Increasing Salt Marsh Resiliency at Blackwater National Wildlife Refuge

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Blackwater National Wildlife Refuge

- Established 1933
- >29,000 acres
Blackwater’s Disappearing Wetlands

1938

1974

1989
Causes of Marsh Loss

- Sea Level Rise (3.53 mm yr$^{-1}$, NOAA)
- Subsidence (3-4 mm yr$^{-1}$, USGS)
- Nutria (non-native herbivore)
- Saltwater intrusion
- Modified river hydrology
- Erosion
Estimated 50,000 nutria on Blackwater NWR in 1998
Chesapeake Bay Nutria Eradication Project
Key points...

• Blackwater marshes sit low in growth range and have small tidal variation (little elevation capital)

• Marsh vertical development is not keeping pace with sea level rise and subsidence
Science-based solution...

Vegetation Classification of Shorter's Wharf
NOTES:
1) Base imagery 2013 orthomagery provided by Salisbury University.
2) Bathymetry obtained in December, 2014 using single beam sonar RTK GPS.
December 2016
26,000 cubic yards of material spread over approximately 40 acres
1. Natural revegetation occurred quickly
2. Spartina patens and Distichlis spicata plugs were installed in bare areas.
New marsh platform

Old marsh platform
1. Natural revegetation occurred quickly
2. Spartina patens and Distichlis spicata plugs were installed in bare areas.
January 2018 topographic survey

- 32.5 acres surveyed with total station
- 25.5 acres had an elevation >20cm NAVD88
- 18.7 acres had an elevation of 24-34 cm

Monitoring

- Vegetation cover and composition (Audubon and USFWS)
- Breeding bird community (SHARP/University of Delaware)
- Below ground biomass production (USGS)
- Marsh elevation change (USGS)
# Geotechnical Laboratory Results

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<th>Sample Location</th>
<th>Percent Coarse Sand</th>
<th>Percent Medium Sand</th>
<th>Percent Fine Sand</th>
<th>Total Sand Percent</th>
<th>Percent Silt</th>
<th>Percent Clay</th>
<th>Total Percentage</th>
<th>Percent Organic Content</th>
<th>Specific Gravity</th>
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Ave. in BWR: 19.8 47.2 32.6
Ave. in Creek: 32.0 37.8 30.2
Section E–E’ PROFILE