

Engineering With Nature is the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits through collaboration

Background

Ongoing research on dune stability has led to an improved understanding of dune systems and their impacts on coastal resiliency. Wrack provides a suite of benefits to the coastal dune system; however, a lack of investigation has produced variation in wrack management practices at the local, coastal, and municipal scale. This research is designed to explore the re-use of wrack material as part of existing coastal management practices. In addition, through collaboration with academic, district, and local government partners, this research aims to identify and explore additional cost-effective and sustainable solutions to improve coastal management practices that can provide environmental, economic, and societal benefits.



Approach

Data collection will foster a holistic approach by incorporating topographic, vegetation, and meteorological measurements. Collection of LiDAR, vegetation coverage and biodiversity, wind speed and wind direction will aid in quantifying ecomorphodynamic linkages critical to supporting a healthy dune environment. With this, to broaden the benefits provided by the local wrack placement effort, a phased approach in identifying novel coastal management practices will be implemented, including workshops to identify dune management needs, and limitations.

Objectives

- Identify current beach dune management operational practices regionally, including environmental dune and wrack management and encourage sustainable management practices.
- Investigate existing beach and wrack management practices, as well as developing innovative management practices that maximize the re-use of natural materials, sustainably and cost-effectively.
- Provide scientific data that can be used as guidance for updating dune construction and organic material management while simultaneously enhancing dune resiliency.

Outcomes

This project will provide coastal engineers and managers a foundational framework for monitoring efforts to evaluate system performance and guidance on sustainable construction practices.

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