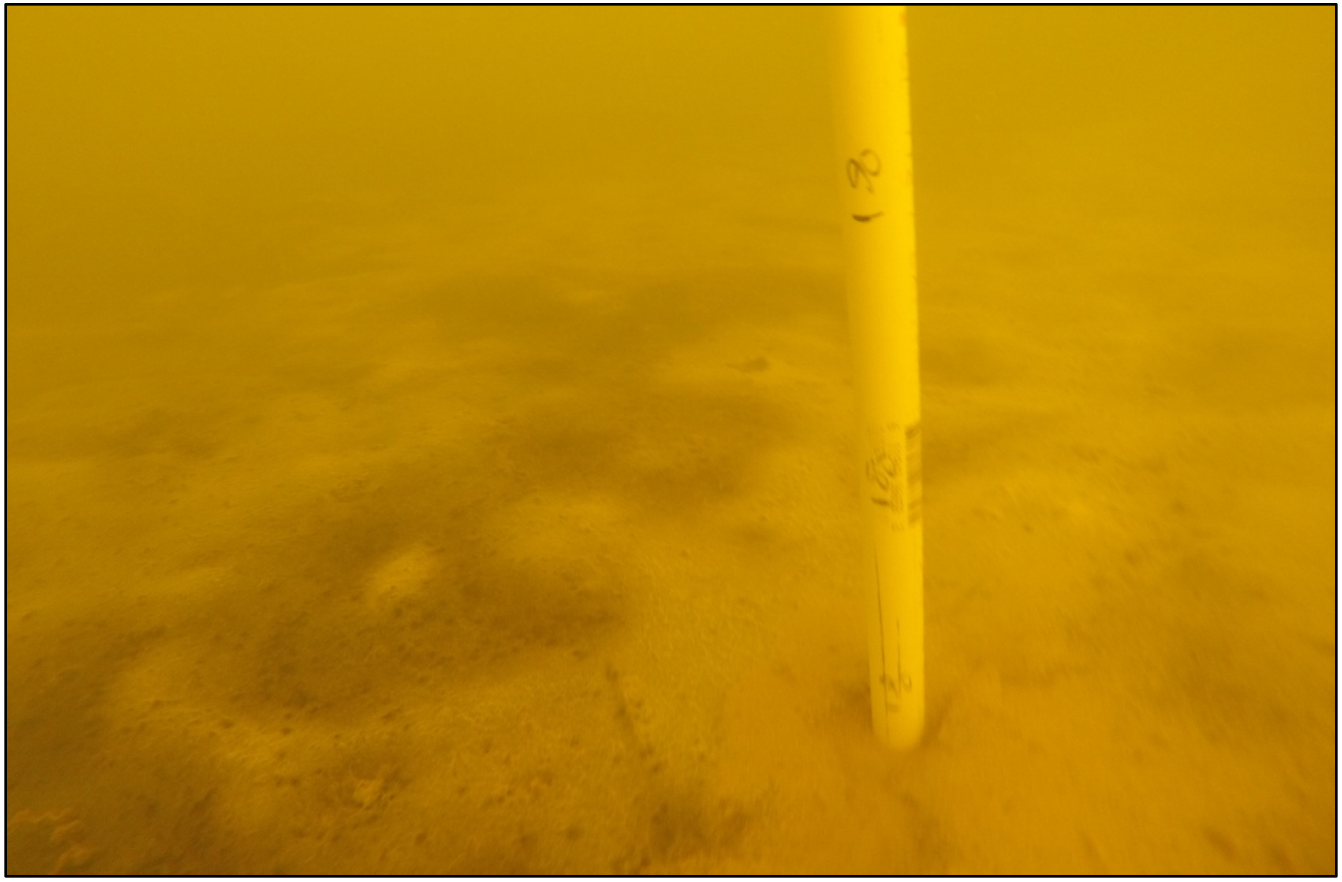
Canal Restoration in Monroe County
Benthic Monitoring Report



Jason Howard and James Fourqurean
Seagrass Ecosystems Research Lab
Florida International University

WATER QUALITY PROTECTION PROGRAM CANAL RESTORATION ADVISORY SUBCOMMITTEE
Feburary 26th, 2016

Made possible by

Christian Lopes
SERL Technician

Sara Wilson
SERL Lab Manager

Made possible by

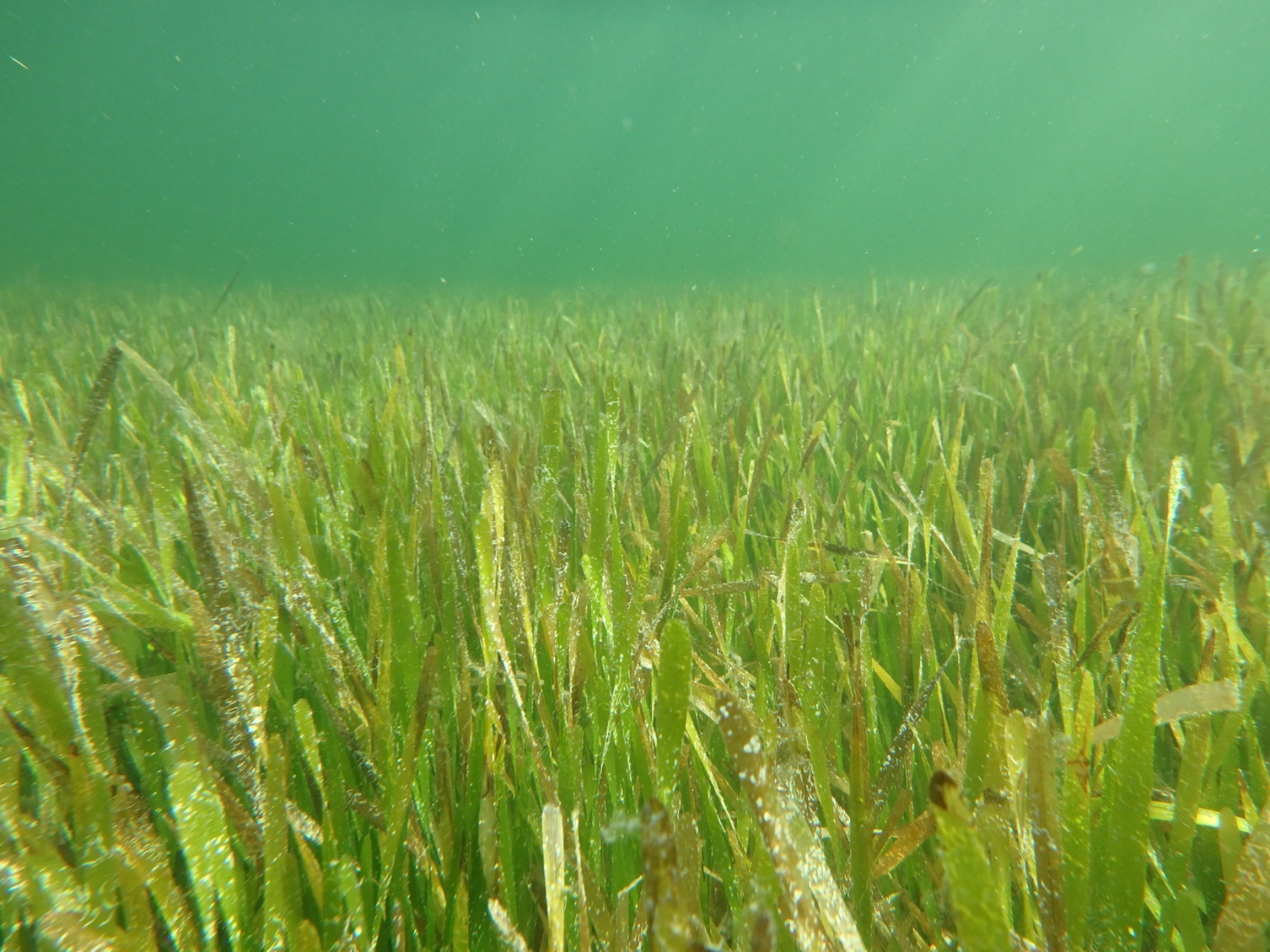
Townships
Homeowner Organizations
Individuals

FIU
Florida International University
Miami's public research university

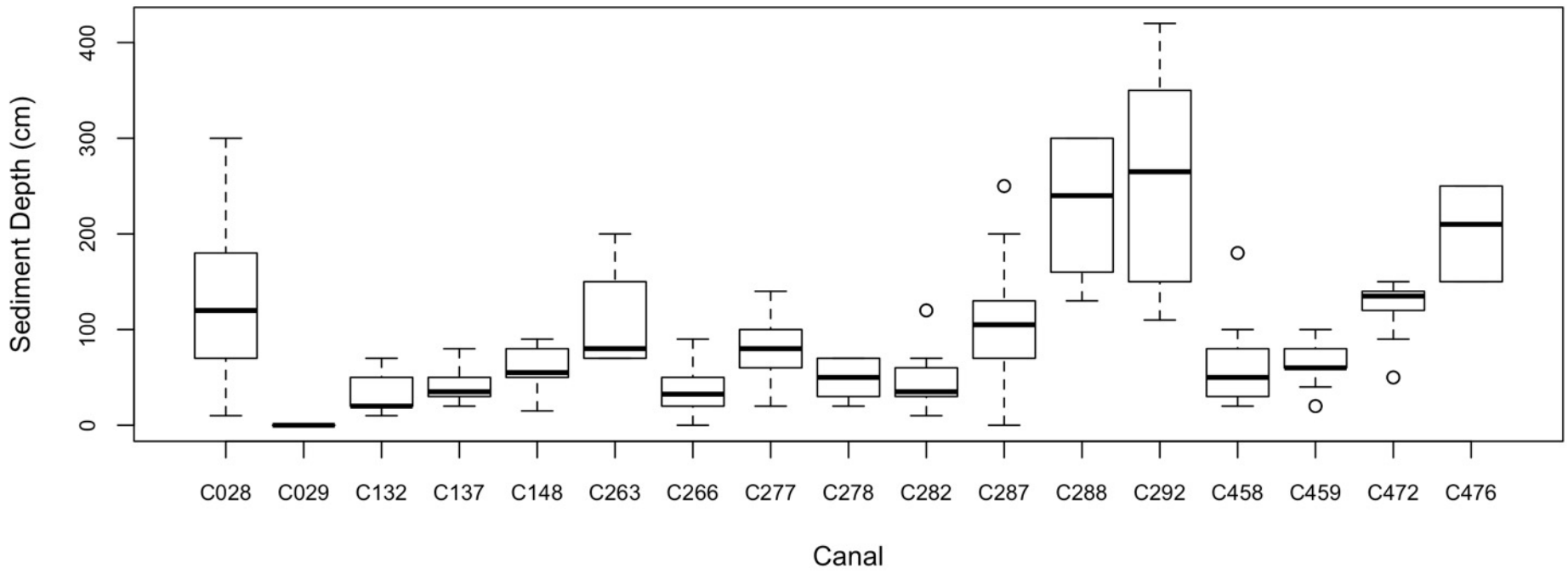
Seagrass Ecosystems Research Lab
Florida International University

About Us

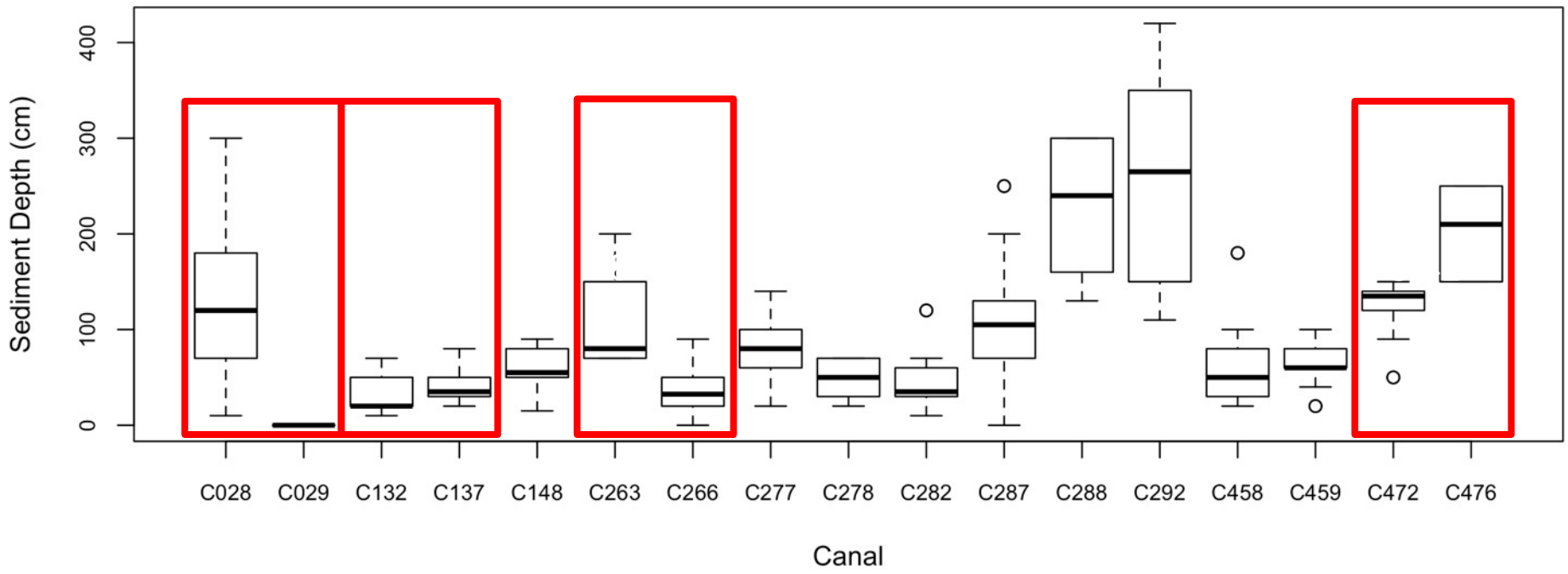
http://seagrass.fiu.edu
jhowa033@fiu.edu



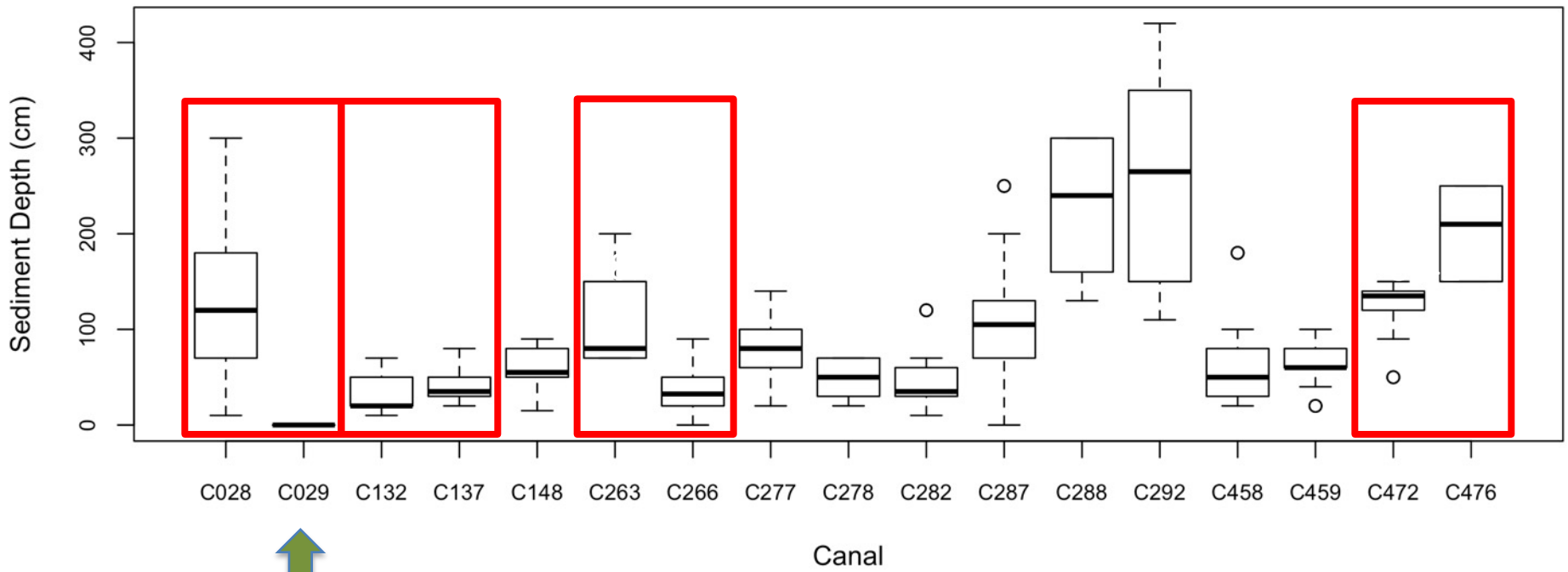
Sediment Depth



Sediment Depth

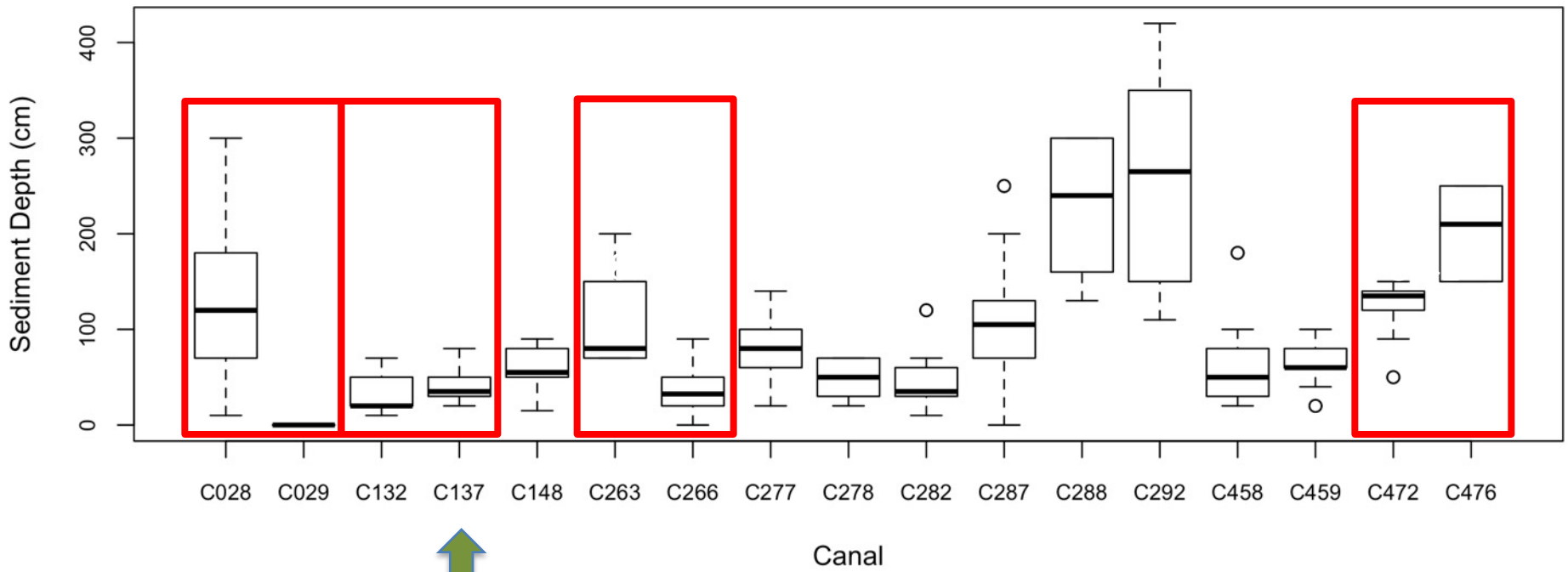


Sediment Depth



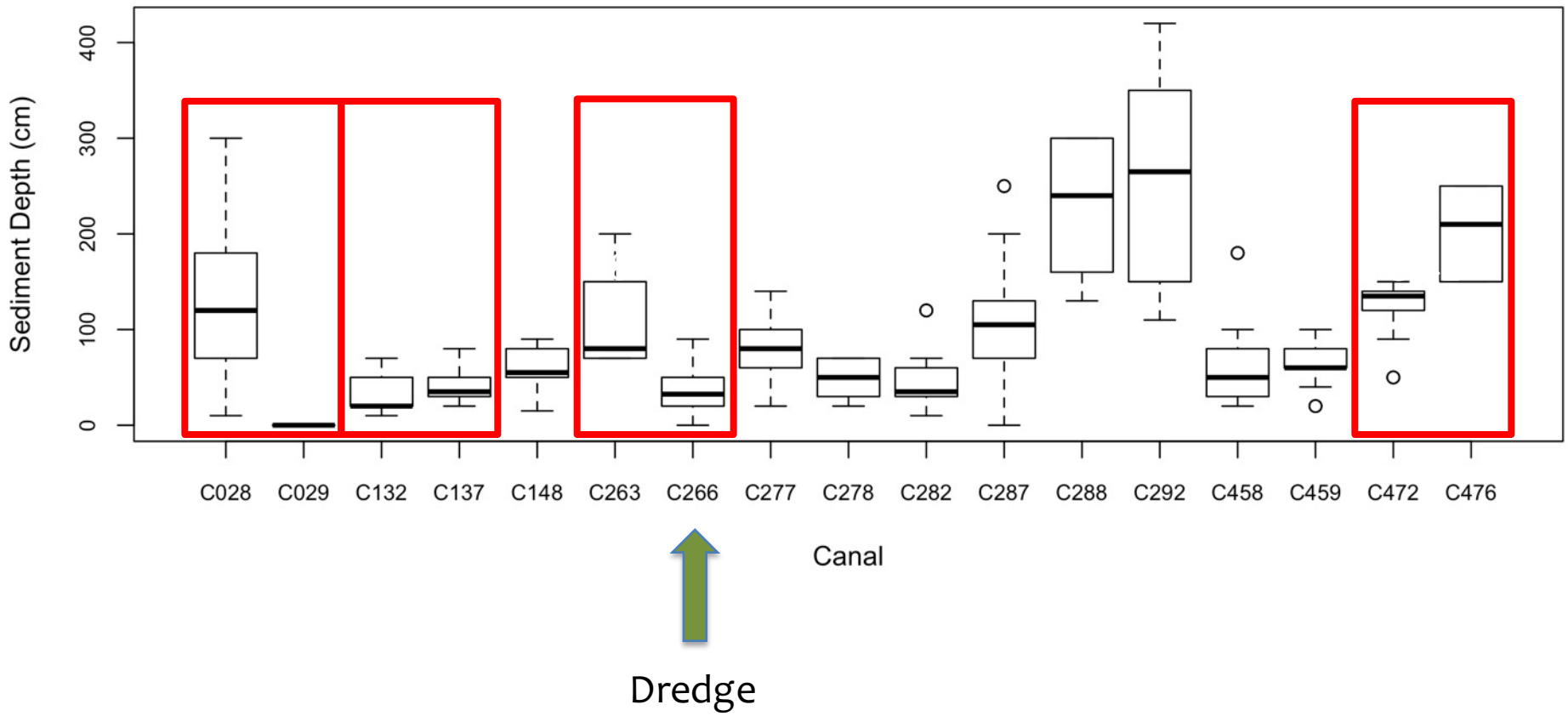
Backfill

Sediment Depth

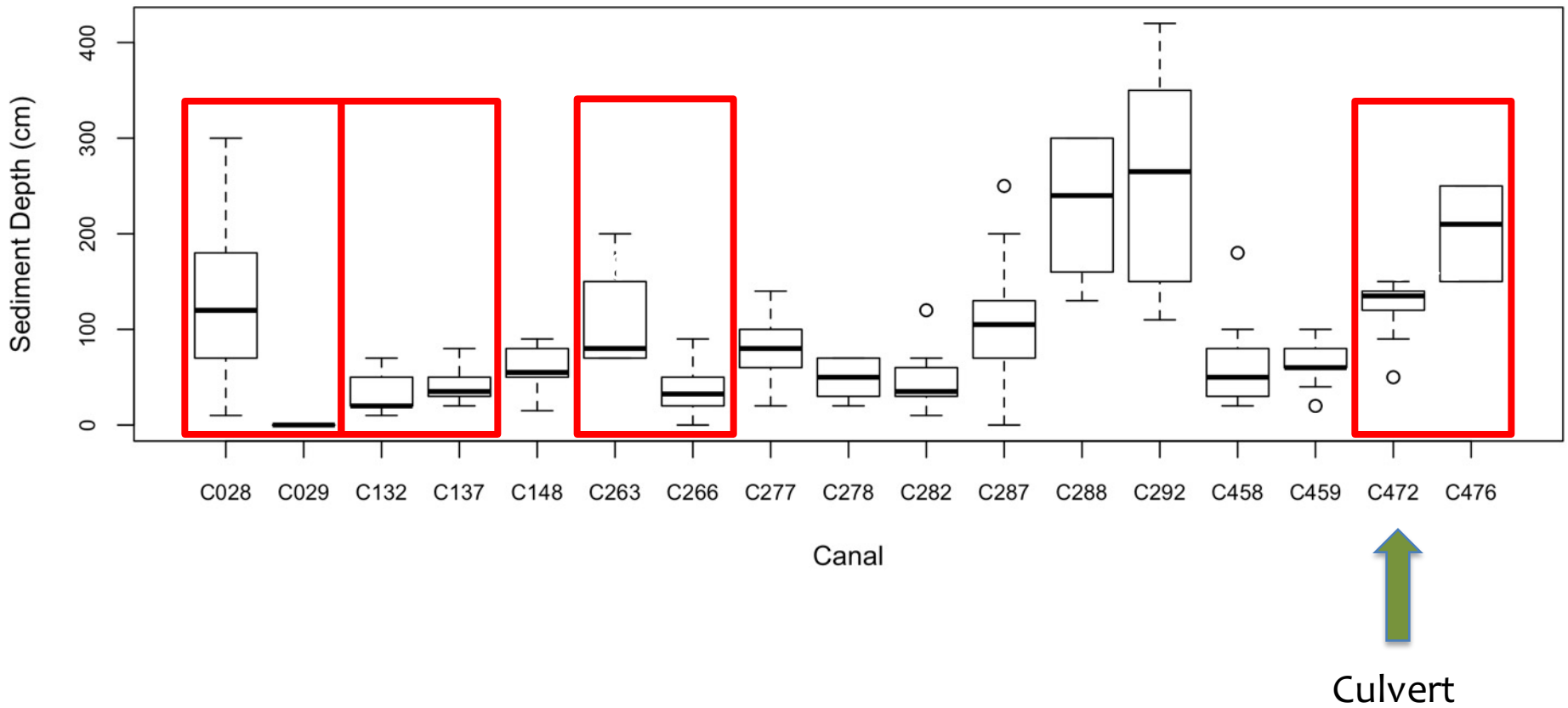


Weed Gate and aerator

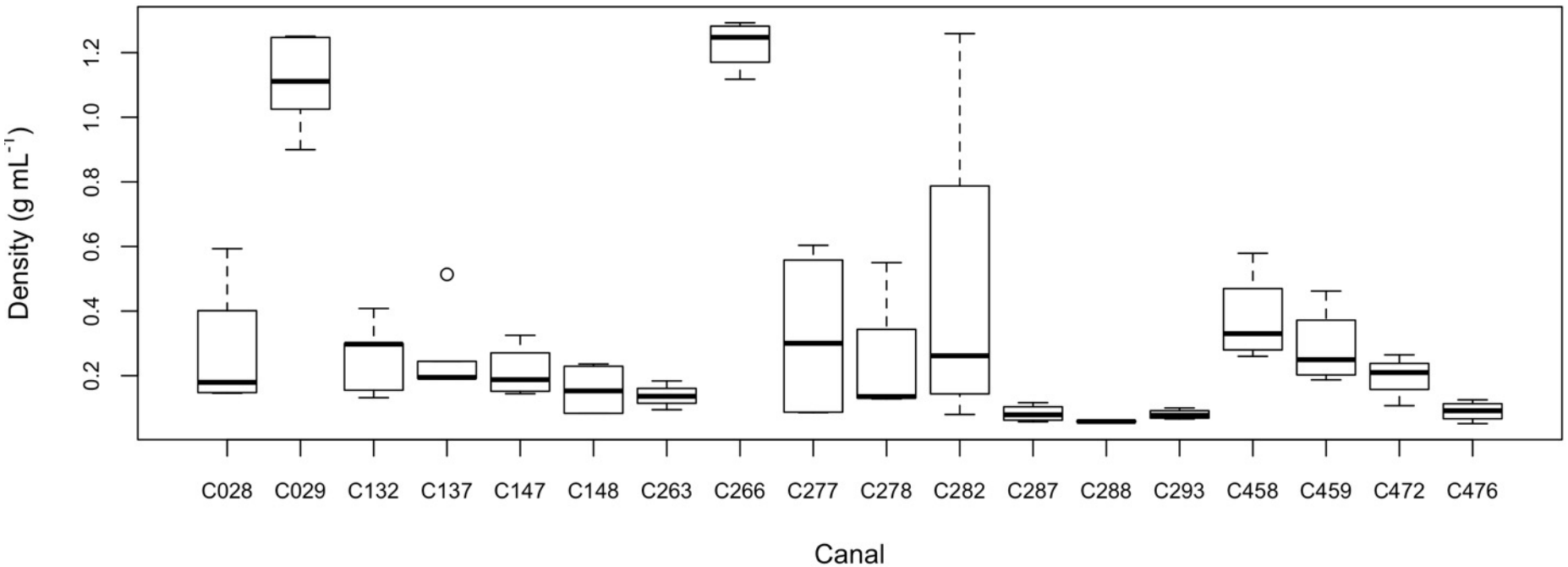
Sediment Depth



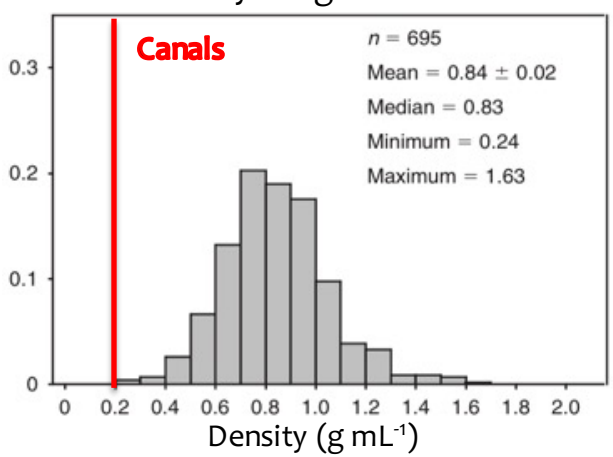
Sediment Depth



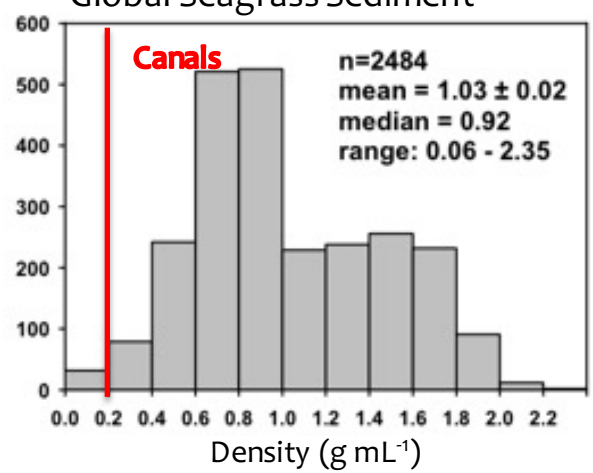
Sediment Density



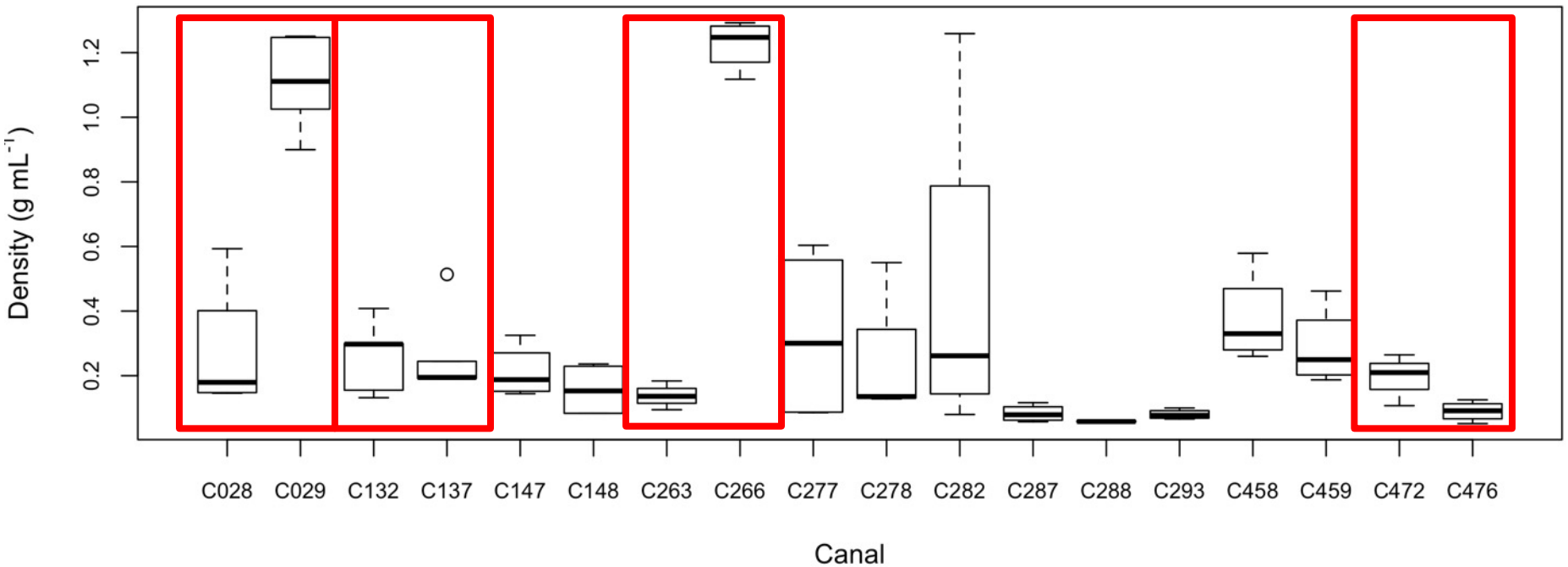
Florida Bay Seagrass Sediment



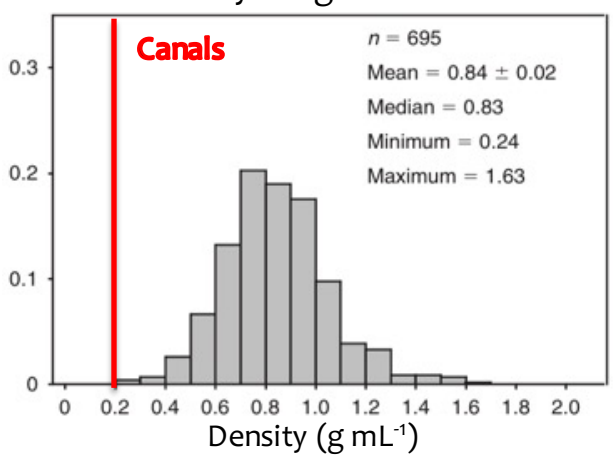
Global Seagrass Sediment



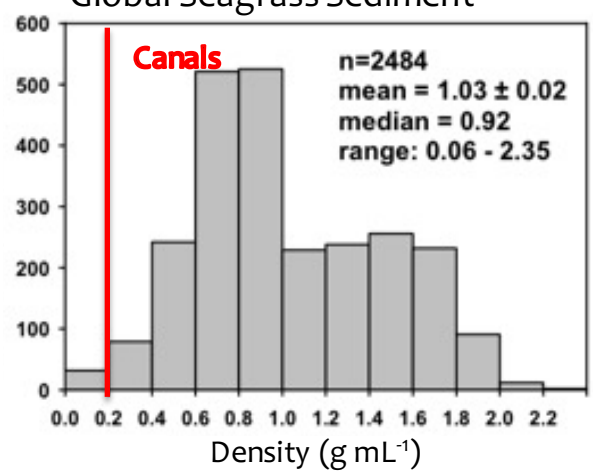
Sediment Density



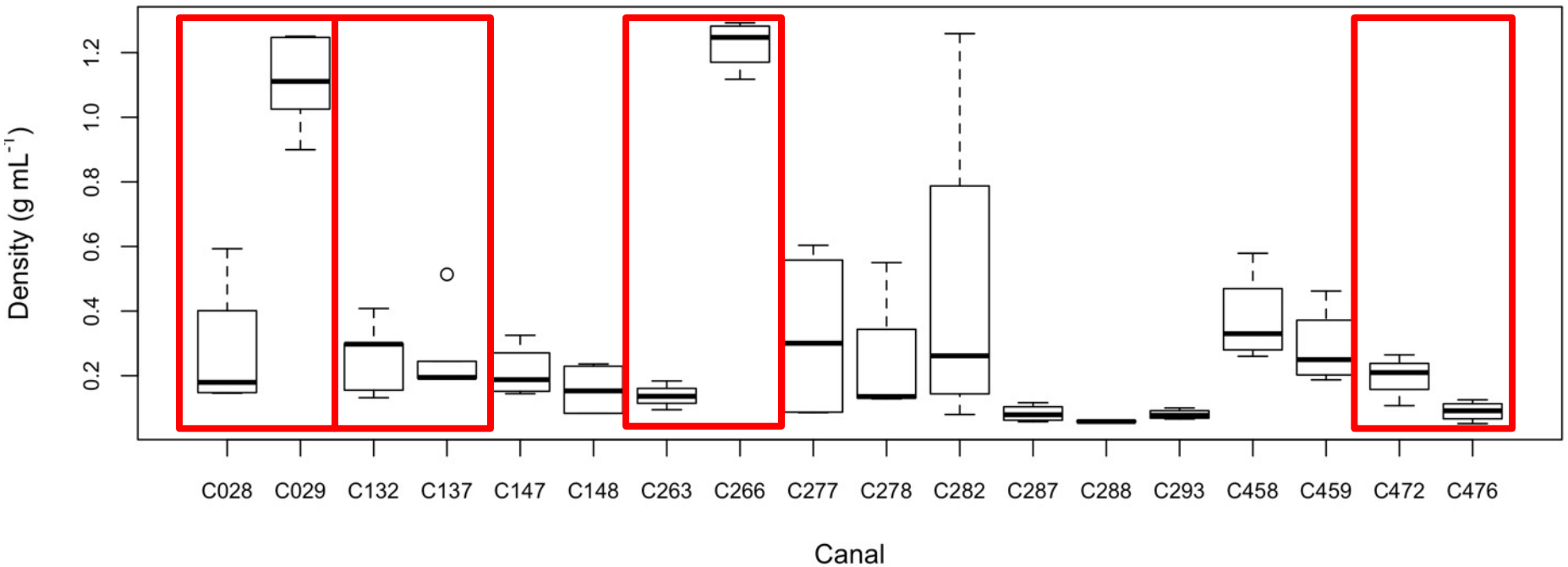
Florida Bay Seagrass Sediment



Global Seagrass Sediment

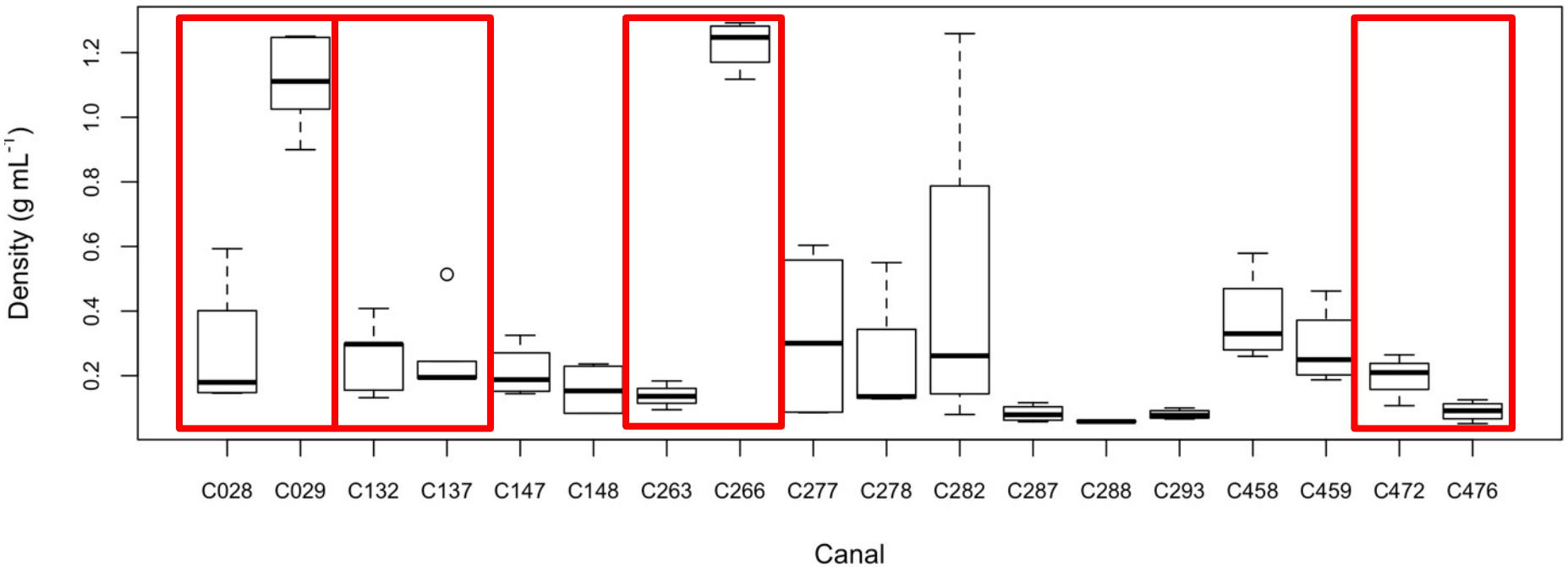


Sediment Density



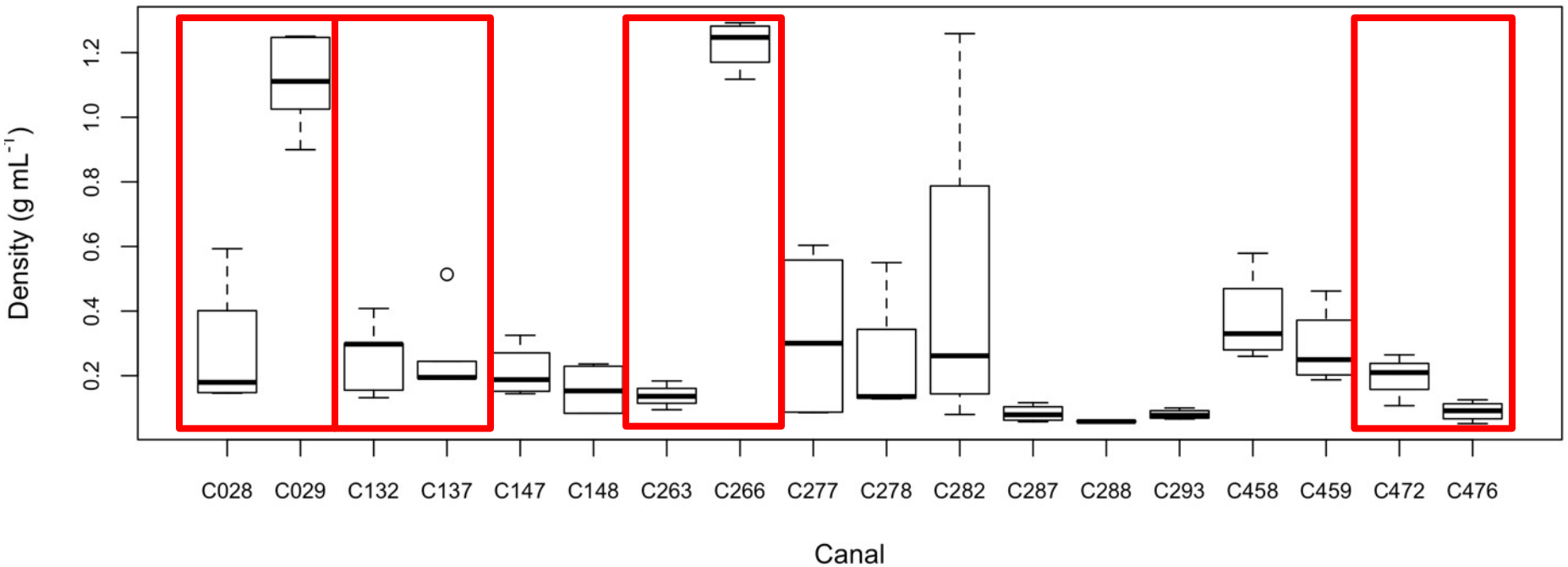
Backfill

Sediment Density



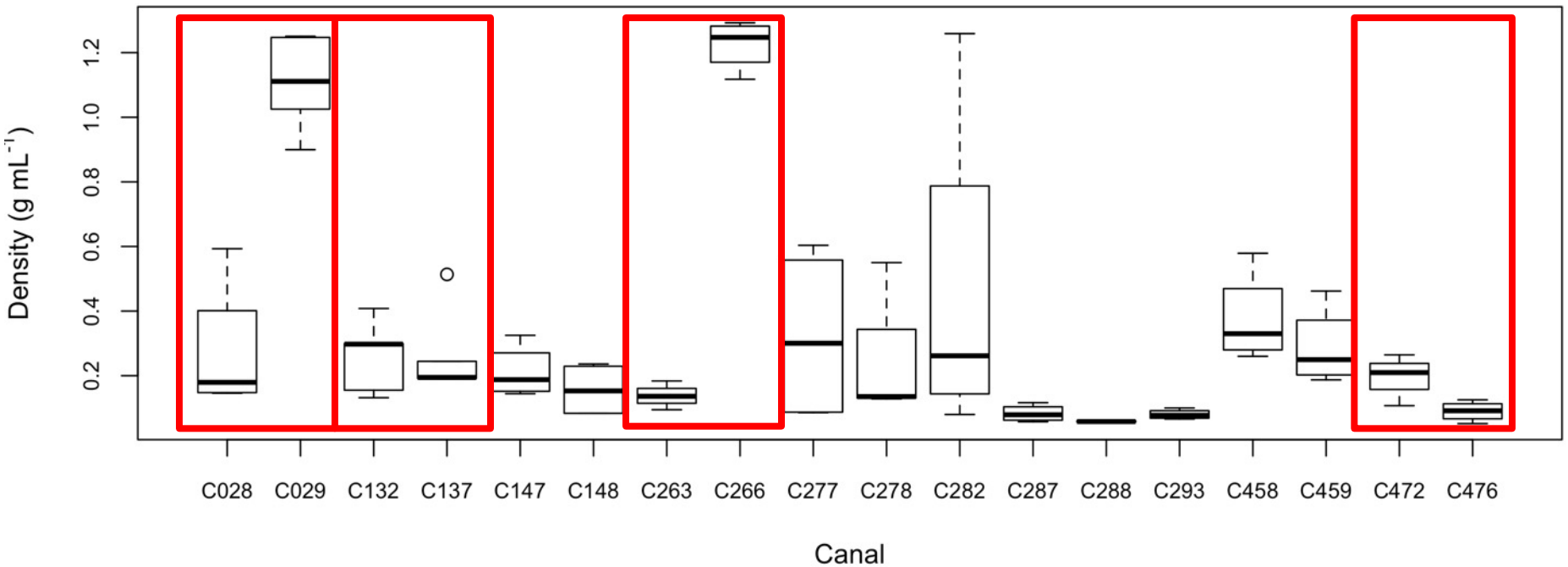
Weed Gate and aerator

Sediment Density



Dredge

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

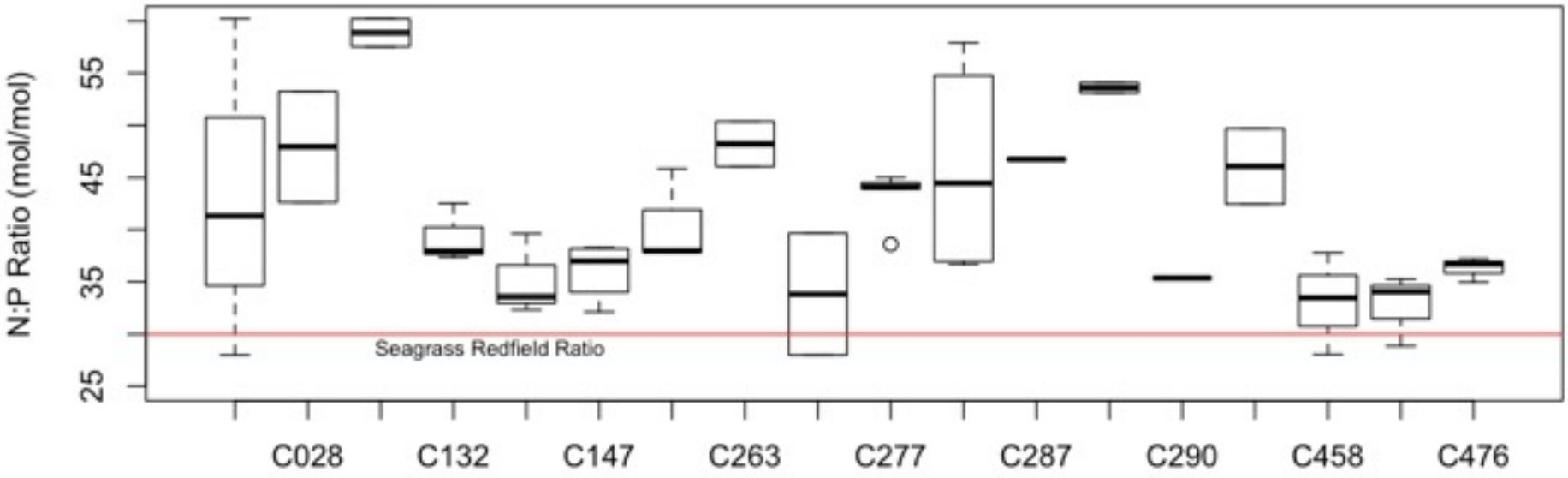
550:30:1 Generalized

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



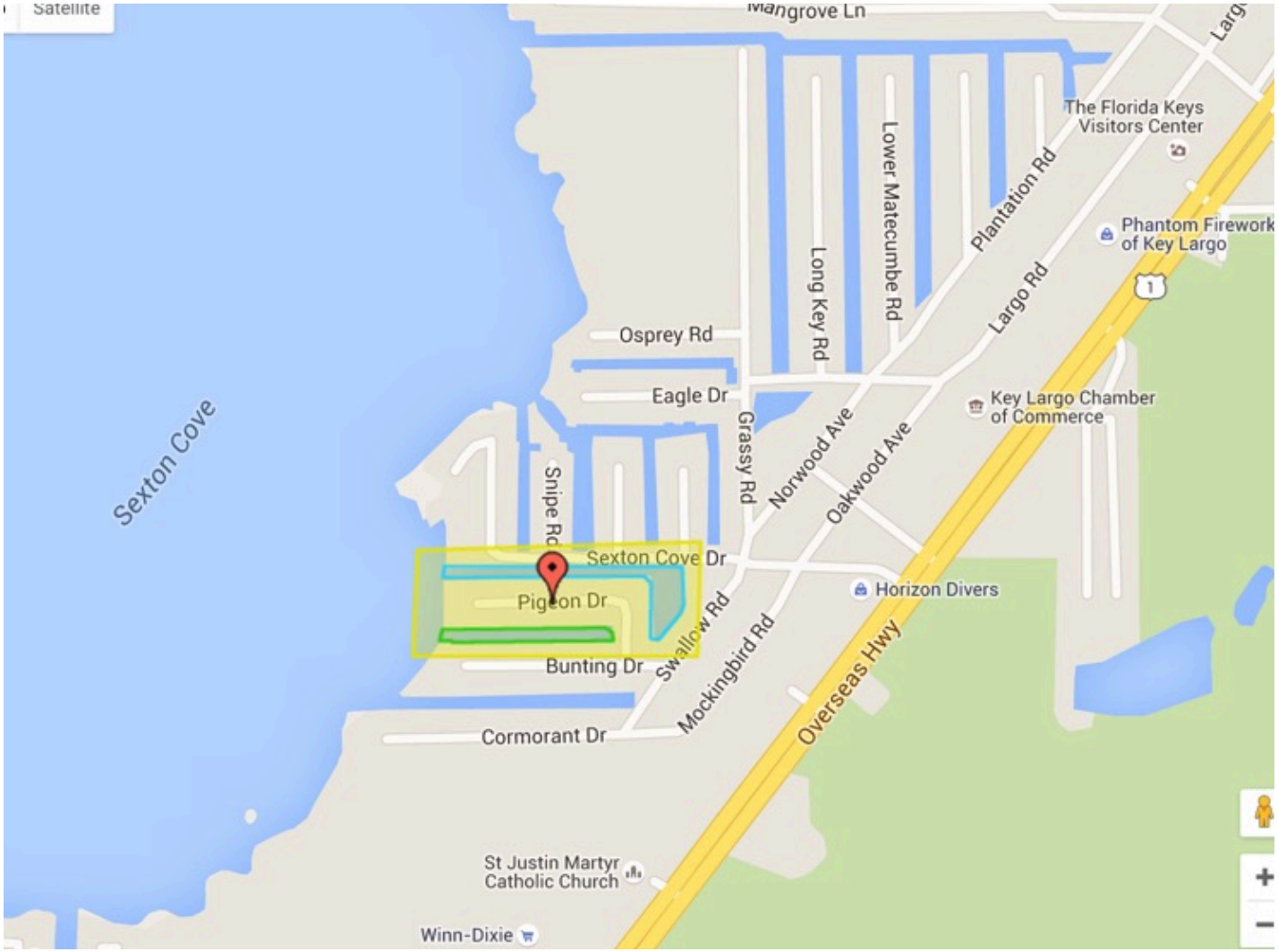
Effect on Seagrasses

^{15}N

Higher $^{15}N/^{14}N$ → More anthropogenic influence

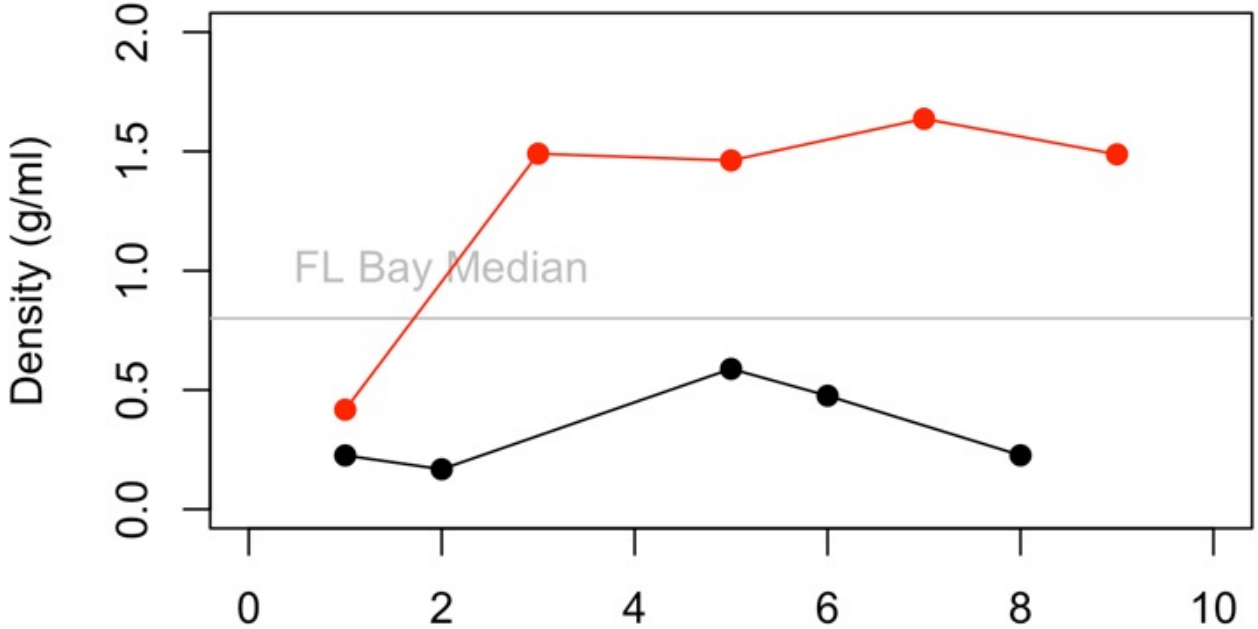
	$\delta^{15}N$	
	South FL	Canals
Mean	2.0	2.1
n	78.0	45.0
SE	0.2	0.3
Median	1.8	2.4
Minimum	-2.2	-2.6
Maximum	5.4	7.2

Canal 28 and 29

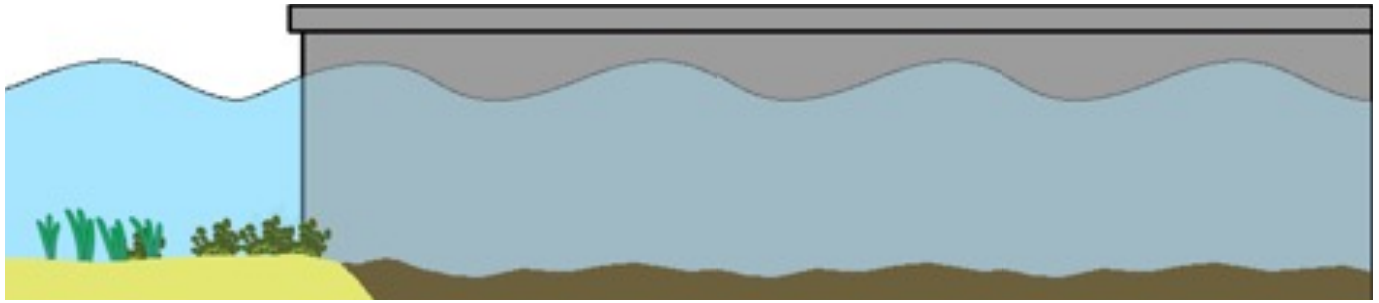


L24
Q4
WHIRL-PAK
Nasco WHIRL-PAK
Nasco WHIRL-PAK
YAMAHA
150

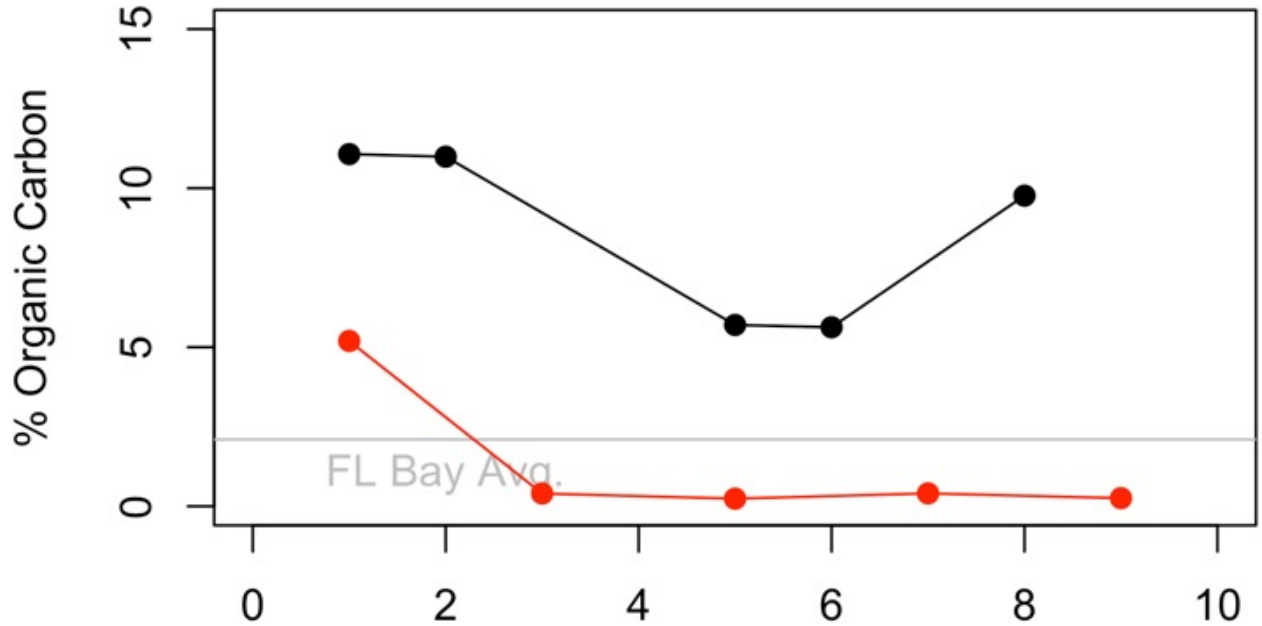
Canals 28 and 29



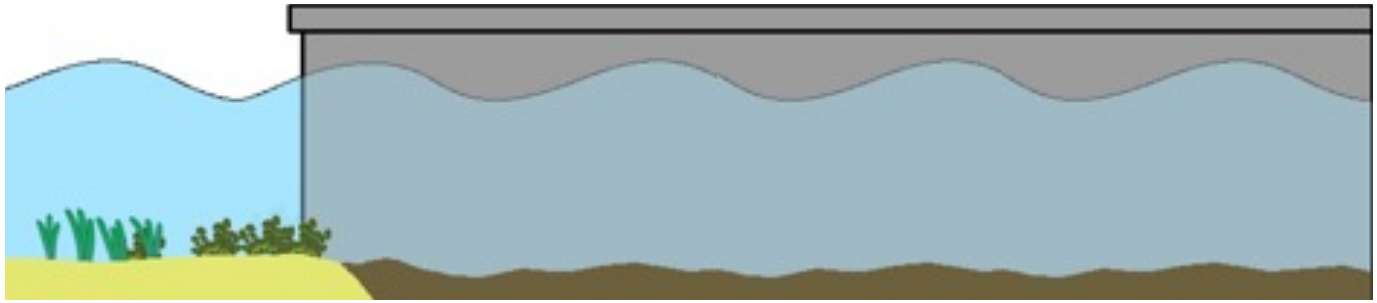
Canal 28
Canal 29



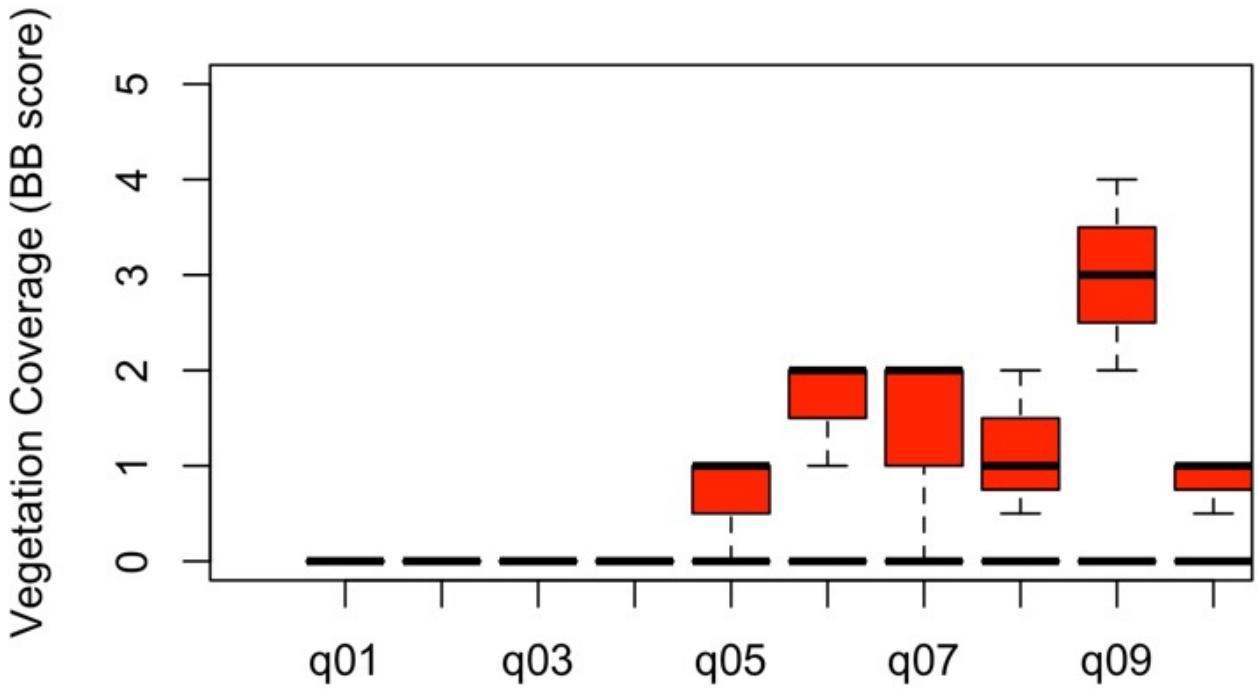
Canals 28 and 29



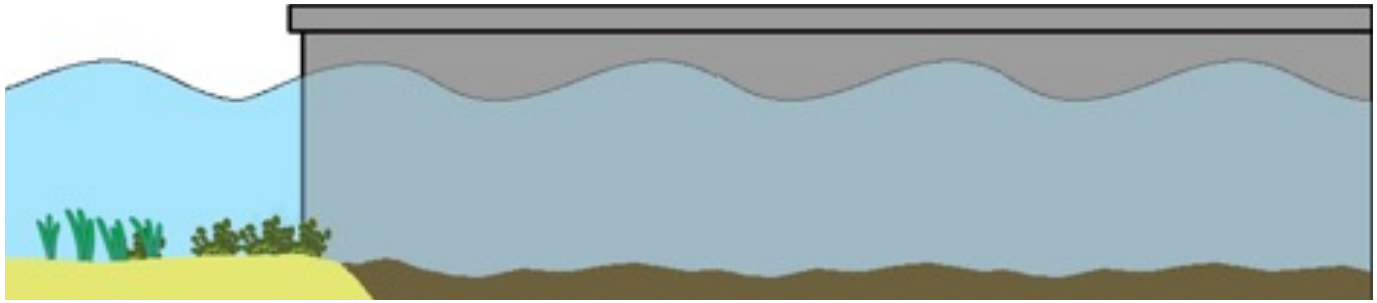
Canal 28
Canal 29



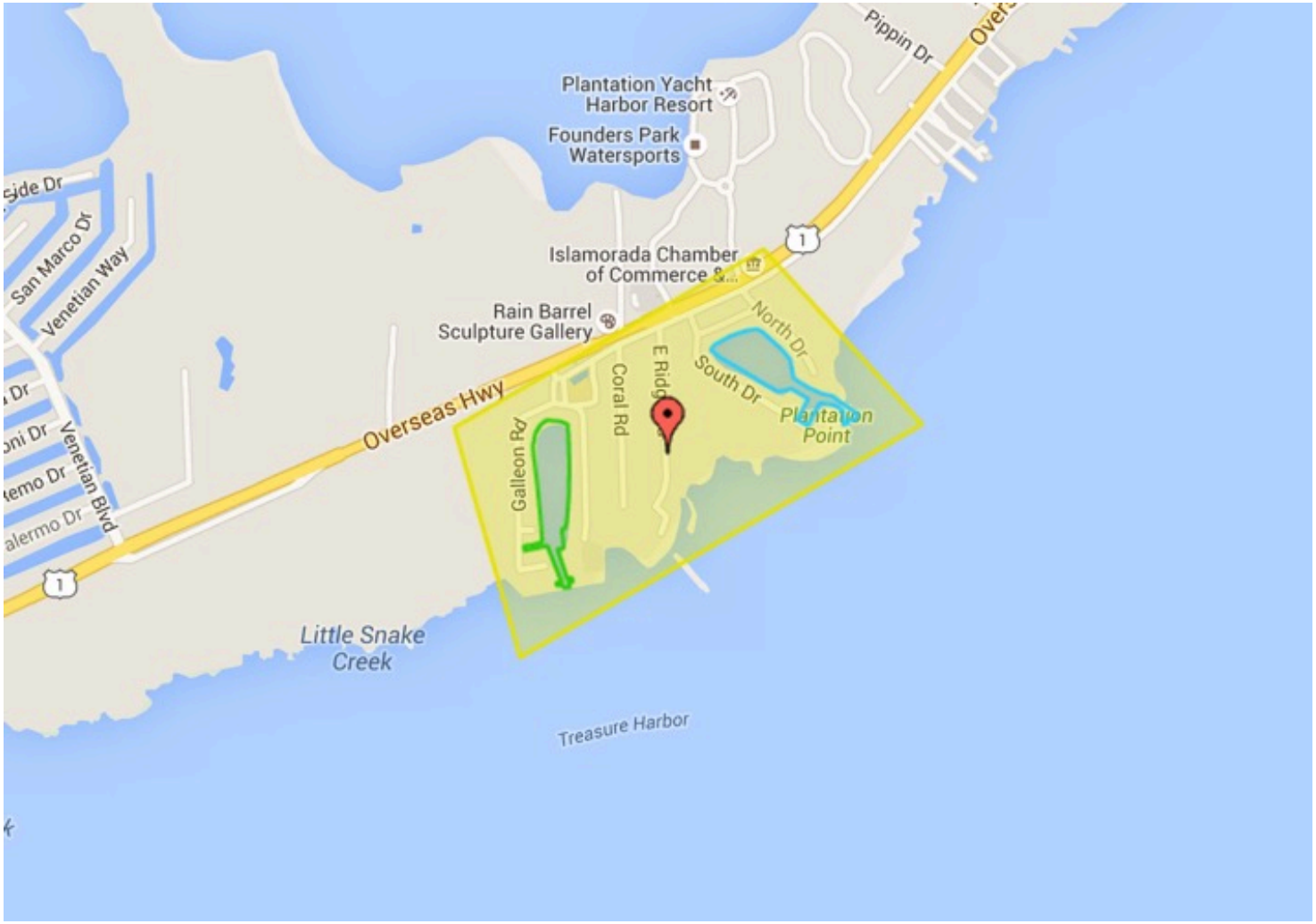
Canals 28 and 29



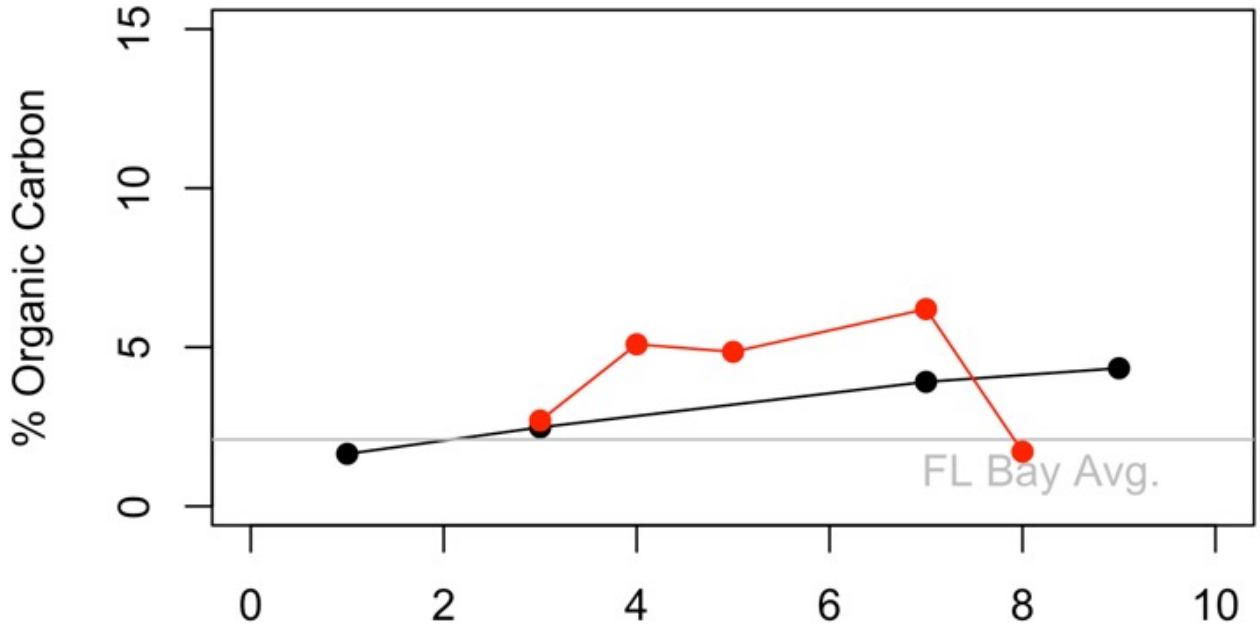
Canal 28
Canal 29



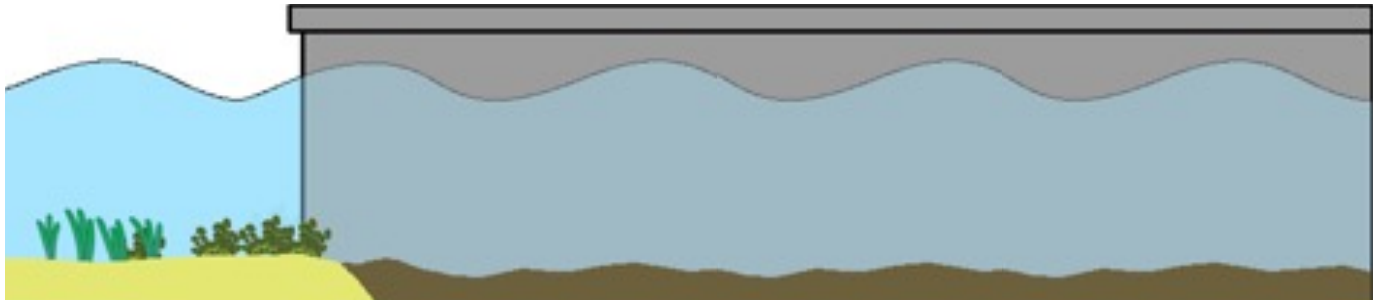
Canal 132 and 137



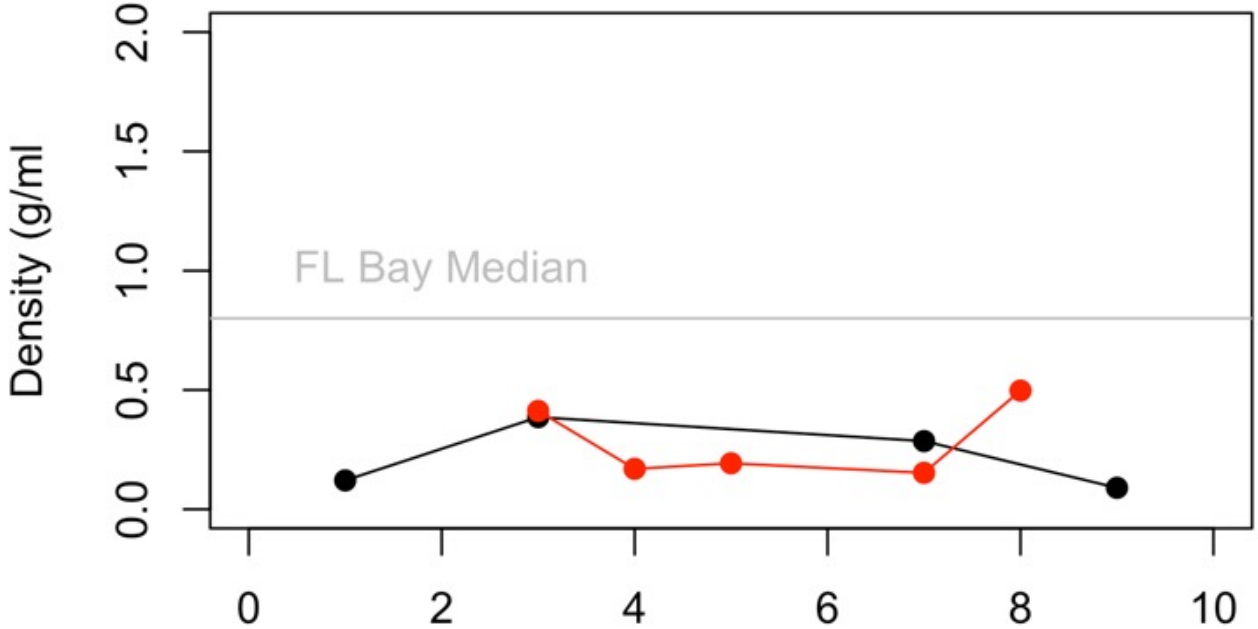
Canal 132 and 137



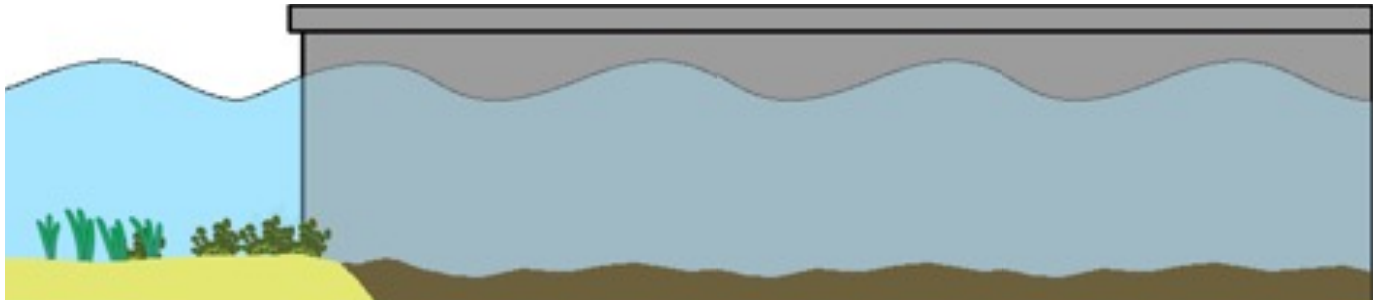
Canal 132
Canal 137



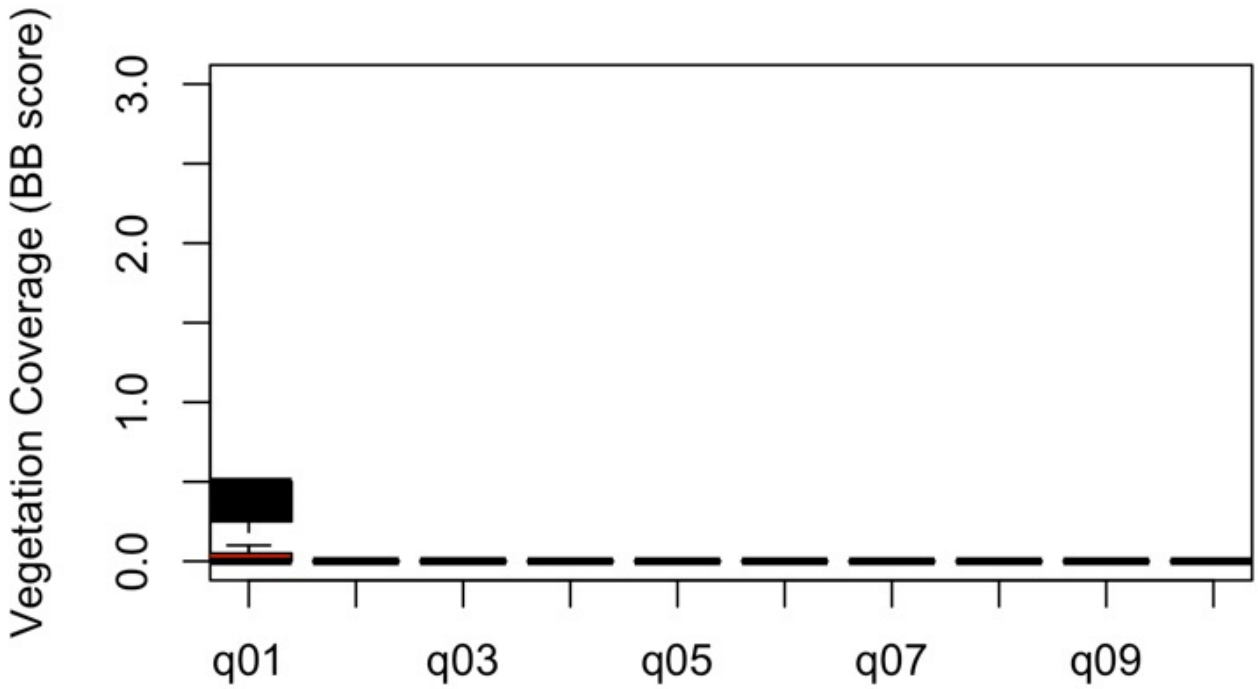
Canal 132 and 137



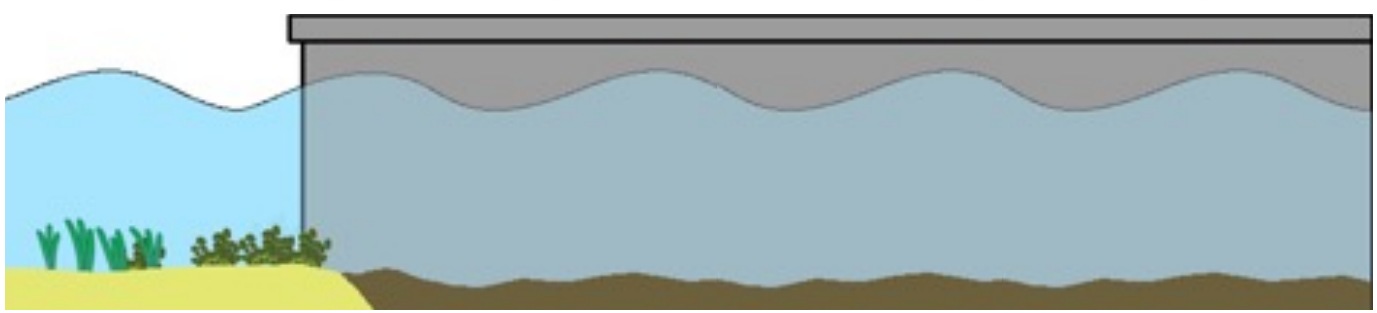
Canal 132
Canal 137



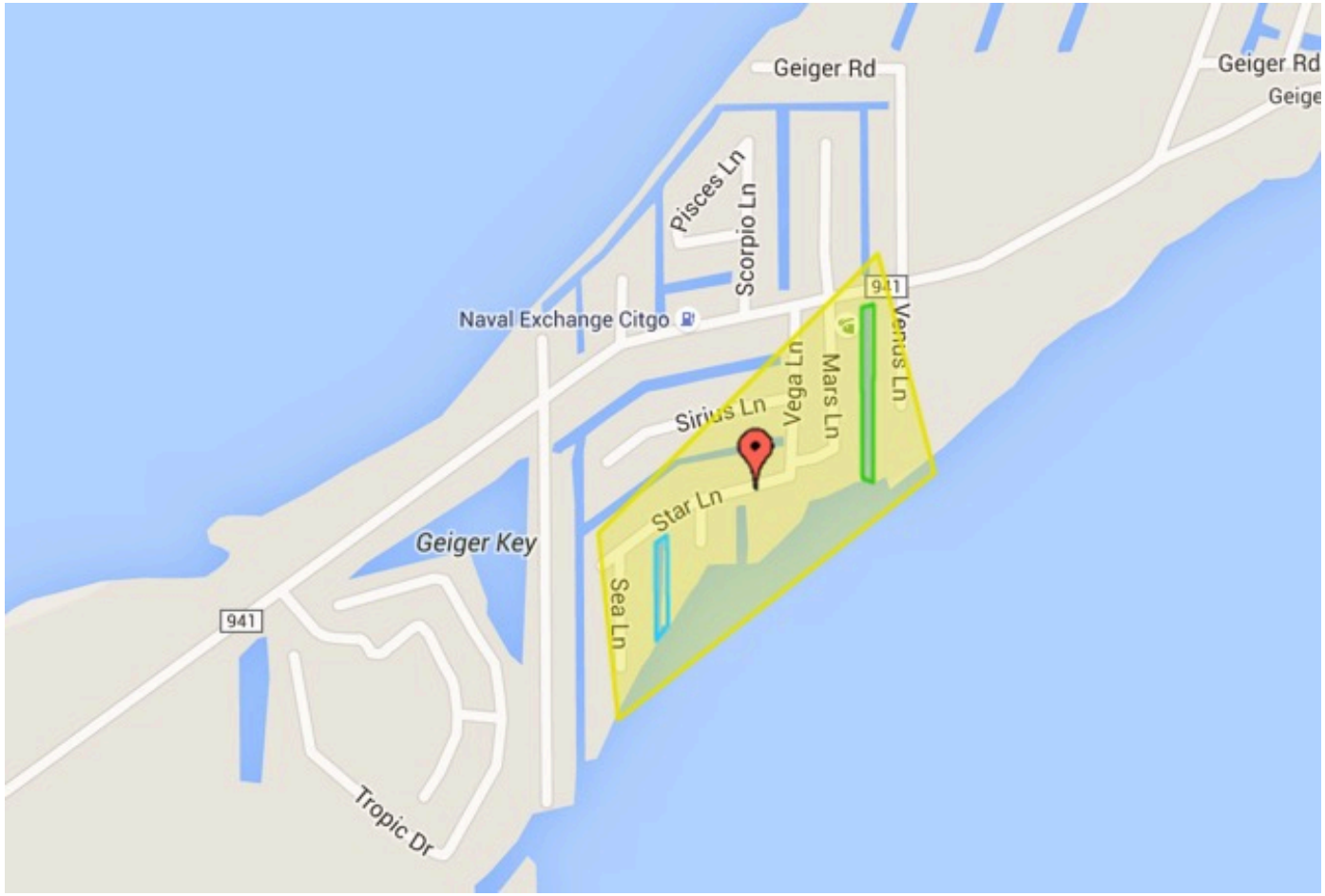
Canal 132 and 137



Canal 132
Canal 137

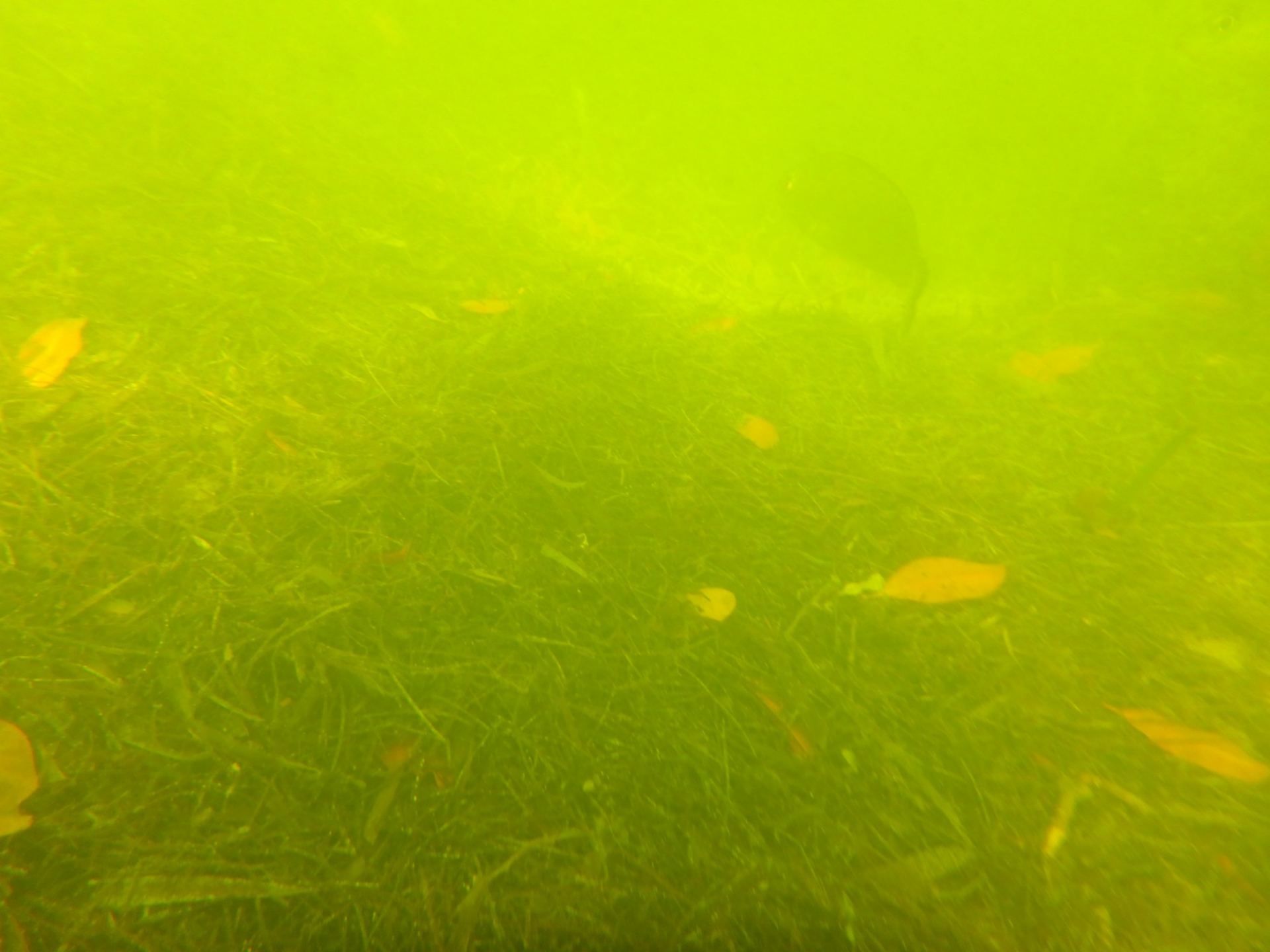


Canal 472

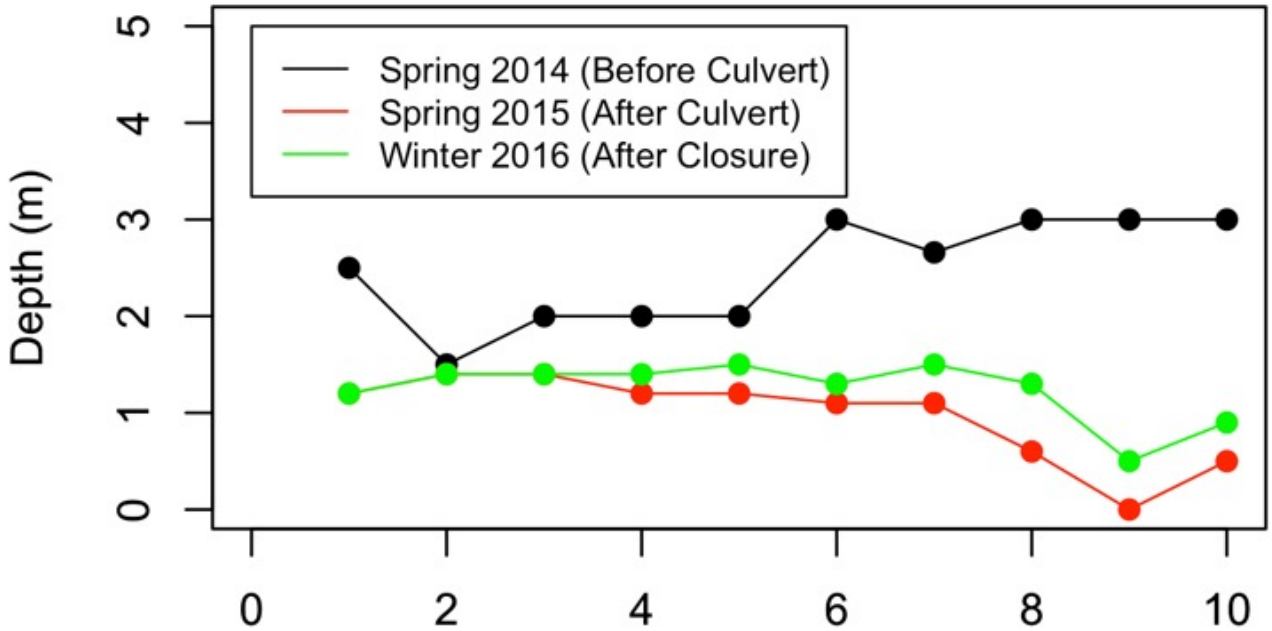

Geiger Rd
Geiger Rd
Geige
Pisces Ln
Scorpio Ln
941
Naval Exchange Citgo
Venus Ln
Mars Ln
Vega Ln
Sirius Ln
Star Ln
Geiger Key
Sea Ln
941
Tropic Dr

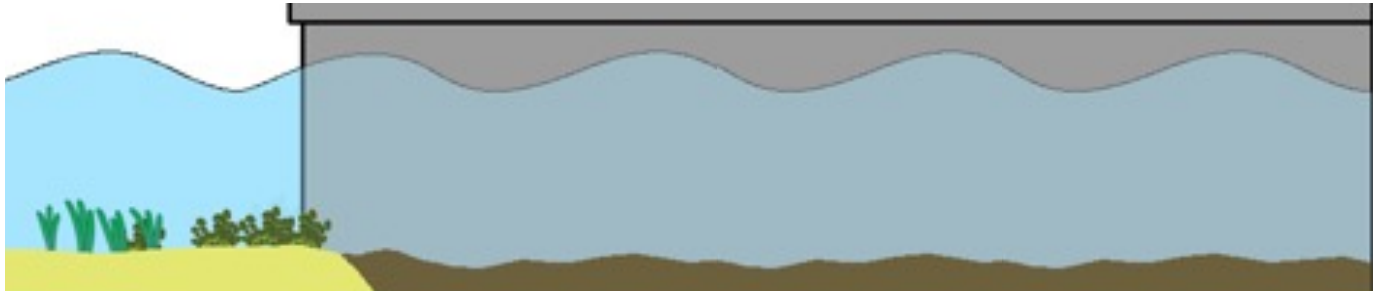
SALTY TOO

B10

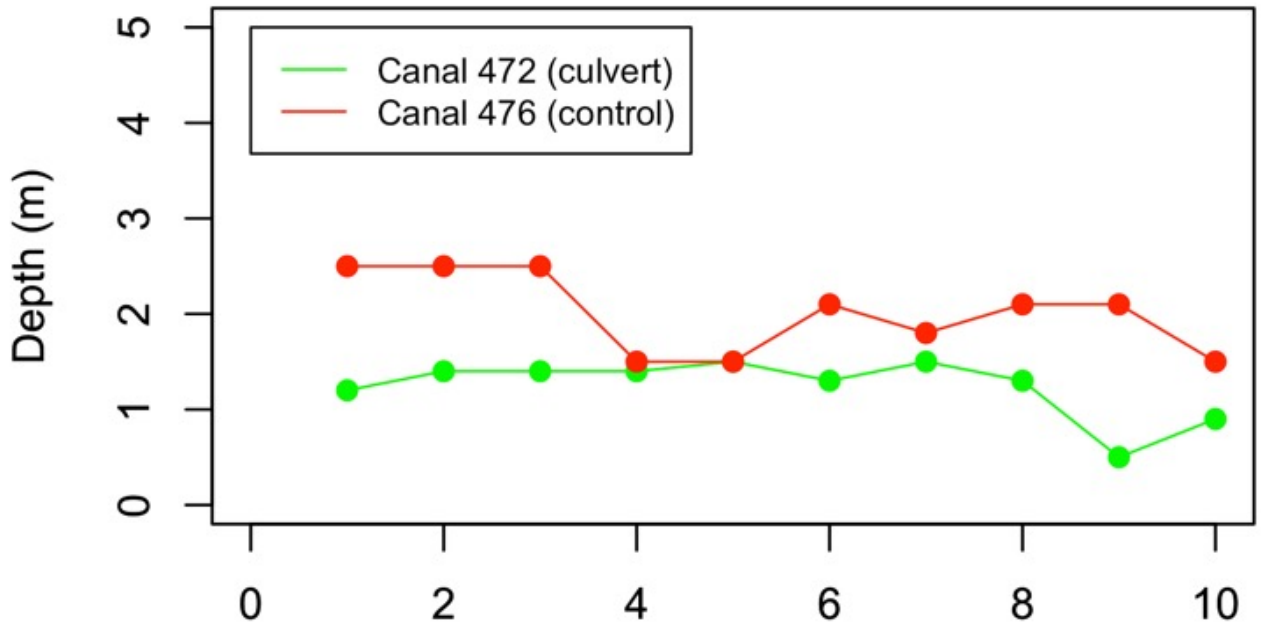


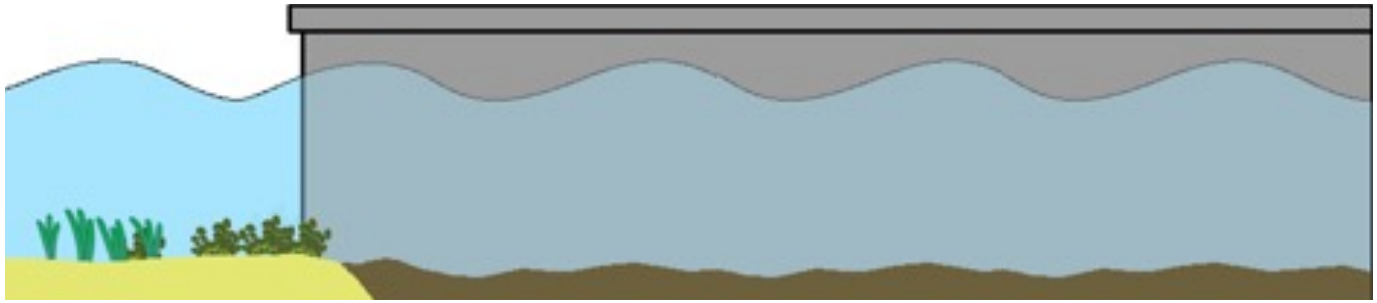
Canal 472


Spring 2014 (Before Culvert)
Spring 2015 (After Culvert)
Winter 2016 (After Closure)
Depth (m)
0
1
2
3
4
5
0
2
4
6
8
10

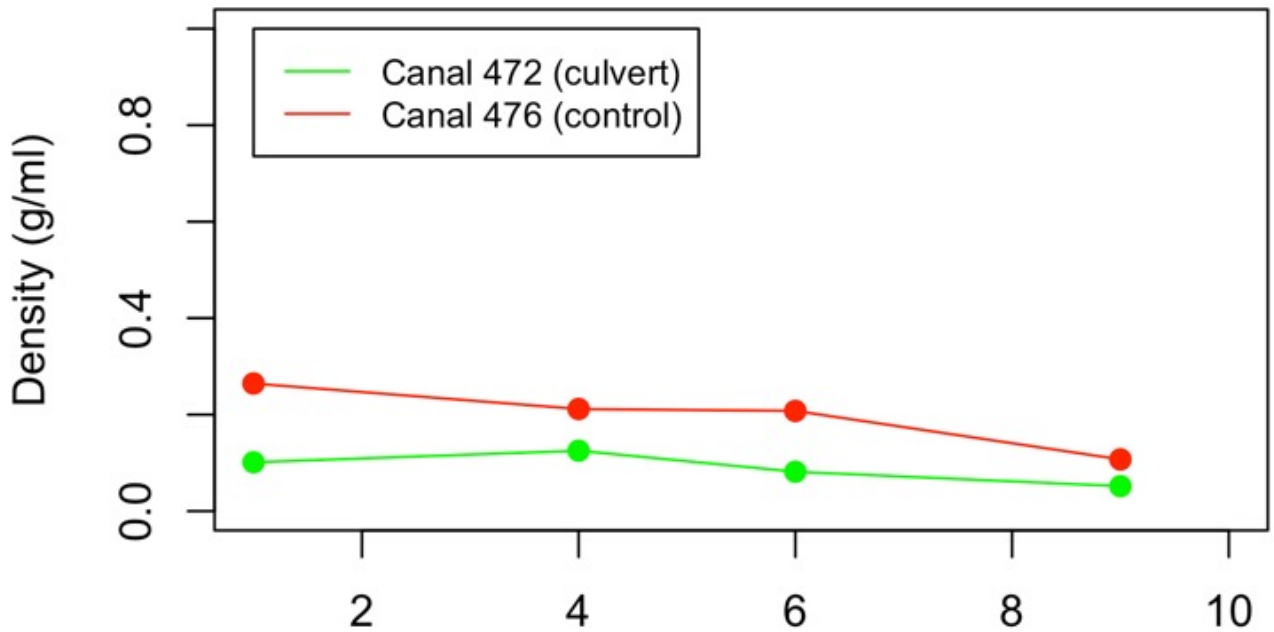


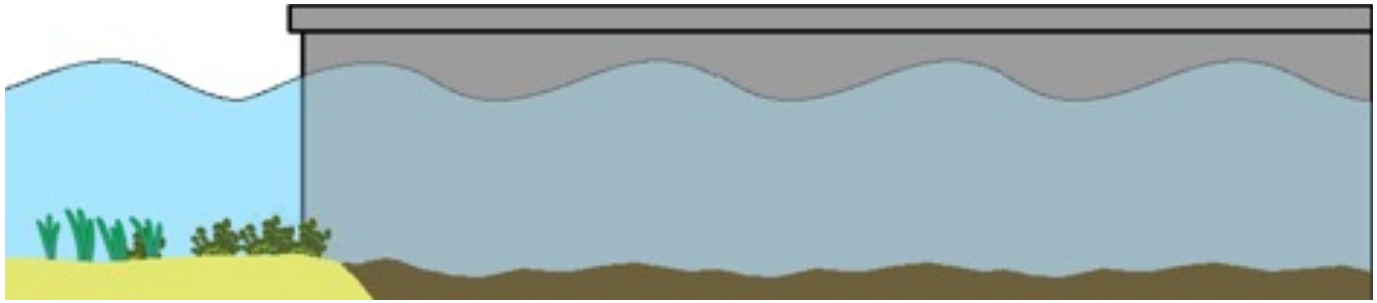
Canal 472



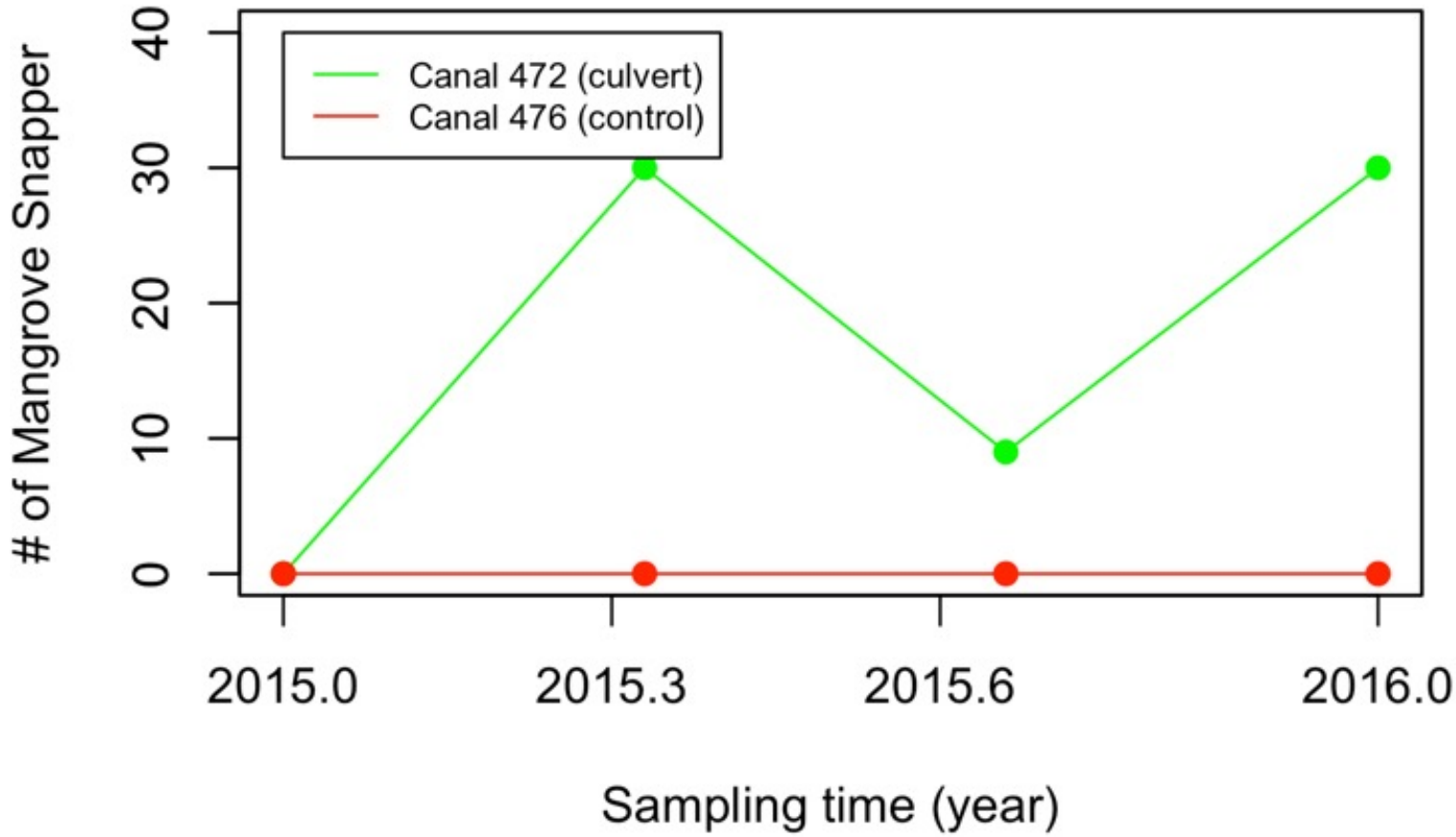


Canal 472

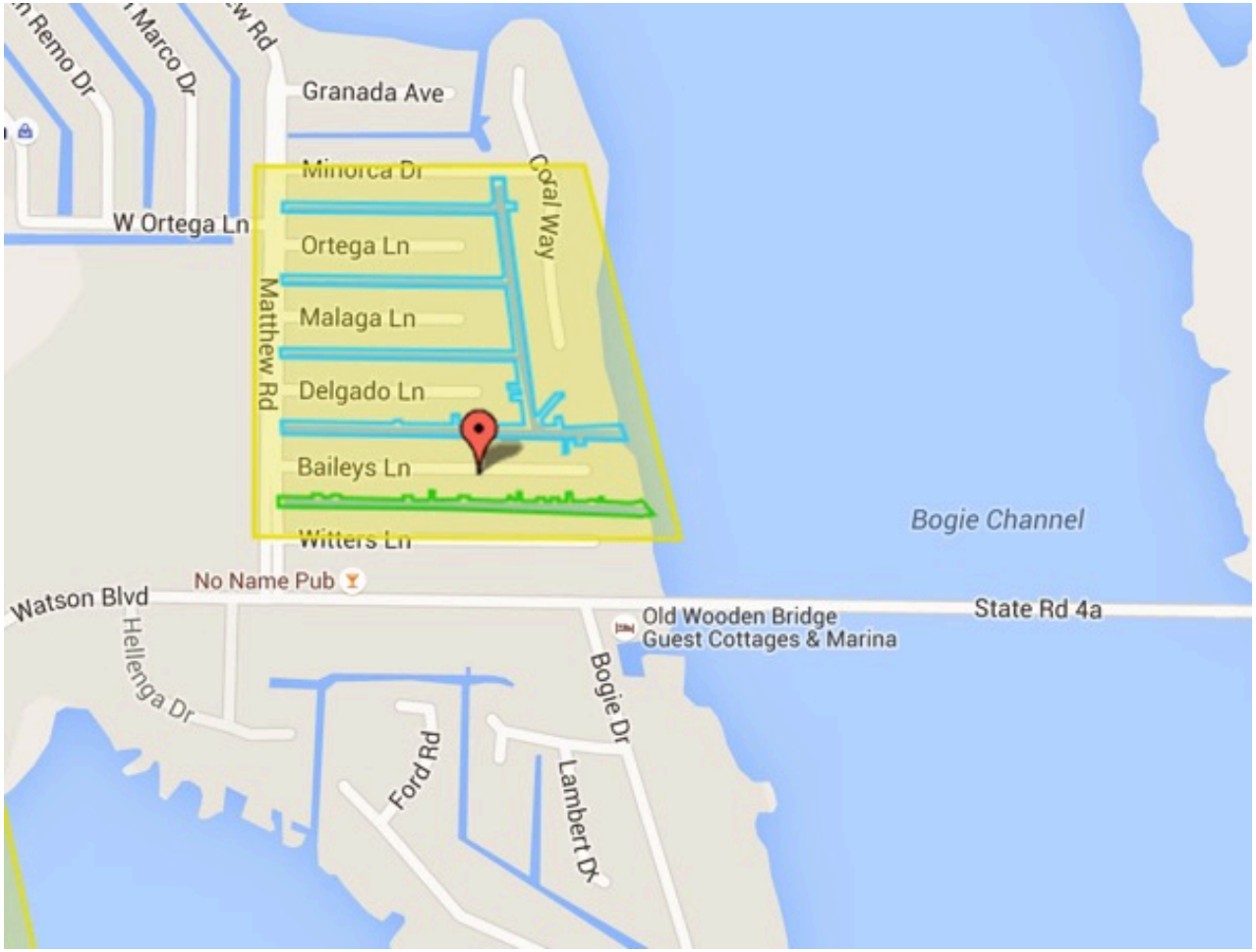

Canal 472 (culvert)
Canal 476 (control)
Density (g/ml)
0.0
0.4
0.8
2
4
6
8
10



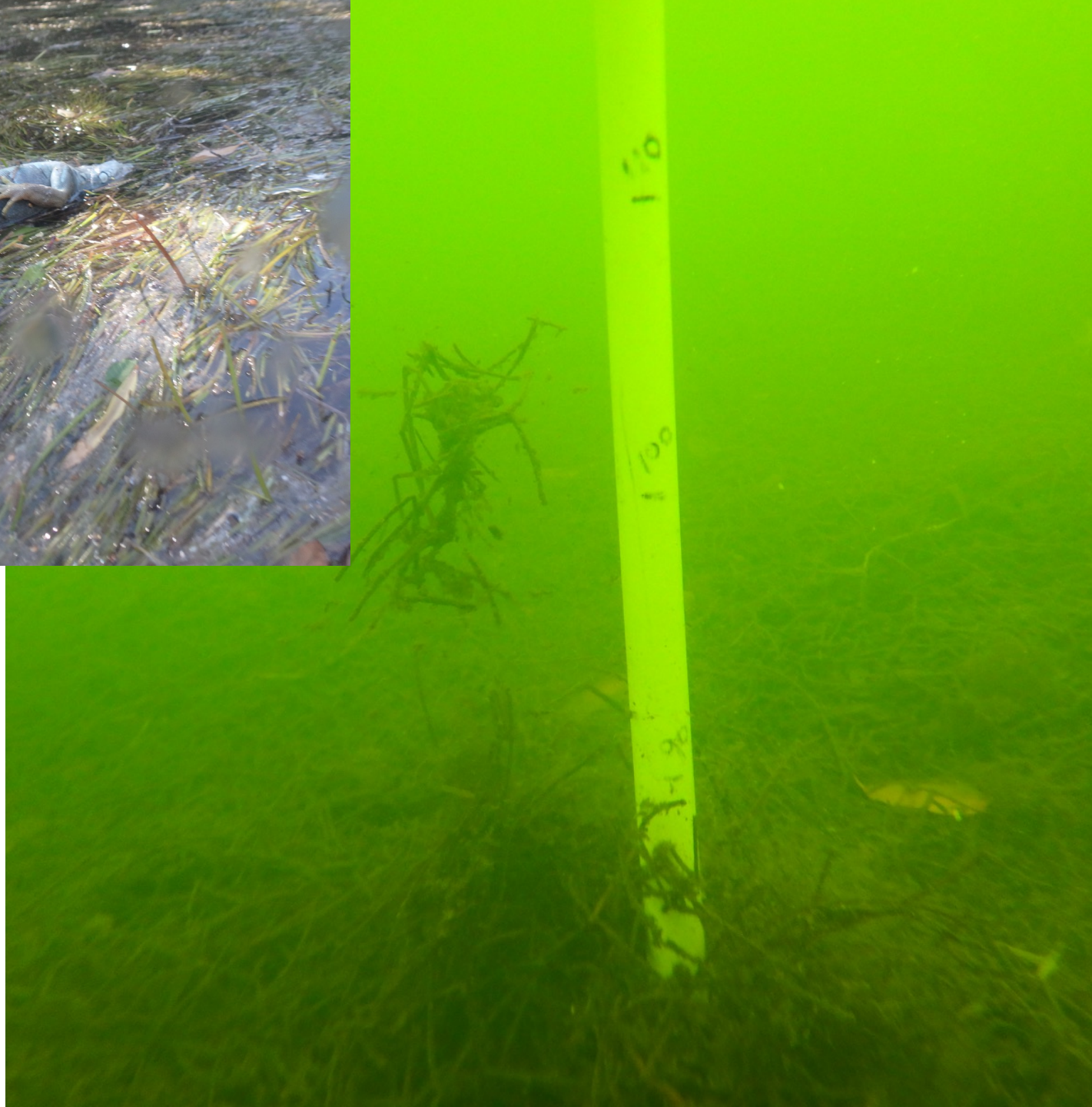
Canal 472


Canal 472 (culvert)
Canal 476 (control)
# of Mangrove Snapper
0
10
20
30
40
2015.0
2015.3
2015.6
2016.0
Sampling time (year)

Canal 266

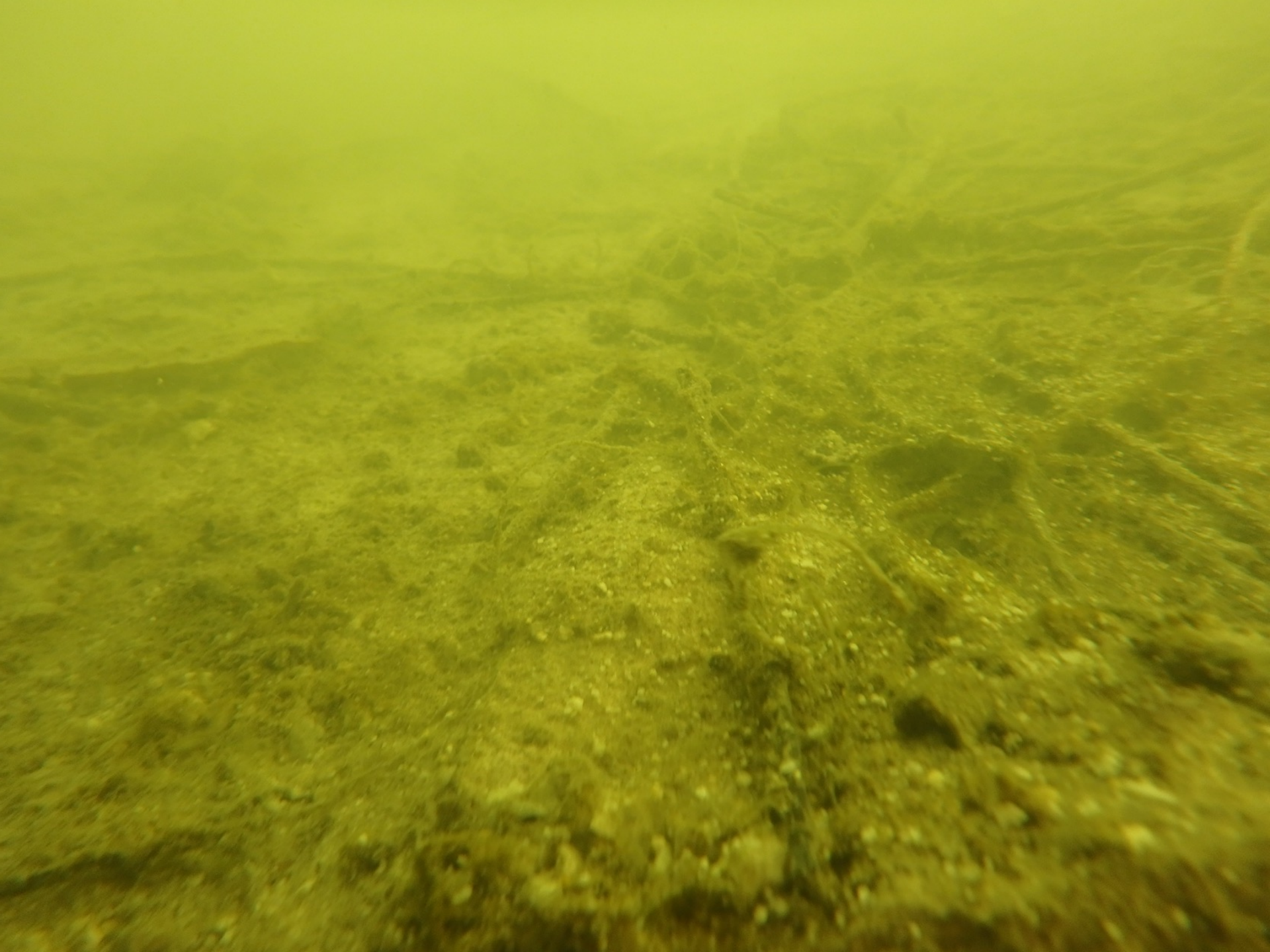

Granada Ave
Minorca Dr
W Ortega Ln
Ortega Ln
Malaga Ln
Delgado Ln
Baileys Ln
Witters Ln
Matthew Rd
Coral Way
Bogie Channel
No Name Pub
Watson Blvd
State Rd 4a
Old Wooden Bridge
Guest Cottages & Marina
Hellenga Dr
Bogie Dr
Ford Rd
Lambert Dr

Canal 266- Before Dredging

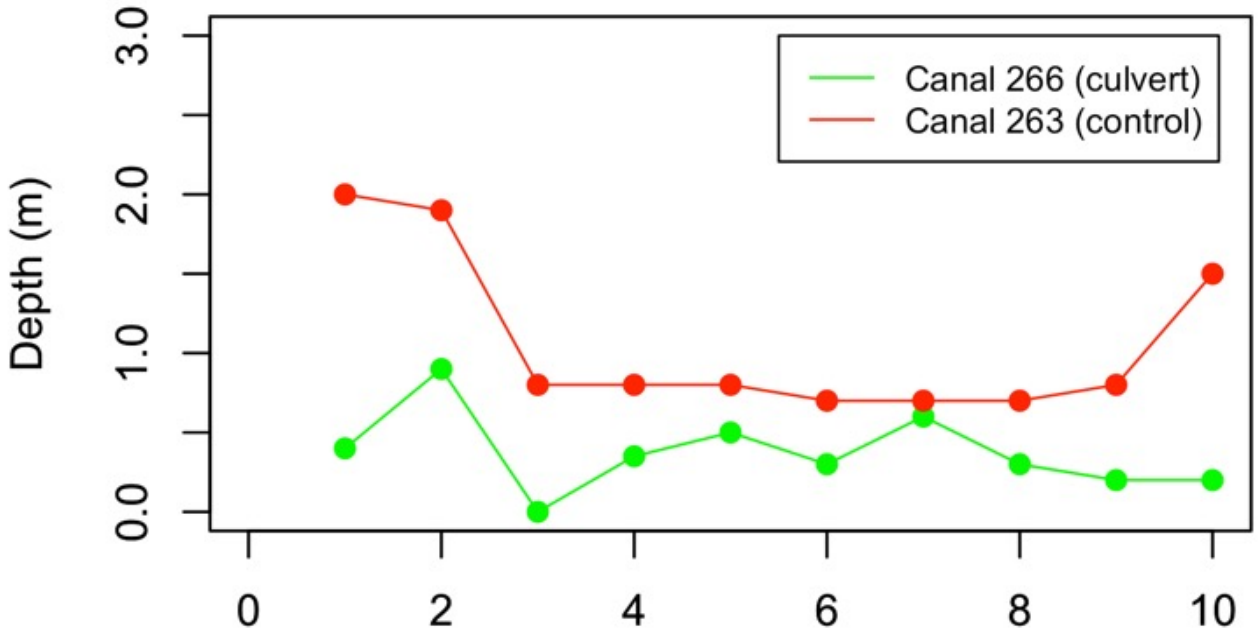


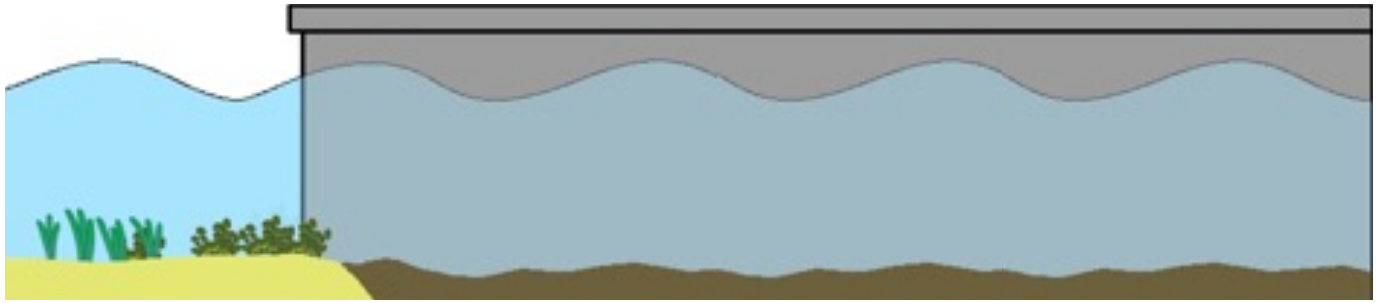
Canal 263-Control

Canal 266- After Dredging

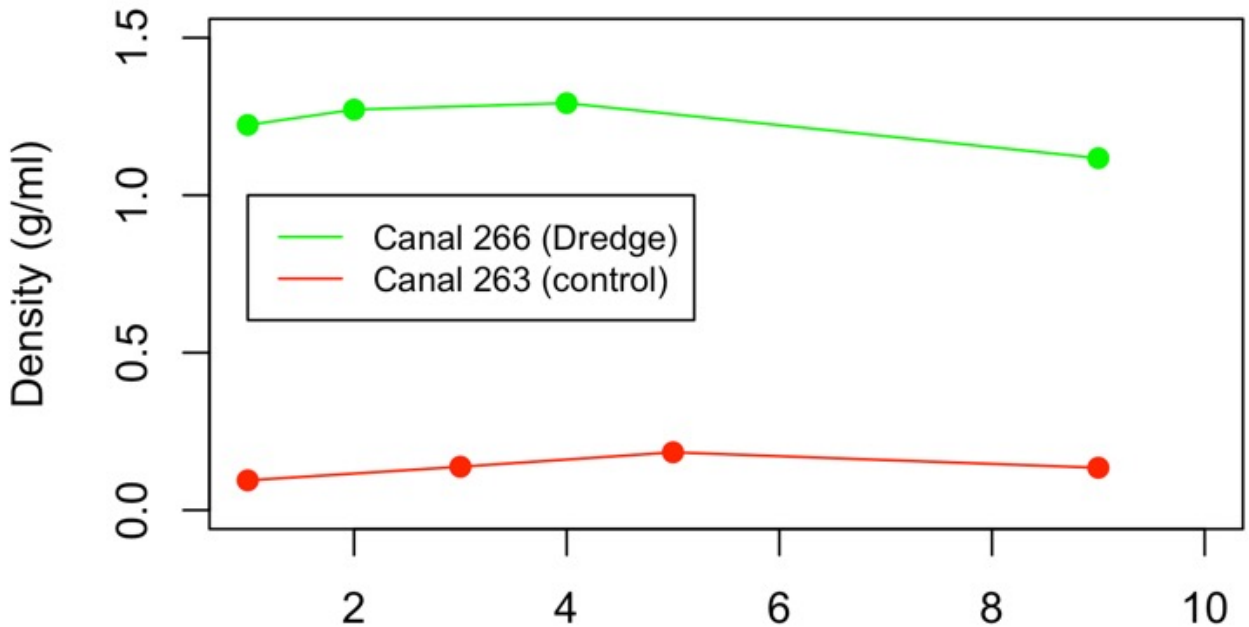


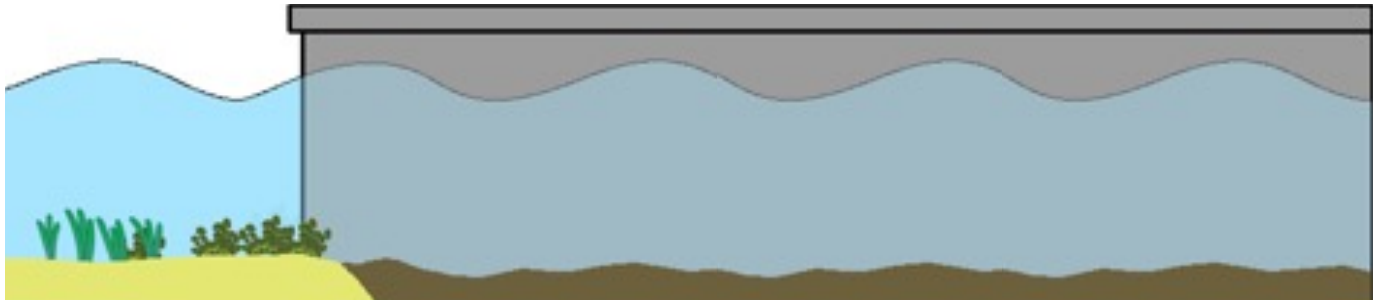
Canal 266


Canal 266 (culvert)
Canal 263 (control)
Depth (m)
0.0
1.0
2.0
3.0
0
2
4
6
8
10



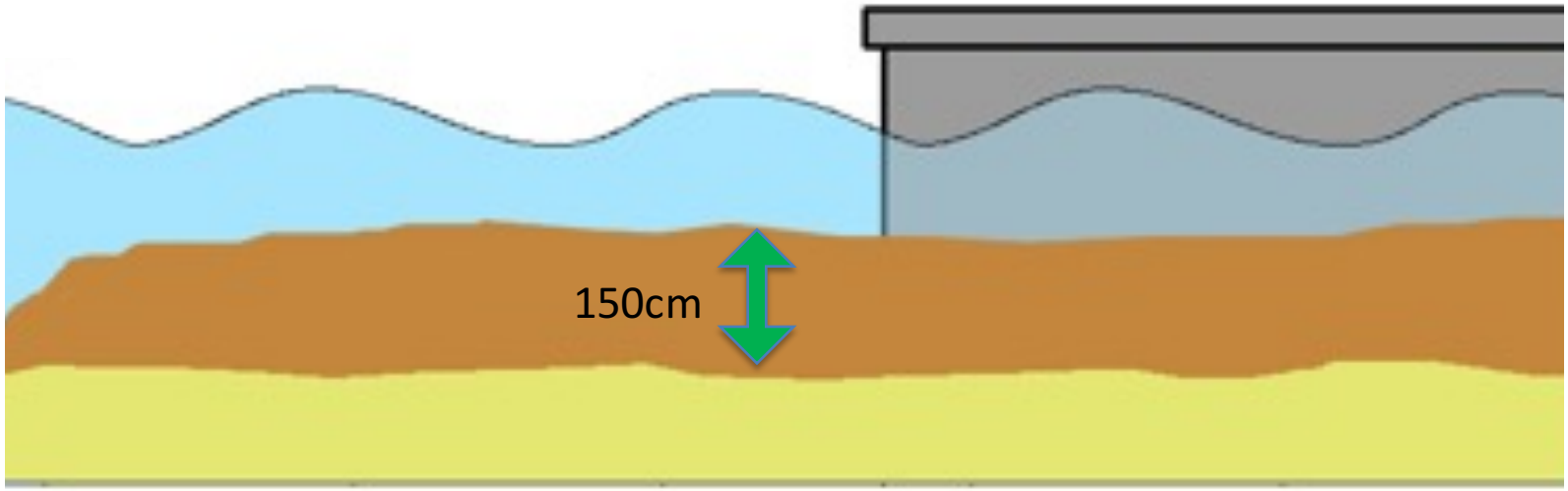
Canal 266


Density (g/ml)
0.0
0.5
1.0
1.5
2
4
6
8
10
Canal 266 (Dredge)
Canal 263 (control)

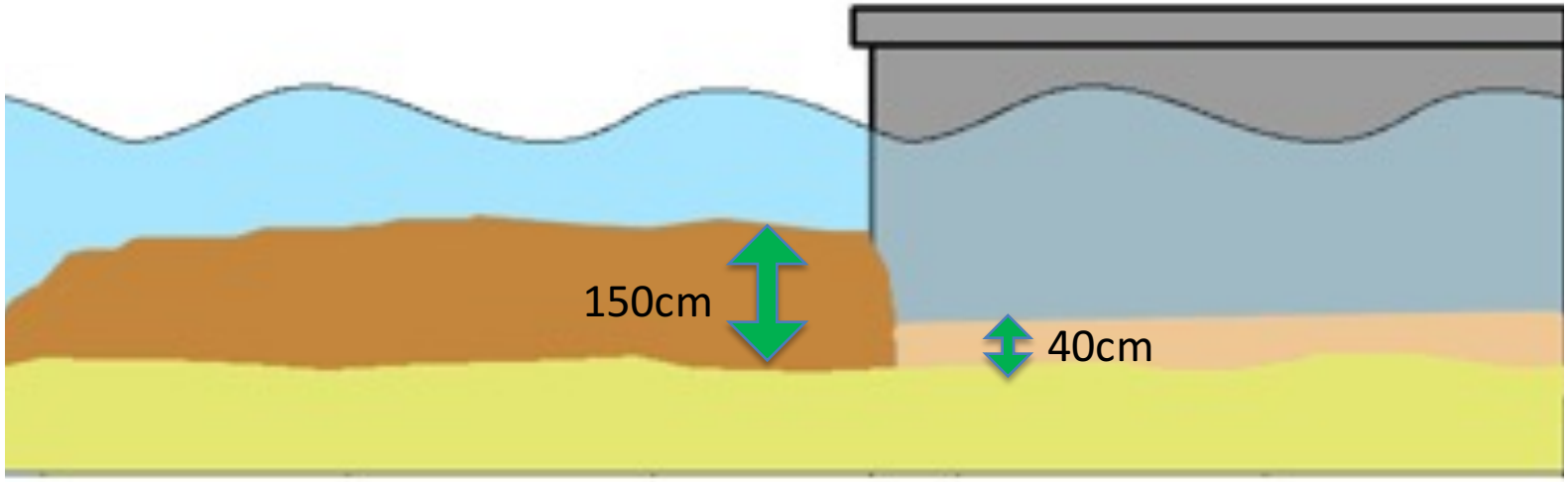


Canal 266

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

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