

# 22nd Tennessee Water Resources Symposium



Photo courtesy of Alan Cressler, USGS

Presented by the TN Section AWRA including  
a Special First Day River 2D Workshop and  
Presentation from China Session

April 11-13, 2012  
Montgomery Bell State Park  
Burns, TN

## KEYNOTE SPEAKER:

**Thomas J. Wilbanks**  
Oak Ridge National Laboratory  
*"Responding to Challenges in  
Assuring Resilient Water  
Systems for Tennessee"*



## LUNCHEON SPEAKER:



**Steve McDonald**  
Carollo Engineering

*"Integrated Water Resources  
Planning – Sustainable Concepts  
and Strategies"*

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



**Montgomery Bell State Park  
Burns, Tennessee  
April 11-13, 2012**

### *Hosted by*

Tennessee Section of the American  
Water Resources Association

### *Planning Committee*

- Barge Waggoner Sumner & Cannon, Inc.
- City of Chattanooga
- Harpeth River Watershed Association
- Nashville Metro Water Services
- Tennessee Association of Utility Districts
- Tennessee Department of Environment and Conservation
- Tennessee Technological University
- University of Tennessee, Biosystems Engineering & Soil Science
- U.S. Geological Survey
- Water Quality Matters!

### **Symposium Chair**

Sherry Wang  
TDEC, Water Pollution Control  
Email: sherry.wang@tn.gov  
Tel: (615) 532-0656

Tennessee Section AWRA  
c/o U.S. Geological Survey  
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# 22nd Tennessee Water Resources Symposium



## Symposium Dates:

April 11-13, 2012

## Pre-registration for Symposium:

Before April 6, 2012

## Symposium Location and Accommodations:

Montgomery Bell State Park

1000 Hotel Avenue

Burns, TN 37029

A block of rooms at the Montgomery Bell Inn and some villas have been reserved. Inn rooms are \$77, 2-bedroom villas are \$325.50 for a 2-night stay (2-night minimum) plus tax. When making your reservations, please specify that your room be reserved under "AWRA". For reservations call (615) 797-3101 or (800) 250-8613.

**Please reserve lodging by MARCH 9, 2012, to ensure availability and rate.**

Directions to park:

For detailed directions to the park, please visit:  
[http://tnawra.er.usgs.gov/2012/map\\_dir.html](http://tnawra.er.usgs.gov/2012/map_dir.html)

## Sponsors & Exhibitors

Opportunities are still available for your organization to be a sponsor. <http://tnawra.er.usgs.gov/2012/exhibitor.html>

### Companies both Sponsoring and Exhibiting

- ARCADIS
- Crawford Hydrology Laboratory
- Hach Hydromet
- Tennessee Stream Mitigation Program

### Exhibitors

- Advanced Drainage Systems, Inc.
- AMEC Environmental & Infrastructure, Inc.
- Applied Polymer Systems
- AquaShield, Inc.
- GEO-Jobe GIS Consulting
- Hydrolocial Services America
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- S&ME, Inc.
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- Tetra Tech
- Water Quality Matters!
- YSI

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- KCI Technologies
- Neel-Schaffer, Inc.
- Secure Waters
- Tennessee Water Resources Research Center/ISSE, UT

## Presentations from China

Apr 11	Agenda-Room B
8:30a	Study on Development and Utilization of Water Resource in Northwest of China. Qiang Huang
8:40a	Research on Dynamic Ecological Water Requirements and its Application to the Main Reach of the Weihe River. Ni Wang
8:50a	Sediment Transport Characteristics under Low Temperature Flow and Its Consequences in Inner Mongolian Reach. Yi Qin
9:00a	Monitoring and Characteristic Analysis of Snowstorm Runoff Pollution in Xi'an City. Huai'en Li
9:10a	Break
9:20a	Experimental Study on Gas-Liquid Two-Phase Flows in a Cylindrical Aeration Tank by PTV Method. Wen Cheng
9:30a	Establishing and Application on Single Parameter Model of Soil Water Diffusivity in Nanxiaohegou Basin. Xiaoyu Song
9:40a	Water Movement and Solute Transport in Heterogeneous Soils. Beibei Zhou
9:50a	Eco-environmental Risks Identification on the Cascade Development in the Upper Reaches of the Yellow River. Dexiu Hu
10:00-11:30a	Chinese Poster Session and Questions for speakers



April 11	AGENDA		
7:00 a.m.	Golf Tournament at Montgomery Bell Golf Course		
7:30 a.m.	Coffee Break in the Exhibit Room		
	Special Sessions		
	Room A	Room B	Room C
8:30 a.m.	River 2D Hydrodynamic and Habitat Modeling Workshop. J. Schwartz <i>Engineering Track</i>	China Presentations-see agenda on separate page	
12:00 p.m.	Lunch with Keynote Speaker: "Responding to Challenges in Assuring Resilient Water Systems for Tennessee", Thomas J. Wilbanks, ORNL		
	Flood I Moderator: Tom Palko, Metro Water Services	Engineering Applications Moderator: Saya Qualls, TDEC-WPC <i>Engineering Track</i>	Groundwater Moderator: David Ladd, USGS
1:30 p.m.	Probabilistic Flood Risk Management Using Monte Carlo Based Fast 2D Flood Model to Incorporate Uncertainty. A. Kalyanapu	Evaluation of a Bioreactor to Reduce Contaminant Loads at Hardeman County Landfill, Tennessee. B. Cobb	Occurrence of Nitrate and Pesticides in the Memphis-Sparta Aquifer in W Tennessee and NW Mississippi. J. Kingsbury
2:00 p.m.	Technical Review of Flooding Issues in the Lick Creek Drainage Basin, Memphis, TN. E. Byrne	Innovative Solutions to Complex Environmental and Wastewater Issues. D. Adams	Geochemistry of Deep Aquifers in Tennessee and Implications for Carbon Sequestration. M. Bradley
2:30 p.m.	Dynamic Stormwater Modeling. J. Avent	SPR High Turbidity Wastewater Purifier and Technology. T. Liao	Hydrologic and Geologic Controls on Carbon Tetrachloride Transport and Biodegradation. T. Byl
3:00 p.m.	Coffee Break in the Exhibit Room co-sponsored by Hach Hydromet & Fulghum, MacIndoe & Associates, Inc.		
	Flood II Moderator: Michael Hunt, Metro Water Services	Restoration I Moderator: Joey Woodard, TSMP <i>Engineering Track</i>	Karst Moderator: Scotty Sorrells, TDEC-Water Supply
3:30 p.m.	Nashville SAFE: A City-wide Program for Flood Emergency Preparedness. J. Higgs	Transportation Mitigation. N. Ober	TN Underwater Caves: Enabling Watershed Management. J. Richards
4:00 p.m.	Cumberland River System Operations during the 2011 Mississippi River Flood. R. Kerr	Stream Restoration & Stormwater Treatment in an Urban Watershed. W. Barry	Deciphering Microbial Controls on Carbon Cycling in Karst Aquifers. T. Brown
4:30 p.m.	Using GIS Techniques to Map and Predict Flood Inundation in Tennessee. D. Ladd	Water Quality Best Management Practices at the Little River Animal & Environmental Unit. A. Ludwig	Quantitative Dye Tracing - Development of a New Interpretative Method. I. Embry
5-6 p.m.	Vendor Equipment Demonstration Session at the dock behind the hotel restaurant		
6-8 p.m.	Dinner and Live Music in Rooms A&B		
April 12			
7:00 a.m.	Fun Run sponsored by Barge Wagoner Sumner & Cannon, Inc.		
7:30 a.m.	Coffee and Biscuits in Exhibit Room co-sponsored by Secure Waters & KCI Technologies		
	Health I Moderator: Frank Bailey, MTSU	Water Supply/Availability Moderator: Shannon Williams, USGS <i>Engineering Track</i>	Education Moderator: Shawn Hawkins, UT
8:30 a.m.	Results of a Data Evaluation to Establish Priority Remediation Areas for Dry Weather Fecal Contamination in a Karst Influenced Watershed. S. Evans	Estimating Water Use at Thermoelectric Power Plants. M. Harris	Building a Successful Rainwater Harvesting Outreach Program through Creative Partnerships. J. Scott
9:00 a.m.	Survey of Pharmaceutical and Personal Care Products in Untreated Drinking Water in Tennessee. A. Layton	Evaluating Effects of Ground-Water Withdrawals Associated with Combined-Cycle Combustion Turbine Plants. C. Haugh	The Potential of Rainwater Harvesting in Tennessee. J. Logan
9:30 a.m.	Review of a Municipality's Use of a qPCR Technique for Fecal Source Tracking in Impaired Streams. M. Stallard	Analysis and Comparison of Low Flow (7Q10) for Rural and Urbanized Basins in North and East Central USA. S. Zabet	The Creation of Nashville's Low Impact Development Manual. R. Dohn
10:00 a.m.	Coffee Break in Exhibit Room co-sponsored by Crawford Hydrology Lab and Buchart Horn		
10a-12p	Poster Session in the Mezzanine-students and professionals will be available for questions		
	Health II Moderator: Tom Moss, TDEC-Water Supply	Monitoring and Water Quality Moderator: Greg Denton, TDEC-WPC	Modeling Tools Moderator: Anne Hoos, USGS <i>Engineering Track</i>
10:30 a.m.	Assessing Microbiological Integrity of Water Supply with High-Throughput Sequencing. Q. He	Tennessee Volunteer Watershed Monitoring. J. McFadden	Simulation of Time-Varying Land Use with LSPC. J. Wyss
11:00 a.m.	Detection of Pentobarbital in Leachate from an Organic Burial Pit Containing Euthanized Large Animals. S. Hawkins	The TVA Kingston Ash Spill: Three Years Later. N. Carriker	A New Tool for CE-QUAL-W2 Model Calibration. G. Burnette
11:30 a.m.	Major Ion Toxicity: Technical Issues, Regulatory Status, and Options in Water Quality Manage. L. Minella	Status of Turbidity Monitoring at TMI Sites in East Tennessee. J. Schwartz	Water Reuse and Conservation Considerations in Drought Planning Using OASIS Modeling. B. Fennell

<b>Lunch with Luncheon Speaker in Rooms A&amp;B: "Integrated Water Resources Planning – Sustainable Concepts and Strategies"</b>			
<b>Steve McDonald, Carollo Engineering</b>			
<b>Noon</b>	<b>Planning I</b> Moderator: George Garden, BWSC	<b>Stormwater</b> Moderator: Paul E. Davis, P.E.	<b>Ecology/Biology I</b> Moderator: Rodney Knight, USGS
<b>1:30 p.m.</b>	The City of Franklin's Integrated Plan to Address Water Resource Challenges. D. Mason	Incorporating Effective Maintenance Strategies into a Stormwater Management Program. M. Miller	What is Effecting the Mussel Populations on the Clinch River? G. Johnson
<b>2:00 p.m.</b>	Dissolved Oxygen, What 10 Years of Data Tells Us about Water Quality in the Harpeth River. M. Cain	What, Where, and How Much will it Cost? Watershed-scale Stormwater BMP Planning and Optimization. D. Bambi	Chemical Analysis of Trout Otoliths as a Measure of the Biological Impact of Aqueous Aluminum in the Smokies. M. Connolly
<b>2:30 p.m.</b>	Working with Non-industrial Private Forest Landowners to Ensure a Clean, Abundant Public Water Supply. D. Arnold	Suspended Sediment Concentrations and Turbidity from Highway Construction Outfalls. T. Diehl	A Network for Monitoring the Effects of Climate Change on Macroinvertebrate Populations in Southeastern Streams. D. Arnwine
<b>3:00 p.m.</b>	<b>Coffee Break in the Exhibit Room sponsored by ARCADIS</b>		
<b>3-3:30p.m.</b>	<b>Poster Session in the Mezzanine-students and professionals will be available for questions</b>		
	<b>Planning II</b> Moderator: Tom Allen, Neel-Schaffer, Inc.	<b>Restoration II</b> Moderator: Forbes Walker, UT	<b>Ecology/Biology II</b> Moderator: Bill Wolfe, USGS
<b>3:30 p.m.</b>	Climate Adaptation for Water Resources in Tennessee. G. Griffith	The Effects of the May 2010 Floods on TSMP Stream Restoration. A. Spiller	Using Species Sensitivity Distributions in a Tennessee Watershed Assessment. B. Coffey
<b>4:00 p.m.</b>	Past, Current, and Future Water-Use Studies in Tennessee. J. Robinson	Rehabilitating Oostanaula Creek: Use of Stream Enhancement and Agricultural BMPs, CFD Modeling, and University Students. K. Neff	Fish Community Response to Altered Ecological Flow Regimes. R. Knight
<b>4:30 p.m.</b>	Understanding Flood Events in the Greater Nashville Metropolitan Area 1970 - 2010: Correlating Urban Growth with Analysis of Storm. C. Schaney	Oostanaula Creek Watershed Restoration Projects To Date: Rural and Town Solutions. L. Reynolds	Which Types of Hydrologic Models Best Address the Needs of Ecological Flow Research? J. Murphy
<b>5:00 p.m.</b>	<b>Poster Session in the Mezzanine: All Poster Presenters will be available for questions about their displayed poster</b>		
<b>6-8pm</b>	<b>Dinner in Rooms A&amp;B followed by TN AWRA Business Meeting</b>		
<b>April 13</b>			
<b>7:30 a.m.</b>	<b>Coffee and Biscuits in Exhibit Room sponsored by Water Resources Research Center/ISSE, UT</b>		
	<b>Municipal Storm Water</b> Moderator: Tom Lawrence, Water Quality Matters!	<b>Geomorphology</b> Moderator: Tim Diehl, USGS	<b>Reservoir I</b> Moderator: Dan Eagar, TDEC-WPC
<b>8:30 a.m.</b>	Environmental Stewardship Program: Sustainable Approaches to the Age Old Public Works Requests for Pipe and Rip Rap. P. Gibson	Streambank Video Mapping to Determine Erosion Susceptible Areas. B. Connell	Permitting, Mitigation, and Monitoring of a Small Cumberland Plateau Reservoir. R. Martin
<b>9:00 am.</b>	Stormwater Utility Lessons Learned - Kingsport, TN. D. Mason	Geomorphic and Fish Community Response to Disturbance in a Middle Tennessee Flat Rock Creek. B. Wolfe	Engineering Design and Construction Management of a Small Cumberland Plateau Reservoir. W. Griggs
<b>9:30 a.m.</b>	Green Infrastructure and Urban Retrofit Initiative in the City of Chattanooga. D. Green	Mapping Tennessee River Systems with Sensor Technology and Georeferenced Above and Below Water Video. P. Ayers	Creating Streams from Ponds: Two Approaches. B. Wood
<b>10:00 a.m.</b>	<b>Coffee Break in Exhibit Room co-sponsored by Tennessee Stream Mitigation Program &amp; EnSafe</b>		
	<b>GIS</b> Moderator: Yvette Clark, TTU	<b>TN's Nutrient Reduction Strategy</b> Moderator: Scott Gain, USGS	<b>Reservoir II</b> Moderator: Jim Hagerman, City of Knoxville
<b>10:30 a.m.</b>	Geomorphology from the GIS Desktop: Interpretation of High-Resolution DEMs for Urban Watershed Assessment. N. Jokay	Application of Regional Regression Models of Nutrient Transport to Water-Quality Assessments in the Southeastern U.S. A. Hoos	Water Management in the Cumberland River Basin. R. Dillingham
<b>11:00 a.m.</b>	A GIS-based Geomorphic Classification Technique for West TN Streams. C. Bridges	State of Tennessee Nutrient Reduction Strategy for Rivers and Streams. S. Qualls	An Overview of Water Quality Impacts Resulting from Pool Level Restrictions Imposed Within the Cumberland River Basin Reservoir System. R. Tippit
<b>11:30 a.m.</b>	Why the Internet and Your GIS is the Next Power Couple. R. Duncan	Developing West Tennessee's Nutrient Reduction Plans for Agricultural Watersheds. F. Walker	Center Hill Lake Hydrodynamic and Water Quality Model Development Using CE-QUAL-W2 Version 3.6. J. Gregory
<b>Adjourn</b>			

# 22nd Tennessee Water Resources Symposium Pre-Registration Form

(Online registration is available at: <http://tnawra.er.usgs.gov/2012/TWRS-Reg.html>)

Title \_\_\_\_\_  
 Name \_\_\_\_\_  
 What do you prefer to be called \_\_\_\_\_  
 Title \_\_\_\_\_  
 Organization \_\_\_\_\_  
 Address \_\_\_\_\_  
 City, State, Zip \_\_\_\_\_  
 Daytime Phone \_\_\_\_\_  
 Email Address \_\_\_\_\_

Additional registrants if at the same address. If addresses differ or if more space is needed, please use a separate piece of paper.

2. Name: \_\_\_\_\_  
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Type of Registration	Cost per person	Number of registrants	Subtotal
Regular Registration	\$100**		
Speaker	\$100**		
Professional Poster Presenter	\$100**		
Moderator	\$100**		
Sub Total			
Discount 10% (if more than 10 \$100 registrations)			
Student Registration*	\$30**		
Student Poster Registration*	\$30**		
Extra Meals for spouses	\$15		
Grand Total			

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](mailto: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  
 Credit Card # \_\_\_\_\_  
 Exp. \_\_\_\_\_ CVV2 Number (last 3 digits on back) \_\_\_\_\_  
 Signature \_\_\_\_\_  
 Please print name on card (if different from above): \_\_\_\_\_

\*\*Pre-registration fee is \$100 until April 6, 2012; 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 and Mastercard are also accepted. The registration fee covers the costs for attendance to all sessions, a CD copy of the summary of abstracts and the costs for both lunches, both dinners, coffee breaks, and 2012-13 membership fees. Additional meals may be purchased for spouses for \$15 each.



## Social Events



**Fun Run sponsored by BWSC.** A morning jog is scheduled for April 12 at 7am. If you are interested, please sign up at the Registration Desk.

**Golf Tournament.** The tournament is scheduled for 7:00 am, April 11. To sign up or for more information, please call Larry Lewis at (731) 234-0360 or email him at [larrylewis@taud.org](mailto:larrylewis@taud.org).

 **Live Entertainment at both dinners**



## Attn: ASCE Members

The ASCE Tennessee Section is again a sponsor of the TN AWRA Water Resources Symposium. This year's agenda identifies an "Engineering Track" that might be of particular interest to many civil engineers. Earn up to 16 Professional Development Hours by participating in these activities:

- River 2D Hydrodynamic and Habitat Modeling Workshop
- Keynote luncheon address by Thomas J. Wilbanks, ORNL and Luncheon Speaker Steve McDonald, Carollo Engineering
- Break-out sessions with presentations on flood, storm water, ground water and surface water supply, treatment technologies, stream restoration, and engineering applications.

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

## River 2D Hydrodynamic and Habitat Modeling Workshop

April 11, 2012, 8:30 a.m. Room A

River2D is a hydrodynamic and habitat model that has multiple uses for flow regulation using the In-stream Flow Incremental Methodology (IFIM), fish habitat analysis using the Physical Habitat Simulation (PHABSIM) modeling approach, flood mapping, and stream restoration design. River2D is public-domain software, and attendees will download the software for the workshop. Please bring a laptop. The workshop will include a short lecture on hydraulic theory and PHABSIM. The workshop will focus on attendees learning the software and its potential applications, and interpreting the model results through in-class exercises.



## Vendor Equipment Demo Session

Where: At the boat dock behind the hotel restaurant

When: April 11, 2012, 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/2012/equipdemo.html>

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

Be sure to stay for the door prizes.

## Presentations from China April 11, 2012 8:30am Room B

New to this year's Tennessee Water Resource Symposium is an international session focused on water resources in Northwest China, home of the Loess Plateau and origin of the Yellow River. Much like Tennessee, Northwest China boasts grand mountains and large rivers, but also faces the same challenge of sustainability in rapid development. Emblematic of this challenge is that the soil of the Loess Plateau region is actually the "most highly erodible soil on earth" and Yellow River, the sixth-longest river in the world, is named after the perennial color of the muddy water in the lower course of the river, arising from sediment being carried downstream.



This special China session will feature speakers from the College of Water Resources and Hydropower Engineering of Xi'an University of Technology, which has one of the top ranked water resource engineering programs in China with 3,400 students in the college alone. The presentations will cover diverse topics, ranging from water resource management, sediment transport and modeling, eco-environmental risk assessment, to reservoir management, nutrient cycling, and pollutant transport and fate modeling.

Please join us in welcoming the Chinese delegation and opportunities to developing mutually beneficial research exchange and collaborations.

## Poster Session

In the Mezzanine on Thursday afternoon at 3:30 p.m., the Poster Judges will be judging the Student Posters. The general Poster Session will follow at 5:30 p.m. 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 Vena Jones at: [venaj@cumberlandrivercompact.org](mailto:venaj@cumberlandrivercompact.org)

For a listing of this year's poster presenters, please visit: <http://tnawra.er.usgs.gov/2012/posters.htm>