Using Wetland Monitoring and Assessment in Virginia’s Regulatory Program

Michelle M. Henicheck, PWS
Senior Wetland Ecologist
Office of Wetland and Stream Protection
Department of Environmental Quality
Virginia Water Protection Permitting Program
The goal of Virginia’s nontidal wetlands program is “to achieve a no net loss of wetland acreage and function through our regulatory program and a net gain in wetland resources through voluntary programs” (§62.1-44.15 of the code of Virginia).

Status of wetland resources
- location and extent of wetlands in watersheds
- knowledge of the quality of these wetlands

Functions of impacted wetlands must be evaluated to assess whether functions are being compensated
Objectives

Establish baseline conditions in various broad contexts (i.e., land use, watershed, and wetland type) to guide:

- management decisions regarding restoration efforts
- programmatic compensatory mitigation
- integration with overall water quality standards

Strategy becomes an integral part of VA's comprehensive water quality monitoring program strategy.
Method to the madness....

**Level 1 (Model Development):**
- Census of all NWI wetlands using a GIS-based analysis of remotely sensed information. (200,000 polygons, 70 pages of GIS code)
- Grouped by watersheds (14 digit HUC).
- Condition of wetland based on landscape position.

**Level 2 (Calibration):**
- Statistically selected subsample of the watershed wetland population (stressors identified within 100 meter radius)
- Involves a more sophisticated analysis of remotely sensed information and a site visit for verification and additional data collection. (2126 sites visited)

**Level 3 (Validation):**
- Very detailed analysis of wetland performance of specific functions (habitat provision & water quality modification)
- Extensive sampling of a limited number of sites (80-90 sites)
Nontidal Wetlands Viewer

Identify Results

NWI
Wetlands selected: 1

Selection #1:
snow
buffer
rescore

Habitat Score: 0.1
Habitat Stress Level: Severely Stressed
Habitat Restoration Potential(%): 260

Water Quality Score: 0.4
Water Quality Stress Level: Somewhat Severely Stressed
Water Quality Restoration Potential(%): 75
Average Habitat Score for HUC: 0.79
Minimum Habitat Score for HUC: 0.1
Maximum Habitat Score for HUC: 1
Average Water Quality Score for HUC: 0.69
Minimum Water Quality Score for HUC: 0.1
Maximum Water Quality Score for HUC: 1
### Rescore Wetland

- **Water Quality Score:** 0.4  
  - Somewhat Severely Stressed
- **Average Habitat Score for HUC:** 0.79  
  - (Min. 0.1, Max. 1)
- **Average Water Quality Score for HUC:** 0.69  
  - (Min. 0.1, Max. 1)

#### Landuse Percentages

<table>
<thead>
<tr>
<th>Landuse</th>
<th>Within 200m Buffer</th>
<th>Within Drainage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual%</td>
<td>Changed To%</td>
</tr>
<tr>
<td>Natural</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Row Crops</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Pasture</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Developed</td>
<td>31</td>
<td>71</td>
</tr>
</tbody>
</table>

**Wetland Size**
- **Actual:** 4.28 acres  
- **Changed To:** 2.18 acres

**New Habitat Score:** 0.1  
- Severely Stressed

**New Water Quality Score:** 0.1  
- Severely Stressed

---

**Map Contents**

- NPDES Facilities
- NWI Habitat Condition
- Impaired Water
- Conservation Lands
- VEVA
- 2006 Condensed Land Cover
- Soils
- Street Map

---

*Recalculate Scores Explanation placeholder*
## Restoration Score

**Water Quality Score:** 0.4  Somewhat Severely Stressed

**Average Habitat Score for HUC:** 0.79  (Min. 0.1, Max. 1)

**Average Water Quality Score for HUC:** 0.69  (Min. 0.1, Max. 1)

**Landuse Percentages:**

<table>
<thead>
<tr>
<th>Natural</th>
<th>Within 200m Buffer</th>
<th>Within Drainage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual%</td>
<td>Changed To%</td>
<td>Actual%</td>
</tr>
<tr>
<td>9</td>
<td>69</td>
<td>9</td>
</tr>
<tr>
<td>Row Crops</td>
<td>40</td>
<td>42</td>
</tr>
<tr>
<td>Pasture</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td>Developed</td>
<td>31</td>
<td>18</td>
</tr>
</tbody>
</table>

**Wetland Size**

- Actual: 4.28 acres
- Changed To: 4.28 acres

**New Habitat Score:** 0.36  Somewhat Severely Stressed

**New Water Quality Score:** 0.70  Somewhat Severely Stressed

---

**Map Contents**

- NPDES Facilities
- NWI Habitat Condition
- NWI Water Quality Condition
- Ya Tech Preservation Sites
- Impaired Water
- Conservation Lands
- VAWA
- 2006 Condensed Land Cover
- Soils
- Street Map
## Alternative Analysis

### Nontidal Wetlands Viewer

<table>
<thead>
<tr>
<th>Function</th>
<th>Present Condition</th>
<th>Project Impact</th>
<th>Potential Restoration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat</td>
<td>0.1</td>
<td>0.1</td>
<td>0.29</td>
</tr>
<tr>
<td>Water Quality</td>
<td>0.4</td>
<td>0.1</td>
<td>0.70</td>
</tr>
</tbody>
</table>

![Map of Nontidal Wetlands Viewer with data points indicating habitat and water quality analysis.](image)
Identify permits in the area

Compare scores independent or relative to each HUC
Uses of Wetland Data Viewer

Regulatory:
- Potentially different permit conditions
- Ability to assess quality impacts vs. quantity of impacts (i.e. may want to permit impacts to 50 acres of stressed wetlands vs. 25 acres of higher quality wetlands)
- Ability to use baseline of current wetland condition to justify purpose and need
- Potential enforcement action for functional loss of permitted compensation (i.e. secondary impacts to on-site preservation)

Non-regulatory:
- Ability to identify correlation between wetland condition and improved water quality (i.e. wetland restoration)
- Evaluate the cumulative impacts of wetland loss and restoration in watersheds relative to ambient ecological conditions
- Potentially target degraded watersheds for compensation due to a greater need to improve water quality and habitat
- Better land use planning on a local level
Long Term Goals

- Develop a long-term implementation plan for a wetland monitoring and assessment program that protects the physical, chemical, and biological integrity of the Commonwealth’s water resources;
- Allow for both general reporting on status/trends, and provide for more intense analysis of select watersheds that will be used as part of Virginia's 305(b) report; and
- Evaluate the effectiveness of regulatory and voluntary programs.
- Provide information for policy/program development
QUESTIONS?
Answers to all those mathy questions....

Don't feel bad if you only got a 3% raise; I only got 2% myself.

Can we feel bad that 2% of your pay is bigger than 3% of our pay?

Don't get all mathy on me.

Acknowledgements
USEPA Region III – Regina Poeske
USEPA HQ
USEPA Corvallis
Mid-Atlantic Wetland Workgroup (MAWWG)
Virginia Institute of Marine Science – Center for Coastal Resource Management
(our collaborative partner)

Virginia Institute of Marine Science
Kirk Havens Kirk@vims.edu
Carl Hershner Carl@vims.edu