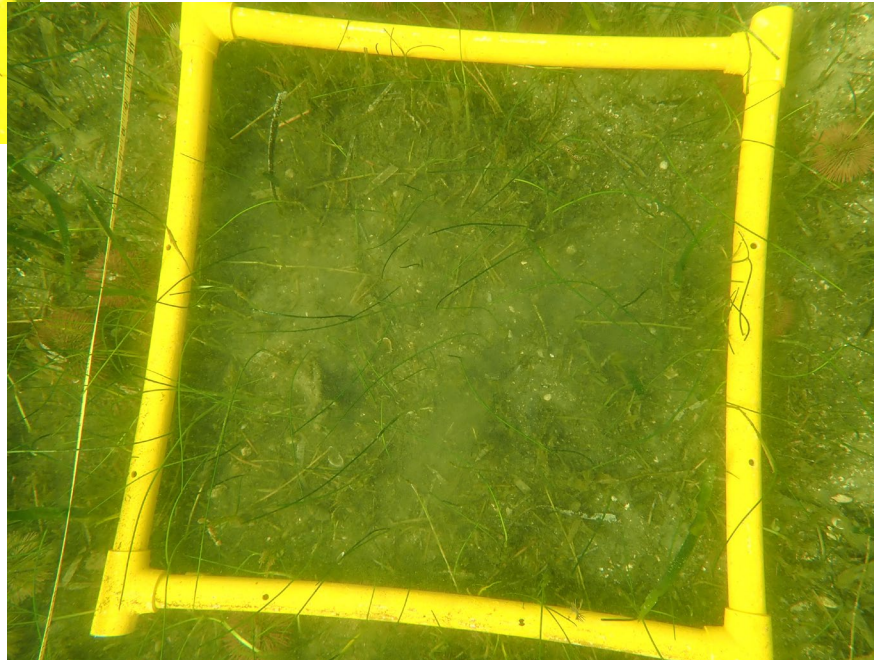
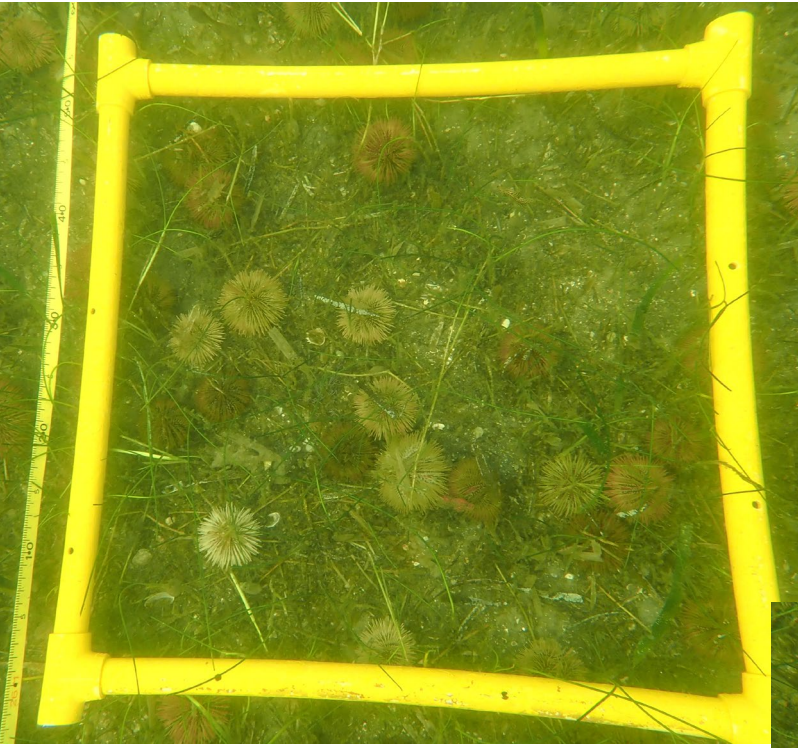
Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHIN S	SCALLOPS	GRASS_ALGAE	TOTAL_SAV_PERCENT_OVER	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYTETYPE	SEDIMENT_TYPE	Rhizomes
3/7/2023	USB05	Bare	TTES	3	11	18	17	23	0	Grass	10	10	0	Light	Sand Mud Shell	Yes
3/7/2023	USB05	Bare	SFIL	7	28	7.5	1			Grass						

Temp	DO (mg/L/)	Salinity	pH
23.7	6.2	31.18	7.71

Urchin Survey Bare Quad

USB6

GPS:29.80691 -83.6216



Urchin Survey Bare Quad

USB6
GPS:29.80691 -83.6216

Data

Date	Site Name	Type	SPECIES	PERCENT_COVER	Canopy Height (cm)	Canopy Height (cm)	Canopy Height (cm)	URCHIN S	SCALLOPS	GRASS_ALGAE	TOTAL_SAV_PERCENT_COVER	TOTAL_GRASS_PERCENT	TOTAL_MACROALGAE_PERCENT	EPIPHYT_DENSITY	SEDIMENT_TYPE	Rhizomes
3/9/2023	USB06	Bare	TTES	2	13	11	8.5	21	0	Grass	10	10	0	Light	Sand Mud Shell	Yes
3/9/2023	USB06	Bare	SFIL	8	20.7	21	15.6			Grass						

Temp	DO (mg/L/)	Salinity	pH
20.573	6.19	31.95	7.6

Average Canopy Height for all sites 1-6

Site Name	Type	SPECIES	avg canopy
USB01	Bare	TTES	12.33333
USB04	Bare	TTES	1.233333
USB04	Bare	SFIL	4.333333
USB05	Bare	TTES	15.33333
USB05	Bare	SFIL	12.16667
USB06	Bare	TTES	10.83333
USB06	Bare	SFIL	19.1

Site Name	Type	SPECIES	avg canopy
USU01	Urchin	TTES	14.93333
USU01	Urchin	SFIL	19
USU02	Urchin	TTES	10.2
USU03	Urchin	TTES	13.66667
USU03	Urchin	SFIL	8.066667
USU04	Urchin	TTES	10.66667
USU04	Urchin	SFIL	8
USU04	Urchin	HWRI	8
USU05	Urchin	TTES	15
USU05	Urchin	SFIL	19.66667
USU05	Urchin	HWRI	9
USU06	Urchin	TTES	16.83333
USU06	Urchin	SFIL	14.66667
USU06	Urchin	HWRI	12.66667

Site Name	Type	SPECIES	avg canopy
USG01	Grass	TTES	21.66667
USG01	Grass	SFIL	18.66667
USG01	Grass	HWRI	20.66667
USG02	Grass	TTES	18
USG02	Grass	SFIL	20.66667
USG02	Grass	HWRI	14.66667
USG03	Grass	TTES	17.33333
USG03	Grass	SFIL	16.66667
USG04	Grass	TTES	18.33333
USG04	Grass	SFIL	24.66667
USG05	Grass	TTES	21
USG05	Grass	SFIL	23.86667
USG06	Grass	TTES	23.93333
USG06	Grass	SFIL	27.06667

Other Averages for all sites 1-6

Density averages by type of quad

	avg % total sav	average % grass	average urchin count	average BB score
Bare	6.666667	6.666667	19.66667	2
Grass	32.333333	32.16667	0.666667	3
Urchin	20.833333	20.833333	103.1667	2

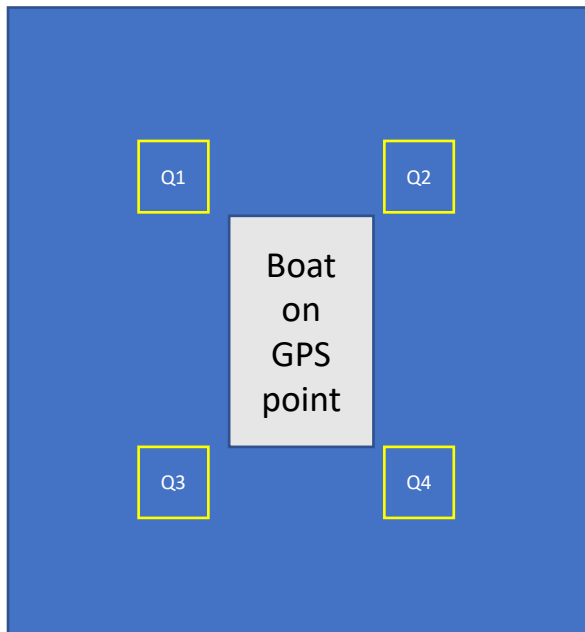
Average canopy
height of TTES by
type

type	average TTES Height
Urchin	13.55
Grass	20.04444
Bare	9.933333

Note the average Braun-Blanquet density between 2017-2022 was 4.54 at DBKB14 and 4.42 at DBKB15. The surveys were conducted between DBKB 14 and DBKB15. The surveys of DBKB14 and DBKB15 on 8 February 2023 show that DBKB BB density as 1.25 for DBKB14 where the urchins have passed through already and 3.5 at DBKB15 where the urchins are headed. DBKB14 had a BB density of 3.5 and average total SAV % of 47.5% in 2022. DBKB15 had a BB density of 3.75 and total SAV % of 58% in 2022. Analysis of established sites March surveys in following slides.

The following slides use a 1m² quadrat to reflect seagrass monitoring protocols followed by BBSAP. The following sites, DBKB14 and DBKB15, are established seagrass sites monitored yearly by BBSAP. SOP can be found on [SEACAR](#) under BBSAP Protocols. These sites were used to compare to historical seagrass monitoring data. Sites 14 and 15 are on either side of the seagrass front line, urchins have passed 14 and are heading in the direction of 15 currently.

Sample Design



Four quadrats thrown randomly around boat which sits atop the site GPS point.

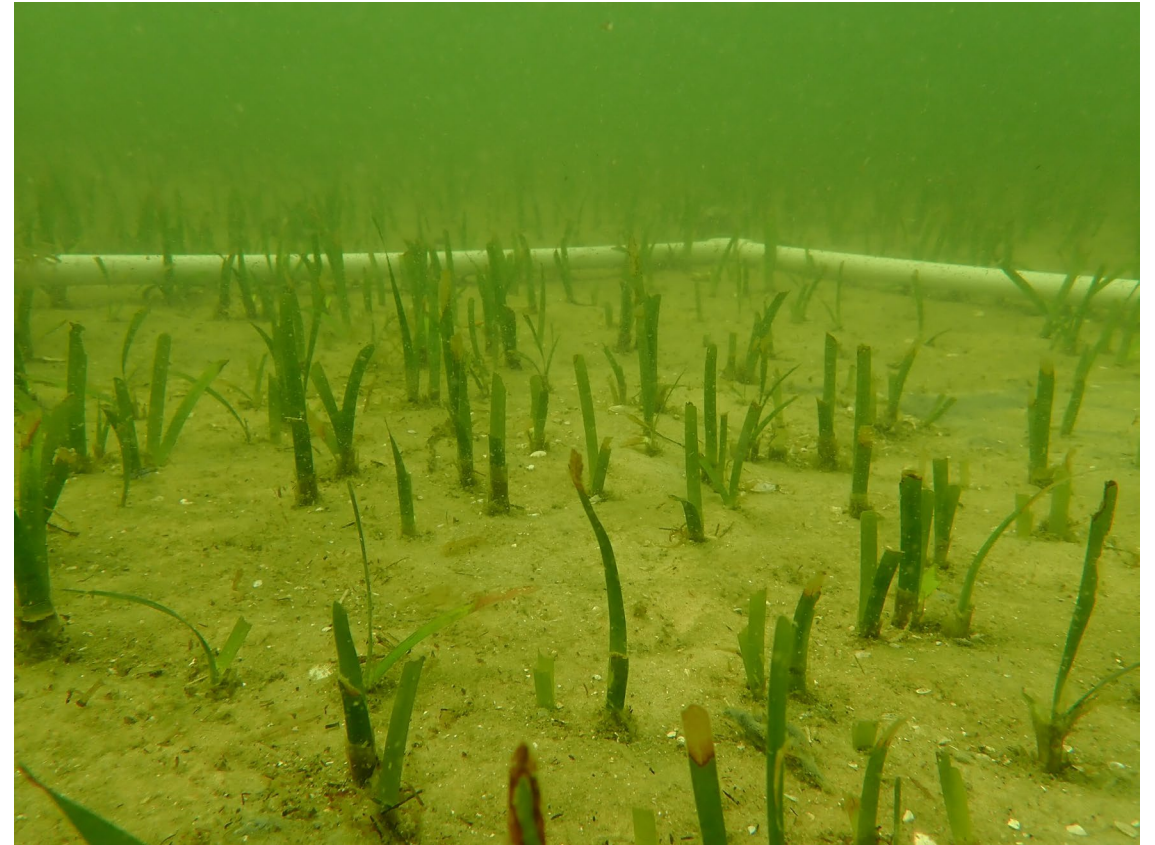
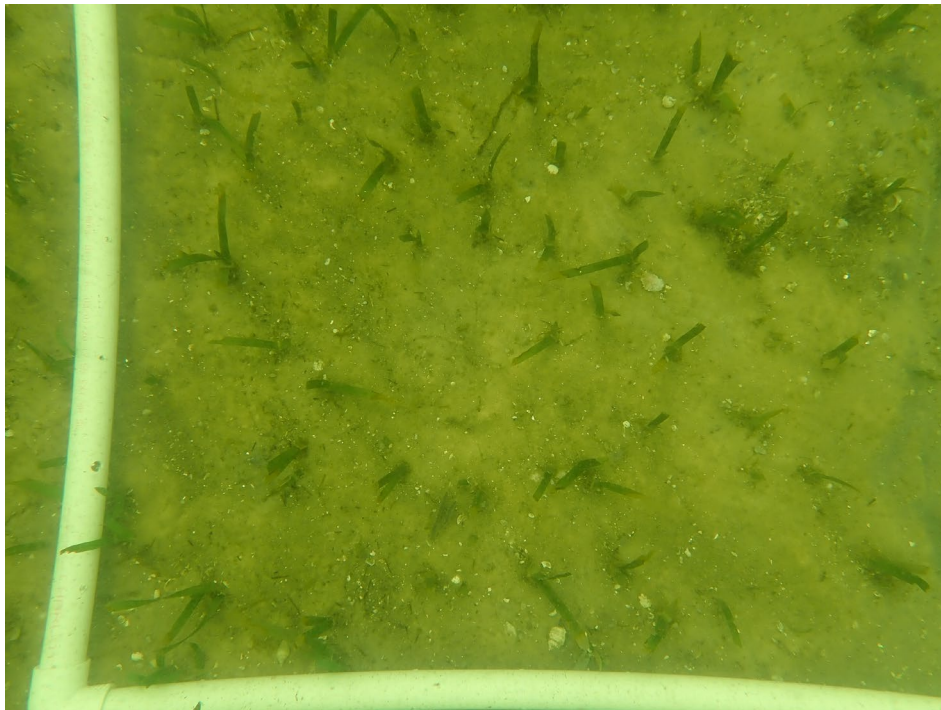
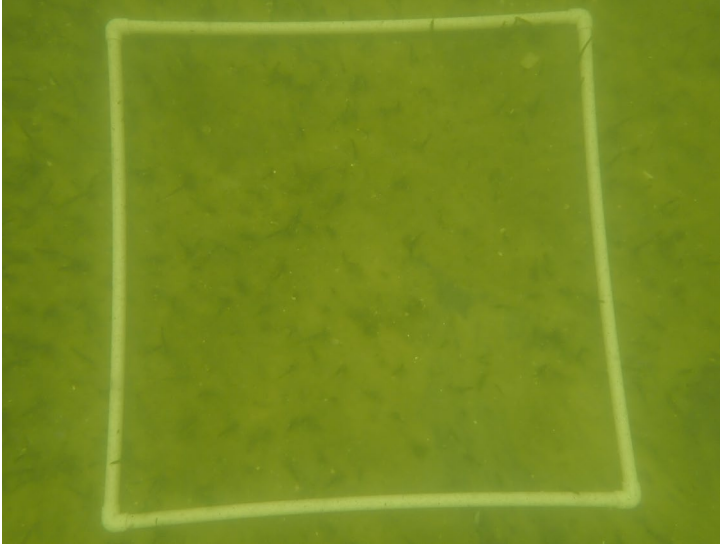


Urchin Survey DBKB14 Quad 1

DBKB14 GPS:

Latitude 29.8067

Longitude -83.6311



No urchins present,
not many around
quad, longer shoots

Urchin Survey DBKB14 Quad 2

DBKB14 GPS: Latitude 29.8067
Longitude -83.6311

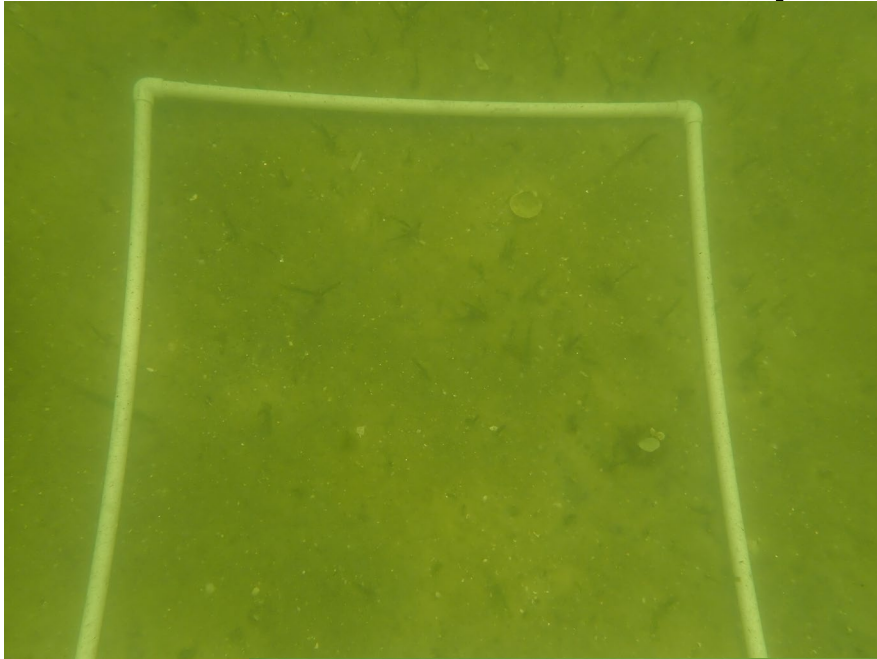
No urchins present



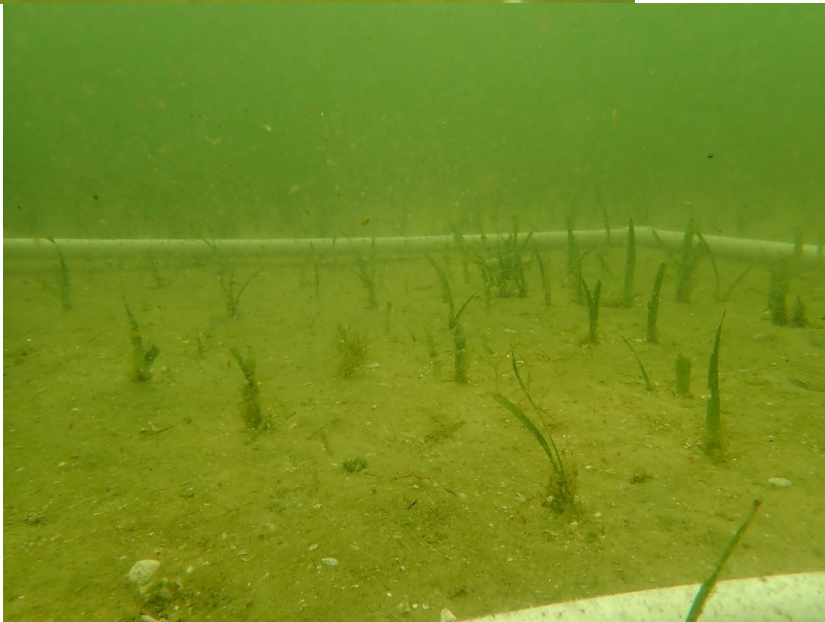
Urchin Survey DBKB14 Quad 3

DBKB14 GPS:

Latitude	29.8067
Longitude	-83.6311

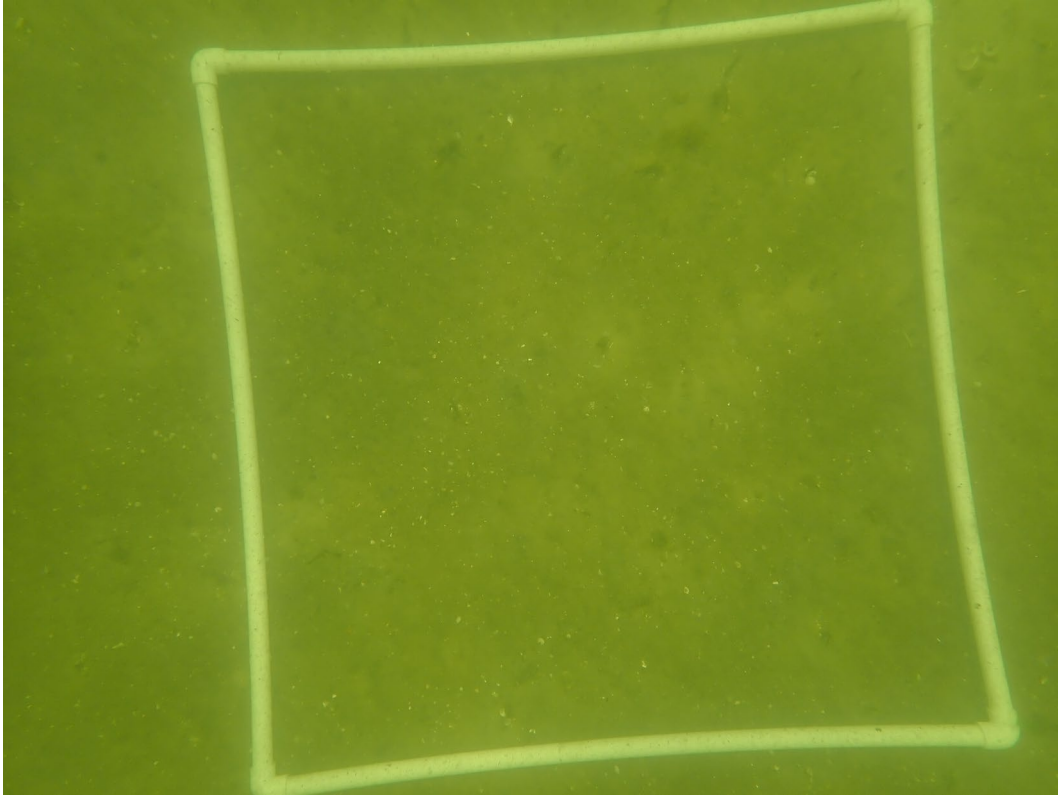


1 urchin in quad, shorter shoots
than first 2 quads



Urchin Survey DBKB14 Quad 4

DBKB14 GPS: Latitude 29.8067
Longitude -83.6311



No urchins present in quad, more around than the other quads. Very bare, short shoots

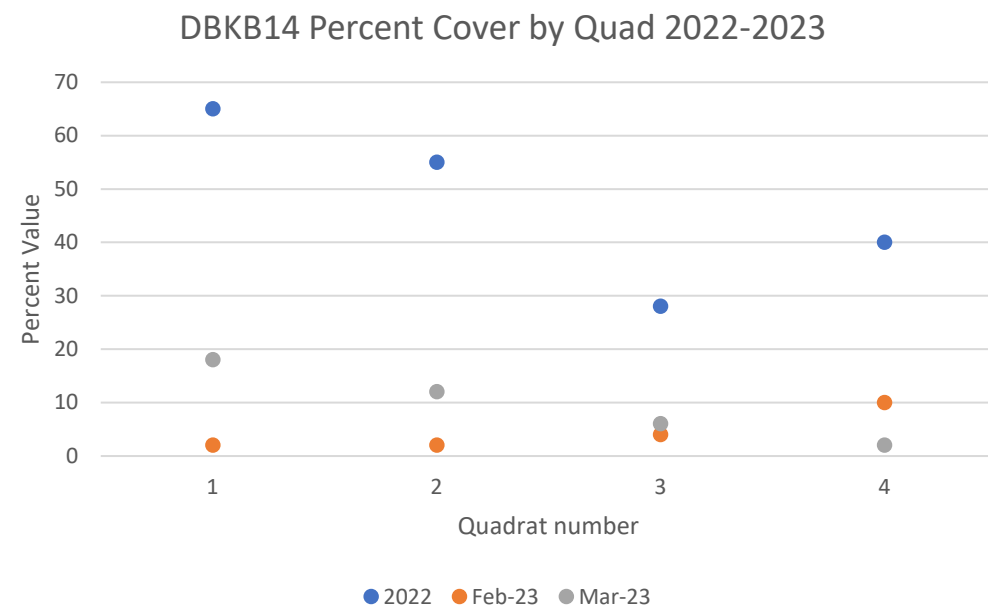


DBKB14 GPS: **Latitude** 29.8067

Longitude -83.6311

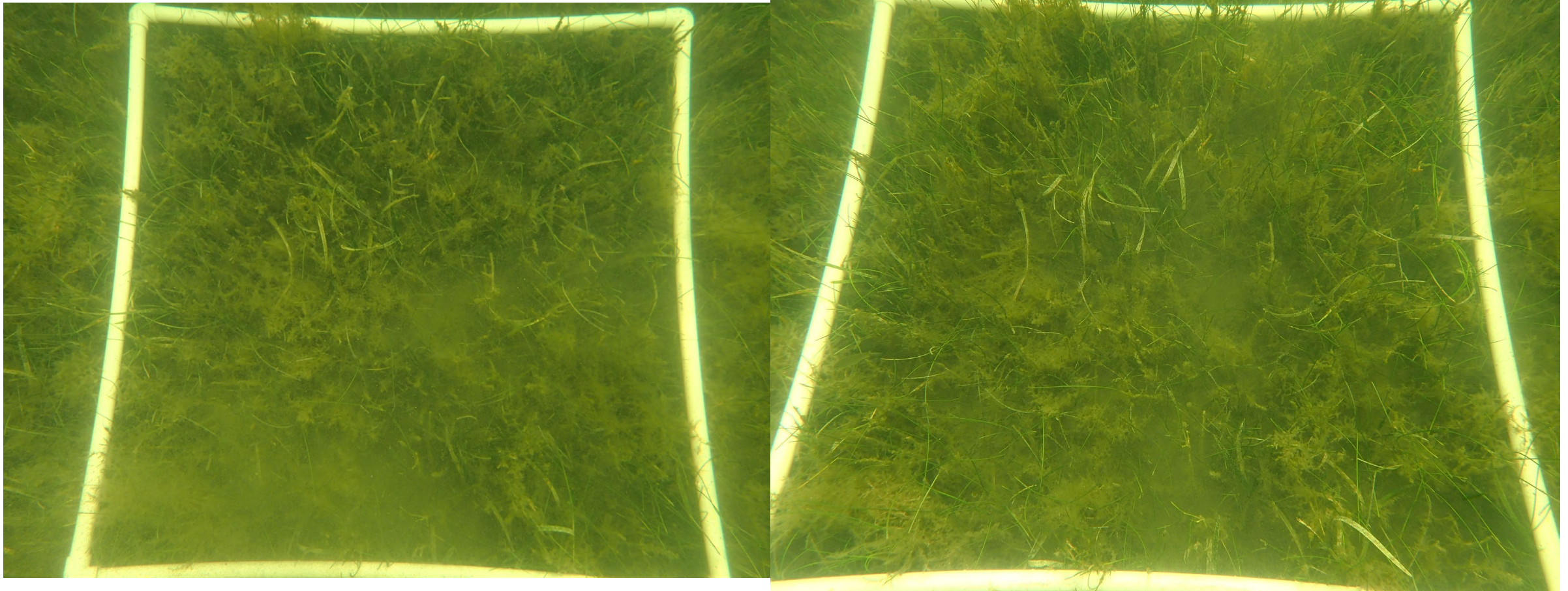


Percent Cover by Quad	2022	Feb-23	Mar-23
Quad 1	65	2	18
Quad 2	55	2	12
Quad 3	28	4	6
Quad 4	40	10	2



Urchin Survey DBKB15 Quad 1

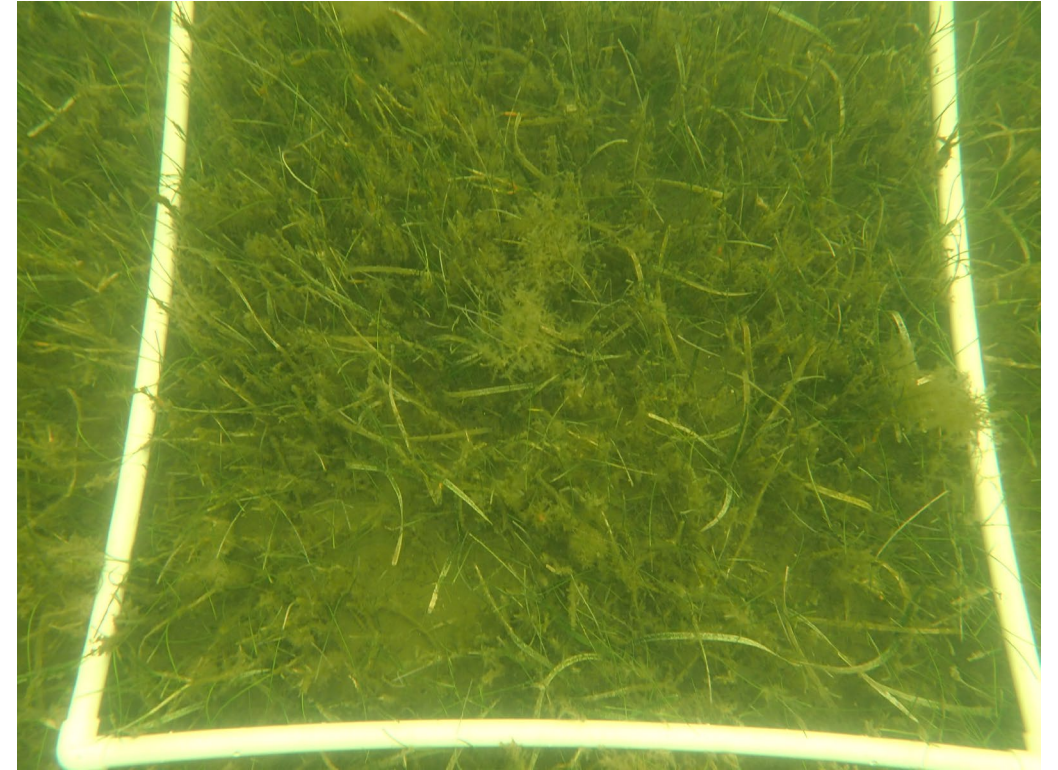
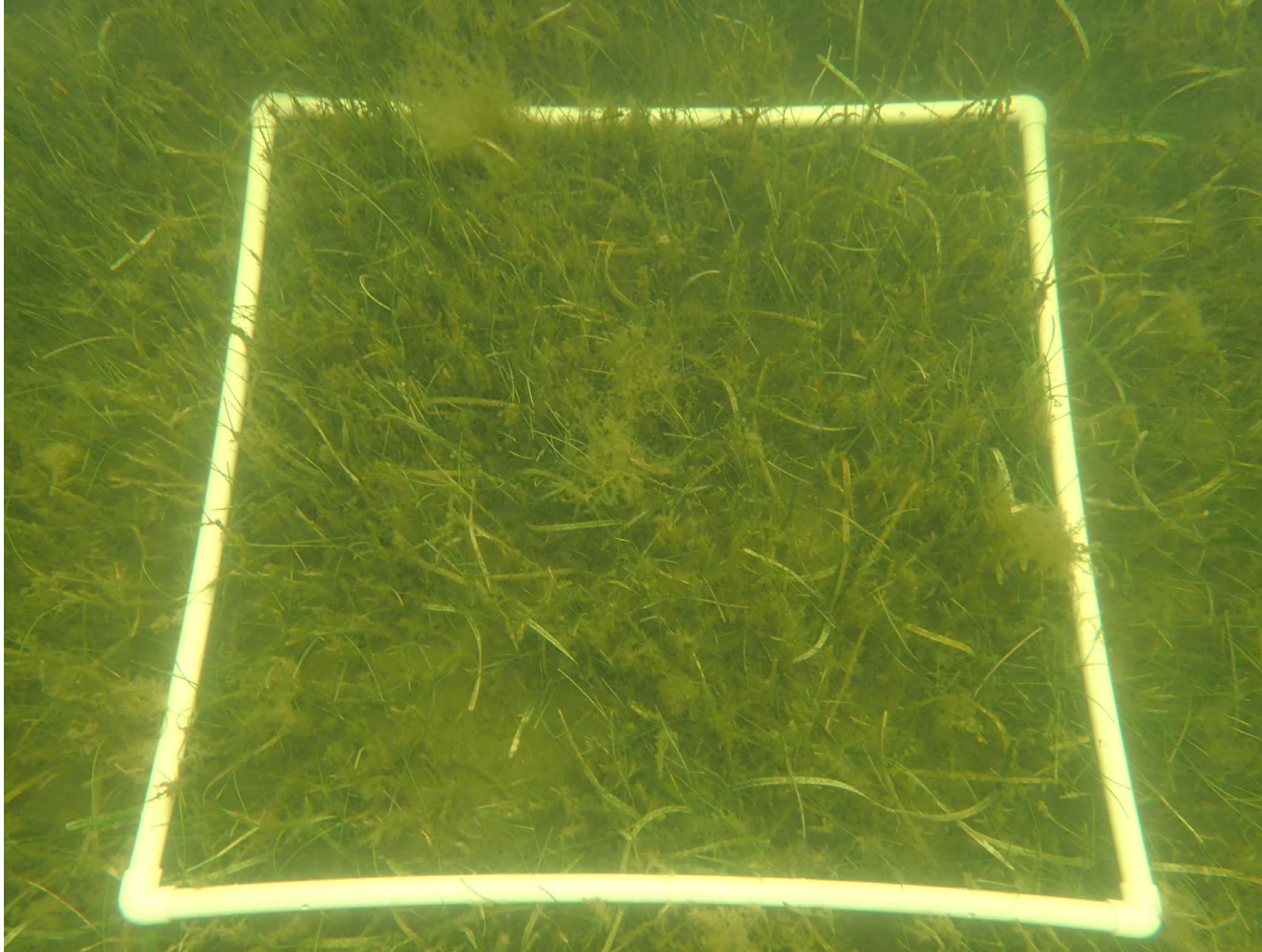
DBKB15 GPS: Latitude 29.8015
Longitude -83.6171



No urchins present

Urchin Survey DBKB15 Quad 2

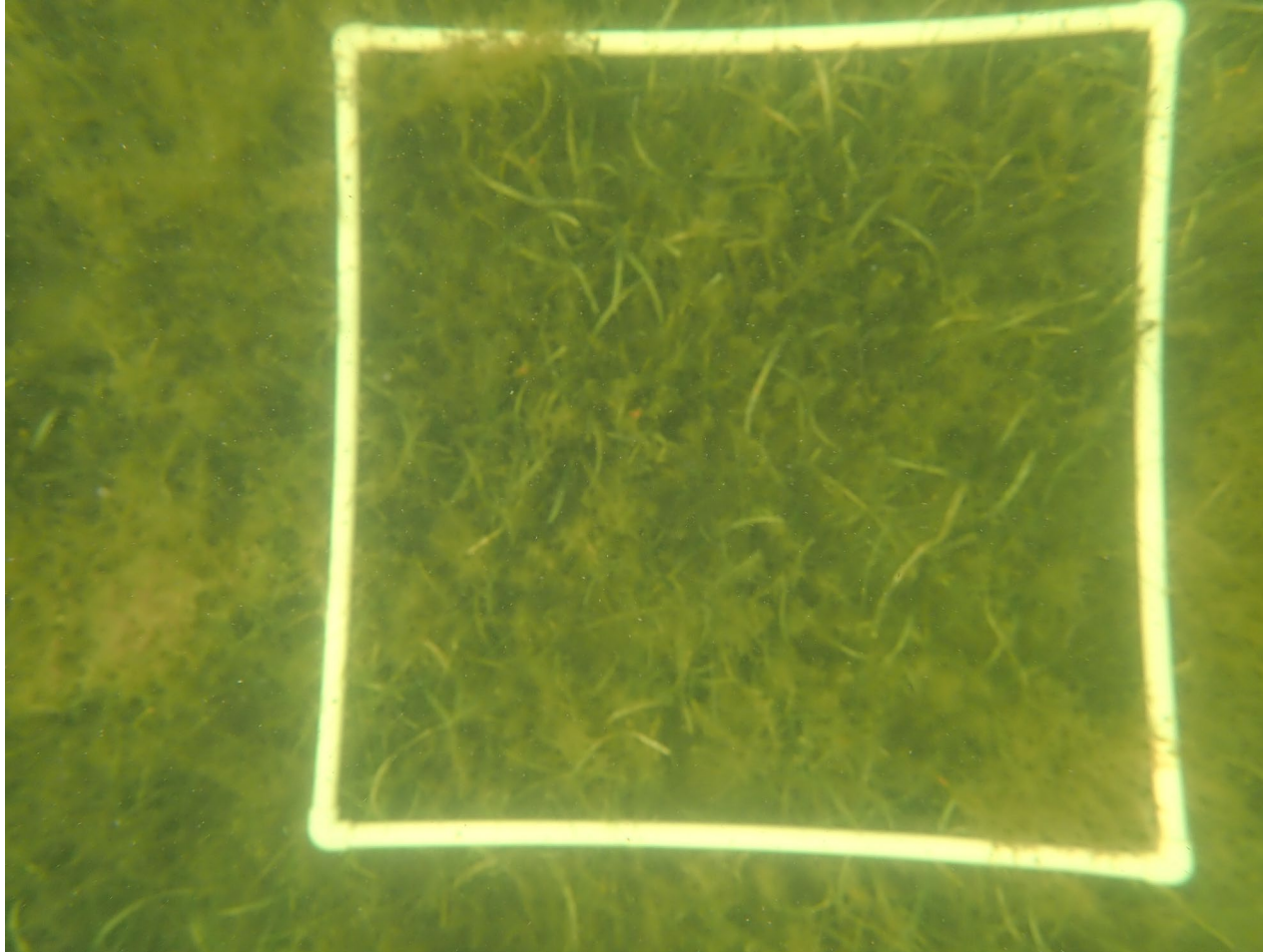
DBKB15 GPS: Latitude 29.8015
Longitude -83.6171



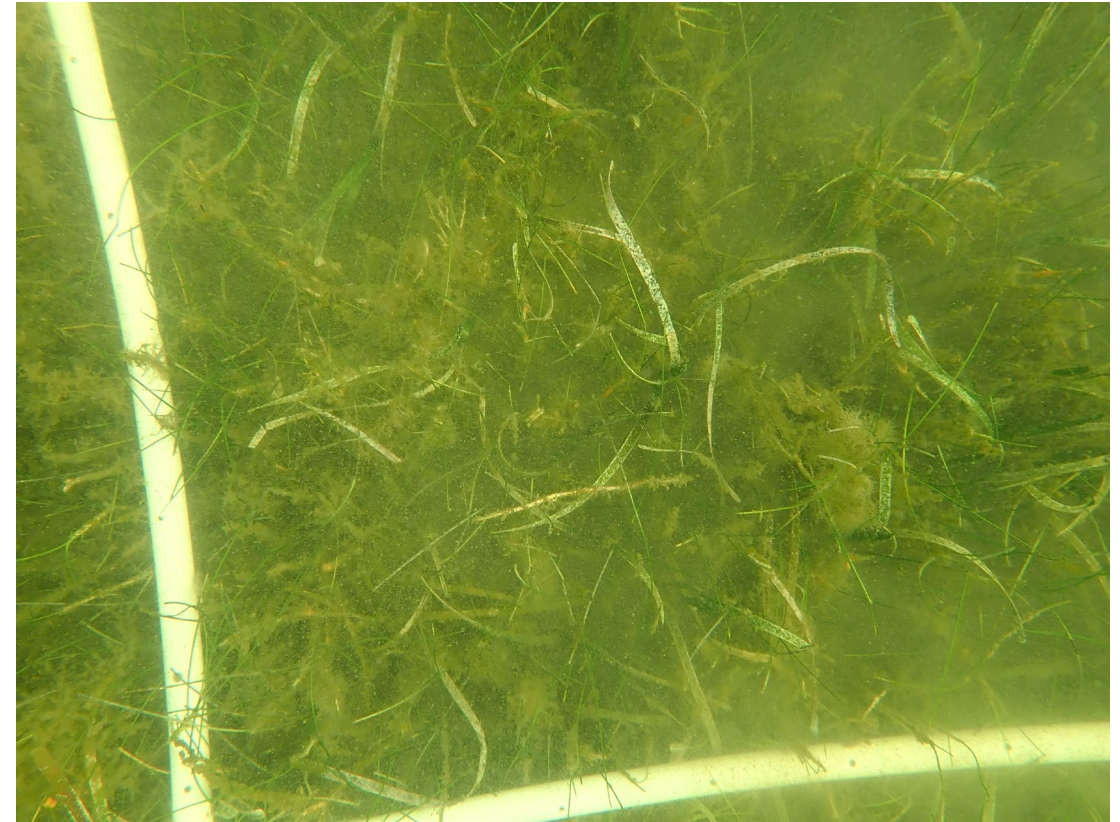
No urchins present

Urchin Survey DBKB15 Quad 3

DBKB15 GPS: Latitude 29.8015
Longitude -83.6171



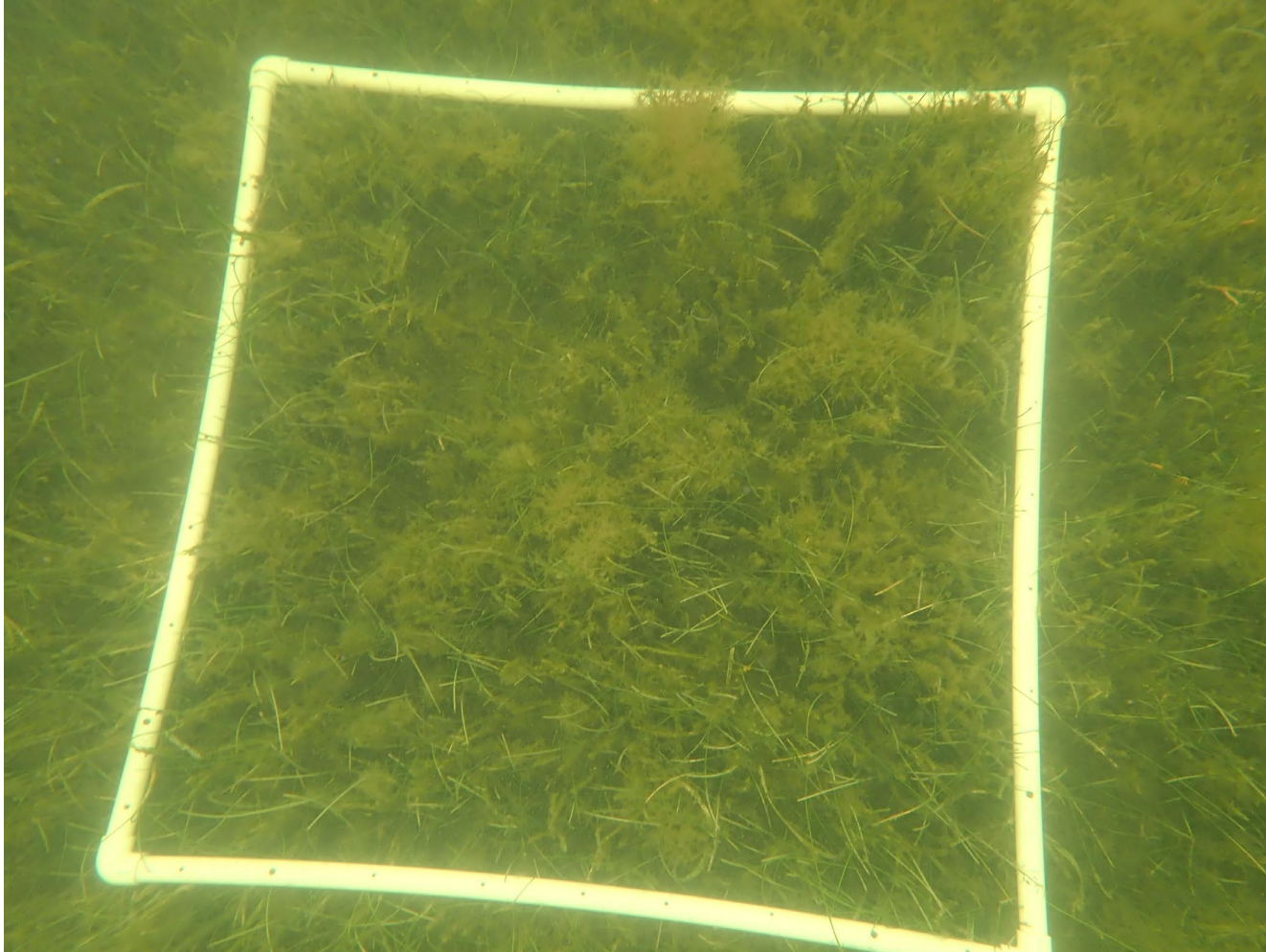
No urchins present



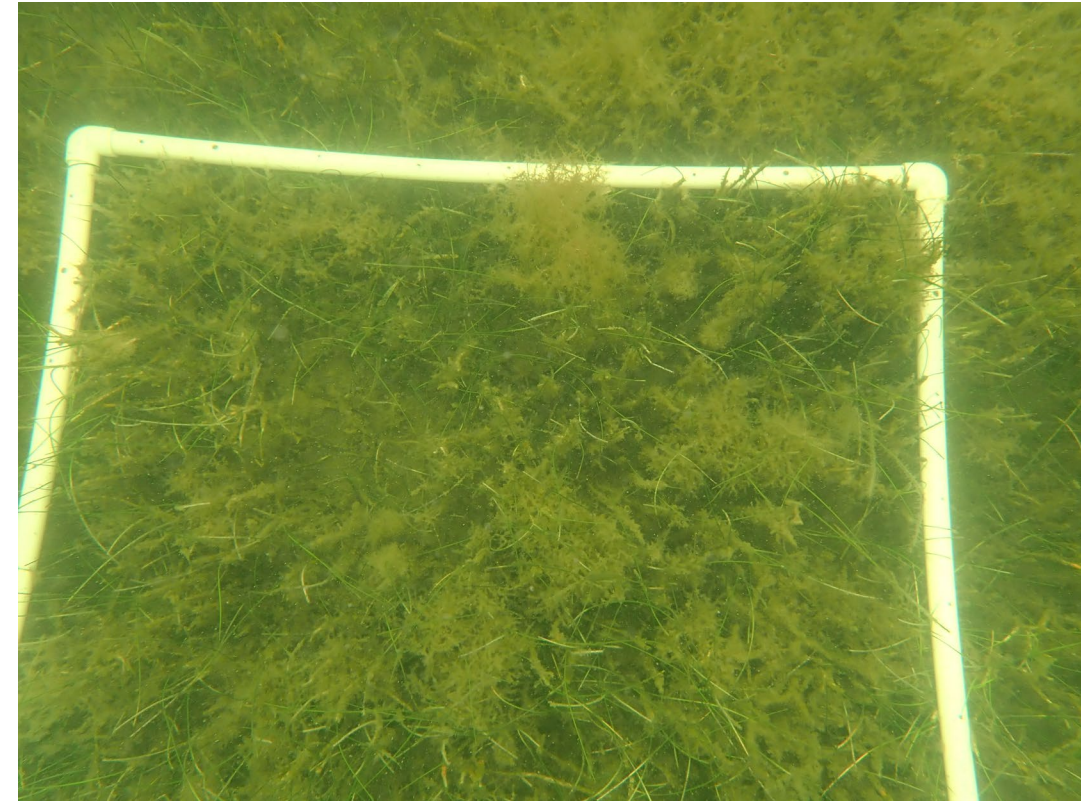
Notes from the field: sparse between the grass blades, lots of attached drift algae

Urchin Survey DBKB15 Quad 4

DBKB15 GPS: Latitude 29.8015
Longitude -83.6171



No urchins present



Notes from the field: sparse between the grass blades, lots of attached drift algae, big gap in top left corner.

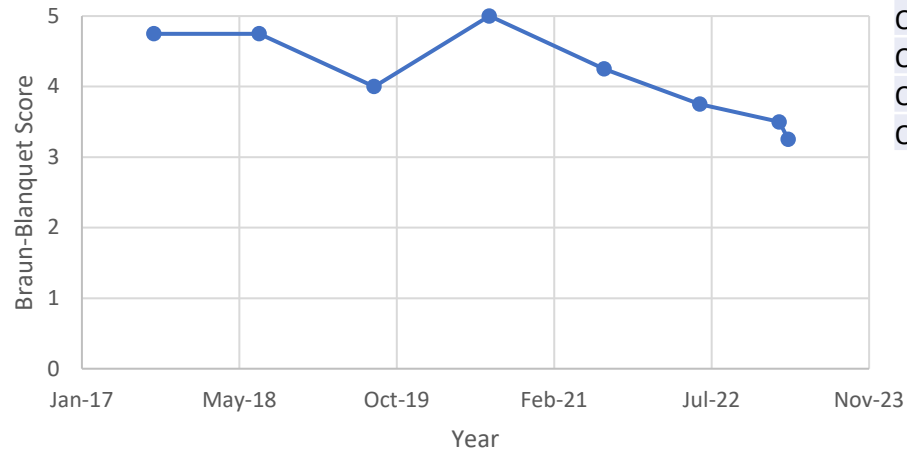
Urchin Survey DBKB15 Visit

DBKB15 GPS:

Latitude 29.8015

Longitude -83.6171

DBKB15 Total Seagrass Density

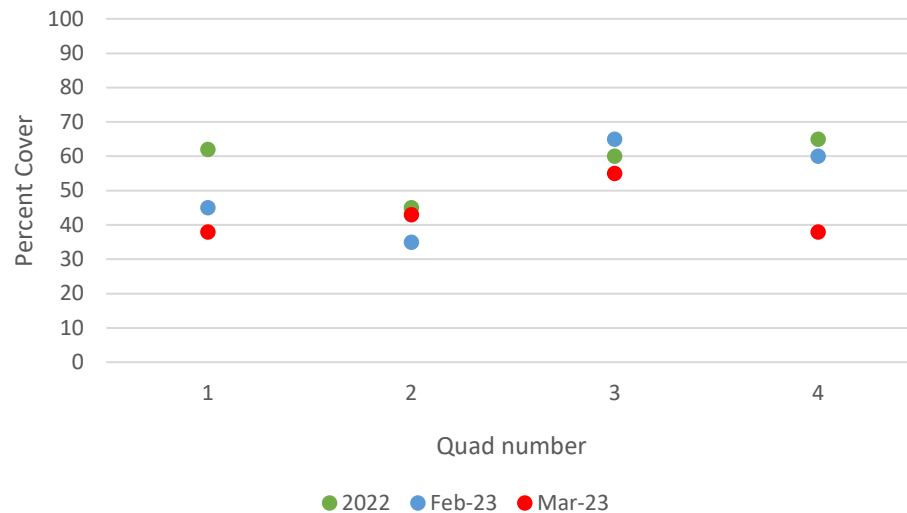


Braun-Blanquet Scores	2017	2018	2019	2020	2021	2022	Feb-23	Mar-23
Quad 1	5	4	4	5	5	4	3	3
Quad 2	5	5	2	5	4	3	3	3
Quad 3	5	5	5	5	5	4	4	4
Quad 4	4	5	5	5	3	4	4	3

Year	Density
Sep-17	4.75
Aug-18	4.75
Aug-19	4
Aug-20	5
Aug-21	4.25
Jun-22	3.75
Feb-23	3.5
Mar-23	3.25

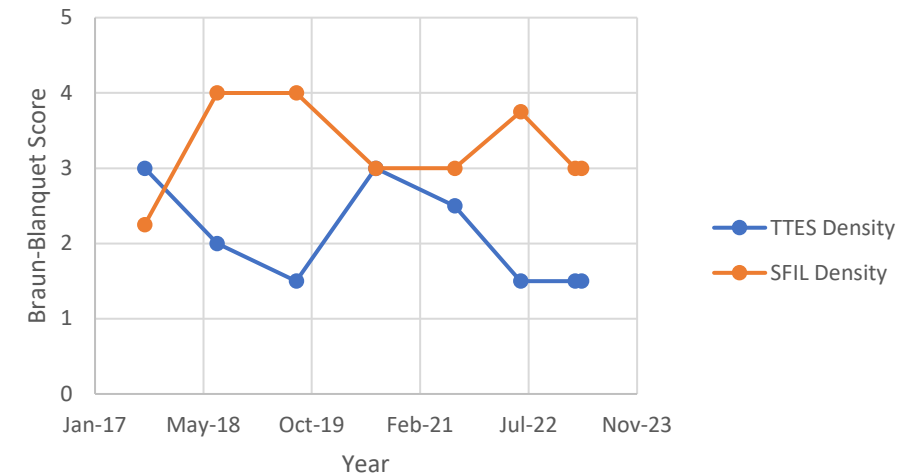
Year	TTES Density	SFIL Density
Sep-17	3	2.25
Aug-18	2	4
Aug-19	1.5	4
Aug-20	3	3
Aug-21	2.5	3
Jun-22	1.5	3.75
Feb-23	1.5	3
Mar-23	1.5	3

DBKB15 Percent Cover by Quad 2022-2023



Percent Cover	2022	Feb-23	Mar-23
Quad 1	62	45	38
Quad 2	45	35	43
Quad 3	60	65	55
Quad 4	65	60	38

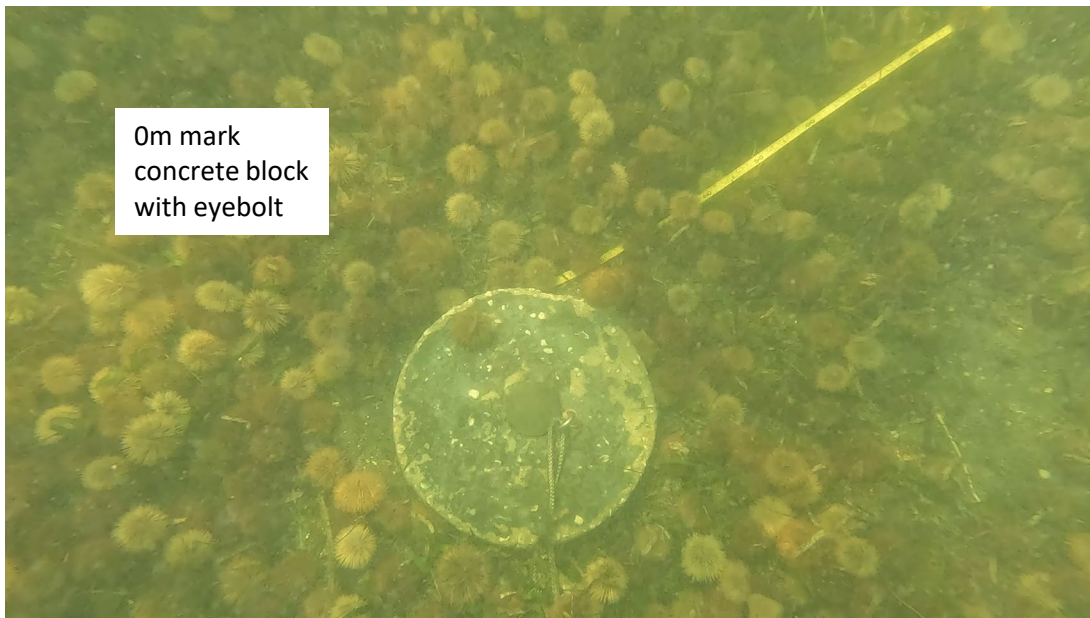
DBKB15 TTES and SFIL Density



Established Transect for Shoot Counts

Addition of a 20m established transect starting in March. A cinderblock with and eyebolt was placed on the back edge of the urchin front and a transect of 20m was run from it toward the grazed area. At the 20m mark rebar was placed and flagged. GPS coordinates were taken at each end. Mini quadrats of 0.04 m^2 were placed every 2m starting at zero. Shoot heights of any living seagrass shoot were measured in millimeters using a ruler and recorded. The goal of this transect is to monitor any regrowth of seagrass following the grazing event. Pictures were taken at each quadrat and a video was taken of the entire line. We hope to establish a second transect in the future but were limited by time this month.

GPS:29.80332 -83.6267



Established Transect Data

Fig1 Shoot Counts per Quadrat along Transect 1 with Urchin counts

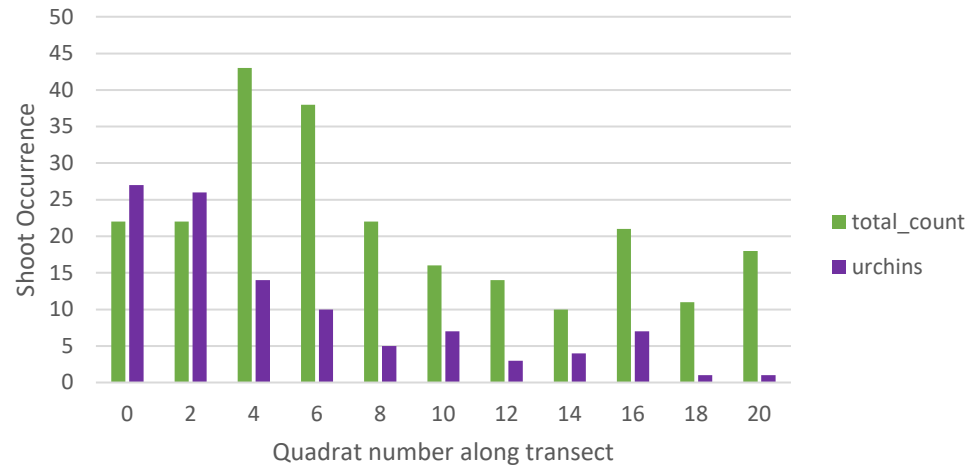


Fig2 Transect One Average Shoot Height and Urchin Count

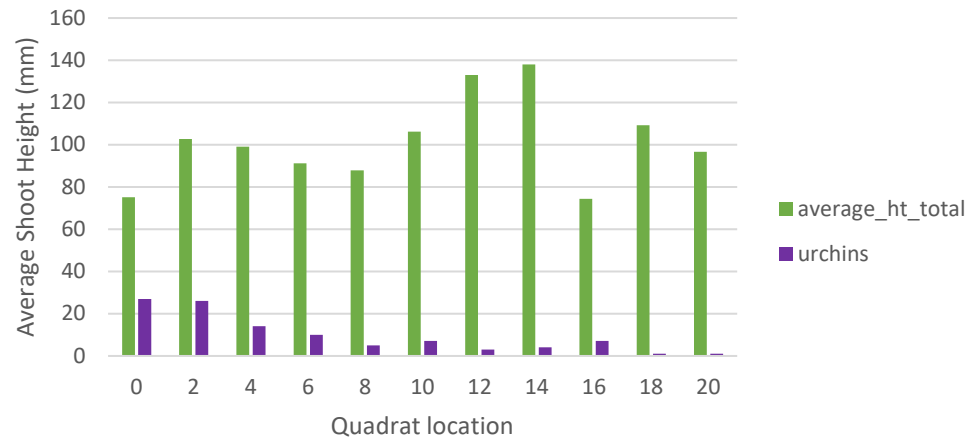


Fig3 Transect 1 Average Species Height

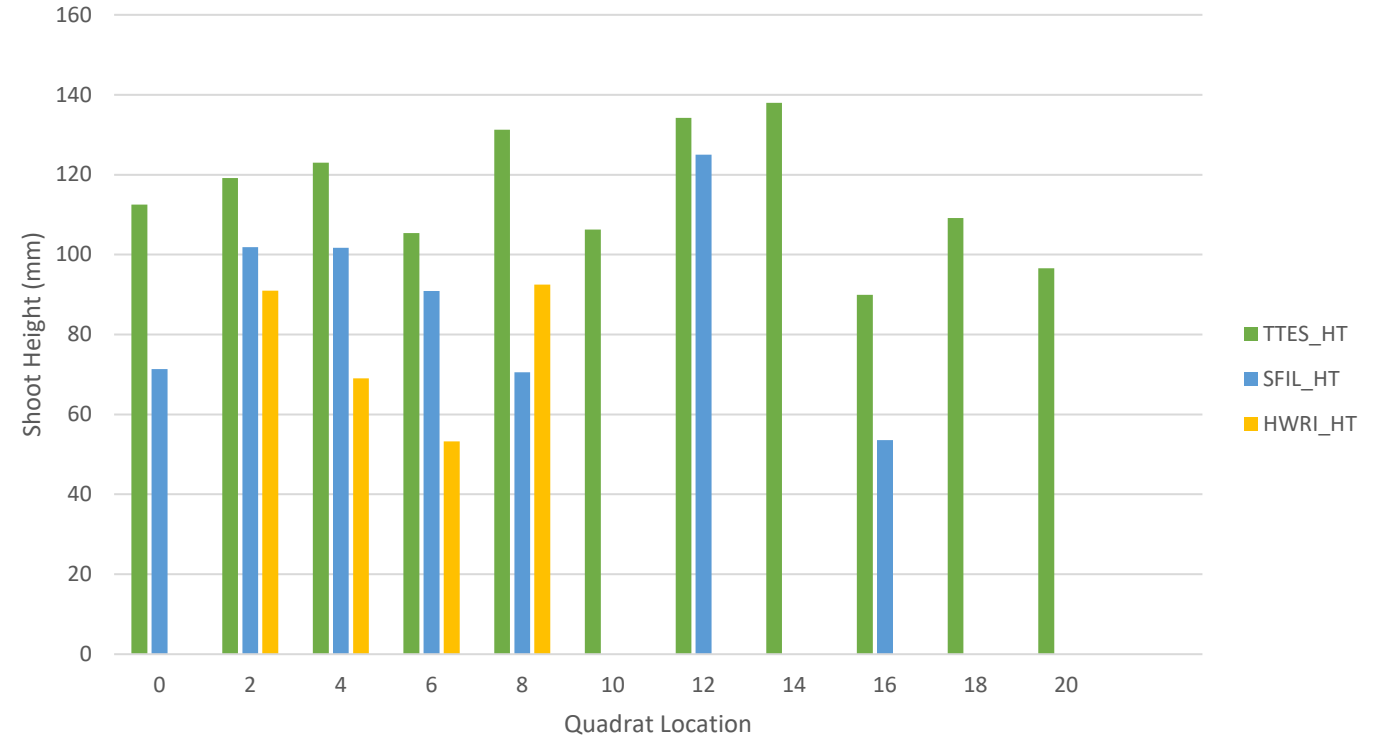
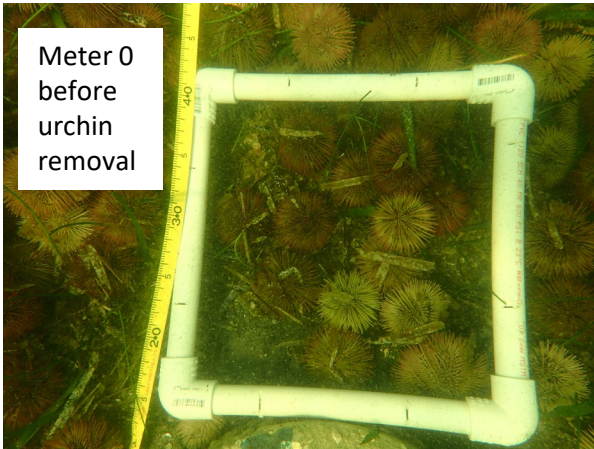


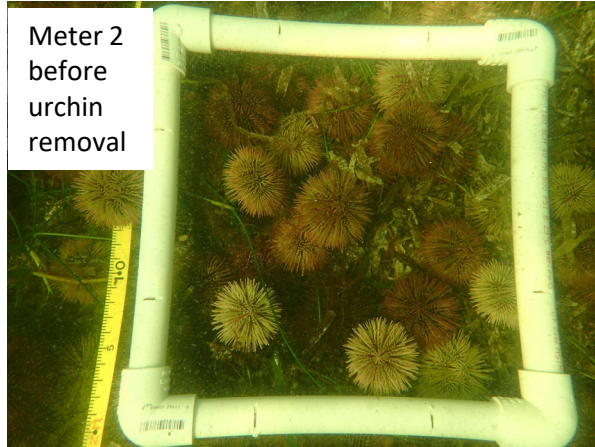
Figure 1. Number of individual shoots and number of urchins per quad. Figure 2. Average height in mm of all shoots in the quad and urchin count. Figure 3. Average height (mm) of each species shoot found in a quadrat, not all quads had all species present.

Established Transect Pictures

Meter 0
before
urchin
removal



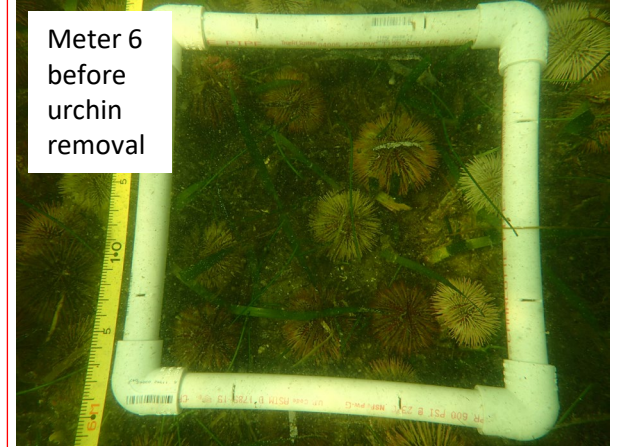
Meter 2
before
urchin
removal



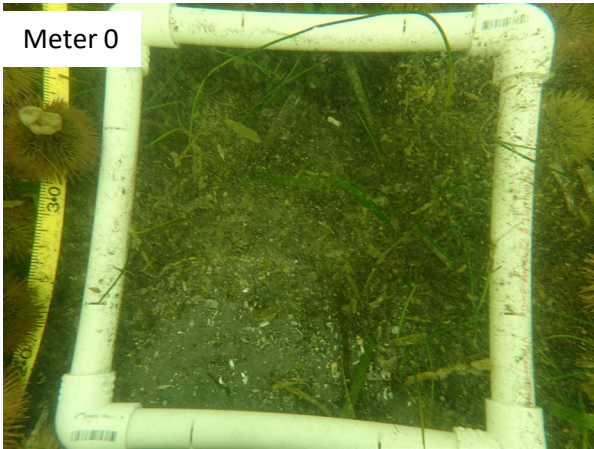
Meter 4
before
urchin
removal



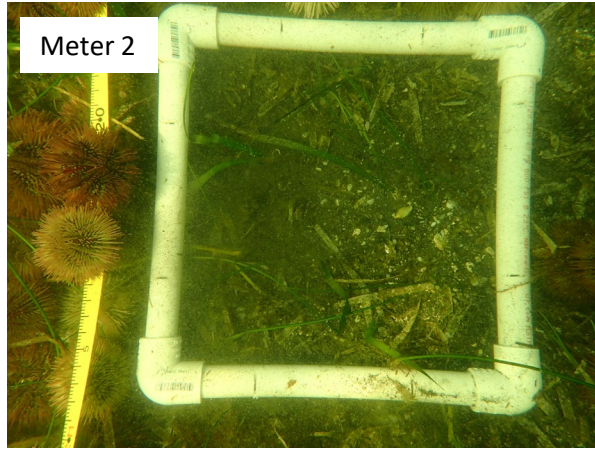
Meter 6
before
urchin
removal



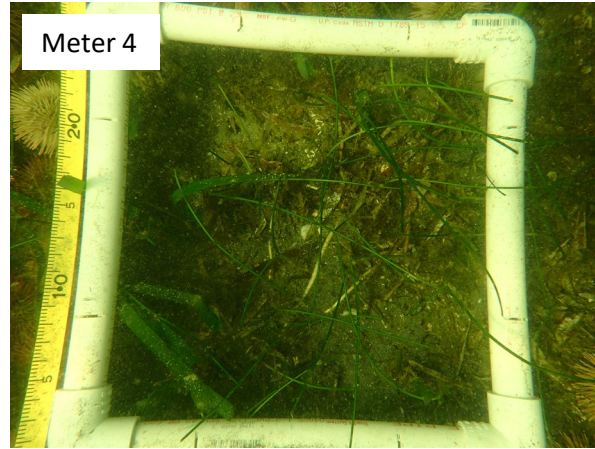
Meter 0



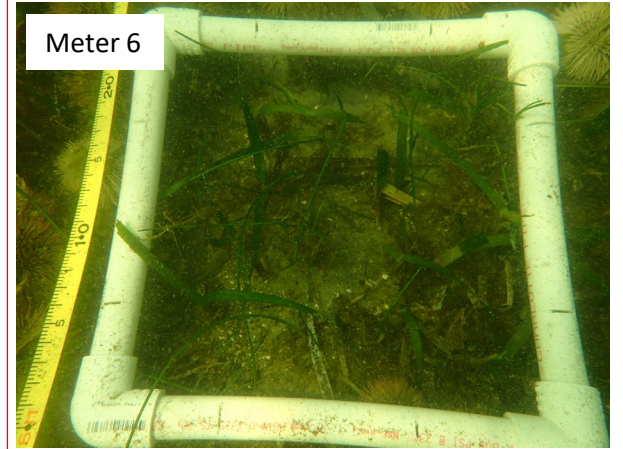
Meter 2



Meter 4



Meter 6



Meter 0 Data

Urchin Count: 27

Shoot count: 22

Average Height (mm): 75.11364

Meter 2 Data

Urchin Count: 26

Shoot count: 22

Average Height (mm): 102.6364

Meter 4 Data

Urchin Count: 14

Shoot count: 43

Average Height (mm): 99.070

Meter 6 Data

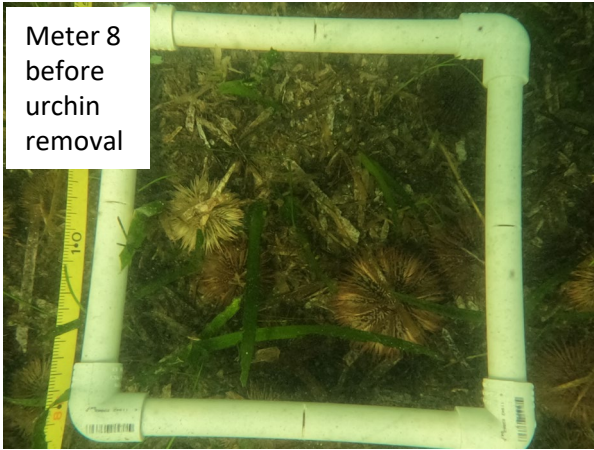
Urchin Count: 10

Shoot count: 38

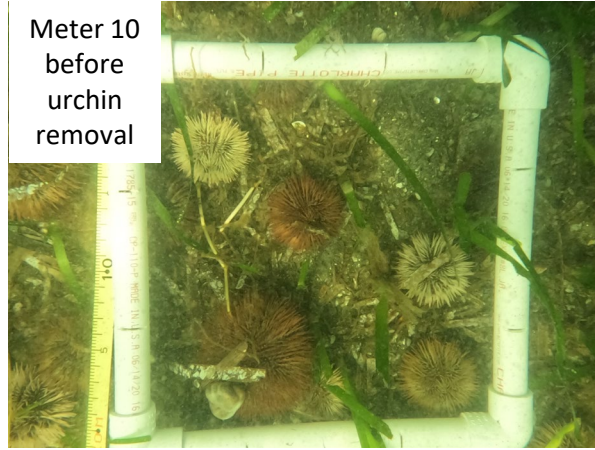
Average Height (mm): 91.105

Established Transect Pictures

Meter 8
before
urchin
removal



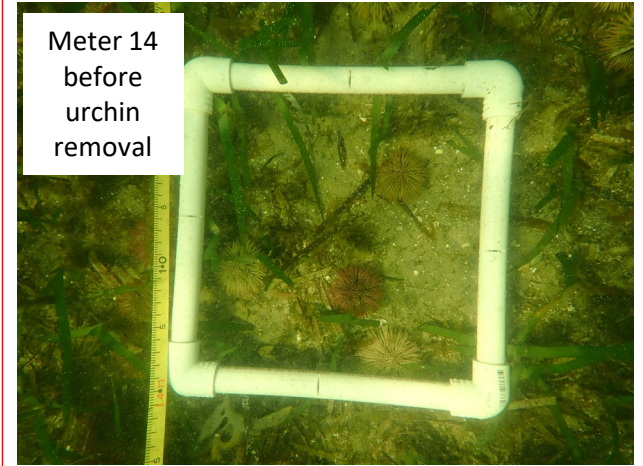
Meter 10
before
urchin
removal



Meter 12
before
urchin
removal



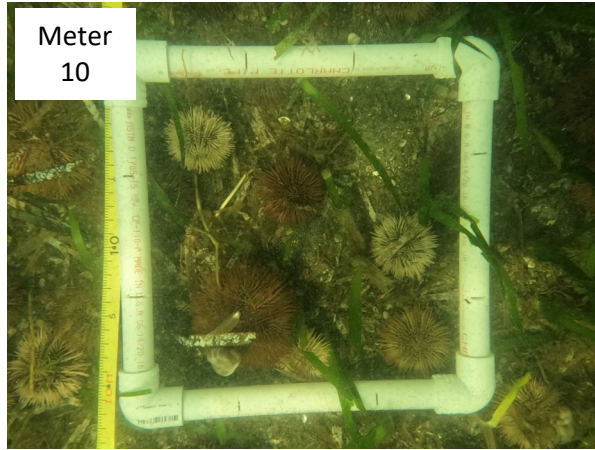
Meter 14
before
urchin
removal



Meter 8

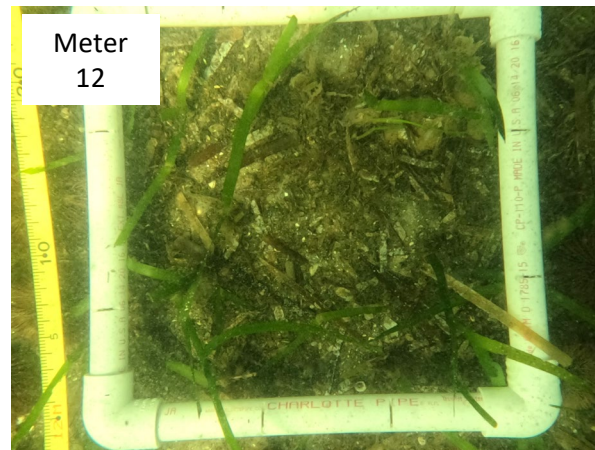


Meter
10

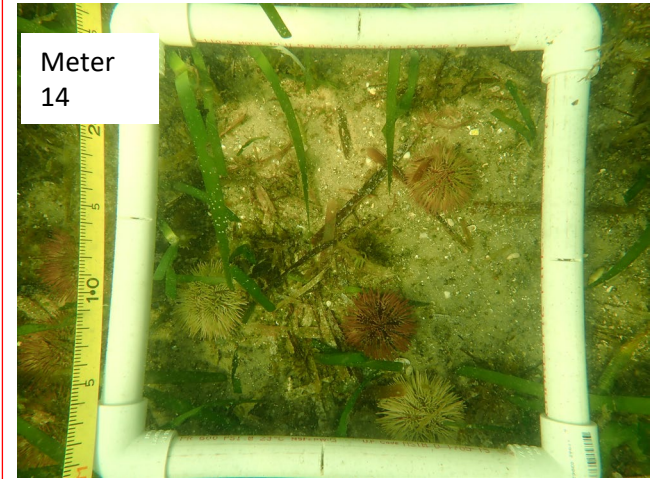


No pic taken without urchins

Meter
12



Meter
14



No pic taken without urchins

Meter 8 Data

Urchin Count: 5

Shoot count: 22

Average Height (mm): 87.909

Meter 10 Data

Urchin Count: 7

Shoot count: 16

Average Height (mm): 106.25

Meter 12 Data

Urchin Count: 3

Shoot count: 14

Average Height (mm): 132.9286

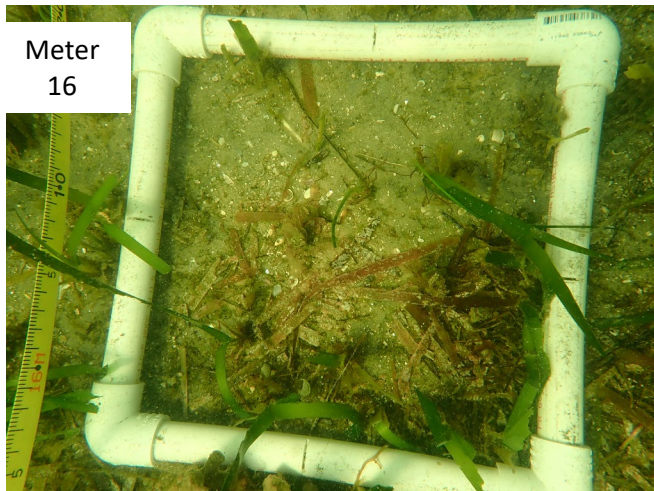
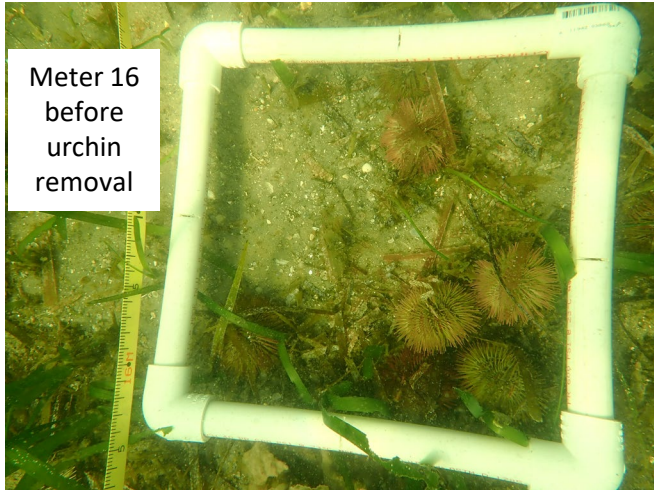
Meter 14 Data

Urchin Count: 4

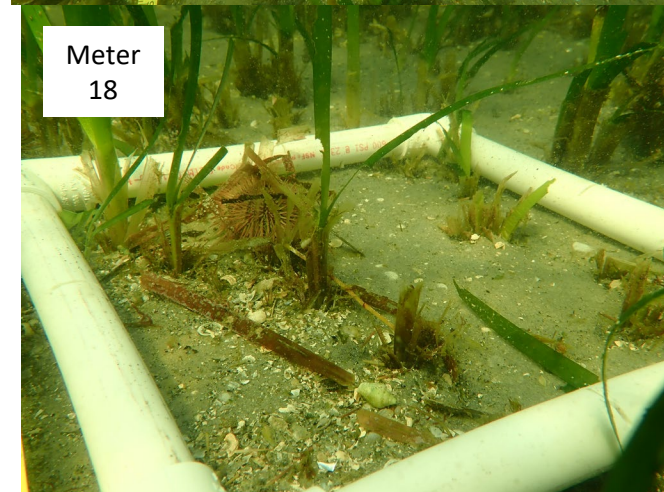
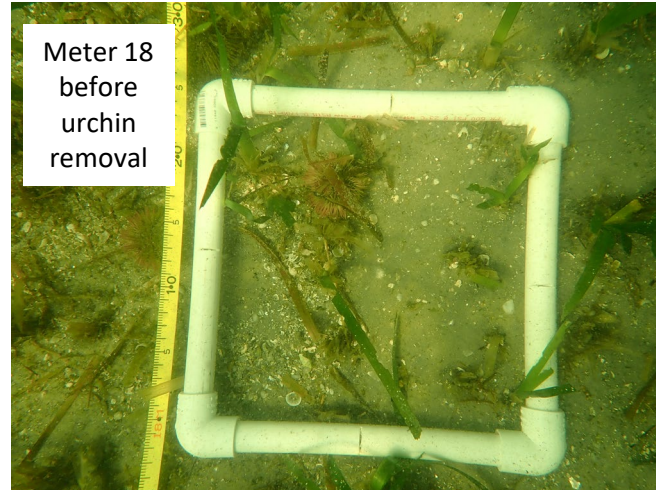
Shoot count: 10

Average Height (mm): 138.00

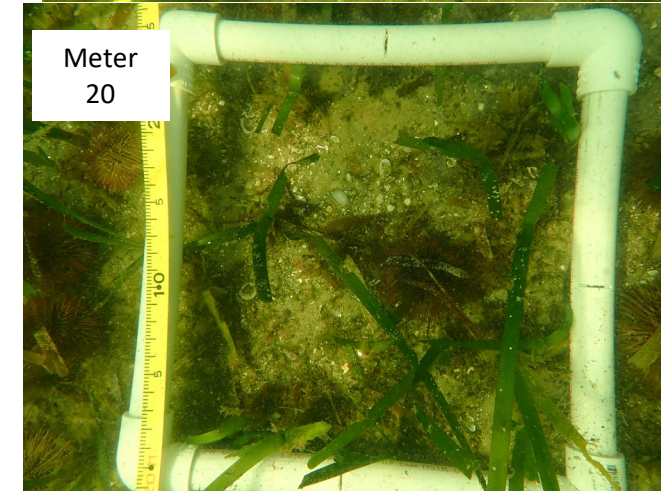
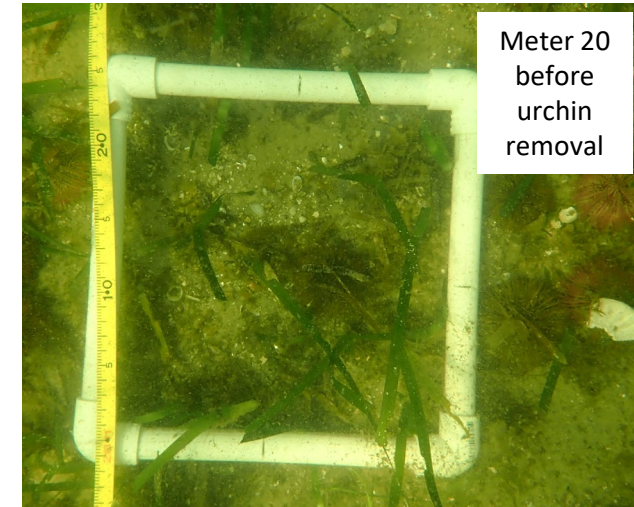
Established Transect Pictures



Meter 16 Data
Urchin Count: 7
Shoot count: 21
Average Height (mm): 74.333



Meter 18 Data
Urchin Count: 1
Shoot count: 11
Average Height (mm): 109.1818

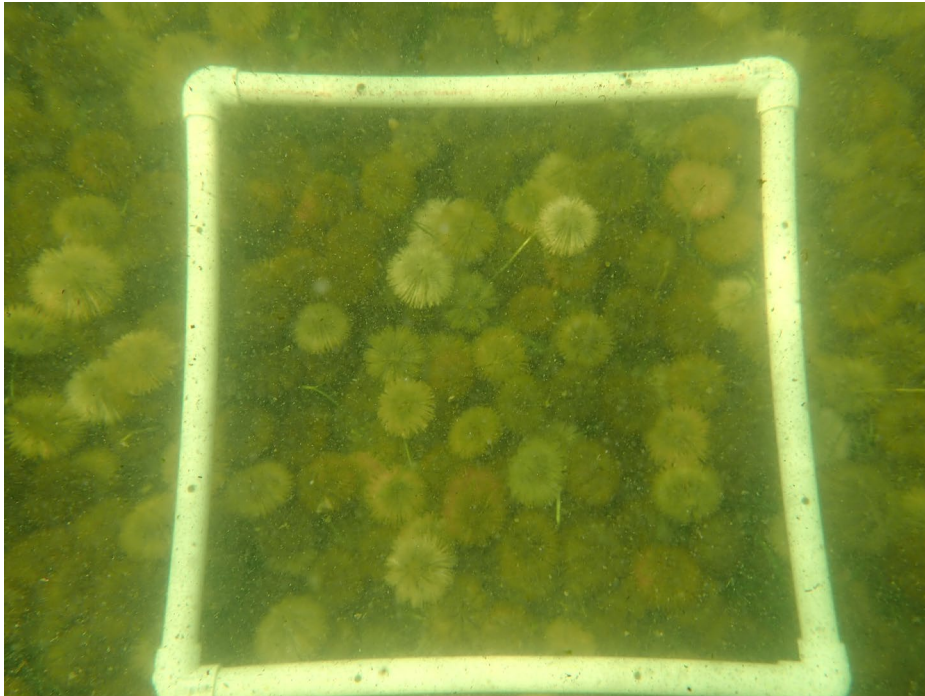


Meter 20 Data
Urchin Count: 1
Shoot count: 18
Average Height (mm): 96.111

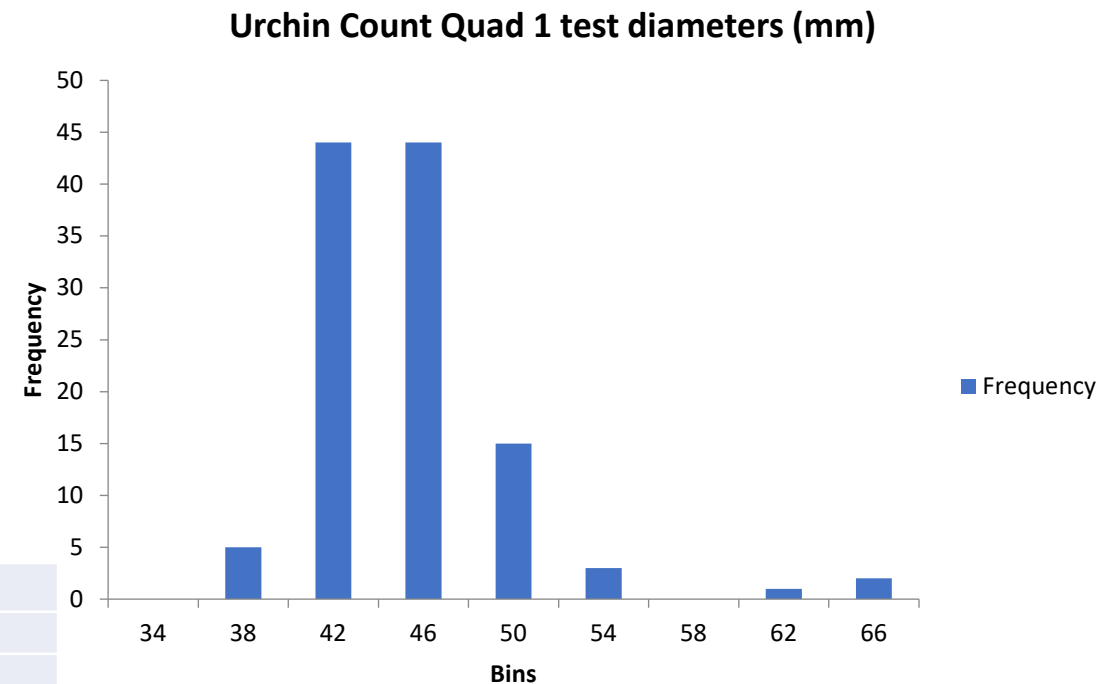
Extra Urchin Count

GPS:29.80338 -83.6267

In an effort to collect more urchin per quad data, an extra quad was taken near the transect 1 site in the urchin front. The quad was randomly thrown over the front and all urchins inside were collected and measured. Quadrat named UrchCo1, more urchin count quads may be taken moving forward.

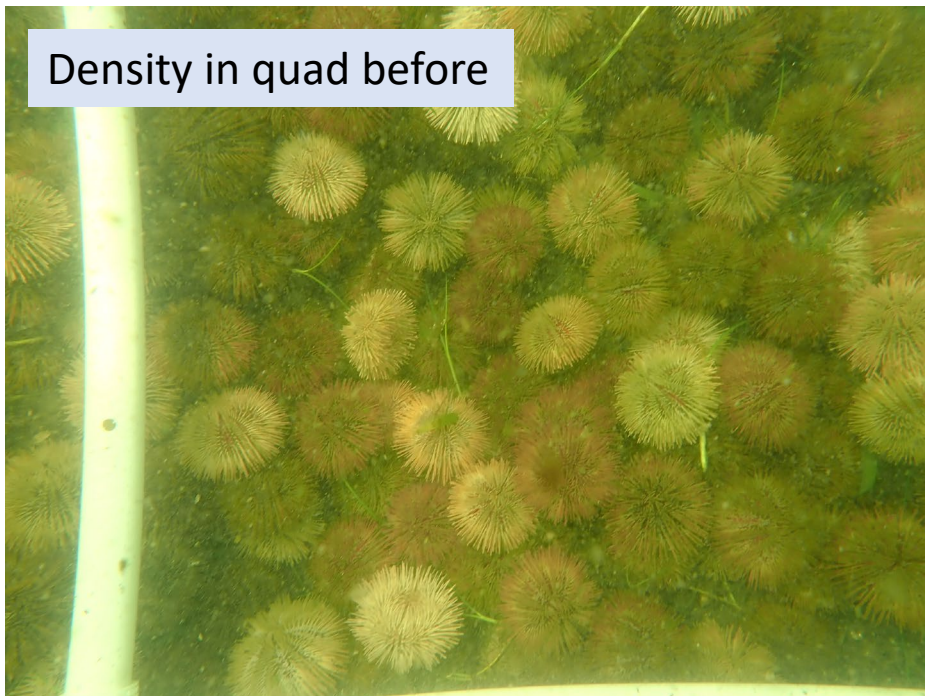


Urchin_test (mm)	
Mean	43.44825
Standard Deviation	4.605907
Range	28.46
Minimum	35.85
Maximum	64.31
Count	114

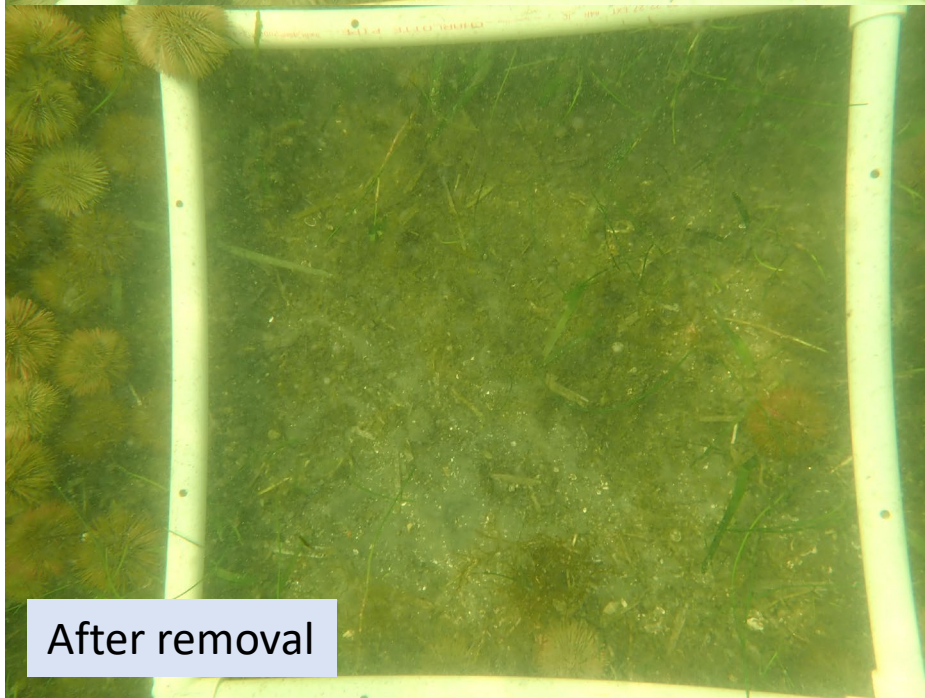


UrchCo1 pictures

Density in quad before



After removal



View in quad after removal, you can see some grass shoots and the front around the removed area.



Next urchin surveys will occur in April.
We hope to add another transect and take turbidity measurements moving forward. Still working on getting aerial imagery to map the front and extent of damage.

Data collected by Big Bend Seagrasses Aquatic Preserves.

Please contact Kate Suchanec at Katherine.Suchanec@floridadep.gov with any questions, comments, or requests for further data & pictures.

Special thanks to Cheryl Clark, DEP central office, for assisting with urchin measurements.