DMF Oyster Sanctuary Monitoring Protocol

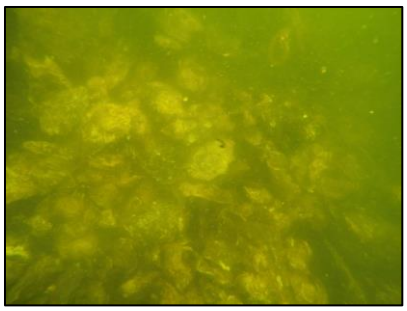
2018

Objectives:

- To Evaluate Material Performance as Oyster Habitat
- To Evaluate Material Long-term Durability and Stability
- To Evaluate Overall Material Performance for Reproductive Potential and Larval Recruitment

Challenges:

- Multi-substrate Sanctuaries
- Time/Staff
- Travel Logistics
- Water clarity/Visibility



Extraction vs. Non-Extraction

		Marl Rip Rap (class B)	Limestone Marl	Granite	Crushed Concrete	Reef Balls	Concrete Pipe	Concrete Box Units
OS-01	Croatan Sound							
OS-02	Deep Bay							
OS-03	West Bay							
OS-04	Clam Shoal							
OS-05	Crab Hole							
OS-06	Ocracoke							
OS-07	Middle Bay							
OS-08	Neuse River							
OS-09	West Bluff							
OS-10	Gibbs Shoal							
OS-11	Long Shoal							
OS-12	Raccoon Island							
OS-13	Pea Island							
OS-14	Little Creek							
OS-15	Swan Island							

Evaluation Metrics: Performance measurements of Oyster Sanctuaries can be assessed with the following questions

(1) Is the material stable and durable over time?

(2) Is the habitat meeting its intended function pertaining to reproductive potential?

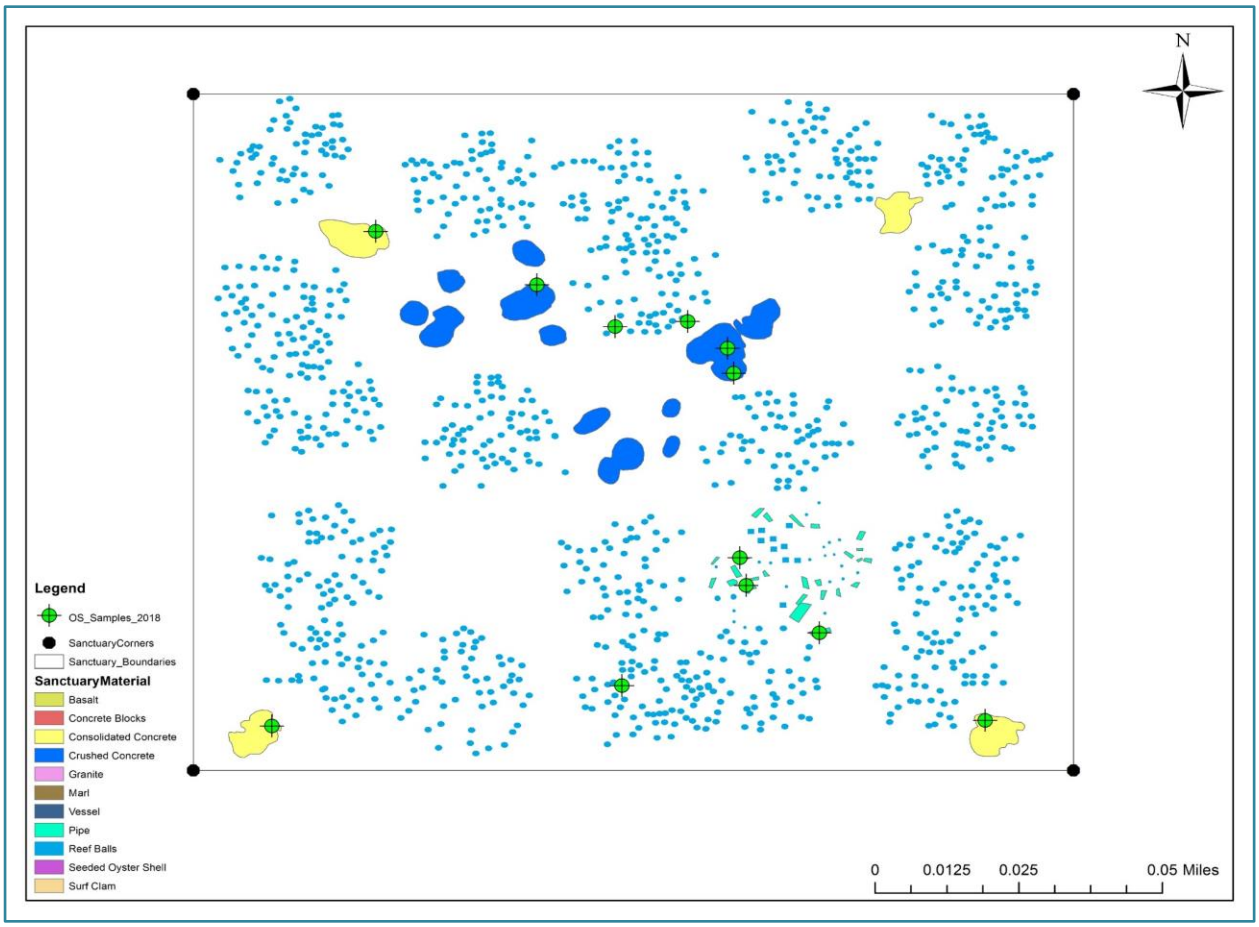
(3) Is there evidence of successful recruitment?

Sample Size

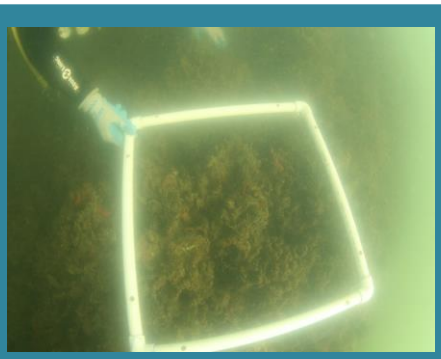
Acres	OS-01	OS-02	OS-03	OS-04	OS-05	OS-06	OS-07	OS-08	OS-09	OS-10	OS-11	OS-12	OS-13	OS-14	OS-15
#4 Marl	0.257	0.339	0	0	0	0	0	0	0	0	0	0	0	0	0
Basalt	0	0	0	0	0	0	0	0	0	0	0	0	0	0.265	0
Consolidated Concrete	0	0	0	0	0	0.036	0	0	0	0	0	0.222	1.463	1.534	0
Crushed Concrete	0	0	0	0	0	0.054	0	0	0	0	0	0.216	0.766	0.888	0
Granite	0	0	0	0	0	0	0	0	0	0	0	0	0	0.471	0
Marl	1.479	2.824	0.893	18.17	13.26	4.478	0.2723	2.766	2.693	5.671	0	0	0	0.298	6.3629
Other (tires/unknown)	0		0.006	1.032	0	0	0	0	0	0	0	0	0	0	0
Reef Balls	0.163	0.194	0.022	0	0	0.017	0	0	0.095	2.388	1.126	1.278	0.32	2.638	0
Shell/Seeded Shell	0.471	0.792	0.673	0	0	0	0	0.35	0	0	0	0	0	0	0
Vessel	0	0	0	0	0	0.193	0	0	0	0	0	0	0	0	0
	2.371	**4.149**	**1.595**	**19.203**	**13.260**	**4.778**	**0.272**	**3.116**	**2.787**	**8.059**	**1.126**	**1.716**	**2.549**	**6.094**	**6.363**

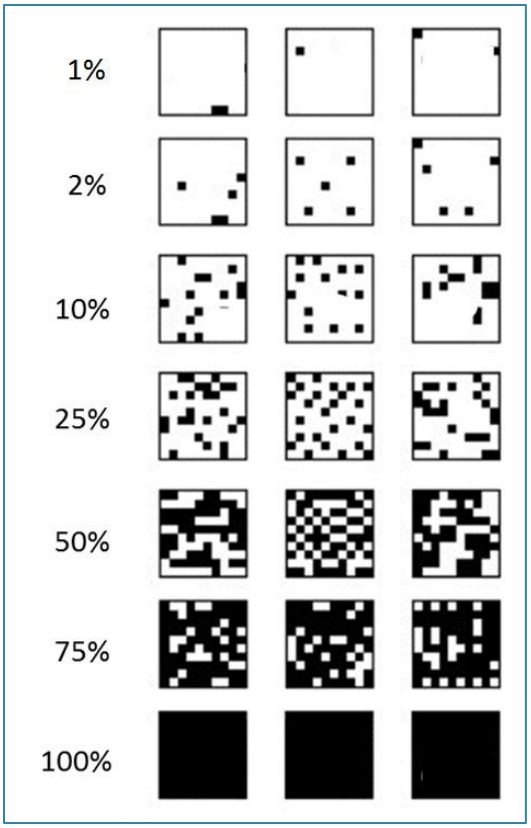
	OS-01	OS-02	OS-03	OS-04	OS-05	OS-06	OS-07	OS-08	OS-09	OS-10	OS-11	OS-12	OS-13	OS-14	OS-15
#4 Marl	3	3	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
Basalt	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	3	NULL
Consolidated Concrete	NULL	NULL	NULL	NULL	NULL	3	NULL	NULL	NULL	NULL	NULL	3	4	4	NULL
Crushed Concrete	NULL	NULL	NULL	NULL	NULL	3	NULL	NULL	NULL	NULL	NULL	3	3	3	NULL
Granite	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	3	NULL
Marl	4	5	3	8	8	7	3	5	5	8	NULL	NULL	NULL	3	8
Other (tires/unknown)	NULL	NULL	3	4	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
Reef Balls	3	3	3	NULL	NULL	3	NULL	NULL	3	5	4	4	3	5	NULL
Shell/Seeded Shell	3	3	3	NULL	NULL	NULL	NULL	3	NULL	NULL	NULL	NULL	NULL	NULL	NULL
Vessel	NULL	NULL	NULL	NULL	NULL	3	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
Total Samples	**13**	**14**	**12**	**12**	**8**	**19**	**3**	**8**	**8**	**13**	**4**	**10**	**10**	**21**	**8**
Excavated Samples	**10**	**11**	**6**	**8**	**8**	**10**	**3**	**8**	**5**	**8**	**0**	**3**	**3**	**12**	**8**

Randomization



Sampling Methods





Percent Cover

1 m² quadrat frame
Divided into 100 (10x10cm) squares
0 = 0%
1 = 1%-24%
2 = 25%-49%
3 = 50%-74%
4= 75%-100%

Size Classes

- Recruit (≤25 mm valve length)
- Sublegal (25 mm<valve length<75 mm)
- Brood-stock (≥75 mm valve length)

Ancillary Information






Fish Species

- Weakfish
- Spotted Seatrout
- Atlantic Croaker
- Striped Bass
- Red Drum
- Flounder spp.
- Sheepshead
- Black Drum

Sedimentation Rating

0=None

1=Light

2=Medium

3=Heavy

Categorical Boring Sponge Rating

A=sponge not present

B=evidence of sponge (boring)

C=sponge present in beta (encrusting)

D=prolific sponge cover (massive)

Date		**Site**		
Material			Crew:	
Lat.				
Lon.				
Weather				
Air Temp				
Wind				
	Surface	Bottom	Depth	
Salinity			Secchi	
DO			Bottom Habitat	
H_2OTemp			Sample Depth	
Quadrat Sample:	**1 m^2**	**1/4 m^2**	**1/16m^2**	**Excavated**	**Non-Excavated**