

# SEAGRASS ECOSYSTEM SUCCESSION: A MANIPULATIVE EXPERIMENT

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The secondary succession of seagrass beds was examined in a shallow (2 m) area of Teague Bay lagoon on St. Croix, U. S. Virgin Islands. The hypothesis tested was nutrient accumulation in the sediment limits the rate of secondary succession. The alternative hypothesis was sediment stabilization controls the rate of succession. A corollary was rhizophytic algal colonizer species are more important as agents of nitrogen cycling than as sediment stabilizers. The hypothesis was tested by completely denuding areas of seagrass bed and fertilizing, sediment stabilizing (using plastic algae in plots where colonizing algae were removed), sediment stabilizing plus organic input (colonizing algae not removed), and disturbing sediments (colonizing algae removed) in August 1979. Colonization proceeded fastest in fertilized plots and slowest in disturbed plots. After 9 mon. the number of algae declined while the number of leaf bundles of seagrasses Syringodium filiforme and Thalassia

testudinum increased greatly. After 1 yr, the number of Syringodium declined while Thalassia continued to increase. As Thalassia became dominant, dissolved nitrogen in the top 20 cm of sediments became depleted and the rate of ammonification increased. This study supported the hypothesis that sediment nutrients limit the rate of seagrass succession and fertilization of disturbed beds will greatly enhance recovery.