Peripheral Oyster Mapping in Santa Rosa Sound, FL

Dr. Geoffrey Smith

Mattie M. Kelly Environmental Institute
At
Northwest Florida State College

Oysters

- Oysters, primarily the Eastern Oyster *Crassostrea virginica,* are important components of many estuarine systems along the Atlantic and Gulf coasts and provide ecosystem services including:
  - Providing food and shelter for numerous species of fish, marine invertebrates, birds, etc.
  - Filtering water and trapping sediments
  - Reducing wave action and preventing erosion

Photo Credit: PPBEP

Oysters

- Oysters are also a targeted fisheries species (commercially and to a lesser extent recreationally)
- Overharvest, pollution, and shifts in water parameters such as salinity and dissolved oxygen have led to localized declines
- This has led to increased efforts to map and monitor wild oyster populations, restore oyster habitat, and mariculture oysters for both harvest and restoration

Photo Credit: Pensacola Oyster Cluster

What is a peripheral oyster?

- Oysters not in a typical oyster reef setting
- Found growing on various structures (both natural and man-made)
  - Mangrove prop roots (southern Florida)
  - Other shoreline vegetation or woody debris
  - Dock and bridge pilings
  - Seawalls
  - Rip rap shorelines

Peripheral Oysters

- Populations not commonly mapped or monitored
- Can be locally abundant, especially in areas with many man-made structures
- May make-up a large portion of the total oyster population, especially in areas where natural reefs have been impacted
- Can provide ecosystem services similar to oyster reefs
  - Providing food and shelter for numerous species of fish, marine invertebrates, etc.
  - Filtering water and trapping sediments
  - Serving as a larval source for restoration efforts

Mapping

- Satellite Imagery
  - Identify docks, bridges, and boat ramps
  - Classify 0.25 km shoreline sections as marsh, seawall, rip rap, or bare
  - Randomly select 20% of each habitat type to sample (dock, bridge (all), boat ramp (all), marsh, seawall, and rip rap)

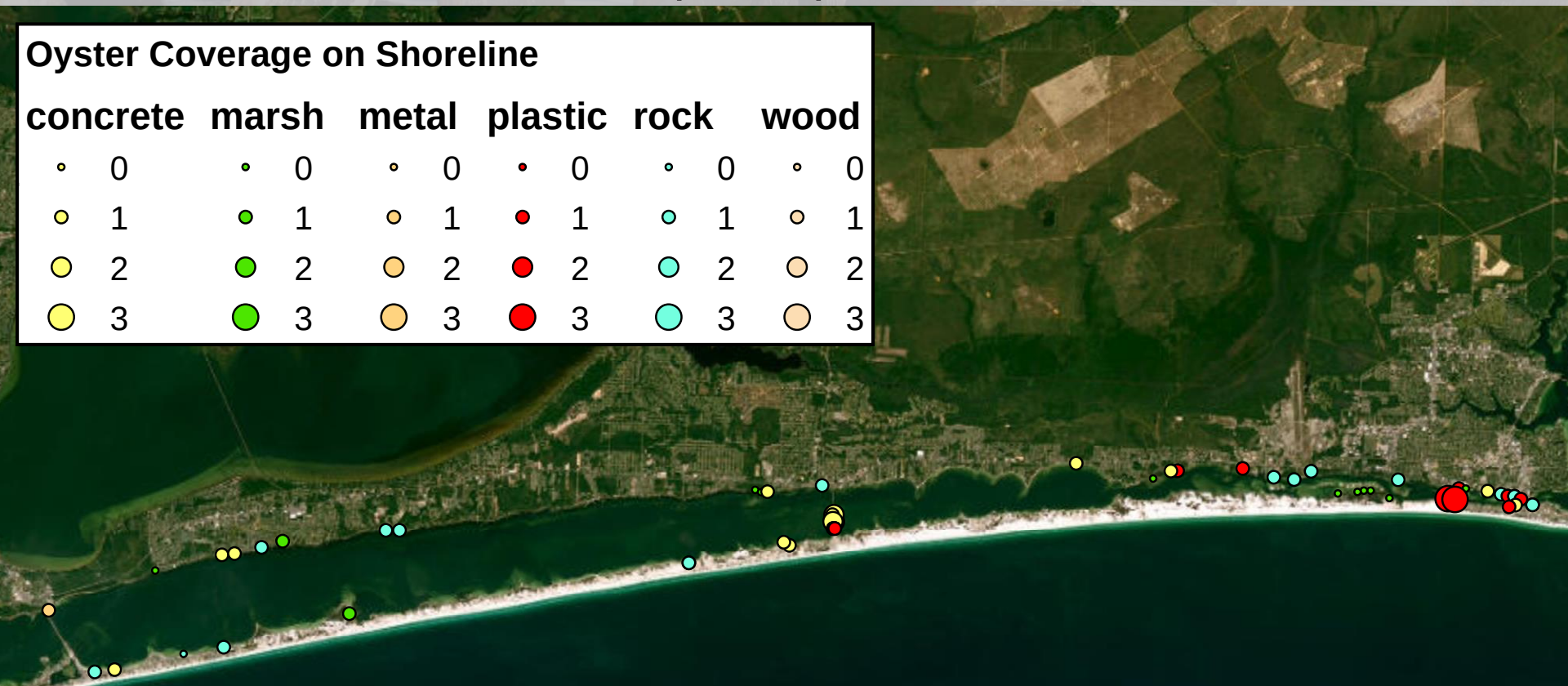
Mapping

- Sample each randomly selected site
  - Assign visual coverage (how many) and condition code (alive or dead)
  - Record GoPro video of 3 points along shore or 3 pilings from surface to bottom
  - A stationary grid was attached to the camera apparatus allowing for abundance and size estimates to be calculated

Coverage/Layers	Code
None	0
Light: <6”; 1-2 layers	1
Medium: >6”≤12”; >1 layer	2
Heavy: >12”≤18”; >1 layer	3
Very Heavy: >18”; >1 layer	4
Condition	**Code**
Mostly Dead	0
Even Distribution Live/Dead	1
Mostly Live	2

Preliminary Findings

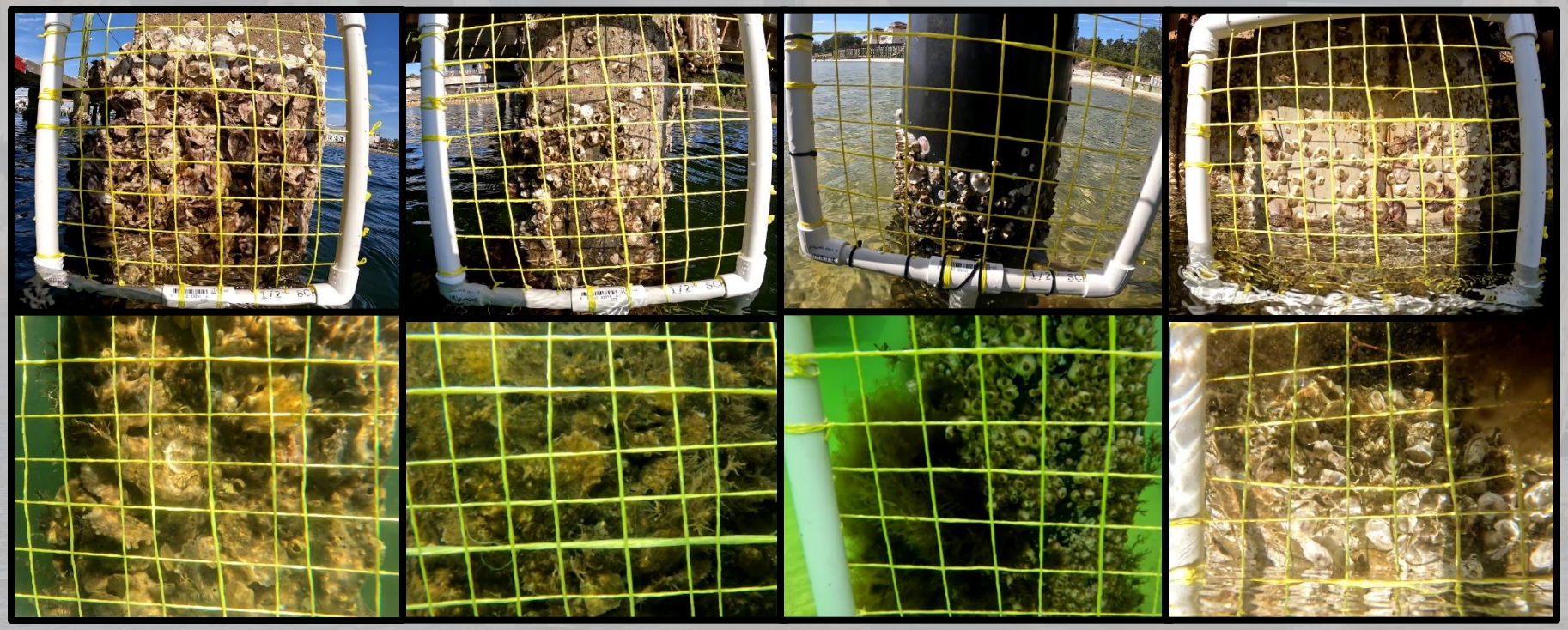
- Very few oysters found among marsh shoreline
- Seawalls (both plastic and concrete) generally had more oysters than rip rap shorelines
- Shoreline coverage was often less than on structures and often had a low condition code (0 or 1)



Preliminary Findings

- Plastic pilings often had low coverage
- Concrete pilings generally had the highest coverage regardless of location
- Wood piling coverage varied by location but was generally higher than plastic and lower than concrete

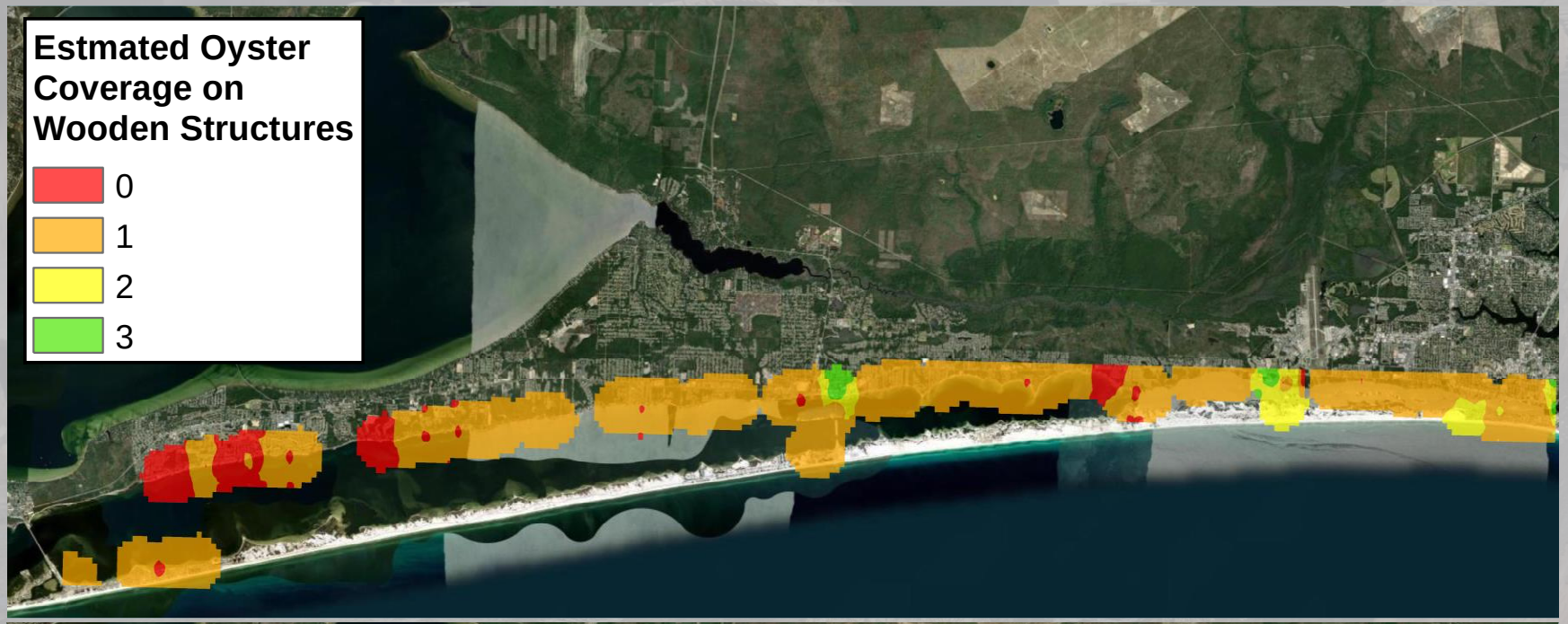
Preliminary Findings



Preliminary Findings

- The northwestern portion of Santa Rosa Sound generally had the lowest coverage while the eastern portion of the sound had greater coverage
  - Possibly related to wave action?
  - Age of structures?
  - Urban canals were not assessed but many oysters in the canals in the northwestern portion of the sound were observed

Preliminary Findings



Next Steps

- Reassess visual classification with modified abundance code to account for numerous sites with very few oysters (not a 0 but should it be a 1?)
- Analyze videos to calculate abundances and possibly size distributions
- Sample a sub-set of urban canals in Santa Rosa sound?
- Recently finalized sampling in Bayou Grande in the Pensacola Bay system: create maps and perform similar analyses
    - Observations from sampling: similar trends regarding structure type and oyster density, there appears to be a limit to oyster distribution in the upper portion of the bayou (due to salinity in wet years?)

Acknowledgments

- Funding: Pensacola and Perdido Bays Estuary Program

PENSACOLA & PERDIDO BAYS ESTUARY PROGRAM

- Sampling:Isaac Todd (NWFSC-MKEI), Dr. Amanda Croteau (UWF), NWFSC students
- Photo Credits: background and question slide photos (Logan McDonald-PPBEP); question slide photos (Dr. Amanda Croteau-UWF)

Questions