

Guardenier, Hope (1994). "Role of Plant-Sediment Interaction in Barrier Beach Maintenance Mechanisms at Seawall Beach". Standard Theses.

Development along the Maine coast and subsequent disruption of the natural processes affecting Maine's sandy beaches is an issue that has sparked many debates among politicians, homeowners, and environmentalists. In an effort to understand barrier beach maintenance mechanisms and thereby the consequences of shoreline development, this study investigates the processes of recovery from winter erosion and the factors which may have a significant influence on sand accretion.

The study focuses on the beach processes occurring at Seawall Beach in Phippsburg, Maine. A determination of the significance of wrack and berm colonizers in enhancing sand accumulation allows an assessment of the volume of sand assisting in beach recovery after winter erosion. Beach profiling through a modified and control site on the beach provides quantitative evidence for differential recovery between the site containing wrack and berm colonizers and the site where these factors are absent.

The formation of a berm and eolian ramp, two accretionary structures, are significantly more pronounced in the presence of wrack and berm colonizers. Wrack consists of land and ocean plant debris, mainly seaweed and marsh plants, and is capable of accumulating an amount of sand four to thirty-eight times its weight. Berm colonizers include *Cakile edentula*, *Salsola kali*, *Artemisia stelleriana*, *Ammophila breviligulata*. These plants provide a matrix through their root system by which sand is stabilized. The volume of sand which accumulates in the wrack and berm colonizer-free site is significantly less than that which accumulated in the unaltered site. The interaction of eolian processes and vegetation is significant in the accumulation of sand.

The importance of the study lies in the potential to change current practices at municipal beaches in Maine which may be damaging the beach by preventing natural recovery processes. These practices include clearing of the wrack and berm colonizers which assist in beach recovery. Since Maine's sandy beaches are such a valuable resource, ecologically and economically, their preservation is of utmost importance. This study clearly indicates that the interaction between eolian activity and wrack and berm colonizers is an essential process which increases volume and height on the beachface and is an integral component of barrier beach maintenance mechanisms. For this reason the perpetuation of this interaction is vital to the preservation of barrier beaches in Maine.