Submerged Aquatic Vegetation Mapping

APNEP Ecosystem Symposium 2017

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SAV Partnership

- Federal: ACE, FWS, NOAA, NPS, NRCS
- Combined: APNEP, NERR
- State: DCM, DMF, DWQ, DWR, EEP, WRC, DOT
- Academia, ECSU, ECU, NCSU, UNC-CSI, UNC-IMS, UNC-W, NC Seagrant, DUML, CW&M-VIMS
- NGOs: NCCF, TNC
Environmental Parameters for Submerged Habitat Mapping

- Winds low – preferably 5 mph or less
- Sun Angle 20 – 45 degrees to reduce glint
- Low tide
- Turbidity low
- No clouds or haze
- Adequate biomass of target
Intergraph’s Z/I Digital Mapping Camera (DMC)
2006 0.3 m vs. 2007 1 m DMC imagery

2007 1m Pixels
6.4 mi. long
3.6 mi. wide

2006 0.3m Pixels
2.6 mi. long
1.4 mi. wide

0.3 m image ~ 0.7 GB; 1.0 image ~ 0.25 GB
SAV in NC and Back Bay, VA 2006-2008

Seagrass in NC, 2013-2014
Issues with the 2013-2014 Imagery

Clouds in Core Sound
Study Areas

Study Area 1
- Northern extent: Highway 64 Bridge from Roanoke Island to Nags Head
- Southern extent: Oregon Inlet

Study Area 2
- Northern extent: Oregon Inlet
- Southern extent: Hatteras Inlet
## Study Area 1 Change Detection Results

<table>
<thead>
<tr>
<th>Vegetation Change Description</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dense SAV to Patchy SAV</td>
<td>1,160.02</td>
</tr>
<tr>
<td>Patchy SAV to NO SAV</td>
<td>633.04</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Dense SAV Acres</th>
<th>Patchy SAV Acres</th>
<th>Total SAV Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>2447</td>
<td>2753</td>
<td>5201</td>
</tr>
<tr>
<td>2013</td>
<td>1354</td>
<td>3966</td>
<td>5320</td>
</tr>
</tbody>
</table>

119 acre difference (2.28%) between 2013 and 2007
## Study Area 2 Change Detection Results

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dense SAV Acres</td>
<td>37,149</td>
<td>19,061</td>
</tr>
<tr>
<td>Patchy SAV Acres</td>
<td>28,581</td>
<td>42,447</td>
</tr>
<tr>
<td>Total SAV Acres</td>
<td>65,730</td>
<td>61,508</td>
</tr>
</tbody>
</table>

4,222 acre difference (6.4%) between 2007 and 2013

### Vegetation Change Description

<table>
<thead>
<tr>
<th>Change Description</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dense SAV to Patchy SAV</td>
<td>18,055.09</td>
</tr>
<tr>
<td>Patchy SAV to NO SAV</td>
<td>6,236.75</td>
</tr>
</tbody>
</table>
Deep Water Edge Difference 2007-13
Dense to Patchy Change 2007-13
NC Seagrass Abundance

**ABUNDANCE**

- Zostera marina
- Ruppia maritima
- Halodule wrightii

**TIME OF YEAR**
- January
- June
- December
“At each site, we classified seagrass meadows as declining or increasing if the areal extent changed by >10% or as no detectable change if the areal extent change by ≤10% [which is typically within the error of assessment techniques (Kendrick et al. 1999)]. (Waycott et al. 2009)
