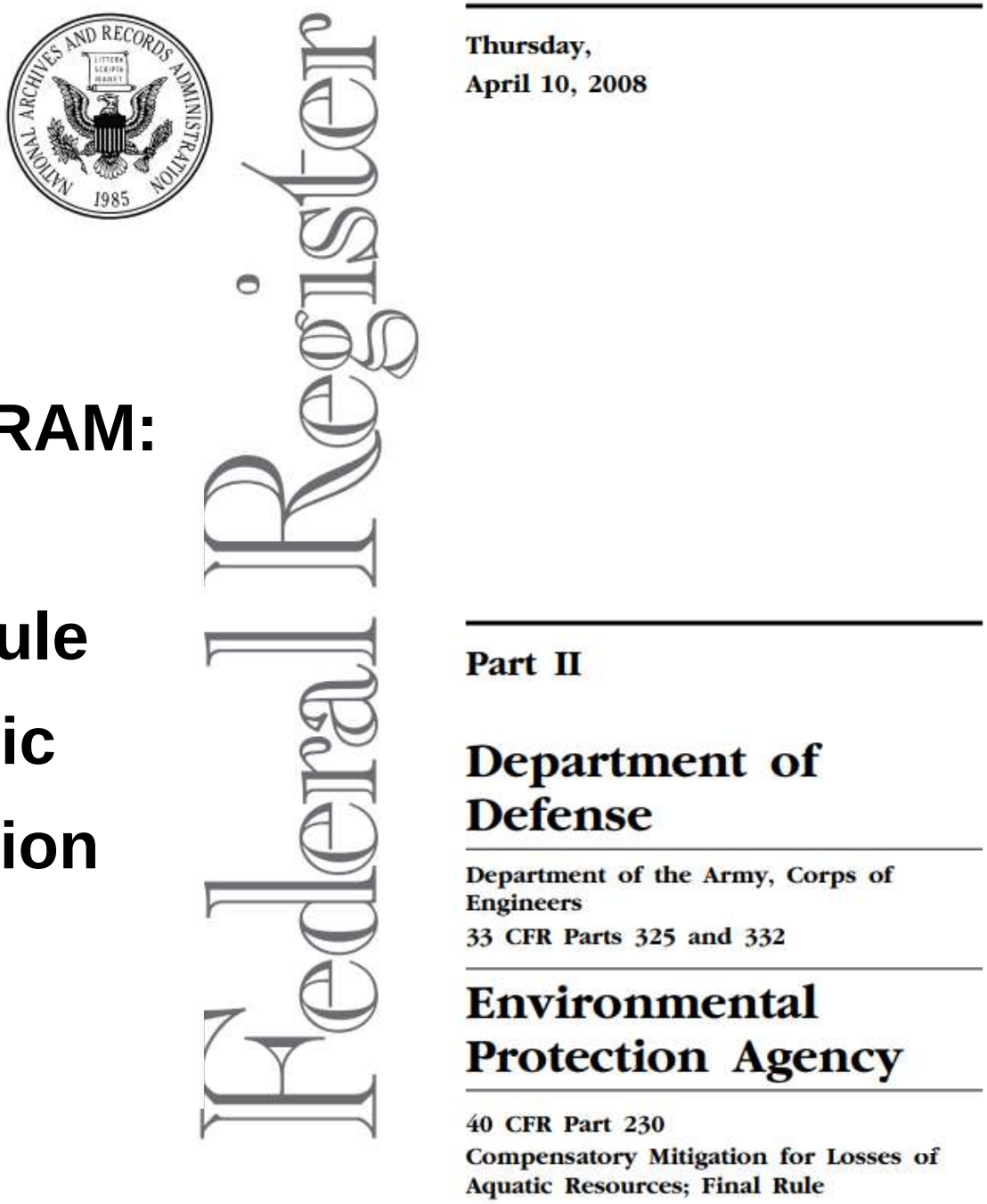
Introduction to WVWRAM:
WV Wetland Rapid Assessment Method

Elizabeth Byers
Jack Hopkins
John Wirts
Brian Bridgewater

Catalyst for developing WVWRAM:

2008 Mitigation Rule

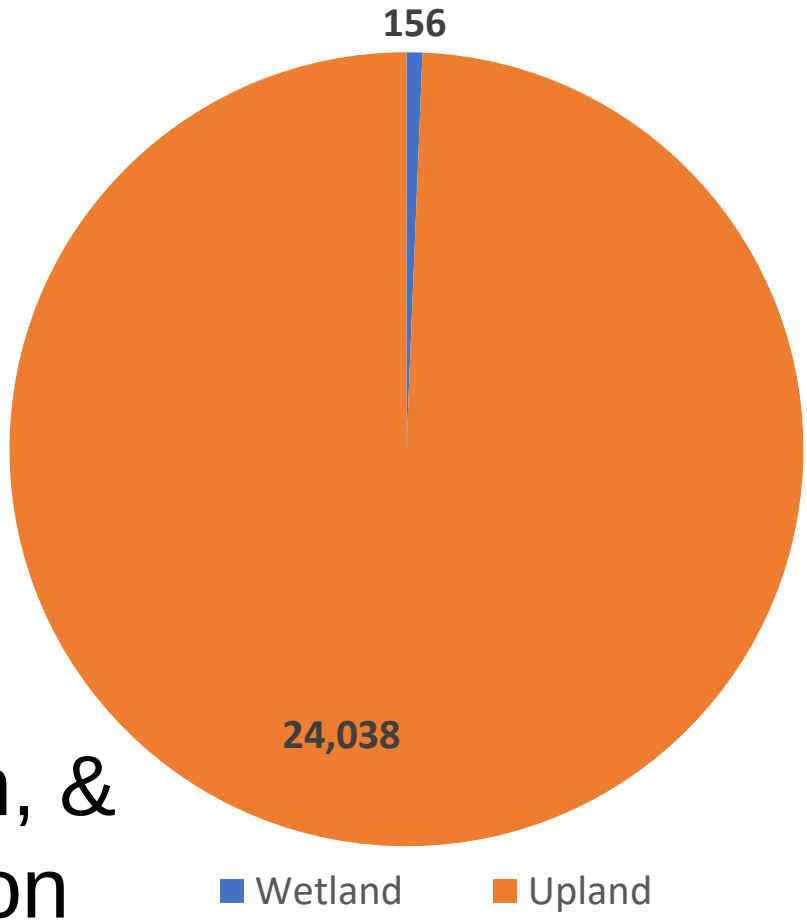
- **Evaluate aquatic resource function**
- **"No Net Loss"**



Regulatory Protection of Wetlands

- Clean Water Act 1972
  - 2008 Mitigation Rule
- WV Water Pollution Control Act

Total Wetland Area in WV (in square miles)



avoidance, minimization, & compensation

Financial support from:

EPA United States Environmental Protection Agency

Environmental Topics | Laws & Regulations | About EPA | Search EPA.gov

CONTACT US SHARE

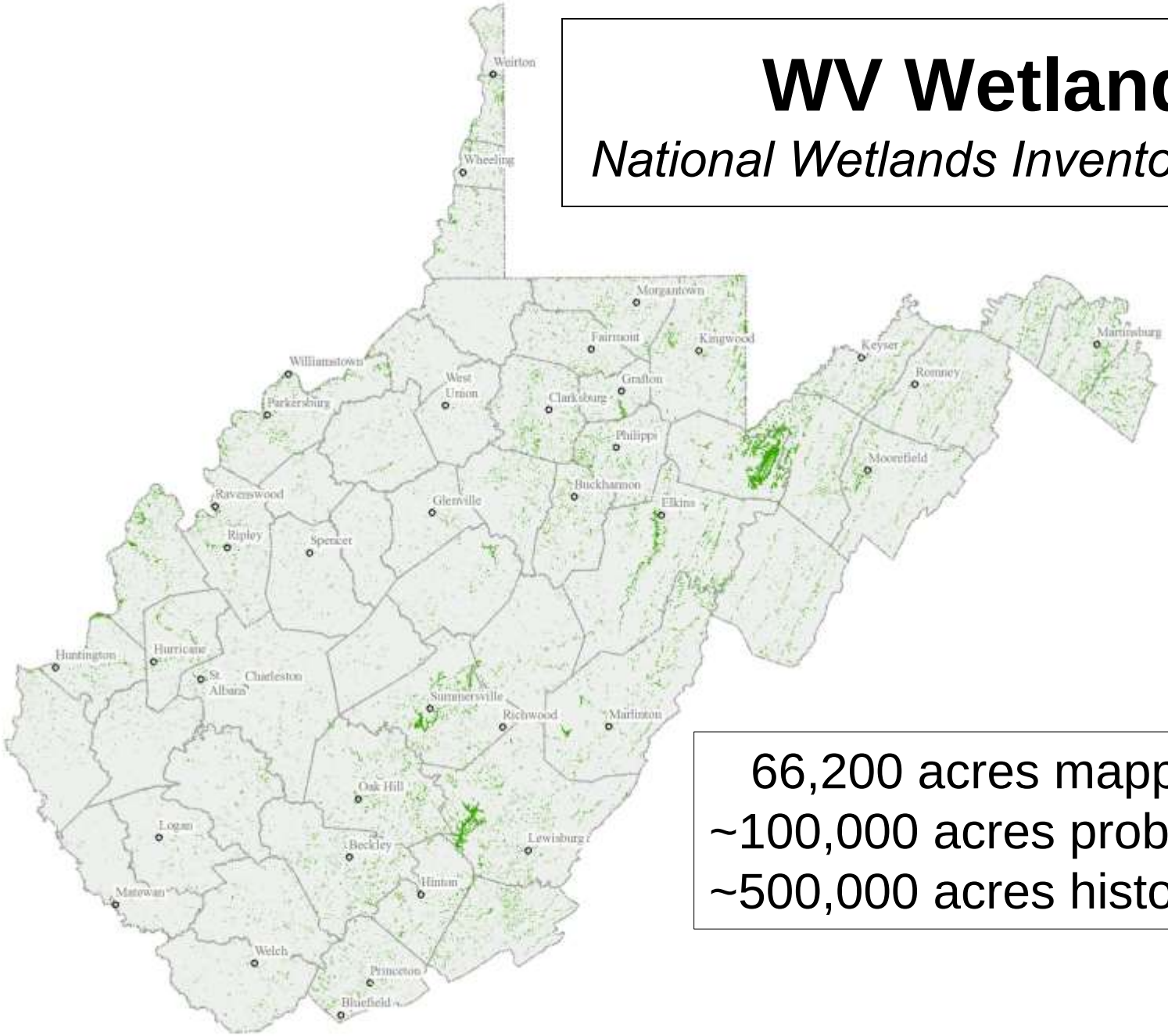
Wetlands

- Wetlands Protection and Restoration Home
- Learn About Wetlands
  - Types
  - Functions

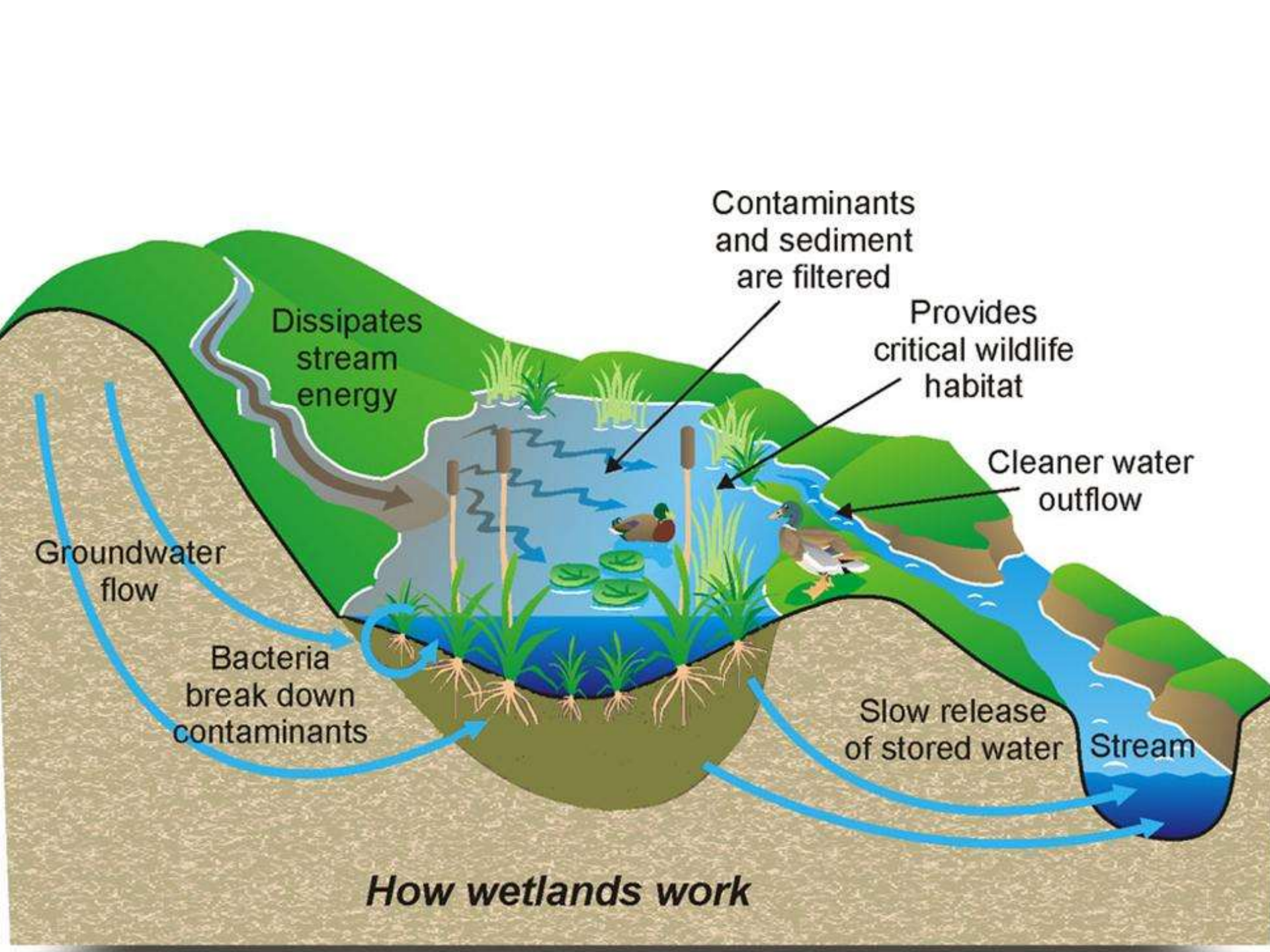
Wetland Program Development Grants and EPA Wetlands Grant Coordinators

WV Wetlands

National Wetlands Inventory (1980's)

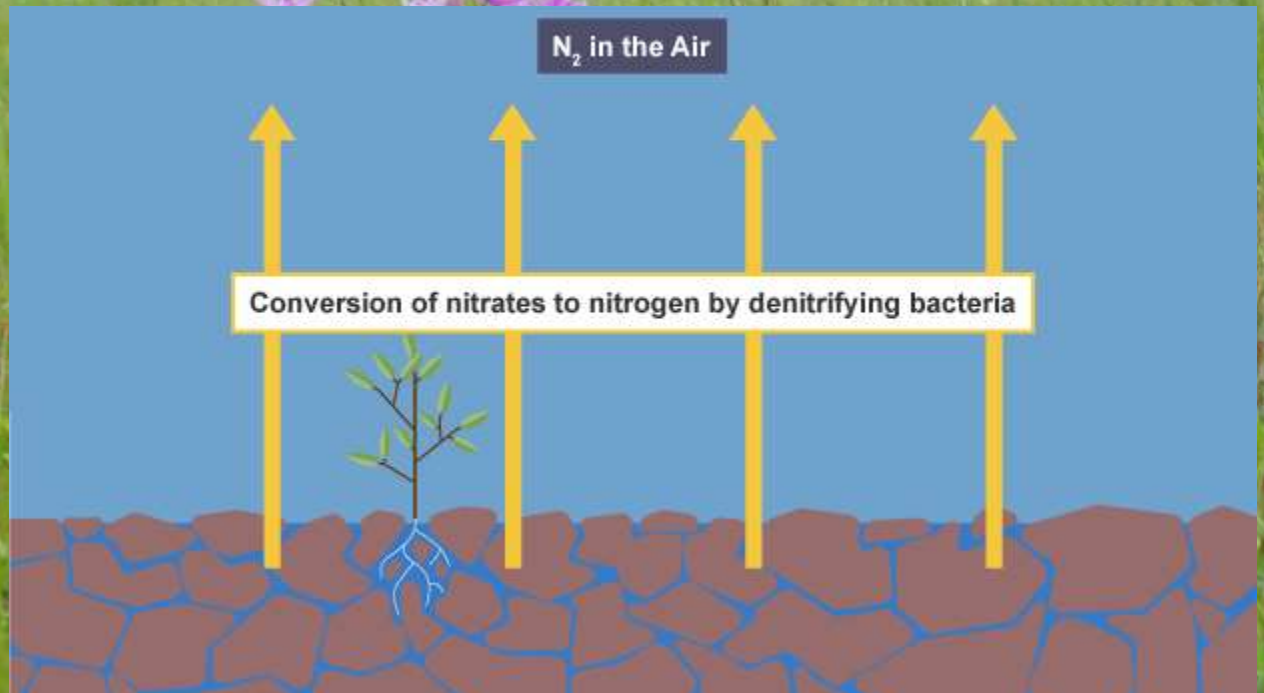


66,200 acres mapped
~100,000 acres probably exist
~500,000 acres historically

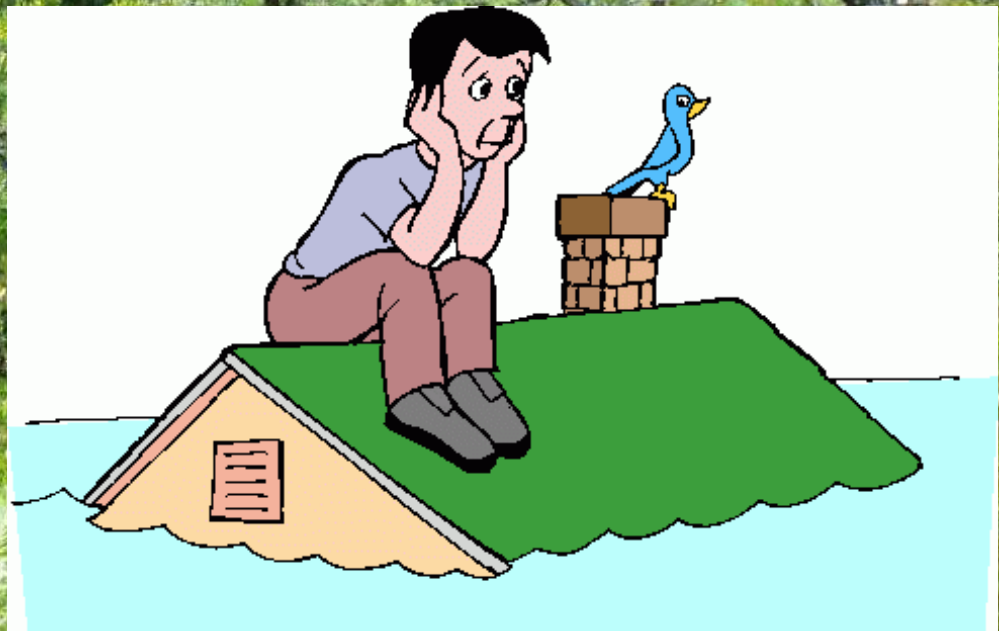

Contaminants and sediment are filtered
Dissipates stream energy
Provides critical wildlife habitat
Cleaner water outflow
Groundwater flow
Bacteria break down contaminants
Slow release of stored water
Stream
How wetlands work

Fish & wildlife, rich biodiversity, productivity

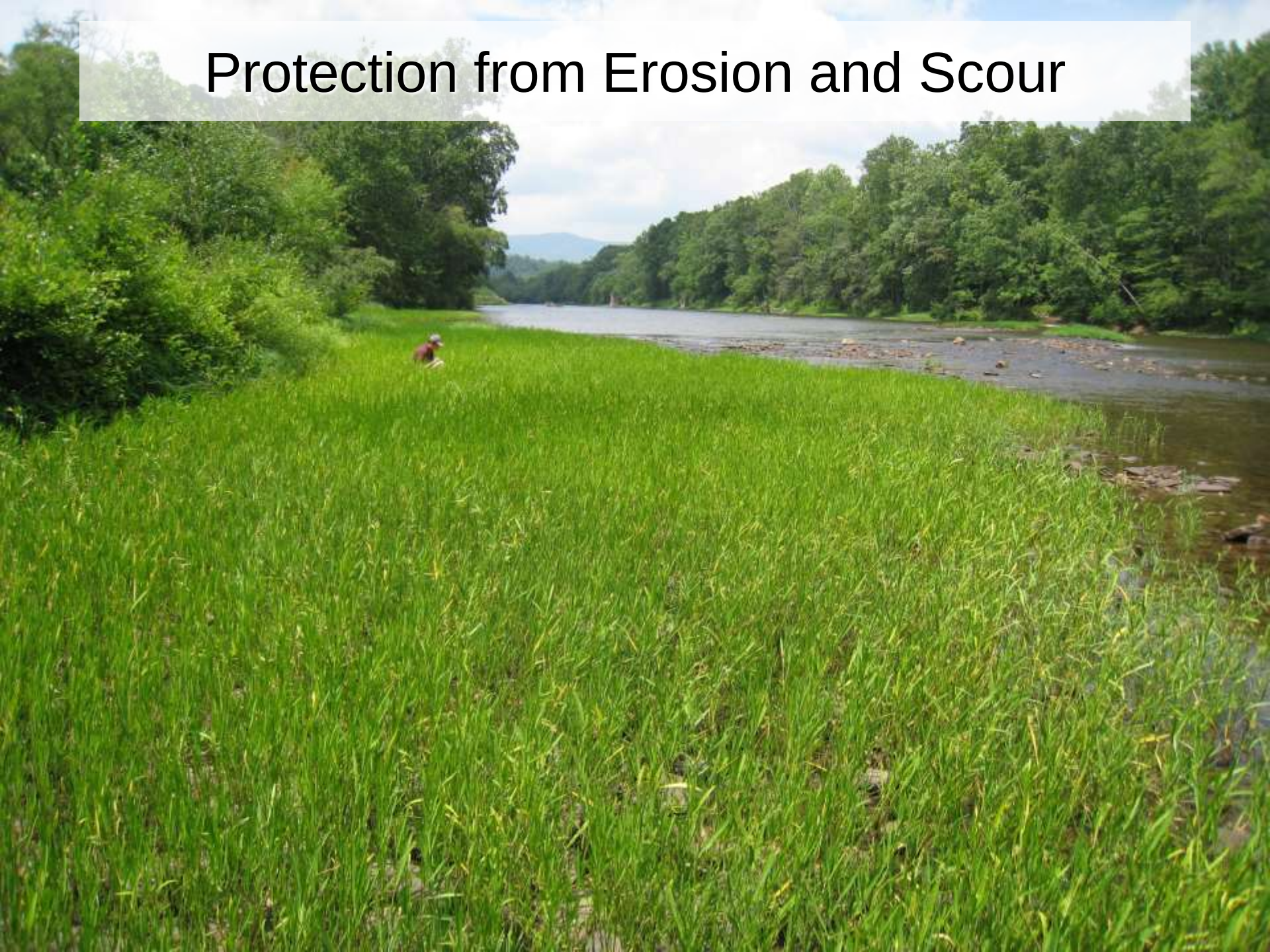
Kidneys of the Landscape



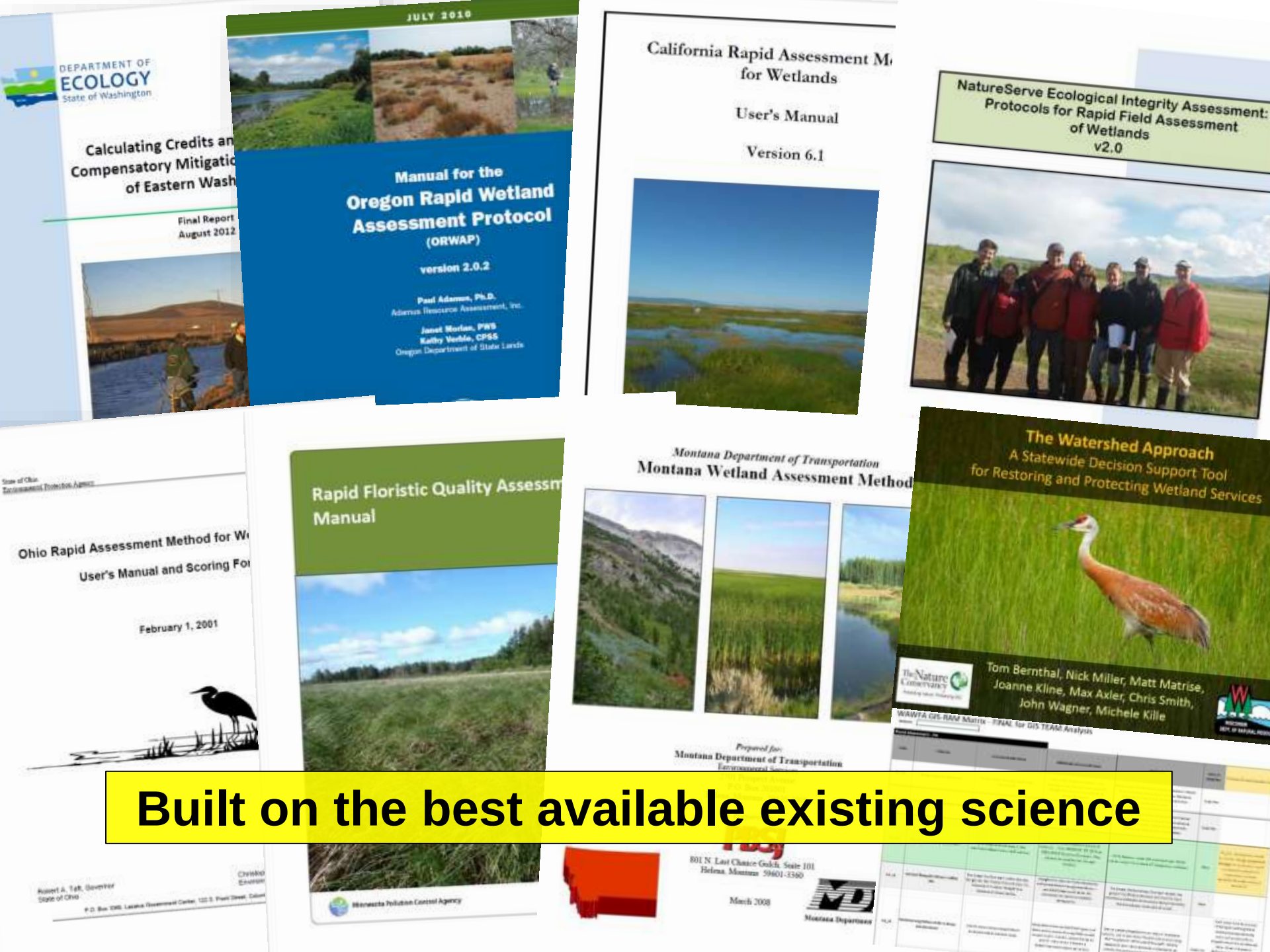
Stabilize Water Supply



Protection from Erosion and Scour



2015-16 Develop tool for functional assessment of wetlands



Built on the best available existing science

…DEP looked only at tested, validated methods & metrics

2017-18 Field-testing: 69 stakeholders from 22 organizations

2019 Training:

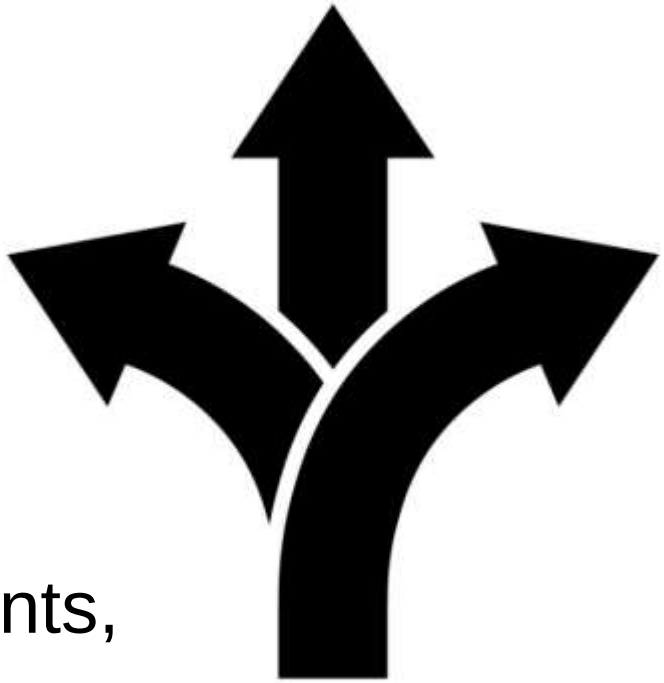
112 stakeholders from 40 organizations

2020

public notice
and **moving**
toward agency
adoption

Ecological integrity & wildlife habitat

Water quality: sediment, nutrients, pollutants



Flood attenuation

3 composite functions

65 metrics in 6 categories (regulatory)

	Intrinsic Potential	Landscape Opportunity	Value to Society
Water Quality	vegetation, soil, hydrology	50 m buffer, contributing watershed	public use, planning
Flood Attenuation	vegetation, soil, hydrology	50 m buffer, contributing watershed	economic risk
Habitat/ Ecological Integrity	vegetation, soil, hydrology	perimeter, 300 m / 1 km buffer, contrib. watershed	investment, public use, access

Roll-up of metrics into stakeholder-requested scores:

- **Regulatory Score: physical, chemical & biological**
- Full function (all metrics)
- State lands acquisition
- Condition assessment

GIS plus rapid field assessment: the best of landscape-level assessment + metrics that must be obtained in the field

+

= **Regulatory score**

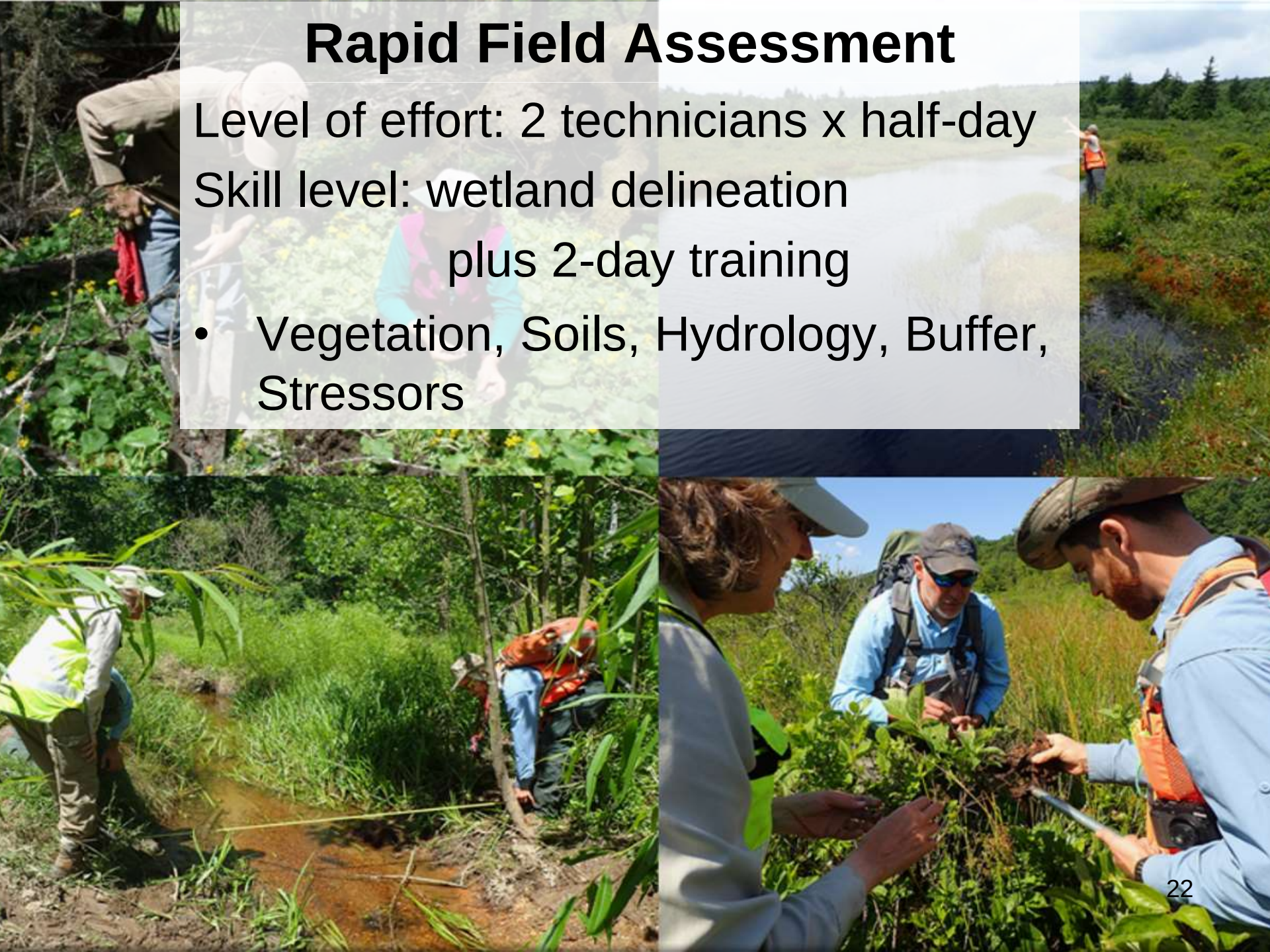
Rapid Field Assessment

Level of effort: 2 technicians x half-day

Skill level: wetland delineation

plus 2-day training

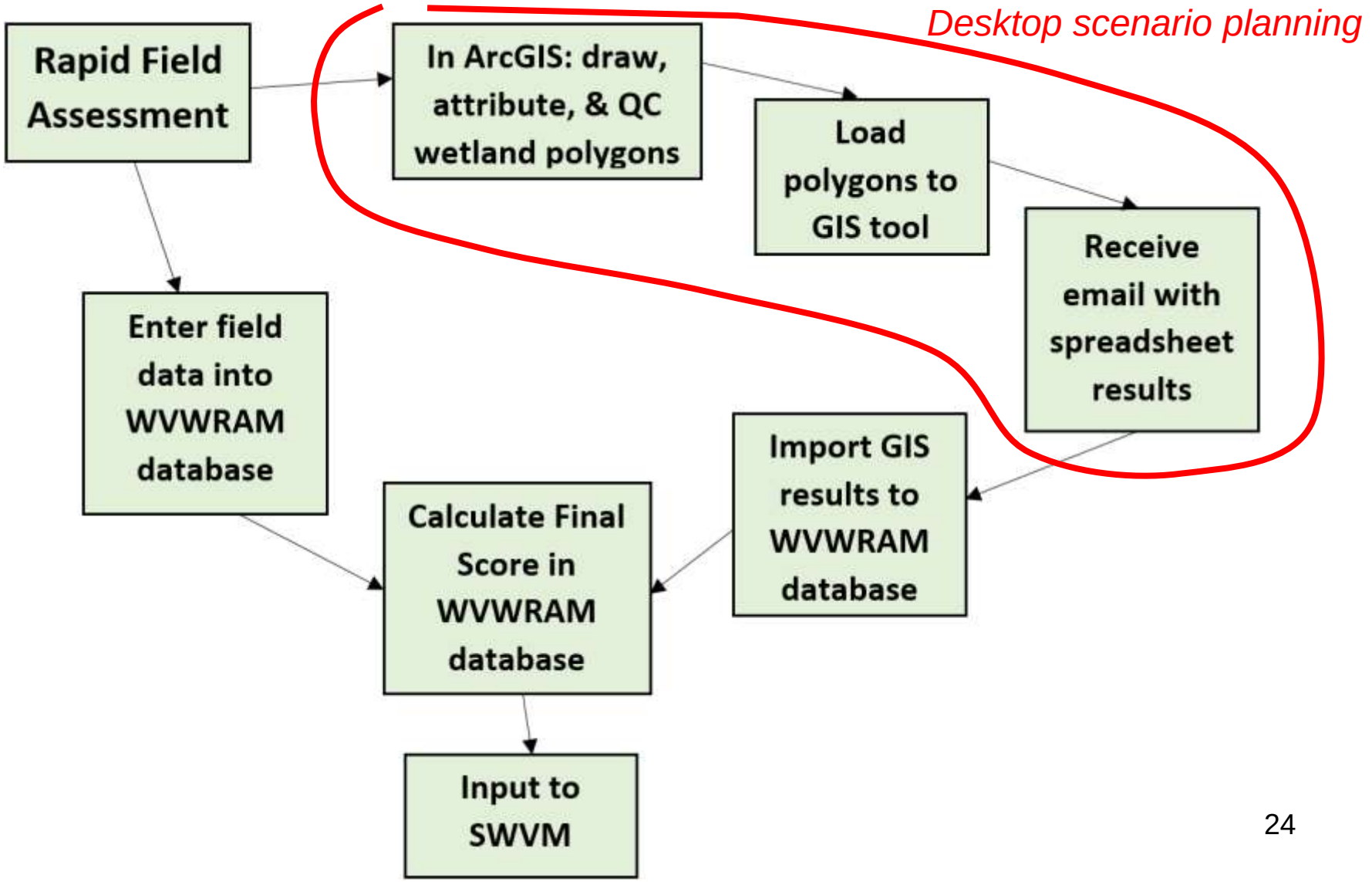
- Vegetation, Soils, Hydrology, Buffer, Stressors



62 statewide GIS datasets

- Biodiversity
- Ecosystems
- Elevation
- Geology
- Hydrology
- Imagery
- Infrastructure
- Jurisdiction
- Landcover
- Landform
- Soils
- Stressors

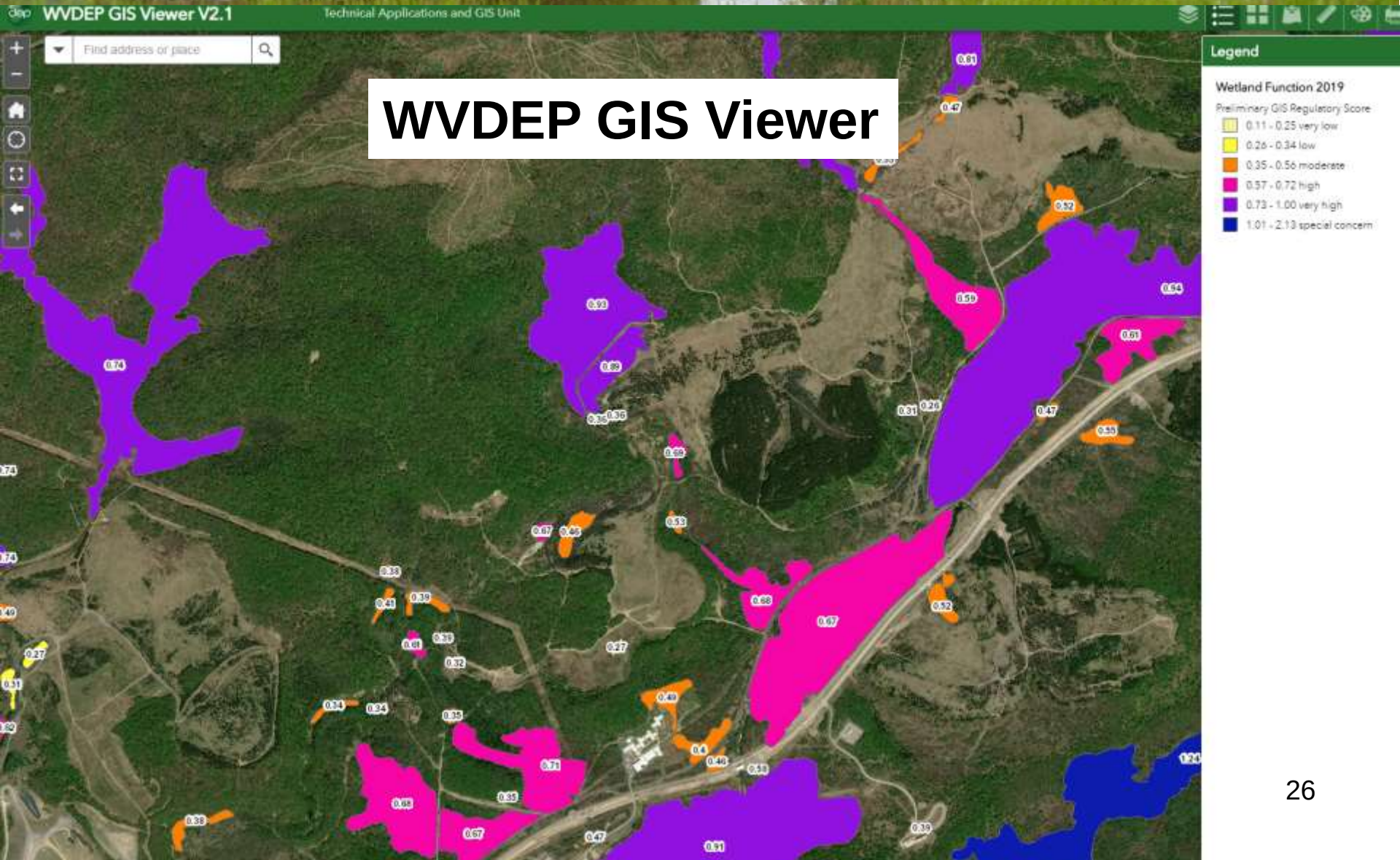
WVWRAM Work Flow



WVWRAM Allows Scenario Planning

- GIS-based desktop planning supported
- Predict mitigation costs of different sites or corridors
- Compare potential mitigation credits at different sites prior to land acquisition

Preliminary GIS Score for every mapped wetland in WV



west virginia department of environmental protection

Watershed Map
Water Quality Monitoring
Biological Monitoring
Water Quality and Impaired Streams
Total Maximum Daily Loads (TMDL)
Reports
Special Studies
Nonpoint Source Program
Water Quality Standards
Algae
Watershed Improvement Branch
Wetland Assessment
WVWRAM

WVWRAM

The Watershed Assessment Branch of DEP has developed a standardized method for rapidly assessing some of the important natural functions of all types of wetlands present in West Virginia. It is called the West Virginia Wetland Rapid Assessment Method (WVWRAM). WVWRAM uses on-site observations and off-site spatial data. This is a regulatory assessment tool for agency staff and environmental professionals. It requires a knowledge of Geographic Information Systems (GIS), wetland soils, plants, hydrology, and stressors.

WVWRAM has two components: (1) GIS tool for preliminary scoring and off-site metrics, and (2) rapid field method for final scoring. Both components are required for regulatory use, but the GIS tool can be used as a stand-alone for planning purposes.

Download the WVWRAM Datasheets

Download the WVWRAM User Manual

Download the WVWRAM Reference Manual

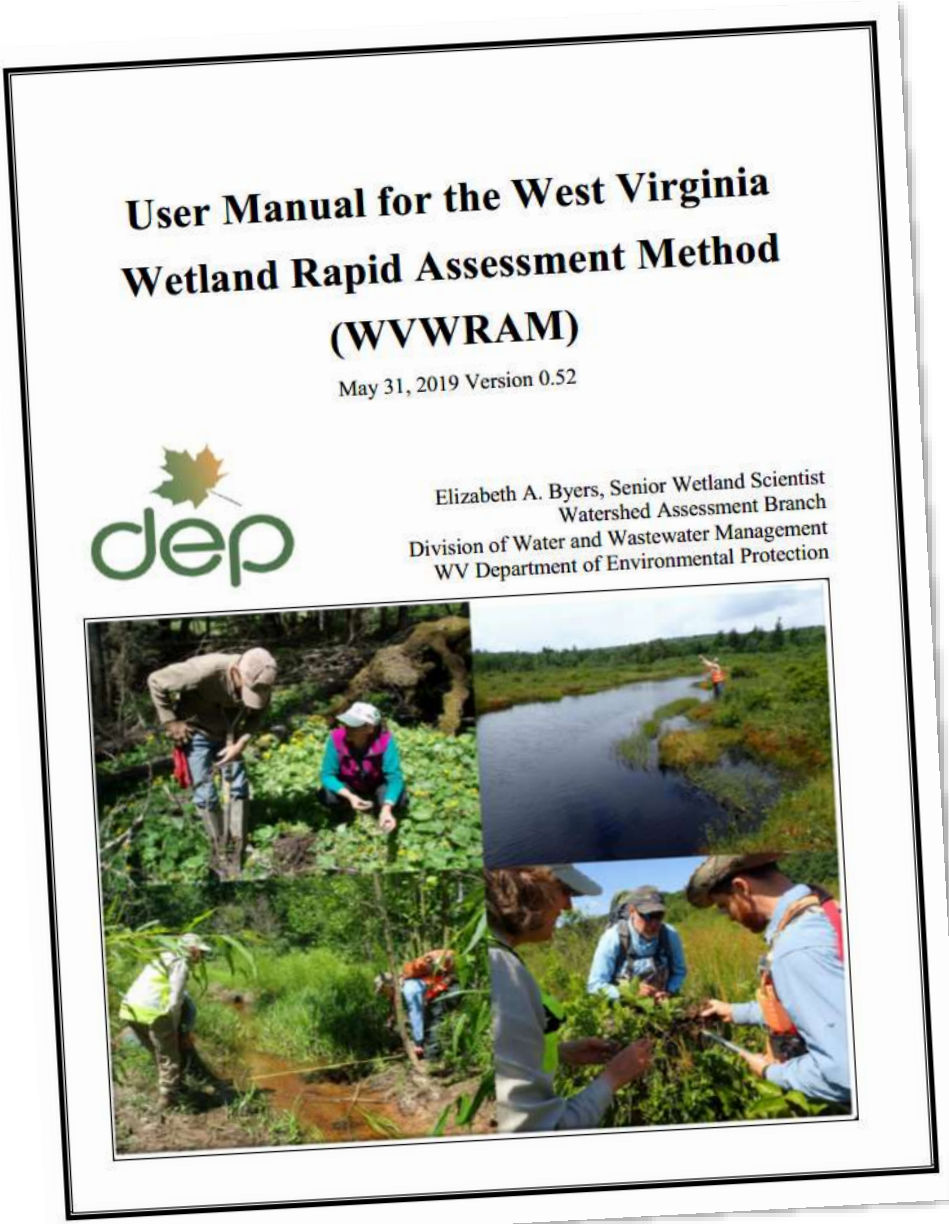
View information about our WVWRAM Trainings 2019

Download the WVWRAM Database

WVWRAM GIS Tool Website

Type “WVWRAM” into your search engine

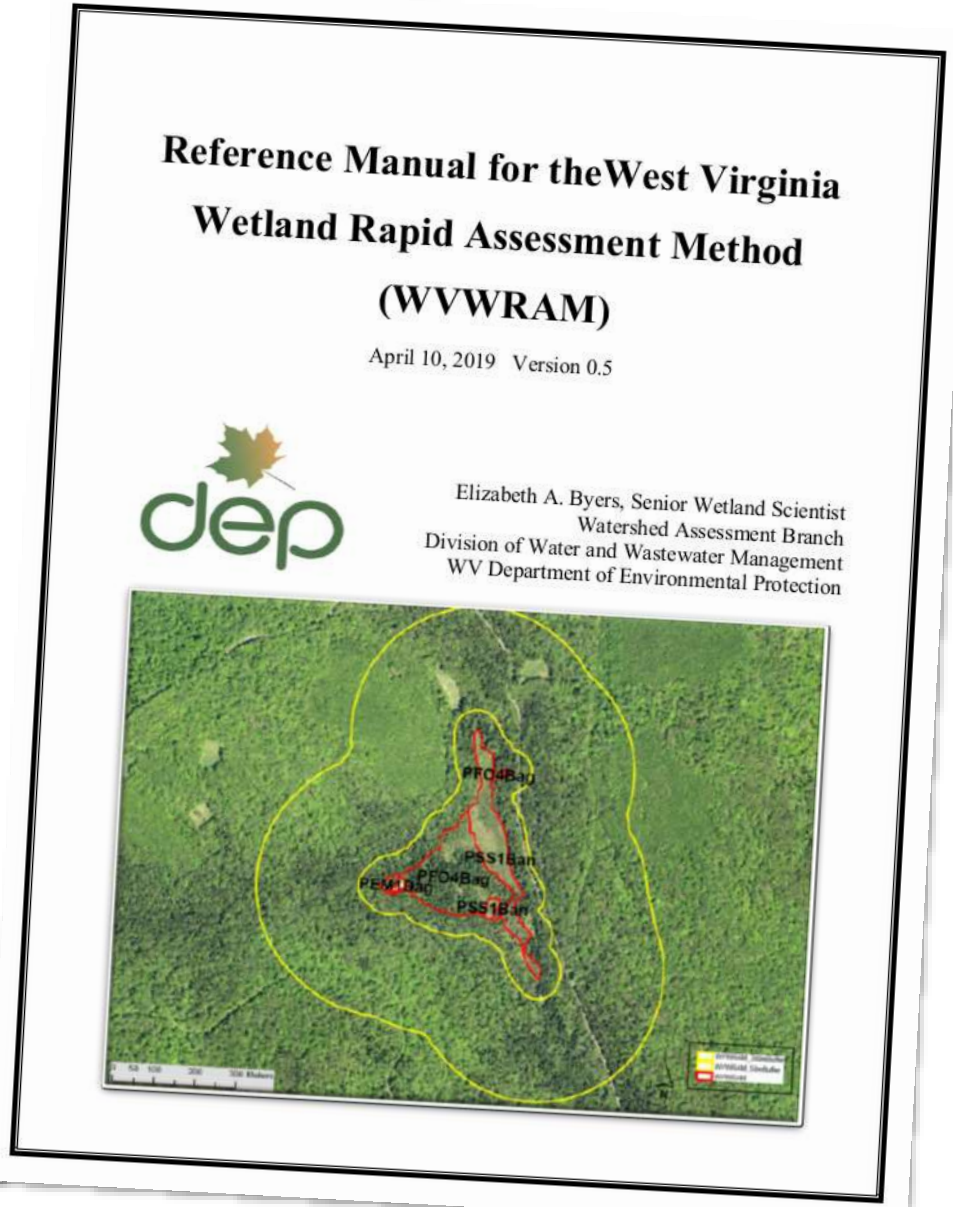
WVWRAM Manuals



User Manual for the West Virginia Wetland Rapid Assessment Method (WVWRAM)

May 31, 2019 Version 0.52

Elizabeth A. Byers, Senior Wetland Scientist
Watershed Assessment Branch
Division of Water and Wastewater Management
WV Department of Environmental Protection

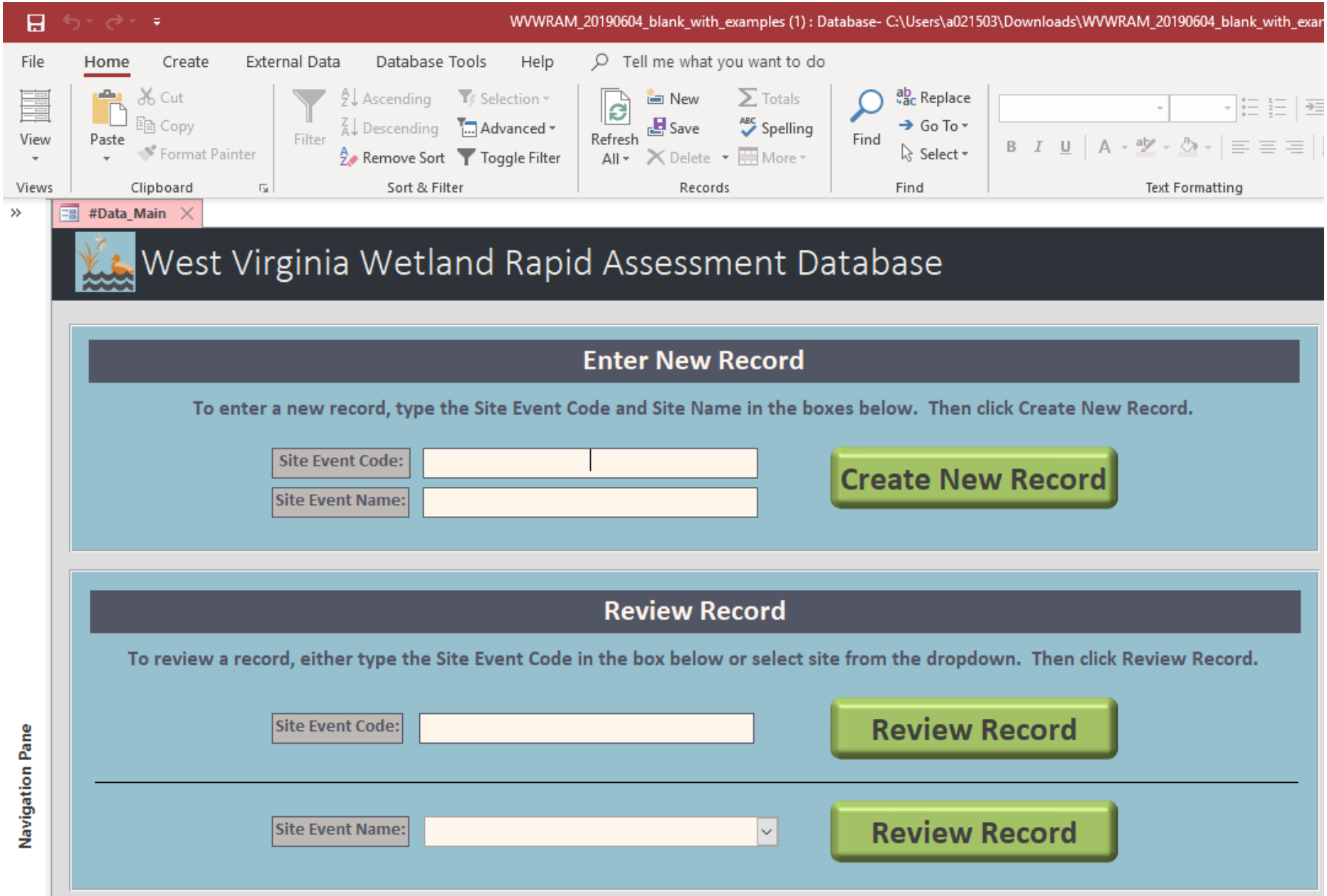


Reference Manual for theWest Virginia Wetland Rapid Assessment Method (WVWRAM)

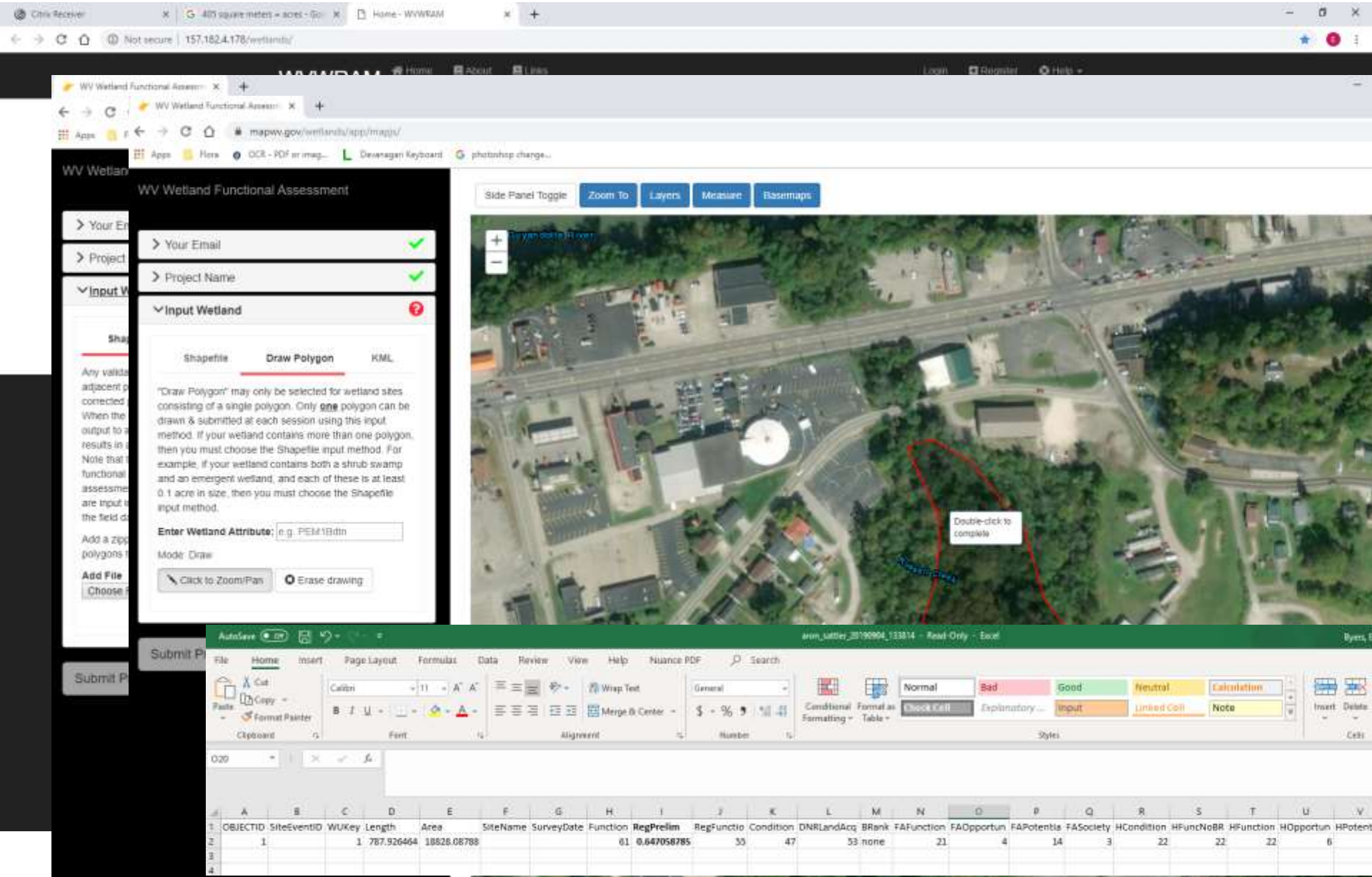
April 10, 2019 Version 0.5

Elizabeth A. Byers, Senior Wetland Scientist
Watershed Assessment Branch
Division of Water and Wastewater Management
WV Department of Environmental Protection

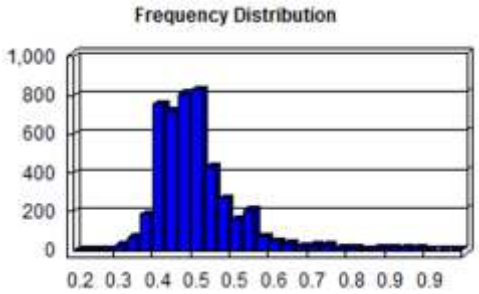
WVWRAM Database

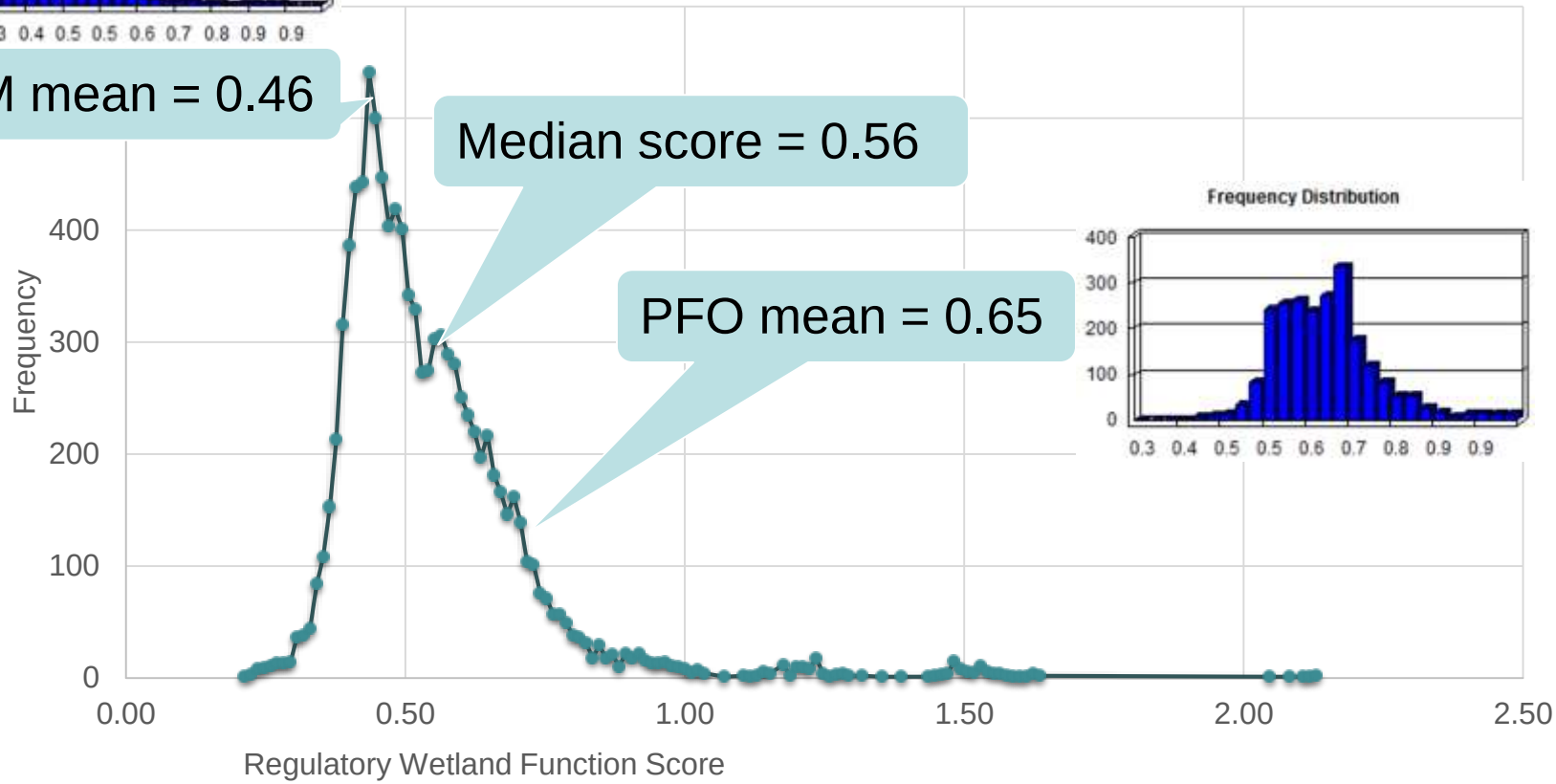


GIS Tool: https://mapwv.gov/wetlands/

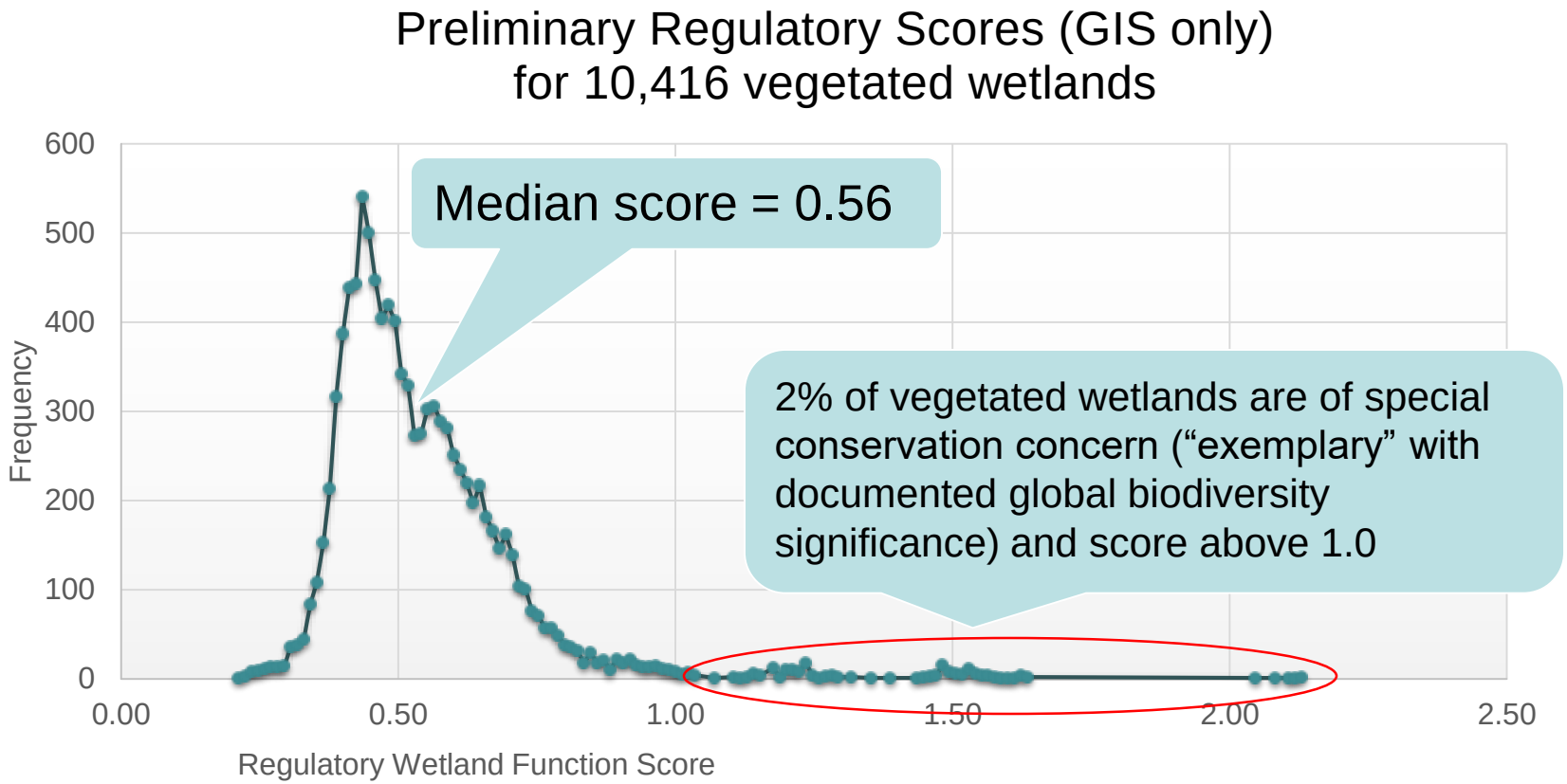


Preliminary Regulatory Scores (GIS only)

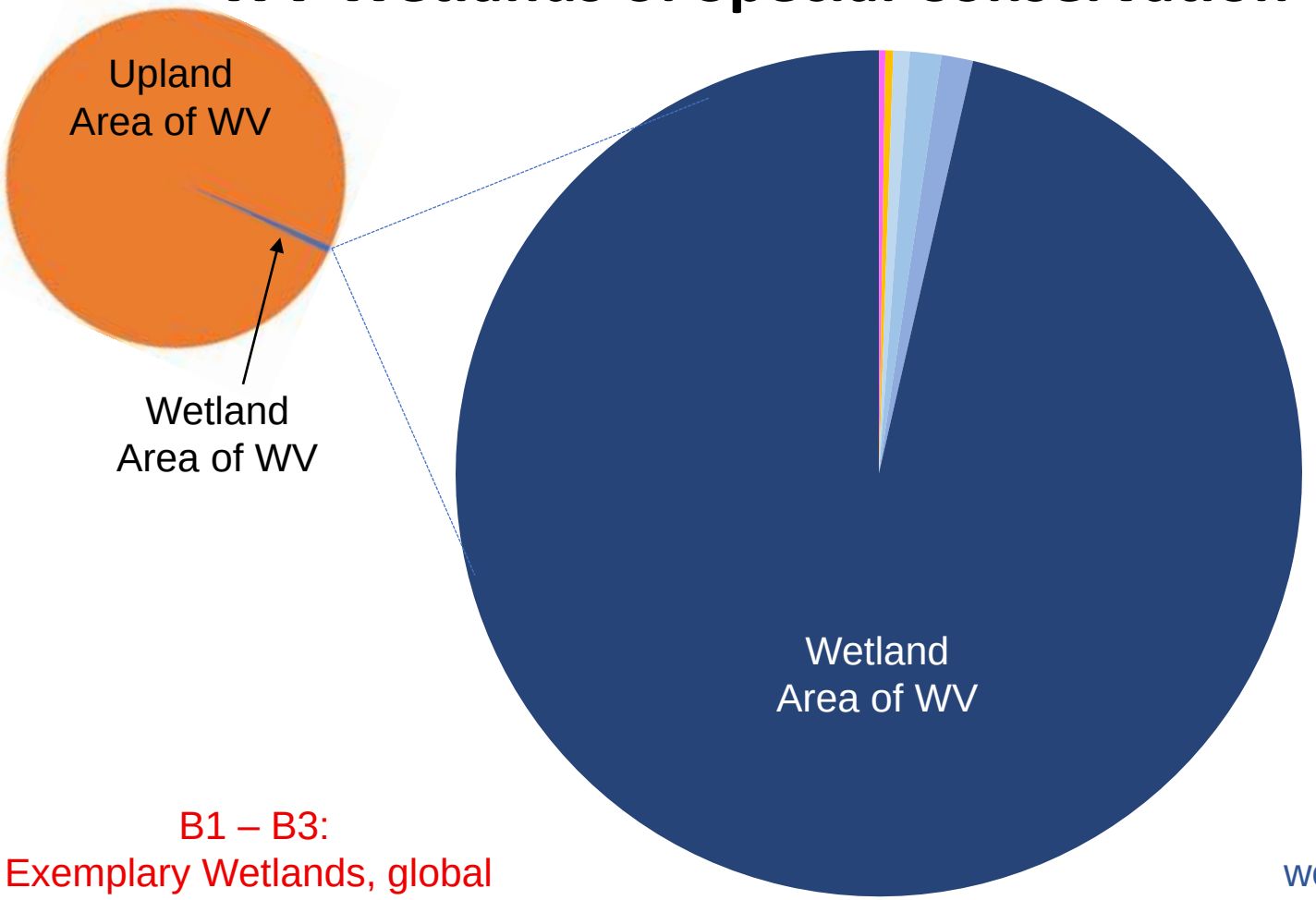




Avoiding High-Functioning Wetlands



WV Wetlands of Special Conservation Concern



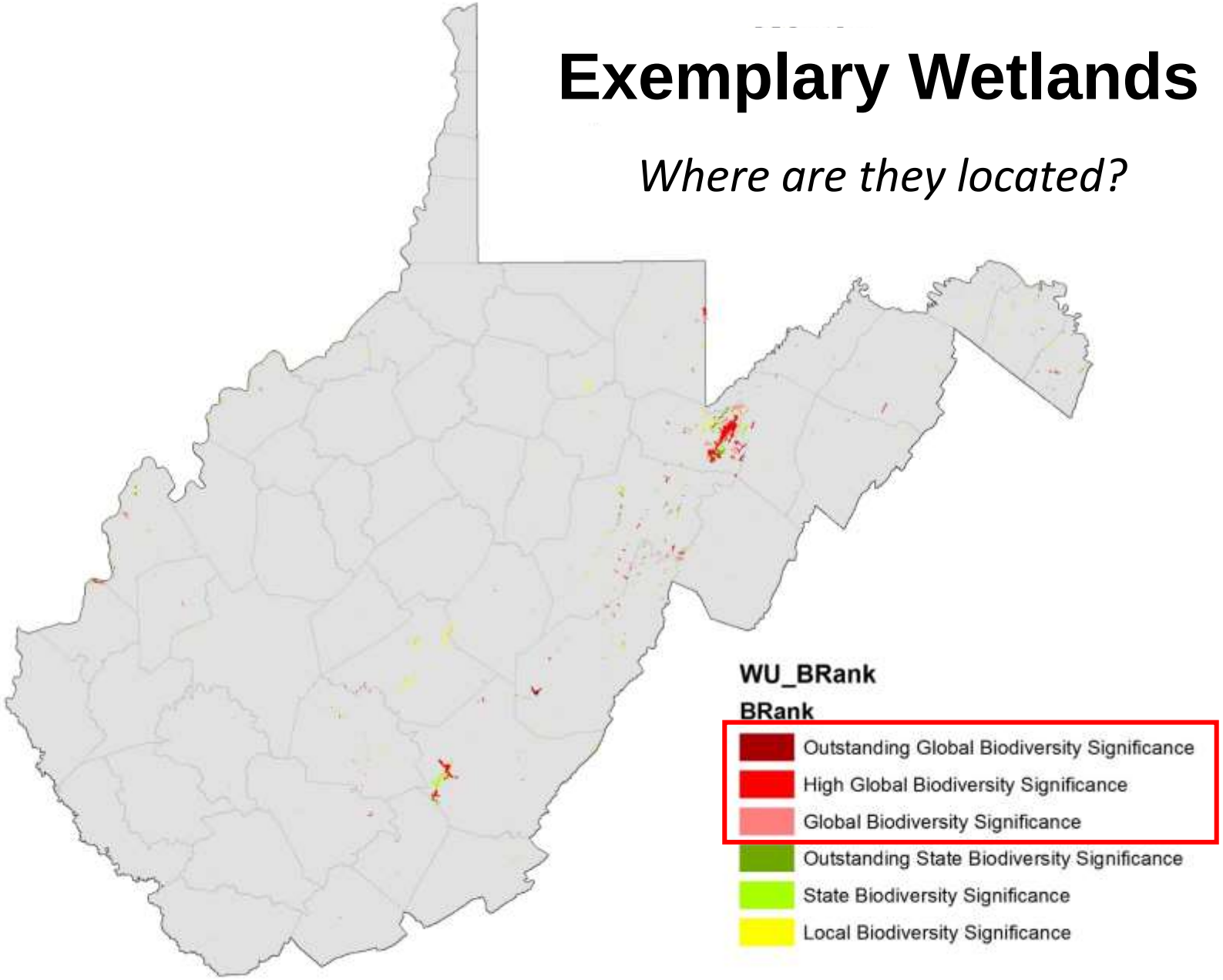
B1 – B3:
Exemplary Wetlands, global conservation concern, WVWRAM score > 1.0

B1 B2 B3 B4 B5 B6 none

B4 – B6:
wetlands of state or local conservation concern, WVWRAM score ≤ 1.0

Exemplary Wetlands

Where are they located?



WVWRAM Credits/Debits are Cost-Neutral

- Average amount of mitigation required statewide will not change due to WVWRAM
- However, individual projects will see changes
- Low-functioning wetlands will require less mitigation than under the current system
- High-functioning wetlands will require more mitigation than under the current system

Compliance with the 2008 Mitigation Rule

- WV is currently in compliance with the mitigation rule for streams, but NOT for wetlands
- WVWRAM was developed at the request of the Inter-Agency Review Team.
- WVWRAM as part of SWVM offers simple & streamlined permitting, predictable costs

WVWRAM will be required when:

- There will be permanent impacts to wetlands, which includes conversion from PSS/PFO to PEM.
- Section 404/401 permitting is triggered

WVWRAM will NOT be required for projects when:

- wetlands are avoided or temporarily impacted (< 1 year) and Section 404/401 NOT triggered

WVWRAM score will be an input to SWVM

Representative Sampling

- Wetlands that are < 1 acre in size AND with preliminary GIS scores varying < 10% from one another may be considered as a comparable assessment group.
- Field assessments of a randomly selected 10% of these wetlands will be accepted as representative of the whole group.

Year-round Assessment

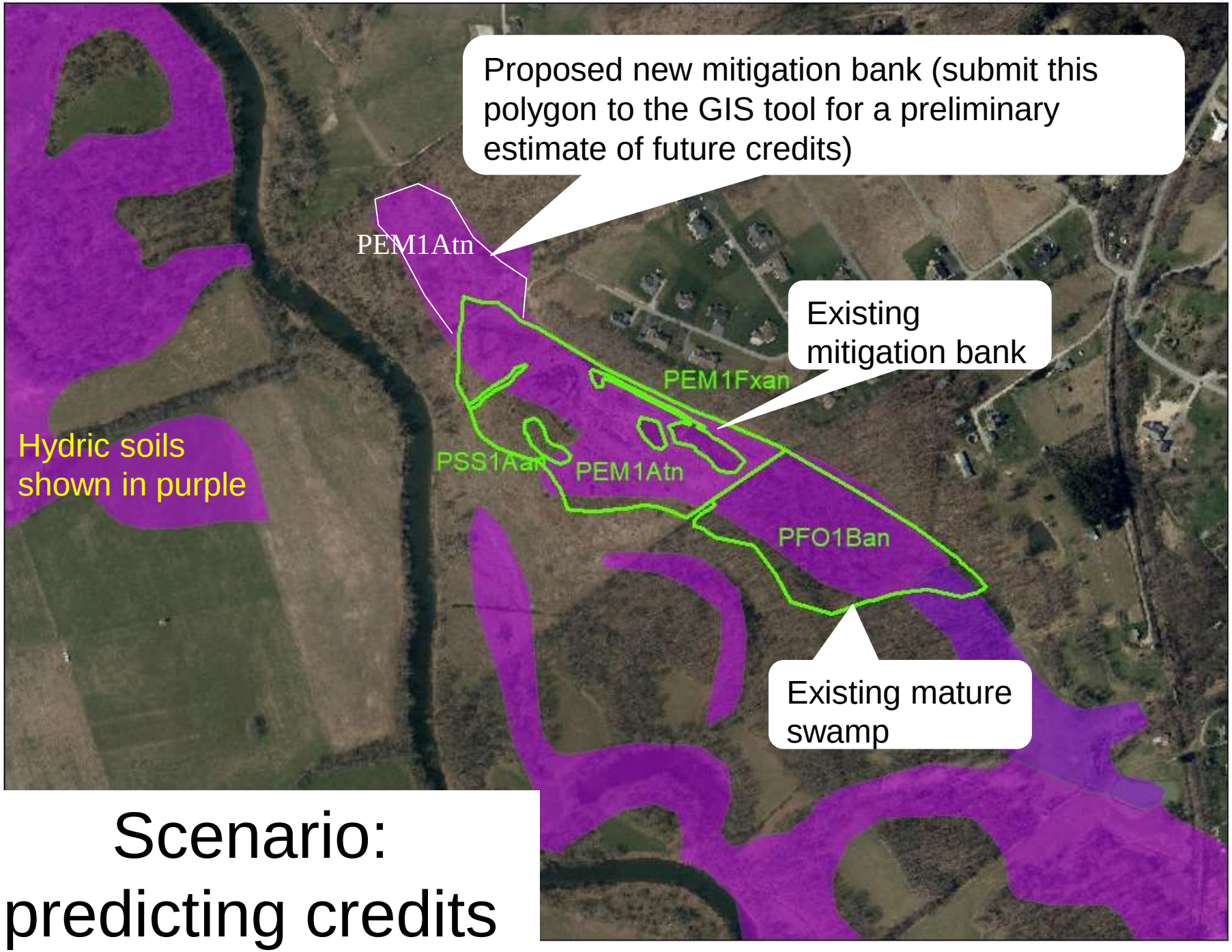
- WVWRAM is designed to produce robust, repeatable results during the growing season. Assessors are strongly encouraged to perform the assessment during the months of May-September (June-September for elevations above 3000 feet).
- Outside this period, the maximum score for the Rapid Floristic Quality metric will be assigned to debits.

WVWRAM
Mitigation Banking, In-Lieu Fee, PRM

- WVWRAM will become <u>part</u> of the baseline and monitoring requirements for credit release
- WVWRAM will be an input to SWVM calculation of credits for restoration, enhancement, and preservation

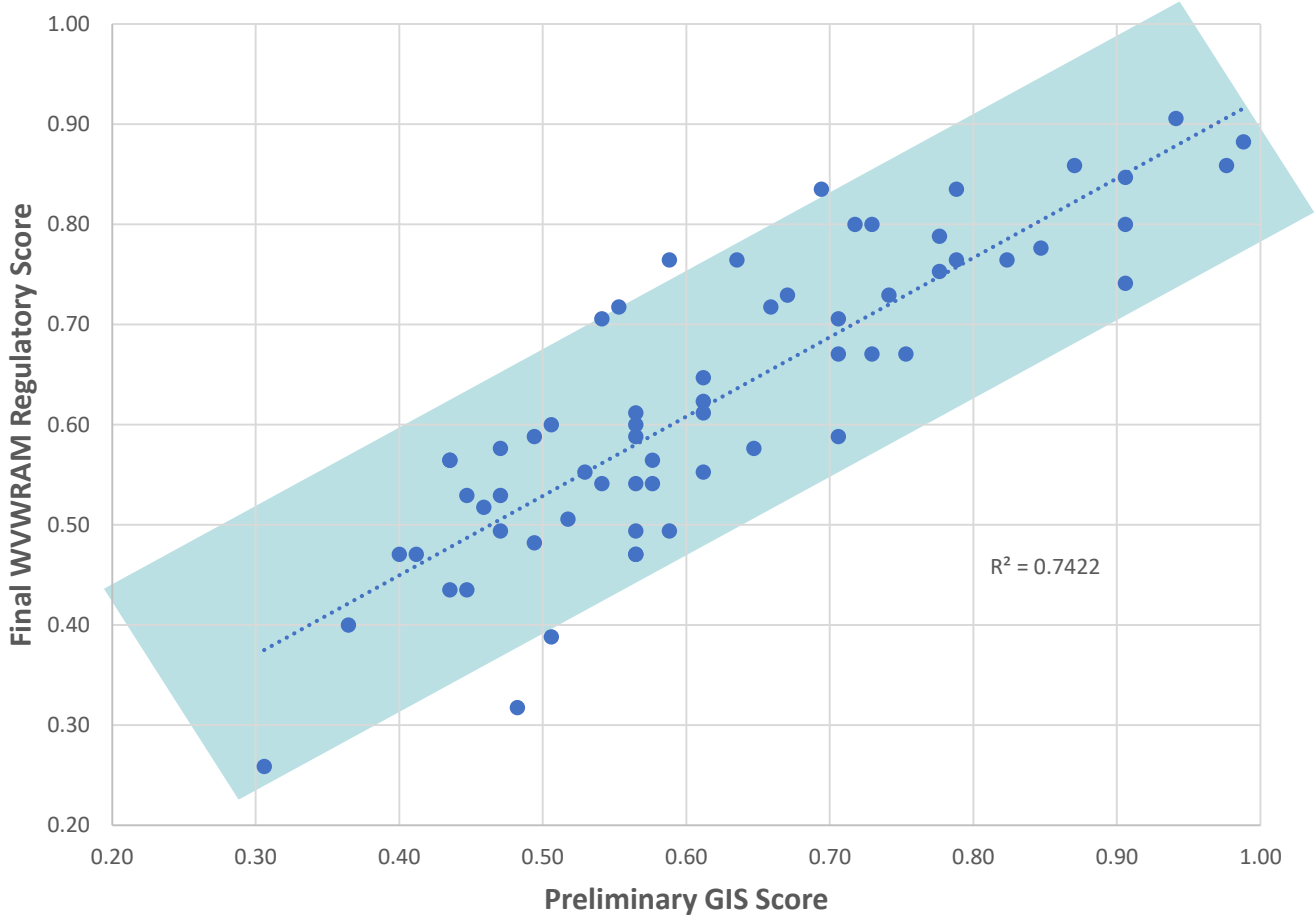
Predicting WVWRAM Scores

- Prep work (checking nearby wetland scores or running desktop scenarios) before you go to the field will allow you to ballpark estimate the WVWRAM score while still in the field.



Scenario: predicting credits

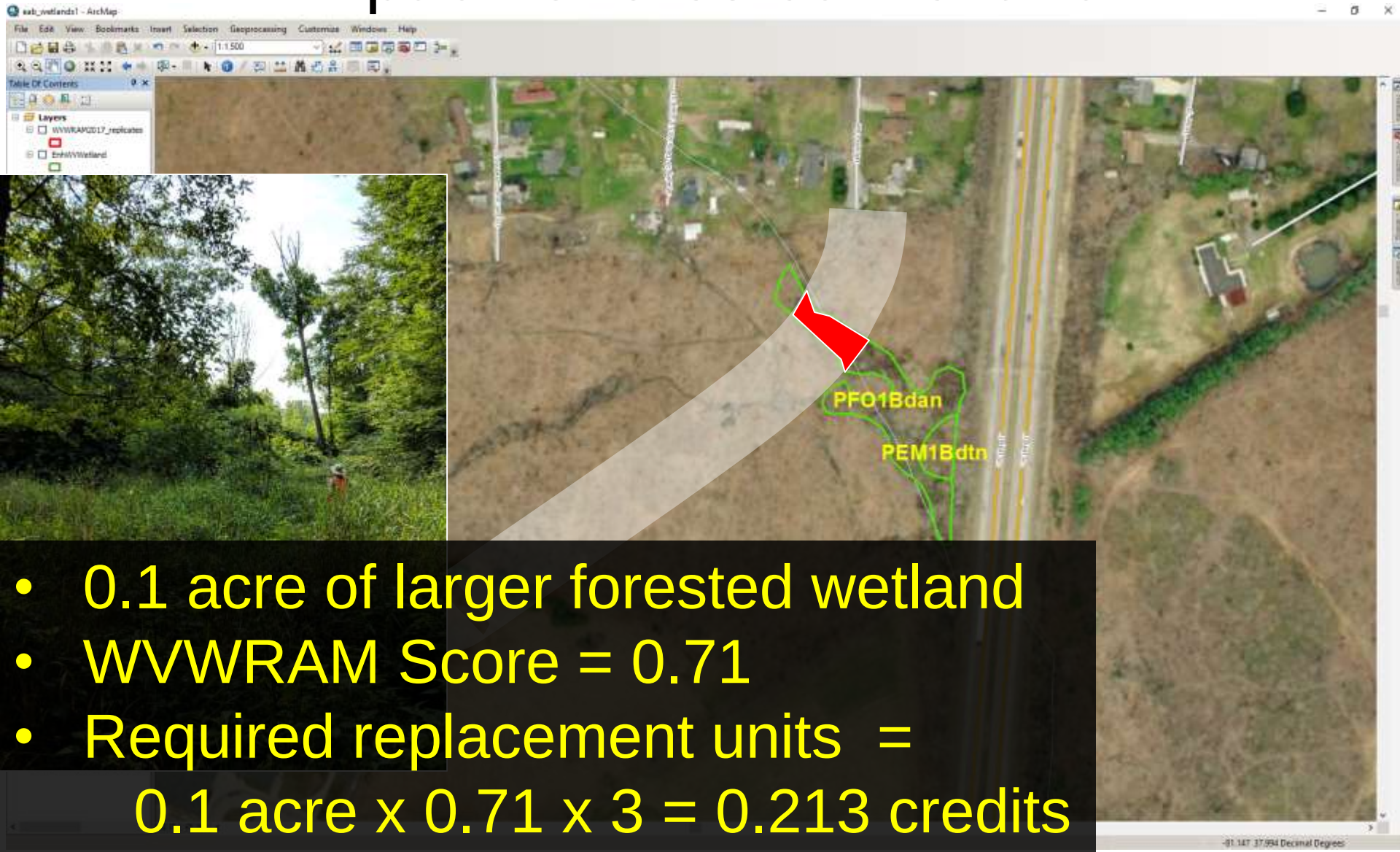
Preliminary GIS Score vs. Final Score



Scenario: impact to emergent

- 0.1 acre of emergent
- WVWRAM Score = 0.44
- Required replacement units =
  0.1 acre x 0.44 x 2 = 0.088 credits

Scenario:
impact to forested wetland



- 0.1 acre of larger forested wetland
- WVWRAM Score = 0.71
- Required replacement units =
  0.1 acre x 0.71 x 3 = 0.213 credits

Proposed SWVM Revision

WVDEP Watershed Assessment Branch

SWVM Proposal: Wetlands Parts I-II

Wetlands Part I-II

West Virginia Stream and Wetland Valuation Metric (SWVM), Version 2.4w-March 2020 w

USACE FI NO /Project Name:	LRH-2020-001-W / Miscellaneous				
COORDIN	38.91698	Longitu			
WETLAND SITE ID AND SITE DESCRIP	Eight example wetlands for test pu				
WATER JURISDICTION:	Waters of	□	Waters of the state:	□	
MITIGATION PROVIDER:	Mitigation Bank				
DATE:	07 20	Weather:	Sunny/Dry	Precipitation (in) past 48 hrs:	0.02

WVWRAM score added

Mitigation Provider determines classification ratio

PART I - Wetlands Impacted

Impact Wetland ID	Acres lost to impact	WVWRAM score (functional units)	Impact wetland classification	Classi-fication ratio ILF or PRM	Classi-fication ratio MB or PRM-prior	Replacement units
W1: avg emergent	1.00	0.47	Emergent	2	1	0.47
W2: avg scrub-shrub	1.00	0.54	Scrub-shrub	3	1	0.54
W3: avg forested	1.00	0.68	Forested	3	1	0.68
W4: high-function emergent	1.00	0.58	Emergent	2	1	0.58
W5: conversion woody - PEM	1.00	0.68	Conversion	2	1	0.68
W6: low-functioning forested	1.00	0.53	Forested	3	1	0.53
W7: high-functioning forested	1.00	0.73	Forested	3	1	0.73
W8: exemplary forested	1.00	1.38	Forested	3	1	4.14
				0	1	0.00
				0	1	0.00
				0	1	0.00
				0	1	0.00
Total impacted acres	8.00					

PART II - Replacement Units

Total required replacement units (total impacted units)	8.35

Required replacement units = impact acres * WVWRAM score * ratio

SWVM Proposal: Wetlands Part III

New credit tab

Wetlands Part III

West Virginia Stream and Wetland Valuation Metric (SWVM), Version 2.4w-March 2020 working draft

PART III - Advanced Mitigation, Credits Generated

Credit Wetland ID	Form of mitigation	Acres restored / protected	WVWRAM baseline	WVWRAM maturity	Replace-ment Credit Units	Buffer type 26-50 ft	Buffer fraction of 26-50 ft	Buffer type 51-150 ft	Buffer fraction of 51-150 ft	Buffer type 151-400 ft	Buffer fraction of 151-400 ft	Buffer credit units
CW1	Re-establishment	8	0	0.5	4.00	Pres&Reve	1.0	Pres&Reve	1.0	Pres&Reve	0.5	1.14
CW2	Restoration	2	0.3	0.6	0.60	Pres&Supp	1.0	Pres&Supp	1.0	Preserve	1.0	0.14
CW3	Enhancement	2	0.4	0.5	0.20	Pres&Reve	1.0	Preserve	1.0	None		0.05
CW4	Preservation	2	0.72	0.72	0.14	Pres&Reve	1.0	Preserve	0.5	None		0.03
CW5	Re-establishment	2	0	0.4	0.80	Pres&Supp	0.8	None		None		0.09
CW6	Re-establishment	2	0	0.35	0.70	Preserve	0.7	None				0.05
CW7	Re-establishment	2	0	0.51	1.02	None						0.00
					0.00							0.00
					0.00							0.00
					0.00							0.00
					0.00							0.00
					0.00							0.00
				Total replacement credit units	7.46							1.49

Total credit units	8.95

SWVM Proposal: Wetlands Parts IV-V

Wetlands Parts IV-V

West Virginia Stream and Wetland Valuation Metric (SWVM), Version 2.4w-March 2020

PART IV- Factors
(See instruction page for default values for MITIGATION BANKING and ILF)

Temporal Loss-Construction (debit)	
**Note: Reflects duration of aquatic functional loss between the time of an impact (debit) and completion of compensatory mitigation (credit).*	
Years	**1**
Multiplier	0
Subtotal	**0**

Lack of Long-term Protection (debit)	
% Add. Mitigation and Monitoring Period	**Long-Term Protection (Years)**
0 + 5/10 Year Monitoring	**101**
Multiplier	0
Subtotal	**0**

Temporal Loss-Maturity (debit)	
**Note: Period between completion of compensatory mitigation measures and the time required for maturity, as it relates to function (i.e. maturity of tree stratum to provide organic matter and detritus within riparian stream or wetland buffer corridor).*	
% Add. Mitigation	**Temporal Loss-Maturity (Years)**
No additional mitigation	**5**
Multiplier	0
Subtotal	**0**

No significant changes

PART V - Final Unit Score (for MITIGATION BANKING and ILF Compensatory Mitigation)

Replacement Units (from Part II)	**Adjusted Final Unit Score to Offset (Debit)**	**Advanced Mitigation** (from Part III) **(Credit)**	**Balance**
8.35	**8.350**	**8.95**	**0.605**

Thank you

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