26th Tennessee Water Resources Symposium

Presented by the TNAWRA, including pre-symposium events on April 5, 2017:

Using the Stream Quantification Tool for Ecological Uplift - Will Harman, Stream Mechanics

Introduction to Water Quality Modeling using EPA’s WASP Model - Tim Wool, EPA

BSTEM Workshop - Andrew Simon, Cardno Entrix

April 5-7, 2017
Montgomery Bell State Park
Burns, TN

KEYNOTE SPEAKER:
William Harman
Stream Mechanics

LUNCHEON SPEAKER:
Barry Thacker
Schnabel Engineering

Registration and Preliminary Agenda
(ATTN Engineers: Opportunity for PDHs/CEUs)

Montgomery Bell State Park
Burns, Tennessee
April 5-7, 2017

Hosted by
Tennessee Section of the American Water Resources Association

Planning Committee

- Tom Allen, Neel-Schaffer, Inc.
- Ken Barry, S&ME
- Paul Davis, P.E.
- David Duhl, TDEC, DWR
- Michael Hunt, Nashville Metro Water Services
- Alfred Kalyanapu, Tennessee Tech University
- DeeDee Kathman
- Rodney Knight, U.S. Geological Survey
- Tom Lawrence, Water Quality Matters!
- Ingrid Luffman, ETSU, Geosciences
- Regan McGahen, TDEC, DWR
- Patrick McMahon, S&ME, Inc.
- Daniel Saint, Tennessee Valley Authority
- Scott Schoefneracker, CAESER, University of Memphis
- John Schwartz, University of Tennessee
- Forbes Walker, University of Tennessee, Biosystems Engineering & Soil Sciences
- Sherry Wang, TDEC, DWR
- Adrian Ward, Barge, Waggoner, Sumner & Cannon, Inc.
- Lori Weir, U.S. Geological Survey
- Mike Williams, Barge, Waggoner, Sumner & Cannon, Inc.

Symposium Chair
David M. Duhl
TDEC, Division of Water Resources
Email: david.duhl@tn.gov
Tel: (615) 532-0438
Symposium Dates:
April 5-7, 2017

Pre-registration for Symposium:
Before March 31, 2017

Symposium Location and Accommodations:
Montgomery Bell State Park
1000 Hotel Avenue
Burns, TN 37029

A block of rooms at the Montgomery Bell Inn has been reserved. Inn rooms are $84 plus tax. When making your reservations, please specify group code #7867. For reservations call (615) 797-3101 or (800) 250-8613.

Please reserve lodging by FEBRUARY 20, 2017, to ensure availability and rate.

Directions to Montgomery Bell State Park:
For detailed directions to the park, please visit: http://tnawra.er.usgs.gov/2017/map_dir.html

Sponsors & Exhibitors
Opportunities are still available for your organization to be a sponsor.

Both Sponsoring and Exhibiting
- Amec Foster Wheeler Environment & Infrastructure, Inc.
- OTT Hydromet
- Stevens Water Monitoring Systems, Inc.
- Trutta Environmental Solutions
- UT, Tennessee Water Resources Research Center and Institute for a Secure and Sustainable Environment

Exhibitors
- Ecosystem Planning and Restoration
- EnviroScience, Inc.
- Eureka Water Probes
- HydroTech ZS
- S&amp;ME
- Stantec
- Stream Mechanics
- TTU, Professional Science Master’s
- UTK, Student Chapter
- Xylem Analytics/YSI

Sponsors
- ARCADIS, Inc.
- Barge Waggoner Sumner & Cannon, Inc.
- Buchart Horn, Inc.
- Center for Applied Earth Science and Engineering Research
- Center for the Management, Utilization and Protection of Water Resources, TTU
- Civil & Environmental Consultants, Inc.
- KCI Technologies
- Neel-Schaffer, Inc.
- Tennessee American Society of Civil Engineers / Environmental & Water Resources Institute

Poster Session
The Poster Session will be in the Mezzanine on Thursday afternoon. The Poster Judges will be judging the Student Posters from 10a-12p and from 3:00-3:30p. Please be sure to attend. To encourage student participation, TN Section AWRA will present awards for the best student posters. If you are not affiliated with a university or a student poster presenter and would like to be a judge, please send email to either:

Regan McGahen regan.mcgahen@tn.gov
Daniel Saint dpsaint@tva.gov

For a listing of this year’s poster presenters, please visit: http://tnawra.er.usgs.gov/2017/posters.html
### 26th TWRS AGENDA

**Coffee Break in the Exhibit Room**

<table>
<thead>
<tr>
<th>Room A</th>
<th>Room B</th>
<th>Room C</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m.</td>
<td>Introduction to Water Quality Modeling Using EPA’s WASP Model - Tim Wool, EPA Region IV</td>
<td>Using the Stream Quantification Tool for Ecological Uplift - Will Harman, Stream Mechanics</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Lunch/ Keynote: “Quantifying Functional Lift from Stream Restoration Activities,” Will Harman, Stream Mechanics</td>
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<tr>
<td>12:00 p.m.</td>
<td>Stream Health: Science, Citizens &amp; Regulations</td>
<td>Stream Restoration</td>
</tr>
<tr>
<td>Moderator: Melissa Harris, USGS</td>
<td>Moderator: Patrick McMahan, S&amp;ME</td>
<td>Moderator: Bill Wolfe, USGS</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>Clinic River Mussel Die Off - G. Johnson</td>
<td>Channelized: Is All Hope Lost for West Tennessee Streams? H. Meadors</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Watershed Restoration Approaches in West Tennessee. D. Blackwood</td>
<td>Characterizing TN Stream Morphology: Developing Statewide Regional Curves to Aid in Stream Restoration Design. V. Jones</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>Baseline Spring Hydrograph and Water Quality Monitoring at a Large Karst Spring, The Boils WMA, Jackson County, TN. E. Hart</td>
<td>Stream Restoration to Address TMDLs. K. Barry</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Coffee Break in the Exhibit Room - co-sponsored by KCI Technologies &amp; Buchart Horn, Inc.</td>
<td></td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Nutrients &amp; Agriculture</td>
<td>Stream Restoration &amp; Bank Stabilization</td>
</tr>
<tr>
<td>Moderator: Shawn Hawkins, UT</td>
<td>Moderator: John Schwartz, UT</td>
<td>Moderator: Michael Bradley, USGS</td>
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<tr>
<td>5:00 p.m.</td>
<td>5-6 p.m. Vendor Equipment Demonstration Session at the dock behind the hotel restaurant</td>
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<tr>
<td>6-8 p.m.</td>
<td>Dinner and Entertainment, in Rooms A&amp;B-evening beverages sponsored by Stevens Water Monitoring and OTT Hydromet</td>
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### Apr 6

**Coffee and Biscuits in Exhibit Room - sponsored by Amec Foster Wheeler**

<table>
<thead>
<tr>
<th>Algae &amp; Nutrients</th>
<th>Stormwater I</th>
<th>Drought</th>
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</thead>
<tbody>
<tr>
<td>Moderator: Sherry Wang, TDEC-DWR</td>
<td>Moderator: Tom Lawrence, Water Quality Matters!</td>
<td>Moderator: Chris Clark, UT</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>Structure of Algal Assemblages and Trophic State of Streams in Middle Tennessee. J. Lebkuecher</td>
<td>Comparison of Roadway Runoff Quality Surrounding Repaving Events. K. Wyckoff</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>A Simple Way of Calculating Site-Specific Threshold Nutrient Concentrations Based on a Targeted Chlorophyll_a. M. Shiao</td>
<td>Stormwater Detention Pond Monitoring Program at CBU Soccer Field. Y. Lin</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Coffee Break in Exhibit Room - sponsored by CAESER</td>
<td></td>
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<tr>
<td>10a-12p</td>
<td>Poster Session in the Mezzanine - students and professionals will be available for questions</td>
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<tr>
<td>Water Use and Agriculture</td>
<td>Stormwater II</td>
<td>Public Outreach</td>
</tr>
<tr>
<td>Moderator: Forbes Walker, UT</td>
<td>Moderator: Paul Davis, P.E.</td>
<td>Moderator: Regan McGahen, TDEC-DWR</td>
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</tbody>
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**Fun Run sponsored by Barge Waggoner Sumner & Cannon, Inc.**

<table>
<thead>
<tr>
<th>Fun Run</th>
<th>7:00 a.m.</th>
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<tbody>
<tr>
<td>Coffee and Biscuits in Exhibit Room</td>
<td>7:30 a.m.</td>
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<tr>
<td>Noon</td>
<td>Dam Removal</td>
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<tr>
<td>11:00 a.m.</td>
<td>Preparations for Dam Removal in Athens, Tennessee. F. Walker</td>
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</tbody>
</table>

Coffee Break in the Exhibit Room - sponsored by Civil & Environmental Consultants, Inc.

Poster Session in the Mezzanine - students and professionals will be available for questions

<table>
<thead>
<tr>
<th>Restoration to Improve Ecological Conditions</th>
<th>Flood</th>
<th>Water Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderator: Jimmy Smith, TDEC-DWR</td>
<td>Moderator: Shannon Williams, USGS</td>
<td>Moderator: Sindhu Jagadamma, UT</td>
</tr>
</tbody>
</table>

| 3:30 p.m. | Regulatory Program Updates - U.S. Army Corps of Engineers, Nashville District, Regulatory Division. W. Worrall | Seven Steps Closer to Flood Resilience. B. Heilwagen | Sulfur Isotope Composition of Ecosystem Components at Select GRSM Catchments. A. Gonzalez |
| 4:00 p.m. | Clinch Powell Clean Rivers Initiative. B Kreps | PMP/PMF Automation Tool Overview. T. Cropp | Presence of Fecal Indicator Bacteria in Sand by Distance and Depth at a Freshwater Recreational Beach. F. Bailey |
| 4:30 p.m. | May 26, 2016 Permitee-Responsible Mitigation Guidance: Implications for Prospective Applicants. B. McPherson | Investigating Hydrologic Non Stationarity within the Obion River, TN Watershed. B. Abban | An Experimental Analysis of Photocatalytic Degradation for Pharmaceutical Personal Care Products Using Rhodamine B as a Surrogate. A. Ahmed |

Lunch with Luncheon Speaker in Rooms A&B: "Restoring More than Land and Water," Barry Thacker, Schnabel Engineering

Coffee and Biscuits in Exhibit Room - sponsored by WRRC/ISSE

<table>
<thead>
<tr>
<th>Watershed Restoration Planning</th>
<th>Modeling</th>
<th>Tools &amp; Techniques</th>
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<tbody>
<tr>
<td>Moderator: Karina Bynum, TDEC-DWR</td>
<td>Moderator: Adrian Ward, BWSC</td>
<td>Moderator: David Duhl, TDEC-DWR</td>
</tr>
</tbody>
</table>

| 8:00 a.m. | Using Bioassessments to Track Changes in Stream Conditions in Response to Stream Restoration Projects. V. Logue | Hydrological Model Calibration and 2D Hydraulic Analysis of Ralston Creek. J. Shaver | Creating an Application-Specific Tool for Loading Data to WQX. G. Burnette |

Coffee Break in Exhibit Room - co-sponsored by KCI Technologies

<table>
<thead>
<tr>
<th>Planning for Growth and Aquatic Resources in Tennessee</th>
<th>ASCE EWRI Track</th>
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<tbody>
<tr>
<td>Moderator: Scott Gain, USGS</td>
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</table>

Michael Hunt CSM, CPMSM, CPSWQ, Program Manager, Nashville Metro Water Services - Storm Water Division- NPDES Office
Tisha Benton, Director, TDEC Division of Water Resources
Stephanie A. Durman, TDEC Assistant General Counsel
Andrea Ludwig, Associate Professor & Watershed Faculty Consortium Chair, UTK Department of Biosystems Engineering & Soil Science
Chris Granju, Knox County Stormwater Management Director

Adjourn
# 26th Tennessee Water Resources Symposium Pre-Registration Form

(Online registration is available at: [http://tnawra.er.usgs.gov/Submit/TWRS-Reg.html](http://tnawra.er.usgs.gov/Submit/TWRS-Reg.html))

<table>
<thead>
<tr>
<th>Title</th>
<th>Mr., Ms., Dr. (circle one)</th>
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<tbody>
<tr>
<td>Name</td>
<td>___________________________</td>
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<tr>
<td>What you prefer to be called</td>
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<tr>
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<th>Type of Registration</th>
<th>Cost per person</th>
<th>Number of registrants</th>
<th>Subtotal</th>
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<tbody>
<tr>
<td>Regular Registration</td>
<td>$100**</td>
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<tr>
<td>Speaker &amp; Moderator</td>
<td>$100**</td>
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<tr>
<td>Professional Poster Presenter</td>
<td>$100**</td>
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<tr>
<td>Sub Total</td>
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Discount 10% (if more than 10 $100 registrations)

<table>
<thead>
<tr>
<th>Type of Registration</th>
<th>Cost per person</th>
<th>Number of registrants</th>
<th>Subtotal</th>
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<tbody>
<tr>
<td>Student Registration*</td>
<td>$30**</td>
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<tr>
<td>Student Poster Registration*</td>
<td>$30**</td>
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<tr>
<td>Extra Meals for spouses</td>
<td>$15</td>
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<tr>
<td>Grand Total</td>
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**Pre-registration fee is $100 until March 31, 2017; onsite registration fee is $120. Student registration is $30. A 10% discount applies if 10 or more people register from one organization (student registrations are already discounted). Make check payable to “Tennessee AWRA” or “TNAWRA.” Visa, MasterCard, American Express, and Discover are also accepted. The registration fee covers the costs for attendance to all sessions, and the costs for both lunches, both dinners, coffee breaks, and 2017-18 membership fees. Additional meals may be purchased for spouses for $15 each.

Send Registrations to:
TN AWRA
c/o U.S. Geological Survey
640 Grassmere Park, #100
Nashville, TN 37211
ATTN: Lori R. Weir
Phone: (615) 837-4720
FAX: (615) 837-4783
Email: lrweir@usgs.gov

*Student sponsorships for registration fees are available again this year. If you are a student and would like to be considered for sponsorship, please write “Student Sponsorship” on this form by your name.

Please circle one: Visa MasterCard American Express Discover
Credit Card #_________________________ Exp. _________
CVV Number (last 3 digits on back V/MC; 4 digits on front of AmEx) _______
Signature __________________________ Billing address zip code of credit card statement ________
Please print name on card (if different from above): __________________________

2. Name: __________________________
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10. Name: __________________________
    Email: __________________________
    Phone: __________________________

Please print name on card (if different from above): __________________________
Social Events

Mountain Bike Ride sponsored by Trutta Environmental Solutions. A bike ride is scheduled for April 5 at 9am. If you are interested, please sign up at the Symposium Registration Desk. Contact Brett Connell, baconnell@gmail.com, (419) 215-7897, if you have any questions.

Fun Run sponsored by BWSC. A morning jog is scheduled for April 6 at 7am. If you are interested, please sign up at the Symposium Registration Desk.

Live Entertainment at both dinners

Vendor Equipment Demo Session

Where: At the boat dock behind the hotel restaurant
When: April 5, 5-6 p.m.

Vendors are signing up to demonstrate their equipment in the field. Check the following website for vendor information: http://tnawra.er.usgs.gov/2017/equipdemo.html

Please contact Don Green for more information: (615) 308-1014 or biogreen1@comcast.net.

Introduction to Water Quality Modeling
Using EPA’s WASP Model
Tim Wool, EPA
April 5 @ 8:00 a.m.

This workshop will provide an overview of the general principles of water quality modeling with emphasis on conventional pollutants. US EPA’s Water Quality Analysis Simulation Program (WASP8) will be used to illustrate how these principles are incorporated into a model. Attendees will have the option of running the model or following along in the presentation. WASP is one of the most widely used water quality models in the US and throughout the world. WASP can be applied to streams, rivers, lakes/reservoirs, and estuaries in 1, 2 or 3 dimensions. WASP is used routinely throughout the United States in the development of TMDLs and waste load allocations. The model is capable of simulating: nutrients (nitrogen, phosphorus, silica), dissolved oxygen (including sediment diagenesis), biochemical oxygen demand (3 types), phytoplankton (5 species), benthic & macro algae (3 species), inorganic/organic solids (5 types including mechanistic sediment transport), pathogens, water temperature, pH and alkalinity.

Using the Functional Lift Quantification Tool for Assessing Stream Restoration Projects
Will Harman, Stream Mechanics
April 5 @ 8:00 a.m.

Will Harmon, principle of Stream Mechanics, Inc., will present on his function-based framework for stream assessment and restoration projects, including a functional lift pyramid and the quantification tool. An overview of the qualification tool and procedures for data collection and analysis will be presented.

BSTEM Workshop
Dr. Andrew Simon, Cardno-Entrix, Inc.
April 5 @ 10:00 a.m.

Dr. Andrew Simon, senior developer of the Bank-Stability and Toe-Erosion Model (BSTEM) while at the USDA-National Sedimentation Laboratory will present a 2-hour workshop on the fundamental processes controlling bank erosion, and application of the model to quantifying the effectiveness and cost-effectiveness of conventional and environmentally sensitive protection measures.

Attn: ASCE Members

The ASCE EWRI Tennessee Chapter is again a sponsor of the TN AWRA Water Resources Symposium. This year’s agenda identifies an “ASCE EWRI Track” that might be of particular interest to many civil engineers. Earn up to 15 Professional Development Hours by participating in these activities:
• Workshops: WASP, BSTEM, and Using the Stream Quantification Tool for Ecological Uplift
• Keynote address by Will Harman, Stream Mechanics, and Luncheon Speaker Barry Thacker, Schnabel Engineering.
• Break-out sessions with presentations on flood issues, stormwater quality, environmental sustainability, and more.
• Closing Panel Discussion: "Planning for Growth and Aquatic Resources in Tennessee"

Of course, with your $100 registration you can attend any of the sessions offered and come and go as you need. Take a look. We hope you can join us and keep yourself at the forefront of water resource issues in Tennessee.