

Canal Restoration in Monroe County Benthic Monitoring Report



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Florida International University

WATER QUALITY PROTECTION PROGRAM TAC CANAL RESTORATION Meeting
October 28, 2016

Made possible by



Townships
Homeowner Organizations
Individuals



**Seagrass Ecosystems
Research Lab**
Florida International University



About Us



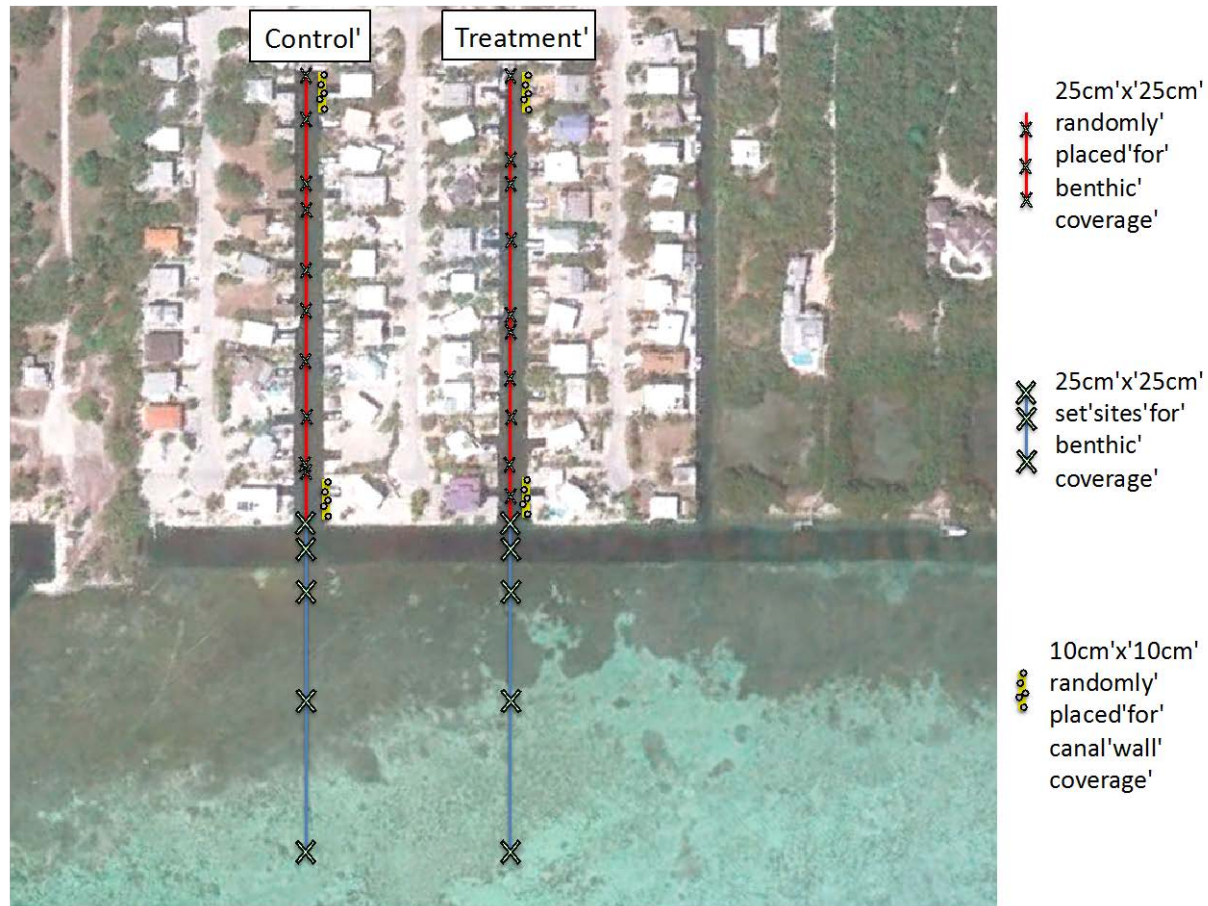
<http://seagrass.fiu.edu>
jhowa033@fiu.edu



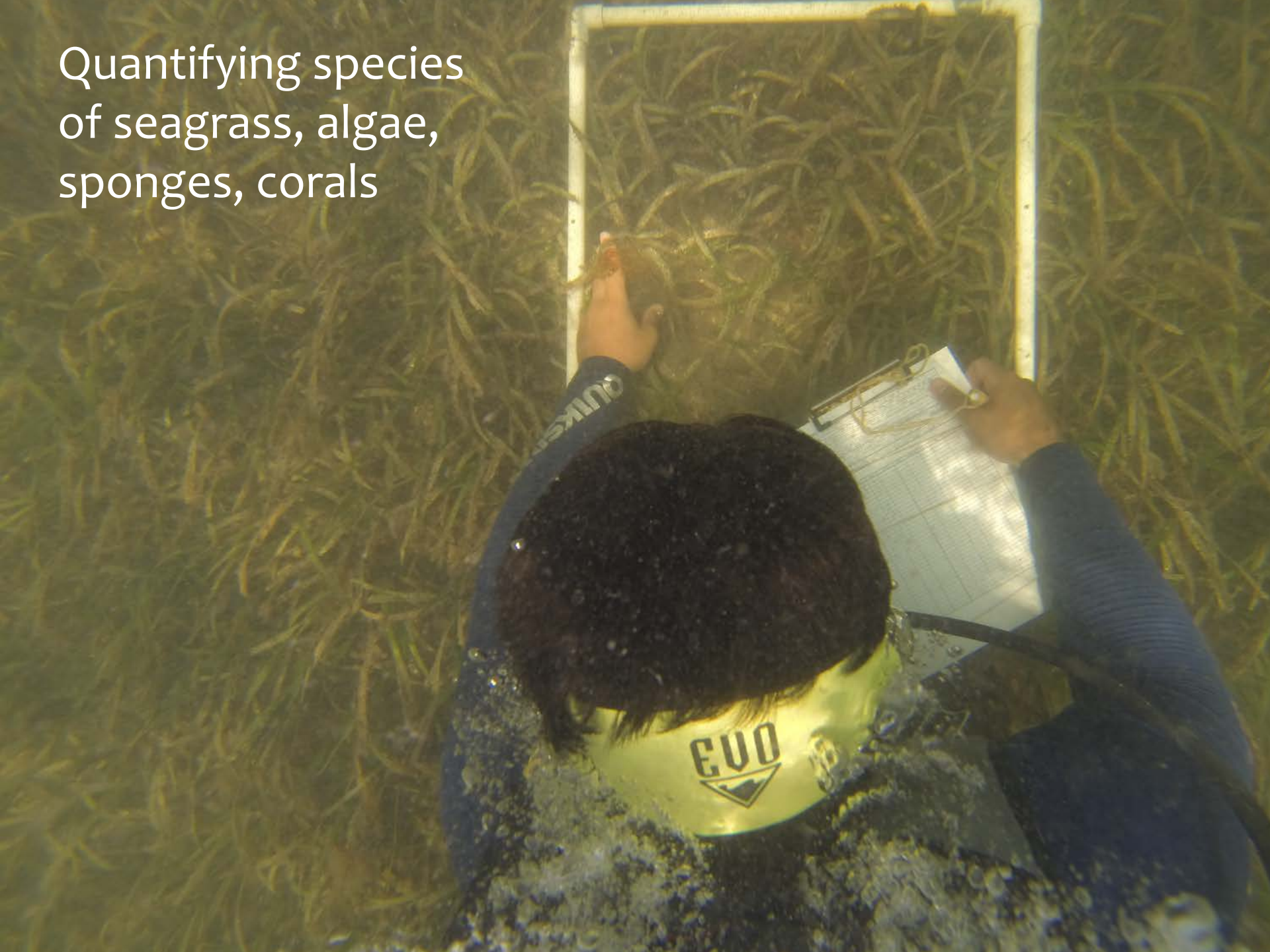


Canal Sampling

Nine experimental Pairs, Five Technologies
Sampled 3 times/year



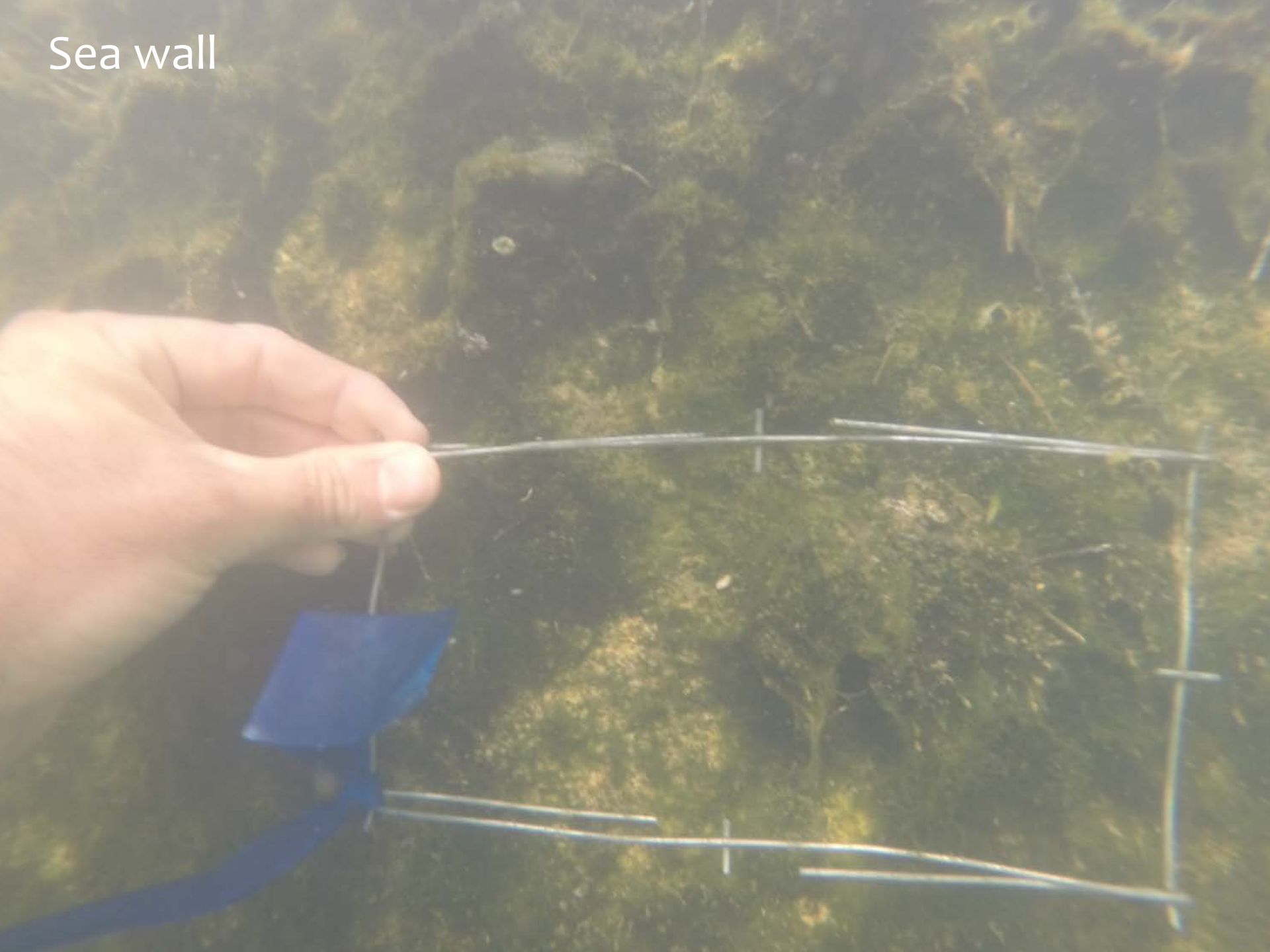
Quantifying species
of seagrass, algae,
sponges, corals



Animal surveys

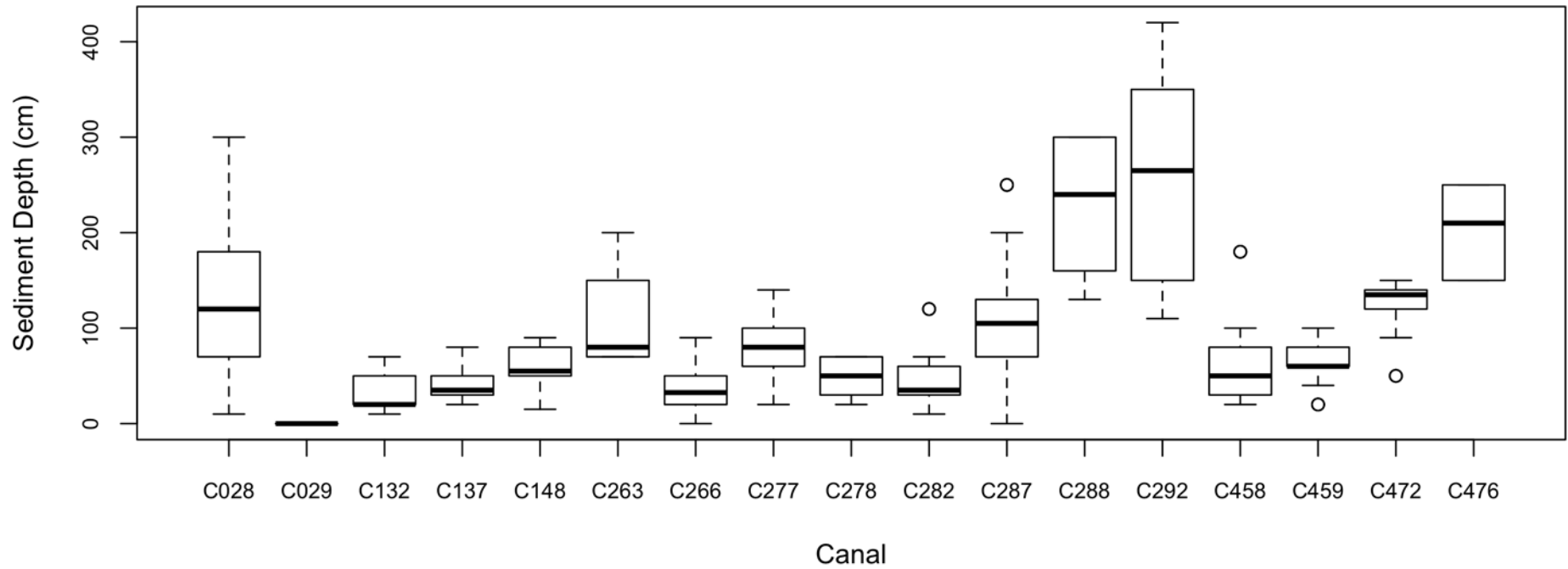


Sea wall

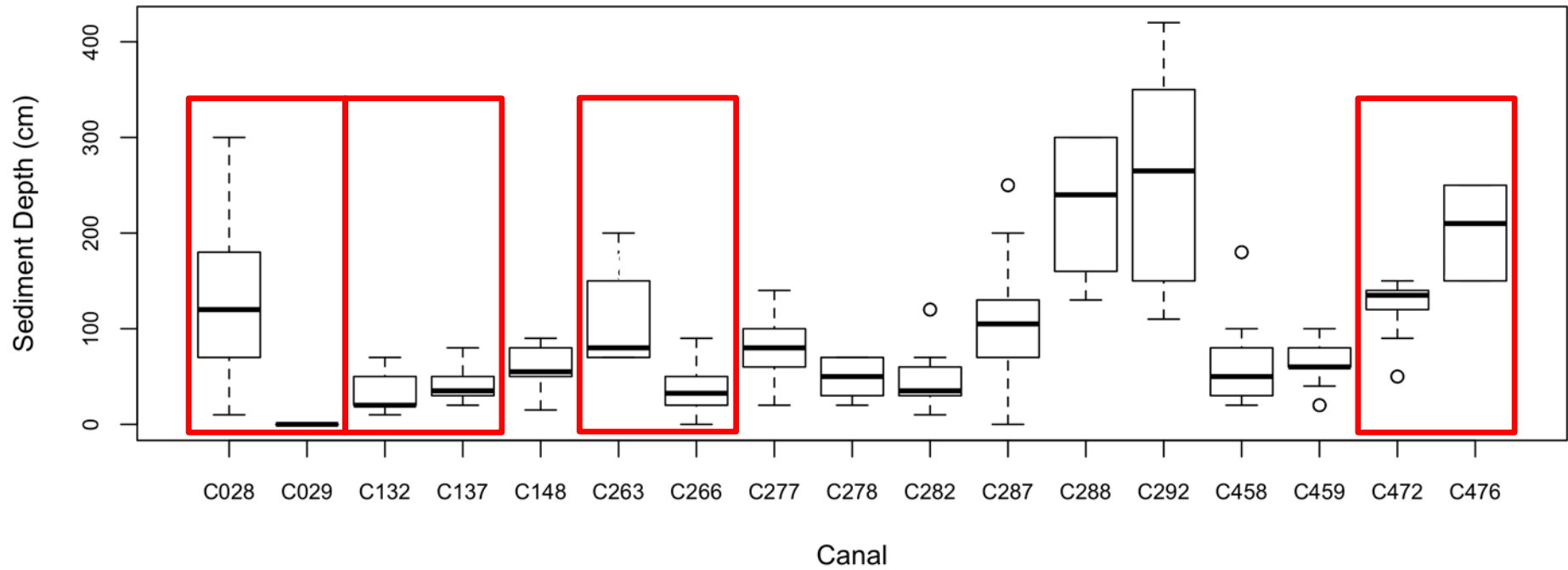




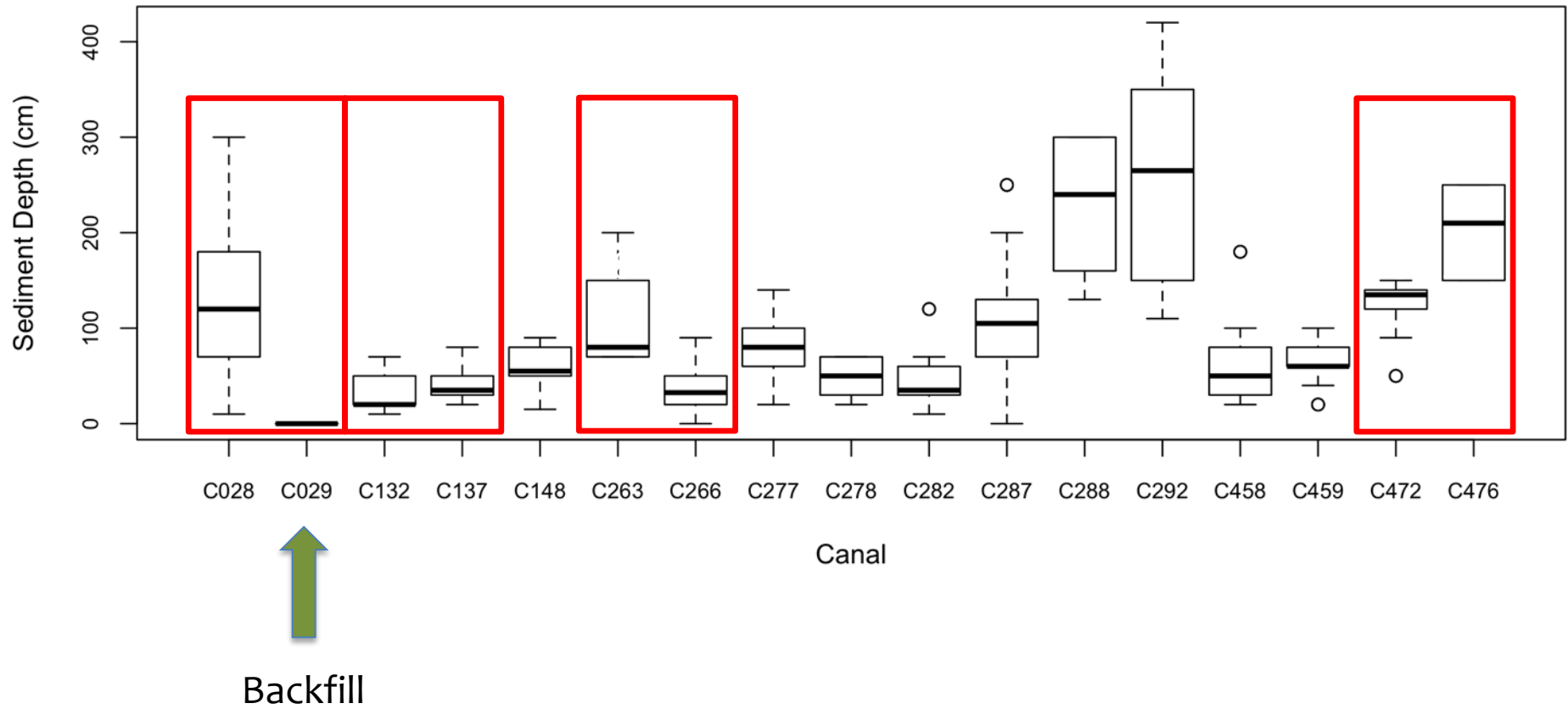
Sediment Depth



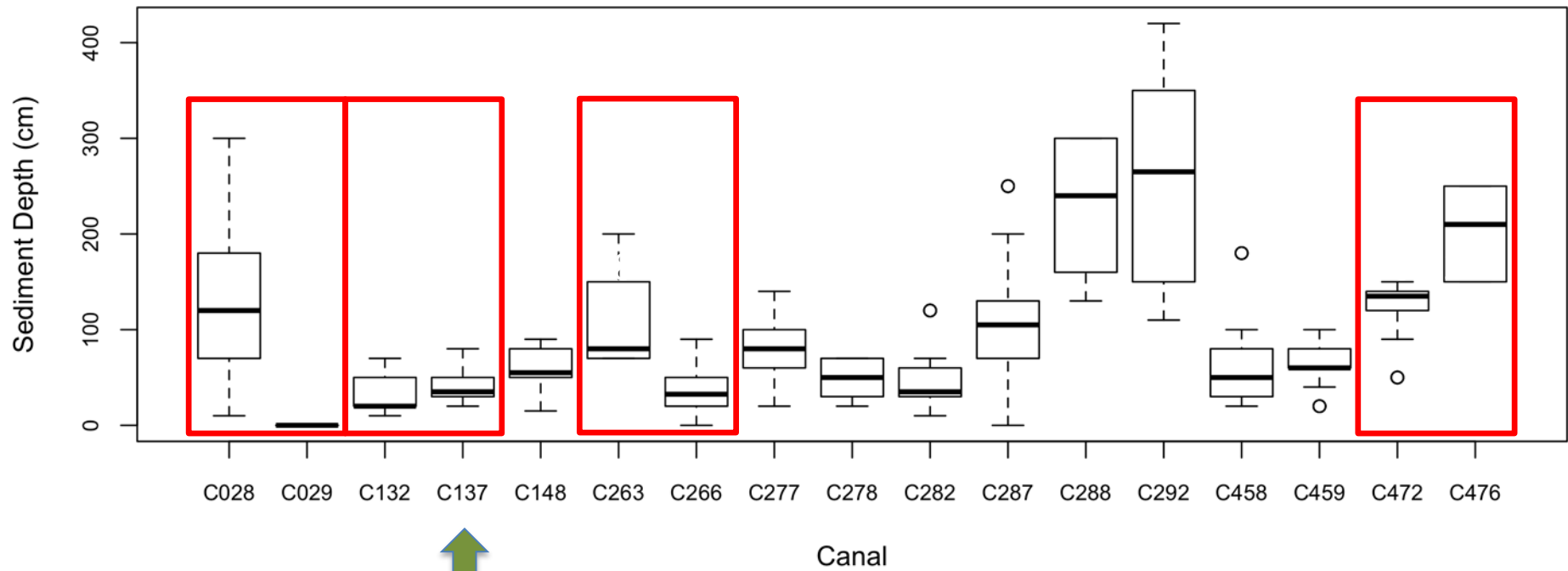
Sediment Depth



Sediment Depth

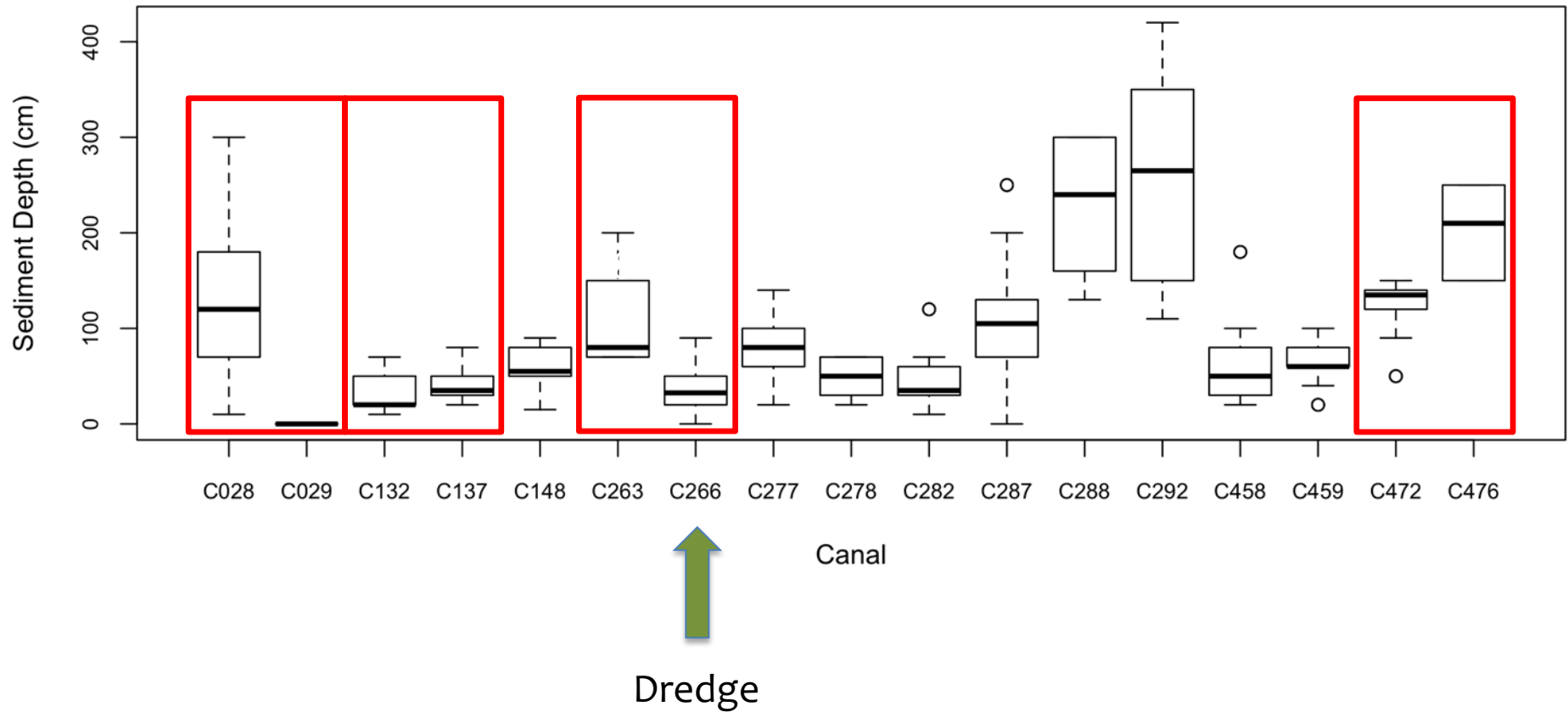


Sediment Depth

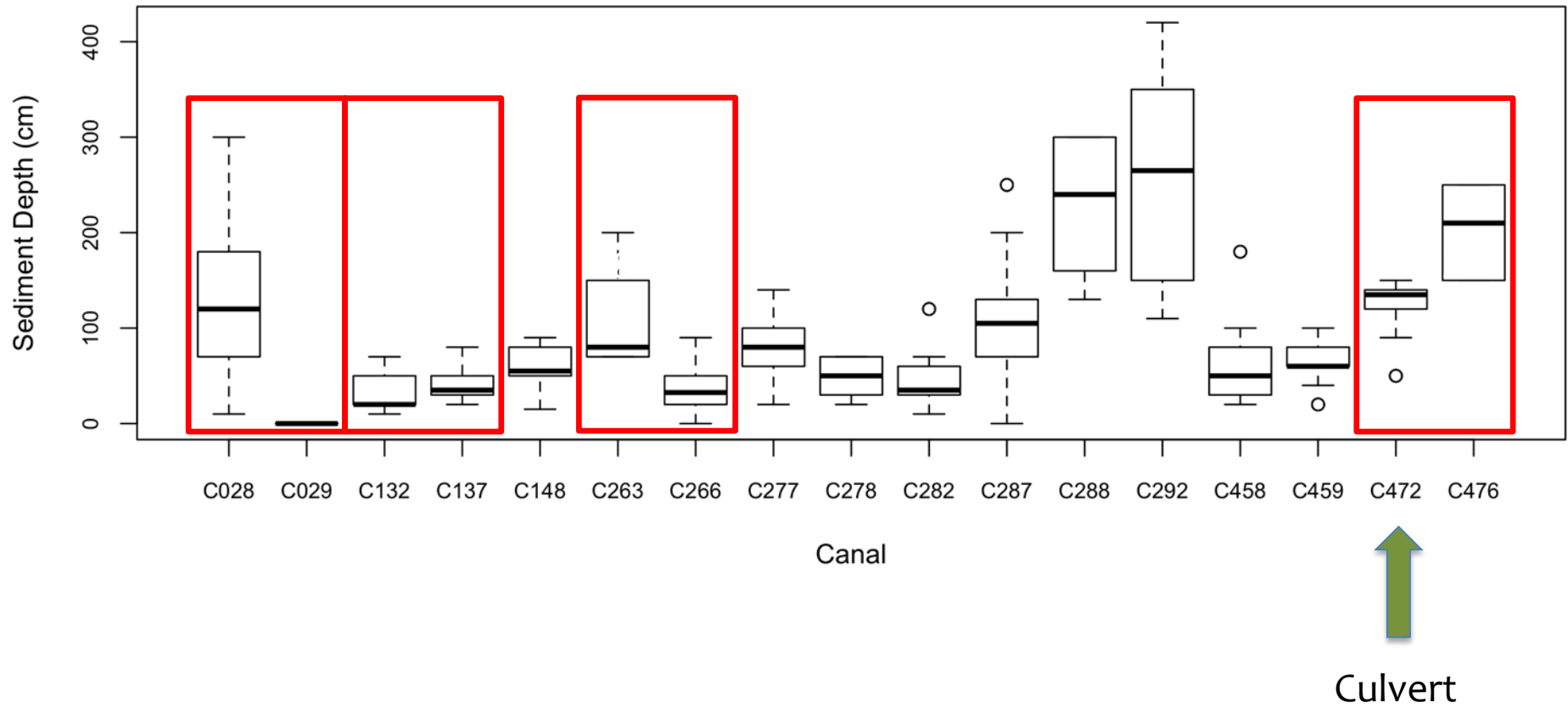


Weed Gate and aerator

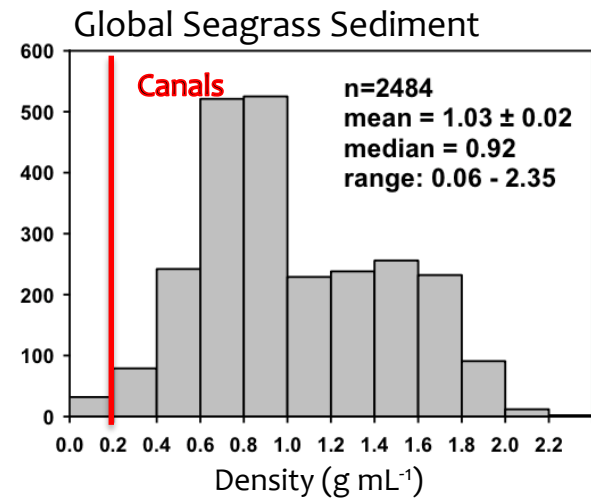
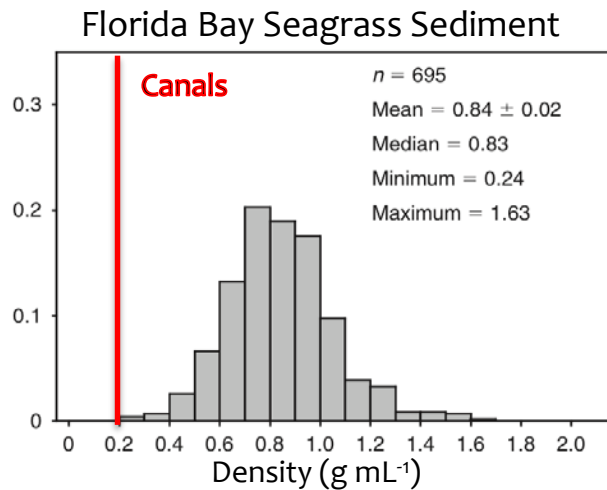
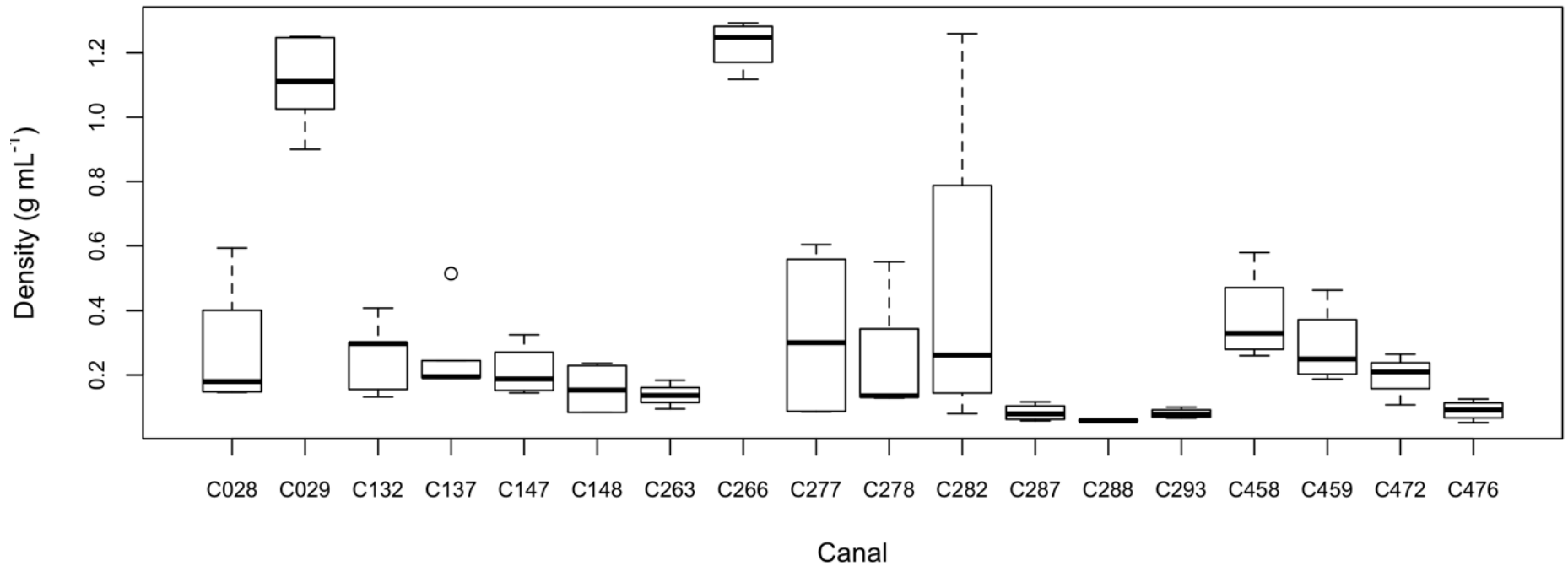
Sediment Depth



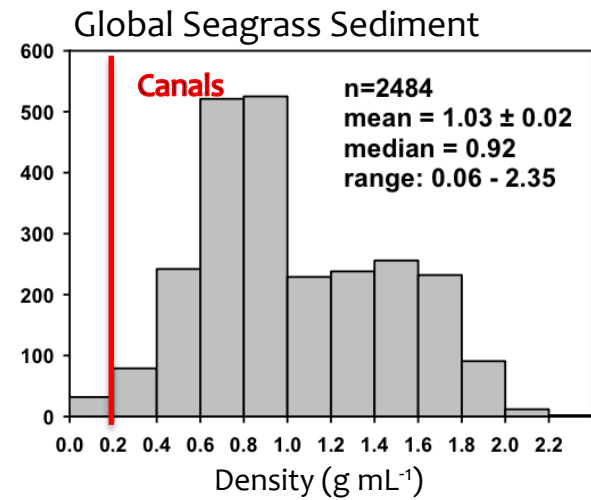
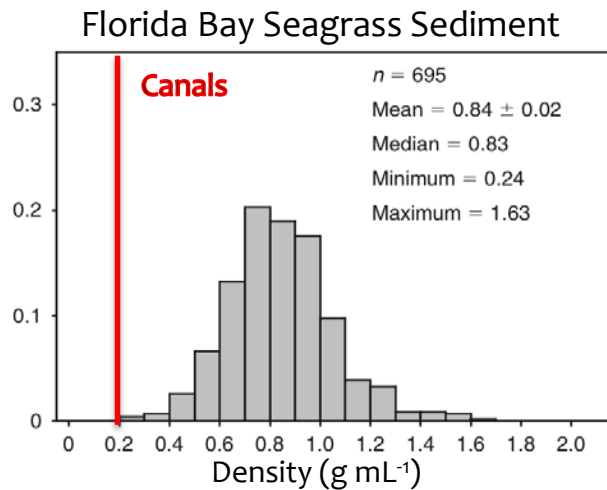
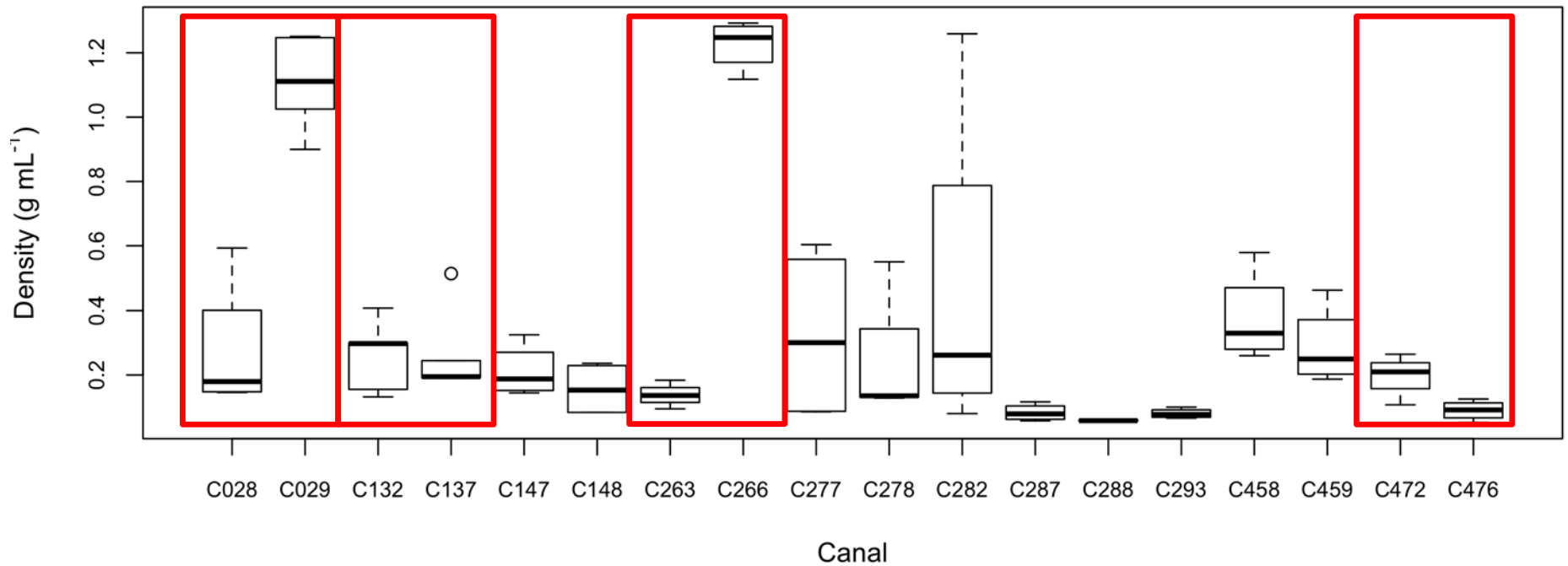
Sediment Depth



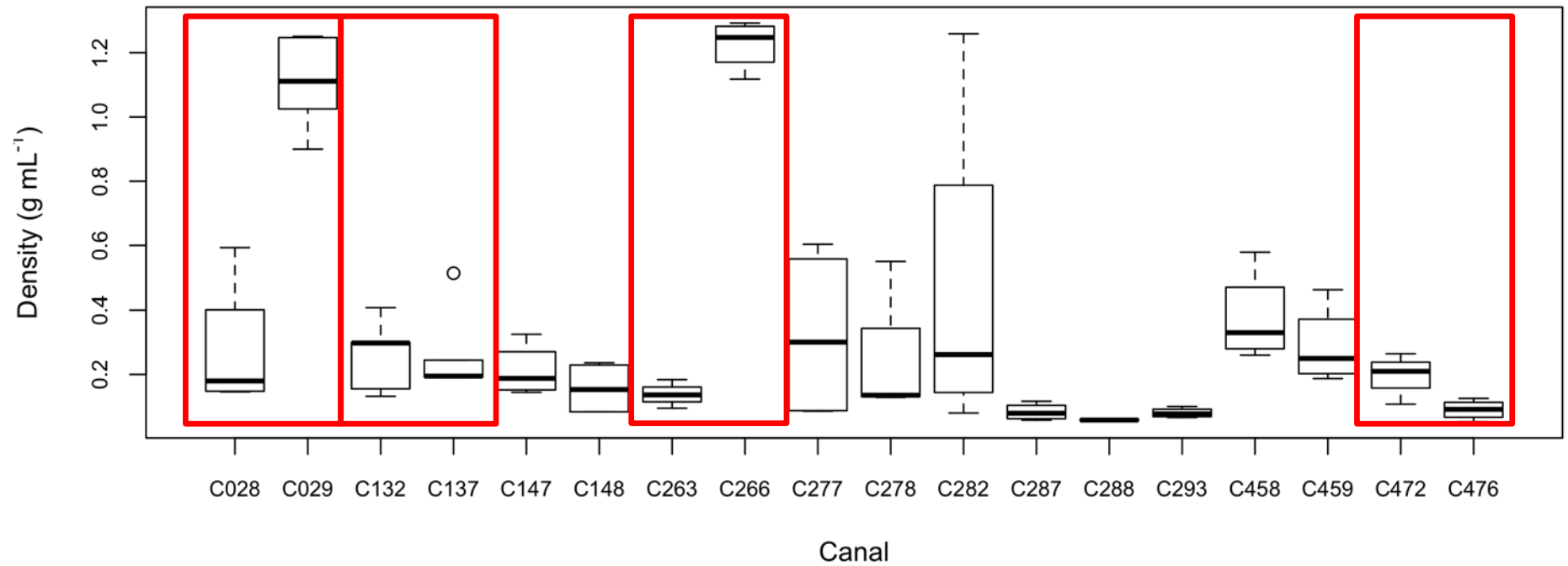
Sediment Density



Sediment Density

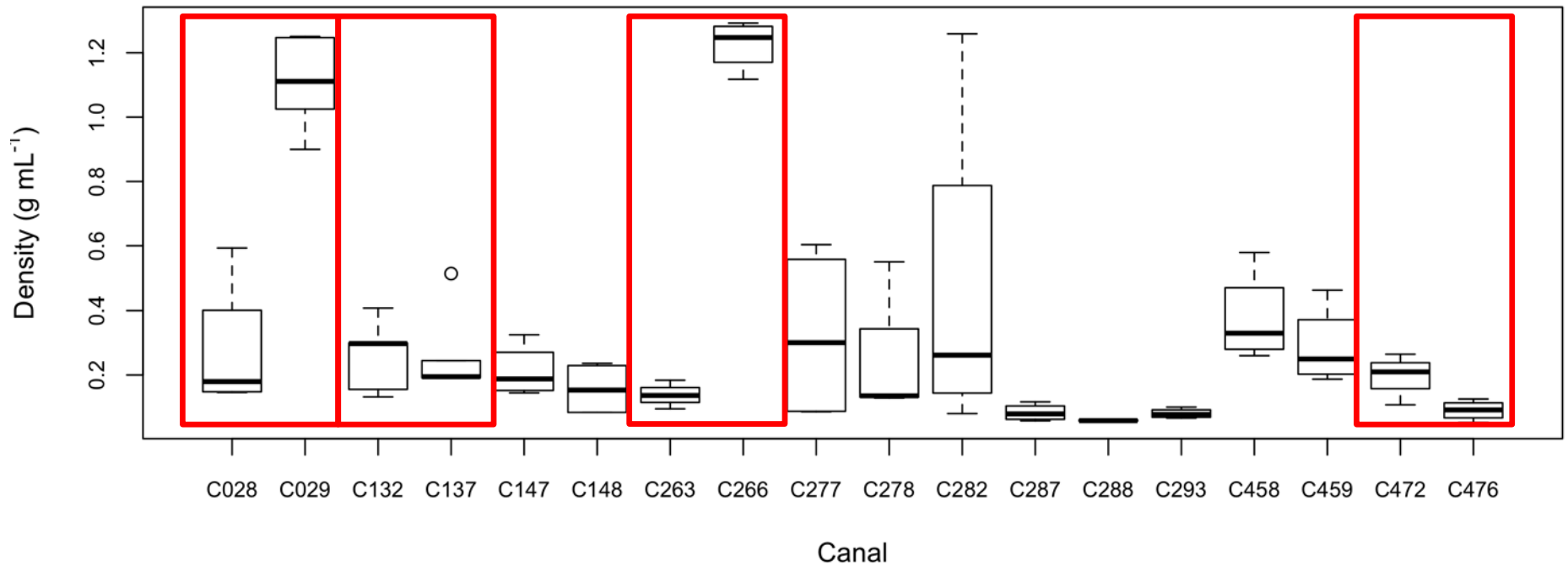


Sediment Density



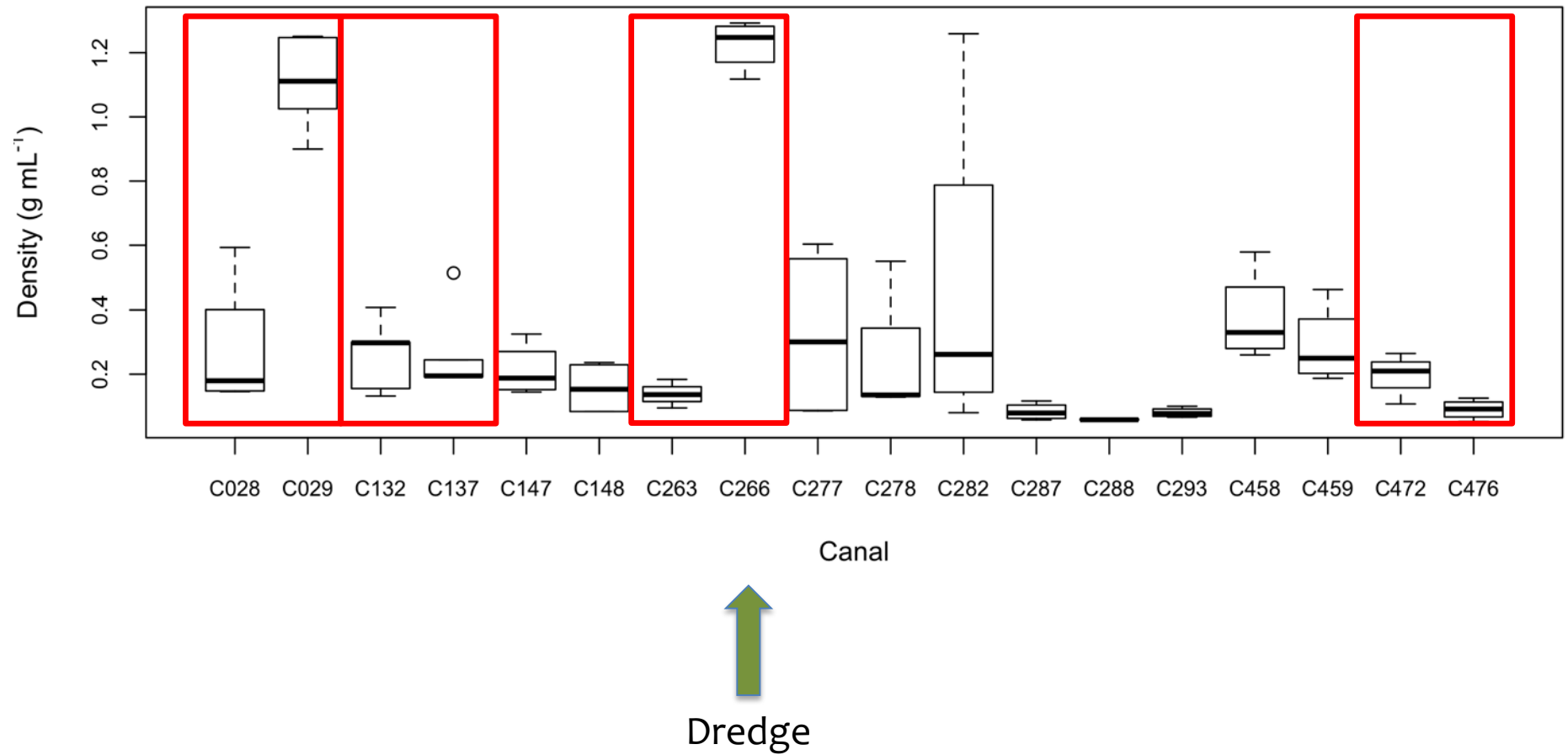
Backfill

Sediment Density

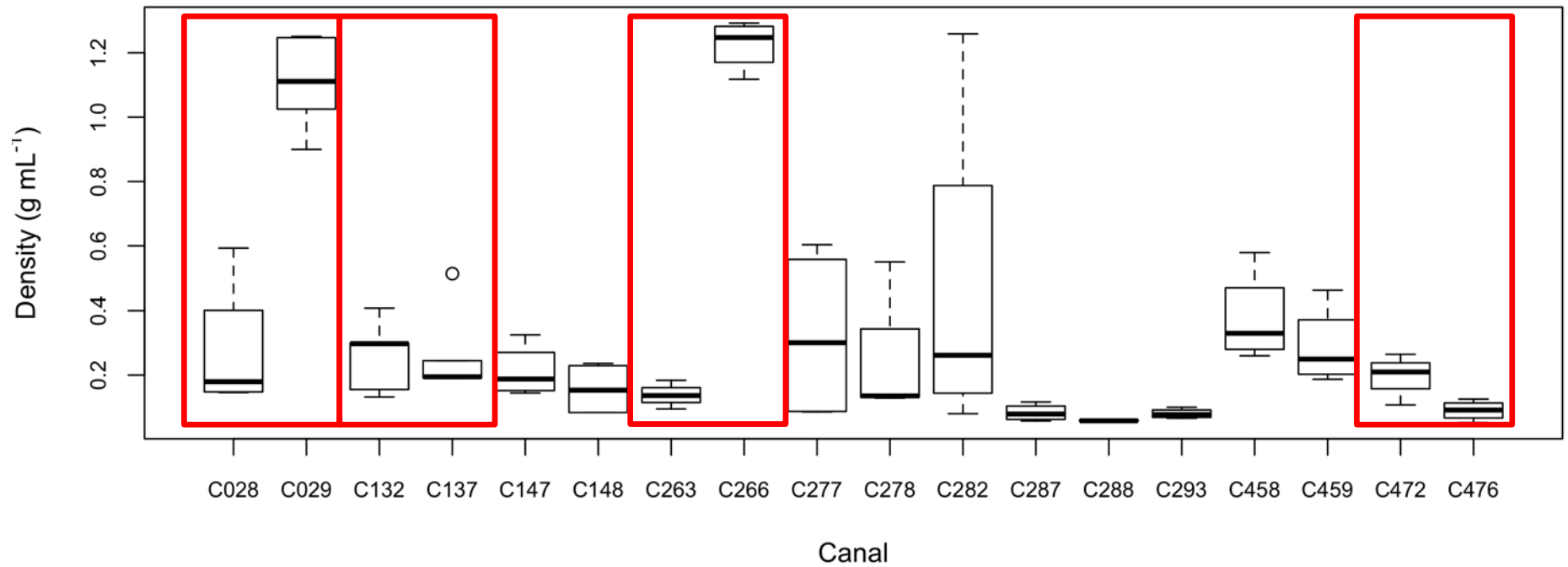


Weed Gate and aerator

Sediment Density



Sediment Density



↑
Culvert

Effect on Seagrasses

Canal	Distance from Canal Mouth (m)				
	0	10	50	100	250

Thalassia testudinum

28	0	4	2	4	1
29	2	4	5	4	0
132	0	0	1	0	1
137	0	0	2	0	5
147	0	0	0	2	2
148	0	0	0	5	0
263	0	0	5	5	0
266	0	3	4	4	0
277	1	2	2	0	3
278	1	0	0.5	0	3
282	0	0	0	5	5
287	0	0	0	0	4
288	0	0	0	0	5
290	0	0	3	4	1
293	0	0	0	0	4
472	0	0	2	1	4
476	0	0	1	5	2



Canal	Distance from Canal Mouth (m)				
	0	10	50	100	250

Halodule wrightii

28	2	2	2	0	0
29	0	0	0	0	2
132	0	0	0	0	0
137	0	0	0	1	0
147	1	0	4	3	3
148	2	0	0	0	0
263	0	0	0	0	0
266	0	3	0	0	0
277	2	3	2	4	0
278	5	3	5	4	0
282	0	0	3	2	0
287	0	0	0	0	0
288	0	0	0	0	0
290	0	0	0	0	0
293	0	0	0	0	0
472	0	2	2	1	0
476	0	0	1	0	0



Effect on Seagrasses

C:N:P



Effect on Seagrasses

C:N:P
550:30:1

Generalized



Effect on Seagrasses

C:N:P

550:30:1

Generalized

870:36:1

South Florida
Thalassia

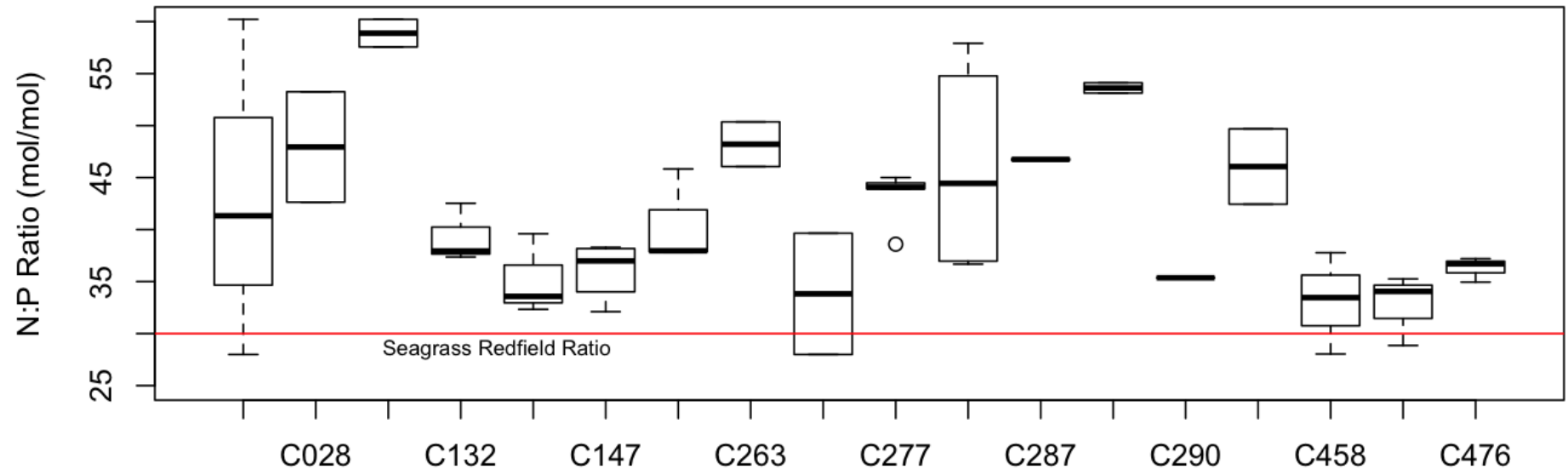
707:41:1

Thalassia
Outside canals



Effect on Seagrasses

N:P



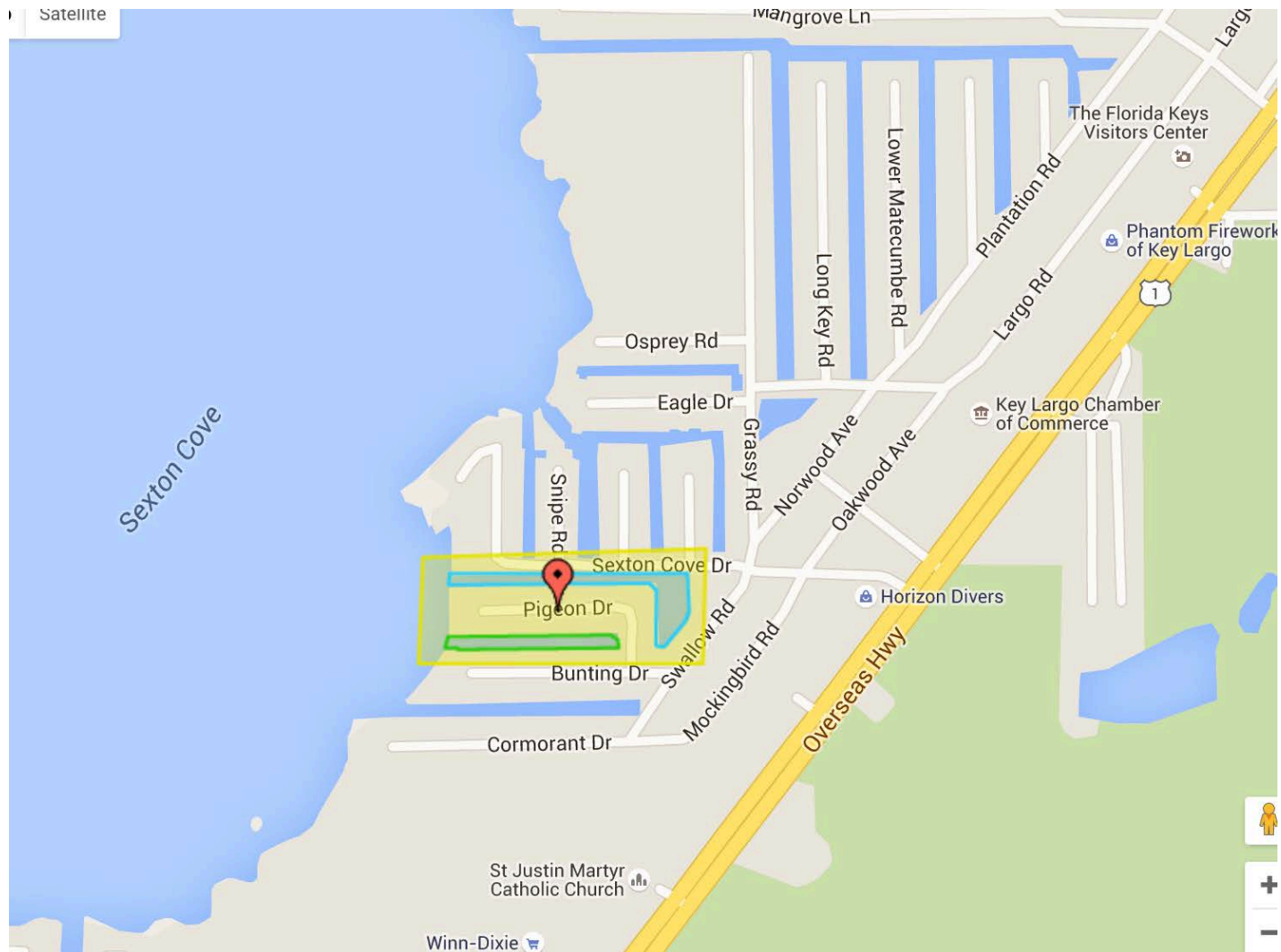
Effect on Seagrasses

^{15}N

Higher $^{15}\text{N}/^{14}\text{N} \rightarrow$ More anthropogenic influence

	$\delta^{15}\text{N}$	
	South FL	Canals
Mean	2.0	2.1
n	78.0	45.0
SE	0.2	0.3
Median	1.8	2.4
Minimum	-2.2	-2.6
Maximum	5.4	7.2

Canal 28 and 29





128
Q4.

WHIRL-PAK. Nemo WHIRL-PAK. Nemo WHIRL-PAK.

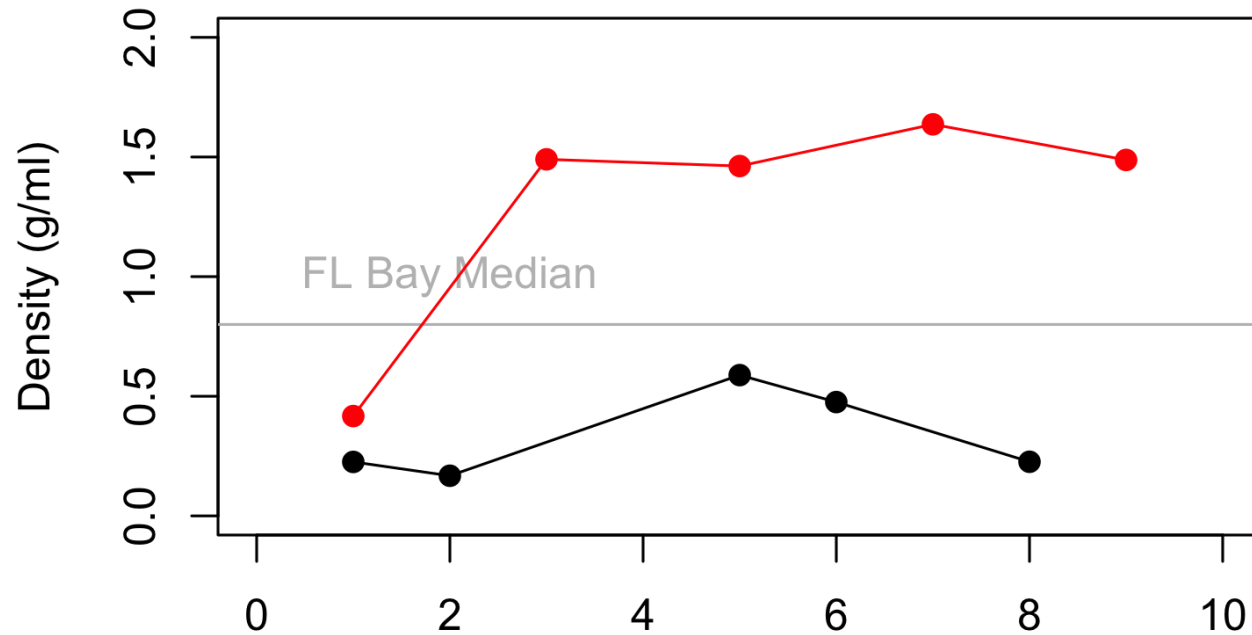
YAMAHA

150

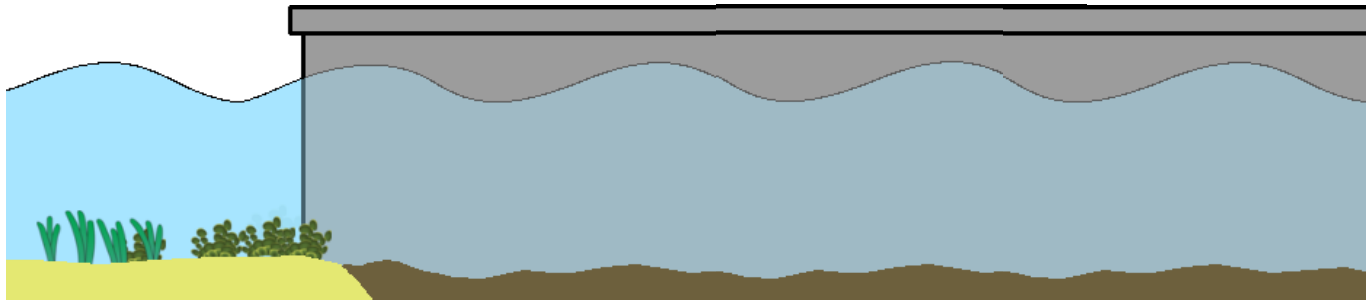




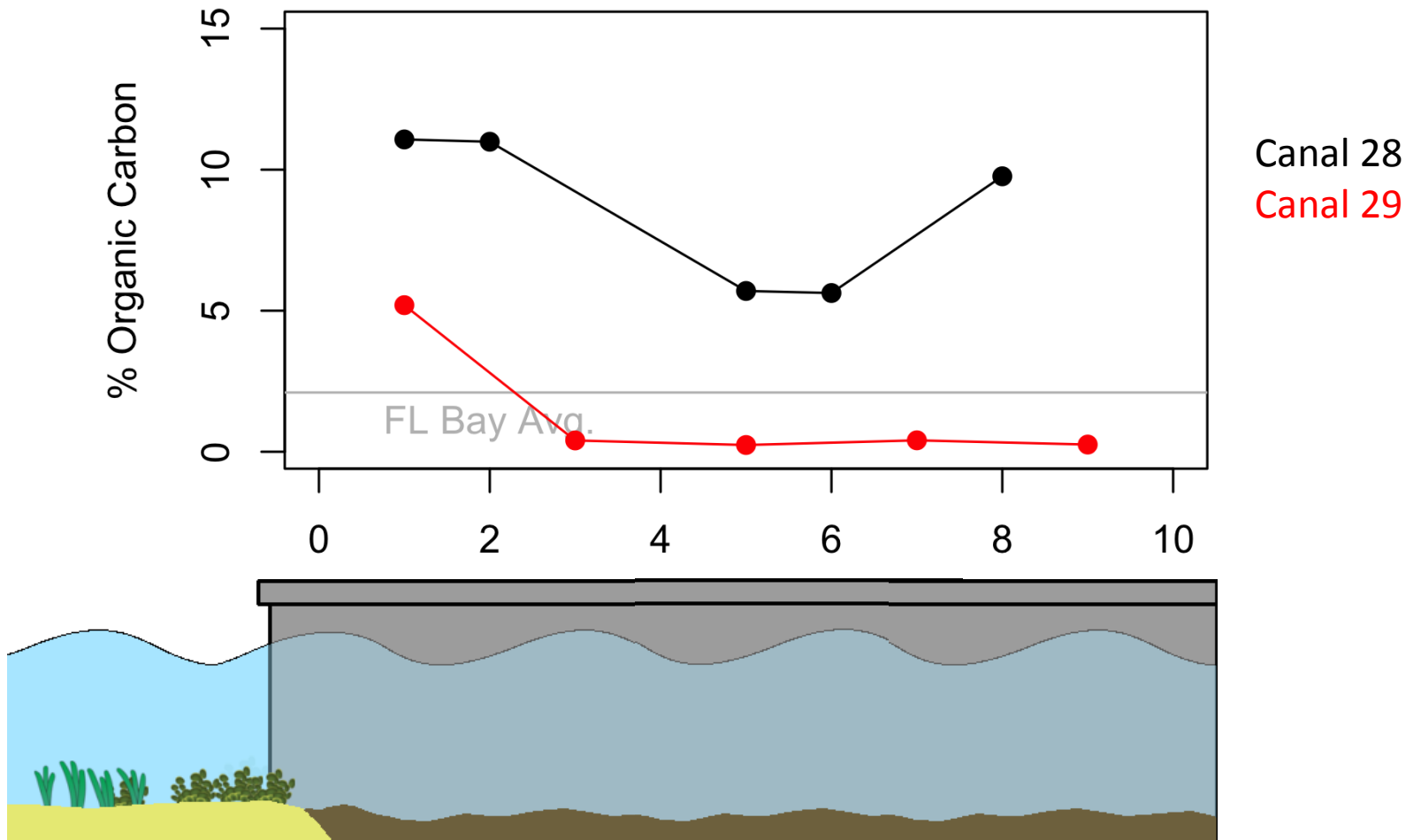
Canals 28 and 29



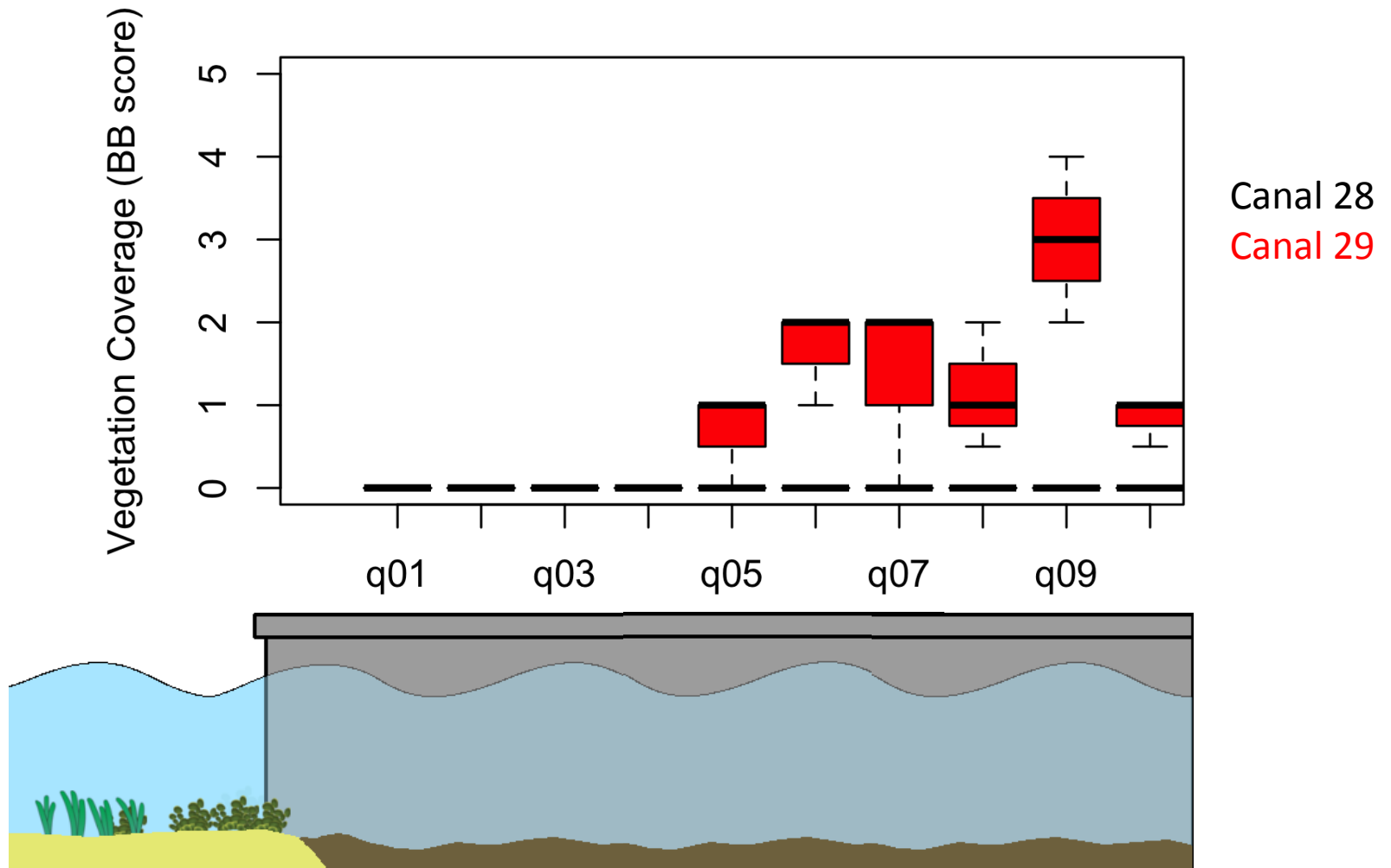
Canal 28
Canal 29



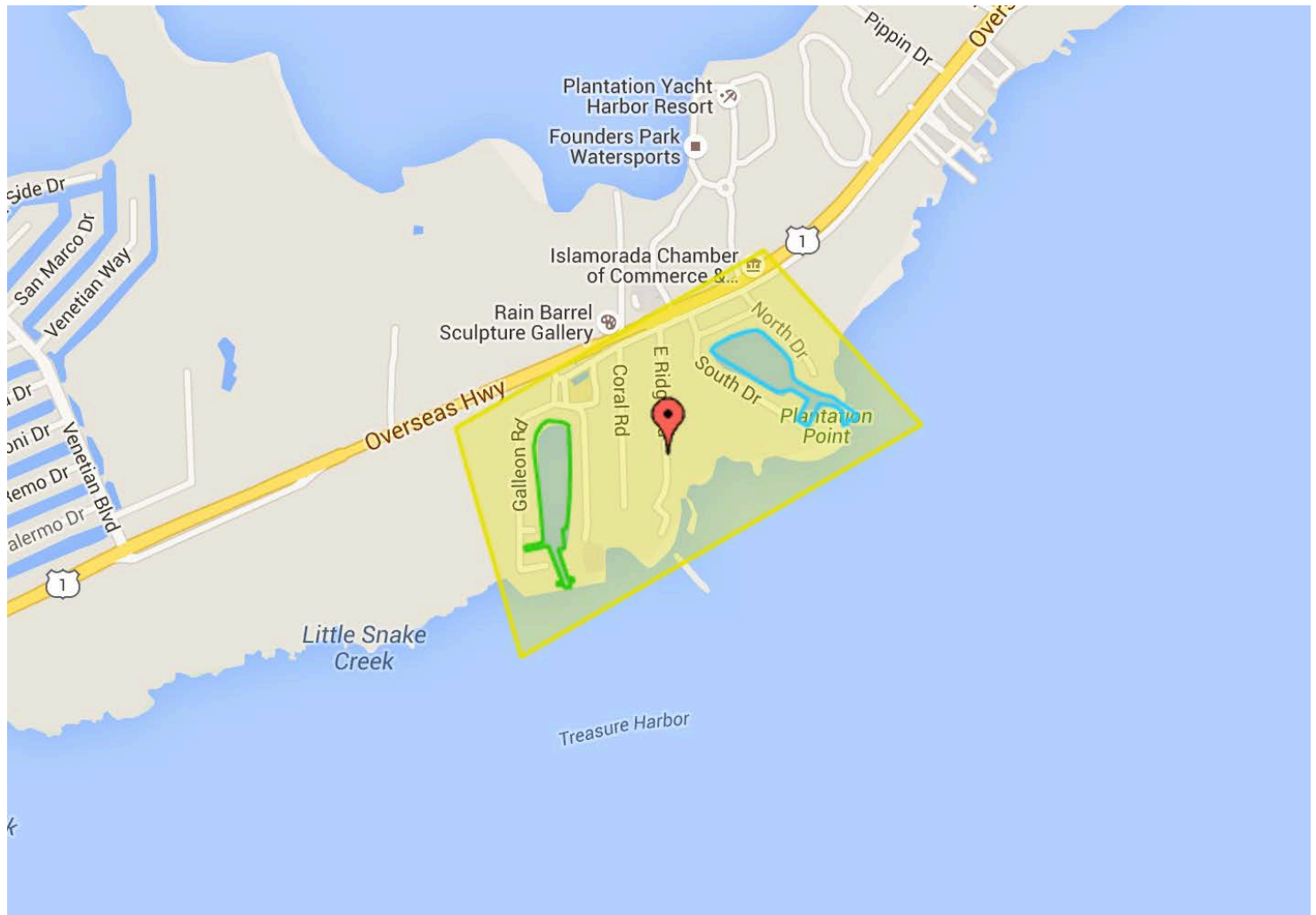
Canals 28 and 29



Canals 28 and 29



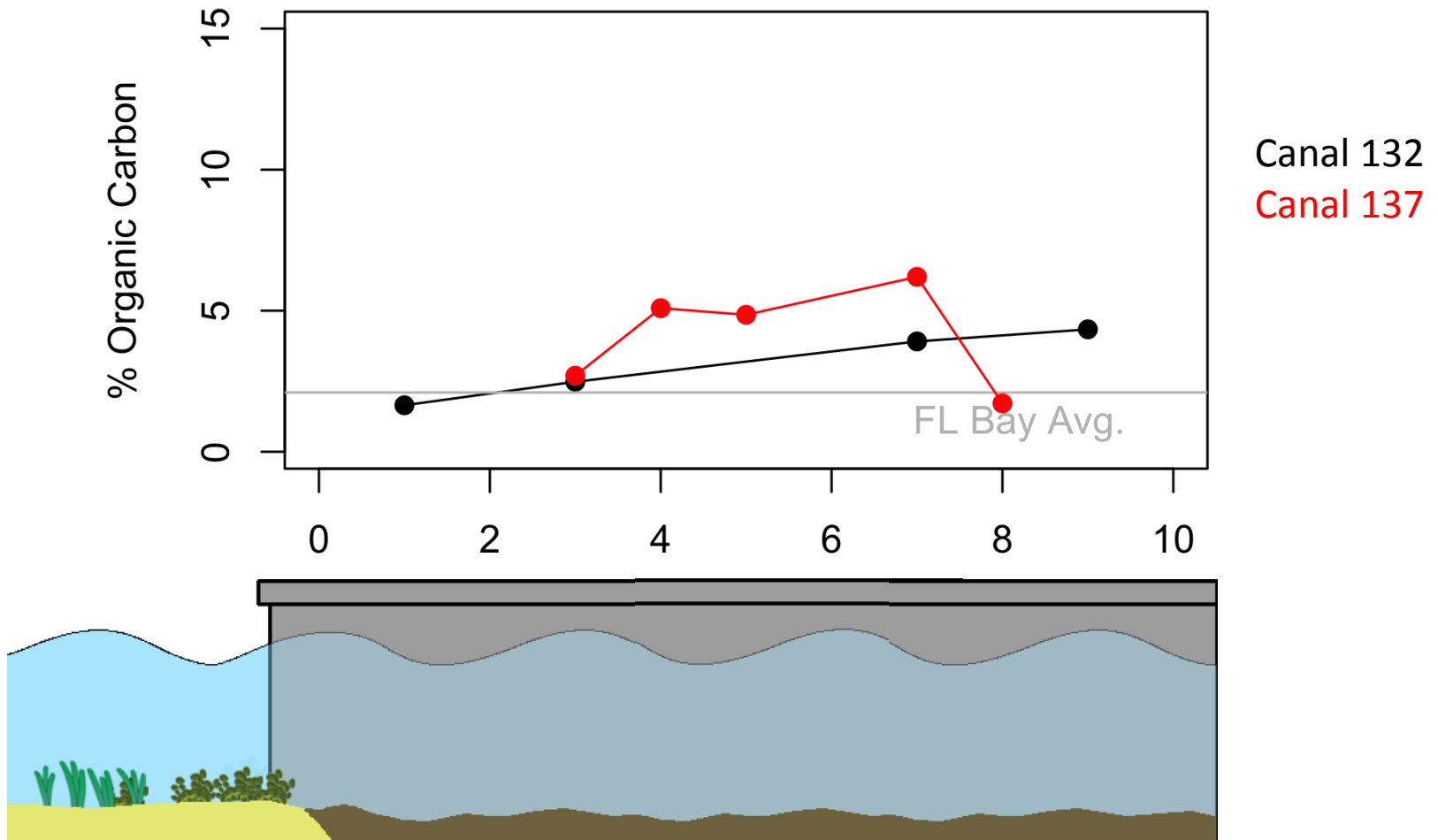
Canal 132 and 137



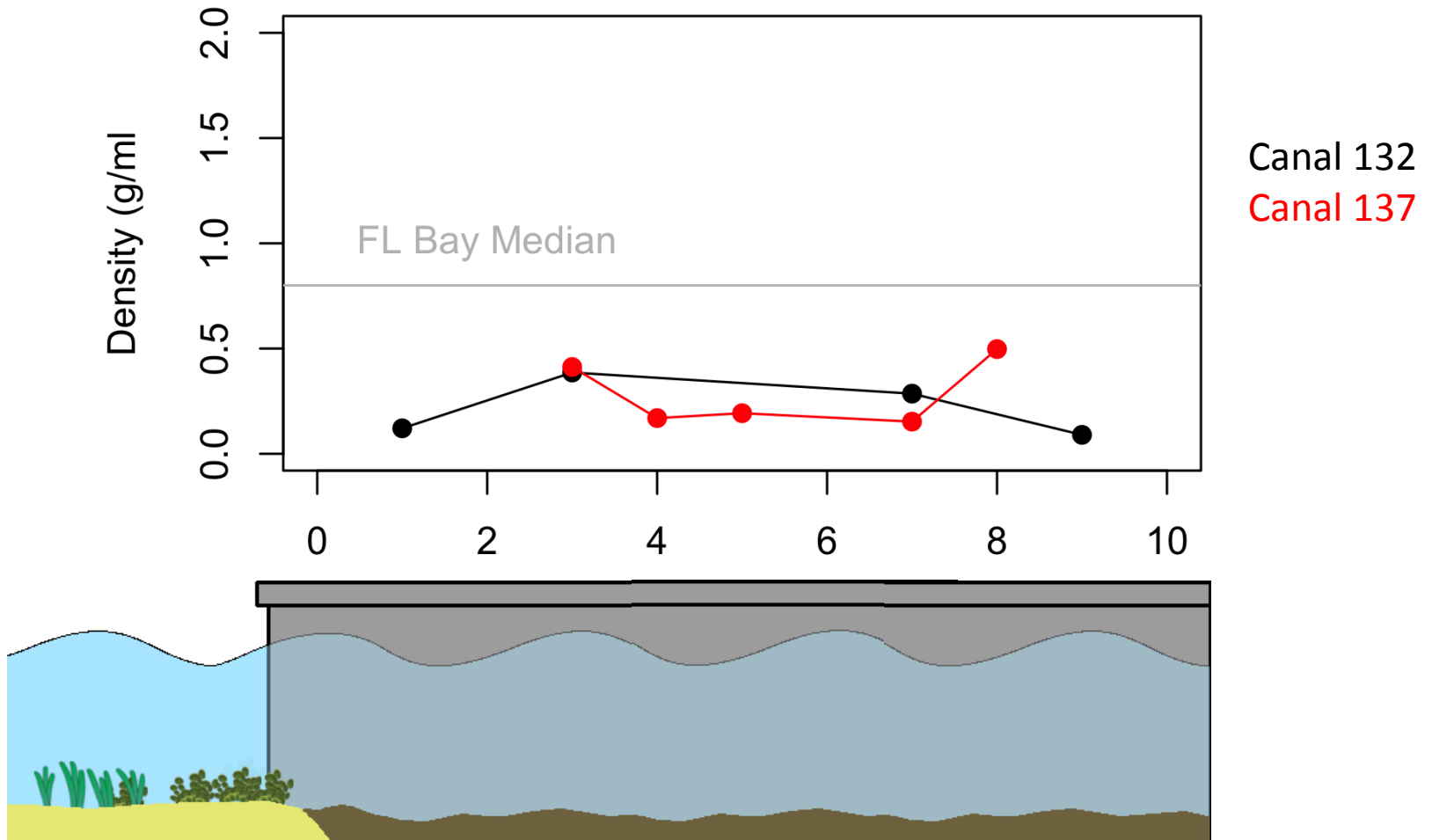
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100

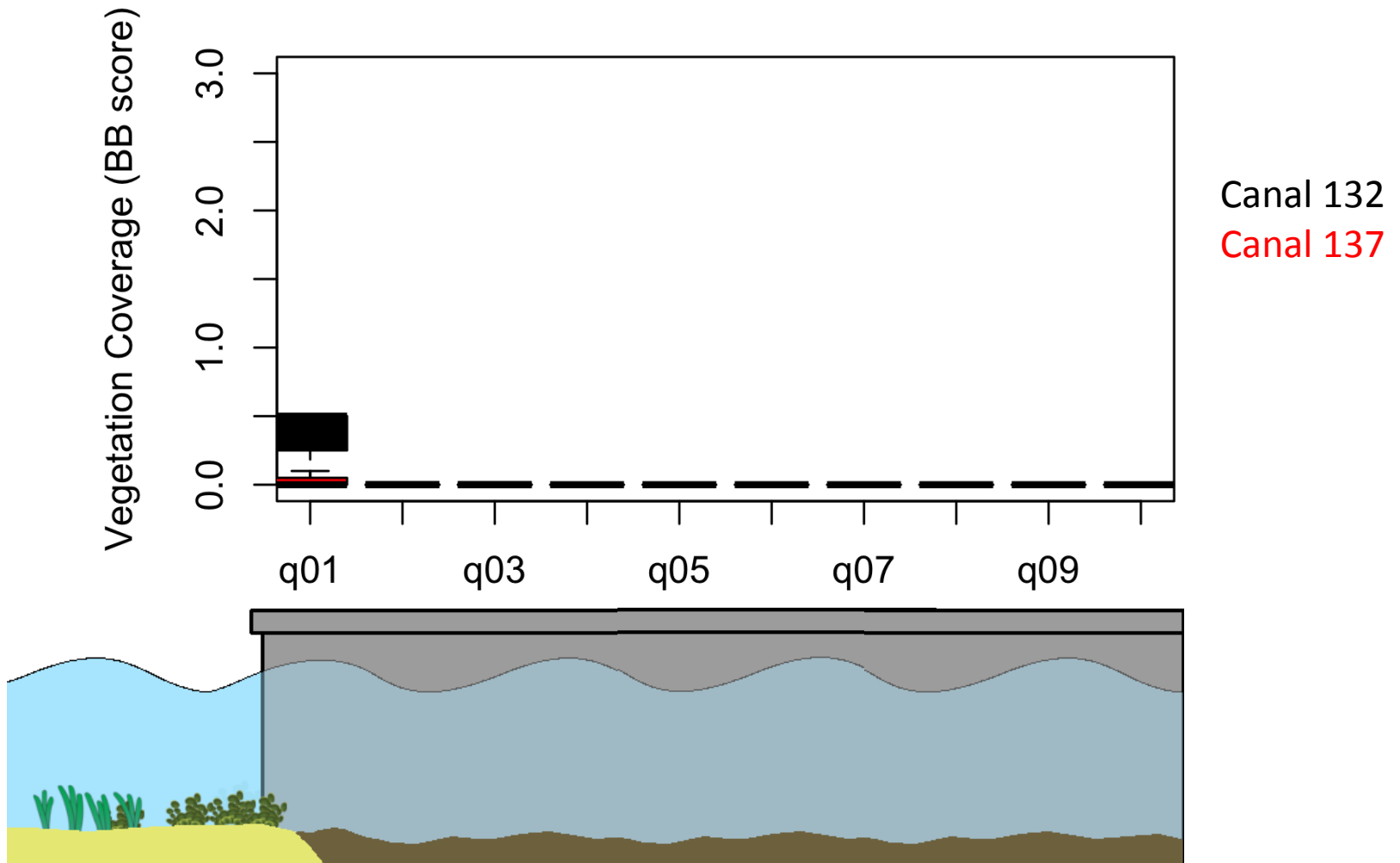
Canal 132 and 137



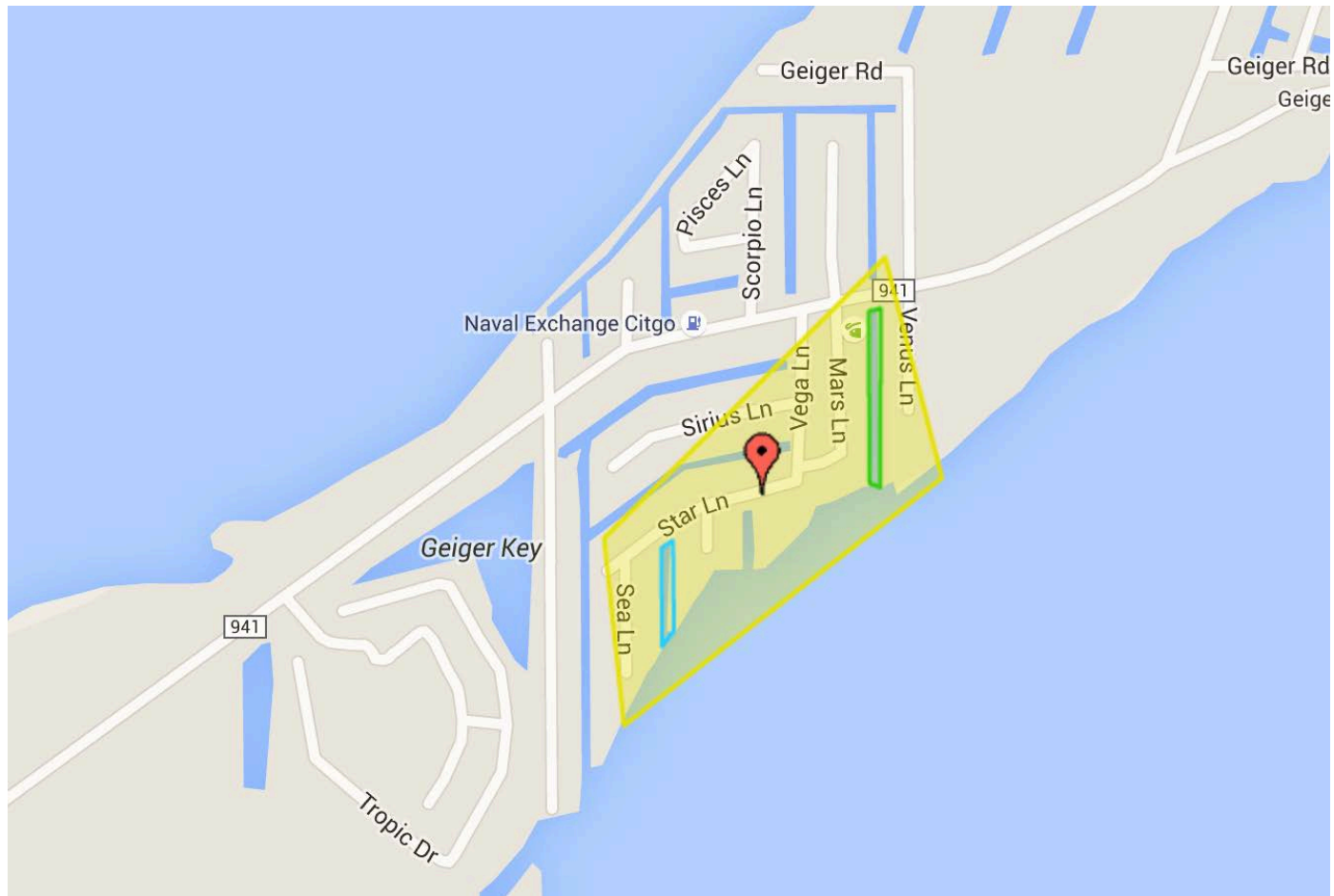
Canal 132 and 137



Canal 132 and 137



Canal 472



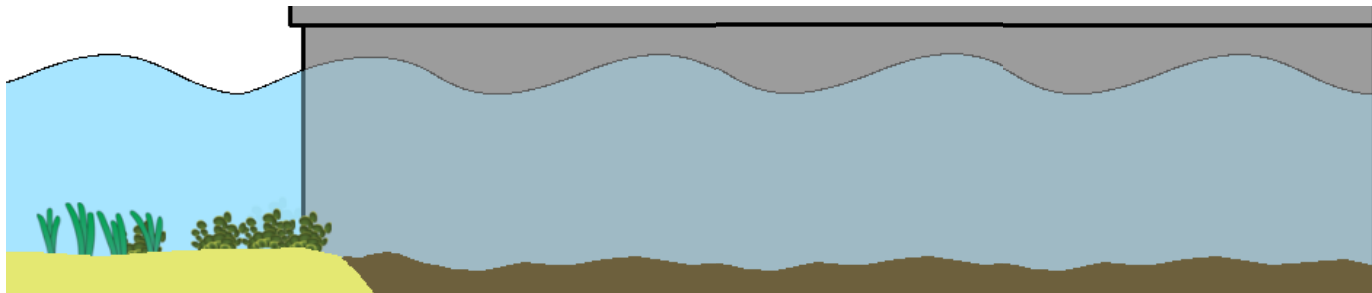
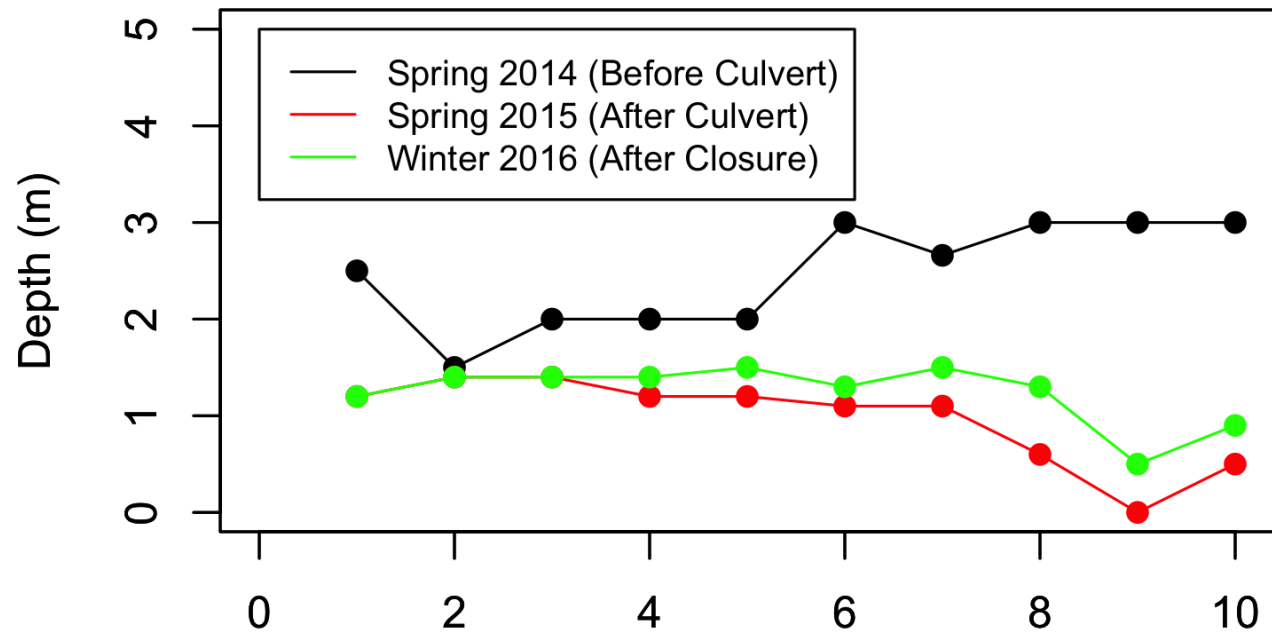




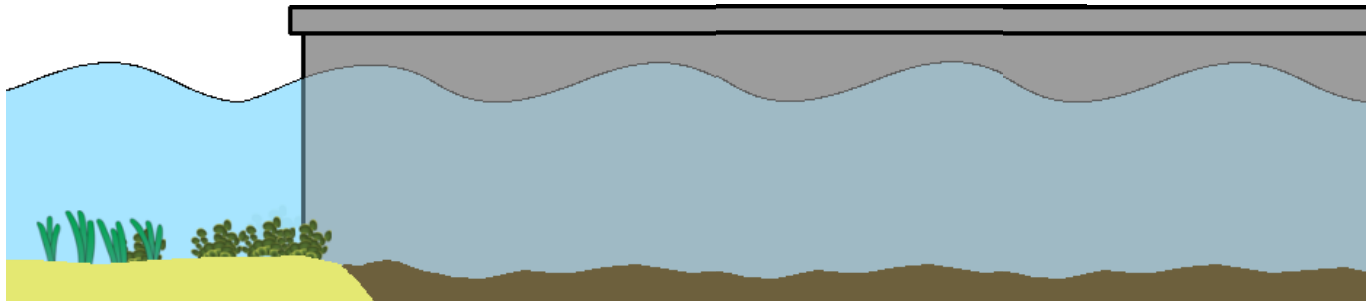
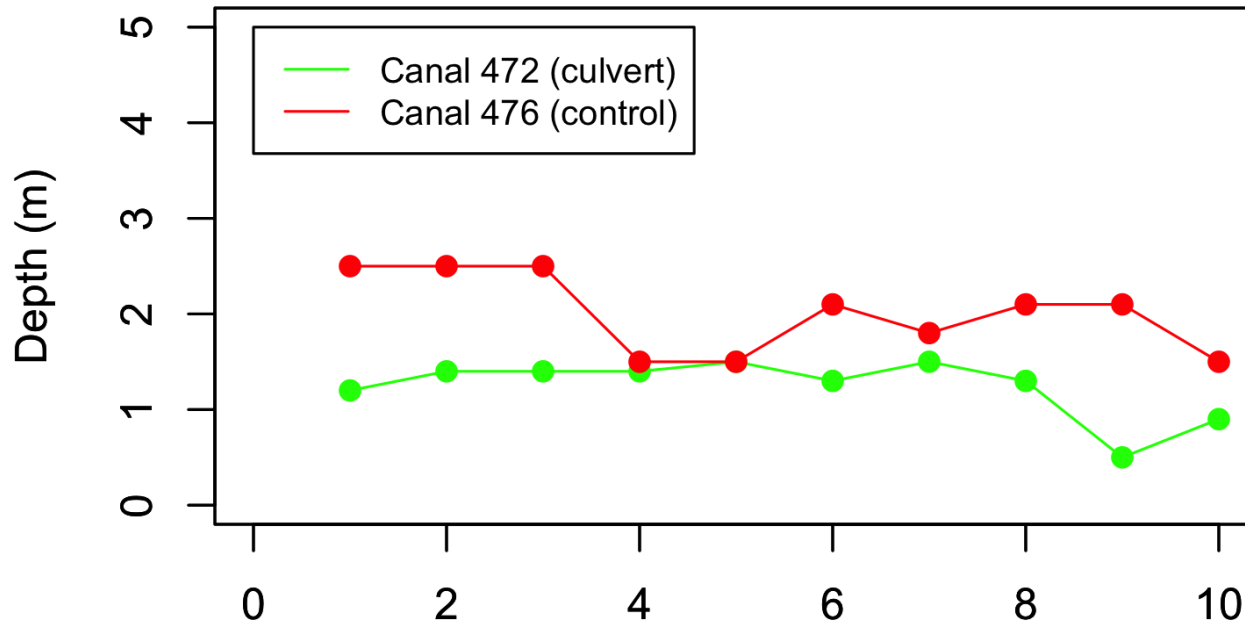




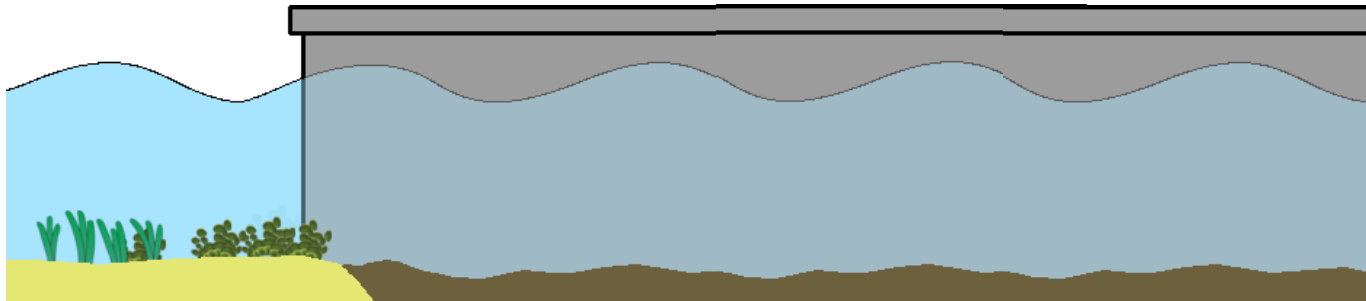
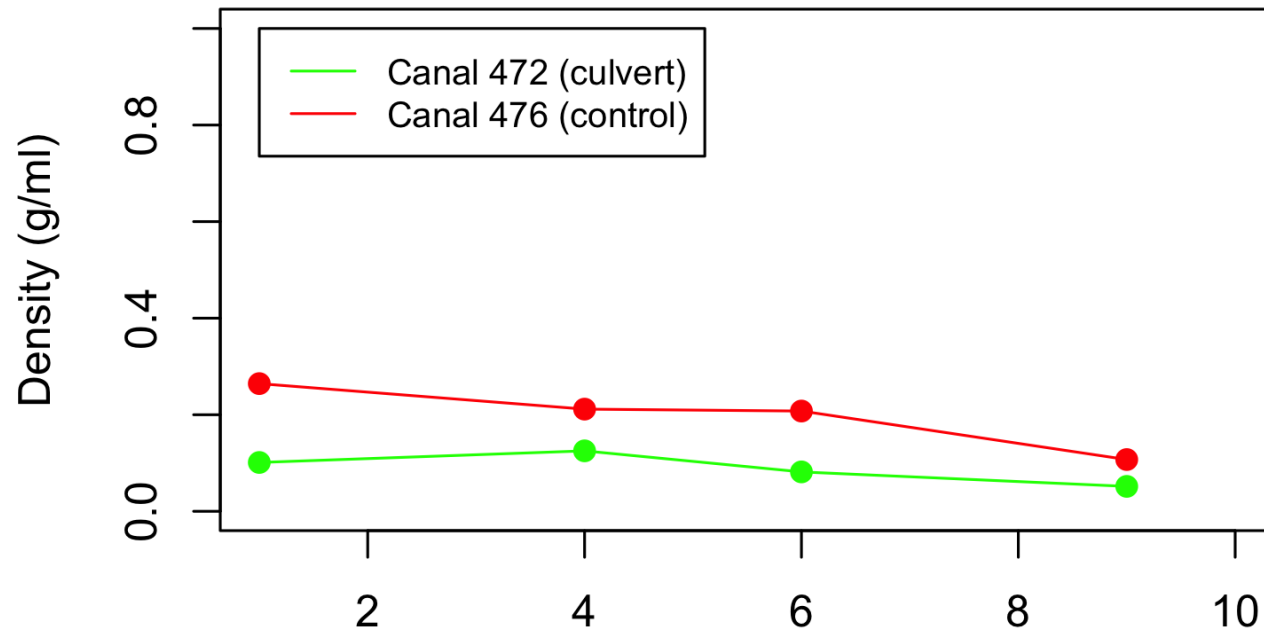
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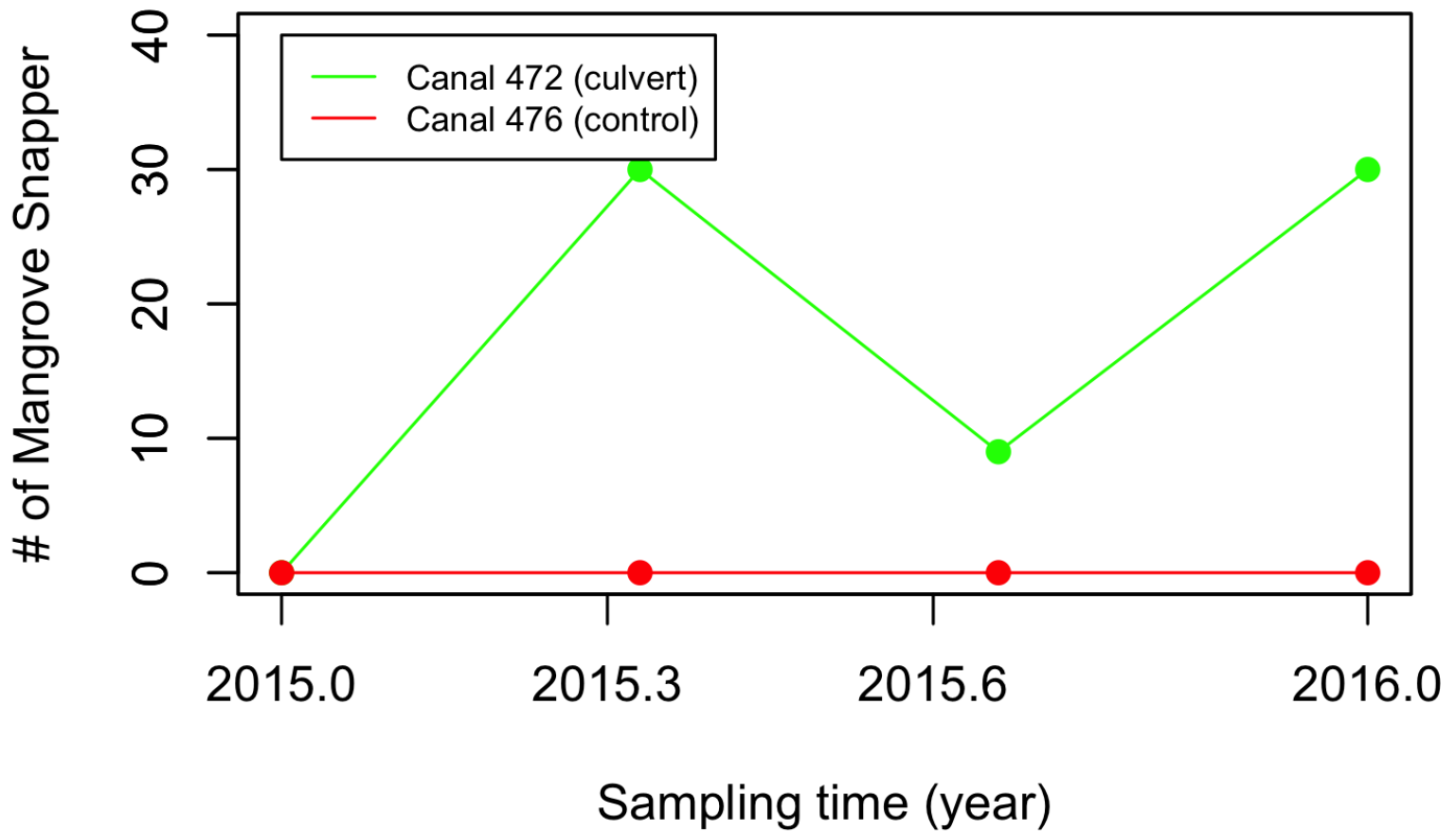
Canal 472



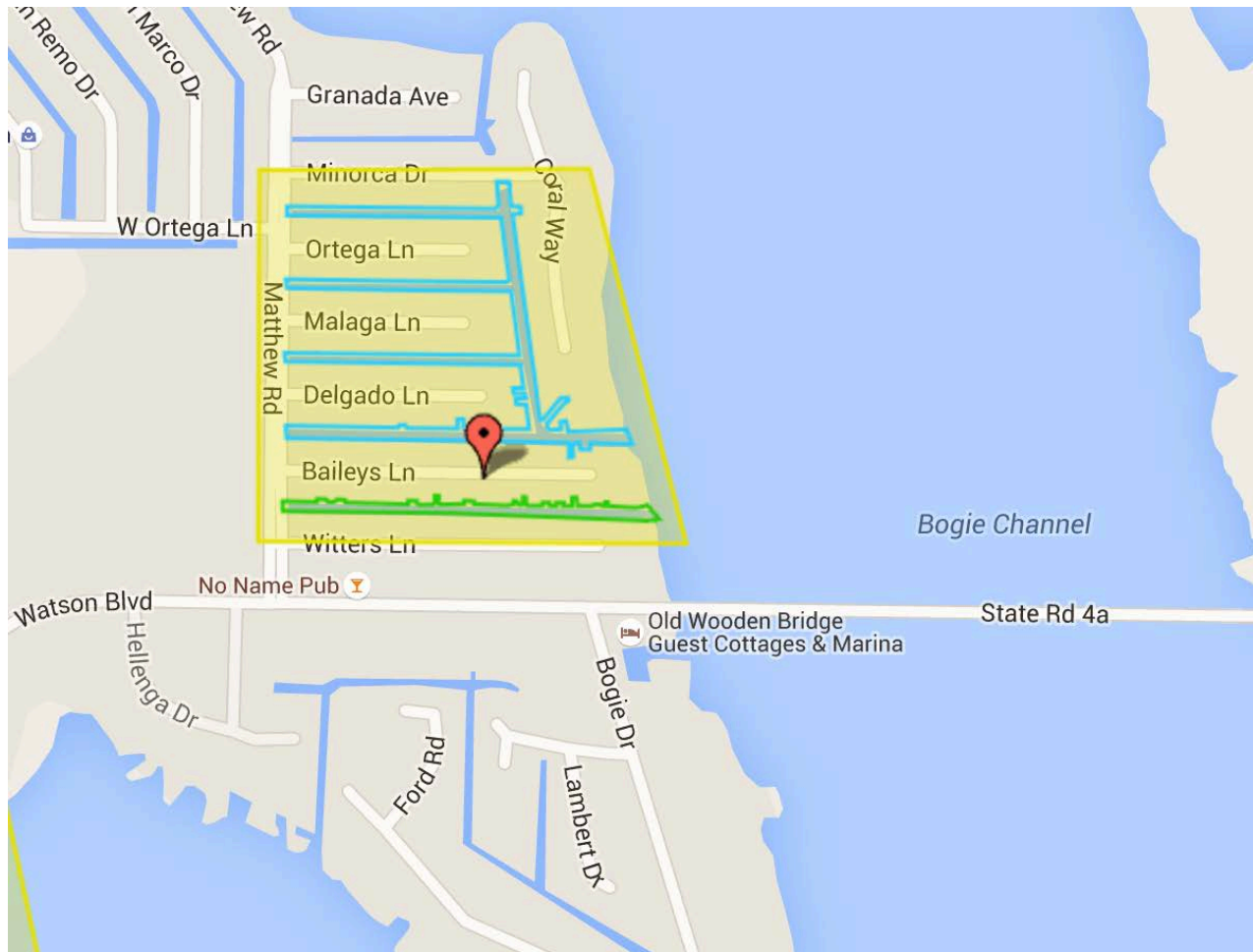
Canal 472



Canal 472

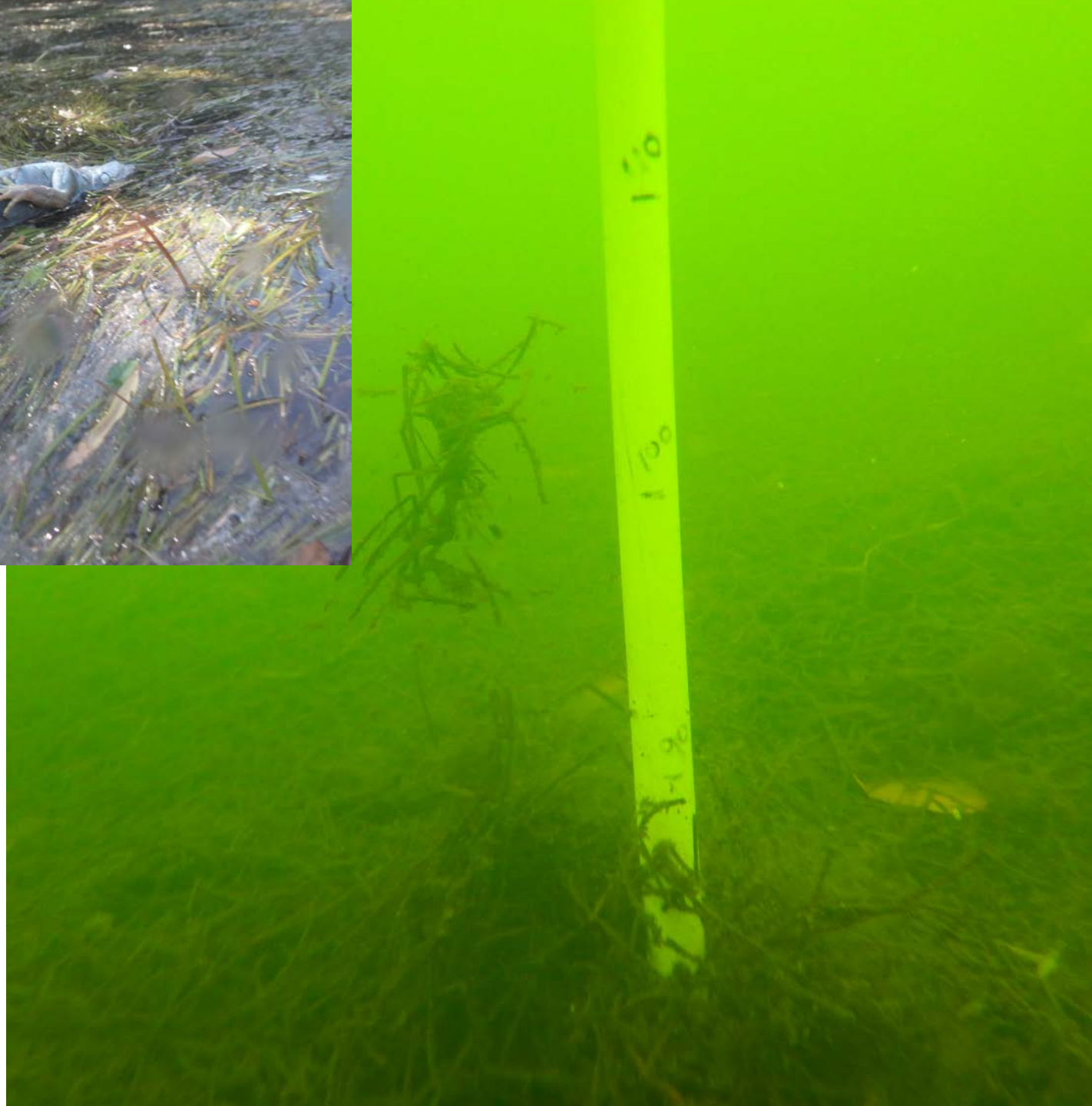


Canal 266



Canal 266- Before Dredging

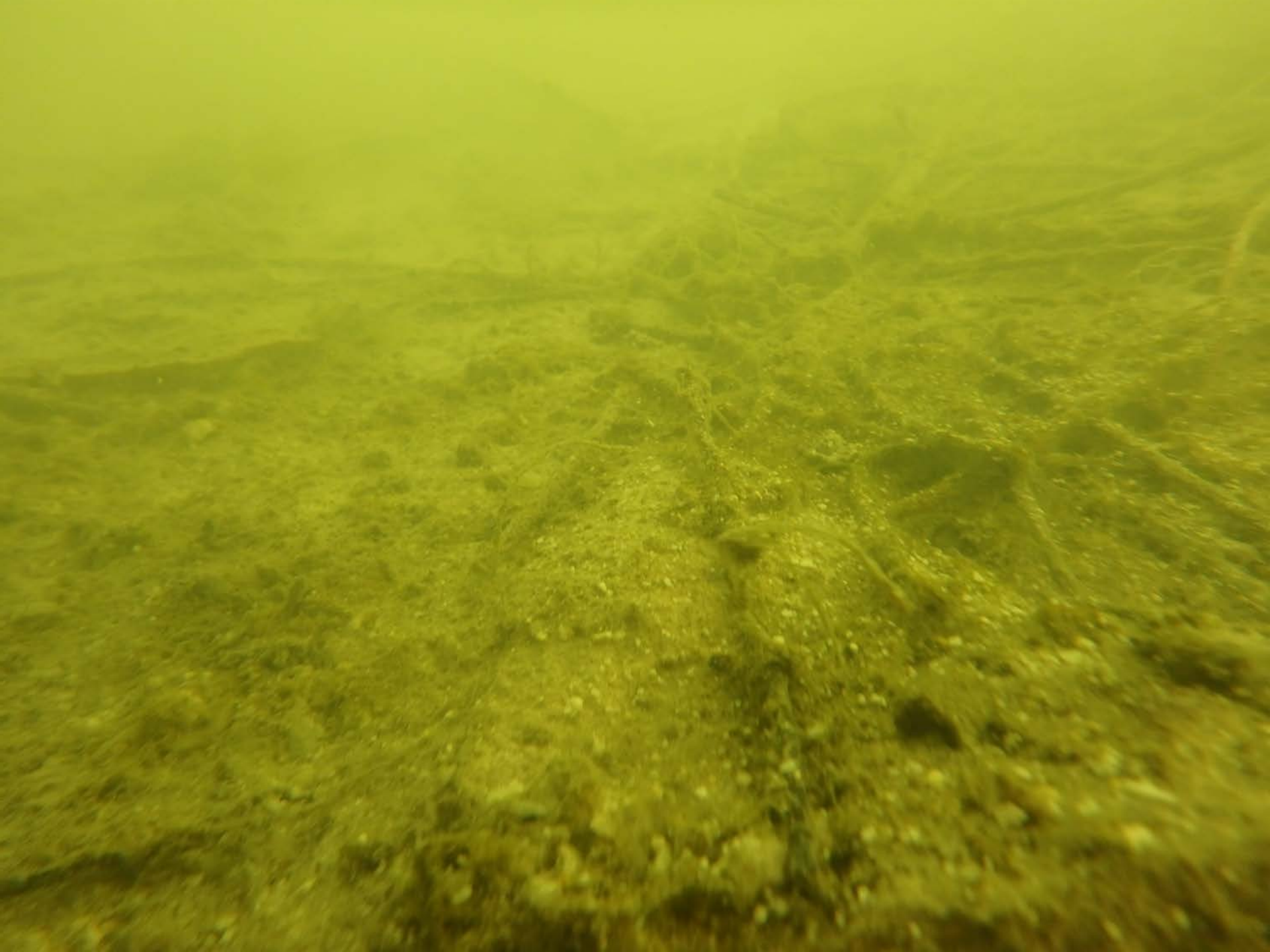




Canal 263-
Control

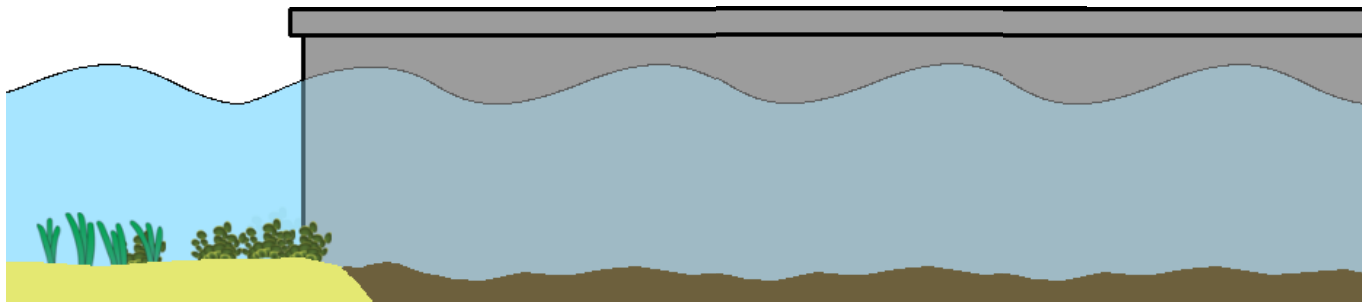
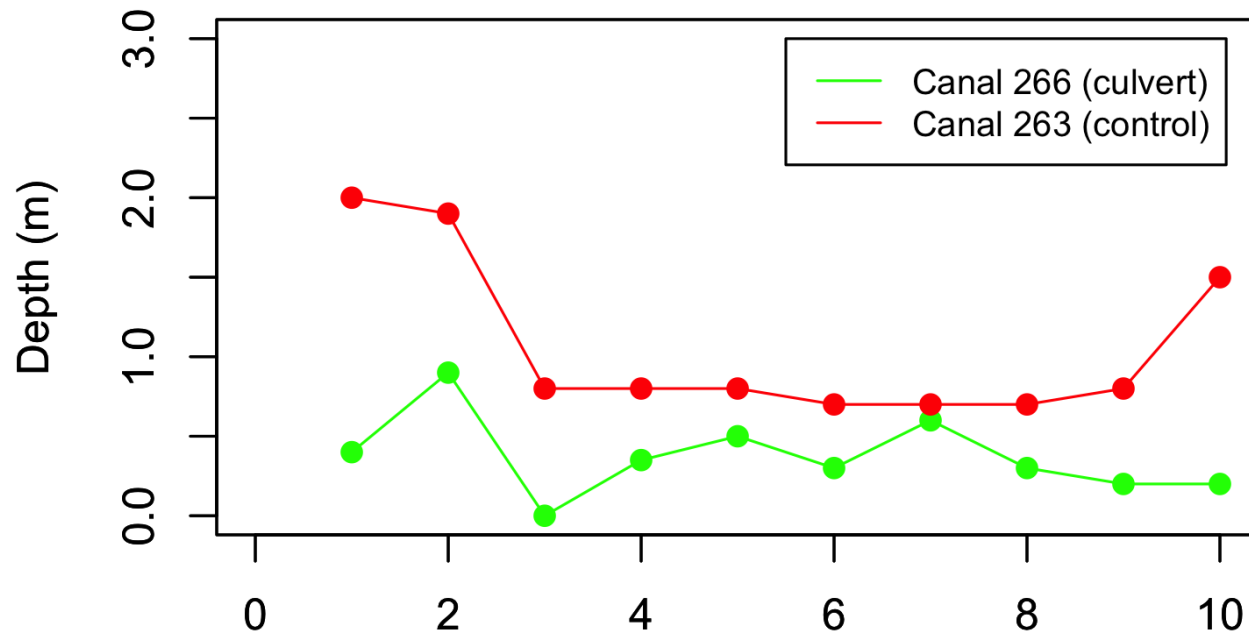
Canal 266- After Dredging



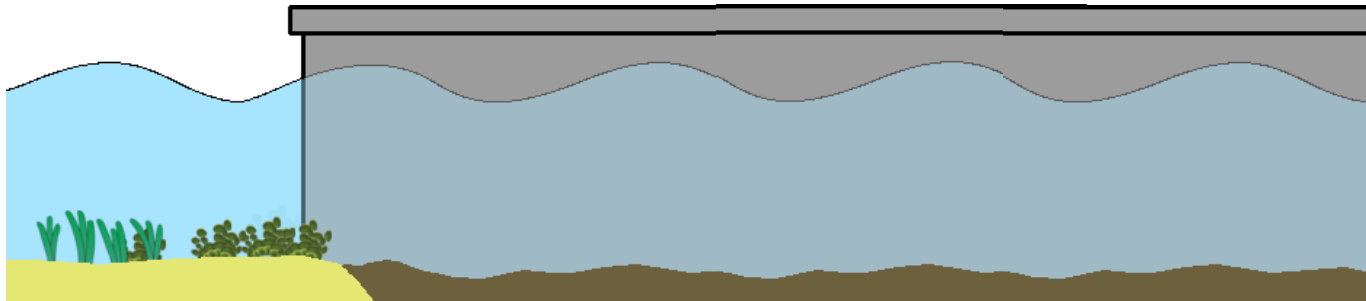
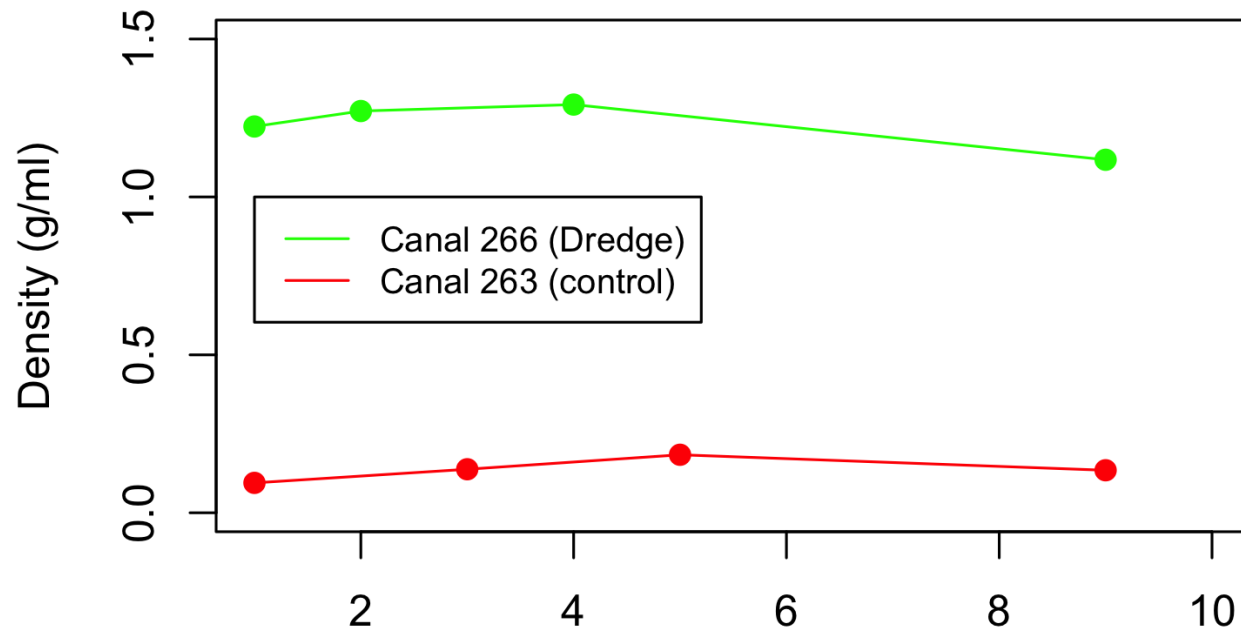




Canal 266

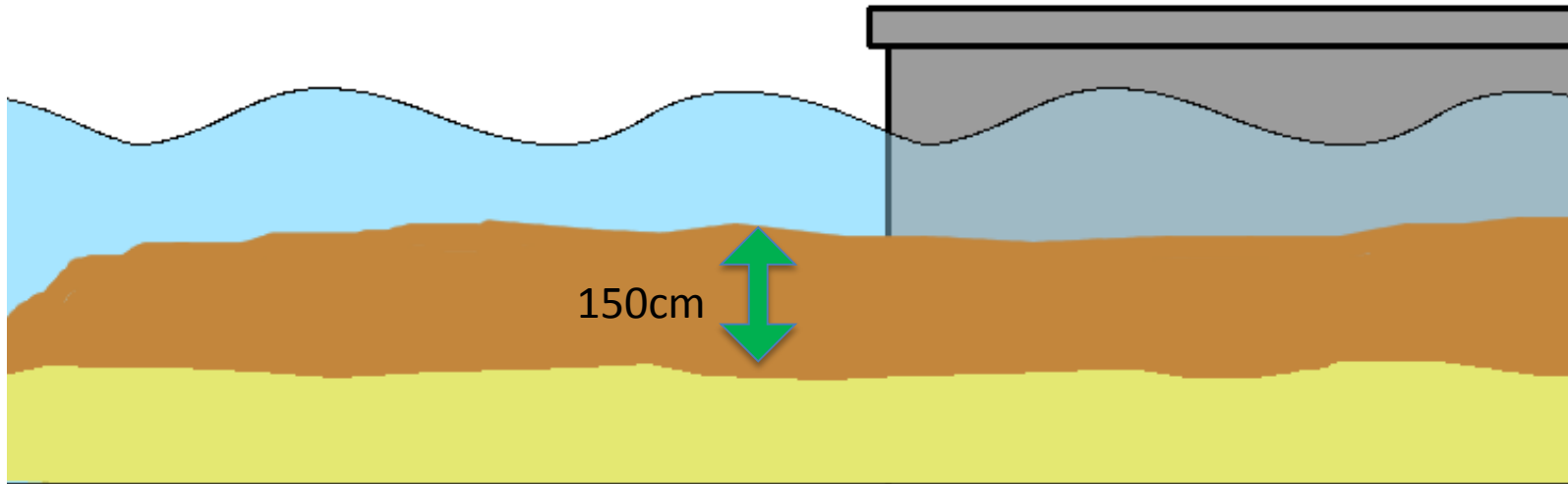


Canal 266

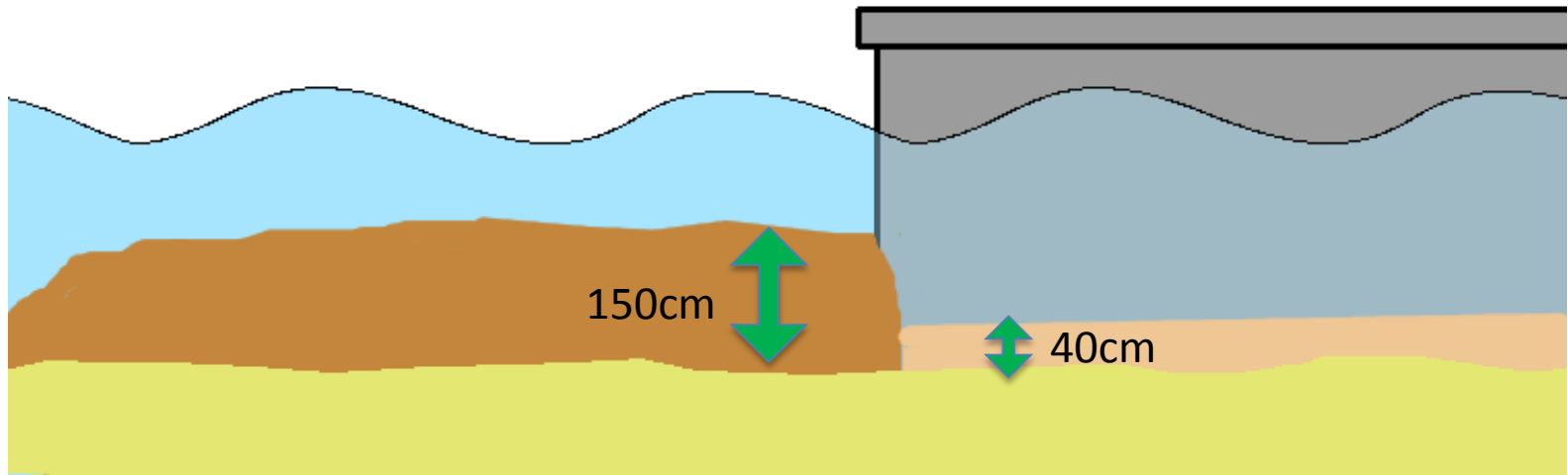


Canal 266

Before
Dredging



After
Dredging









Conclusions

- Most remediation Techniques are showing positive results on sediments
- Plant responses are delayed from remediation
- Canals are affecting adjacent waters
 - Further sampling required to assess the effects of remediation on adjacent waters



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