EFFECTS OF THE ADDITION OF DREDGED SEDIMENT TO A MARSH ECOSYSTEM ON BENTHIC MICROALGAL BIOMASS

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ABSTRACT

Estuarine marsh ecosystems offer enormous amounts of biological activity and resources to the environment, comprising about 83 percent of the coastal wetlands in the conterminous United States. Deteriorating marsh systems have become more numerous in back barrier salt marshes of the southeastern North Carolina coastal plain and other coastal zone areas. Loss of sediment from these diebacks results in loss of nutrients from the ecosystem, which can in turn affect the biomass of benthic microalgae. Believed to be among the most important primary producer in these ecosystems, it is important to find some way to reverse the negative effects of marsh deterioration. One way which sediment deficits may be offset is by artificially introducing inorganic sediment to deteriorating marshes. This was done to both deteriorated and non-deteriorated sections of marsh on Masonboro Estuarine Research Reserve, NC. Dredge sediment from the Atlantic Intracoastal Waterway was added in increments of 0mm-25.4mm, 25.4mm-76.2mm, and 76.2mm-102mm to the marsh surface. Mean sediment chlorophyll *a* samples were taken in non-deteriorated and deteriorated sites both pre and post-sediment addition. Monthly sediment chlorophyll *a* means increased from an average of 13.3 mg chlorophyll *a* m^{-2} for degraded and 66.2 mg chlorophyll *a* m^{-2} for non- degraded pre-sediment addition to an average of 92.74 mg chlorophyll *a* m^{-2} for degraded and 81.89 mg chlorophyll *a* m^{-2} for non-degraded post-sediment addition. Both deteriorated and non-deteriorated sites saw a significant increase in benthic microalgae biomass post-sediment addition. The amount of sediment added and the grain size of the amended material had no significant effect on biomass.

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DEDICATION

For my father, Edward Anthony Panasik, who never got to see me achieve any of my academic goals.

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