Protecting Sea Grass Habitats: Designing an Automatic Water Filtration System for Turbidity Mitigation

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The objective of this experiment is to develop an efficient automatic water filtration system aimed at safeguarding sea grasses in the wild from turbidity. This system is proposed as a viable alternative to chemical water treatment in coastal areas. The hypothesis posits that the filtering process can effectively replace chemical treatment, and the design of an automatic system can minimize the need for manual labor. To conduct the experiment, a two-phase test was performed. The first phase involved experimenting with various filter media (cotton fabric filter, sponge foam filter, felt filter, and micron polyester filter) to finalize the water filter design and optimize its efficiency. The final design contained a three filtration system: 1) a mesh fabric to filter larger and visible components in a turbid water 2) durable foam sponge with high water absorption and particle capacity to capture dirt and sediment 3) activated carbon filter for chemical removal.The second phase was a comparison performance test using aluminum sulfate while simulating a "random" sediment disruption in the controlled tank. The data suggests that the current water filtration system is not fully developed due the following design flaws: poor construction of the circuit, weak building materials, short term power battery source, and limitations of the chosen turbidity sensor. To successfully implement this as a in-stream device, the automatic water filtration system will still need to be further redesigned and re accessed it's impact on the environment, long term use, and cost effectiveness.

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