

# Forging the Link between Wetland Monitoring & Assessment and “Traditional” Water Monitoring Programs

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VA DEQ

# Why Wetland Monitoring & Assessment?

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- EPA's national effort to incorporate wetland monitoring and assessment into state water quality monitoring programs
- Signatory to the Chesapeake Bay 2000 Agreement
- VA statutory requirement for no net loss of wetland acreage and function through permitted impacts
- Key Performance Indicator in DEQ's Strategic Plan

# Overall Wetland Monitoring & Assessment Strategy

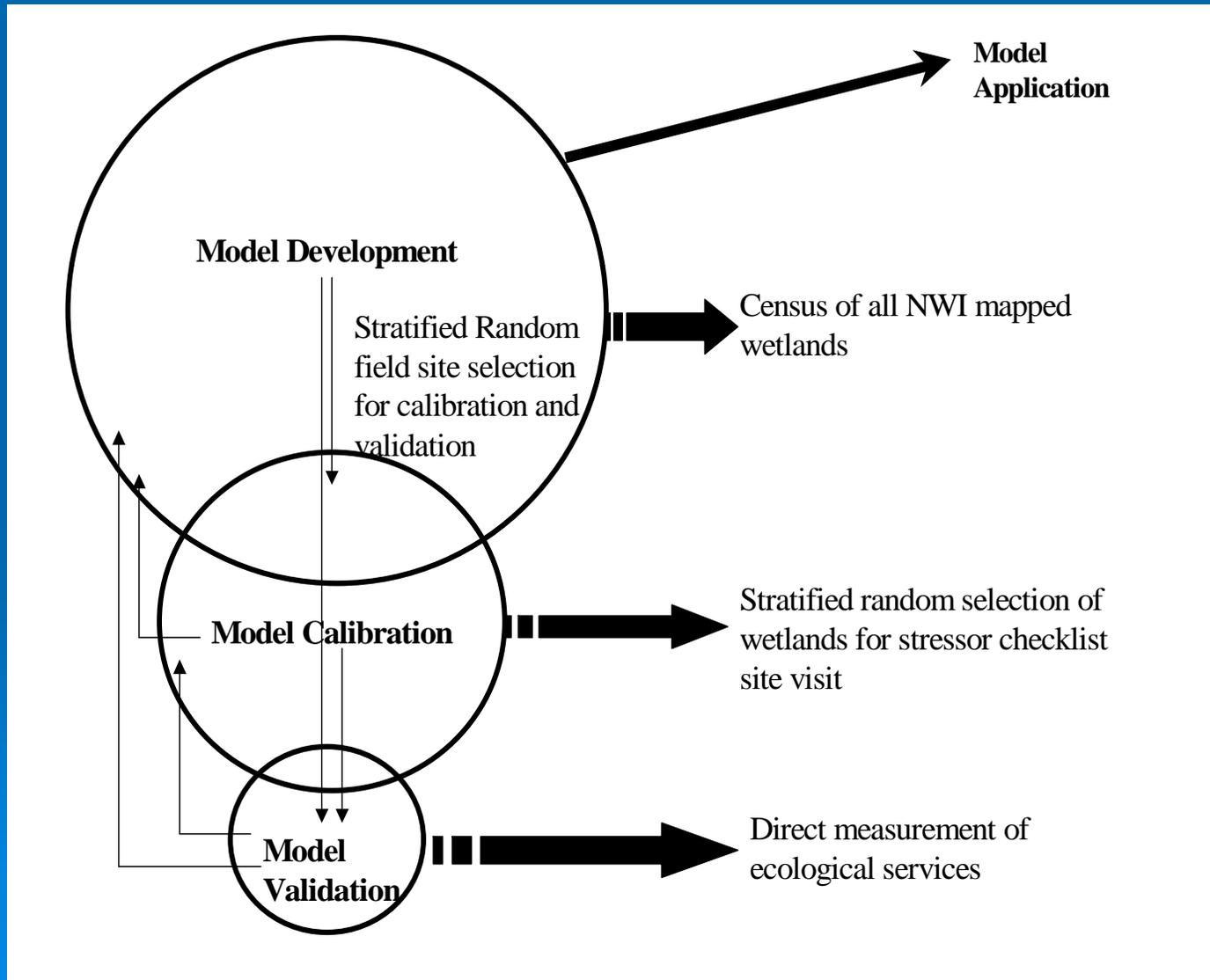
- Establish baseline conditions in various broad contexts (i.e., land use, watershed, and wetland type) to guide:
  - management decisions regarding restoration efforts
  - programmatic compensatory mitigation
  - integration with overall water quality standards
- Strategy becomes an integral part of VA's comprehensive water quality monitoring program strategy.

# Virginia Approach

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- A 3-level method
- Comprehensive survey
- Not based on reference wetlands
- Landscape emphasis
- Focused on ecosystem service impacts

# Wetland Monitoring & Assessment Design



# Level 1

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- GIS protocol to predict probable level of ecosystem service
- Assesses every NWI-mapped wetland (vegetated polygons)
- Estimates probable stressor level
- Based on remotely sensed information

**70 pages of GIS code**

**195,794 wetland polygons**

**1 minute 49 seconds/wetland**

**247 days (24/7) of computer run time**

# Level 2

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- On-site stressor inventory
- Calibrates the level 1 model
- Very rapid (usually)
- Uses Handheld PDAs for data collection

**2126 sites visited**

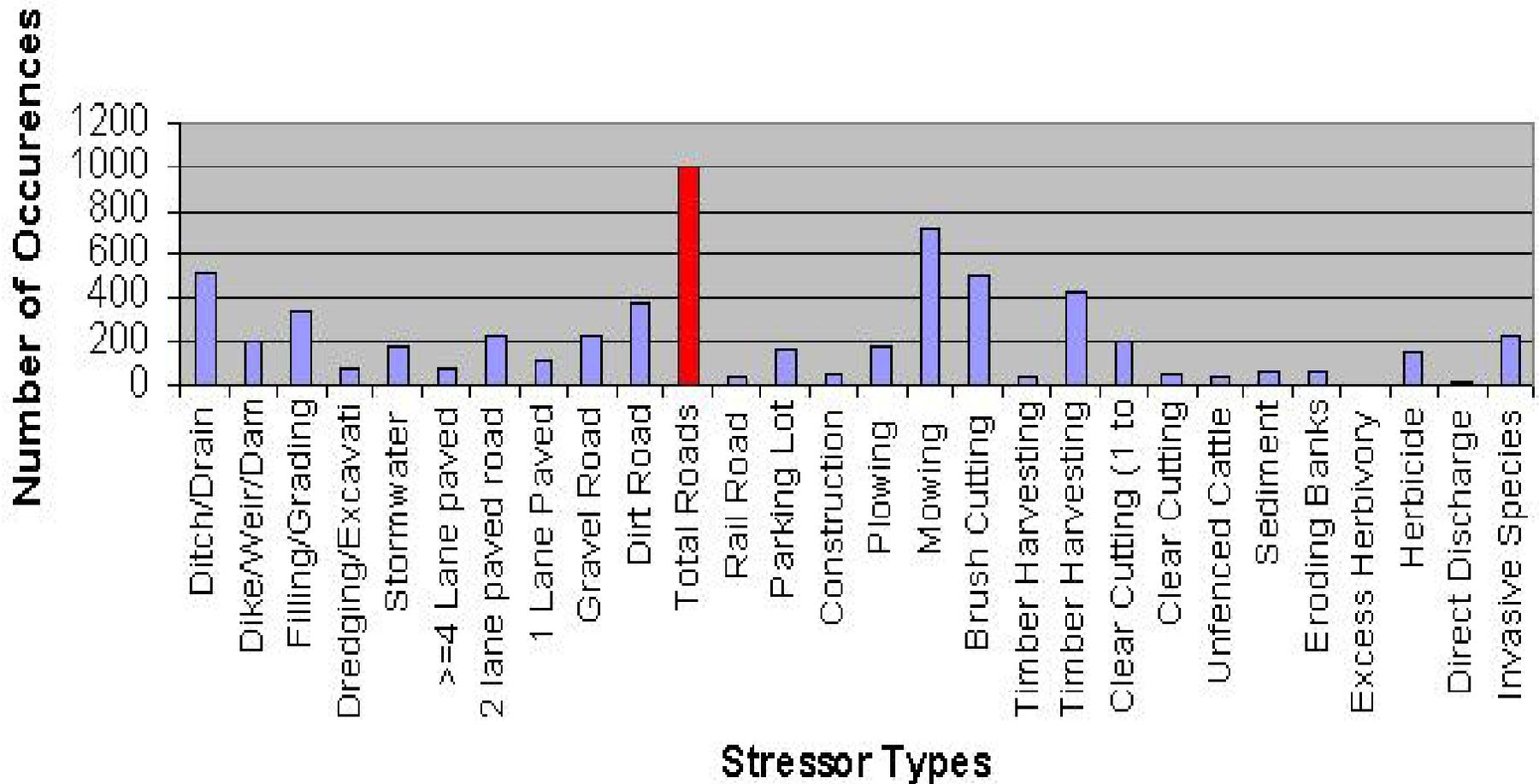
**Average time on site: 18 min 28 sec**

**Max on-site time: 3hr 17 min 56 sec**

**Min on-site time: 1 min 6 sec**

# Types of Stressors

## Stressors in the Coastal Plain

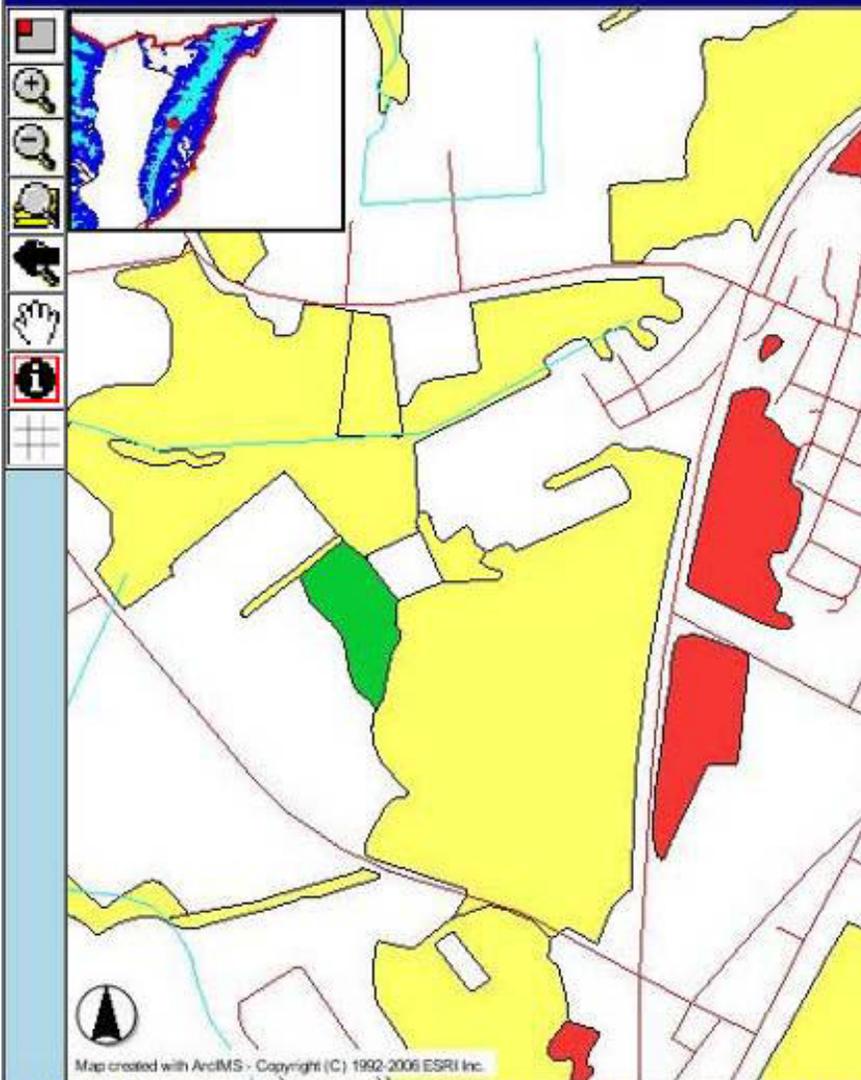


# Level 3

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- On-site assessment of ecosystem service level
- Validates the level 1 model
- Habitat: Birds and amphibians (frog loggers), Plants (FQAI)
- Water quality Flow path budgets

## Wetlands Data Viewer



<http://rmapnt52.wetlan.vims.edu/servlet/com.esri.esrimap.Esrimap?ServiceName=w...>  
File Edit View Favorites Tools Help

### Data for this wetland

Type (NWI classification): PFO4B

Size (hectares): 8.83

Final habitat score:	0.26	<b>severely stressed</b>
Final water quality score:	0.19	<b>severely stressed</b>
Habitat restoration potential:	30%	
Water quality restoration potential:	17%	
Average habitat score for HUC:	0.615	
(Min. 0.23, Max. 0.88)		
Average water quality score for HUC:	0.795	
(Min. 0.18, Max. 1)		

Wetlands Data Viewer - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://rmapnt52.wetlan.vims.edu/wetlandsdv/viewer.htm>

<http://rmapnt52.wetlan.vims.edu/servlet/com.esri.esrimap.Esrimap?ServiceName...>

File Edit View Favorites Tools Help

## Wetlan

Map created with ArcIMS - Copyright (C) 1992-2006 ESRI Inc.

### Data for this wetland

Type (NWI classification): PFO4B

Size (hectares): 8.83

Final habitat score: 0.26 **severely stressed**

Final water quality score: 0.19 **severely stressed**

Percent landuse:

	<u>Habitat</u> (within buffer)	<u>Water quality</u> (within drainage)
Natural	13%	16%
Row crops	26%	17%
Pasture	29%	49%
Developed	31%	18%

Average habitat score for HUC: 0.615  
(Min. 0.23, Max. 0.88)

Average water quality score for HUC: 0.795  
(Min. 0.18, Max. 1)

Microsoft PowerPoint - [mawwg11-05.ppt]

Wetlands Data Viewer - Netscape

File Edit View Go Bookmarks Tools Window Help

http://rmapnt52.wetlan.vims.edu/wetlandsdy/viewer.htm

Netscape Enter Search Terms Search Highlight Pop-Ups Blocked: 155 Form Fill Clear Browser History News Email Weather

### Wetlands Data Viewer

Legend

Study Area

Map created with ArcIMS - Copyright (C) 1992-2006 ESRI Inc.

Identify How to use Contact us Return to GIS Map Tools

Map: 427311.45 , 4153783.56 -- Image: 637 , 462 -- ScaleFactor: 1.4625944038882093

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## Previous Permits

**Wetlands Impacts and  
Wetland Condition  
Modification due to  
previous permit  
activity**

**Acres impacted = 3.2**

**Condition  
modification**

**2002 = 0.83**

**2003 = 0.79**

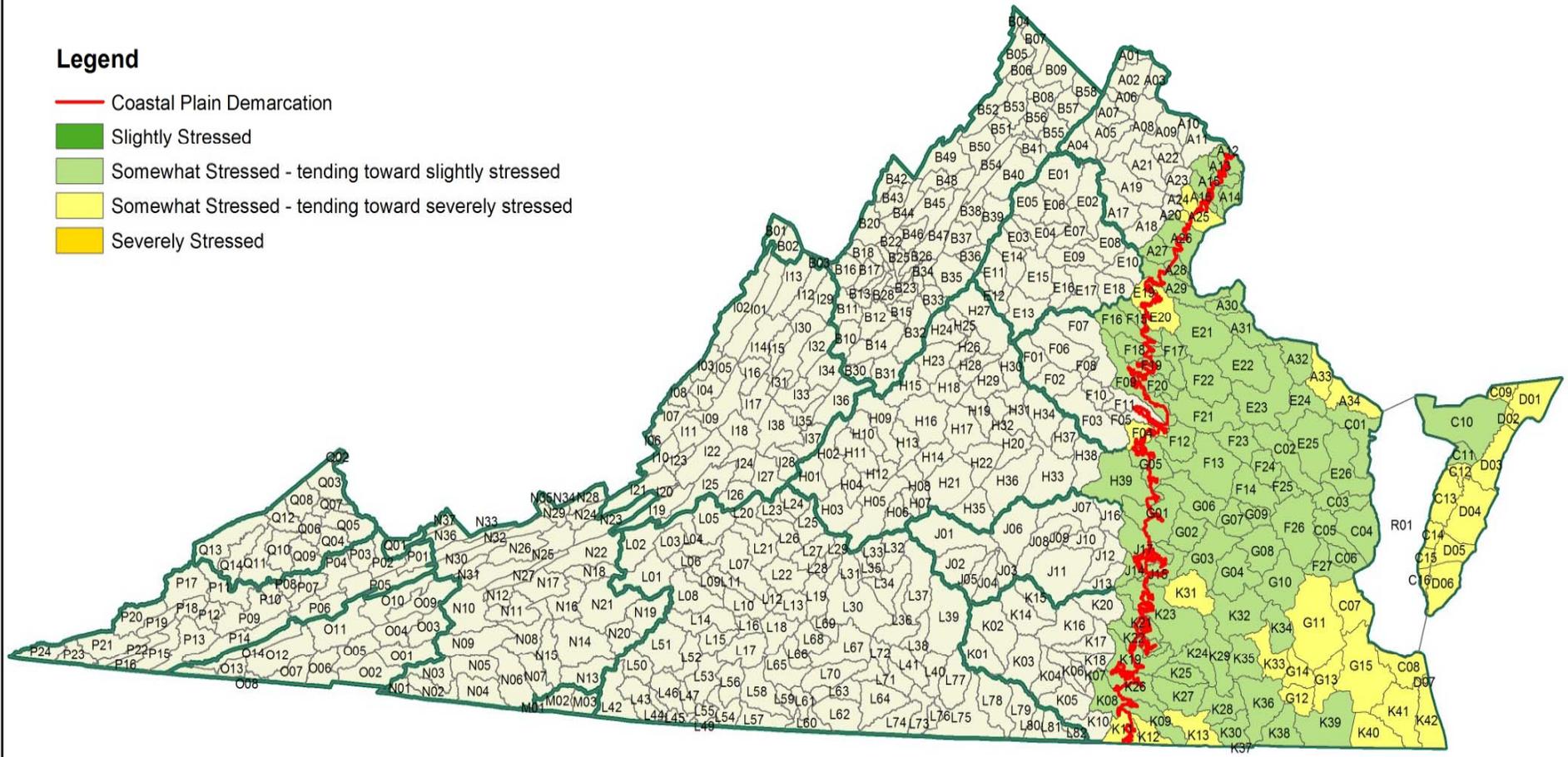
**2004 = 0.65**

# Preliminary Results of Wetland Condition (Coastal Plain only)

# Wetland Condition Assessment - Water Quality

## Legend

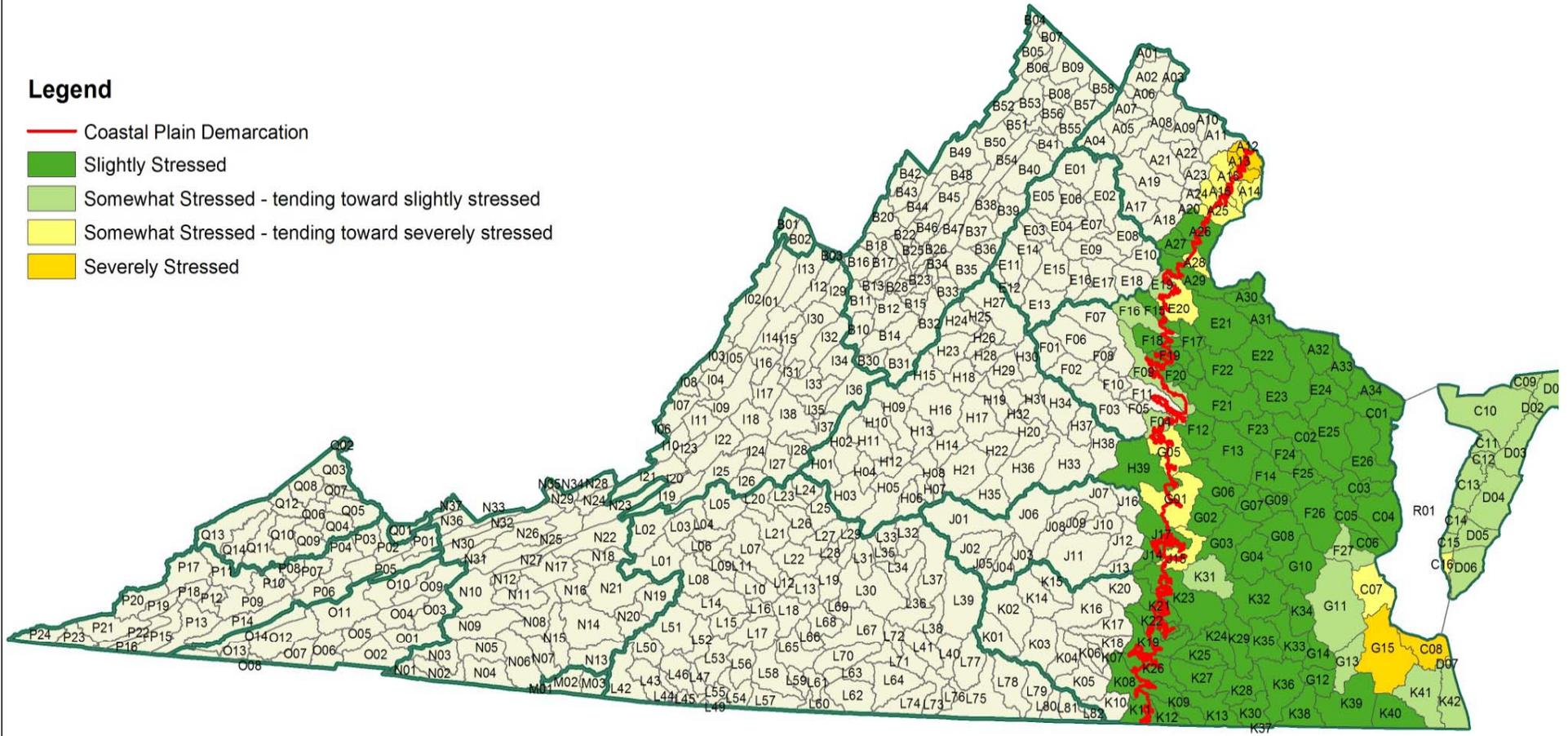
- Coastal Plain Demarcation
- Slightly Stressed
- Somewhat Stressed - tending toward slightly stressed
- Somewhat Stressed - tending toward severely stressed
- Severely Stressed



# Wetland Condition Assessment - Habitat

## Legend

- Coastal Plain Demarcation
- Slightly Stressed
- Somewhat Stressed - tending toward slightly stressed
- Somewhat Stressed - tending toward severely stressed
- Severely Stressed



# Using Wetland M&A Data in a Regulatory Context

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- Evaluate proposed wetland impacts during permit review as part of a regulatory program
  - How many wetland impacts have already been permitted in the watershed?
  - What is the relative quality of remaining wetlands in the watershed?
  - Will permitted impacts degrade the remaining wetland's quality?
  - How is the required compensatory mitigation performing in relation to those impacted functions?
  - Should compensation ratios be adjusted to assure that we are meeting a minimum of no net loss?

# Cumulative Impacts

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- Evaluate cumulative wetland impacts and restoration efforts in watersheds relative to ambient ecological conditions
  - May result in identifying exceptional value wetlands with different permitting requirements
  - Can be used to target degraded wetlands for restoration projects.
- Can direct where compensation should be located (watershed).

# Wetlands & Water Quality Standards



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# Existing Designated Uses of State Waters

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- Wildlife Uses
- Aquatic Life Uses
- Fish Consumption Uses
- Shellfish Consumption Uses
- Recreation/Swimming Uses
- Public Water Supply Uses

# Quality Standards for Wetlands

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- Evaluate the 6 designated uses for applicability to wetland conditions.
- Consider other designated uses of wetlands.
- Goal to develop wetland quality standards as narrative use criteria.
- Evaluate other indicators to assess whether a particular wetland is meeting the standard.

# “Don’t Get All ‘Mathy’!”

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- Most wetlands function to naturally improve water quality.
- Some impaired water criteria naturally occur in wetlands
- Example: Bottomland hardwood swamps
  - Low dissolved oxygen (saturated hydric soils and decaying organics)
  - Low pH (acidic from tannic acids)
- Example: Riverine wetlands
  - High nutrient/sediment loads from surrounding land uses

# VA Management Goal

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The overarching goal of our M & A strategy:

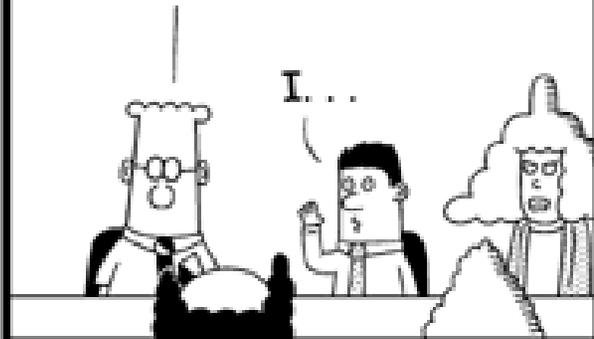
- Develop a long-term implementation plan for a wetland monitoring and assessment program that protects the physical, chemical, and biological integrity of the Commonwealth's water resources;
- Allow for both general reporting on status/trends, and provide for more intense analysis of select watersheds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

# Acknowledgements

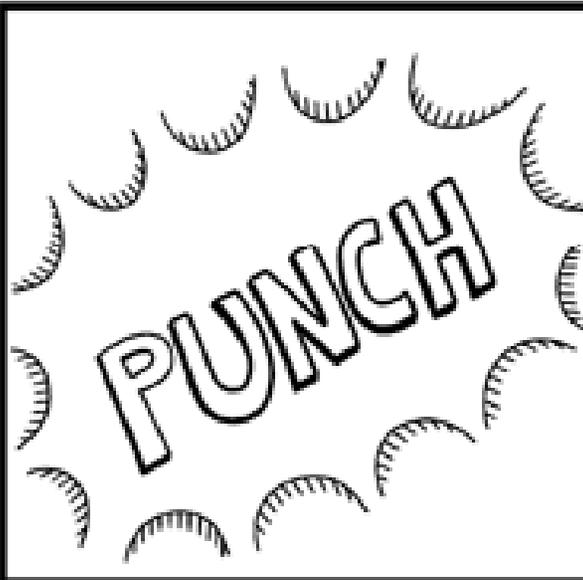
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- USEPA Region III – Regina Poeske
- USEPA HQ – Mike Scozzafava
- USEPA Corvallis – Mary Kentula and Rich Sumner
- Mid-Atlantic Wetland Workgroup (MAWWG)
- Virginia Institute of Marine Science - Center for Coastal Resource Management (our collaborative partner)
  - Carl Hershner
  - Kirk Havens
  - David Stanhope
  - Marcia Berman

PHEW. THIS HAS BEEN  
A LONG MEETING. DOES  
ANYONE HAVE ANY  
OTHER ISSUES?

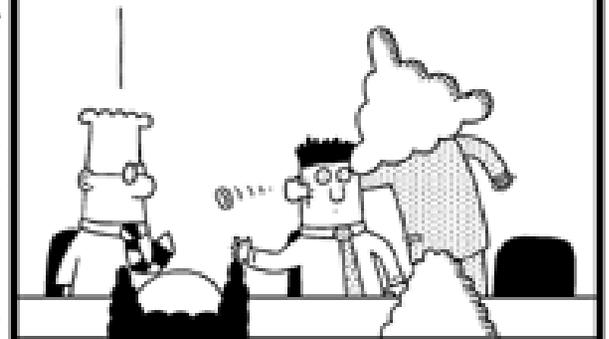


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ADJOURN.



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# How'd we get here, and where're we going...?



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