Wetland Studies / Peterson Foundation
Wetland Mitigation Research Symposium 2013

March 13, 2013

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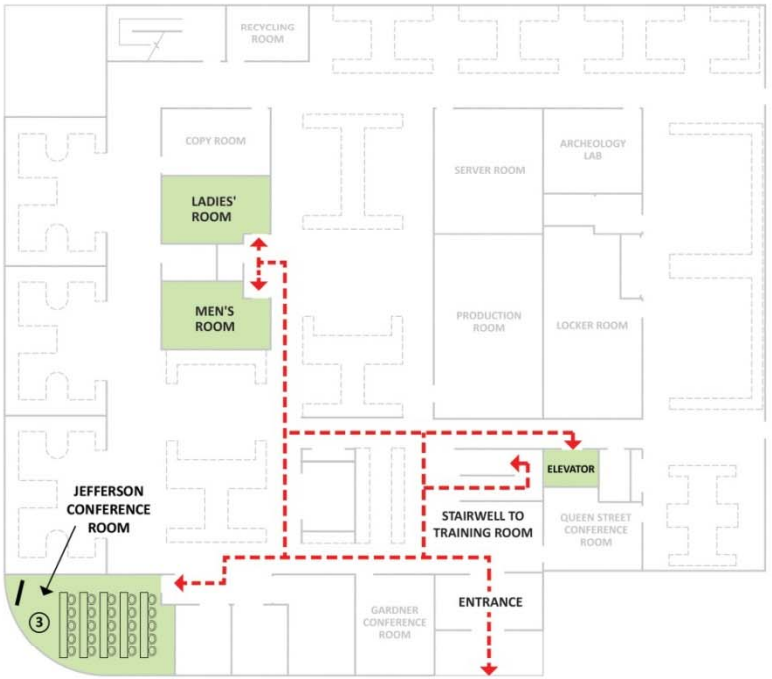
Peterson Family Foundation

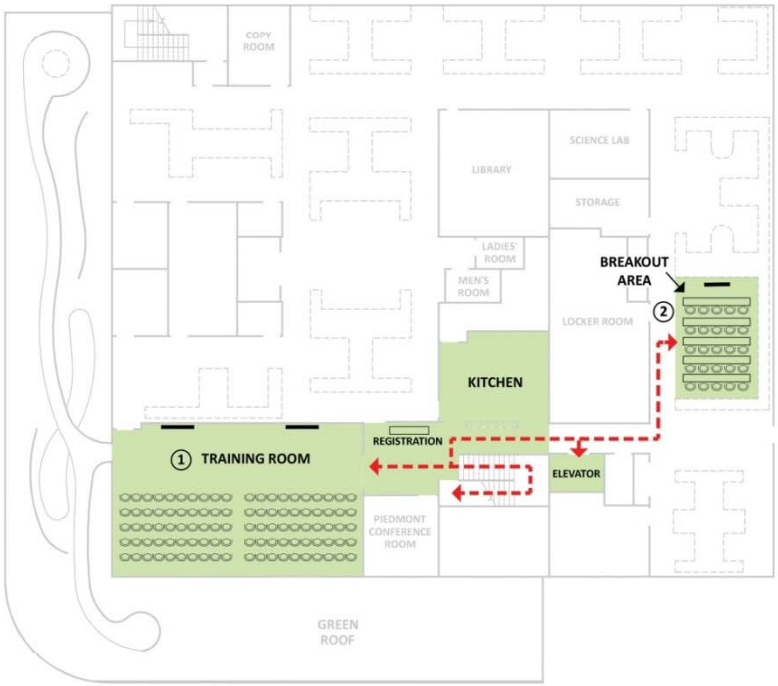
Wetland Studies and Solutions/Peterson Foundation Wetland Mitigation Research Symposium

Facility Map

First Floor



Second Floor



① ALL PRESENTATIONS AND Q&A WILL TAKE PLACE IN THE TRAINING ROOM.

ADDITIONAL SEATING WITH TABLES AND LIVE FEED FROM TRAINING ROOM WILL BE AVAILABLE IN BREAKOUT AREA ② AND IN THE JEFFERSON CONFERENCE ROOM ③.

- WIFI:
NETWORK: WSSI_WiFi
PASSWORD: Publicwifi1

- SNACKS AND LUNCH SERVED IN KITCHEN.

- DOGS STEAL FOOD!

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Agenda – Morning Session

Time	Title	Speaker(s)
8:30 – 9:00	Registration	
9:00 – 9:15	Introduction and Overview	Mike Rolband, WSSI
9:15 – 9:45	Measuring water levels in clayey created wetland soils W. Lee Daniels, VT	W. Lee Daniels, VT
9:45 – 10:30	New methods for water budgeting – WetBud	Rich Whittecar and Kerby Dobbs ODU; Tess Thompson and Eric Neuhaus, VT; Zach Agioutantis,Technical University of Crete
10:30 – 10:45	Morning Break	
10:45 – 11:15	Sustainable wetland reforestation practices	Jim Perry and Wes Hudson, VIMS
11:15 – 12:00	Wetland Assessment Tools Developed by Mid-Atlantic Wetland Workgroup (MAWWG) to Aid Mitigation	Regina Poeske, USEPA, Reg. 3; Rob Brooks, Penn State

Agenda – Afternoon Session

Time	Title	Speaker(s)
1:00 – 1:45	USACE Science Support for Compensatory Mitigation	Sally Yost, USACE, ERDC
1:45 – 2:05	Greenhouse gas dynamics in response to added organic matter in a freshwater mitigation wetland in southeastern Virginia	Scott Winton & Curt Richardson, Duke
2:05 – 2:25	Determining physiochemical parameters to enhance tree growth and design plans for Piedmont created wetlands	Rob Atkinson and Shawn Wurst, CNU
2:25 – 2:40	Afternoon Break	
2:40 – 3:00	Alteration of Soil Hydraulic Properties During the Construction of Mitigation Wetlands in the Virginia Piedmont	Bradley Petru & Changwoo Ahn, GMU
3:00 – 3:20	The effects of site preparation, planting stock, and planting aids on growth of American sycamore and willow oak for Piedmont wetland restoration	Mike Aust, VT
3:20 – 4:00	General Questions/Discussions	

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Piedmont Wetlands Research Program

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Establish a wetlands research funding mechanism from revenues from credit sites in 3 mitigation banks

Piedmont Wetlands Research Program

Special thanks to our Regulatory Champions

- Ron Stouffer and Bruce Williams (U.S. Army Corps of Engineers)
- Ellen Gilinsky (DEQ – now at EPA)
- Kim Smith (USFWS)
- Peter Stokely (EPA)

Mission and Purpose

The **mission** of this program is to fund applied research that makes a real and measurable difference (in terms of how mitigation sites are designed and built) in wetland creation, restoration, and enhancement activities in the Virginia Piedmont.

- Advancing the state of Science and Engineering
- Educating Students

- Today's symposium's **purpose** is to communicate the initial results of this research program to Regulators and Practitioners.

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The Topics

How did we pick them?

- Brainstorming with Practitioners, Agencies and Researchers

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Educational Institutions Currently Involved

Virginia Tech

William & Mary VIMS
Virginia Institute of Marine Science
School of Marine Science

Duke University

Christopher Newport University

George Mason University

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Topics/Projects Selected

Topic	Status
1. Wetland Hydrology Monitoring	Final Report
2. Water Budget Modeling	Under Way
3. Sustainable Created Forested Wetlands	Under Way
4. Growing Season	Lower Priority (other research underway)
5. Dedicated Research Areas	Too Expensive
6. Soils Organic Matter Improvement Techniques	Lower Priority (other research underway)
7. Small Grant Program	Under Way

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Wetland Hydrology Monitoring

In the 1993-1994 era, Ron Stouffer and I observed standard USACE well installations did not correlate well with adjacent soil pits.

We submitted comments, WES changed the standard, and observations improved – but measurement still seems to have high error rates:

1. How to effectively and accurately monitor wetland hydrology in surface water driven systems with clayey soils.

2. How such readings can be obtained in a manner that minimizes the ability for fraudulent measurements to be submitted (elevation, location, and timing).

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9:15 – 9:45

Presentation by

W. Lee Daniels

Wetland Water Budget (1 of 2)

The majority of wetlands restoration and creation failures occur due to hydrology issues. An improved water budget methodology could reduce this failure mode rate.

Three water budget modeling methods dominate the current industry practice.

1. **“Pierce Method”** – The most commonly used water budget in industry practice in Virginia.
2. **“Garbish Methodology”** – Similar to Pierce Method, but a less quantitative method.
3. **DRAINMOD** – Rarely seen in industry use due to user interface difficulty, the lack of soil data parameters needed by the program, and local geotech labs unfamiliarity with testing requirements.

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Wetland Water Budget (2 of 2)

While the **"Pierce Method"** has resulted in numerous successful mitigation projects, the following areas of improvement are needed:

a. Modeling wetlands on a slope (i.e., it assumes a level pond).

b. High roughness and very slow flow rates at shallow depths (i.e., 0.10 to 0.30 feet).

c. Limited ability to model ground water.

d. Volume of run off may be overestimated.

e. Overbank flow difficult to calculate.

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9:45 – 10:30

Presentation by:

Rich Whittecar, Kerby Dobbs,

Tess Thompson, Eric Neuhaus

And Zach Agioutantis

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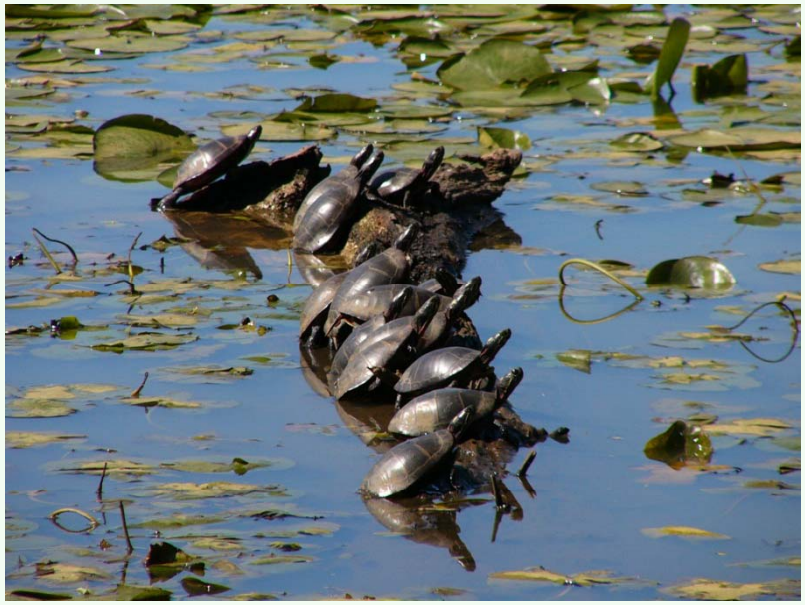
10:30 – 10:45

Morning Break



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Sustainable Created Forested Wetlands

The public, as well as regulatory agencies are concerned with the assurance of successful creation of forest wetlands as mitigation for forested wetland impacts.

1. Since wetland mitigation is based on performance criteria, what is the 'best recipe' for establishing and ensuring a successfully created sustainable forested wetland in the Piedmont Region of Virginia?

2. How can the plant community be specified and managed to provide he greatest diversity and quality of wetland functions and values (wildlife habitat, flood flow attenuation, nutrient uptake, etc.).

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Sustainable Created Forested Wetlands

(2 of 2)

The Real World

Some permits require:

80% survival

200 stems/acre

400 stems/acre

5-feet tall in Year 10

10% growth/year

- Some people use just Bare Root, others use tublings or container.
- Our “nicest” site use a mix of seed, Bare Root, tublings, container and B+B.
- Is “nice” ecological valuable?
- Was it worth the cost?

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10:45 – 11:15

Presentation by:

Jim Perry and Wes Hudson

11:15 – 12:00

Wetland Assessment Tools Developed by Mid-Atlantic Wetland Workgroup (MAWWG) to Aid Mitigation

Presented by:

Regina Poeske and Rob Brooks

12:00 – 1:00

Lunch

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1:00 – 1:45

USACE Science Support for Compensatory Mitigation

Presented by:

Sally Yost

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Small Grant Program

A consortium managed by Lee Daniels (VT) and Jim Perry (VIMS) designed to help develop MS level students.

Projects:

1. "Changes in Soil-Water Characteristics Due to Construction Practices of a Mitigation Bank Wetland in the Virginia Piedmont".
2. "A Comparison of Wetland Functions and Services on Restored Wetlands of the Piedmont: Carbon and Nitrogen Storage Release"
3. "Determination of Wetland Soil Hydroperiod, Rooting Depth and Organic Matter Levels in Natural vs. Created Wetlands".
4. "Assessing Availability of Groundwater Resources for Piedmont Mitigation Wetlands".

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Small Grant Program

5. “Improving Wetland Creation and Restoration: Species Selection, Site preparation, and Planting Techniques.”

6. “Determining Physiochemical Parameters to Enhance Tree Growth and Design Plans for Piedmont Created Wetlands”.

7. “Development of a Wetland Vegetation Hydraulic Properties Database”.

8. “Comparing Mitigation Success to Mitigation Banking Instrument and Permit Conditions: Vegetation”.

9. Comparing Mitigation Success to Mitigation Banking Instrument and Permit Conditions – Development of Hydrophytic Vegetation, Hydric Soil, and Wetland Hydrology.

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1:45 – 2:05

Greenhouse gas dynamics in response to added organic matter in a freshwater mitigation wetland in southeastern Virginia

Presented by:

Scott Winton and Curt Richardson

2:05 – 2:25

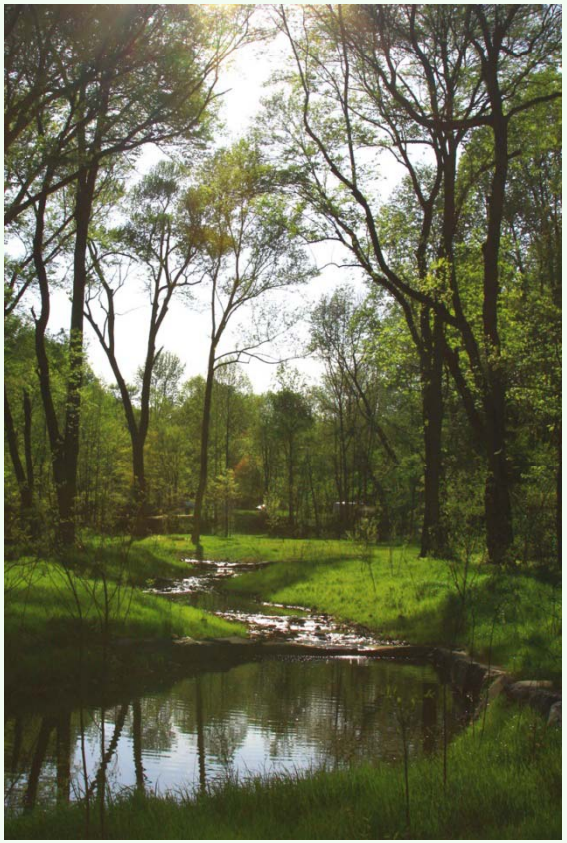
Determining physiochemical parameters to enhance tree growth and design plans for Piedmont created wetlands

Presented by:

Rob Atkinson and Shawn Wurst

2:25 – 2:40

Afternoon Break



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2:40 – 3:00

Alteration of Soil Hydraulic Properties During the Construction of Mitigation Wetlands in the Virginia Piedmont

Presented by:

Bradley Petru and Changwoo Ahn

3:00 – 3:20

The effects of site preparation, planting stock, and planting aids on growth of American sycamore and willow oak for Piedmont wetland restoration

Presented by:

Mike Aust

Future Research

- Expand, Enhance and Calibrate WetBud
- Develop a text book
- Streams?

Q & A

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