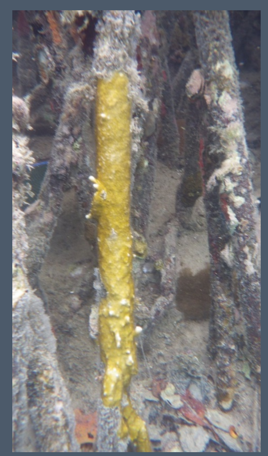
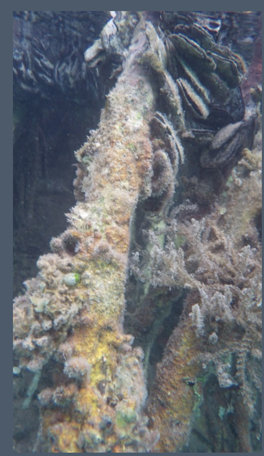

THE ECOLOGY OF ST. JOHN BAY MANGROVE-ROOT FOULING COMMUNITES: RECOVERY OF THE EPIBIOTA COMMUNITY

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INTRODUCTION

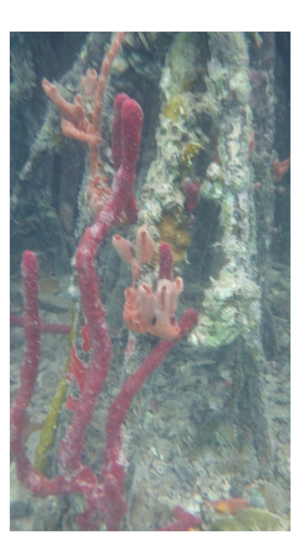
Tropical ecosystems represent a substantial diversity of life and are especially susceptible to climatological events that could cause extreme damage or even death to these communities. Mangroves along with seagrass beds and coral reefs provide an invaluable resource of fish and other aquatic life. The red mangrove is one of the species that provides a valuable and safe habitat for epibionts, which use the tree roots to escape predation from larger marine life. The reasons these mangrove forests are utilized by the aquatic life when compared with other tropical habitats were found to be: an attraction to the structural complexity of the prop roots, protection from predators, and food for juvenile fish is greater in mangrove habitats than in other habitats (Laegdsgaard and Johnson 2000).

The mangrove roots provide habitat to organisms that attach to them, called epibionts. Examples of epibiota include: algae, sponges, seaweed, coral, mollusks, hydroids, etc. The increase of algae growing on substrate below mangrove roots reduces predatory fish density, suggesting that the nature of the epibiota is important to its influence. (MacDonald and Weis 2013) Most juvenile fish feed on the small crustaceans and gastropods that live within the prop roots. (MacDonald, Shahrestani, Weis 2009).

Even though hurricanes are common in the Caribbean, St. John still suffered from two major ones in May of 1989 and 1995. Hurricane Hugo (1989) cut off the tidal flows to Great Lameshur Bay by choking the life of the forest and the aquatic animals that called it home. The trees and species could no longer get the replenishment of salt water needed to survive. Hurricane Marilyn (1995) washed out some of the sediment wall retuning minimal tidal flows to the dead mangrove forest. However, it was not until 2010 when another Hurricane fully broke down the sediment wall and natural flow returned.

METHODS

- Pictures were taken at three Bays: Hurricane Hole (HH), Coral Bay (CB), and Great Lameshur (GL), of individual submerged roots
- The pictures were then downloaded to a computer and identified to the best of our ability
- The first 40 pictures at each site were used in this study
- Some pictures were discounted due to the picture quality being out of focused or the picture's water quality was cloudy and hard to make out the species

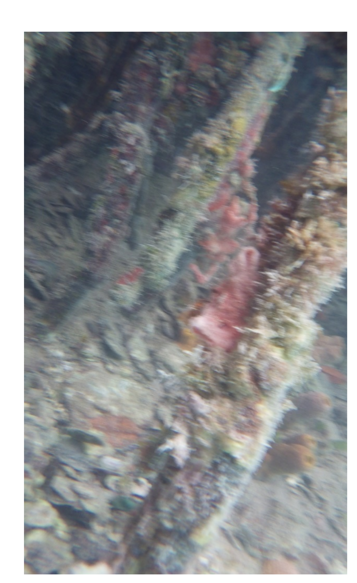
Above: the Sea Anemone (*Actiniaria*)
Left: Various sponges and oysters
Right: unidentified blue white sponge
Far Right: unfocused or cloudy pictures

ABSTRACT

In May 1989, Hurricane Hugo impacted St. Johns USVI destroying the Red Mangrove (*Rhizophora mangle)* Forest of Great Lameshur Bay. The impact restricted the tidal flow and caused mass death in the mangroves. Hurricane Marilyn (1995) hit St. John causing the storm wall formed by Hugo to be washed out and returned limited tidal flow to the dead forest. It was not until 2010 when another Hurricane broke down the sediment wall and natural flow returned. Up to that point, water quality restricted any fouling organisms to survive on prop roots. Using photo identification we looked at three different bays of St. John to identify the local fouling community diversity and compared the new fouling community of Great Lameshur to the undisturbed bays. Settling plates were deployed in January and retrieved in March. Results showed active recruitment of oysters, and sponges along with other fouling organisms. Given enough time, Great Lameshur Bay's fouling community is suspected to increase in diversity and become similar to undisturbed sites.

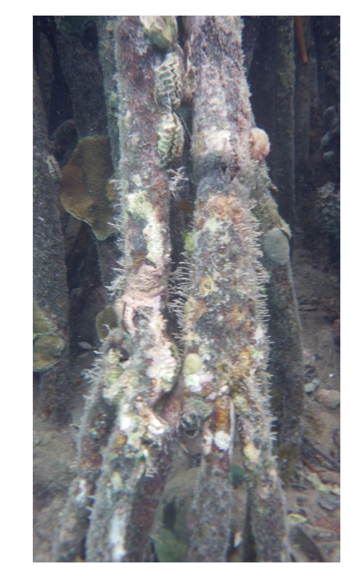
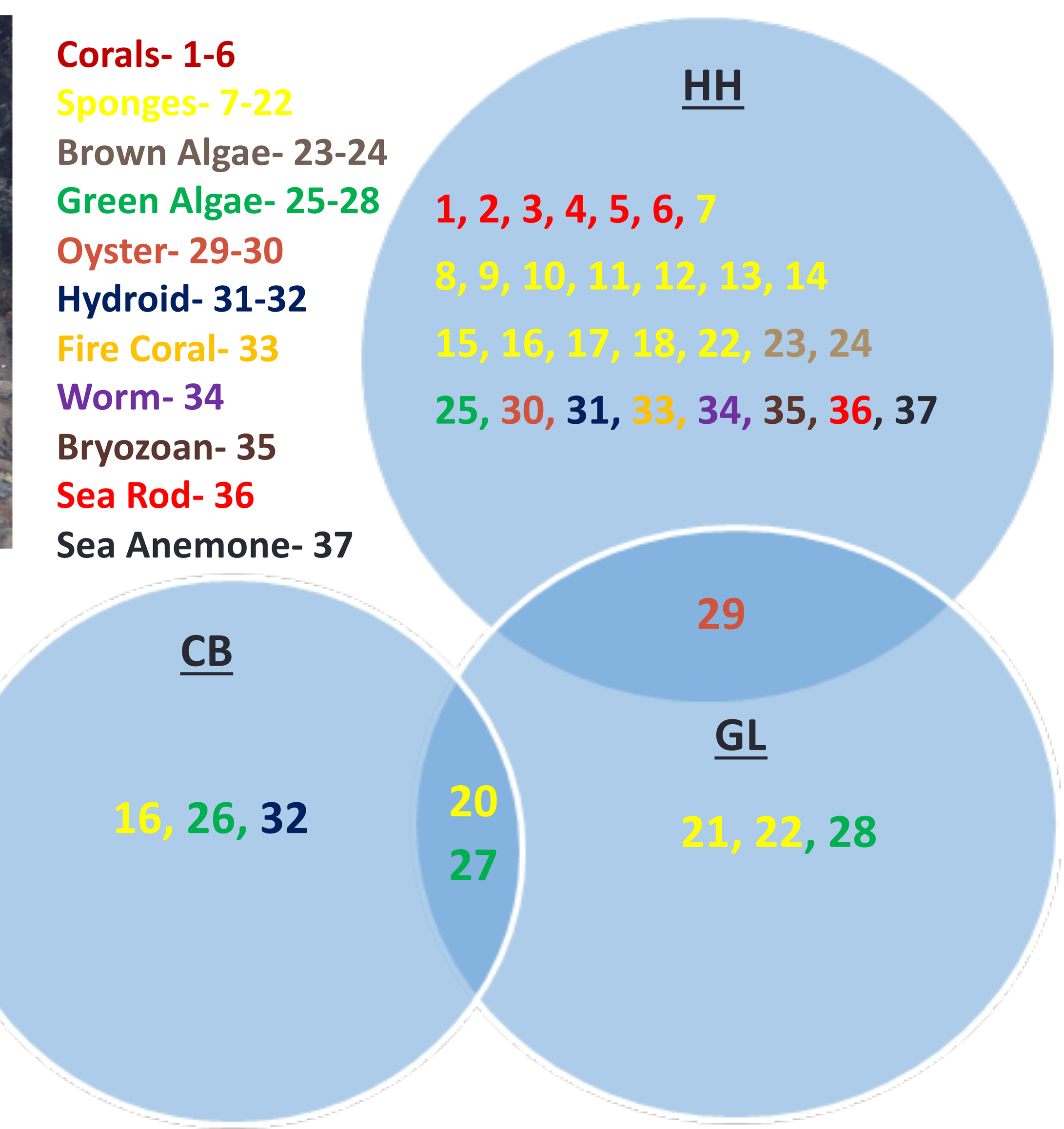
TAXA LIST

1. *Porites astreoides*
2. *Manicina areolata*
3. *Astrocoeniidae*
4. *Agaricia lamarcki*
5. *Agaricia grahamae*
6. Unidentified red encrusting coral
7. *Agelas Schmidti*
8. *Igernalla notabilis*
9. *Mycale microsigmatosa*
10. *Dysidea etheria*
11. *Biemna caribea*
12. *Ircinia strobilina*
13. *Scopalina ruetzleri*
14. *Wrightiella blodgettii*
15. *Amphimedon* – sponge
16. Unidentified blue/white sponge
17. *Ectyoplasia ferox*
18. *Auletta*
19. Unidentified White Sponge
20. *Tedania klausi*
21. *Stelletta kallitetilla*
22. *Chalinula molitba*
23. Unidentified filamentous brown algae
24. *Dictyopteris justii*
25. *Caulerpa Mexicana*
26. *Dictyota spp.*
27. Unidentified Green Algae
28. *Caulerpa uva*
29. *Isognomon alatus*
30. *Lopha frons*
31. Unidentified Hydroid
32. *Sertularella spp*
33. *Millepora alcicornis*
34. Bristle worm
35. *Scrupocellaria sp.*
36. *Alcyonacea Holaxonia Plexauridae*
37. *Actiniaria*

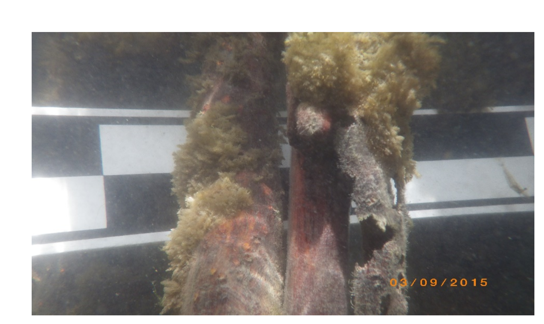
RESULTS

- 37 epibiota species were identified growing across all 3 sites with the most at HH
- Some pictures had to be discarded because they were out of focus
- It was found that HH had the widest species diversity and that only one species was shared with GL (Isognomon Alatus)
- GL had six different species identified growing on the roots with three species shared between sites (two with CB and one with HH)
- CB had 5 species identified and had only two species shared with GL (Unidentified Green Algae, and Tedania Klausi)

CONCLUSIONS

- Each site was relatively unique in richness with very few species being shared between sites.
- A higher species richness was found in the recovering GL than in the undamaged CB however neither are at the richness level as HH.
- Coral was only present at HH
- Although CB had the lowest species richness GL is still in the process of recovering and given enough time may begin to look akin to HH.



Reference
Laegdsgaard, P., and Johnson, C. 2000. Why do juvenile fish utilize mangrove habitats?. Journal of Experimental Marine Biology and Ecology 257: 229-253.
Macdonald, J., and Weis, J. 2013. Fish community features correlate with prop root epibionts in Caribbean mangroves. Journal of Experimental Marine Biology and Ecology 441: 90-98.
Macdonald, J., Shahrestani, S., & Weis, J. (2009). Behavior and space utilization of two common fishes within Caribbean mangroves: Implications for the protective function of mangrove habitats. Estuarine, Coastal and Shelf Science, 84(2009), 195-201.