Drivers of Alongshore Varying Dune Evolution
Implications for Susceptibility to Climate Change Hazards

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BACKGROUND
The ability to predict coastal hazard vulnerability will be important for future coastal managers as changes in climate increase sea level and alter storminess. Coastal dunes help protect against destructive surge and waves during storm events. Dune height, width, and stability are affected by waves, wind, storms, and beach grass species.

The objective of this interdisciplinary research is to understand how dunes respond to storm events and recover afterward in order to assess the resiliency of natural and managed beaches. Outcomes from this research will improve the ability to forecast coastal vulnerability to extreme events.

FIELD DATA COLLECTION
October 2016, 2017, and 2018 field campaigns
Collected the following at 77 sites along the study area...
Real Time Kinematic (RTK) GPS surveying:
• Cross-shore topographic profiles
• Along-crest topographic profiles
• Ecological quadrat
Ecological quadrat sampling:
• Percent ground cover
• Percent plant cover
• Density of beach grasses
Sand samples

RESULTS
Interested in differences along the coast and change from year to year.
• Dune: toe, crest, heel, and volume
• Shoreline position
• Density and species of beach grasses
Variability in the dune properties across the four barrier islands from 2016 to 2017.

RESULTS CONT.

POST HURRICANE FLORENCE
• October 09-19, 2018

FUTURE WORK
Windsurf (numerical model) includes waves, wind, sand size, and grass species

• Simulate beach and dune evolution over a range of time scales
• Estimate alongshore variable probabilities of dune erosion, overwash, and inundation under present and possible future scenarios