Effect of Shoreline Restoration on Invertebrates

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Background

- Living shoreline benefits:
  - Purify water
  - Buffer flooding & protect against storms
  - Decrease erosion
  - Store carbon
  - Provide wildlife habitat
  - Attractive recreation areas for people

Fig 1. Riprap (Construction Mentor)

Fig 2. Living Shoreline (Maryland DNR)

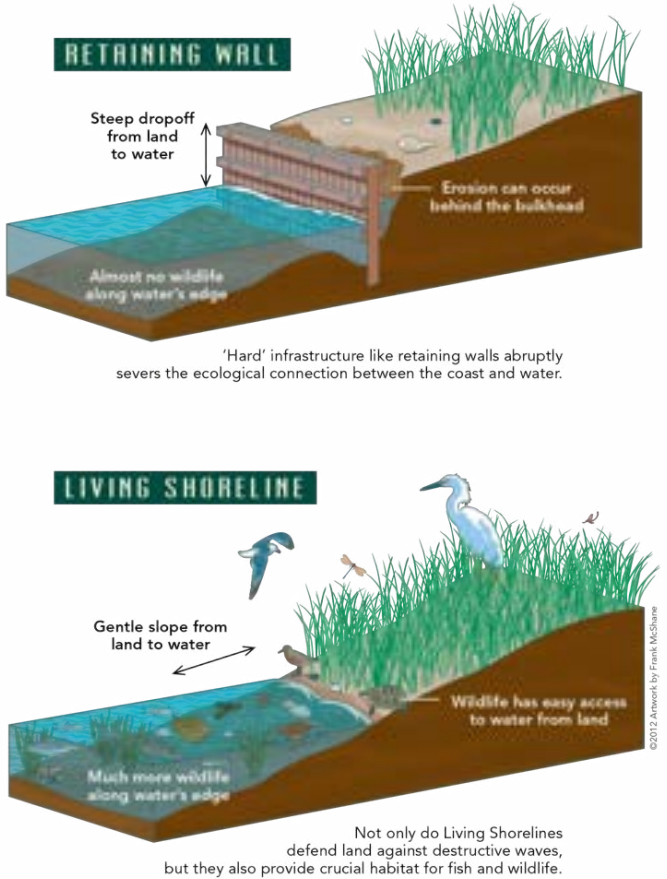


Fig 3. Retaining Wall vs. Living Shoreline (McShane)

Fig 4. Eastern Oyster (NOAA)

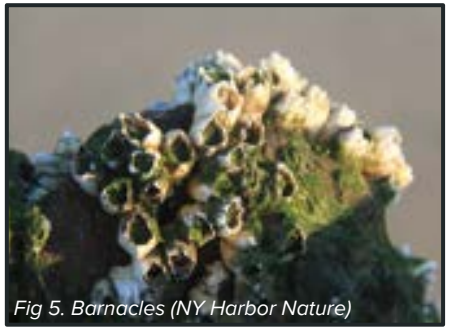


Fig 5. Barnacles (NY Harbor Nature)

Fig 6. Amphipod (AJ Cann)

Fig 7. Softshell Clam (David Cowles)

Fig 8. Sandworm (David Fenwick)

Fig 9. Blue Crab (NWF)

Fig. 10 Malcoma Balthica (Plantsam)

Fig. 11 Skeleton Shrimp (Peter Bryant)

Fig 12. Cyathura polita (Robert Aguilar)

Fig 13. Fiddler Crab (Jay Gao)

Fig 14. Ribbed Mussel (Robert Aguilar)

Sherman Creek Park

Fig 15. Sherman Creek Restoration (NYRP)

Post-restoration

Fig 16 & 17. After Restoration (NYRP)

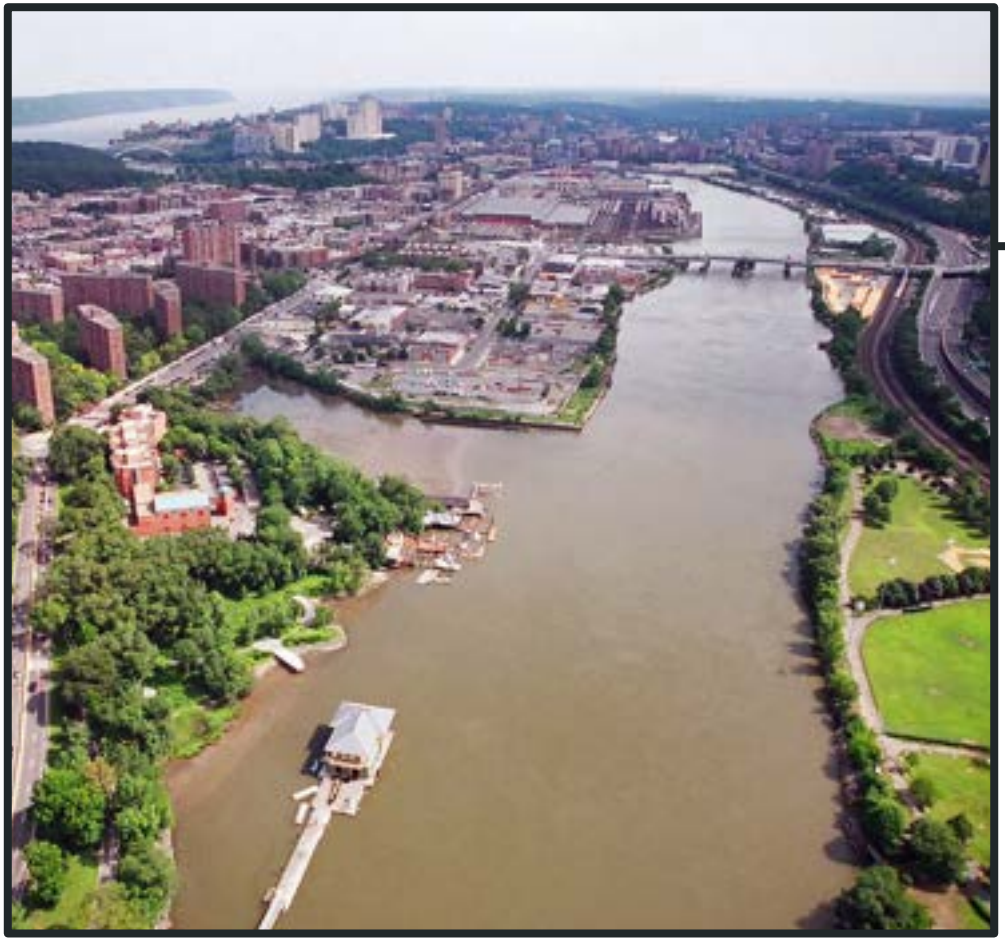


Fig 18. Harlem River (Cassim Shepard)

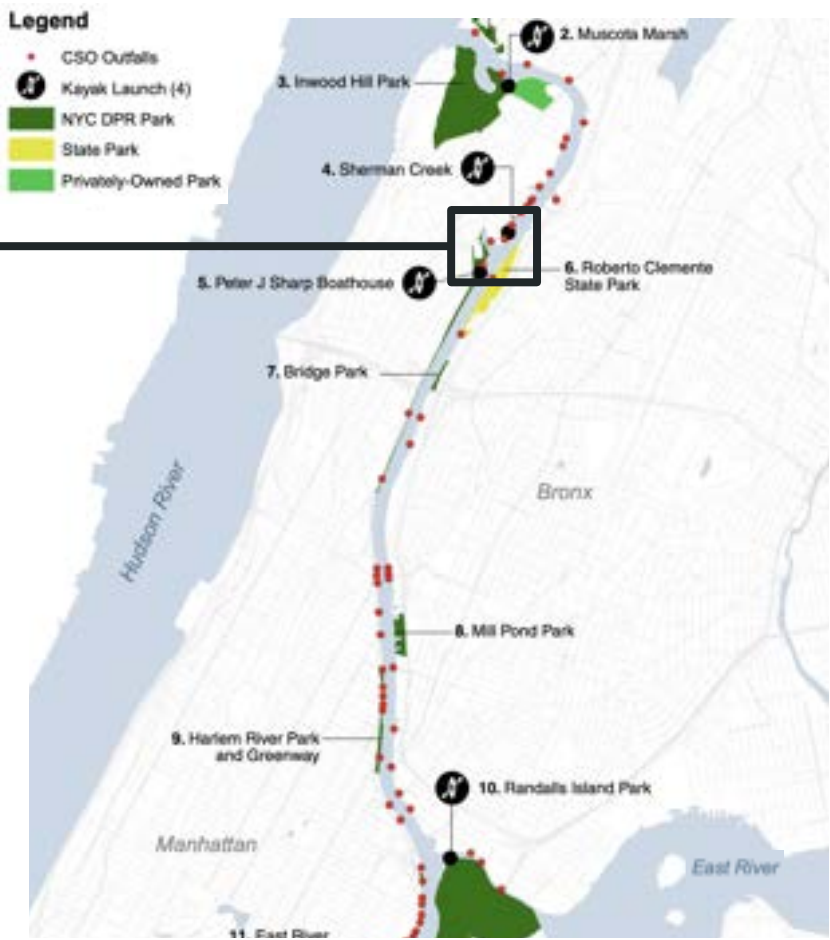


Fig 19. Harlem River CSO's (NYC Environmental Protection)

Research Question:

1. *How is invertebrate richness, diversity, and density in an urbanized area affected by shoreline restoration?*

2. *How long does “recovery” from a shoreline restoration project take?*

Methods

- Invertebrates sampled pre and post NYRP's shoreline restoration
- Three habitat types sampled
    1. Riprap Zone (2019 & 2020)
    2. Mudflat (2019 & 2020)
    3. New Restored Marsh (2020)

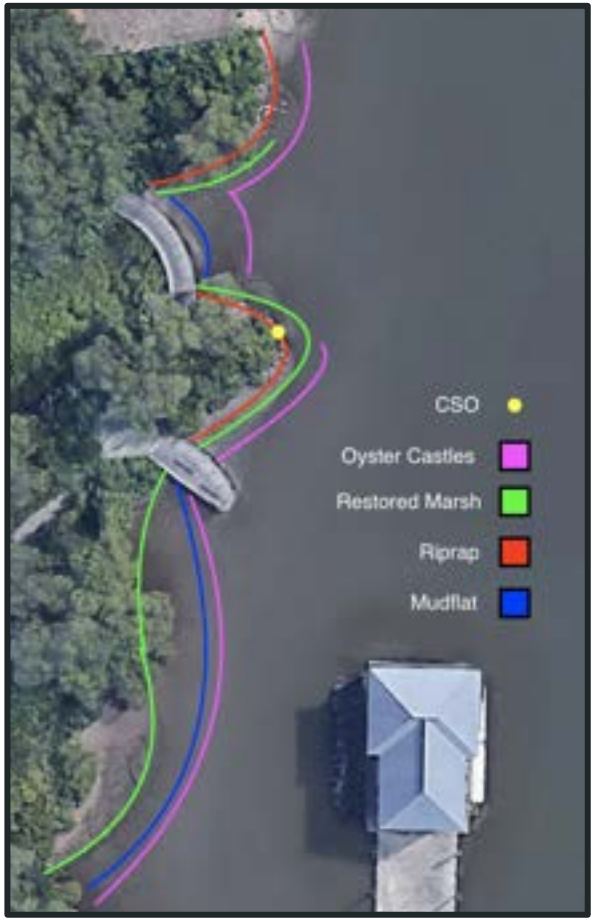


Fig 20. Sherman Creek from Above (Google Earth)

Methods

- Both **epifauna** and **infauna** typically sampled
  - Epifauna - invertebrates visible on surface in 10-20 0.25 m^2 quadrats
  - Infauna - smaller quadrat sieved for macroinvertebrates at depth of 15cm

Fig 21. Quadrat Example (Aerial-PhotoCo)

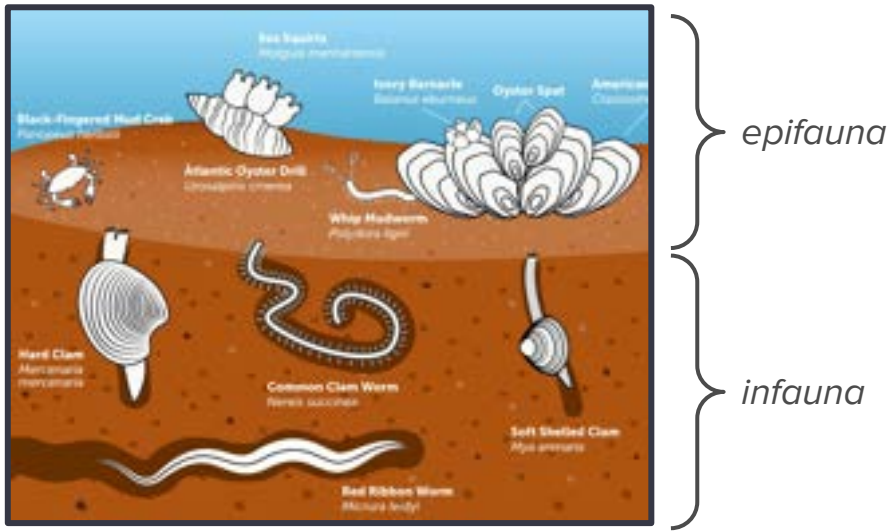
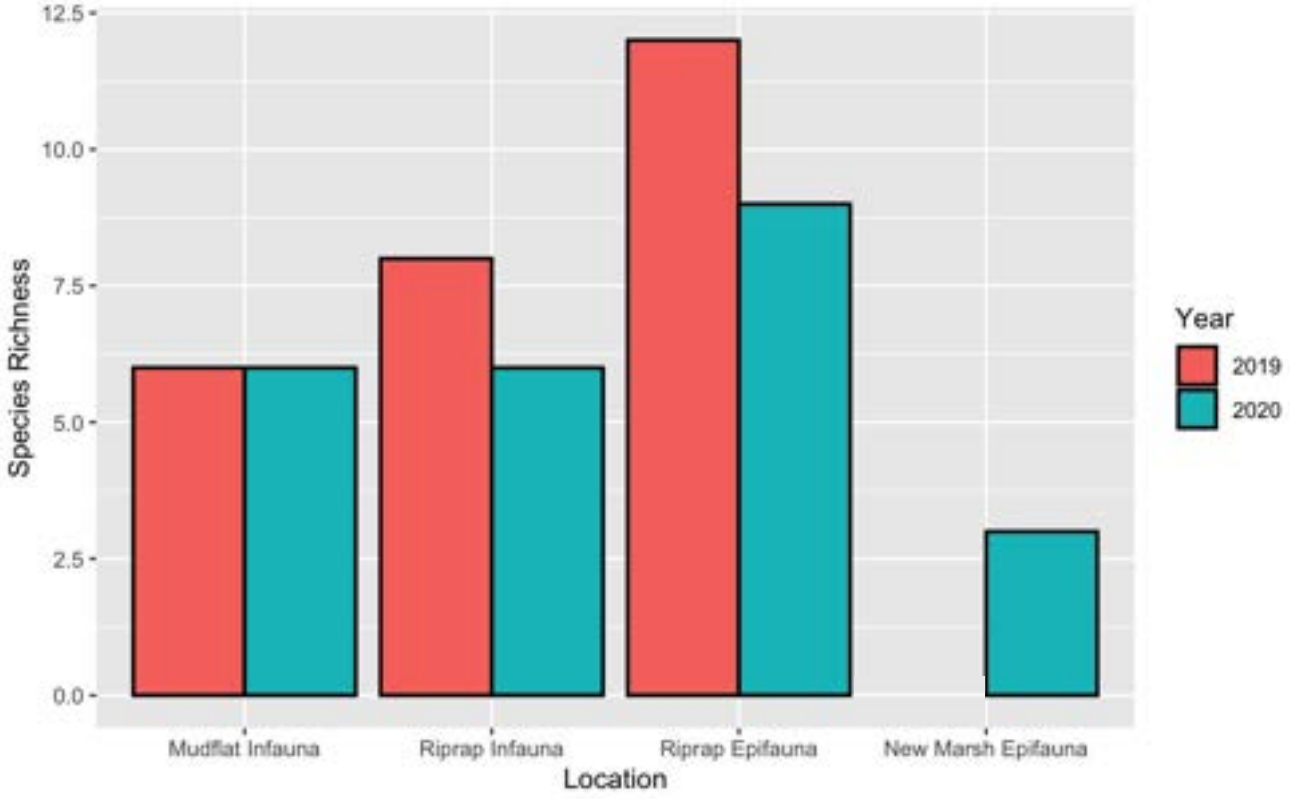
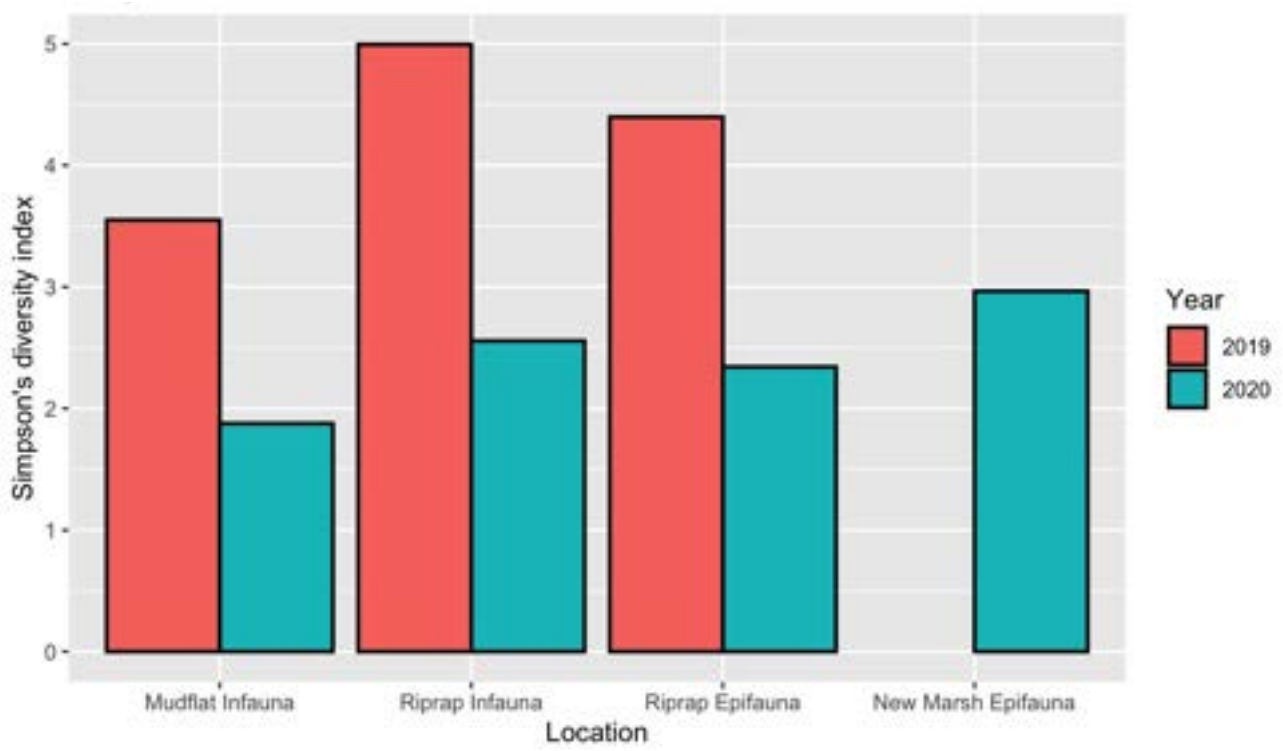


Fig 22. Epi vs. Infauna (Chesapeake Bay Program)

Preliminary Analyses: Species Richness



Preliminary Analyses: Simpson's Diversity



Discussion

Moving forward:

- Sample Sherman's Creek for epifauna and infauna in riprap zone, mudflat, and the new marsh again
- Analyze data for changes in richness, diversity, and density across years

Fig 23 & 24. Sherman Creek Restoration (Ben Hider)

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NSF

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Questions?

Main project ideas:

- How is invertebrate richness, diversity, and density in an urbanized area affected by shoreline restoration?
    - So far, we have found decreased richness and diversity of invertebrate species following restoration.

- While living shorelines have been shown to improve biodiversity of habitats overtime, we are interested in exploring how long this transition takes after this large disturbance.
    - *How long does “recovery” from a shoreline restoration project take?*