

BEYOND WETLANDS: Engineering the Landscape



June 11–14, 2008
Virginia Tech • Blacksburg, Virginia

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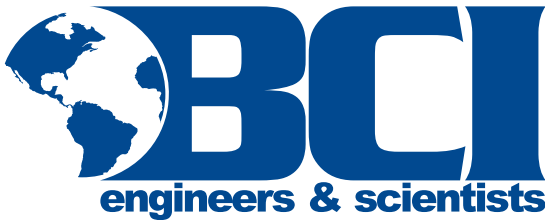
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Beyond Wetlands: Engineering the Landscape

Hosted By: Dr. Cully Hession & Dr. Tess Wynn,
Biological Systems Engineering, Virginia Tech

Dates: June 9th – 14th, 2008

Location: Virginia Tech, Blacksburg, VA

Monday, June 9th, 2008

- 11 am - 5 pm** Workshop: Ecological Design 101 (Seitz 108)
- 11 am - 5 pm** Workshop: Process-Based Stream Restoration Design (Seitz 300)
- 11 am - 5 pm** Workshop: Mitigation Wetland Design (Seitz 105)

Tuesday, June 10th, 2008

- 8 am - 5 pm** Workshop: Ecological Design 101 (Seitz 108)
- 8 am - 5 pm** Workshop: Process-Based Stream Restoration Design (Seitz 300)
- 8 am - 5 pm** Workshop: Mitigation Wetland Design (Seitz 105)
- 6 pm - 9 pm** Pre-Conference Social (University Club)

Wednesday, June 11th, 2008

- 8 am** AEES Business Meeting (Colonial Hall)
- 9 am** Registration, continental breakfast
- 10 am** Opening Remarks: Hession, Matlock (Colonial Hall)
- 10:30-11:30 am** Keynote Speakers (3) (Colonial Hall)
- 11:30-12:15 pm** Panel discussion with Keynote Speakers (Colonial Hall)
- 12:15 pm** Lunch provided (Old Dominion Ballroom)

1:30-3:00 pm

Breakout 1 – Three concurrent sessions

Speaker	Stream Restoration: Case Studies (Colonial Hall)	Wetlands: Treatment (Brush Mountain Room A)	Wetlands: Misc. (Squires 341/345)
1	"Rock Creek Stream Restoration - Mission, Kansas" <i>Ms. Laura Adams</i>	"Use of Constructed Wetlands to Remove N and P From Dairy Barnyard Runoff: Synthesis of Results from Field Experiments, Laboratory Isotherms, and Stormwater Monitoring" <i>Dr. Cynthia M. Hill</i>	"Characterization of Microorganisms Contributing to Denitrification in Tile Drain Biofilters in Illinois" <i>Ms. J. Malia Appleford, Dr. Luis F. Rodriguez, Dr. Richard Cooke, Dr. Yuanhui Zhang, Ms. Angela D. Kent, Ms. Julie Zilles</i>
2	"Urban Stream Renewal in the Midwest: Rock Creek in Mission, Kansas" <i>Ms. Laura Adams</i>	"Optimizing Methane Production and Electricity Generation in Small-Scale Agricultural Digesters in Costa Rica" <i>Ms. Stephanie Lansing, Mr. Raúl Botero, Ms. Tatiana Nogueira, Mr. Ederson Silva, Mr. Joaquín Viquez, Ms. Helen Martínez, Mr. Emilio Martínez, Ms. Perla Servián, Dr. Jay Martin, Mr. Bryan Smith</i>	"Temporal Analysis of Microbial Ecosystems using Systems of Ordinary Differential Equations" <i>Mr. Glen K. Menezes, Ms. Jennifer M. Appleford, Dr. Angela D. Kent, Dr. Luis F. Rodriguez</i>
3	"Engineered Restoration Options for an Impaired Flood Plain and Stream Channel on a Manufacturing Site" <i>Mr. John H. Brooks III, Mr. Steven F. Church, Mr. George Karalus</i>	"Almost Beyond Wetlands: Enhancing Ammonia Removal in Constructed Treatment Wetlands using Oxygenation" <i>Dr. Marc Beutel, Mr. Huckleberry Palmer</i>	"Cultured Periphyton in a Subalpine Environment: Results from a Tahoe Basin Demonstration Project" <i>Dr. Steven Patterson, Dr. Alan Heyvaert, Mr. Collin Strassenburgh</i>
4	"A Case Study of an Urban Stream Restoration Project in Roanoke, Virginia" <i>Mr. Scott Lowe, Mr. George W. Simpson III, Mrs. Carolyn Keeler</i>	"Nutrient Removal in Small Wastewater Treatment Systems" <i>Mr. Michael Ogden</i>	"A Spatial Hydrology Model for Wetlands on Phosphatic Clay Settling Areas" <i>Mr. Sean A. King, Dr. Mark T. Brown</i>
5	"Mitigating the Ecological Impacts of a Low Head Dam on Swan Creek in Toledo, Ohio" <i>Mr. Scott B. Dierks, Ms. Erin N. Switala</i>	"Low Energy Use, Cost Effective, Low Maintenance Cluster Wastewater Treatment and Dispersal System Producing Effluent Meeting Unrestricted Water Reuse Standards – Malibu Creek Plaza, Malibu, CA" <i>Mr. Pio Lombardo</i>	"Beyond Wetlands: Solving Global Warming with Landscape Engineering" <i>Professor Alex J. Horne</i>
6	"Rehabilitation of the Yarqon River, Israel: A Model for Urban Watersheds in Water-Stressed Regions" <i>Mr. David C. Austin, Dr. David Pargament, Mr. Scott Wallace</i>	"No Net Discharge Wastewater Collection, Treatment and Dispersal System – Large Commercial/ Retail Development, Malibu, CA" <i>Mr. Pio Lombardo</i>	

3:00-3:30 pm

Break, visit exhibits (Old Dominion Ballroom)

3:30-5:00 pm

Breakout 2 – Three concurrent sessions

Speaker	Stream Restoration: Design Tools (Colonial Hall)	Wetlands: Design (Brush Mountain Room A)	Urban Systems: Stormwater BMPs (Squires 341/345)
1	"Incorporating Large Woody Debris into Urban Stream Restoration? A Case Study of the Design of the Northwest Branch of the Anacostia River" <i>Mr. Scott Lowe, Mr. Rob Shreeve, Mr. Steve Morsberger</i>	"A Wetland Feasibility Approach that Considers Landscape Hydrogeology to Facilitate Design" <i>Mr. Bradley J. Petru</i>	"Channel Scour and Loss of Traditional Mayan Stormwater Management at Copan Archaeological Site in Honduras" <i>Dr. Theodore Endreny, Dr. Stewart Diemont</i>
2	"Effective Discharge Analysis for Restoration along the Northwest Branch Anacostia River" <i>Mr. Mike Miller, Mr. Scott Lowe, Mr. Rob Shreeve</i>	"Hydrologic Evaluation for Ecological Engineering of Phosphate Clay Settling Areas" <i>Mr. Daniel L. McLaughlin, Dr. Mark T. Brown</i>	"Troy Brook Watershed, Morris County, New Jersey: A Case Study in the Formation of a Regional Stormwater Management Plan" <i>Dr. Christopher C. Obropta, Mr. Jeremiah D. Bergstrom, Ms. Sandra M. Goodrow</i>
3	"The High-Flow Low-Flow Problem in River Restoration" <i>Dr. Mark R. Tompkins</i>	"Characterization of Stormwater Pollution Loads: Implications for Design and Management of Ecologically-Engineered Systems" <i>Mr. Mauricio E. Arias</i>	"Greening the Urban Center: Stormwater Management in the Built Environment" <i>Ms. Susan A. McDaniels, Ms. Michele C. Adams</i>
4	"Developing a Methodology to Assess and Manage the Effects of Urban Development on Stream Geomorphology" <i>Mr. Gary E. Palhegyi</i>	"Enhancing Wetland Plant Communities On Clay Settling Area Wetlands" <i>Ms. Mary C. Boyd, Dr. Mark T. Brown</i>	"Simulation of Natural Treatment Systems to Support Watershed Management Decisions in an Urbanized Watershed" <i>Mr. Paul Frank, Mr. James Bays</i>
5	"Excavated Floodplains and Stream Restoration: Design Considerations and Lessons Learned" <i>Mr. Kevin Tweedy</i>	"Vegetation-Induced Roughness: A Flume Study with Natural Wetland Plants" <i>Ms. Candice Piercy, Dr. Tess Wynn</i>	"Replacing Incised Headwater Channels and Failing Stormwater Infrastructure with Regenerative Stormwater Conveyance" <i>Mr. Joe Berg, Mr. Keith Underwood</i>
6	"Efficacy of River Restoration for Flood Wave Attenuation" <i>Mr. Joel Sholtes</i>	"Energy Requirements for Nitrification and Biological Nitrogen Removal in Engineered Wetlands" <i>Mr. David C. Austin, Ms. Jaime Nivala</i>	"Reductions in Stormwater Quantity and Pollutant Loads due to Bioretention and Structural Soil Practices" <i>Ms. Kathy M. DeBusk, Dr. Tess Wynn</i>

5:30-7:30 pm

Poster Session (Torgersen Museum)

7:30 pm

Dinner on your own

Thursday, June 12th, 2008

8 am Registration, continental breakfast

9:00-10:30 am Breakout 1 – Three concurrent sessions

Speaker	Stream Restoration: Geomorphology Research (Colonial Hall)	Wetlands: Floodplain/ Coastal/Reservoir (Brush Mountain Room A)	Landscape Design: Ecological (Squires 341/345)
1	<p>"Using Current Knowledge of River Channel Processes to Predict the Equilibrium Topography of a Sand-bed Channel within a Floodplain"</p> <p><i>Dr. Anne Lightbody, Mr. Jeffrey Marr, Dr. Chris Paola</i></p>	<p>"Integrating Stream Restoration and Stormwater Wetlands for Comprehensive Restoration of the Ecological Functions of an Urban Riparian Corridor"</p> <p><i>Mr. Jason Doll, Mr. Brad Fairley, Ms. Amber L. Coleman</i></p>	<p>"Adaptive Reuse and Flood Water Control for the Historical Oradell Waterworks"</p> <p><i>Dr. Beth Ravit, Dr. Wolfram Hoefler, Dr. Christopher Obropta, Dr. Robert Miskewitz, Mr. Jonathan Mullineaux, Ms. Jillian Thompson, Mr. Richard Bartelone</i></p>
2	<p>"Self-forming Streams"</p> <p><i>Mr. Dan Mecklenburg, Mr. Daniel Ketzer</i></p>	<p>"Evaluating a Constructed Floodplain Wetland for Nutrient Removal Efficiencies"</p> <p><i>Ms. Andrea L. Ludwig, Mr. Jim Lawrence, Dr. Cully Hession</i></p>	<p>"Beyond Production: Designing Multifunctional Farm Landscapes"</p> <p><i>Dr. Sarah T. Lovell</i></p>
3	<p>"Evaluation of an in situ Measurement Technique for Streambank Critical Shear Stress and Soil Erodibility"</p> <p><i>Ms. Cami Johnson, Dr. Tess Wynn</i></p>	<p>"Pathogen Removal by Constructed Riparian Wetlands During Variable Hydrologic Conditions in Central Ohio"</p> <p><i>Ms. Charissa Young, Dr. Jay Martin, Dr. William Mitsch, Dr. Armando Hoet, Dr. Fred DeGraves</i></p>	<p>"Teaneck Creek – Restoring Neglected Urban Lands"</p> <p><i>Dr. Christopher C. Obropta, Dr. Beth Ravit, Mr. Jeremiah D. Bergstrom</i></p>
4	<p>"Changes in Boundary Shear Stress due to Streambank Vegetation"</p> <p><i>Ms. Leslie Clark, Dr. Theresa Wynn</i></p>	<p>"Ecosystem Restoration in a Hydroelectric Reservoir"</p> <p><i>Mr. Jeff F. Zylland, Ms. Beth A. Cade, Ms. Lisa R. Morgan, Mr. Terrell L. Noble</i></p>	<p>"Urban Stream Daylighting: Design Application to Stroubles Creek, Blacksburg, VA"</p> <p><i>Ms. Tracy A. Buchholz</i></p>
5	<p>"Measuring Channel Morphology with Terrestrial Lidar for Stream Restoration Design"</p> <p><i>Mr. Jonathan P. Resop, Dr. Cully Hession</i></p>	<p>"Quantifying Benefits of Flow Diversion to Coastal Marshes for Louisiana Coastal Protection and Restoration"</p> <p><i>Mr. Kyle McKay, Mr. Craig Fischenich</i></p>	<p>"Evaluation of New Methods for Development of Sustainable Roadside Landscapes for the State of Texas"</p> <p><i>Dr. Kim D. Jones, Dr. Beverly Storey, Dr. Debbie Jasek, Dr. Joseph Sai, Dr. Xubin Pan</i></p>
6	<p>"Spatial and Temporal Changes in Bank Erosion Rates in a Small Headwater Urban Stream"</p> <p><i>Ms. Barbra C. Utley, Dr. Tess M. Wynn, Miss Cami Johnson, Mr. Frank M. Smith, Mr. Alan Simpson</i></p>	<p>"Application of the CADDIS Method for Identifying Stressors in Aquatic Ecosystems"</p> <p><i>Mr. E. Cummings, Dr. Marty Matlock</i></p>	

10:30-11:00 am Break, visit exhibits (Old Dominion Ballroom)

11:00-12:30 pm Student Design Competition (Seitz Hall)

12:30 pm Lunch on your own

2:00-3:00 pm

Breakout 2 – Three concurrent sessions

Speaker	Stream Restoration: Biota (Colonial Hall)	Urban Systems: Innovative BMPs (Brush Mountain Room A)	Landscape Design: TMDLs/Watersheds (Squires 341/345)
1	"Analysis of Functional Traits in Reconfigured Channels: Implications for the Bioassessment and Disturbance of River Restoration" <i>Dr. Desiree Tullos, Dr. David Penrose, Dr. Gregory Jennings</i>	"Green Vine Canopies for Restoring Ecological Benefits to Urban Surfaces" <i>Dr. Dave R. Tilley, Ms. Laura M. Schumann</i>	"Proposed Revisions to Mining Permit Limits for TMDL Assessment" <i>Dr. Gene Yagow, Dr. Brian Benham, Ms. Karen Kline</i>
2	"Improving the Macroinvertebrate Predictive Model in Maryland and Incorporating Into a GIS Environment" <i>Ms. Yin-Phan Tsang, Dr. Glenn Moglen, Dr. Gary Felton</i>	"Effect of Roof Vine Canopy on Indoor Building and Roof Temperatures in July" <i>Ms. Laura M. Schumann, Dr. David R. Tilley</i>	"Rockaway River Water Quality Study: Evaluating and Implementing TMDLs in an Urban Watershed" <i>Mr. Jeremiah D. Bergstrom</i>
3	"Spatial Distribution and Geomorphic Condition of Fish Habitat in Streams: An Analysis using Hydraulic Modeling and Geostatistics" <i>Ms. Jessica S. Clark, Dr. Donna M. Rizzo, Dr. Mary C. Watzin, Dr. Cully Hession</i>	"An Advanced Application of a Gravel Wetland for Stormwater Treatment in South Burlington, Vermont" <i>Mr. David Whitney, Mr. Evan Fitzgerald</i>	"Meeting Bacterial TMDL's By Way of an Innovative New Technology" <i>Mr. Daniel J. Penczak</i>
4	"Hydraulic Complexity Metrics for Evaluating In-stream Brook Trout Habitat" <i>Ms. Jessica L. Kozarek, Dr. Cully Hession, Dr. C. Andrew Dolloff, Dr. Panos Diplas</i>	"Wetland Filters for Removing Phosphorous from Eutrophic Retention Ponds" <i>Mr. Shawn E. Rosenquist, Dr. Cully Hession, Dr. David H. Vaughan</i>	"Urban Watershed Assessment" <i>Mr. Kyle M. Kruger</i>

3:00-3:30 pm

Break, visit exhibits (Old Dominion Ballroom)

3:30-4:45 pm

Breakout 3 – Three concurrent sessions

Speaker	Stream Restoration: Measurement and Monitoring (Colonial Hall)	Urban Systems: Misc. Design (Brush Mountain Room A)	Teaching Ecological Knowledge (Squires 341/345)
1	"Stream Restoration Project Evaluation in North Carolina" <i>Dr. Greg Jennings, Mr. David Penrose, Ms. Barbara Doll</i>	"Importance of Regional Context in Understanding Stream Morphology" <i>Professor Mintai Kim</i>	"Knowledge Gap Assessment: A Tool for Improving Watershed Information/Education Programs" <i>Dr. Robert A. Morgan, Mr. Shawn Grindstaff</i>
2	"Improving Stream Restoration through Monitoring: A Case Study of Multiple Stream Restoration Projects in the Hiwassee River Watershed of North Carolina" <i>Mr. Jason M. Zink, Ms. Lara Rozzell, Mr. Dave Penrose, Dr. Greg Jennings</i>	"Establishing Metrics for Environmental Benefits Analysis" <i>Mr. Kyle McKay, Mr. Craig Fischenich</i>	"Organization of an Introductory Green Engineering Course for Engineering Undergraduates" <i>Ms. Andrea Ludwig, Ms. Barbra C. Utley, Dr. John Cundiff</i>

Speaker	Stream Restoration: Measurement and Monitoring (Colonial Hall)	Urban Systems: Misc. Design (Brush Mountain Room A)	Teaching Ecological Knowledge (Squires 341/345)
3	"How do we Measure Ecological Restoration Success?" <i>Mr. Craig Fischenich,</i> <i>Mr. Lawrence L. Skaggs</i>	"Modeling Relationships Between Ecological Processes and Human Development Patterns within Lacustrine Ecosystems" <i>Mr. Eric Roy,</i> <i>Dr. Jay Martin,</i> <i>Dr. Elena Irwin,</i> <i>Dr. David Culver</i>	"Traditional Ecological Knowledge (TEK): Ideas, Inspiration and Designs for Ecological Engineering" <i>Dr. Jay F. Martin,</i> <i>Mr. Eric Roy,</i> <i>Dr. Stewart Diemont,</i> <i>Dr. Bruce Ferguson</i>
4	"Applicability and Constraints of Current Virginia Erosion and Sediment Control Standards on Stream Restoration Projects" <i>Mr. Reid Cook</i>	"What About Utility Corridors?" <i>Mr. Ben Leatherland</i>	"Are we Teaching 'Liberal Science'?": Revisiting H.T. Odum on Ecological Engineering Education" <i>Dr. Stewart A. Diemont,</i> <i>Dr. Theodore A. Endreny,</i> <i>Dr. Timothy Lawrence</i>
5	"Design of Post-implementation Monitoring Plans for Channel-floodplain Restoration: Testing for Effects when Limiting Factors are Uncertain" <i>Dr. Maia S. Singer,</i> <i>Ms. Z. E. Diggory,</i> <i>Ms. T. N. Cosio,</i> <i>Dr. P. W. Downs</i>		

5:00-6:30 pm Blacksburg LID tour (sign up at registration desk)

7:00-9:00 pm Cookout (Virginia Tech Duck Pond)

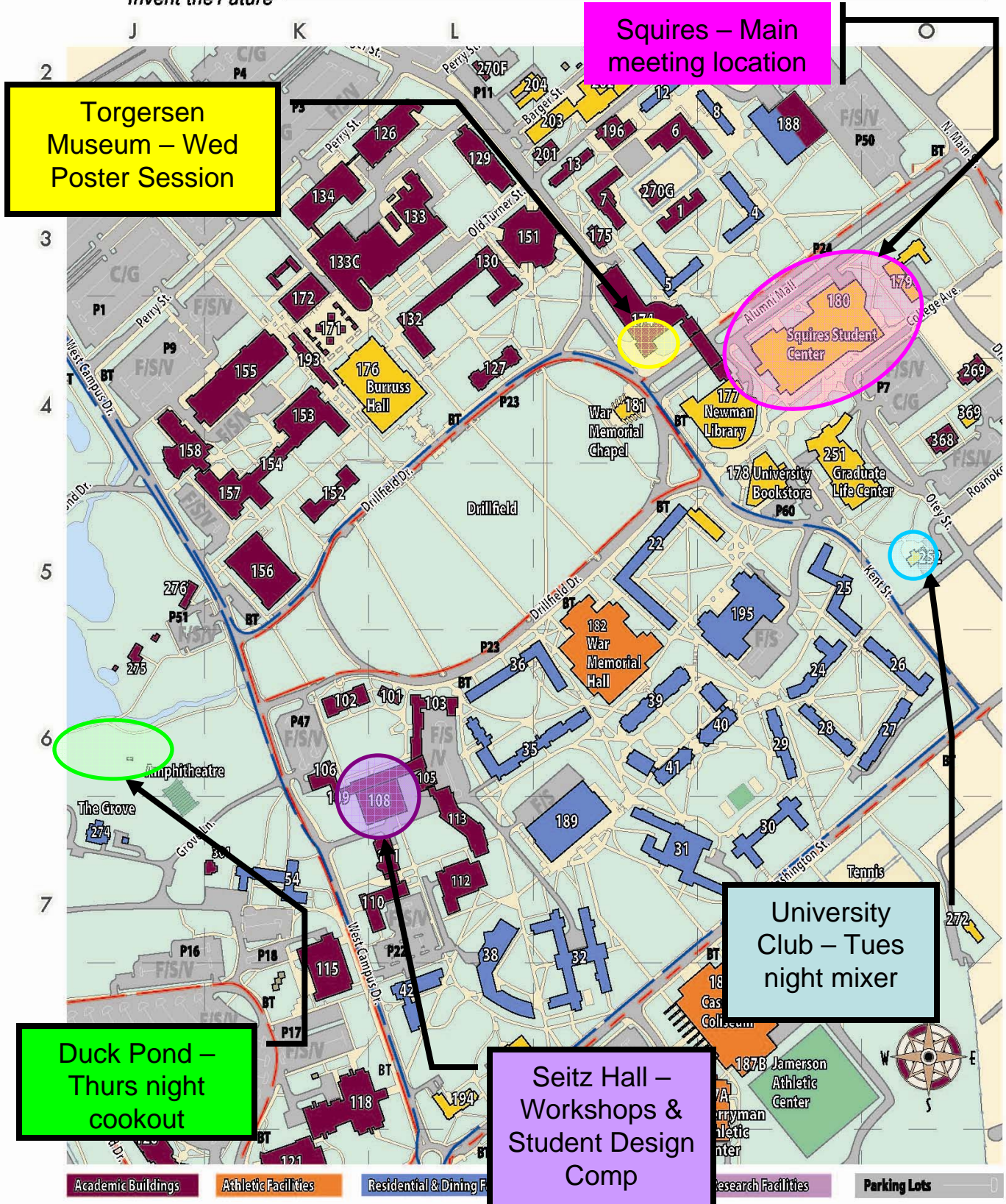
Friday, June 13th, 2008

- 8 am** Registration, continental breakfast
- 9 am** Presentation of workshop results. Three talks: Education, Accreditation, and Professional Certification (Colonial Hall)
- 10 am** Breakout groups to discuss workshop results (Colonial Hall, Brush Mountain Room, Squires 341/345)
- 12 pm** Lunch and discussion of workshop/breakout group discussions - ABET and PE concerns/issues.
- 2 pm** Student award presentations (Colonial Hall)
- 3 pm** Presidential remarks (Colonial Hall)
- 4 pm** Open Forum Academy (Colonial Hall)
- 7 pm** Dinner on your own

Saturday, June 14th, 2008

- 8 am-5:00 pm** Tours
 - New River Tubing Trip
 - Cascades Waterfall Hike
 - Winery Tour/Tasting (CANCELLED)
- 6:00 pm** Social/Dinner/Cookout at Cully Hession's House

CENTRAL CAMPUS MAP



**Torgersen
Museum – Wed
Poster Session**

**Squires – Main
meeting location**

**University
Club – Tues
night mixer**

**Duck Pond –
Thurs night
cookout**

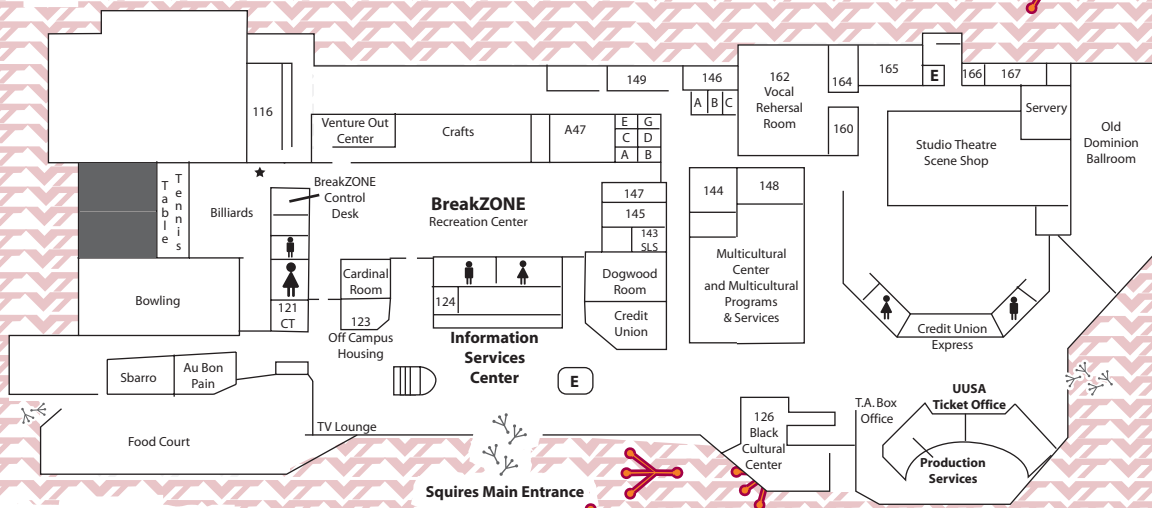
**Seitz Hall –
Workshops &
Student Design
Comp**

- Academic Buildings
- Athletic Facilities
- Residential & Dining
- Research Facilities
- Parking Lots

Alphabetical Key

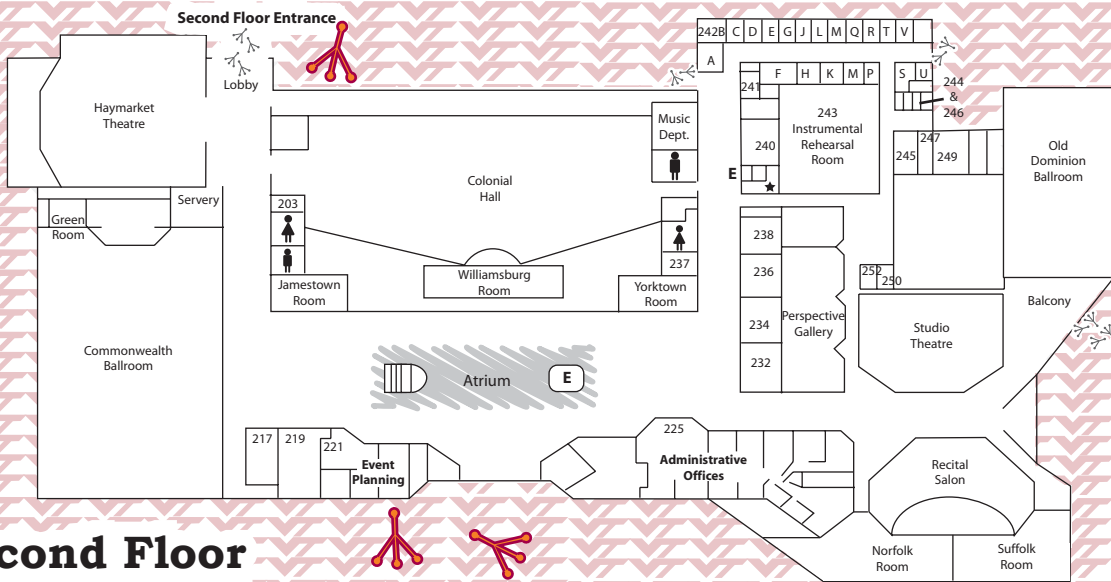
K-7 109 Agnew Hall	O-6 027 Miles Hall
L-7 113 Agriculture/Forestry Research Laboratory Facility	M-2 203 Military Building
M-2 204 Air Conditioning Facility	N-2 008 Monteith Hall
M-8 032 Ambler Johnston Hall	N-6 040 New Residence Hall – East
M-2 196 Art and Design Learning Center	N-6 024 Newman Hall
O-6 026 Barringer Hall	N-4 177 Newman Library
J-9 120 Bioinformatics Phase II	L-4 132 Norris Hall
M-3 005 Brodie Hall	M-3 201 Old Security Building
L-2 270F Building 270F	N-6 029 O’Shaughnessy Hall
K-4 171 Burchard Hall	N-5 195 Owens Hall
K-4 193 Burke Johnston Student Center	K-4 153 Pamplin Hall
L-4 176 Burruss Hall	L-4 127 Patton Hall
L-6 036 Campbell Hall	M-6 039 Payne Hall
L-8 194 Career Services Building	M-6 041 Peddrew-Yates Residence Hall
N-8 187 Cassell Coliseum	M-3 175 Performing Arts Building
L-7 112 Cheatham Hall	M-2 202 Power Plant
J-4 158 Chemistry/Physics Building	K-6 102 Price Hall
L-8 038 Cochrane Hall	L-3 277 Price House/Women’s Resource Center
M-3 270G College of Science Admin. Bldg.	M-7 031 Pritchard Hall
K-3 172 Cowgill Hall	L-3 133 Randolph Hall
K-5 156 Davidson Hall	N-3 004 Rasche Hall
K-4 155 Derring Hall	K-5 154 Robeson Hall
M-7 189 Dietrick Hall	L-6 101 Sandy Hall
L-2 126 Durham Hall	K-6 106 Saunders Hall
M-5 022 Eggleston Hall	L-7 108 Seitz Hall
L-7 110 Engel Hall	N-2 006 Shanks Hall
M-3 013 Femoyer Hall	N-2 188 Shultz Hall
P-10 240 Fleet Services	M-6 035 Slusher Hall
L-7 111 Fralin Biotechnology Center	L-3 356 Smith House
O-5 251 Graduate Life Center at Donaldson Brown	L-6 105 Smyth Hall
J-7 274 The Grove	J-6 275 Solitude
K-5 157 Hahn Hall	N-4 180 Squires Student Center
K-3 133C Hancock Hall	L-8 192 Student Services Building
L-8 042 Harper Hall	N-12 183 Tennis Center
O-3 179 Henderson Hall	M-2 012 Thomas Hall
K-7 054 Hillcrest Hall	M-4 174 Torgersen Hall
L-3 130 Holden Hall	N-5 178 University Bookstore
L-6 103 Hutcheson Hall	O-5 252 University Club
N-8 187B Jamerson Athletic Center	N-5 025 Vawter Hall
N-6 028 Johnson Hall	K-7 301 Wallace Annex
M-3 001 Lane Hall	K-8 115 Wallace Hall
N-7 030 Lee Hall	M-4 181 War Memorial Chapel
K-8 118 Litton-Reaves Hall	M-6 182 War Memorial Hall
M-3 007 Major Williams Hall	K-3 134 Whittemore Hall
M-3 151 McBryde Hall	K-5 152 Williams Hall
N-8 187A Merryman Athletic Facility	J-5 276 Wright House

Squires Student Center

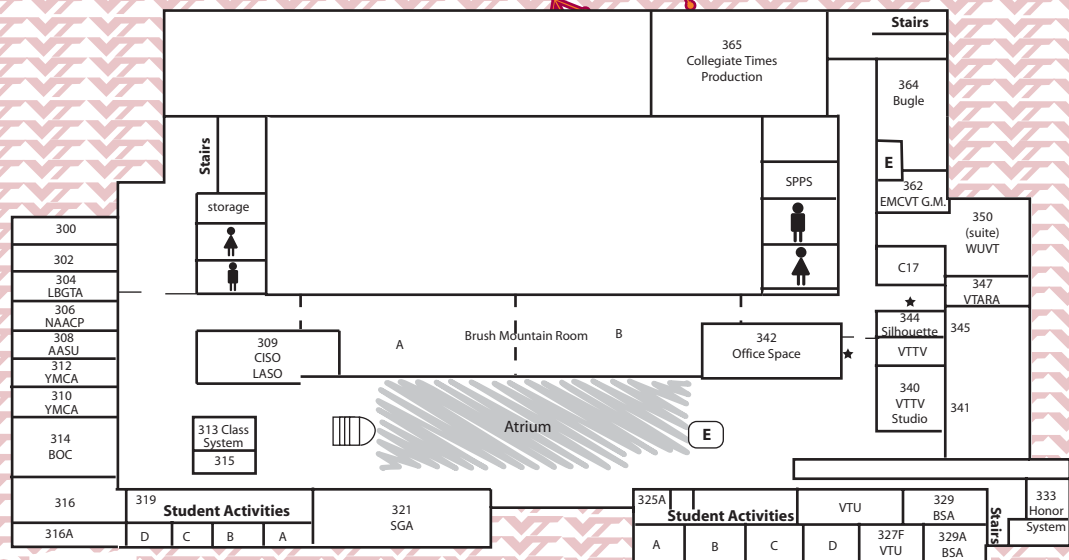


First Floor

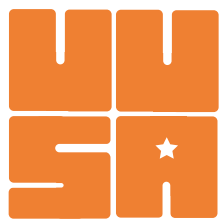
Squires Student Center takes its name from Houston B. Squires (1882-1934). Squires, a graduate of the class of 1905, was a noted scientist, financier, and philanthropist whose gifts and efforts made possible the original student center, which opened in 1938. A plaque was dedicated in his honor by the students of the university on June 7, 1941 and is now located adjacent to the glass elevator on the first floor. The brick facade of the original Squires, covered in 1967, was uncovered and restored, and now encompasses the majority of the second floor atrium. This area in particular stands as tribute to Houston B. Squires and his efforts in bringing forth the student center which proudly bears his name.



Second Floor



Third Floor



- Men's Restroom
- Women's Restroom
- E** – Elevator
- Vending Machine
- Stairs

<i>Topic</i>	<i>Day/Sess</i>	<i>Author(s)</i>	<i>Abstract Title</i>
Landscape Design	W-Poster	Dr. Brian Benham	The Center for Watershed Studies at Virginia Tech: creating resources and tools for watershed management
Landscape Design	W-Poster	Ms. Julie Jesiek, Dr. Brian Benham, Dr. Gene Yagow; Mrs. Becky Zeckoski	TMDL Knowledgebase Clearinghouse: A Tool for TMDL Developers
Stream Restoration	W-Poster	Dr. Christina M. Cianfrani, PhD., Dr. Sullivan P. S. Mazeika, PhD., Dr. William C. Hession, PhD.; Dr. Mary C. Watzin, PhD.	Mixed stream channel morphologies: implications for fish community diversity
Stream Restoration	W-Poster	Mrs. Sheila Ranganath, Dr. William C. Hession; Dr. Tess Wynn	Recovery of Channel Morphology and Benthic Macroinvertebrate Assemblages after Livestock Exclusion
Stream Restoration	W-Poster	Mr. Frank M. Smith, Dr. Theresa Wynn, Dr. William C. Hession; Dr. Gene Yagow	Restoration of Stroubles Creek in Southwest Virginia
Stream Restoration	W-Poster	Mr. Bill Bennett; Ms. Christy Gabbard	Community Driven Stream Restoration
Stream Restoration	W-Poster	Ms. Jessica T. Roberts, E.I.; Dr. Gregory D. Jennings, PhD.	Field Assessment of Culvert Impacts on Stream Channel Morphology
Stream Restoration	W-Poster	Mr. Thomas L. Dietrich, Jr., Dr. Jay F. Martin; Dr. Andy Ward	Can Geomorphologic Features Predict Stream Stability in Small Stream Systems?
Stream Restoration	W-Poster	Dr. Maeve McBride, Dr. William C. Hession; Dr. Donna Rizzo	Riparian reforestation and channel change: A case study of two small tributaries to Sleepers River, northeastern Vermont, USA
Stream Restoration	W-Poster	Ms. Candice Piercy, Dr. Theresa Wynn; Dr. Cully Hession	Evaluating the Rosgen Stream Classification System in the Eastern US using Discriminant and Cluster Analysis
Stream Restoration	W-Poster	Dr. Joanna C. Curran	Separating Natural and Anthropogenically Induced Channel Change of the San Antonio River, Texas
Stream Restoration	W-Poster	Mr. Erich T. Hester; Mr. Martin W. Doyle	Impact of in-stream geomorphic structures on hyporheic exchange and stream temperature
Stream Restoration	W-Poster	Ms. Leslie D. Bartsch, Dr. Brian E. Haggard, Mr. Joel M. Galloway, Dr. Keith A. Loftin; Dr. William R. Green	Antibiotic Fate and Transport in Three Effluent Dominated Ozark Streams
Stream Restoration	W-Poster	V. Zeledon; Dr. Marty Matlock	Measuring Sediment Oxygen Dynamics in Ozark Streams
Stream Restoration	W-Poster	Dr. Scott D. Longing; Dr. Brian E. Haggard	Stream restoration in small agricultural and urban streams of northwest Arkansas
Sustainability	W-Poster	Dr. Michael J. White, Dr. Daniel E. Storm, Mr. Phil Busteed, Dr. Hailin Zhang, Dr. Michael Smolen, Dr. Garey Fox; Dr. Chad Penn	PPM Plus: A Quantitative P Index for Developing Comprehensive Nutrient Management Plans
Sustainability	W-Poster	Dr. Michael J. White, Dr. Daniel E. Storm; Mr. Phil Busteed	Targeting Critical Source Phosphorus Areas in the Spavinaw Creek Basin

Sustainability	W-Poster	Dr. Marty Matlock; G. Thoma; D. Nutter; Z. Clayton-Neiderman; J. Popp	A Life Cycle Analysis Framework for Carbon in Dairy Production and Processing
Sustainability	W-Poster	Dr. Marty Matlock; T. Costello; D. Nutter; G. Thoma; M. Popp	A Life Cycle Analysis of Energy in Cotton Production
Urban Systems	W-Poster	Ms. Bethany Bezak, Dr. W. Cully Hession, Dr. Tess Wynn; Dr. Gene Yagow	Urban Channel Erosion Quantification in Upland Coastal Zone Streams of Virginia, USA
Urban Systems	W-Poster	Ms. Alicia Greene, Dr. Stacy Hutchinson, Mr. Reid Christianson; Ms. Trisha Culbertson	Impacts of Ecological Diversity on Bioretention Cell Performance During Establishment in the Midwest
Urban Systems	W-Poster	Ms. Hillary S. Tanner	Determining Cost and Treatment Effective Soil Combinations in Bioretention Cells for Storm Water Management
Urban Systems	W-Poster	Ms. Maria Pang, Mr. Scott Perry; Mr. Brian Lee	SWMM Hydrology and Non-point Source Pollution Removal Model
Urban Systems	W-Poster	Mr. G.D. Gokak; Dr. Sureshkant Verma, PhD.	Effect of Plant Capacity on Performance of Bare Flat Plate Collector Working as Superheater for Solar Assisted Vapour Compression Heat Pump
Urban Systems	W-Poster	Mr. Ivan A. Zuidhoek; Dr. Jon C. Cawley	The Moorish Garden as a Memetic Permaculture System
Wetlands	W-Poster	Mr. John Fochs, Dr. Garey Fox, Dr. Daniel E. Storm, Dr. Chad Penn; Dr. Glenn Brown	Potential Subsurface Transport of Phosphorus in Riparian Floodplains: Tracer and Phosphorus Transport Experiments
Wetlands	W-Poster	Audrey Michelle Sima; Todd Halihan; Kathleen Thompson; Garey Fox; Dan Storm	Transient Electrical Resistivity Imaging of a Tracer Test, Tahlequah, OK
Wetlands	W-Poster	Mr. David M. Blersch, Dr. Walter W. Mulbry; Dr. Patrick C. Kangas	Whence the hybrid? Engineering autonomy in an algal turf scrubber technoecosystem.
Wetlands	W-Poster	Mr. Neil Agarwal, Mr. Sean Ahearn, Mr. Erik Dudziak, Mrs. Sehba Khan, Mr. Daniel Marcin, Mr. Matthew Shofnos, Ms. Emily Skoda, Mr. Padmasini Venkatachari, Mr. Robert Vocke; Mr. David Tilley	Bacterial Resistance to Common Antibiotics in Maryland Wetlands
Wetlands	W-Poster	Dr. Walter Mulbry	Small-Scale Algal Turf Scrubber Performance on Tributaries of the Chesapeake Bay
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Wetlands	W-Poster	Mr. Sameer Bhattarai; Dr. Changwoo Ahn	Induced microtopography and its effects on the first year vegetation development in a mitigation wetland newly created in the piedmont region of Virginia, USA
Wetlands	W-Poster	Dr. Michael J. White, Dr. Daniel E. Storm, Dr. Garey Fox; Mr. Phil Busteed	Protocol to Determine the Optimal Placement of Riparian BMPs in the Illinois River Basin
Wetlands	W-Poster	Mr. Jason T. Berner	Future Alternatives for Headwater Streams and Associated Wetland Landscapes in the Upper Delaware Basin, New York, USA