

RIDING THE WAVES OF INNOVATION

Sustainable Solutions in Hydraulic
Engineering for a Dynamic Future



2024 NATIONAL HYDRAULIC ENGINEERING CONFERENCE

AUGUST 27-30, 2024
BEAU RIVAGE | BILOXI, MISSISSIPPI

**Dear NHEC Attendees,**

Welcome to Biloxi and the twelfth biennial National Hydraulic Engineering Conference! On behalf of the Mississippi Department of Transportation, I invite you to experience the southern hospitality of the Mississippi Gulf Coast. Over the upcoming days, you will have the opportunity to learn, engage, and network with some of the leading transportation professionals in your industry.

We face many challenges constructing, maintaining, sustaining, and improving hydraulic structures in the present and future physical, natural, social, and economic environments. Themed “Riding the Waves of Innovation: Sustainable Solutions in Hydraulic Engineering for a Dynamic Future”, NHEC 2024 provides a robust agenda with presentation topics that include stream stability, water quality, stormwater management, resiliency, scour, and modeling. In addition to these technical sessions, you will have the opportunity to visit one of Mississippi’s historical landmarks located approximately 12-miles south of Biloxi on Ship Island. Following the War of 1812, Fort Massachusetts was planned for defense of an important shipping channel to the Mississippi Gulf Coast and New Orleans. Over a century later, this masonry structure serves as a historical tourist attraction within the Gulf Islands National Seashore.

While visiting the Mississippi Gulf Coast, I hope you will take advantage of this opportunity to get to know our rich cultural and musical heritage. Enjoy the delicious and distinctive cuisine, discover local art galleries, and experience the vibrant coastal night life. Most importantly, take time to relax and enjoy your time in Mississippi.

A handwritten signature in black ink that reads "Brad White". The signature is written in a cursive, flowing style.

Brad White, Executive Director
Mississippi Department of Transportation



Brad White was named Executive Director of the Mississippi Department of Transportation effective July 1, 2021, and received unanimous confirmation from the Mississippi Senate the following Legislative Session. A native of Simpson County, White is a four time Chief of Staff having previously managed the staffs of the Mississippi Department of Audit, U.S. Senator Thad Cochran, US Senator Cindy Hyde-Smith, and Mississippi Governor Tate Reeves.



Kelly Castleberry, P.E. is a 1996 graduate of Mississippi State University where he earned a Bachelor of Science in Civil Engineering. He retired from MDOT in 2023 after a 28-year career where he served as the District Engineer of the Sixth District representing the southeast area of Mississippi including the Pine Belt and Gulf Coast regions.



Gabe Faggard, P.E. is a 1999 graduate of Mississippi State University where he earned a Bachelor of Science in Civil Engineering. He retired from MDOT in 2021 after a 22-year career where he served as the District Construction Engineer in the Hattiesburg District Office. He currently works for Neel-Schaffer, Inc. on the Mississippi Gulf Coast where he manages design and construction projects.

8:00 AM - 5:00 PM | **Registration** | Registration Desk, Lobby

8:00 AM - Noon

Workshops

Workshop A - Hydraulic Design and Digital Delivery with Bentley Software

Magnolia E | [Kristen Dietrich](#), [Jonathon Smith](#), [Joey LouAllen](#), [Kyle Brandon](#), [Tim Robinson](#), [RoseMarie Klee](#), [Matt Lauffer](#), [Jennifer Johnson](#)

Workshop B - Working Through 2D Hydraulic Modeling Floodplain Permitting Challenges

Magnolia F | [Scott Hogan](#) and [Susan Jones](#)

12:00 - 1:00 PM | **Lunch** | Magnolia A - D

1:00 - 5:00 PM

Opening Session | Magnolia A

Welcome and Opening Remarks

[Brad White](#), Executive Director, Mississippi Department of Transportation

Keynote | A Tsunami Collides with a Landmass – The Often-Overlooked Story of Hurricane Katrina

[Gabe Faggard](#) and [Kelly Castleberry](#)

Presentation of the Mark D. Miles Distinguished Hydraulic Engineer Award

Break

FHWA Update

[Joe Krolak](#)

AASHTO Update

[Charlie Hebson](#)

TRB Update

[Mike Perez](#)

5:00 - 7:00 PM | **Ice Breaker** | Camelia Ballroom



Scan this QR Code to
view session abstracts

7:00 - 9:00 AM | **Breakfast** | Magnolia A - D

8:00 AM - 5:00 PM | **Registration** | Registration Desk, Lobby

8:00 - 10:00 AM

River Morphology & Countermeasures

Camelia A | **Moderator: Aaron Estep**

A Century on the Wolf River: Urbanization and Migration in Memphis, TN
Wesley Peck and DJ Wiseman

Real-Time Bridge Scour Monitoring in South Carolina
Tim Lanier

Scour and Stream Stability at U.S. 98 over the Pearl River
Katie Wimberly and Blake Palmer

Exciting Components of the New Edition of HEC-23
Laura Girard

Advanced Stormwater Modeling

Camelia B | **Moderator: Kyle Brandon**

Evaluation of Screen Performance for Filtering Debris from Stormwater Inlets
Troy Lyons

Computational Modeling and Analysis of the Inlet No. 3 Single Slope Barrier Hydraulic Efficiency
Marta Sitek

Computational Modeling of Infiltration from Ditches into Roadway Embankments
Marta Sitek

Storm Sewer Geysering – An Exercise in Risk and Resiliency with Stormwater Infrastructure in Urban Environments
Erik Carlson, Jose Vasconcelos, and Marta Sitek

10:00 - 10:30 AM | **Break** | Lobby

10:30 AM - 12:30 PM

Aquatic Organism Passage Panel Discussion

Camelia A | **Moderator: Casey Kramer**

Nationwide Practices in Aquatic Organism Passage Design, Construction and Monitoring, Preliminary Findings of NCHRP 55-18
Justin Lennon

AOP Panel Presentations:

NHEC History of AOP and Fish Passage – **Charlie Hebson**

WSDOT Fish Passage Program – **Julie Heilman**

USFS Fish Passage Program – **Bob Gubernick**

FHWA AOP Program – **Abhi Kapoor**

FHWA AOP Implementation Guide – **Gillian O’Doherty**

Interactive Discussion of AOP with participants and the panel

Advanced Hydraulic Modeling

Camelia B | **Moderator: Brianna Corsi**

Determination of Shear Amplification between Approach Flow and Bridge Foundation Obstructions using CFD and a 5000 Case Matrix
Hubert Ley

Selection and Application of Manning’s Roughness Values in Two-Dimensional Hydraulic Models: Results from NCHRP 24-49
Xiaofeng Liu

Automated Meshing and 3D Visualizations for 2D Bridges and Culverts in SMS/SRH-2D
Scott Hogan

Understanding the role of bank vegetation in hydraulic modeling and scour – insights gleaned from CFD simulations for a bridge over the American River
Kevin Flora

12:30 - 1:30 PM | **Lunch** | Magnolia A - D

1:30 - 3:10 PM

Lightning Sessions 1

Camelia A | **Moderator: Roberto Ruiz**

Future River Analysis & Management Evaluation (FRAME): A new forecasting tool for long-term morphological response in river channels
Charlie Little and Blake Mendrop

Impact to infrastructure of the January and March 2023 Flooding
Cathy Avila

Scour calculations using HEC-RAS 2D: Comparison of Modeling and Parameterization Alternatives for Bridges
Shams Al-Amin

Two Dimensional Modeling of the Lower Wolf River in Memphis, TN
Amanda Whitlock

Bridge Scour Mitigation using Concrete Armor Units - 25-years of Performance
Daniel Priest

Flood Monitoring for South Carolina Bridges
Beatrice Hunt and Ellen Newman

Taking on River Woes: The Whitewater Bridge's Battle with Bed Degradation in California's High Desert Amid Climate Challenges
Oscar Suaznabar and Kevin Flora

Bedform Evolution in Aquatic Organism Passage Culverts
Haoyin Shan

The US Coastal Research Program and How it Can Help Our Coastal Roads
Daniel Sharar-Salgado

1:30 - 4:30 PM

Hydraulic Resilience Workshop and Panel Discussion

Camelia B | **Moderator: Megan Frye and Laura Girard**

Adapting to Climate Change in Maryland: Highway Drainage Manual Updates and the St. George Island Coastal Resiliency Project
Ryan Doheny

Building MnDOT's Road to (Hydraulic) Resiliency
Nick Olson

Update on FHWA's Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Program
Robert Kafalenos and Elizabeth Habic

U.S. Department of Transportation Resilience Coalition
Matt Lauffer

Interactive discussion with participants and the panel

1:30 - 6:30 PM

Ship Island Tour with USACE

3:10 - 3:30 PM | Break | Lobby

3:30 - 4:30 PM

Panel Discussion - FHWA Metric 18 under the National Bridge Inspection Program

Camelia A | **John Hunt and Will deRosset**

6:30 - 8:00 PM

Research Needs Discussion

Camelia B | **Brad McManus**

7:00 - 9:00 AM | **Breakfast** | Magnolia A - D

8:00 AM - 5:00 PM | **Registration** | Registration Desk, Lobby

8:00 - 10:00 AM

Scour

Camelia A | **Moderator: Kacie Braddy**

A New Scour Tool: NextScour Shear Decay Method
Kornel Kerenyi and James Pagenkopf

Data-driven Shear Decay Design Analysis
Kornel Kerenyi and Haoyin Shan

Enhancing Coastal Bridge Resilience: Hydrodynamic Modeling for Scour Evaluation
Don Hendon

Lake Superior Water Level Impacts on Bridge Scour
Steve Neary

Hydrology

Camelia B | **Moderator: Luis Calderon**

Introduction to Hydrologic Modeling with SRH-W and SMS
Alan Zundel

Neptune Close Upon Vulcan's Heels: Post-Wildfire Bulked Runoff Analysis of a Burned Watershed Using Multiple First-Response Methods
Steven Griffin

Drainage Area Limitations for NRCS Methods
Rollin H. Hotchkiss

Watershed Surface and Channel Runoff Coefficient Assessment with Unified Runoff Time Implications
Ken Kagy

Lightning Presentation 1 Poster Sessions (and additional posters)

10:00 - 10:30 AM | **Break** | Lobby

10:30 AM - 12:30 PM

Water Quality Analysis and Stormwater Design

Camelia A | **Moderator: Wes Perry**

Uncertainty in stormflow-quality estimates at unmonitored sites can confound efforts to determine if infrastructure projects will have an adverse effect on water quality.
Gregory E. Granato

Updates to the USGS-FHWA Highway-Runoff Database to support highway-stormwater practitioners
Alana B. Spaetzel

Effects of Impoundments on Selected Flood-Frequency and Daily Mean Streamflow Characteristics in Georgia, South Carolina, and North Carolina
Toby D Feaster

FDOT Water Quality BMP Research Updates
Jennifer Johnson

Hydraulic Modeling Case Studies

Camelia B | **Moderator: Jeff Syar**

Aquatic Algorithms: A Comparative Analysis of 2D Modeling Methods
Abigail Richardson

A Comparison of Complex Hydraulic Modeling along Crabtree Creek using HEC-RAS 2D and SRH-2D
Emma Bones and Matt Lauffer

Improving West Memphis Port Hydraulics
Andy McCoy

Salt Creek Boardwalk: Water and Life in Death Valley National Park
Amanda Peters

Coastal Modeling Review/ Sea Level Rise Workshop

Magnolia E & F
Daniel Sharar-Salgado

12:30 - 1:30 PM | **Lunch** | Magnolia A - D

1:30 - 3:30 PM

Lightning Sessions 2

Camelia A | **Moderator: Timothy Mallette**

Comparison of 1D and 2D Hydraulic Models Applications for Maryland SHA Stream Crossings

Pawel Mizgalewicz

The KISS Method – Keep It Simple and Sustainable – for Hydraulic Engineers

Rachel Westerfield

Navigating CLOMR Complexity: Moving a Project with Over a Mile of Natural Stream Design & 9 New Structures Through FEMA’s CLOMR Process

David Spinks

Reliability-based Lower-bound Critical Shear Stress Prediction for Cohesive Soils

Haoyin Shan

Beyond the FEMA Model: Innovations in Flood Assessment

Colin McKernan

Coastal Strategies for Drainage Resilience and Permitting in Florida

Carl Spirio

Developing a New Generation of Hydraulic Engineers

Megan Frye

The Mississippi River Basin Model - A Triumph in Hydraulic Engineering

Don Hendon and Sarah McEwen

FHWA’s Development of a Scour Assessment Template

Paul Sharp and Laura Girard

Innovation

Camelia B | **Moderator: RoseMarie Klee**

TPF 5(461) Research Study Updates

James Pagenkopf

Development of the New Highway Drainage Manual

James Schall and Casey Kramer

New Tools to Support Rapid Assessment and Response in Remote Areas

Michael Knapp

A Tidal Wave of Innovation – Washington State Department of Transportation Hydraulics Office

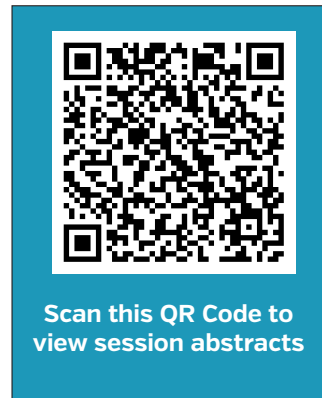
Julie Heilman and Casey Kramer

Introduction to the Stochastic Empirical Loading and Dilution Model (SELDM)

Magnolia E & F

Greg Granato and

Alana B. Spaetzel



3:30 - 4:00 PM | Break | Lobby

4:00 - 6:00 PM

Aquatic Organism Passage (AOP)

Camelia A | **Moderator: Wendy Hiciano**

Design and Resilience of Waterway Crossing for Aquatic Organism Passage in the Coastal Plains of Maryland
Art Parola

Reconnecting the Bayou Darter: A One of its Kind Partnership in the Southeast
Sarah McEwen

Challenges in Meeting Local Community Floodplain Management Requirements for Fish Passage and Stream Restoration Projects
Henry Hu and Julie Heilman

A GIS-based hydraulic modeling tool for Massachusetts stream crossing replacement projects in USGS StreamStats
Gardner Bent

Coastal

Camelia B | **Moderator: Taylor Buie**

A framework for evaluating pavement vulnerability to shallow groundwater rise in coastal Alabama.
Bruno J. O. Sousa

Innovative Culvert Hydraulics for Coastal Climate Resilience
Timothy S. Mallette and Charlie Hebson

Sea Level Rise Adaptation in SCDOT's Coastal Design
Roberto G Ruiz and Mark Gosselin

Using Cumulative Celerity to Predict Damage and Mitigate Risks for Coastal
Garland Pennison

Discussion on the technical foundations of hydroplaning prediction & the use of the NCDOT Hydroplaning Assessment Tool (HAT 2.0)

Magnolia E & F
Matt York, Rick Renna, and Rebecca Purvis

6:00 - 8:00 PM | Maritime and Seafood Industry Museum Tour and Reception

FRIDAY, AUGUST 30

7:00 - 9:00 AM | Breakfast | Magnolia A - D

8:00 - 10:00 AM

Climate

Camelia A | **Moderator: Van Wilson**

Programmatic Discussion of FHWA's Floodplain Program
Susan Jones

Climate change altering geomorphic processes in New England
Nicole Buck

NCDOT Interstate 95 Flood Resiliency
Tyler Longberry and David Markwood

New Inland Flooding Design Standards and Procedures for Resilience and Sustainability in the Face of Climate Change
Roger Kilgore

Coastal Modeling Review/ Sea Level Rise Workshop

Camelia B | **Daniel Sharar-Salgado**

Lightning Presentation 2 Poster Sessions

Lobby

10:00 - 10:15 AM | Break | Lobby

10:15 - 11:30 AM

Closing Session Remarks

Camelia A

Speaker Bios

Shams Al-Amin is a Water Resources Engineer with VHB, currently in Raleigh North Carolina. Shams earned his MS from Florida International University in 2013 and his PhD from NC State University in 2018. Shams is a PE and a Certified Floodplain Manager and has experience in 2D hydrologic and hydraulic modeling and simulations. Shams has worked on projects with roadway design, bridge and culvert replacements, stormwater and integrated hydrologic modeling and contributed in developing frameworks, concepts and tools for watershed assessments, master plans, and resiliency efforts in North Carolina, Massachusetts, Louisiana, and Virginia.

Catherine Avila is a principal who began Avila and Associates Consulting Engineers, Inc. in 2000 and who has over 38 years of public and private sector experience in hydrologic and hydraulic modeling (HEC-RAS, HEC-HMS), environmental assessments, and structure hydraulics. Prior to starting Avila and Associates, Ms. Avila was a Branch Chief for Structure Hydraulics for the California Department of Transportation (Caltrans) where she managed the Scour Critical Bridge Program for State Bridges. Cathy holds a BS and MS in Civil Engineering and MBA in economics.

Gardner Bent is surface-water specialist in the U.S. Geological Survey New England Water Science Center. He has been involved in a number of surface-water related studies in Massachusetts and Rhode Island. These studies have involved state-wide equations for estimating streamflow statistics and bankfull channel geometry, sediment transport assessments, watershed assessments, flood-documentation, and more recently this stream crossing hydraulic modeling tool.

Emma Bones is a water resources engineer with Dewberry. She completed her BS and MS degrees at Georgia Tech, and her thesis focused on bridge hydraulics, specifically developing new approaches to predict scour and risk of failure at bridges. She started her career doing large-scale floodplain modeling and bridge hydraulic designs in 1D HEC-RAS. However, she took a strong interest in 2D modeling as 2D HEC-RAS and SRH-2D became available. Since beginning SRH-2D modeling, Emma has become an enthusiastic user and has completed models across the US. Additionally, she has developed training courses for SRH-2D and most recently conducted a multi-session training for New Jersey DOT. While it sometimes seems like modeling is Emma's hobby, she is an avid gardener and would love to discuss the benefits of 2D modeling and planting natives!

Nicole (Nicki) Buck, P.E., is Water Resources Practice Lead at McFarland Johnson, Inc. Ms. Buck leads a team of five engineers specializing in hydrologic and hydraulic analysis for infrastructure applications. With degrees in civil engineering and geomorphology from Bucknell University and Dartmouth College, she aspires to improve interactions between the built and natural environments through careful study and design. She has specialized in hydrologic and hydraulic engineering related to transportation for the majority of her 25-year engineering career. Prior to joining McFarland Johnson, she was an owner of Northstar Hydro, a small water resources firm, and even earlier a Research Civil Engineer at the US Army Corps of Engineers where she applied her graduate research modeling fundamental fluid dynamics and particle entrainment functions in both fluvial and eolian environments.

Erik Carlson P.E., is the supervisor of the Hydraulic Unit for the Michigan Department of Transportation, which focuses on statewide bridge and culvert work across Michigan. He has worked for MDOT for over twenty years, with various roles within the Hydraulic Unit. Prior to working for the DOT, he worked for a few years for a private Consultant, focusing on stormwater analysis. He has also served as a guest advisor and lecturer at Michigan State University for the Senior Capstone Design course. He also is a member of AASHTO TCHH.

Toby D. Feaster, P.E., is a hydrologist with the U.S. Geological Survey South Atlantic Water Science Center and has been involved in water-resources research and investigations for over 32 years. His research has included such things as statistically hydrology, watershed/streamflow and water-quality modeling, bridge-scour analyses and modeling, and flood documentation. Most of his research has been focused in South Carolina, North Carolina, and Georgia but he has also been blessed to be involved with scientific endeavors in exotic places such as Brazil and Alabama. He is a 1991 graduate of Clemson University with a BS degree in civil engineering and has been registered as a Professional Engineer in South Carolina since 1996.

Kevin Flora is a Senior Bridge Engineer with Caltrans where he has worked as a Professional Engineer for the past 36 years. He oversees the Structure Maintenance and Investigations Hydraulics Branch and has been responsible for the hydraulic performance and safety of the state bridge inventory of California for the past 30 years.

Megan Frye serves as a Hydraulic Engineer with the Federal Highway Administration's (FHWA) Resource Center providing training, technical support, and technology development and deployment for internal and external stakeholders. Her work with FHWA includes 15 years of construction management, project development, and hydrologic and hydraulic analysis and design experience. She worked more than 10 years with the Federal Lands Highway Division on transportation projects in unique and complex settings across the nation's federal lands. She graduated from Carroll College with a Bachelor of Arts Degree in Civil Engineering and the University of Minnesota with a Master of Science Degree in Water Resource Engineering. Ms. Frye specializes in hydrology and hydrologic modeling and assessment and design of bridges and culverts and is a registered professional engineer in the State of Washington.

Laura Girard is a Senior Hydraulic Engineer with the Federal Highway Administration's (FHWA) Resource Center. Ms. Girard has spent the last two decades of her career wading in, measuring, modeling, and studying riverine systems. She provides technical support to bridge owners on scour, countermeasures, and resilience-related hydraulic design. Her experience includes co-authoring the current edition of HEC-23 and being the technical lead for the update to the upcoming fourth edition. She has worked as a researcher on three NCHRP hydraulic studies and author of the corresponding reports. She is an instructor for seven National Highway Institute courses on scour, resilience, stream dynamics, and modeling of river encroachments.

Mark Gosselin is a registered Professional Engineer in the states of South Carolina, Florida, and Louisiana. He earned his bachelor's degree from Dartmouth College in Engineering Sciences, his master's degree from the University of California Berkeley in Naval Architecture and Off-shore Structures, and his doctoral degree from the University of Florida in Coastal and Oceanographic Engineering. Mark served as Chief Engineer at Taylor Engineering, Vice President of Ocean Engineering Associates, and is currently a Vice President at INTERA Incorporated.

Gregory Granato is currently the Federal Highway Administration (FHWA) national stormwater specialist in the FHWA's Office of Project Development & Environmental Review. Gregory comes from the U.S. Geological Survey in Massachusetts and has about 30 years of experience in water quality, stormwater management, water resources coordination in connection with highway programs. Gregory is author or coauthor of more than 60 reports on hydrology, hydraulics, and water quality. Gregory is the author of the Stochastic Empirical Loading and Dilution Model (SELDM) and 19 other hydrological software packages.

Steven Griffin previously served for 15 years as a Hydraulics Unit lead at the Colorado Department of Transportation, and currently serves in the Chief Engineer's Office at CDOT. He is a PhD Candidate at Colorado State University, with a research interest in post-wildfire hydrology, soil conditions, and geomorphology. He has had an active response role in multiple wildfire events during his tenure at CDOT, including the High Park, Cameron Peak, East Troublesome, Marshall Fire, and Grizzly Creek fires.

Charles Hebson is Manager of the Surface Water Resources Division in the MaineDOT Environmental Office. His responsibilities include hydrology and hydraulics for transportation design with a special emphasis on field evaluations and design for fish passage as well as projects with significant water-related environmental issues such as salt marsh and tidal flow issues. With climate change, increased attention is also being given to inland flooding, sea level rise and coastal hydrology/hydraulics. Charlie also provides technical support to ongoing policy development related to hydraulic design and fish passage as well as development of technical guidance materials for hydrology, hydraulics, fish passage design and associated climate change impacts as department hydrology/hydraulics.

Julie Heilman has over 24 years of engineering experience in transportation, hydraulics, construction, and construction management; all of which was obtained through my career with the Washington State Department of Transportation. She currently serves as the State Hydraulics Engineer for the Washington State Department of Transportation. Julie received a Bachelor of Science at Washington State University, and is a licensed Professional Engineer in the State of Washington.

Don Hendon is a Hydraulic and Coastal Project Manager with HDR where his expertise lies in hydrodynamic numerical modeling technologies to design and analyze hydrology and hydraulic structures in the riverine and coastal environments. His experience includes designing hydraulic structures, scour analysis of new and existing structures, analyzing countermeasures, designing replacement and new countermeasures, modeling moving vessel effects, and storm surge modeling. He is currently the President for the Mississippi Engineering Society and Vice-President for Friends of the Mississippi River Basin Model, a non-profit with a goal of making a children science center out of the largest physical hydraulic model ever constructed. He is a regular volunteer for MATHCOUNTS, an active member in ASCE, SAME, & WTS, coaches' soccer and basketball, and makes puns whenever he has an opening. He is a life-long Mississippian, follower of the Lord, husband of 20 years, and father of 4 wonderful children.

Scott Hogan, P.E. has spent more than 30-years working in the field of river engineering hydraulics. For the past 17 years, he has worked with the US Federal Highway Administration (FHWA) and was a consulting engineer prior to that. He graduated from Colorado State University with a B.S. in Civil Engineering and a M.S. in Hydraulics.

Rollin H. Hotchkiss is a water resources engineering professor in the Civil and Construction Engineering Department at Brigham Young University. His research areas include evaluation of peak discharge approaches, reducing fatalities at low-head dams, and extending the useful life of reservoirs using sediment management. Dr. Hotchkiss has authored more than 50 journal papers and more than 100 conference papers. He was the 2017 ASCE Hydraulic Structures medal recipient. He teaches courses in fluid mechanics, 2D river modeling, hydraulic structures, and open-channel flow.

Henry Hu, PHD, PE, PH has directed hydrologic, hydraulic, and sediment transport studies throughout the Pacific Northwest, including backwater, floodplain, hydraulic design, fish passage, levee setback, river and estuarine restoration, geomorphic assessment, sediment transport and scour, and zero-rise analyses for numerous bridges and culverts. He has also conducted 1D/2D/3D modeling studies for fish passage, sediment transport, levee setback, and restoration in rivers and estuaries. He was a principal-in-charge of on-call hydraulics contracts with WSDOT, USACE, and FEMA. In western Washington alone, he has managed culvert/bridge replacement/improvement projects in King, Snohomish, Lewis, Mason, Grays Harbor, Jefferson, and Clallam Counties. In the last nine years, for WSDOT HQ Hydraulics, he has directed task orders/agreements for fish passage design, bridge hydraulics, scour calculations, stream realignment alternatives, and/or floodplain analyses. He is currently leading Stony Run Creek fish passage design for Amtrak in Maryland.

Beatrice Hunt has over 35 years of civil engineering experience which includes bridge structures, hydraulics and scour engineering and project management. She has been the lead hydraulic engineer providing assessments, analysis and design services for over 1,000 bridges in 23 states. Her expertise includes hydrologic, hydraulic, scour and stream stability analyses for new and existing bridges over rivers and tidal waterways; hydraulic bridge design; bridge and culvert scour evaluations including screening, prioritization and management programs; bank stabilization and protection; and the evaluation, development, and implementation of scour countermeasures and monitoring programs. Ms. Hunt

is experienced in the development of Plans of Action (POAs); forensic investigations; special studies on bridge scour; and hydraulic vulnerability assessments. Since 1998 she has lectured and taught short courses on bridge scour nationally and internationally, authored, contributed to, and edited books on bridge scour, and contributed articles on the subject to numerous publications.

Jennifer Johnson, P.E., CPM, [formerly Jennifer Green] serves as the State Drainage Engineer for the Florida Department of Transportation Roadway Design Office. She has over 21 years' experience, 14 years with the Department, working in both District 7 and Central Office. Ms. Green oversees the development of the FDOT Drainage Manual and the FDOT Drainage Design Guide. She earned her bachelor's degree in civil engineering and master's degree with emphasis on water resources from the University of South Florida.

Susan C. Jones, P.E., is a Senior Hydraulics Engineer with FHWA's Office of Bridges and Structures. For the past 2 years, Ms. Jones has served as a Hydraulics Discipline advocate and provides leadership and regulatory and technical assistance for FHWA's floodplain program.

Ken Kagy has worked in engineering for private consulting and local governments for the past forty-two years. He has made presentations on storm water management to national technical organizations, local universities, and several conferences. He has experience in site development design, site storm water management, storm water infrastructure design and construction, floodplain management, and community floodplain outreach programs. Ken is licensed as a Professional Engineer, Certified Floodplain Manager, and a State certified instructor for the Georgia erosion control certification program.

Dr. Kornel Kerenyi is a distinguished hydraulics research engineer at the Federal Highway Administration's (FHWA) Office of Infrastructure Research and Development (R&D). In this role, he spearheads hydraulic and hydrological research initiatives, collaborating closely with State and local agencies, academic institutions, and a wide range of partners and stakeholders. He also oversees the J. Sterling Jones Hydraulics Research Laboratory at the FHWA Turner-Fairbank Highway Research Center. Prior to his current position, Dr. Kerenyi served as a research engineer in the private sector, where he managed laboratory support staff. He earned his Ph.D. in Fluid Mechanics and Hydraulic Steel Structures from the Vienna University of Technology in Austria.

Roger T. Kilgore is a Professional Engineer and board certified in water resources engineering. Based in Denver Colorado he has over 30 years of experience in hydrology and hydraulics, stormwater management, water quality, and flood mitigation. He has written several design manuals for the Federal Highway Administration including Highways in the River Environment - Floodplains, Extreme Events, Risk, and Resilience (HEC-17) and Highway Hydrology (HDS-2). He also served as the Principal Investigator of NCHRP 15-61 "Applying Climate Change Information to Hydrologic and Hydraulic Design of Transportation Infrastructure" and NCHRP 25-60 "Watershed Approach to Mitigating Hydrologic Impacts of Transportation Projects."

Michael Knapp, P.E. currently serves as the Statewide Hydraulics Engineer for the Alaska Department of Transportation and Public Facilities [DOT&PF]. He has held this position for 17 years. He has a BS in Civil Engineering and MS in Water Resources Engineering from Oregon State University.

Mr. Knapp started his career in his hometown of Corvallis, Oregon at the Benton County Public Works Engineering Office. Later he joined a water resources engineering firm [Vigil-Agrimis, Inc.] in Portland, Oregon. A couple of work trips as a consultant brought him to Alaska where he met DOT&PF engineers. When a hydraulic engineering position opened up in their Southcoast Region, Mr. Knapp was invited to apply. Drawn to Alaska's open spaces, mountains, and dynamic rivers, Mr. Knapp ventured north to make Juneau, Alaska his new home. He served as the Regional Hydraulics Engineer for three years before being promoted to Headquarters as the Statewide Hydraulics Engineer within the Bridge Section.

Mr. Knapp is responsible for hydraulic design in support of bridge projects, scour analyses, and countermeasure designs. He is presently managing a drainage manual update and is regularly involved in project prioritization discussions for resiliency initiatives. While Juneau is his home base, statewide responsibilities occasionally require travel to remote areas of the state.

Casey Kramer, PE [Natural Waters, LLC] has over 20 years of experience working in both the public and private sectors in the fields of hydrology, hydraulics, river engineering, and fish passage while specializing in hydraulic design of transportation infrastructure. Casey has been involved with over 400 water and transportation projects and has a thorough understanding of project delivery of hydraulics and restoration projects. Casey was formerly the State Hydraulic Engineer for the Washington State Department of Transportation where he also served as a member of the AASHTO TCHH. He graduated from Washington State University

with a B.S. in Civil Engineering and the University of Iowa with a M.S. in Civil Engineering. Casey is a registered Professional Civil Engineer in AK, CA, HI, OR, MT and WA.

Tim Lanier is a Hydrologist for the U.S. Geological Survey [USGS] in Columbia, SC. He has been with the USGS for over 34 years. His experience encompasses river, bridge, and culvert hydraulics in numerous ways. He is involved with the collection of data documenting hurricane storm surge and flooding due to heavy rains. In addition, he has led or been involved with numerous special projects in multiple states throughout his career with the USGS.

Matt Lauffer is the State Hydraulics Engineer for the North Carolina Department of Transportation and has been with the Department for 25 years. The Hydraulics Unit supports Design, Operations and manages the Department's compliance for stormwater and floodplain management. In addition to his Unit Manager responsibilities, Matt takes an active role in the Department's Resilience Program. He is a member of the National Academy of Sciences Transportation Research Board Committee on Hydrology, Hydraulics and Stormwater and is a member of the AASHTO Committee of Design and Technical Committee on Hydrology and Hydraulics. Matt holds a Bachelor of Science in Civil Engineering from The Ohio State University. Matt is a registered professional engineer in North Carolina.

Dr. Hubert Ley started at Argonne National Laboratory in 1991 as a nuclear engineer and has worked on the development and deployment of a wide variety of simulation codes. He became the director of Argonne's Transportation Research and Analysis Computing Center in 2010, and manages a diverse group of scientists with expertise in Computational Fluid Dynamics, Computational Structural Mechanics, Nuclear Plant Diagnostics and Optimization, and Machine Learning Applications. He also operates the TRACC High Performance Computing user facility for USDOT, providing massive computing resources to various USDOT programs. With his experience in programming and simulation, he has led the development of the OpenFOAM scour code development for the past 5 years.

Charlie Little has been a practicing civil engineer for over forty years. His extensive experience includes engineering and design, project management, and research in the areas of hydraulics and hydrology, river engineering and fluvial geomorphology, erosion control and stream restoration, water control management, and water resource planning. With substantial experience from the U.S. Army Corps of Engineers, he offers a broad range of expertise in local, state, and federal government projects.

Dr. Xiaofeng Liu is an associate professor in the Department of Civil and Environmental Engineering at Penn State. He got his bachelor's degree in Hydraulic Engineering from Tsinghua University and a master's degree in Environmental Science from Peking University, China. He got his Ph.D. in Civil Engineering from the University of Illinois at Urbana-Champaign (UIUC) and a second master degree in Applied Mathematics in 2008. Dr. Liu's research interest includes computational hydraulics, sediment transport, and environmental fluid mechanics. His group specializes on the development and utilization of computational models for problems in environmental and water resource engineering. Dr. Liu received the Harry West Teaching Award from Penn State and the State-of-the-Art of Civil Engineering Award from the American Society of Civil Engineers (ASCE). He is a Fellow of the Environmental and Water Resources Institute (EWRI), ASCE.

Tyler Longberry, PE, CFM, is a water resource engineer with AECOM in the Raleigh, North Carolina office. Mr. Longberry has approximately 17 years of experience specializing in 1D/2D hydrologic and hydraulic modeling, coastal flood studies, dam breach and levee analyses, flood warning gages, and flood risk mapping. Tyler has led and assisted with 1D and 2D modeling projects for FEMA, NCDOT, North Carolina Floodplain Mapping Program, and various others.

Troy Lyons is a Research Engineer and the Associate Director of IHR-Hydroscience and Engineering at the University of Iowa. He holds a PhD in Civil and Environmental Engineering. He has expertise in design of hydraulic structures, hydraulic modeling, stormwater conveyance, river hydraulics, sediment transport, and fish passage. His work primarily focuses on applied research of hydraulic structures using both physical and numerical modeling techniques. He has extensive experience in the testing and design of spillways, outlet structures, diversions, and other water conveyance systems for projects in the US and around the world.

Tim Mallette is an engineering group leader for the NH Department of Transportation. While serving as an hydraulics engineer from 2007 to 2022, he chaired a group of champions to institutionalize 2d hydraulics, and a team of engineers for updating the Department's drainage manual. Currently he is part of a collaborative effort, between NHDOT and GZA, Inc. for the development of a Coastal Supplement to the Dept. drainage manual. Mr. Mallette is a member of the inter-agency Silver Jackets team that helps streamline technical services and emergency response for NH communities. He is a past president of the NH Land Surveyors Association, and the current editor of a one design sailing publication Scots n' Water. Tim is an amateur racer of international Starboats and Flying Scots.

David Markwood is a Professional Engineer and Water Resources Manager for Summit Design and Engineering Services and is based in Raleigh, North Carolina. Mr. Markwood has 19 years of experience in hydrology and hydraulics, flood modeling, and flood mitigation. He was the Inland Hydrology contributor for North Carolina DOT for NCHRP 20-44[23] "Pilot Test of Climate Change Design Practices Guide for Hydrology and Hydraulics" and I-6064 Interstate 95 widening, and developed Levee Analysis and Mapping Plan modeling for levees in Lumberton, Princeville, and Speed, North Carolina for North Carolina Emergency Management.

Andy McCoy leads the Computational Fluid Dynamics practice within the HDR Dams Levees and Civil Works Program. He has more than 23 years of experience using CFD to complete evaluations that support complex designs, regulatory processes, and decision support.

Sarah McEwen is the Central Region Hydrology and Hydraulics Discipline Lead for Neal-Schaffer. In this role, she is responsible for managing all hydrology, hydraulics, and drainage projects in Mississippi, Arkansas, and Louisiana. She is also available to provide H/H Project Management and engineering design services for clients across the firm's nine-state footprint. Sarah has extensive experience in managing DOT projects with respect to bridge hydraulics, scour evaluations, internal technical reviews, and roadway hydraulics. She is experienced with hydrologic modification impact analysis, drainage master planning, and construction administration as part of site design and erosion control measures. Sarah has a background in floodplain mapping and is a Certified Floodplain Manager. She has experience in HEC-HMS, HEC-RAS, HEC-SSP, PCSWMM, HY-8, Hydraulic Toolbox, XPSWMM, ESRI ArcGIS, AutoCAD, and SMS SRH2D. She obtained her BSc in Civil Engineering with emphases in Water Resources from Mississippi State University. She currently serves as Past-Chair of ASCE National Committee on Pre-College Outreach, member of the ASCE National Society Awards Committee, and Chair of ACEC MS Emerging Leaders Committee. With Friends of Mississippi River Basin Model, she serves as secretary and past president.

Colin McKernan, P.E. CFM is a professional engineer specializing in surface water planning and analysis. He has extensive experience with hydrologic and 1D/2D hydraulic analyses, floodplain management, master planning, CLOMR/LOMR submittals, stream restoration, as well as bridge design. He provides decades of extensive experience in hydraulic modeling of bridges over waterways of all sizes. He has successfully navigated through local and federal floodplain management programs throughout the nation and completion of "impossible floodplain projects" within the Denver Metro area. His comprehensive understanding of bridge scour and structure selection with hydraulic impacts considered has made him a valued member of the HDR Bridges and Structures team.

Blake Mendrop has been a practicing civil engineer for over thirty years. His extensive experience includes engineering and project management, surveying, economic development, and technical design of many project components, including hydrologic design, hydraulic design, river engineering, and water resource planning. With substantial experience from the US Army Corps of Engineers, he offers a broad range of expertise in local, state, and federal government projects. Mr. Mendrop is recognized for his expertise in the area of water resources, with advanced studies obtained at Colorado State University.

Pawel Mizgalewicz has been working as a transportation engineer for the Maryland Department of Transportation, State Highway Administration (MDOT SHA) since 2014. His primary responsibilities include Hydrologic, Hydraulic, Stream Morphology and Scour analyses of existing and proposed bridge and culvert structures. Before joining MDOT SHA he conducted research on application of raster GIS in water resources at the University of Texas (UT). His education credentials include a Ph.D. degree in Water Resources from the UT at Austin, Texas (1996), and a Ph.D. in Environmental Engineering from the AGH University of Science and Technology in Krakow, Poland (2005). He's a registered P.E. in Maryland.

Steve Neary is a Hydraulic Design Engineer in the Wisconsin Department of Transportation's Bureau of Structures. He has been designing hydraulic structures since 2014 and has a strong background in hydrology, 1D and 2D hydraulic modeling, scour analysis and countermeasure design, aquatic organism passage, stormwater and floodplain analysis. Steve is a registered P.E. in WI has Masters of Science in Civil/Environmental Engineering and Water Resources Management from UW-Madison.

Ellen Newman is a water resources engineer with AECOM out of the Manchester, New Hampshire office. She has eight years of experience specializing in surface water modeling and bridge and culvert scour analysis. She utilizes the hydraulic modeling software SRH2-D, HEC-RAS, HEC-HMS, and HY-8. She has performed hydraulic analyses in 11 different states, in both riverine and coastal environments. She is familiar with applying climate resiliency in design. She has experience in scour computations, scour countermeasure design and development of Plans of Action (POAs). She has evaluated projects for flood risk analysis, floodway mapping, and a project's impact on the FEMA Floodway, in compliance with the National Flood Insurance Program. She has been a co-author of a Flood Monitoring Guidance Manual in support of the South Carolina Department of Transportation's Metric 18 Program. She is a registered professional engineer in the state of Rhode Island. She received both a B.S.E. in Civil Engineering and a M.S. Eng in Civil Engineering with the Environmental Concentration from the University of Massachusetts, Lowell.

James Pagenkopf is a research hydraulics engineer in FHWA's Office of Infrastructure R&D, providing support for hydraulic and hydrological research activities conducted at Turner-Fairbanks' Hydraulics Research Laboratory, with a focus on scour and soil erosion testing. He was previously a research engineer providing over 12 years of contracting support at TFHRC for both the Hydraulics and Aerodynamics Laboratories.

Blake Palmer, PE is a project manager on the H&H team at Garver. He joined Garver in 2024 and has over 14 years of experience in the H&H field. Blake has a wide range of project experience but specializes in bridge hydraulics and river engineering, including scour analysis and 2D hydraulic modeling. When he isn't at work, Blake is surrounded by children. He and his wife Holly serve in the children's ministry at their local church, while also raising 4 young children of their own.

Dr. Art Parola, P.E., is the director of the Stream Institute and a professor of civil and environmental engineering at the University of Louisville. He received his PhD in civil engineering, water resources, from The Pennsylvania State University in 1990. Dr. Parola is a recognized expert in stream and wetland restoration methods, stream morphology, and sediment dynamics. He has conducted fieldwork in at least 28 US states and Australia and New Zealand, and for more than 20 years, he has collaborated with federal, state, and local agencies and community organizations, provided engineering consulting services, taught, and carried out applied research.

Wesley Peck, PE is state hydraulic engineer and manager of the hydraulic design team at Tennessee DOT. He has been at Tennessee DOT for 28 years.

Dr. Garland Pennison is a HDR Professional Associate and senior project engineer with over 44-years' experience in project planning, engineering, and management. He has diverse engineering experience in large civil, water resources, environmental, coastal, and flood protection projects. His expertise also includes diverse land use, infrastructure, and coastal systems planning. Dr. Pennison is a registered civil and environmental engineer. His undergraduate and graduate degrees are from Louisiana Tech University, with post-graduate coastal studies at LSU. His 2020 PhD degree is from South Alabama with a focus on risks and resiliency of natural and engineered coastal systems when exposed to extreme tropical events. His doctoral advisor at South Alabama is Dr. Bret Webb. He is an active member of numerous professional and technical organizations.

Amanda Peters is a Hydraulic Engineer at FHWA – Central Federal Lands based in Lakewood, CO. Amanda has a bachelor's degree in civil and environmental engineering from the University of Dayton. In her current position, she has worked on many emergency relief projects in California in various National Parks and National Forests. In her free time, she enjoys spending time outdoors running, hiking, and skiing.

Dan Priest is the General Manager for Contech's Hard Armor Solutions and is a registered professional engineer with over 20 years' experience in design and construction of geotechnical and hydraulic structures. Dan holds a M.S. in Civil and Geotechnical Engineering from Northwestern University in Evanston, IL and a B.S. in Civil and Environmental Engineering from the University of Cincinnati. He is a member of the American Society of Civil Engineers and has been published in CE News, Informed Infrastructure, and Erosion Control Magazine.

Abigail Richardson is currently an Engineer Intern at Neel-Schaffer, specializing in Hydrology and Hydraulics. She serves as the Outreach Chair for the Mississippi Women's Transportation Seminar (WTS) and is a member of Mississippi Engineering Society (MES) and the American Society of Civil Engineers (ASCE). Additionally, she is a Certified Floodplain Manager and is a member of the Association of State Floodplain Managers. She has worked on a wide variety of projects involving roadway drainage, floodplain modeling, and scour analyses.

Roberto Ruiz is a registered Professional Engineer (P.E.) in the state of South Carolina, bringing over three decades of expertise in hydrology and hydraulics. He earned his Civil Engineering degree from the University of Cordoba in Argentina in 1987 and a Master of Science in Civil Engineering, with a focus on Water Resources, from the University of South Carolina in 1992.

Jim Schall is a registered professional engineer with over 40 years' experience as a consulting engineer specializing in water resources. His transportation experience includes design of pavement drainage, large storm drainage systems, detention ponds, culverts, energy dissipaters, roadside ditches and bridge hydraulics and scour. Research experience includes National Cooperative Highway Research Program (NCHRP) projects on scour instrumentation. He has been involved in the preparation of many FHWA transportation drainage documents and training courses and is a regular instructor for National Highway Institute (NHI) training courses. Jim completed his undergraduate engineering degree at Purdue University [1976] and his Masters [1979] and Ph.D. [1983] at Colorado State University.

Dr. Haoyin Shan is the Deputy Hydraulics Lab Manager at Genex Systems and is based out of the Hydraulics Laboratory at FHWA's Turner-Fairbank Highway Research Center (TFHRC) in McLean, VA. He has 15 years of experience in bridge hydraulics, bridge scour, sediment transport and clay erosion resistance testing. He is managing the day-to-day lab operation and working on projects including developing the NextScour shear stress decay method and clay erosion resistance equations to more accurately estimate scour depth for bridge foundation design. He is a registered Professional Engineer in VA, a certified project management professional (PMP), and holds a Ph.D. degree in Civil Engineering from the University of Nebraska-Lincoln.

Daniel Sharar-Salgado is a Hydraulic Engineer with FHWA's Office of Bridges and Structures. His responsibilities include leading coastal engineering initiatives for FHWA, managing climate data tools and resources, and assisting with a variety of technical activities in scour, hydrology and numerical modeling. Prior to working at FHWA, Daniel worked for the Maryland DOT, where he developed and reviewed hydraulic models, drainage designs, and stormwater management designs for a range of roadway projects. Daniel has a Masters Degree in Coastal Engineering from the University of Delaware and is a licensed professional engineer.

Paul Sharp is a graduate of Tennessee Technological University with a BS degree in Civil Engineering. He has 42 years of experience serving as a Structural Design Engineer, Bridge Inspection and Evaluation Manager and the State Hydraulics Engineer for the Tennessee DOT and he has served as the FHWA Tennessee Division Bridge Engineer. Paul currently serves as the FHWA Senior Scour Engineer in HQ. He is a registered Professional Engineer in Civil Engineering.

His current responsibilities include the advancement of the FHWA Scour Program as it relates to establishing and interpreting policy, research implementation and deployment of scour design and scour countermeasures activities. He also assists owners in their compliance with the scour-related topics within the National Bridge Inspection Standards.

Marta Sitek graduated from and later worked as an assistant professor at the Faculty of Civil Engineering, Warsaw University of Technology, in Warsaw, Poland. Currently works as a Principal Mechanical Engineer at Argonne National Laboratory, in Lemont, Illinois.

Bruno J. O. Sousa is a civil engineer with a master's in Hydraulic Engineering and Sanitation from the University of Sao Paulo. Currently, he is a Ph.D. student in the Department of Civil and Environmental Engineering with the Hydraulic Research Group at Auburn University. His main research fields are hydrology, hydrologic modeling, and stormwater.

Alana B. Spaetzel serves as a supervisory hydrologist at the U.S. Geological Survey's (USGS) New England Water Science Center. She oversees the maintenance and implementation of the Stochastic Empirical Loading and Dilution Model (SELDLM) and the Highway-Runoff Database in partnership with the Federal Highway Administration. Alana leads projects that support state and municipal stormwater management initiatives by enhancing the USGS StreamStats web application with mapped stormwater infrastructure and roadway information.

David Spinks is a Hydraulic Team Lead at the Tennessee Department of Transportation, responsible for projects in Middle and East Tennessee (TDOT Regions 1 & 3). He grew up in Johnson City, TN and received his bachelor's degree in civil engineering from The University of Tennessee - Knoxville in 2005. In 2006 he started as a Graduate Transportation Assistant with what is now TDOT's Engineering Division, making his way to the hydraulics unit in 2007 where he has been ever since. He has been a licensed PE in the state of Tennessee since 2011. David lives in Nashville with his wife, son and daughter.

Carl Spirio is experienced in hydrology and hydraulics, integrated watershed resource planning, stormwater management and bridge hydraulics and scour, environmental permitting, and coastal planning. His career spans more than 36 years, with 18-years at the Florida DOT and 18-years in the Private sector. While working for FDOT, Carl served as both the District 1 and State Drainage Engineer overseeing the drainage and permitting efforts throughout Florida. Due to the everchanging environmental permitting regulations in Florida, he has spent a considerable amount of time working with various State, Federal and Local permitting agencies addressing water quality criteria, tmdls, Basin Management Action Plans (BMAPs), coastal resiliency and watershed resource initiatives.

Oscar Suaznabar is a dedicated hydraulic engineer at the California Department of Transportation (Caltrans), working in the Structure Maintenance and Investigations - Hydraulics Branch. He specializes in scour evaluations and investigations of bridges throughout California, ensuring the safety and stability of the state's critical infrastructure. Before joining Caltrans, Oscar worked as a Research Hydraulic Engineer contractor for the Federal Highway Administration (FHWA), where he contributed to cutting-edge research and development in bridge hydraulics, stream stability and bridge scour. Mr. Suaznabar holds a M.Sc. in Water Resources Engineering and Management from the University of Stuttgart, Germany.

Jose Vasconcelos is a professor in the Department of Civil and Environmental Engineering and leads the Hydraulic Research Group at Auburn University. His work focuses on unsteady flows in closed conduits, air-water interactions, stormwater management, hydrological modeling, and extreme flows

in urban water systems. He has interests in numerical and laboratory-scale hydraulic modeling, as well as field investigations on urban and undeveloped headwater watersheds. At Auburn, he teaches undergraduate and graduate level classes on water resources, leads student researchers in areas linked to hydraulics, hydrology and sustainability, as well as serving in the university's Stormwater Committee. He serves as an associate editor in the Journal of Hydraulic Engineering (ASCE), Journal of Water Management Modeling (CHI), and Water (MDPI). Dr. Vasconcelos also chairs the ASCE EWRI Task Committee Two-phase Flows in Urban Water Systems and is a member of the Hydraulic Structures Committee and Computational Hydraulics Committee. He also serves as a mentor to the Auburn University student chapter of Engineers Without Borders, having developed projects in Rwanda and Guatemala.

Rachel Westerfield joined Gresham Smith in August of 2020, and is serving as the Hydraulics Practice Leader providing technical oversight and support of Gresham Smith's H&H and Drainage work. She started her career at the Mississippi Dept. of Transportation in Bridge Division in 2003, and served as the State Hydraulic Engineer for seven years before moving into the private sector.

Amanda Whitlock, PE, is the Senior Hydraulic Engineer for West and Eastern Middle Tennessee. She has spent the better part of a decade working for the Hydraulics Division of the Tennessee Department of Transportation.

Kathryn (Katie) Wimberly, PE, CFM is a senior project engineer on the Hydrology and Hydraulics (H&H) team at Garver in the Southeast Region. She has over 17 years of experience in the H&H field and joined Garver in 2019. Her project experience includes stormwater analysis and design, hydraulic analysis of mainline and interchange crossings, floodplain studies, bridge and roadway replacement projects, and dam break inundation modeling and mapping. She has a wealth of experience in both 1D and 2D hydraulic modeling. She has provided the design and analyses for channel improvements, grade control structures, and bank stabilization and countermeasure design. She spends her free time with her daughter Zoe, miniature schnauzer Stella, golden doodle Coffee, and her two cats Nala and Francie.

DJ Wiseman, PE is the Hydraulics Team Lead for West and Eastern Middle Tennessee. She has worked at TDOT for 14 years, 4 of which has been in Hydraulics.

Dr. Alan Zundel leads the Aquaveo, LLC software development team. He was the original architect of the Surface-water Modeling System (SMS) developed under contract to both the Federal Highway Administration (FHWA) and the Engineering Research and Development Center of the Army Corps of Engineers (ERDC). This package is now used around the world and is available in a freely available "Community Model" version.

Workshop A - Hydraulic Design and Digital Delivery with Bentley Software

Kristen Dietrich, Jonathon Smith, Joey LouAllen, Kyle Brandon, Tim Robinson, RoseMarie Klee, Matt Lauffer, Jennifer Johnson

See how you can use Bentley's Civil products with integrated OpenFlows technology to streamline the design of drainage in your transportation projects. From detailed hydraulic analysis to the latest advancements in digital delivery, Bentley provides a solution for the whole workflow. In addition, State DOTs will share their experiences with Drainage Utilities. The session will conclude with a State of the State panel discussion providing an opportunity to ask questions, share, and discuss the future of drainage design.

Speaker Bios:

Kristen Dietrich is a Senior Product Manager for water infrastructure desktop software. Since joining Haestad Methods in 1999 and Bentley via its acquisition of Haestad, she has served as an instructor, Learning Content Manager, Managing Editor for the development of Hydraulics and Hydrology textbooks, Technical Support Manager, Senior Consultant and Consultancy Manager. Prior to joining Bentley, Kristen worked in civil engineering consulting, where she was involved with site design, land development and water resources projects.

Jonathan Smith is a Senior Product Manager with Bentley Civil. Jon started his career in the UK water industry in 1983, before working in a highways design team in 1989. Jon joined MOSS Systems in 1996, initially in the applications support team, before moving in to R&D two years later. He is now a Senior Product Manager, and looks after the Drainage and Utilities functionality.

Joey LouAllen, P.E., earned a civil engineering degree from the University of Alabama in Huntsville. He has worked in the industry for 25 years. During that time, 20 years have been spent with Bentley Systems supporting the users of civil products as a technical support analyst, trainer, consultant, and marketing manager. The remainder of that time was spent working as a civil engineer and partner at an engineering consulting firm delivering private, municipal, and state-level projects. Joey is currently a product manager focused on developing solutions to fulfill the aspirations of digital project delivery for the civil infrastructure market.

Kyle Brandon is the Assistant Administrator of Roadway and Bridge Hydraulics in the Office of Hydraulic Engineering for the Ohio Department of Transportation. He has served in that role since January of 2023. Kyle worked as a Roadway Hydraulic Engineer in the office from September 2012 to January 2023. Prior to this position, Kyle worked in ODOT's Office of CADD and Mapping Services, completed ODOT's Engineer in Training Program, and was a College Intern in District 10 Construction. He is a graduate of Ohio University with a Bachelors of Science in Civil Engineering. He is a registered Professional Engineer and a Surveyor Intern in the State of Ohio.

Tim Robinson is the Branch Manager for the Kentucky Transportation Cabinets Drainage Branch in Central Office Design. He came to central office drainage branch after 25 years in consulting, working mainly in roadway and drainage design. Tim has been working to help develop the KYTC workspace for the ORD platform the last 3 years. He has 2 children and enjoys running, martial arts, and watching college basketball.

Rose Marie Klee is the H&H Section Director in the Design Division of TxDOT. She has served as the State Hydraulic Engineer since June 2020. Her group leads the statewide practice for hydrology and hydraulics, including developing policy and guidance, managing an extensive training program, leading the hydraulics research program, and providing specialized technical support to district offices. She has 25 years of experience in both the public and private sectors. Rose Marie studied at the University of Texas at Austin and has a B.S. in Architectural Engineering and an M.S. in Environmental and Water Resources Engineering.

Matt Lauffer is the State Hydraulics Engineer for the North Carolina Department of Transportation and has been with the Department for 25 years. The Hydraulics Unit supports Design, Operations and manages the Department's compliance for stormwater and floodplain management. In addition to his Unit Manager responsibilities, Matt takes an active role in the Department's Resilience Program. He is a member of the National Academy of Sciences Transportation Research Board Committee on Hydrology, Hydraulics and Stormwater and is a member of the AASHTO Committee of Design and Technical Committee on Hydrology and Hydraulics. Matt holds a Bachelor of Science in Civil Engineering from The Ohio State University. Matt is a registered professional engineer in North Carolina.

Jennifer Johnson, P.E., CPM, [formerly Jennifer Green] serves as the State Drainage Engineer for the Florida Department of Transportation Roadway Design Office. She has over 21 years' experience, 14 years with the Department, working in both District 7 and Central Office. Ms. Green oversees the development of the FDOT Drainage Manual and the FDOT Drainage Design Guide. She earned her bachelor's degree in civil engineering and master's degree with emphasis on water resources from the University of South Florida.

Workshop B - Working Through 2D Hydraulic Modeling Floodplain Permitting Challenges

Scott Hogan and Susan Jones

As state DOTs and others have been transitioning to using 2D hydraulic models for their transportation related hydraulics projects they have been encountering a wide range of challenges and frustrations. The objective of this workshop is to hear from states about their experiences, facilitate discussions that may help resolve some of the issues, and hear from FEMA representatives on their perspectives and come to a better understanding that would hopefully be beneficial to all parties.

Speaker Bios:

Scott Hogan, P.E. has spent more than 30-years working in the field of river engineering hydraulics. For the past 17 years, he has worked with the US Federal Highway Administration (FHWA) and was a consulting engineer prior to that. He graduated from Colorado State University with a B.S. in Civil Engineering and a M.S. in Hydraulics

Mr. Hogan specializes in bridge hydraulic modeling and design, scour analyses, sediment transport, counter measure design, and floodplain analysis. He has spent his entire career working on hydraulic modeling, with a focus on model application, new development, and training. For more than 25 years he has been an instructor for several hydraulics training courses through FHWA National Highway Institute (NHI). He has a sincere passion for hydraulic engineering and advancing the state of our practice.

Susan C. Jones, P.E., is a Senior Hydraulics Engineer with FHWA's Office of Bridges and Structures. For the past 2 years, Ms. Jones has served as a Hydraulics Discipline advocate and provides leadership and regulatory and technical assistance for FHWA's floodplain program.

For the previous 12 years, Susan has been with FHWA's Office of Planning, Environment and Realty as a highway engineer serving as FHWA's technical lead on stormwater and water quality. She has an extensive background in national transportation policy, planning and environmental compliance (NEPA) for highway projects. Before FHWA, Susan worked for the Virginia Department of Transportation in various roles such as Associate Engineer and Water Resources Specialist.

Susan received her BS in Civil Engineering with a Minor in Environmental Science from the University of Virginia and her MS in Civil and Infrastructure Engineering from George Mason University. She is a registered professional engineer in the Commonwealth of Virginia.

Aquatic Organism Passage (AOP) Panel Discussion

Casey Kramer, Justin Lennon, Abhishek Kapoor, Charlie Hebson, Gillian O'Doherty, Julie Heilman, Robert Gubernick

Are you interested in learning more or sharing your experiences and lessons learned on Aquatic Organism Passage (AOP) projects/ programs with other practitioners around the United States? Come join a collaborative discussion on AOP with an interdisciplinary expert technical panel with decades of experience implementing AOP projects. The session will begin with introductions of the expert panel, brief presentations from panel members, followed by an interactive discussion on the topic of AOP with participants and the panel.

Presentations will include:

- **Nationwide Practices in Aquatic Organism Passage Design, Construction, and Monitoring, Preliminary Findings of NCHRP 55-18 – Justin Lennon**
- **National Culvert Removal, Replacement, and Restoration Grants Program – Abhishek Kapoor**
- **Evolution of Best Practices for Aquatic Organism Passage at Waterway-Roadway Crossings – Casey Kramer**

Aquatic Organism Passage (AOP) Panel Discussion, *continued*

Speaker Bios:

Justin Lennon is a Senior Vice President and WSP USA's National Practice Area Leader for Hydraulic Structures within the Water National Business Line. He specializes in river engineering, advanced watershed and river modeling, river / bridge hydraulics and scour, ecological and stream restoration, and climate adaptation and sustainability. Justin has prepared numerous publications and presentations for local and national level conferences focusing on riverine hydraulics, bridge scour, water quality management, climate change adaptation, and watershed restoration.

Charles Hebson is Manager of the Surface Water Resources Division in the MaineDOT Environmental Office. His responsibilities include hydrology and hydraulics for transportation design with a special emphasis on field evaluations and design for fish passage as well as projects with significant water-related environmental issues such as salt marsh and tidal flow issues. With climate change, increased attention is also being given to inland flooding, sea level rise and coastal hydrology/hydraulics. Charlie also provides technical support to ongoing policy development related to hydraulic design and fish passage as well as development of technical guidance materials for hydrology, hydraulics, fish passage design and associated climate change impacts as department hydrology/hydraulics.

Gillian O'Doherty is an Ecologist at Federal Highways where she is a member of the Culvert AOP Program Team, based out of Washington DC. Gillian has over 20 years of experience with fish passage and ecological restoration and has previously held positions as the Alaska Department of Fish and Game's Fish Passage Coordinator and Habitat Research and Restoration Supervisor and a marine habitat specialist in the NOAA Restoration Center.

Julie Heilman has over 24 years of engineering experience in transportation, hydraulics, construction, and construction management; all of which was obtained through my career with the Washington State Department of Transportation. She currently serves as the State Hydraulics Engineer for the Washington State Department of Transportation. Julie received a Bachelor of Science at Washington State University, and is a licensed Professional Engineer in the State of Washington.

Julie manages programs in Stormwater, Fish Passage, Hydraulics, and Hydrology. As the State Hydraulics Engineer her duties include review and oversight of fish passage projects, hydraulic structures, stream bank erosion control and stabilization, scour analysis, scour countermeasures and pretty much everything associated with water that interacts with WSDOT infrastructure. Julie and her team serve as technical experts for complex and unique hydrologic, hydraulic, and river engineering issues statewide including emergency responses. They work very closely with the WSDOT Bridge Office and Geotechnical Office as well as several other specialty groups internal and external to WSDOT. The team develops and maintains statewide design policy for roadway drainage, stormwater, bank stabilization, scour countermeasures, bridge scour and stream restoration designs. When she gets the chance to go in the field, Julie likes to get her feet wet by performing post construction site assessments to observe how designs are functioning to see if they need to make any changes to their design policies.

Robert Gubernick R.G. is an Engineering Geologist at the National Stream and Aquatic Ecology center of the USDA Forest service. He has 40 years of experience in fish passage assessment, design and construction of AOP structures and fish passes, and construction on problem landforms. He is the national AOP team leader providing technical support on complex passage issues, training interdisciplinary in AOP design and restoration design, and developing tools to help designers improve analysis. He is also the recipient of the Career Achievement award for distinguished service in Fish Passage from the International Conference on Engineering and Ecohydrology for fish passage in 2014.

Casey Kramer (PE, Natural Waters, LLC) has over 20 years of experience working in both the public and private sectors in the fields of hydrology, hydraulics, river engineering, and fish passage while specializing in hydraulic design of transportation infrastructure. Casey has been involved with over 400 water and transportation projects and has a thorough understanding of project delivery of hydraulics and restoration projects. Casey was formerly the State Hydraulic Engineer for the Washington State Department of Transportation where he also served as a member of the AASHTO TCHH. He graduated from Washington State University with a B.S. in Civil Engineering and the University of Iowa with a M.S. in Civil Engineering. Casey is a registered Professional Civil Engineer in AK, CA, HI, OR, MT and WA.

Hydraulic Resilience Workshop and Panel Discussion

FHWA Facilitators: Megan Frye, Laura Girard, Elizabeth Habic, and Rob Kafalenos

Contributors: Matt Lauffer, Ryan Doheny, and Nick Olson

This session will highlight resilience concepts, strategies, and risk assessments.

Presentations will include:

- **Update on FHWA's Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Program**
Rob Kafalenos, Elizabeth Habic
- **Adapting to Climate Change in Maryland: Highway Drainage Manual Updates and the St. George Island Coastal Resiliency Project** – **Ryan Doheny**
- **Building MnDOT's Road to (Hydraulic) Resiliency** – **Nick Olson**
- **U.S. Department of Transportation Resilience Coalition** – **Matt Lauffer**

Speaker Bios:

Megan Frye serves as a Hydraulic Engineer with the Federal Highway Administration's (FHWA) Resource Center providing training, technical support, and technology development and deployment for internal and external stakeholders. Her work with FHWA includes 15 years of construction management, project development, and hydrologic and hydraulic analysis and design experience. She worked more than 10 years with the Federal Lands Highway Division on transportation projects in unique and complex settings across the nation's federal lands. She graduated from Carroll College with a Bachelor of Arts Degree in Civil Engineering and the University of Minnesota with a Master of Science Degree in Water Resource Engineering. Ms. Frye specializes in hydrology and hydrologic modeling and assessment and design of bridges and culverts and is a registered professional engineer in the State of Washington.

Laura Girard is a Senior Hydraulic Engineer with the Federal Highway Administration's (FHWA) Resource Center. Ms. Girard has spent the last two decades of her career wading in, measuring, modeling, and studying riverine systems. She provides technical support to bridge owners on scour, countermeasures, and resilience-related hydraulic design. Her experience includes co-authoring the current edition of HEC-23 and being the technical lead for the update to the upcoming fourth edition. She has worked as a researcher on three NCHRP hydraulic studies and author of the corresponding reports. She is an instructor for seven National Highway Institute courses on scour, resilience, stream dynamics, and modeling of river encroachments.

Elizabeth Habic is an Environmental Protection Specialist on the Resilience Team at the Federal Highway Administration (FHWA) and program manager for the PROTECT Discretionary Grant Program. Elizabeth previously worked at The Secretary's Office with Maryland Department of Transportation, and State Highway Administration as the Climate Risk and Resilience Program Manager. Elizabeth has worked on many State transportation planning initiatives to include initiating the climate change program and working on Asset Management. She has an environmental background working on state projects for over 20 years.

Rob Kafalenos is an Environmental Protection Specialist in the Office of Natural Environment at the Federal Highway Administration. He works on research and policy focused on improving the resilience of transportation to climate change and extreme weather events. He manages the PROTECT Formula Program, which funds resilience projects and planning activities. Rob also led development of a National Highway Institute course focused on addressing climate change resilience

Matt Lauffer is the State Hydraulics Engineer for the North Carolina Department of Transportation and has been with the Department for 25 years. The Hydraulics Unit supports Design, Operations and manages the Department's compliance for stormwater and floodplain management. In addition to his Unit Manager responsibilities, Matt takes an active role in the Department's Resilience Program. He is a member of the National Academy of Sciences Transportation Research Board Committee on Hydrology, Hydraulics and Stormwater and is a member of the AASHTO Committee of Design and Technical Committee on Hydrology and Hydraulics. Matt holds a Bachelor of Science in Civil Engineering from The Ohio State University. Matt is a registered professional engineer in North Carolina.

Hydraulic Resilience Workshop and Panel Discussion, *continued*

Ryan Doheny is the Assistant Chief of the Maryland State Highway Administration's Highway Hydraulics Division. In his current role, he helps oversee eight teams specializing in project development and asset management and leads the development of water resources technical guidance and training. He has 13 years of experience with hydrologic and hydraulic analysis, drainage, storm-water management, and erosion and sediment control design on a wide array of transportation projects. Recently, he was the chief editor of the 2023 update to the Maryland Highway Drainage Manual. He graduated from the University of Central Florida with a Bachelor of Science in Civil Engineering and Virginia Tech with a Master of Science in Environmental Engineering and is a registered professional engineer in the State of Maryland.



Panel Discussion: FHWA Metric 18 under the National Bridge Inspection Program

Moderator: John Hunt: Ayres

Contributors: Paul Sharp: FHWA Senior Scour Engineer, Ed Miltner: FHWA Division Bridge Engineer for Idaho, Erik Carlson: Michigan DOT, Monte Deis: North Dakota DOT, Will deRosset: Ayres

FHWA Division Bridge Engineers perform reviews of the states' compliance with the National Bridge Inspection Program (NBIP). Metric #18 Inspection Procedures-Scour, lays out the requirements for bridges that are scour critical. Its requirements include:

Bridges over water have a documented appraisal of scour vulnerability.

Bridges that are scour critical have a scour plan of action (POA) prepared to monitor known and potential deficiencies and to address scour critical findings.

Bridges that are scour critical are monitored in accordance with the POA.

Recently, multiple DOTs have been found non-compliant, and are in the process of responding to Plans of Corrective Action (PCAs).

This Panel Discussion will explore Metric 18 requirements, providing information about strategies to proactively maintain compliance from multiple perspectives. The panel will include the FHWA Senior Scour Engineer, a FHWA division bridge engineer, DOT hydraulic engineers and a consultant who works with DOTs to help them navigate Metric 18 and respond appropriately to PCAs.

Attendees and participants will gain a better understanding of the requirements and how to navigate compliance.

Panel Discussion: FHWA Metric 18 under the National Bridge Inspection Program, *continued***Speaker Bios:**

Paul Sharp, P.E., is the Senior Scour Engineer in FHWA Headquarters. His current responsibilities include the advancement of the FHWA Scour Program as it relates to establishing and interpreting policy, research implementation and deployment of scour design and scour countermeasures activities. He also assists bridge owners in their compliance with the scour-related topics within the National Bridge Inspection Standards. Paul holds a BS Degree in Civil Engineering from Tennessee Technological University and has 42 years of experience as a structural design engineer and as the Bridge Inspection and Evaluation Manager and the State Hydraulics Engineer for the Tennessee DOT.

Erik Carlson P.E. is the supervisor of the Hydraulic Unit for the Michigan Department of Transportation, which focuses on statewide bridge and culvert work across Michigan. He has worked for MDOT for over twenty years, with various roles within the Hydraulic Unit. Prior to working for the DOT, he worked for a few years for a private Consultant, focusing on stormwater analysis. He has also served as a guest advisor and lecturer at Michigan State University for the Senior Capstone Design course. He also is a member of AASHTO TCHH.

Ed Miltner, PE, is the FHWA Idaho Division Office Structures Engineer, based in Boise, ID. Ed primarily works with the Idaho Transportation Department and local governments on highway bridge safety, planning, design, and construction. Ed has also served on several FHWA bridge and tunnel initiatives outside of Idaho. He was on the rulemaking team that developed the final rule that became the 2022 National Bridge Inspection Standards (NBIS) regulation. He also helped to develop guidance for implementing the 2022 NBIS regulation. Ed holds a BS degree in Civil Engineering from Cleveland State University and a Master's in Public Administration from Boise State University.

Monte Deis, P.E., leads the Hydraulics and Preliminary Engineering Group at the North Dakota Department of Transportation. With a decade of experience in transportation engineering, he oversees the initial stages of bridge project development and handles all aspects of rural and urban drainage. Monte earned his B.S. in Civil Engineering from North Dakota State University and is a Registered Professional Engineer in North Dakota. Outside of work, he dedicates much of his time to outdoor activities and spending time with his family.

Will deRosset, P.E., is a senior hydraulic engineer with Ayres Associates, based in Fort Collins, Colorado. Over 27 years, he has performed bridge hydraulic analysis, scour evaluation and design throughout the United States. He has contributed to multiple FHWA hydraulic documents, including the recent updates to HDS-7 and HEC-23. He is also the Principal Investigator for the new project to update FHWA HEC-20 Stream Stability at Highway Structures. He is an accomplished instructor of NHI hydraulics and scour courses, having been awarded as Instructor of Excellence in multiple years. Will holds a BS degree in Civil Engineering from Colorado State University.

Moderator:

John Hunt, P.E., is the National Practice Leader for Transportation Hydraulics at Ayres Associates, based in Fort Collins, Colorado. With 37 years of engineering experience, John has performed bridge hydraulic analysis, scour evaluation and design throughout the United States. He is the lead author and Principal Investigator of the recently updated FHWA HDS-7 Hydraulic Design of Safe Bridges. John is the lead instructor for multiple NHI hydraulics courses and manages Ayres' IDIQ contract with NHI. He holds a BS in Civil Engineering from Colorado State University and an MS in Civil Engineering from the University of California at Davis.



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Introduction to the Stochastic Empirical Loading and Dilution Model (SELDM)

Gregory E. Granato (FHWA) and Alana B. Spaetzel (USGS)

The U.S. Geological Survey (USGS) in cooperation with the Federal Highway Administration (FHWA) developed the Stochastic Empirical Loading and Dilution Model (SELDM) to help quantify the risk of adverse effects of runoff on receiving waters, the potential need for mitigation measures, and the potential effectiveness of such mitigation measures for reducing these risks. SELDM can be used for permitting analyses, endangered species issues, calculating pollutant yields with and without stormwater control measures to help develop total maximum daily loads. Documentation, example applications and case studies are available on the SELDM website at: <https://www.usgs.gov/SELDM>. This workshop will be a hands on exercise using the latest version of SELDM available to do a hypothetical case-study to become familiar with the model and its interface.

Participants should:

1. Have their own computer with a professional version of Microsoft Office (with MS Access)
2. Be familiar with the contents of the manual available at: Granato, G.E., 2013, Stochastic empirical loading and dilution model (SELDM) version 1.0.0: U.S. Geological Survey Techniques and Methods, book 4, chap. C3, 112 p. , CD-ROM. <https://doi.org/10.3133/tm4C3>
3. Have downloaded a copy of version 1.1.1 of SELDM available at: Granato, G.E., 2021, Stochastic Empirical Loading and Dilution Model (SELDM) software archive: U.S. Geological Survey software release, <https://doi.org/10.5066/P9PYG7T5>
4. Have downloaded a copy of version of the highway-runoff database available at: Granato, G.E., 2019, Highway-Runoff Database (HRDB) Version 1.1.0: U.S. Geological Survey data release, <https://doi.org/10.5066/P94VL32>
5. Be familiar with the SELDM YouTube training page available at: <https://www.youtube.com/@StormwaterRunoff/>
6. Have set up a workshop file folder and set the folder as a Trusted Directory while using MS Access (see: https://www.youtube.com/watch?v=t_AdFhs0tqw)
7. Have contacted the instructors to obtain class files.
 - i. aspaetzel@usgs.gov
 - ii. gregory.granato@dot.gov
8. SELDM output can be manipulated by using MS Excel, for best results, however, users can download and install InterpretSELDM and the graphing utility DPLot available at: Granato, G.E., 2019, InterpretSELDM version 1.0 The Stochastic Empirical Loading and Dilution Model (SELDM) output interpreter: U.S. Geological Survey software release, <https://doi.org/10.5066/P9395YHY>

Speaker Bios:

Alana B. Spaetzel serves as a supervisory hydrologist at the U.S. Geological Survey's (USGS) New England Water Science Center. She oversees the maintenance and implementation of the Stochastic Empirical Loading and Dilution Model (SELDM) and the Highway-Runoff Database in partnership with the Federal Highway Administration. Alana leads projects that support state and municipal stormwater management initiatives by enhancing the USGS StreamStats web application with mapped stormwater infrastructure and roadway information.

Gregory Granato is currently the Federal Highway Administration (FHWA) national stormwater specialist in the FHWA's Office of Project Development & Environmental Review. Gregory comes from the U.S. Geological Survey in Massachusetts and has about 30 years of experience in water quality, stormwater management, water resources coordination in connection with highway programs. Gregory is author or coauthor of more than 60 reports on hydrology, hydraulics, and water quality. Gregory is the author of the Stochastic Empirical Loading and Dilution Model (SELDM) and 19 other hydrological software packages.

Discussion on the technical foundations of hydroplaning prediction & the use of the NCDOT Hydroplaning Assessment Tool (HAT 2.0)

Matt York, Rick Renna, Rebecca Purvis

This workshop will discuss the technical foundations of hydroplaning prediction and familiarize attendees with the use of the NCDOT excel-based Hydroplaning Assessment Tool (HAT 2.0). Over the past two years since we presented this at NHEC2022, NCDOT's hydroplaning policy has evolved in areas of pavement texture, tire inflation and tread effects and superelevation transition analysis methodology. HAT 2.0 was improved to account for these advancements in research and now has the capability to seamlessly produce a hydroplaning report to be included in drainage documentation. During this hands-on user workshop, NCDOT policy improvements, research efforts, and mitigation strategies will be discussed, and you will learn how to use HAT 2.0 to assess hydroplaning challenges in your transportation practice.

Speaker Bios:

Matthew York, PE joined NCDOT in 2013 after graduating from North Carolina State University with a degree in Civil Engineering. Matthew has over a decade of experience involving transportation drainage, H&H modeling, drainage design, permitting, and drainage design guidance. In 2019, Matt began efforts to modernize hydroplaning analysis using the latest available research and created a multi-discipline Hydroplaning Technical Advisory Group for the department. Through these efforts and the partnership of AtkinsRéalis, the hydroplaning analysis tool, mitigation selection guide, and hydroplaning guidelines were created to address safety and resiliency of major transportation facilities.

Rick Renna, PE, joined AtkinsRéalis in 2016 after 42 years with FDOT, finishing his FDOT career serving for 15 years as the State Drainage Engineer. At AtkinsRéalis, Rick has had the pleasure of working with Matt and NCDOT since 2020 in supporting the development of hydroplaning policy and analysis. As FDOT's State Drainage Engineer, Rick pioneered innovative stormwater management policy and BMPs, pipe service life policy, pier scour policy and equations, and other H & H policies.

Rebecca Purvis, PhD, PE has been with AtkinsRéalis for 6 years and is a Senior Water Resources Engineer. Her experience includes hydrologic and hydraulic analysis and modeling, floodplain modeling and reviews, stormwater design and management, and project management. She has been involved with updating the interface, user experience, and coding of the hydroplaning tool. Dr. Purvis has her B.S. and M.S. in Biosystems and Agricultural Engineering from Oklahoma State University and earned her Ph.D. in Biological and Agricultural Engineering from North Carolina State University in 2018. Her doctoral research involved optimizing bioswale design parameters alongside NCDOT.

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Sea Level Rise & Coastal Modeling Review

Daniel Sharar-Salgado

The science on sea level rise has been rapidly advancing in the past 7 years. The first part of the workshop will cover recent advances in sea level rise science, how these relate to the current HEC-25 3rd edition framework, and show some helpful tools to estimate sea level rise for a project. The second part of the workshop will focus on coastal modeling reviews. This modeling portion will first cover some of the theoretical differences between coastal models and riverine models. It will then explain the various coastal modeling options, and relate those to the specific transportation project needs. It will follow up showing some helpful online coastal data sources and end with a description of the various items to check for in a coastal modeling report. This workshop will have multiple hands-on activities that require the attendee to access and use different online data sources. Attendees will need a laptop with internet access to complete these activities.

Speaker Bio:

Daniel Sharar-Salgado is a Hydraulic Engineer with FHWA's Office of Bridges and Structures. His responsibilities include leading coastal engineering initiatives for FHWA, managing climate data tools and resources, and assisting with a variety of technical activities in scour, hydrology and numerical modeling. Prior to working at FHWA, Daniel worked for the Maryland DOT, where he developed and reviewed hydraulic models, drainage designs, and stormwater management designs for a range of roadway projects. Daniel has a Masters Degree in Coastal Engineering from the University of Delaware and is a licensed professional engineer.



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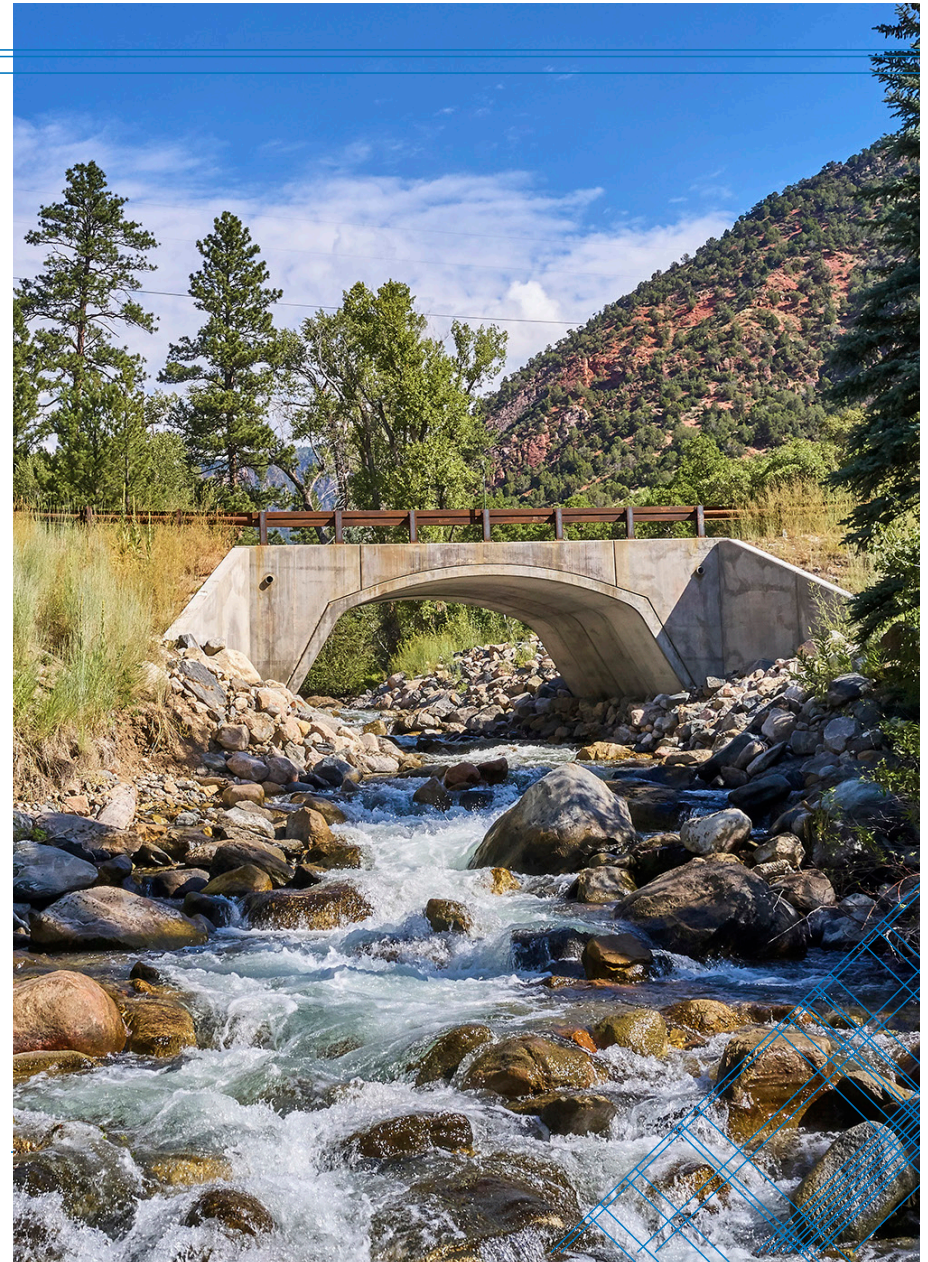
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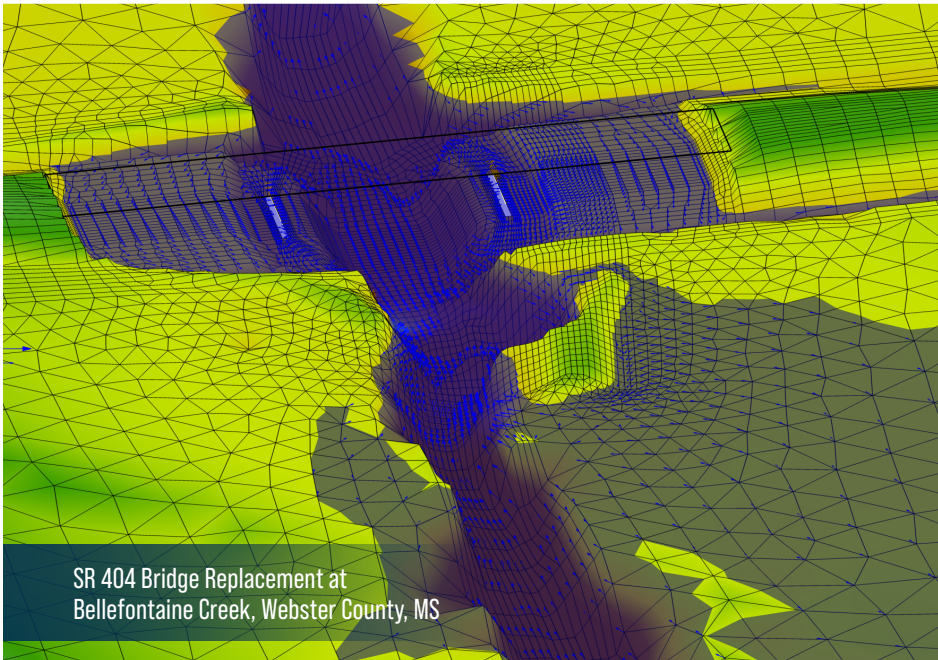


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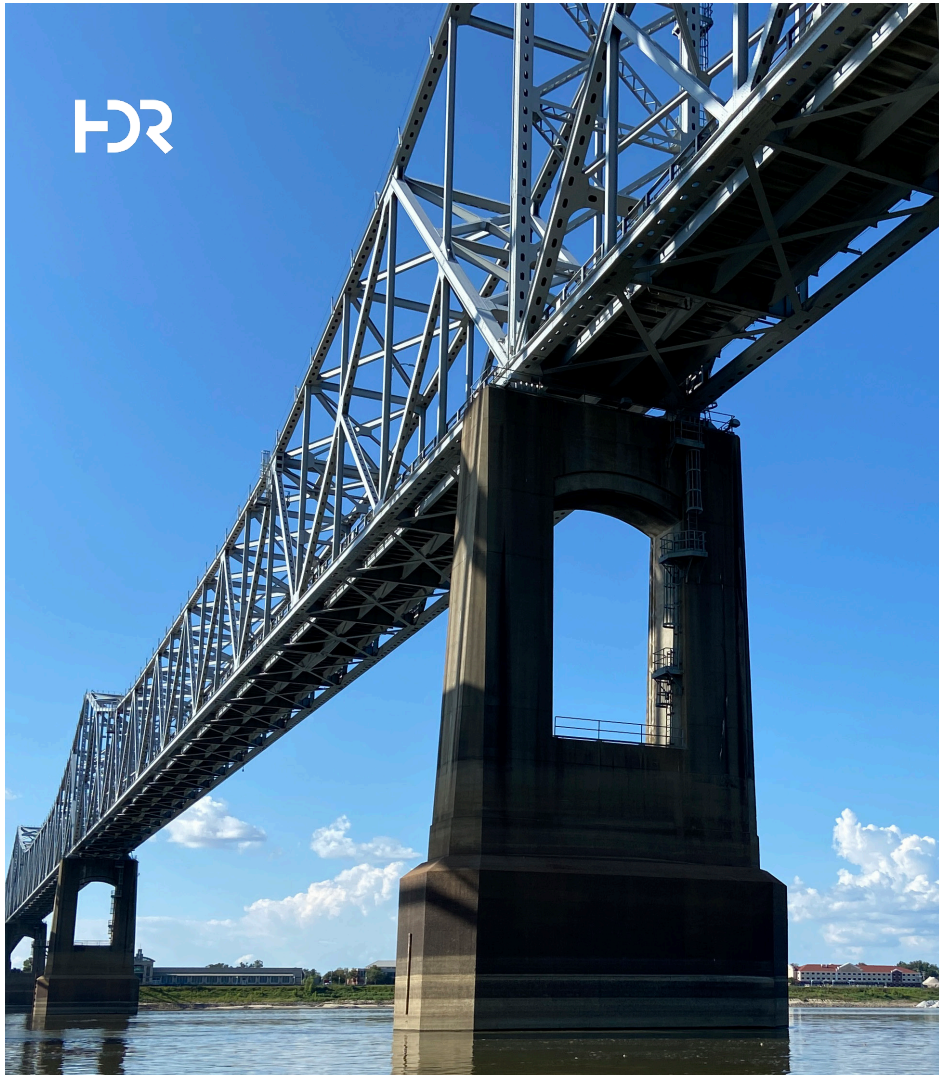
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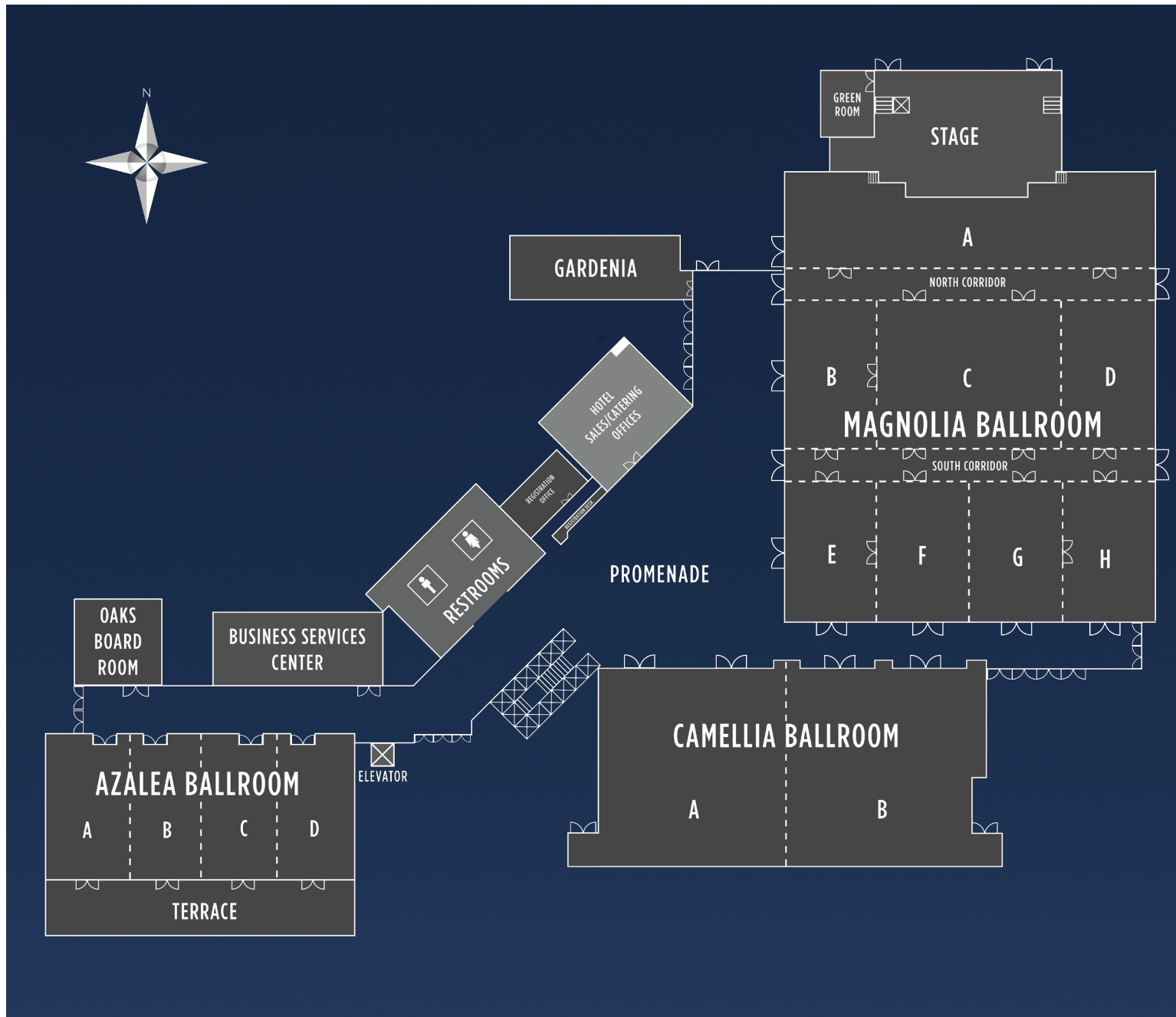


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