

A decorative graphic consisting of a thin yellow circle on the left side, a thick yellow vertical bracket on the right side, and a horizontal yellow bar across the middle. The text '2011 National Wetland Condition Assessment (NWCA)' is written in blue on the yellow bar.

2011 National Wetland Condition Assessment (NWCA)

USDA, NRCS State Soil Scientists Meeting
Columbia, SC
March 30, 2010

Michael Scozzafava, National Coordinator
Wetlands Monitoring and Assessment Team
U.S. EPA, Office of Wetlands, Oceans, and Watersheds

Presentation Outline

- Overview of EPA National Aquatic Resource Surveys
- Overview of National Wetland Condition Assessment
- Opportunities for Collaboration with NRCS State Soil Scientists

National Aquatic Resource Surveys (NARS)

- **Independent reviews highlight monitoring limitations**
 - GAO, Heinz Center, NRC, etc
 - Existing data inadequate for statistically-valid characterization of water quality condition in U.S.
- **EPA Monitoring Initiative**
 - Conduct Nation Aquatic Resource Surveys using a statistical sampling design
 - Enhance State and Tribal monitoring programs

National Aquatic Resource Survey Schedule

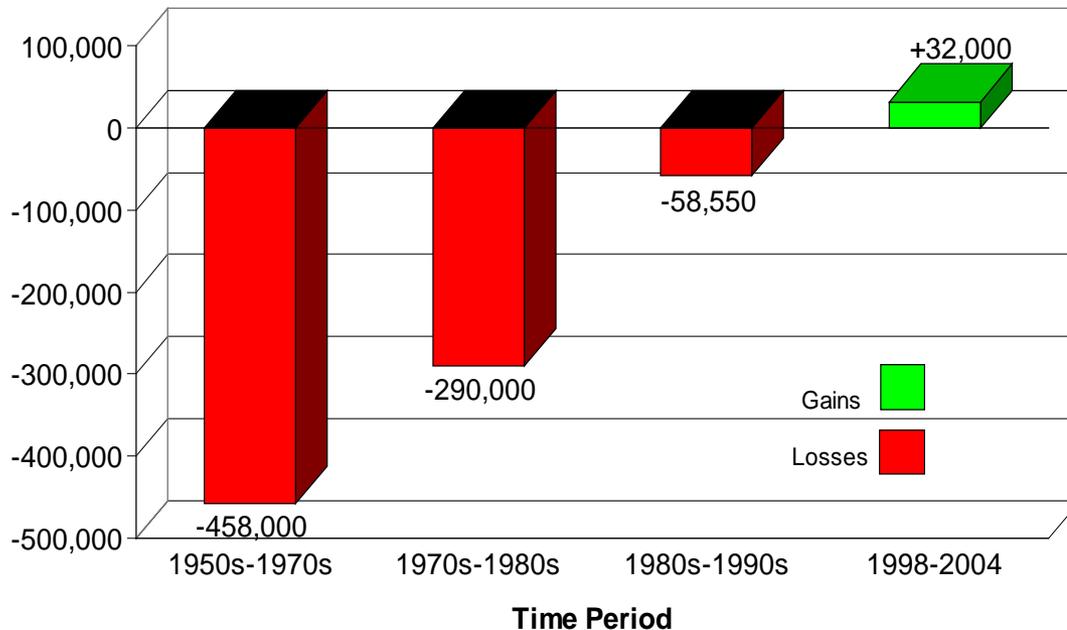
	FY07	FY08	FY09	FY10	FY11	FY12	FY13
Lakes	Field	Lab, data	Report	Research	Design	Field	Lab, data
Rivers	Design	Field	Lab, data	Report*	Research	Design	Field
Streams	Research	Design	Field	Lab, data	Report	Research	Design
Coastal	Report	Research	Design	Field	Lab, data	Report	Research
Wetlands	Research	Research	Research	Design	Field	Lab,data	Report

*The rivers and streams results will be combined into one report issued in 2011, that covers condition of both rivers and streams and changes in stream condition since the baseline report that was finalized in 2006.

What is the Condition of the Nation's Wetlands?

Existing sources of information do not provide a sufficient answer to this question.

Average Annual Net Loss and Gain Estimates for Wetlands in the Conterminous United States, 1954-2000



2004 CWA 305b Report

- 10 States reported
- 1.8 million acres
- 1.5% of the estimated 107 million acres in the conterminous United States

2005 FWS Wetland Status & Trends Report
(Trends in Wetland Acreage)

National Wetland Condition Assessment Goals

1. Produce a national report that describes the ecological condition of the nation's wetlands.
2. **Help States and Tribes implement wetland monitoring and assessment programs.**
3. Advance the science of wetlands monitoring and assessment.

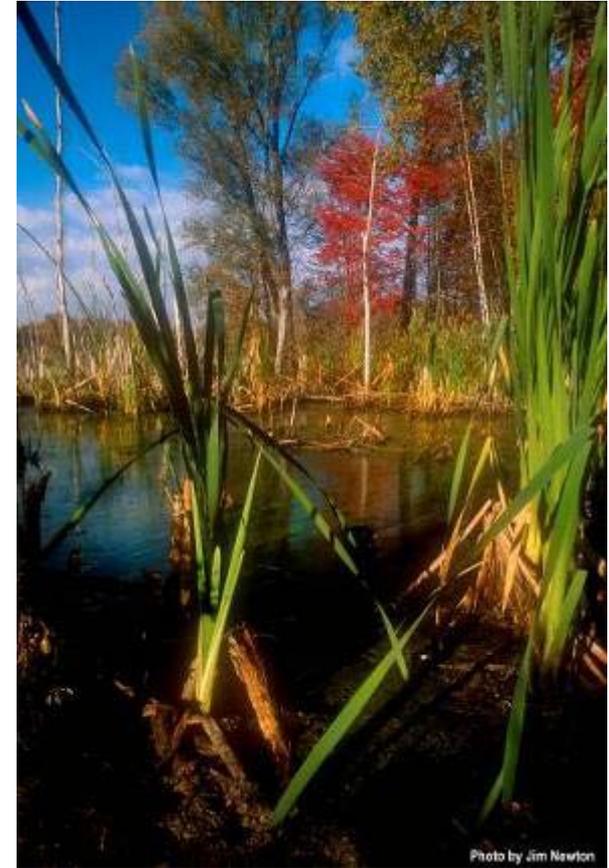
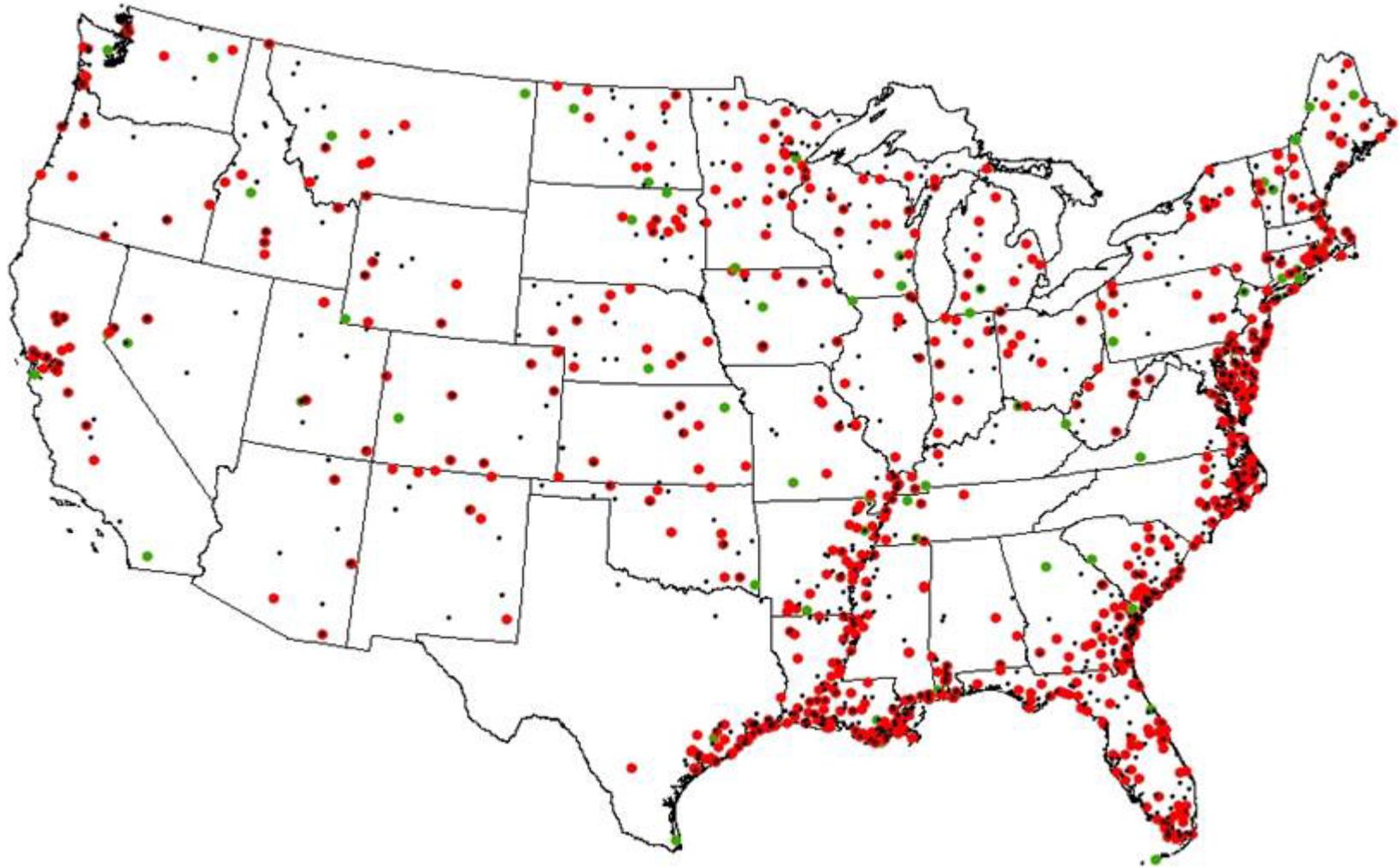


Photo by Jim Newton

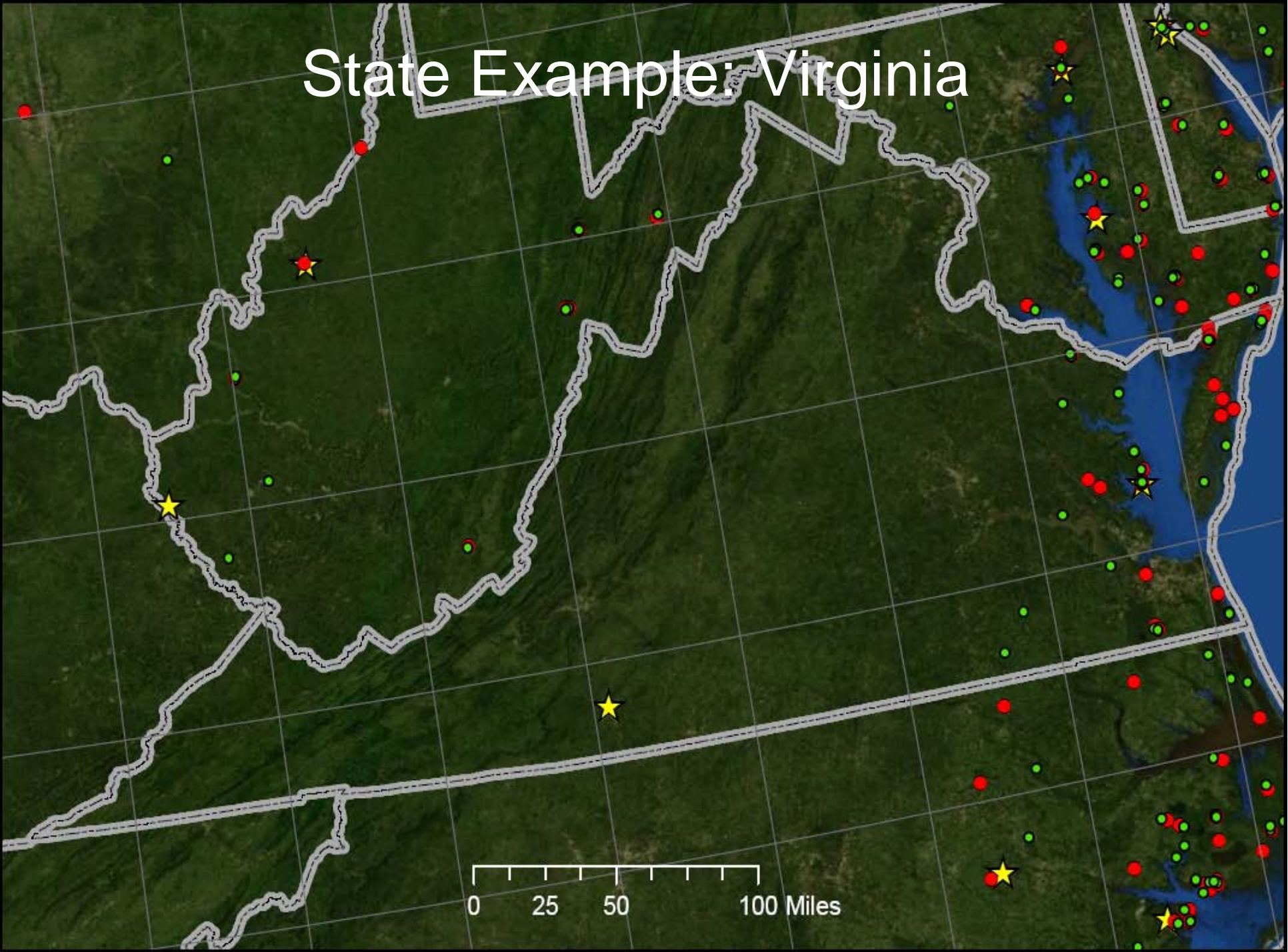
Using the NWCA Results

- Establish the **national baseline** of wetland condition.
- Improve NRCS Hydric Soils Database
- Coordinate with the U.S. FWS Wetland (acreage) Status and Trends program.
- Enhance State and Tribal wetland monitoring programs
- Identify wetland types and ecoregions that are especially degraded
- Identify the stressors most commonly associated with degraded wetland conditions.
- Inform development of ecologically-meaningful performance standards to direct restoration and improvement activities.
- Explore ways to quantify the ecosystem services that are derived from wetlands and their restoration.

2011 NWCA Site Map

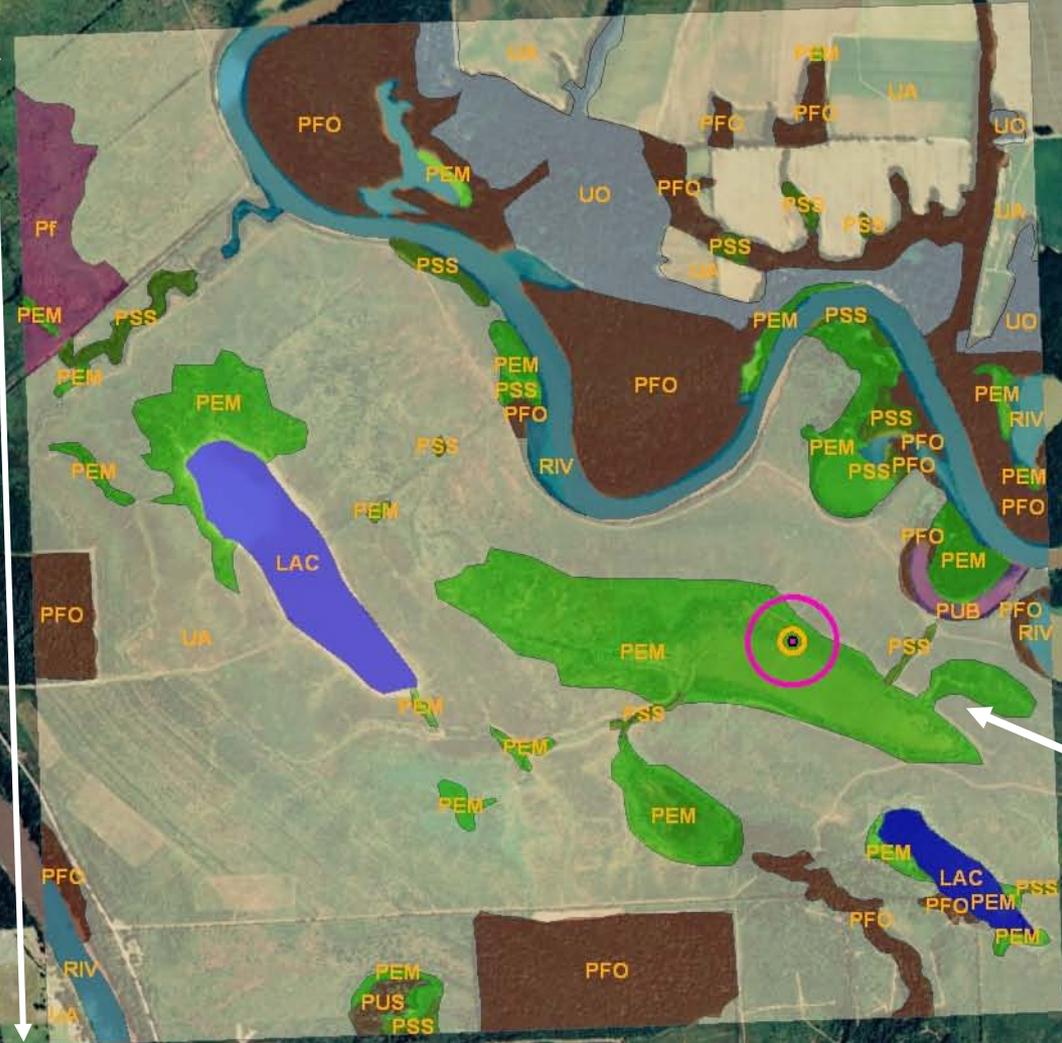


State Example: Virginia



Fish and Wildlife Service Status and Trends Plot (with coded wetland attributes)

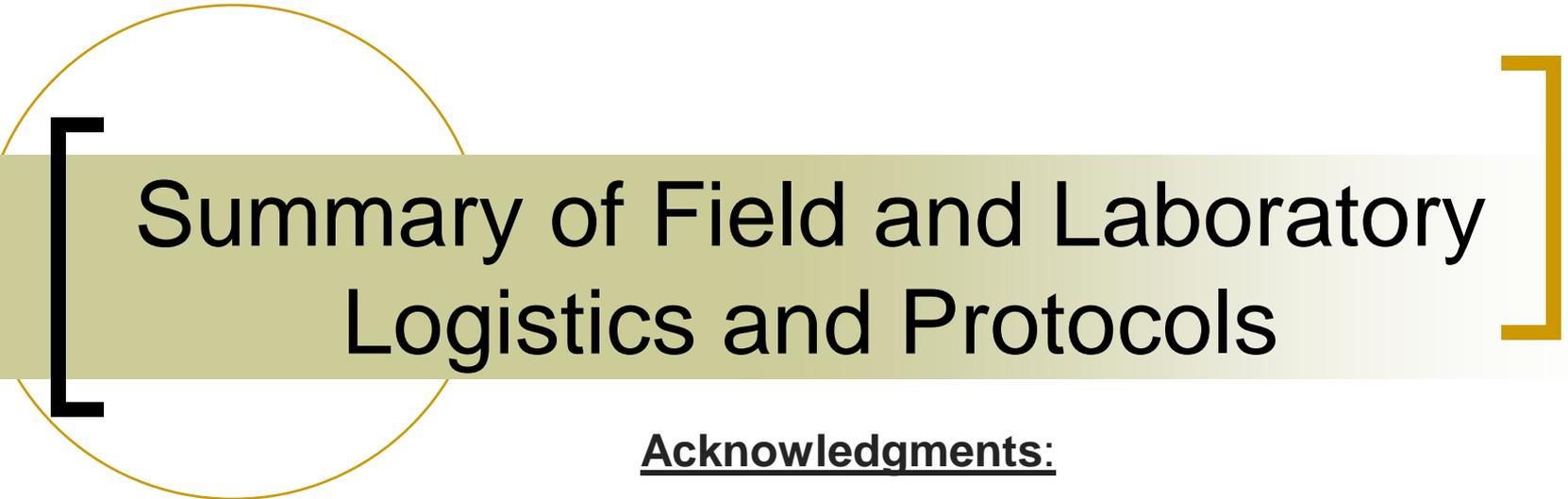
2 mi



NWCA Sample Point
AA is in orange circle (40m)
Buffer is pink circle (140m)

Number of Sites by Wetland Type

FWS Status and Trend Category	Common Examples	Number of Sites
Estuarine Intertidal Emergent	<ul style="list-style-type: none"> ■ Saltwater Marsh 	127
Estuarine Intertidal Forested/Shrub Scrub	<ul style="list-style-type: none"> ■ Mangrove Forest ■ Swamp Tupelo 	127
Palustrine Forested	<ul style="list-style-type: none"> ■ Bottomland Hardwoods ■ Cypress Swamps 	133
Palustrine Shrub/Scrub	<ul style="list-style-type: none"> ■ Bogs ■ Pocosins 	130
Palustrine Emergent	<ul style="list-style-type: none"> ■ Fringe Wetlands ■ Freshwater Marsh ■ Wet Meadows 	127
Palustrine Unconsolidated Bottom / Aquatic Bed <i>(some subcategories)</i>	<ul style="list-style-type: none"> ■ Prairie Potholes/Kettles ■ Natural Ponds ■ Created Ponds 	130
Palustrine Farmed <i>(not currently in crop production)</i>	<ul style="list-style-type: none"> ■ Agricultural Fields with natural wetland characteristics 	126



Summary of Field and Laboratory Logistics and Protocols

Acknowledgments:

Mary Kentula, Teresa Magee, Janet Nestlerode, EPA ORD
Regina Poeske and Mary Anne Theising, EPA Regional Offices
Gregg Lomnicky, Sandy Bryce, Howard Bruner, Dynamac, Inc.
Elizabeth Riley, Gregg Serenbetz, and Chris Faulkner, EPA OW

Larry West, Lenore Vasilas, Chris Smith, Phil King, Richard Ferguson, Mike
Wilson, Richard Pullman, Rebecca Burt, Jon Hempel, Thomas Reinsch, NRCS

John Galbraith, VTU and Mike Vepraskas, NCSU

National Wetland Monitoring and Assessment Work Group

Biological Indicators for the NWCA

Indicator Type	Details
Vegetation	<ul style="list-style-type: none">■ Wetland vegetation is an expression of the underlying wetland structure.■ Collect species presence and abundance in 5 10x10m plots distributed across the Assessment Area■ Probable Indicator is a Multi-Metric Index of Biological Integrity (VIBI)
Algae	<ul style="list-style-type: none">■ Algae respond more rapidly than plants (e.g. excess nutrients) and can indicate recent wetland inundation■ Standardized collection across all wetland types.■ Probable Indicator is indicator species or Multi-Metric Index of Biological Integrity (IBI).

Abiotic Indicators for the NWCA

Indicator Type	Details
Hydrology & Water Chemistry	<ul style="list-style-type: none">■ Hydrologic dynamics influence biological community composition and indicate disturbance.■ Difficult to assess hydrology in one site visit; water for chemistry sampling not always present.■ Hydrologic surrogates and water chemistry when possible.
Buffer/Stressors	<ul style="list-style-type: none">■ Buffer disturbance will impact wetland biological communities.■ Aerial photos and site verification.
Rapid Assessment Method	<ul style="list-style-type: none">■ 3 Indices: Buffer, Stress, Condition■ 30 – 60 minutes to start sampling day■ Calibrate with Intensive Data nationally
Soils	<ul style="list-style-type: none">■ Next Slide

[Soils



Rationale and Focus:

- Soil characteristics are indicative of wetland hydrology and the ability to sustain biological communities.
- Our focus is ***wetland ecological integrity***

Field Protocol:

- Four (4) soil pits, sample from randomly selected pit
- Soil Profile (60cm) in all four pits
 - Verify profile to 1.25 meters with auger in randomly selected pit
 - Reviewed by Soil Scientist before submitted
- Bulk Density
 - Hammered Core at most sites (standard)

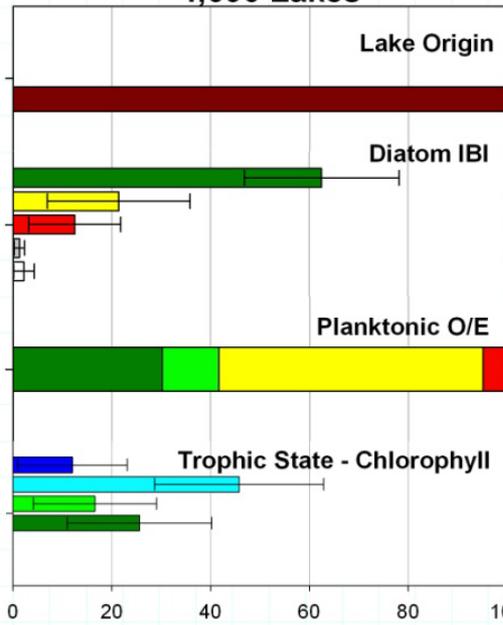
Soil Parameters Measured

Method	SSL Method	Analyte
PSDA, <2mm, air dry	3A1a1a	Clay, Silt, Sand
Calcium carbonate equivalent, <2mm	4E1a1a1a1	CaCO ₃
Calcium carbonate equivalent, <20mm	4E1a1a1a2	CaCO ₃
Total Carbon, Nitrogen and Sulfur	4H2a1-3	C, N, S
pH	4C1a2a1a-b1, 4C1a2a2a-b1	1:1 H ₂ O, 1:2 0.01 M CaCl ₂
Cation exchange capacity	4B1a1b1-4	CEC, Ca ²⁺ , K ⁺ , Mg ²⁺ , Na ⁺
Ammonium Oxalate Extraction	4G2a1a1-5	Al, Fe, Mn, P, Si
Electrical Conductivity	4F1a1a1a1	EC
Dithionite-Citrate Extraction	4G1a1-3a-b1	Al, Fe, Mn
Olsen Phosphorus	4D5a1a-b1	P
Mehlich Phosphorus	4D6a1a-b1	P
Trace Elements	4H1a1a1a1-20	Ag, As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, P, Pb, Sb, Se, Sn, Sr, VW, Zn
Bulk Density	3B1a3B1b, 3B1c3B1d	Db _f , Db _{od} , Db ₃₃

Data Analysis: Example From the National Lakes Assessment (2009)

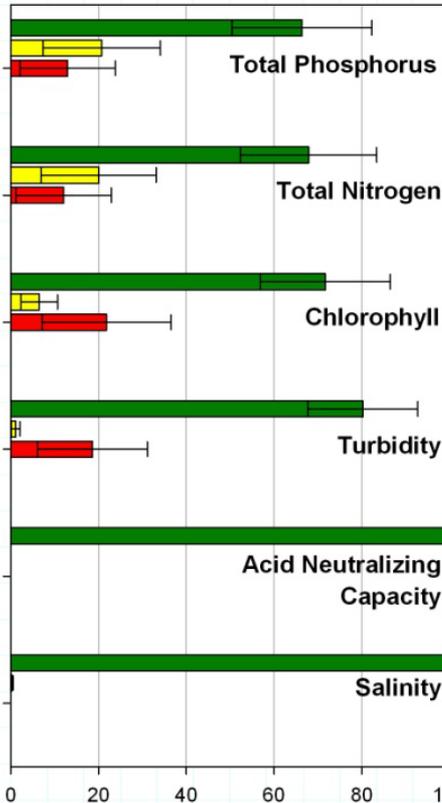


**Southern Appalachians
4,690 Lakes**



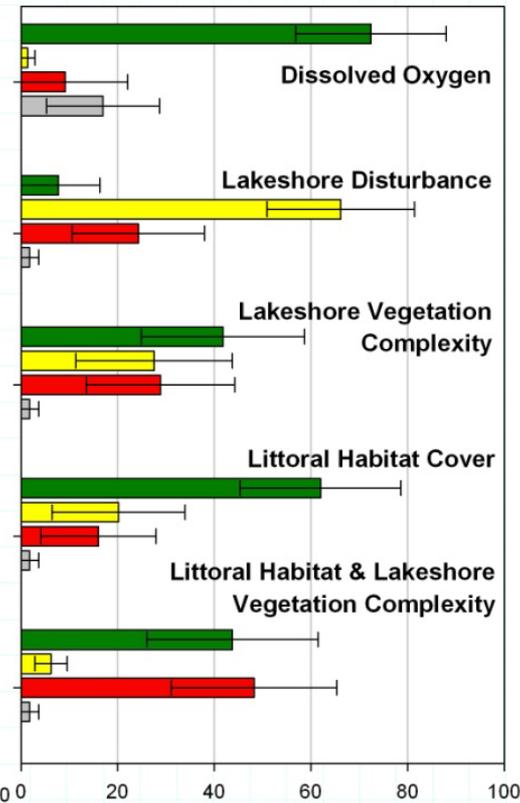
Percentage of Lakes

- For Lake Origin:
 - Blue: Natural
 - Brown: Man-Made
- For Diatom IBI:
 - Green: Good
 - Yellow: Fair
 - Red: Poor
 - Grey: Not Assessed
 - White: No Data
- For Plankton O/E:
 - Dark Green: < 10%
 - Light Green: 10-20%
 - Yellow: 20-50%
 - Red: > 50%
 - Grey: Not Assessed
 - White: No Data
- For Trophic State - Chlorophyll:
 - Blue: Oligotrophic (<= 2 ug/L)
 - Cyan: Mesotrophic (>2-7 ug/L)
 - Green: Eutrophic (>7 to 30 mg/L)
 - Dark Green: Hypereutrophic (> 30 ug/L)



Percentage of Lakes

- Green: Good
- Yellow: Fair
- Red: Poor
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- White: No Data



Percentage of Lakes

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- White: No Data

NWCA Field Crews

- States, Tribes, or Contractors
 - Federal Partners where possible

- Four Person Crew: One Day for Sampling
 - Vegetation Team – All Vegetation Sampling
 - Botanist/Ecologist – Education and Training in Botany
 - Botanist Assistant – No specific expertise

 - AA/Buffer Team – All Other Indicators
 - No specific expertise required
 - Wetland delineation experience recommended
 - Soils experience recommended but not required

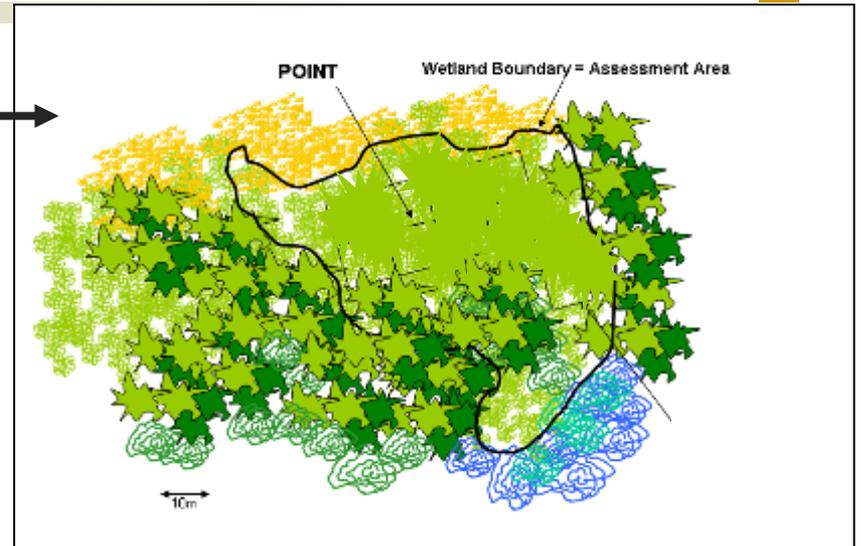
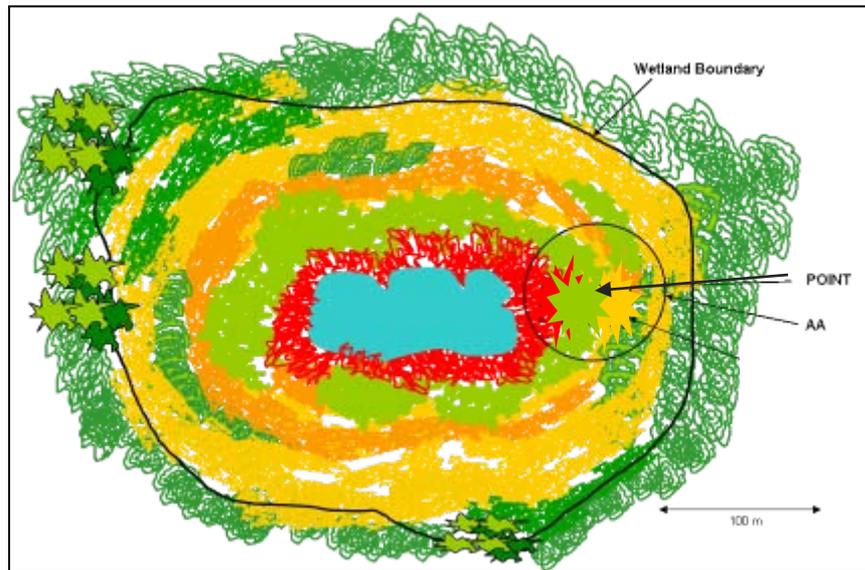


Photo courtesy of Janet Nestlerode

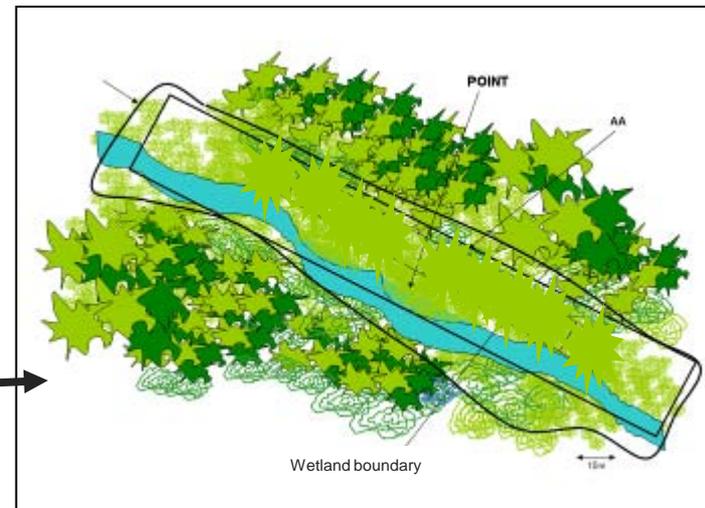
NWCA Assessment Area

Small Wetland

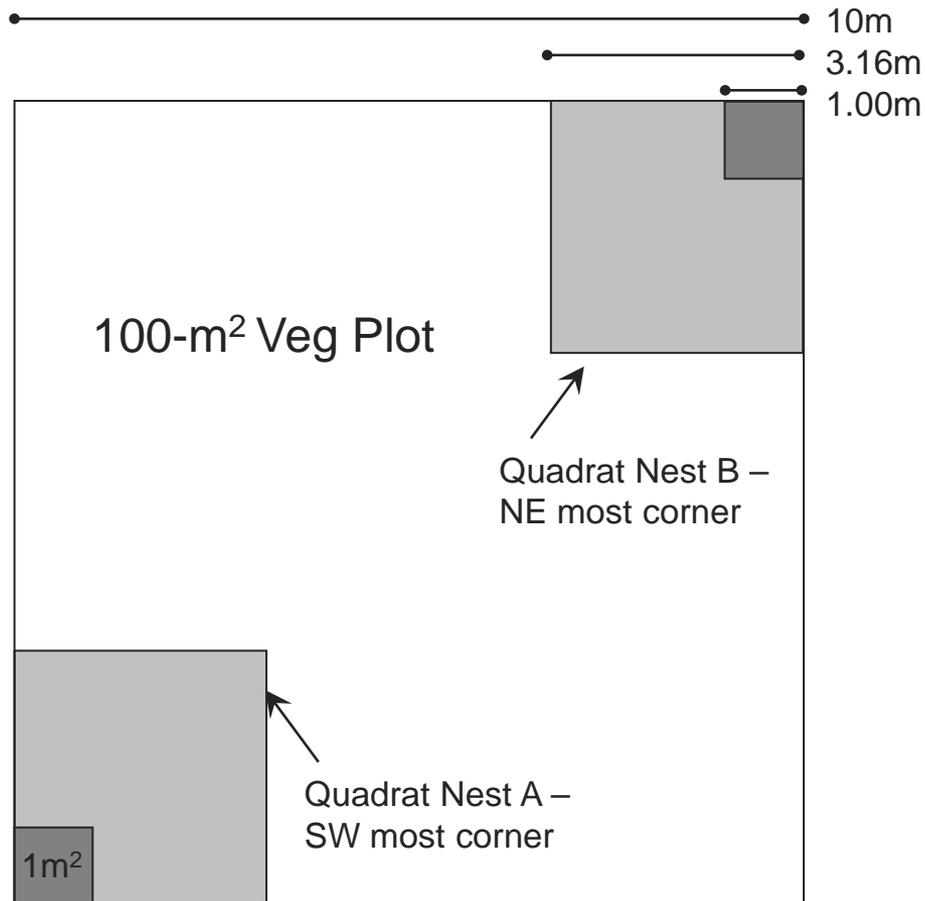
Standard



Riverine Wetlands



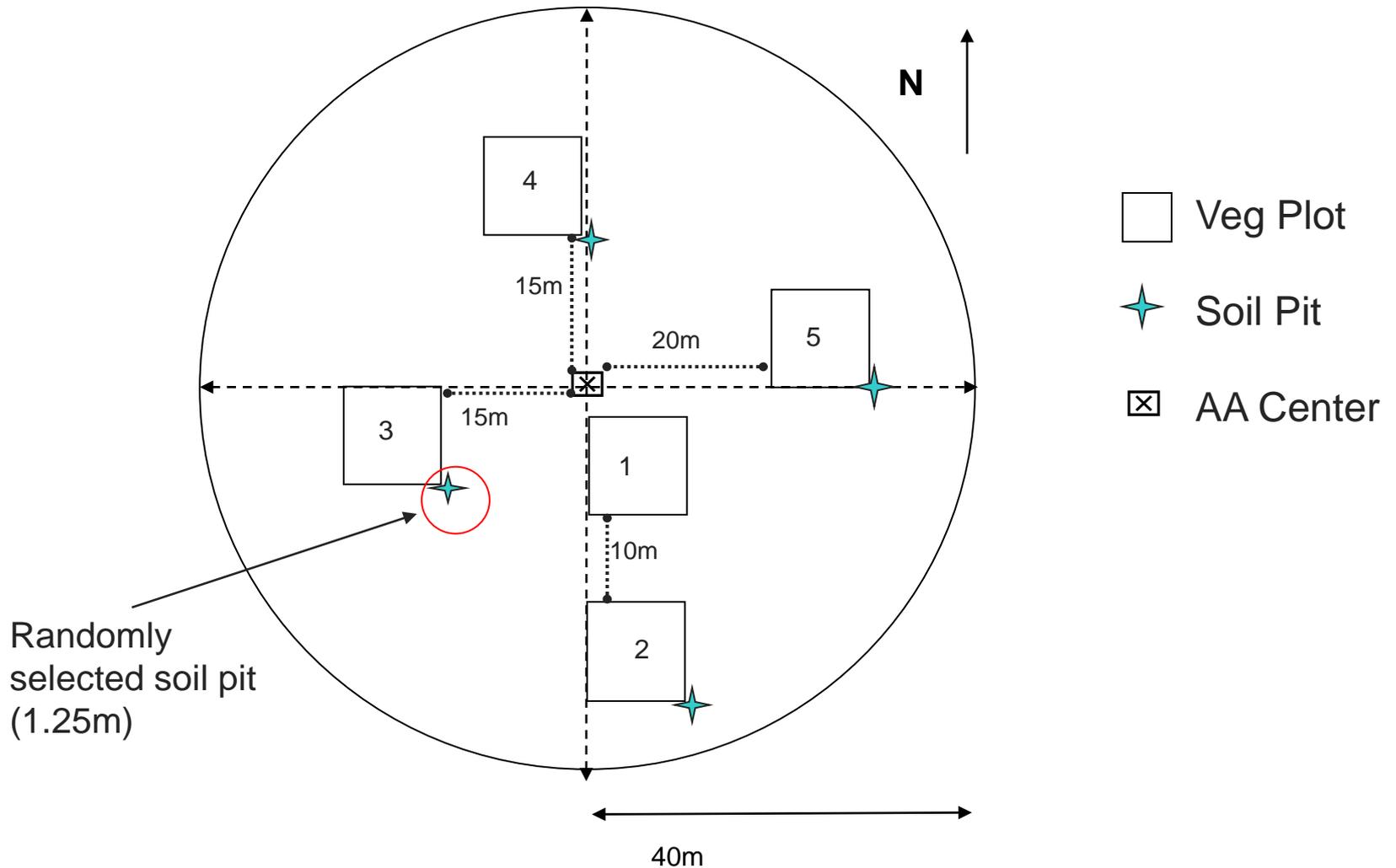
Vegetation Plot



Vegetation Data

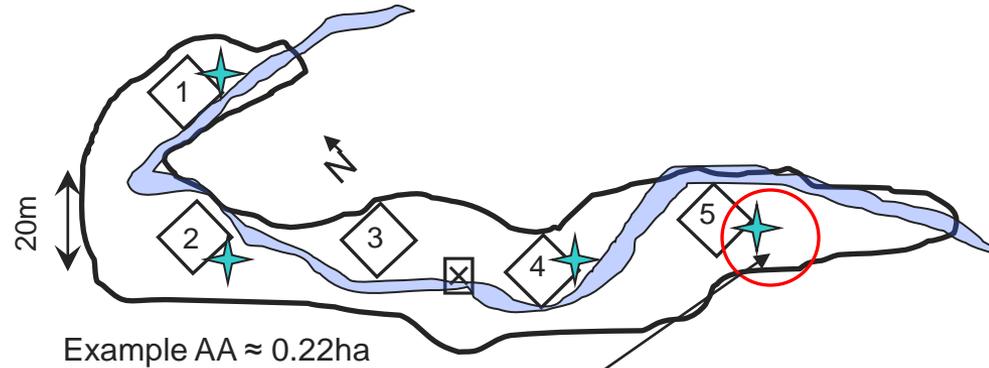
- Species Occurrence
- Percent Cover

Standard Vegetation and Soil Plot Layout



Examples of Soil Pit Locations in a Small Wetland

Example AA ≈ 0.14 ha



-  Veg Plot
-  Soil Pit
-  AA Center

Randomly selected soil pit (1.25m)

Collaboration with NRCS State Soil Scientists is Vital

- Ensure the data we collect is high quality, defensible and useful for EPA and NRCS
 - Report wetland condition nationally
 - Build NRCS Hydric Soils database
- Provide Knowledge for Unique or Problem Soils
 - “Tricks of the Trade”
 - Specialized Sampling and Excavation Equipment

Collaboration with NRCS State Soil Scientists

Minimal Level of Collaboration (hoping for)

- Feedback on Field Protocols

- Assist State Field Crews with Desktop Reconnaissance
 - Identify sites with potential problem soils and provide suggestions on how to sample.

- Interact with agricultural community to help field crews secure access to sites

- QA/QC on Soil Profiles
 - Check and/or correct soil profile before final submission

Collaboration with NRCS State Soil Scientists

Highest Level of Collaboration

- Participate in State and Regional Trainings
 - 4-day trainings will cover all NWCA protocols, including soils
 - States may request more detailed trainings from you

- Assist States with Field Sampling
 - All sites in your state OR
 - Only “problem” sites

EPA – NRCS – State Coordination Process

- Regina Poeske, EPA Philadelphia
 - Oversee coordination efforts between states and NRCS
- Timeline
 - Spring 2010: States contact NRCS State Soil Scientists
 - Summer 2010: Begin initial site reconnaissance
 - Fall 2010: Finalize plan for NRCS involvement
 - Spring 2011: Site recon and Field Crew Training
 - Summer 2011: Field Sampling
 - Fall 2011: Laboratory QA/QC Procedures
 - Spring 2012: Data Analysis and Interpretation

We Need Your Help!

- Opportunity to collaborate on a mutually beneficial national project
- NRCS clearly has soils expertise and experience that EPA does not
- Available for questions in Group 2 Tomorrow Morning
- Revised Field and Lab Protocols Available 4/15/10
 - Final Testing and Review this Summer
 - Feedback on Unique Situations and “Tricks of the Trade.”

Key Contact Information

■ Contacts: Overall Coordination and Logistics

- Michael Scozzafava: Scozzafava.michaele@epa.gov, 202-566-1376
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■ NRCS SSS Contact

- Regina Poeske: poeske.regina@epa.gov, 214-814-2725

■ Contacts: Technical Questions

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