Managing Oysters to Maintain Our Islands (MOMI)

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The hazardous Ala Wai Canal, suffering from hypereutrophication and an abundance of pollutants due to the combined drainage of the Manoa, Palolo, and Makiki, streams, carries its toxins into our ocean, harming aquatic habitats and marine life. Research suggests that oysters, a natural resource with innate filtration properties, will make a significant impact on the polluted water, filtering tens of thousands of gallons of water daily, which should result in less dissolved oxygen and pollutants in the canal. This project focuses on designing strong, sustainable, eco-friendly cages that will provide security for oysters and encourage their growth. After several tests and significant consideration of materials, mechanisms, mesh sizes, strength of 3D prints, and more to optimize water flow and security, we have designed and built several types of effective cages, including a portable tethered wire cage, a suspension rig stretched between a buoy and habitable concrete anchor with bags hanging across the line, and a smaller "purse" with a modular screw-cap system, which can also be used for community outreach. We hope to produce cages capable of facilitating filtration for thousands of oysters in varying aquatic environments. We have also engineered safe, cheap, unfixed sensors with a secure, reliable cellular connection that track temperature, conductivity (salinity), and turbidity in the water around the cages. Our goal for these sensors is that they will ultimately indicate the impact of the oysters on the water while also determining optimal locations for oyster growth. We hope to see our cage and sensor designs contributing to making the Ala Wai Canal a clean, abundant resource that can provide work-related, educational, and recreational opportunities for our community.

Awards Won: