

# Using Wetland Monitoring and Assessment in Virginia's Regulatory Program



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# Virginia Wetland Monitoring & Assessment Strategy

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- **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

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- 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....

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- **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

Watershed  
Downstream  
Cumulative  
Rescore

Clear Graphics Measure Tools Find Address Find Permit Find X,Y Geoprocessing Print

### Identify Results

make container moveable  expand container

**NWI**  
Wetlands selected: 1

Selection #1:

Selection # 1  
10 Digit HUC Code: 0208010404  
Wetland Unique ID: E23506  
Attribute: PEM1/SS1E  
Acres: 4.28  
**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

### Map Contents

- NPDES Facilities
- NWI Habitat Condition  
Transparency:
- NWI WQ Condition  
Transparency:
- Va Tech Preservation Sites  
Transparency:
- Impaired Water  
Transparency:
- Conservation Lands  
Transparency:
- VEVA  
Transparency:
- 2006 Condensed Land Cover  
Transparency:
- Soils  
Transparency:
- Street Map  
Transparency:

# Wetland Impact Score

Watershed

Downstream

Cumulative

make container moveable

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:				
	Within 200m Buffer		Within Drainage	
	Actual%	Changed To%	Actual%	Changed To%
Natural	9	<input type="text" value="9"/>	9	<input type="text" value="9"/>
Row Crops	40	<input type="text" value="0"/>	42	<input type="text" value="0"/>
Pasture	20	<input type="text" value="20"/>	31	<input type="text" value="31"/>
Developed	31	<input type="text" value="71"/>	18	<input type="text" value="60"/>
Wetland Size	Actual:	4.28 acres	Changed To:	<input type="text" value="2.18"/> acres

New Habitat Score: 0.1 Severely Stressed

New Water Quality Score: 0.1 Severely Stressed

[Recalculate Scores Explanation placeholder](#)

ess Find Permit Find X,Y Geoprocessing Print

### Map Contents

- NPDES Facilities
- NWI Habitat Condition  
Transparency:
- NWI WQ Condition  
Transparency:
- Va Tech Preservation Sites  
Transparency:
- Impaired Water  
Transparency:
- Conservation Lands  
Transparency:
- VEVA  
Transparency:
- 2006 Condensed Land Cover  
Transparency:
- Soils  
Transparency:
- Street Map  
Transparency:

# Nontidal Wetlands Viewer

The screenshot displays the Nontidal Wetlands Viewer interface. The main map area shows an aerial view with several overlays: a yellow hatched area representing wetlands, a red hatched area, a blue hatched area, and a green hatched area. A red circle highlights a specific area on the map, and a red 'X' is placed within it. The interface includes a top toolbar with buttons for 'Clear Graphics', 'Measure Tools', 'Find Address', 'Find Permit', 'Find X,Y', 'Geoprocessing', and 'Print'. A left sidebar contains a vertical scale and buttons for 'Watershed', 'Downstream', 'Cumulative', 'Rescore', and 'Results'. A right sidebar titled 'Map Contents' lists various map layers with checkboxes and transparency sliders.

**Map Contents**

**Map Contents:**

- Study Area
- County Boundary
- Hydrologic Units/Watersheds
- Individual Permits
- Individual Permit Labels
- General Permits
- General Permit Labels
- WQ Monitoring Sites
- NPDES Facilities
- NWI Habitat Condition
- Transparency:
- NWI WQ Condition
- Transparency:

# Restoration Score

Watershed

Downstream

Cumulative

**Rescore Wetland** ✕

make container moveable

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)

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Landuse Percentages:

	Within 200m Buffer		Within Drainage	
	Actual%	Changed To%	Actual%	Changed To%
Natural	9	<input type="text" value="69"/>	9	<input type="text" value="82"/>
Row Crops	40	<input type="text" value="0"/>	42	<input type="text" value="0"/>
Pasture	20	<input type="text" value="0"/>	31	<input type="text" value="0"/>
Developed	31	<input type="text" value="31"/>	18	<input type="text" value="18"/>
Wetland Size	Actual:	4.28 acres	Changed To:	<input type="text" value="4.28"/> acres

New Habitat Score: 0.36 Somewhat Severely Stressed

New Water Quality Score: 0.70 Somewhat Severely Stressed

[Recalculate Scores Explanation placeholder](#)

Find Permit

Find X,Y

Geoprocessing

Print

?



**Map Contents** ✕

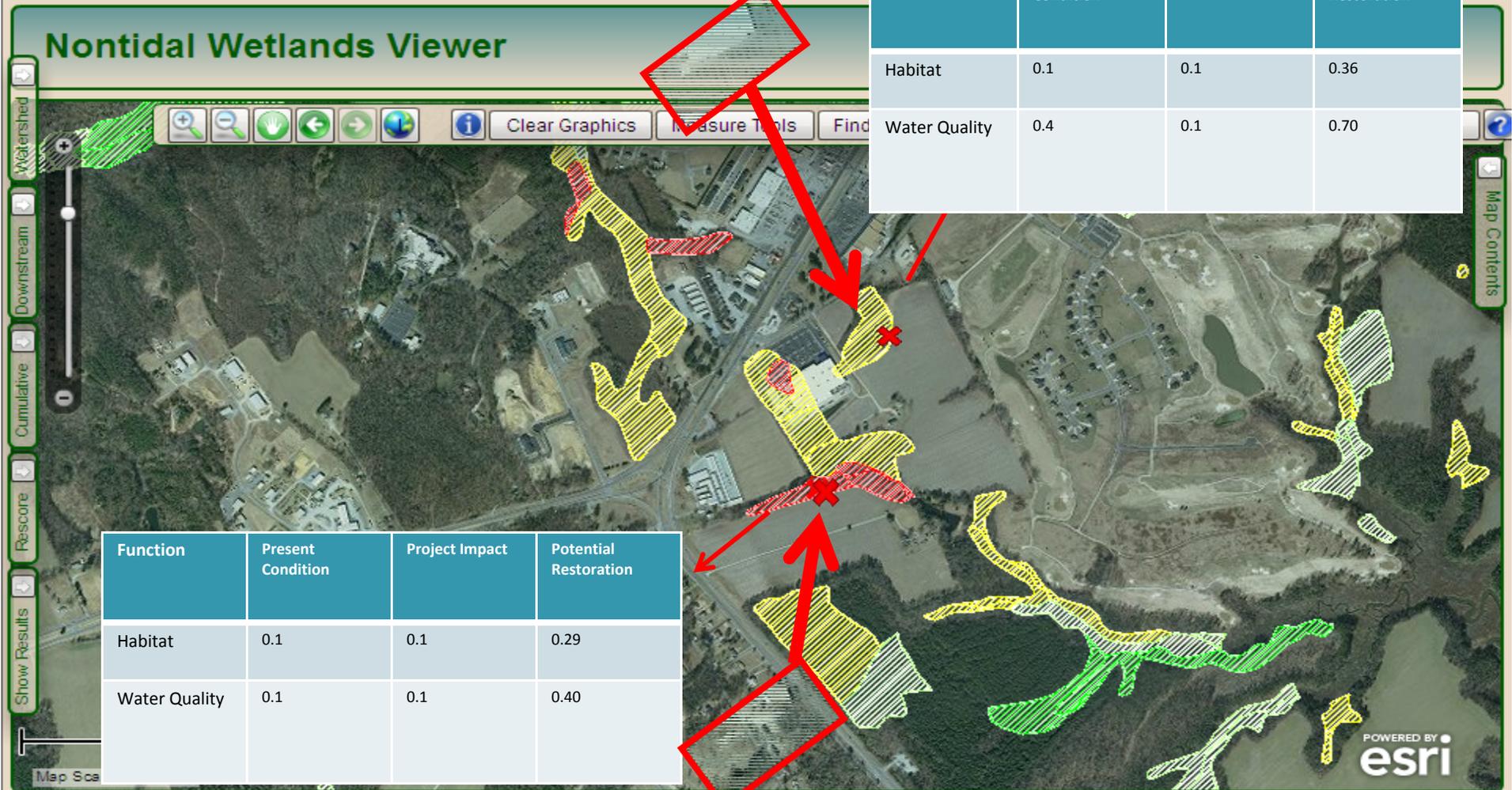
- NPDES Facilities
- NWI Habitat Condition  
Transparency:
- NWI WQ Condition  
Transparency:
- Va Tech Preservation Sites  
Transparency:
- Impaired Water  
Transparency:
- Conservation Lands  
Transparency:
- VEVA  
Transparency:
- 2006 Condensed Land Cover  
Transparency:
- Soils  
Transparency:
- Street Map  
Transparency:

# Alternative Analysis

## Nontidal Wetlands Viewer

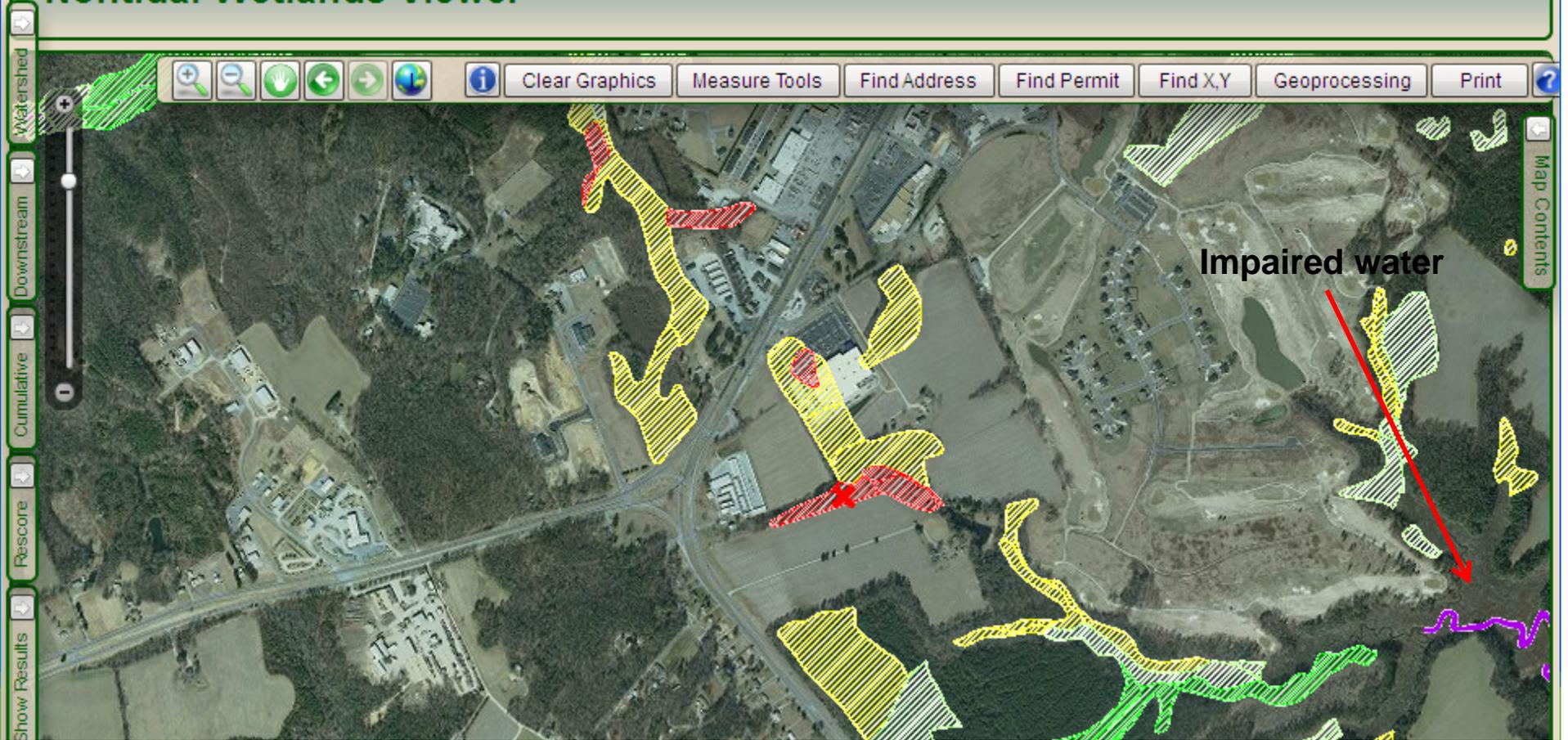
Function	Present Condition	Project Impact	Potential Restoration
Habitat	0.1	0.1	0.36
Water Quality	0.4	0.1	0.70

Function	Present Condition	Project Impact	Potential Restoration
Habitat	0.1	0.1	0.29
Water Quality	0.1	0.1	0.40



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# Nontidal Wetlands Viewer



# Identify permits in the area

The screenshot displays the Nontidal Wetlands Viewer interface. The main map shows a watershed with various wetland types and scores. The Identify Results window is open, showing details for a selected permit.

**Nontidal Wetlands Viewer - Map Data:**

HUC	Ave Habitat Score	Ave WQ Score	% Impaired Waters
0208010403	0.76	0.63	10.07
0208010504	0.76	0.65	0.11
0208010404	0.79	0.69	6.69
0208010505	0.77	0.73	1.19
0208010506	0.79	0.73	3.4
0208010202	0.79	0.75	0.95

**Identify Results Window:**

- Selection # 1
- Permit Number: WP4-05-0070
- SPGP Type:
- Activity Type: Commercial
- Project Description: Construction of a Lowes and associated parking at intersection of U.S. Route 17 and White Oak Drive in Tappahannock, Virginia.
- Receiving Stream: Piscataway Creek, UT
- Date Effective: Mar 22 2005 12:00AM
- Nontidal Emergent Permitted: 0.31
- Nontidal Scrub Permitted: 0.15
- Nontidal Forest Permitted: 1.2
- Nontidal Nonvegetated Permitted: 0
- Nontidal Open Water Permitted: 0
- Isolated Emergent Permitted: 0
- Isolated Scrub Permitted: 0
- Isolated Forest Permitted: 0
- Isolated Nonvegetated Permitted: 0

**Map Legend:**

- NWI Emergent
- NWI Habitat Condition
- NWI WQ Condition
- Va Tech Preservation Sites
- Impaired Water

Compare scores independent or relative to each HUC

# Uses of Wetland Data Viewer

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## 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 landuse planning on a local level

# Long Term Goals

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- 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....



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