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## **Modeling Biotic & Abiotic Drivers Affecting Biogeomorphic Coastal Foredunes**

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**MONTCLAIR STATE**  
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The Doctoral Program in Environmental Science & Management  
and MSU Sustainability Seminar Series Present:

# Modeling Biotic & Abiotic Drivers Affecting Biogeomorphic Coastal Foredunes



WHEN: November 23, 3:45 pm via Zoom

**Bianca Charbonneau**

**ORISE Fellow USACE ERDC EL Ecological Modeling**



**ERDC**  
ENGINEER RESEARCH & DEVELOPMENT CENTER



Dr. Charbonneau recently defended her doctoral dissertation from the University of Pennsylvania Biology Department in August 2019. Prior to this, she completed her M.S. from Villanova University's Biology Department in 2014 and B.A. in Ecology & Evolutionary Biology & Environmental Studies at Princeton University in 2012. Completing her doctorate, she was an NDSEG Fellow, received 2 USACE BAA contracts for her research and was & remains the PI of the Waretown Wind Tunnel in NJ. More details on [TheDuneGoon.Weebly.com](http://TheDuneGoon.Weebly.com) @theDuneGoon [TheWindTunnel.weebly.com](http://TheWindTunnel.weebly.com)

Coastal dunes are exceptionally dynamic terrestrial habitats that will only grow increasingly vulnerable with climate change. A structured approach to protect and restore these and other coastal biogeomorphic interface habitats is needed to maintain their invaluable ecosystem services. Vegetation in these habitats acts as ecosystem engineers such that, to achieve this, one must understand and accurately forecast vegetation dynamics at the nexus of shifting abiotic conditions and drivers of change. We developed a process-based model for coastal dune vegetation ecology, specifically, growth, density, and colonization as it affects and is affected by shifting habitat topography and storm event impact. The model is complex enough to capture biologically and abiotically relevant drivers of habitat change with usability in mind for managers, and underlying theory guided by extensive fieldwork.

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