



Tuesday, September 12, 2023

OPTIONAL CONCURRENT WORKSHOPS (7 CEC's)

8:00 AM – 5:00 PM

8:00 am – 5:00 pm

WORKSHOP A: **The Basics of Floodplain Management 101**

Instructors: Paul Gutierrez, CFM, Texas Water Development Board
John Grounds, PE, CFM, LJA Engineering

This 7-hour course is intended for floodplain administrators to get an introductory understanding of the basics of floodplain management. Topics covered include: an overview of flooding in Texas, the role of local communities in floodplain management, the history of the National Flood Insurance Program (NFIP), reading Flood Insurance Rate Maps and understanding flood zones, ordinances, permitting processes, substantial damage/substantial improvement, higher standards, flood insurance, federal and state funding, and state support. By attending this presentation, participants should understand the basic concepts of floodplain management, such as regulations, permitting, and mapping.

8:00 am – 5:00 pm

WORKSHOP B: **NFIP 201: Intermediate Floodplain Management**

Instructors: Brian Bartley, FEMA, Region 6 and Gil Giron, CFM, FEMA Region 6

Attendees enrolled in this workshop should have had the NFIP 101 or the L0273- Managing Development through the National Flood Insurance Program course and/or had some experience in floodplain administration. Attendees will dive deeper into NFIP regulations, local ordinances, enforcement and permitting, higher standards, Letters of Map Change, the Community Rating System, substantial damage and outreach. Attendees will also learn what to expect from FEMA floodplain management visits and assistance to the community.

8:00 am – 5:00 pm

WORKSHOP C: **Hands-On HEC-RAS**

Instructors: Jeremy Dixon, PE, CFM, Nick Boardman, CFM & Beatriz Estrada Guerra – Freese and Nichols, Inc.

In this all-day workshop, participants will learn how to develop HEC-RAS models, including new features for version 6. The workshop will alternate between brief lectures and hands-on exercises. Topics covered include spatial precipitation infiltration, bridge hydraulics in 2D areas, editing and visualization tools, and computational solvers. Participants will need to bring their laptops for hands-on exercises.

8:00 am – 5:00 pm

WORKSHOP D: **Introduction to Geographic Information Systems**

Instructor: Miguel A. Pavon, CFM, Texas Natural Resources Information System (TNRIS), Austin

Geographic Information Systems (GIS) is a Swiss Army knife that can be used in a wide variety of scenarios, data management, what is near, elevation query, floodplain management, response, and recovery are just a few examples of it. A brief introduction on how to get GIS software, data, and how to work with it will be given. Bringing your own laptop/charger is required.



WEDNESDAY – SEPTEMBER 13

8:15 AM to 11:30 AM

PLENARY SESSION

8:15 am – 8:30 am

SUMMIT WELCOME

Stephanie Griffin, PE, CFM, F.ASCE – TFMA President

8:30 am – 9:00 am

Mill Creek – Large-scale Drainage Relief for Dallas

Speakers: Todd A. Woodson, PE, PMP, LEED BD+C - Halff Associates
Jason Becker, PE, CFM - Halff Associates, Houston

The Mill Creek and Peaks Branch watersheds in Dallas were developed in the 1930s. As part of the development, the streams that were Mill Creek and Peaks Branch were enclosed in storm sewers that had the capacity for roughly a 20% annual chance event (5-year storm) when originally constructed. The storm-sewer capacities are now closer to a 50% annual chance event (2-year storm) due to on-going development and the associated increase in impervious area. The City of Dallas is undertaking a large-scale project to provide drainage relief to these areas. Drainage relief will be accomplished by a 27,000-foot-long tunnel.

This presentation will provide an overview of the project; cover the history and causes of flooding; touch on the 2D analysis used for system assessment and design; examine key-project components including the tunnel, intakes, outfall shaft, and related improvements; review construction considerations; and provide an overview of current construction.

9:00 am – 9:30 am

More Than a Master Plan: A Comprehensive Stormwater Program Assessment

Speakers: Chris Johnson, PE, CFM, IAM – Freese and Nichols, Denton
Kimberly Dewailly, PE, CFM – Dallas Water Utilities, Dallas

This presentation will describe how Dallas Water Utilities (DWU) is completely refreshing their stormwater program. This assessment of DWU's program is more than a long-term CIP. In addition to finding solutions to urban flooding, all functional elements of their drainage utility are evaluated to leverage strengths, identify and fill gaps, improve current processes, enhance regulatory compliance, and define future resource needs. This effort recommends refinements to DWU's organizational structure and business practices, data and asset management, level of service characterization and flood risk reduction strategies, and their capital projects planning processes. The presentation will show how these recommendations have been integrated to unify staff to complete their mission. Numerous project findings, recommendations, and action plans are being organized into a web-based platform for quick, at-hand use by staff and senior management to support future implementation activities.

Zone X Sponsors





9:30 am – 10:00 am **BREAK**

10:00 am – 11:00 am

Story of MAAPnext

Speaker: Ataul Hannan, PE, CFM– Harris County Flood Control District, Houston

Flood Control District was working with FEMA with advanced modeling from 2012. In early 2018, the Flood Control District initiated a year-long planning and preparation effort. The planning team developed a new hydrologic methodology and proposed a hydraulic modeling approach that involves a one-dimensional (1D) representation of stream channels coupled with a two-dimensional (2D) representation of overbank (floodplain) areas outside of the channel banks. The Flood Control District plans to launch of a robust public outreach campaign aimed at heightening flood risk awareness countywide. The author will share his experience and thinks this type of analysis will help to protect future flood damage by informing the risk.

11:00 am – 11:30 am

TWDB BLE Update

Speaker: Manny Razo, CFM – Texas Water Development Board

Statewide coverage of flood risk data has been a big push of the Texas Water Development over the last few years, but there have been some other great projects that the TWDB has undertaken. This presentation will give a status update on the various projects the Flood Science and Community Assistance Division has been working on.

11:30 am – 1:30 pm **Lunch Break**

Zone AE Sponsors



MCADAMS





WEDNESDAY, SEPTEMBER 13

CONCURRENT SESSIONS

1:30 PM – 5:15 PM

TRACK A – TECHNICAL H&H

1:30 pm – 2:00 pm

A1 Storm Sewer Modeling in 2D HEC-RAS v6.3.1

Presenter: Lonnie Anderson, PE, CFM– Pape-Dawson Engineers, Houston

The focus of this presentation will be on making the most of the tools that HEC-RASv6.3.1 to make it do more. We will discuss how storm sewer modeling can be accomplished within HEC-RASv6.3.1 and some of the key things to consider when using this approach. We will present a few case studies showing how these techniques can be used in either an impact study or to inform more traditional storm sewer modeling providing improved efficiency and avoiding errors often missed in 1D modeling.

2:05 pm – 2:35 pm

A2 Big Data in Modeling and Analysis: Challenges and Solutions

Presenter: Justin Terry, PE, CFM – Terry Consulting, Houston

In modeling, challenges associated with access to reliable and quality data have always existed. In the past, the problem was too little, while in the present, the problem is too much and of unknown certainty. As a result, today's models are often crammed full of data of questionable certainty and quality that despite our best efforts, affects our ability to produce accurate and representative models of the real world. Considering this, the complexity of modern datasets requires tools and technical expertise to unlock its full capabilities and allow us to fully understand the data we work with and those that are best suited for a given application. This presentation covers some of the challenges associated with working with hydrologic and meteorological datasets, their application in analysis and modeling, and solutions for effectively working with these large datasets. By the end of this presentation, attendees should have gained some insight into the datasets that are available for modeling applications, methods for processing datasets, and best practices.

2:40 pm – 3:10 pm

A3 Easy as HEC: Case Studies in Maximizing New HEC-RAS Capabilities

Presenters: Greg Mika, EIT, CFM– Freese and Nichols, Austin
Jeremy Dixon, PE, CFM - Freese and Nichols, Dallas

In recent years, the timeline for new HEC-RAS releases has generally shifted from years to months. Since May 2021, the HEC team has moved from HEC-RAS v6.0 to v6.1, v6.2, and v6.3. Each release brings with it exciting new features that lead to new opportunities and new challenges. This presentation will provide specific examples of how Freese and Nichols, Inc. (FNI) modeling teams have quickly adapted and automated approaches to take advantage of the latest HEC-RAS features, providing increased efficiency and precision to hydraulic model development. By the end of this presentation, attendees should have an understanding of new industry approaches for large scale automated engineering. Attendees will hopefully also leave with plenty of ideas for automating workflows in their own projects.

3:15 PM – 3:35 PM BREAK



3:35 PM – 5:15 PM

TRACK A – TECHNICAL H&H

3:35 pm – 4:05 pm

A4 Stormwater Modeling Sensitivity and Calibration

Presenters: Jacob Lesue, PE, CFM– Dewberry, Dallas
Vanessa Garcia, EIT– Dewberry, Dallas

This presentation examines methods that can be applied to urban stormwater modeling by evaluating model parameter sensitivity and includes steps to perform model calibration. Recent advances in 2D modeling and availability of calibration data have facilitated more reliable results and improved mitigation planning. This analysis utilizes several project examples and observed flooding events to compare model results with varying stormwater model parameters and methods. Calibration data for small-scale and complex storm sewer systems are examined to assist with model development, reliability, and accuracy. The results are examined to inform which parameters significantly impact stormwater model results and to better understand which equations and methods are appropriate for various conditions. With more reliable data and modeling results, communities can better plan for future development, improve infrastructure through mitigation efforts, and prioritize capital improvement projects.

By attending this session, the key takeaways for participants will be to understand the sensitivity of Stormwater model parameters and methods to calibrate a local storm sewer model.

4:10 pm – 4:40 pm

A5 Optimizing and Reducing Structure Related Instabilities in HEC-RAS 2D

Presenters: Rakib Ahmed Siddique, EIT,CFM– WSP, Dallas
Eva Krauss, EIT– WSP, Houston

When any HEC-RAS 2D model includes hydraulic structures, it can be challenging to maintain stability. Some of the factors that affect the stability and accuracy of 2D models are cell mesh, computation time step, boundary conditions, and geometry properties. This presentation includes some techniques and recommendations for improving the stability of 2D models with hydraulic structures, such as using appropriate cell sizes and time step based on Courant condition to avoid unrealistic depths or velocities and using the best practices to model structures inside a single 2D flow area. These techniques can help reduce numerical errors and produce more reliable results for 2D modeling of hydraulic structures in HEC-RAS.

By the end of this presentation, attendees should be aware of the sources of instability issues in HEC-RAS 2D modeling and learn more about the ways and best practices to minimize the structure instabilities.

4:45 pm – 5:15 pm

A6 Detention Intervention: A “101” Look at Detention Pond Analysis and Design

Presenters: Niraj Acharya, PE, CFM – Teague Nall and Perkins, Fort Worth
Sawyer Maness, PE, CFM – Teague Nall and Perkins, Fort Worth

Do you need a detention intervention? This presentation will cover the fundamentals of stormwater detention. The audience will gain technical knowledge on the analysis and design of stormwater detention systems, including best practices for modeling and designing effective, long-lasting, and sustainable systems. Topics covered will include factors that influence analysis and design, applications of dry and wet detention, as well as typical challenges, solutions, and best practices. Concepts will be showcased through presentation of practical applications and lessons learned.



1:30 PM – 5:15 PM

TRACK B – STORMWATER MANAGEMENT

1:30 pm – 2:00 pm

B1 Flood Inundation Depth Mapping - Challenges & Solutions

Presenter: Austin Strickland, PE, CFM - Harris County Flood Control District, Houston

Presenting a focus on the topic of flood inundation depth mapping. Harris County Flood Control District has recently taken on the initiative of mapping the flooding extents of our 23-watershed system. These inundation depth maps produced from our Flood Forecasting team will serve the purpose of giving foresight to Harris County residents during a rainfall event. Methods used to generate these inundation depth maps include ArcMap, HEC-RAS, & Python. Our inundation depth library will work in tandem with our already existent real-time inundation to provide more information on our Flood Warning website. There will also be a discussion on historical inundation maps that have been worked on to represent flooding extent in Harris County during our most severe storms. Forecasted inundation mapping will also be a topic as we discuss its validity & reliability.

By attending this session, the key takeaways for participants will be improved understanding of the capability & possibilities of flood inundation mapping. They will also get a vision for where the future of the Harris County Flood Control District's 'Flood Warning' website.

2:05 pm – 2:35 pm

B2 Fort Worth's Urban Flood Risk Modeling & Mapping

Presenters: Zubin Sukheswalla, PE, CFM- Pape-Dawson Engineers, Frisco
Lonnie Anderson PE, CFM - Pape-Dawson Engineers, Houston
Yuvraj Ningisetty, PE, CFM – Pape-Dawson Engineers, Houston
Ben Thompson, PE, CFM – City of Fort Worth

The City of Fort Worth has been at the forefront of adopting the newest and most relevant technologies to better understand and manage its urban flood risk. This presentation will cover the new citywide non-FEMA flood risk products developed by Pape-Dawson using HEC-RAS 2D. These products are currently being used to regulate and advise development in the newly mapped areas. By participating in this session, attendees will get a behind-the-scenes look in to the results of using HEC-RAS 2D vs. ICM/XPSWWM results in urban settings at a citywide scale.

2:40 pm – 3:10 pm

B3 Fort Worth's Flood Warning System

Presenters: Zubin Sukheswalla, PE, CFM- Pape-Dawson Engineers, Frisco
Lonnie Anderson PE, CFM - Pape-Dawson Engineers, Houston
Yuvraj Ningisetty, PE, CFM – Pape-Dawson Engineers, Houston
Ranjan Muttiah, PhD, PE, CFM – City of Fort Worth

The City of Fort Worth has been maintaining and operating a flood warning system that is primarily used as a high-water alert system. This presentation will cover the methodology developed by Pape-Dawson to trigger real-time alerts at gauged and ungauged low water crossings without running models in real time. The pilot-study test phase is now complete and we will show results from actual storms where this methodology shows promise and discuss tested concepts that minimize false-positives.

3:15 pm – 3:35 pm BREAK



3:35 PM – 5:15 PM

TRACK B – STORMWATER MANAGEMENT

3:35 pm – 4:05 pm

B4 Is it a Dam??

Presenters: Mitchell Jensen, PE, CFM - Kimley-Horn, Frisco
Maddie Green, EIT – Kimley-Horn, Houston

There are currently over 7,400 state regulated dams in the state of Texas but there could be hundreds more that fall under state regulations that are unknown to the state, local communities, or local residences. These facilities bring unnecessary risk to their local communities and residents. Instead of waiting until it becomes an issue, this session is geared to give professionals the information and tools needed to identify whether an existing or proposed embankment falls under state jurisdiction before they are at risk of failure or even built. This session will focus on the basics of the TCEQ Dam Safety program, and we will be learning how to identify and classify state regulated dams. We will also discuss the elements of what is required by the state in the event that an existing or proposed embankment falls under their jurisdiction. By attending this session, the key takeaways for participants will be a basic understanding of the TCEQ Dam Safety program, how to identify a potential regulated dam, and what process to follow in event the dam is regulated.

4:10 pm – 4:40 pm

B5 Regulating with Drastically Lower New Flows in a Flat Terrain Region

Presenters: Andrew Avis, PMP – Midland County, Midland
Rene Hawklee, PE, CFM - Parkhill, Midland

In Midland County the FIS maps appear to be over-estimates. Using an innovative Green & Ampt loss methodology in a 2d model that computes infiltration all time steps, our FIF Category 1 regional flood planning has proven flow rates should be MUCH lower. What are the floodplain management implications? Midland County needs to adopt floodplain management strategies and policies that leverage the new data. Are there risks in using a study not reviewed by FEMA? How will policies differ in areas zoned A and AE? What return frequency should be used for design? Can the County treat landowners equitably when two vastly different models are available? How will other agencies utilizing our data be impacted? Floodplain administration in our region of flat terrain with ponding areas and few draws requires a special approach. The County has seen explosive growth in oil and gas infrastructure and more typical development. All these factors will be addressed with respect to available data. Participants will understand challenges facing Midland County for floodplain regulations, not identical to most of the state. Participants will also understand “best available data” and when it can be applied (or not). Participants will gain insight into soil infiltration and effects on model results.

4:45 pm – 5:15 pm

B6 Rain Garden & Biofiltration Design Challenges in Flat Terrain

Presenters: Laura Casset, PE, CFM, CPESC - Lockwood, Andrews & Newnam, Austin
Ashley Hanson, PE, CFM - Lockwood, Andrews & Newnam, Round Rock

Lockwood, Andrews & Newnam, Inc. (LAN) prepared plans for drainage & water quality treatment for 2.3-mile roadway extension of E. Slaughter Ln, located southeast of Austin. The design includes centralized & localized water quality infrastructure, storm system conveyance infrastructure, & runoff attenuation measures to meet the City of Austin drainage and environmental criteria. Additional impervious cover proposed with the roadway extension will be treated with 9 rain gardens & 5 biofiltration ponds. Drainage conveyance & attenuation will be provided with cross drainage culverts, storm sewer, open back inlets, inline channel storage & stacked detention.

This design met many challenges due to elevation constraints, flat floodplains, and coordination with multiple entities and concurrent designs of adjacent roadways. This presentation will discuss water quality, hydraulic analysis, & considerations made by the design team to address these challenges.



1:30 PM – 5:15 PM
TRACK C – FEDERAL/STATE/LOCAL

1:30 pm – 2:00 pm

C1 The City of Garland has a Voluntary Buyout Program! How Did They Do That?

Presenters: Jake Fisher, PE, CFM – City of Garland
Marla Waters, CTCM, CTCD - Texas Water Development Board, Austin
Ryan Mortensen PE, CFM - Westwood Professional Services, Dallas

The City of Garland established a flood-prone properties fund through their 2019 Bond Program. This fund was created to purchase frequently flooding properties located in the floodplain, restore those properties to their natural flood functions, and promote the health, safety, and welfare of the residents. However, the City needed a program and process to expend the funds in a fair, consistent, and indiscriminate basis. This presentation will review how the City established their Voluntary Flood-prone Property Buyout Program, including: leveraging FEMA FMA Grant Funding to stretch local funds, adopting a new ordinance (Nov. 2022), and establishing guidelines for the program (Jan. 2023). The guidelines create a process to:

- Establish Eligibility
- Inform Potential Applicants
- Apply for the Program
- Evaluate and Prioritize Applications
- Utilize Grant Funding
- Select and Purchase Properties
- Establish Permissible Uses of the Properties
- Demo and Maintain the Properties

2:05 pm – 2:35 pm

C2 Tips and Tricks for Improving Your Community’s CRS Score

Presenters: Randy Peterman, CFM, EIT, ENV SP, Halff Associates, Richardson
Jack Young, PE, CFM, PMP, Halff Associates, Richardson

The Federal Emergency Management Agency’s (FEMA’s) Community Rating System (CRS) program provides opportunities for residents and businesses of participating communities to receive flood insurance discounts ranging from 5% to 45%. The lower the community’s CRS class is, the higher the discount is that can be achieved; however, a lower CRS class doesn’t always have to correlate to a high level of additional effort by the community. Halff has experience compiling CRS submittals for two large municipalities within the DFW metroplex and providing ongoing guidance to these communities on how to decrease their CRS classes. This presentation will demonstrate tips and tricks Halff has discovered for how to maximize CRS credit while minimizing the burden on City staff and resources.

By participating in this session, attendees will learn how to assess the best ways to maximize credit and minimize effort in improving their community’s CRS scores.

Floodway Sponsors

Westwood



1:30 PM – 5:15 PM

TRACK C – FEDERAL/STATE/LOCAL

2:40 pm – 3:10 pm

C3 Use This Free Post-Disaster Plan, Get CRS Credit

Presenter: Brian Bartley, CFM – FEMA, Denton

Rebuilding after a flood provides an opportunity to make buildings and communities stronger and safer. The primary goal is to reduce risk from future floods. Local officials are responsible for doing assessments to determine if structures in the floodplain have been substantially damaged (SD)– meaning the cost to repair the home is equal to or greater than 50 percent of its market value before the flood damage. It helps to prepare in advance for this important and daunting program requirement. FEMA Region 6 with contracted support has developed a planning framework called IDEAL STATE, which provides 5 foundational concepts and a scalable planning template. Learn about these valuable tools and how to develop and implement a tailored Substantial Damage Response Plan (SDRP), for your community. You can also use the planning template to pursue CRS credit.

By participating in this session, attendees will develop and implement a tailored Substantial Damage Response Plan (SDRP), for your community, and possibly pursue CRS credit.

3:15 pm – 3:35pm BREAK

3:35 pm – 4:05 pm

C4 High and Dry: High Properties

Presenters: Rebecca Dake, CFM – FEMA, Denton
Charlie Cook, CFM – FEMA, Denton

The federal government is slowly moving out of repeatedly flooded neighborhoods in high risk flood areas. Why? Lots of reasons. Flood insurance is required on federally backed loans and mortgages in high risk flood areas. NFIP flood insurance is now actuarially rated, and repeat NFIP claims on a structure increase the flood insurance premiums for to insure that structure. The most-damaged, most-at risk of future flood damage structures must be rebuilt to current floodplain standards after a damaging event. Households receiving federal disaster assistance after a flood event must get and keep flood insurance or they won't be eligible for future disaster assistance after a flood event. In this presentation, learn how we define high risk properties, and why it's important they are mitigated.

By participating in this session, attendees will learn about properties at high risk of flooding due to repeat NFIP flood claims, substantial damage, and repeat FEMA disaster assistance for a flood event.

4:10 pm – 4:40 pm

C5 Beyond the FIRM: The Evolution of Region 6 Flood Risk Data Investments

Presenters: Rachel Mollenhoff, PE, CFM – AECOM, Dallas
Diane Howe, CFM - FEMA, Denton
Jack Young, PE, CFM, PMP – Halff Associates, Richardson

FEMA Region 6 is investing in the development of flood hazard data to help all communities in the Region become more resilient. In this presentation, FEMA Region 6 and Compass PTS JV, FEMA's Mapping Partner, will cover how the Region is planning and delivering Risk MAP projects throughout Region 6. The audience will understand how Region 6 is shifting their investment strategy to focus on risk-based decisions that go beyond FEMA's regulatory data. We will discuss a pilot program for incorporating Base Level Engineering (BLE) onto Flood Insurance Rate Maps (FIRMs) with Paper Inventory Reduction (PIR) projects, and how community input is being used in FIRM mapping decision-making. The audience will also gain an understanding of regulatory data vs available flood hazard data and how communities can adopt non-regulatory data to manage flood risk in their communities.



1:30 PM – 5:15 PM

TRACK C – FEDERAL/STATE/LOCAL

4:45 pm – 5:15 pm

C6 Permitting Developments in Harris County 100-year Floodplain

Presenters: Darrell Hahn, PE, CFM – Harris County Engineering Department, Houston
Ortierre Lawson, CFM – Harris County Engineering Department, Houston

Harris County regulates all development that is in the special flood hazard area using the 500-year elevation. All habitable structure freeboard that is in the 100 yr floodplain must be elevated 2' above the 500-year elevation. Uninhabitable structures that are in the 100 yr floodplain and their freeboard is lower than the base flood must have flood vents. All development that is in the 100-year floodplain foundation type must be pier and beam. Furthermore, constituents are not allowed to change the flow of water are drain on the neighboring property. Therefore, Harris County requires engineered foundation drawings. The foundation drawings must include the development footing details, foundation layout, anchoring detail, base flood elevation, finish floor elevation, 500-year flood elevation, wind speed, Harris County floodplain notes, and flood vent location and calculation (if required). By participating in this session, attendees will understand how to permit a development that is in the floodplain located in Harris County.

1:30 PM – 5:15 PM

TRACK D – CASE STUDIES

1:30 pm – 2:00 pm

D1 One Water in Action - Texas' First One Water School

Presenter: Nick Dornak, M.S.– Doucet and Associates, San Marcos

Built to be "the first One Water school in Texas", Wimberley Independent School District's newest campus —Blue Hole Primary— was designed and constructed with strong support from a community of stakeholders, educators, architects, and engineers. One Water is an intentionally integrated approach to water that promotes the management of all water—drinking water, wastewater, stormwater, greywater—as a single resource. In an area where water supplies are limited and drought-prone (except when it floods!), Blue Hole Primary serves the growing Hill Country communities of Wimberley and Woodcreek with one of the most water efficient and cost-effective approaches ever envisioned for a school campus in Texas. This case study documents the need for innovative water solutions, bond and investment decisions, incorporated design elements, construction, and first year performance of Blue Hole Primary to serve as a reference, inspiration, and guidance for future projects.

2:05 pm – 2:35 pm

D2 Fairway in the Floodway: Solving Municipal Golf Course Erosion

Presenters: Michael DeMotte, PE, CFM – Teague Nall and Perkins, Allen
Guy Pokhrel, PE, CFM – Teague Nall and Perkins, Allen
Sawyer Maness, PE, CFM – Teague Nall and Perkins, Fort Worth

Situated within Rowlett Creek, one of the largest floodplains in North Texas, Pecan Hollow Golf Course has experienced severe erosion that threatens its functionality. This presentation will discuss how the City of Plano and TNP implemented a multifaceted floodplain approach to addressing this challenge. The approach considered stream geomorphology and soil conditions, hydraulic analysis, floodplain management, and environmental considerations to inform and drive the development of natural and hard-armored solutions at various locations throughout the course. Attendees of this presentation will learn about challenges and solutions encountered during the process, as well as best practices to implement when addressing similar challenges.



1:30 PM – 5:15 PM
TRACK D – CASE STUDIES

2:40 pm – 3:10 pm

D3 Managing the Muck: Sediment Transport and Flood Risk Study

Presenter: George Fowler, PE, CFM – Freese and Nichols, Austin

To support the design of a proposed low head dam and raw water pump station, the City of Cameron conducted a flood study and sediment management analysis of an unmapped 19-mile section of the Little River. This project was funded by a Flood Infrastructure Fund (FIF) Category I grant from the Texas Water Development Board and is the first Category I project completed under the program. The project included development and calibration of a new two-dimensional (2D) hydraulic model of the Little River. This model was also used for evaluation of alternatives, downstream impact analysis, and sediment management analysis using the 2D sediment transport feature that was recently added in HEC-RAS version 6.2. This analysis was used to predict the level of sedimentation around the proposed intake in an effort to minimize future maintenance activities. Twenty-seven stakeholders were also invited to two public meetings to solicit information on local flooding knowledge and to present findings.

Participants should be able to understand how a TWDB FIF Category 1 grant was used by a community to measure their risks from sedimentation and flooding.

3:15 pm – 3:35 pm BREAK

3:35 pm – 4:05 pm

D4 San Antonio River Basin – DFIRM 2.0

Presenters: Yasmin Ramones, CFM - San Antonio River Authority, San Antonio
Joe Fernandez, CFM – San Antonio River Authority, San Antonio

The San Antonio River Authority (River Authority) has been awarded grants from the Federal Emergency Management Agency (FEMA) to manage Risk Mapping Assessment and Planning (Risk MAP) project in the Medina, Cibolo, and Upper San Antonio watersheds. Additionally, the River Authority funded floodplain mapping updates for the Salado, Leon, and Medio watersheds. As these mapping projects have been completed, the River Authority has been coordinating with the communities to move forward with the mapping updates. These studies incorporate updated terrain and land use data, Atlas 14 rainfall intensities, and revised hydrologic methodologies, in an effort to better identify the flood risks within Bexar County. This presentation will discuss the expected rollout schedule, a summary of major changes in methodology and input data, how to access best available models, and the LOMC procedure moving forward.

4:10 pm – 4:40 pm

D5 College Street Improvements: Failing Historic System Under Private Property

Presenters: James S. R. Gaertner, PE, CFM, CPM - City of Waxahachie
Holly Ahumada, PE, CFM - Freese and Nichols, Fort Worth
Emily Sestak, P.E., CFM, ENV SP – Freese and Nichols, Fort Worth

The City of Waxahachie worked with Freese & Nichols through the analysis and design of the College Street Drainage Improvements. The project area consisted of an existing brick storm drain located through multiple private properties, under buildings, including crossing a railroad and outfalling to an open channel. This system was built in segments with varying sizes and materials that causes reduced pipe capacity, erosion, storm system failures, and results in significant inundation. There were several on-site constraints to navigate through including relocating drainage infrastructure to ROW, a railroad crossing, historic trolley car tracks, and alternate outfall locations. The final alternative was designed to convey public runoff through a public drainage system within the ROW, provide a 25-year storm event level of service to the project area, and utilized 2D model results for hydraulic calculations.



1:30 PM – 5:15 PM
TRACK D – CASE STUDIES

4:45 pm – 5:15 pm

D6 City of Arlington Lynn Creek and Bowman Branch Watershed Study

Presenters: Sidney Kelly, PE, CFM – City of Arlington
Jinwei Qiu, PhD, PE, CFM – AECOM, Dallas
Ivy Xiong, PE, CFM, PMP – AECOM, Dallas
Md Arifur Rahman, PhD, EIT – AECOM, Dallas

The Lynn Creek and Bowman Branch watersheds are two of the ten major watersheds within the City of Arlington (City), Texas. As a part of City’s Watershed Study Program, AECOM provides comprehensive analysis of the existing channel and drainage system for both watersheds, including the floodplain modeling and mapping updates for 17 miles of mainstream and its tributaries, the evaluation of the level of service (LOS) of existing infrastructures for flooding hazards, and the geomorphologic study for channel bank erosions. The proposed mitigation alternatives were developed based on the discussion with the City and mitigation solutions were identified to increase the LOS of major crossings along the two creeks. This presentation will provide an overview of Lynn Creek and Bowman Branch hydrologic and hydraulic analysis on existing and ultimate conditions that provides the City with the updated drainage information to coordinate future development and helps alleviate potential flood risks.

1:30 PM – 5:15 PM
TRACK E – CHANNELS

1:30 pm – 2:00 pm

E1 Cottonwood Park: How a City Turned an Erosive Nightmare into a Stabilized Dream

Presenters: Oscar Cetina, PE, CFM – Pacheco Koch, Dallas
Austin Smith, PE, CFM - Pacheco Koch, Dallas
Tiffany Tillison, PE, CFM – City of Frisco, Frisco

Cottonwood Creek Park is located in Frisco, Texas. The park is located within the FEMA floodplain and floods during the 2-year storm event. High velocities and shear stress have caused erosion threatening the stability of the channel banks and two ponds situated on either side of the creek. Engineering Services coordinated to protect the existing sanitary line, reuse line, and hike and bike trail. The design implemented 2D hydraulic modeling to determine the best locations for erosion control improvements. The final design included standard elements of gabion walls and turf reinforcement matting as well as preventive maintenance with bendway weirs and grade controls throughout the creek. The project also includes innovative green design elements to preserve the natural aesthetic of the park. The presentation will also focus on the importance of including preventative maintenance to be proactive in protecting assets located within creeks in order to mitigate future expenses.



1:30 PM – 5:15 PM
TRACK E – CHANNELS

2:05 pm – 2:35 pm

E2 Urban Channel Stabilization Along Stewart Creek

Presenters: Tiffany Tillison, PE, CFM - City of Frisco
John Foose, PE, CFM - Cardinal Strategies, Wylie

Rapid growth in North Texas is affecting the natural creeks that once graced the area. Often, damaged and failing banks are repaired using the approach of gabion walls or other large retaining walls. This can be effective; however, many times it moves the erosion problem further downstream or across the channel and doesn't address the whole issue. This presentation focuses on alternative bank stabilization and erosion control measures via examination of a design Cardinal Strategies completed at a bank failure along Stewart Creek in Frisco, Texas. This project exemplifies a customized approach to designing erosion control and bank stabilization along an urban stream through the use of bendway weirs, bio-engineered slopes, and erosion control matting. This presentation provides a clear example of the process for evaluating and designing alternative bank stabilization, and it shows how bendway weirs and bio-engineered banks can be designed to protect a bank of an urban channel.

2:40 pm – 3:10 pm

E3 So That's How You Calculate Scour – TxDOT Scour Evaluation Guide Updates

Presenters: Lacy Rhoades, PE, CFM – Huitt-Zollars, Dallas
Trenton Ellis, PE, CFM – TxDOT, Austin

Scour evaluations for transportation infrastructure in Texas are covered by the TxDOT Scour Evaluation Guide, which was first released in 2020 and revised in the summer of 2023. The Scour Evaluation Guide is intended to be a singular and detailed resource for practitioners. This presentation will focus on recent updates related to scour analyses (i.e., estimating future scour depths). The Scour Evaluation Guide now has flow charts and bridge graphics to assist in deciding which calculation method should be used for a bridge. Examples will be provided to demonstrate recently added guidance in the areas of pressure scour, layer-by-layer analyses, and lateral channel migration.

By participating in this session, attendees will be informed of recently added guidance and resources in the TxDOT Scour Evaluation Guide.

3:15 pm – 3:35 pm BREAK

3:35 pm – 4:05 pm

E4 Assessing Risk To Sedimentation and Erosion in The Petronilla Creek Watershed

Presenters: Joseph Yarosz, EIT – Halff Associates, San Antonio
Sohaib Alahmed, Ph.D., EIT – Halff Associates

This study investigates erosion-related issues in the Nueces watershed to provide an integrated analysis for flood damage and watershed management. A 2D HEC-HMS model was developed to study the impacts of multiple rainfall frequencies on sediment transport in Petronilla Creek Watershed in the Valley of Texas. Preliminary results show mud and silt as major constituents of eroded sediment under the 10-year frequency storm event. The findings can help identify areas susceptible to erosion and locate sediment deposition areas for targeted mitigation and maintenance activities. Stakeholders can also identify materials for beach nourishments and river restorations.

By participating in this session, attendees will better understand some of the complexities with sediment transport within a watershed model. Attendees will learn how to incorporate sediment transport within 2d HEC-HMS and RAS applications and be able to identify vulnerabilities within a watershed for different rainfall events for better watershed management strategies.



1:30 PM – 5:15 PM
TRACK E – CHANNELS

4:10 pm – 4:40 pm

E5 Asset Management, Maintenance, and Rehabilitation of Concrete Channels and Flumes

Presenters: Brett Garrett, M.Eng - Peloton Land Solutions, Fort Worth
Paul Kelly, AWB - Peloton Land Solutions

Concrete defects within the complete concrete channel and flume system maintained by the City of Grand Prairie cause erosive conditions, structural integrity concerns, and safety challenges. In coordination with City of Grand Prairie staff and GIS data, the City's complete concrete channel and flume system consists of over 20 linear miles and 277 Asset ID's. Collection of approximately 3,800 total concrete defects were spatially located and digitally recorded. Along with other pertinent parameters, numerous data points were collected and analyzed to produce an organized and prioritized plan for maintenance, improvement, and rehabilitation. An engineering report, an interactive web map, and cost estimates were developed to provide overall recommendations and categorization for each concrete channel and flume. By participating in this session, attendees will develop an asset management program and categorization strategy of an extensive concrete channel and flume system. They will integrate cross-platform technologies for effective scope management and execute well-ordered recommendations and cost estimates supported by structured, bulk data.

By participating in this session, attendees will better understand how to develop an asset management program and categorization strategy of an extensive concrete channel and flume system. Attendees will also learn how to Integrate cross-platform technologies for effective scope management and execute well-ordered recommendations and cost estimates supported by structured, bulk data.

4:45 pm – 5:15 pm

E6 Resilience Through Restoration: How Fort Worth is Protecting Its Infrastructure

Presenter: Keith Byrne, PE CFM – Freese and Nichols, Fort Worth

The levee system protecting Fort Worth's only wastewater treatment plant biosolids facility is in danger of failing due to continued erosion of the West Fork Trinity River. The City is using an innovative approach of stream restoration techniques to analyze the erosion, stabilize the river and protect the facility.

Using this case study, the presentation will explain the challenges of protecting infrastructure near large streams/rivers, teach the importance of understanding the cause of the erosion to determine a holistic approach, and equip utility managers to find the optimum solution that maximizes protection based on budget.

END OF WEDNESDAY



THURSDAY – SEPTEMBER 14

8:00 AM to 11:30 AM PLENARY SESSION

8:00 am – 8:30 am

Data Life Cycle in a Flood Decision Support System

Speakers: Miguel A. Pavon, CFM - Texas Water Development Board, Austin
Rewati Niraula PH, CFM - Texas Water Development Board, Austin

Most of us know about the value of LiDAR, the now ubiquitous 3D LiDAR points cloud data. Now, pair that with hydrodynamic models such as the HEC-RAS 2D Base –Level Engineering (BLE) models, you can create local flood inundation libraries. Integrate those with depth-damage curves, 3D buildings, parcels, a basemap and you can produce a decision support system that is understandable, and able to be handled by anybody with a browser. The Flood Decision Support Toolbox (FDST) allows analysis by emergency planners, and general public preparing for preparedness and potential response activities in advance of flood events.

This presentation should produce a better understanding of the efforts of the USGS, in cooperation with the TWDB, to map and forecast floods in Texas and share the knowledge with Texas communities. New LiDAR, new buildings, and/or updated CAD data will drive data refreshments in the data life cycle of FDST keeping it current and relevant. Attendees will learn about The Flood Decision Support Toolbox (FDST) and its data life cycle.

8:30 am – 9:30 am

Building a Resilient Future: Views from Multiple Lenses

Speaker: Annie Vest – Freese and Nichols

The National Hazard Mitigation Association (NHMA) will facilitate a panel discussion. In this presentation, we will explore the topic of flood resilience through the lens of multiple perspectives. We will hear from experts in various fields, including planning, floodplain management, sustainable development, and social justice. Through their diverse perspectives, we will gain a deeper understanding of the interconnectedness of resilience and its implications for floodplain management. Attendees will be challenged to think more deeply about resilience and its implications for their work and their communities. We will examine the challenges and opportunities associated with building resilience in the face of flood hazards, as well as the role of leadership and collaboration in driving progress. By sharing insights and experiences from multiple perspectives, we will provide a rich and thought-provoking exploration of this critical topic.

Attendees will be challenged to think more deeply about resilience and its implications for their work and their communities. We will examine the challenges and opportunities associated with building resilience in the face of flood hazards, as well as the role of leadership and collaboration in driving progress. By sharing insights and experiences from multiple perspectives, we will provide a rich and thought-provoking exploration of this critical topic.



THURSDAY – SEPTEMBER 14

8:00 AM to 11:30 AM - PLENARY SESSION

9:30 am – 10:00 am

Developing Video Content to Engage Fort Worth Residents on Stormwater Management

Speakers: Stephanie Griffin, PE, CFM, F.ASCE – Halff Associates, Fort Worth
Linda Sterne, Communications Specialist – City of Fort Worth
Keith Courson, Communications Manager – Halff Associates

The City of Fort Worth recently completed production of five Stormwater Management outreach videos, which are 30 seconds to three minutes in length. The videos explain the elements of the City of Fort Worth Stormwater Management Program in easily understandable terms for the general public. They show how the program achieves its mission of “Protecting People and Property from Harmful Stormwater Runoff” through 1) maintaining existing systems, 2) improving drainage through projects, 3) warning the public of hazards and 4) reviewing development for compliance with City standards. The City will use these videos on its website, social media, YouTube and for other appropriate educational outreach opportunities. Attendees will visually understand key components of the City’s Stormwater Management Program and how the City acts to inform residents. Participants can implement similar ideas within their own local jurisdictions.

10:00 am – 10:30 am BREAK

10:30 am – 11:00 am

Low-Cost Flood Sensors Guidance for Texas Communities

Speakers: Tatum Lauten, PE, GISP – Texas Water Development Board, Austin
Ramesh S. Chintala, PE, CFM, D.WRE – WEST Consultants, Dallas
Nick Z. Fang, Ph.D., PE - University of Texas at Arlington

Flood early warning systems (FEWS) are expected to rank prominently among Flood Mitigation Strategies (FMS) in the State’s first Flood Plan that is expected to be ready by September 1, 2024. To better prepare communities plan for FEWS implementation, the Texas Water Development Board (TWDB) is developing guidance on the essentials of installing, operating, and maintaining traditional as well as low-cost flood sensor FEWS. This presentation will focus on the guidance being developed to inform communities on low-cost flood sensor systems. An overview of efforts to-date including desktop research, interviews with organizations across the United States, and pilot study testing being proposed will be discussed. The low-cost FEWS draft guidance document is anticipated to be published in late 2024 with pilot studies starting in 2023/2024. Attendees will understand guidance being developed by the TWDB to help communities implement low-cost flood early warning systems (FEWS).

11:00 am – 11:30 am

Need Money for Flood Mitigation Projects? TWDB Can Help.

Speakers: Marla Waters, CTCM, CTCD – Texas Water Development Board
Cody Ransone, CTCM, CTCD, CFM – Texas Water Development Board

Flooding continues to be a major natural disaster plaguing our state and Texas continues to have the highest losses associated with floods in the nation. The Texas Water Development Board (TWDB) can provide financial assistance to communities to become more resilient and to mitigate against future flood losses. This presentation will provide an overview of the two flood mitigation funding programs, the FMA (federal funding) and FIF (state funding), administered at the TWDB. These programs can provide up to 100% funding to assist communities in planning studies, implementation of drainage and stormwater projects, meeting the local match to a federal grant program, flood early warning systems, elevation of flood prone structures, acquisition/demolition, and more. By the end of the presentation participants will have an overall understanding of the funding programs, eligible projects, funding available, and how to submit a successful application for these funds. Attendees will become knowledgeable about the state and federal funding for flood mitigation projects offered through the Texas Water Development Board



11:30 am – 1:30 pm

TFMA Membership Meeting & Luncheon

THURSDAY – SEPTEMBER 14

2:00 PM – 5:05 PM

AFTERNOON CONCURRENT SESSIONS

2:00 PM – 5:05 PM

TRACK F - TECHNICAL H&H

2:00 pm – 2:30 pm

F1 A Technical Look at Integrating Transportation and Stormwater Infrastructure

Presenters: Kate Zielke - North Central Texas Council of Governments, Arlington
Matthew T. Lepinski, PE – U.S. Army Corps of Engineers, Fort Worth

A proactive stormwater planning effort was introduced at the Spring TFMA conference and seeks to address increasingly flooded roadways, neighborhoods, and critical infrastructure as rapid development and intense rain events collide in North Central Texas. The study goals will be outlined from a more technical perspective during the TFMA Fall Technical Summit:

1. Reduced infrastructure flooding within and downstream of rapid development areas
2. Tools that identify the financial benefit of adopting higher standards
3. Enhanced technical models and emergency management capabilities
4. Planning menu for transportation design, stormwater detention, and environmental features

The study integrates stormwater, transportation, and environmental planning in a unique effort to reduce risk in a region growing by 150,000 people per year. Study partners include the North Central Texas Council of Governments, US Army Corps of Engineers, academia, and impacted communities and organizations.

2:35 pm – 3:05 pm

F2 Leon River Watershed Study-Validating with Historical Rainfall Data

Presenters: Emily Daniel, PE, CFM – HDR, Dallas
Nate Clements – HDR, Fort Worth
JJ Oznick – City Manager, City of Eastland

As part of a FIF grant sponsored by TWDB, City of Eastland (City) sub-contracted HDR Engineering, Inc (HDR) to develop updated hydrology for the entirety of the Leon River HUC-10 watershed along with hydraulic models to support analysis of flood mitigation alternatives. Hydrologic modeling utilizing the Snyder Unit Hydrograph was performed using the USACE HEC-HMS. In total, the watershed is 323 square miles. There are currently no USGS stream gages in the area for use in model calibration. Gage adjusted rainfall (GARR) data for two historical events (Sept 2020&May 2021) in the area was used to validate the Snyder peaking coefficients for the watersheds. The GARR rainfall data was run in a rain-on-grid RAS model imported from DSS data. The HWMs were taken with a depth rod, photograph, then collected as a survey point. Additionally civilian photos from the historic events were used to note depths. Field HWMs were compared to the 2020 & 2021 GARR model results iterated to be within 1'.

At the end of this presentation, attendees should know how to use high water marks and historical rainfall data to validate a watershed model. More rural communities will be informed on how to use readily available data to validate their watersheds and update their effective mapping. Communities will also be made aware how to integrate these efforts into the TWDB's State Flood Plan. Many of the Regional Flood Planning Groups, particularly in West Texas and the Panhandle included County-wide watershed studies as Flood Mitigations Evaluations for the future.



2:00 PM – 5:05 PM

TRACK F - TECHNICAL H&H

3:05 pm – 3:35 pm

F3 Using ICM for Master Planning and Project Selection in a Coastal City

Presenters: Ben Setterbo, PE, CFM – Pape-Dawson Engineers, San Antonio
Anthony Schepis, EIT – Pape-Dawson Engineers, San Antonio
Jake Powell, PE, CFM – Pape-Dawson Engineers, San Antonio

Many challenges exist when developing a Storm Water Master Plan for a city with flat terrain influenced by hurricanes, such as Corpus Christi. After an exhaustive data collection effort, limited data and/or data that uses outdated modeling techniques were found. These were not compatible with the City’s desire for a comprehensive stormwater master planning document. Furthermore, significant portions of the City had no data or models and there was a need to create new models from scratch using current techniques and update to Atlas 14 rainfall.

This presentation discusses the process for developing the Storm Water Master Plan, different modeling approaches, stakeholders involved, and some of the challenges faced during the planning stage. This presentation will also take an in-depth look at the Infoworks ICM modeling approach used for analyzing the developed portion of the City, aging infrastructure, and coastal constraints. The goal of this presentation is to provide insight into planning and coordination when developing a Storm Water Master Plan, as well as discuss the different modeling approaches based on watershed type and available data.

3:40 pm – 4:00 pm **BREAK**

4:00 pm – 4:30 pm

F4 Endless Floodplains - Addressing Lateral Flow into Adjacent Drainage Areas

Presenter: Stephen Bolster, PE, MS, CFM – Bolster Engineering, St. George, Utah

Lateral flows that “spill” out of a stream’s drainage area can pose serious complications to hydraulic and hydrologic analysis. In one-dimensional (1D) modeling it can cause cross sections to bend to avoid floodplain delineations that appear to endlessly flow into the adjacent drainage area. These scenarios can occur in areas with relatively level topography and near the confluence of streams. With the loss of flood volume and conveyance changes additional analysis can be completed to evaluate the impacts to the stream hydraulics and hydrology.

This presentation will review the limitations of 1D modeling and best practices when handling lateral flows into adjacent drainage areas. Comparisons between 2D analysis results and 1D approximations will be reviewed. Recommendations for best practices and steps to meet regulatory requirements will be provided. By participating in this session, attendees will be better prepared to understand best practices and concepts related to lateral flows into adjacent drainage areas.



2:00 PM – 5:05 PM

TRACK F - TECHNICAL H&H

4:35 pm – 5:05 pm

F5 Roughen Up Your 2D Model - The Manning's Way

Presenters: Rifat Alam, PE, CFM – WSP, Dallas
Darud Sheefa, CFM – WSP, Dallas
Imran Kabir, CFM – WSP, Dallas

With the current capacities of HEC-RAS, 2D Rain-on-Mesh (ROM) modelling is gaining popularity nationwide. In 2D ROM modelling, the landcover plays a critical role in the sensitivity of results. In this presentation, a framework to understanding how the roughness values in a 2D ROM model can be enhanced to provide more detail in all types of studies (BLE, Approximate, and Detailed) will be showcased. With the help of WSP's Proprietary 2D Modelling Automation Tool, the roughness values in a 2D ROM model can be enhanced to:

1. Develop a “blended” (weighted average) Manning's n layer where detailed landcover is not available (dependent on RAS versions and options selected).
2. Better model sheet and rill erosion by applying overland Manning's n values.
3. Apply a Manning's n value more accurately through hydro-connector cuts in a model that roughly represent the flow that would pass through the represented structure.

2:00 PM – 5:05 PM

TRACK G – TECHNOLOGICAL ADVANCES

2:00 pm – 2:30 pm

G1 Machine Learning to Evaluate Storm Drain Capacity in Dallas

Presenters: Sam Sarkar, PE – Halff Associates, Dallas
Jarred Overbey, PE, CFM – Halff Associates, Richardson

In the face of increasingly frequent severe flooding events and aging infrastructure, municipalities have an urgent need to evaluate their existing stormwater drainage systems. Analyzing a city-wide drainage network with detailed dynamic modeling is cost-prohibitive to many cities.

This presentation will focus on a City of Dallas case study that includes a machine learning model developed to evaluate the capacity of the citywide drainage network. The ML model was trained using a subset of local, detailed urban storm drainage models. Then, the ML model was fed data from an independent digital database of common conduit characteristics to predict stormwater capacity in the entire drainage network. The presentation highlights the achievements and challenges of using artificial intelligence and incomplete data to estimate capacity in over 1,800 miles of stormwater pipes.



2:00 PM – 5:05 PM

TRACK G – TECHNOLOGICAL ADVANCES

2:30 pm – 3:00 pm

G2 2D Floodway 101: Automated 2D Floodway Delineation & 2D Plotting

Presenter: Rifat Alam, PE, CFM – WSP, Dallas

Gridded precipitation-infiltration and 2D rain-on-mesh modeling techniques have gained popularity across the industry recently. As more 2D regulatory flood risk products are being developed nationwide, 2D floodway delineation approach is still evolving, and can be challenging. Multiple/split flow path, along with significantly and insignificantly flooded mesh cells presents another set of challenges. Another critical challenge is plotting the 2D floodplain and floodway results seamlessly, as the current HEC-RAS has some limitations. Automating the whole 2D floodway delineation process can be a game changer by resolving a lot of recurring issues. The novel “network floodway” framework will be presented to automate 2D floodway delineation which can be adopted basinwide, for multiple detailed streams simultaneously. Finally, a complete post-2D hydraulics automation approach will be presented, combining 2D floodway delineation, floodplain and floodway plotting, and 507 checks.

By attending this session, participants should be better able to: learn the basic of 2D Floodway delineation in latest HEC-RAS with gridded precipitation and infiltration; learn about real life example and success stories about Automated 2D Floodway delineation, 2D Plotting and 507 checks.

3:05 pm – 3:35 pm

G3 Streamlining Flood Modeling: Focus on Automation Tools for 2D Hydraulic Modeling

Presenter: Runal Shrivastava – AECOM, Dallas

Accurate and efficient flood modeling is crucial to mitigate the impact of flood events. The HEC-RAS 2D hydraulic modeling technique has greatly improved the efficiency of floodplain mapping, and several automation tools have been developed to aid in the flood modeling process, potentially minimizing the time and resources required to create 2D hydraulic models. However, choosing the appropriate tool can be a challenge. This presentation aims to assist in the selection of automation tools, including available open-source tools, and provide a framework for developing new in-house tools. With a focus on the application of these tools to the 2D rain on mesh process, we will discuss common problems and their solutions, ranging from cell computation point alignment to adding hydro-corrective terrain modifications. Overall, we aim to highlight automation tools that can streamline flood modeling workflows for base level engineering.

3:40 pm – 4:00 pm BREAK

Thursday Night Networking Social Sponsor



LJA Engineering, Inc.



2:00 PM – 5:05 PM
TRACK G – TECHNOLOGICAL ADVANCES

4:00 pm – 4:30 pm

G4 Leveraging Automation to Assist Large-Scale Watershed Modeling in HEC-RAS

Presenters: Manoj Kc, PhD, PE, CFM – Michael Baker International, Katy
Prashanta Bajracharya, PhD, EIT – Michael Baker International, Katy
Kushal Regmi, PE – Michael Baker International, Katy
Cesar doLago, PhD, EIT – Michael Baker International, San Antonio
Mujahid Chandoo, PE – Michael Baker International, Katy

H&H modeling are crucial tools for understanding and managing the impacts of stormwater, such as flooding, drought etc. However, developing watershed scale model can be time-consuming. To address this, we have developed scripts/tools to automate the creation and modification of HEC-RAS model elements such as cross-sections, reaches, connections, structures, etc. hence highly increasing efficiency in model development. Furthermore, the use of scripting tools ensures the accuracy and consistency of the model. We will begin by describing the essential features of HEC-RAS input/output files and how they can be used for automation in Python and R.

The presentation will then exemplify a few case studies demonstrating the automation's effectiveness and how it can be beneficial in reducing costs, increasing efficiency, and improving consistency. Finally, the presentation will summarize the key steps, some of the main challenges we faced, and future directions on how we plan to address them. By attending this session, the key takeaways for participants will be able to get introduction on how to automate the creation and modification of HEC-RAS model elements.

4:35 pm – 5:05 pm

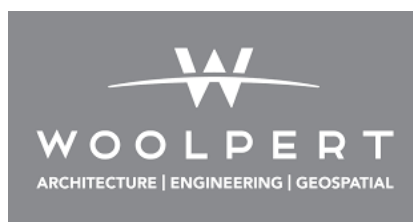
G5 Automated Map Production (AMP): Amp-ing up FIRM Production

Presenters: Miguel Segura – AECOM, Dallas
Ethan Guyer – AECOM, Dallas

For many years FEMA Flood Insurance Rate Maps (FIRM) were created using manual GIS processes by many different PTS providers. In January 2020 FEMA released an automated tool that generates FIRMs based on Geospatial database that was submitted with the Project Task. Since AMP was released there has been a lot of questions on when it's appropriate to use AMP over the Manual method, along with other technical questions-based symbology, labels, and Notes to User languages. This Presentation will cover a brief history of Flood Boundary Hazard Maps, Map Mod FIRMS, and Risk Map FIRMS and go into detail how to and how we can mitigate the obstacles that presented itself with the switch from manual production to Automated Map Production. The information that will be covered during this presentation will be valuable for individuals working on FEMA Physical Map Revisions and County Wide Flood Projects.

By attending this session, the key takeaways for participants will be how FEMA FIRM production has evolved to be fully automated, and how we can mitigate the obstacles that presented itself with the switch from manual production.

Lanyard Sponsors





2:00 PM – 5:05 PM

TRACK H – STATE AND LOCAL TOPICS

2:00 pm – 2:30 pm

H1 New HMA Program Guidance – 8 Years in the Making!

Presenters: Marla Waters, CTCD, CTCM - Texas Water Development Board, Austin
Cody Ransone, CTCM, CTCD, CFM – Texas Water Development Board, Austin
Kathy Hopkins, CTCM, CTCD, CFM - Texas Water Development Board, Austin

FEMA has updated the Hazard Mitigation Assistance Program Guidance, to replace the 2015 HMA Guidance and HMA Guidance Addendum. The Texas Water Development Board (TWDB) Staff will provide an overview of the HMA Program and discuss the changes that apply to Flood Mitigation Assistance. The new policy guide has been long overdue and incorporates 8 years of updates. By attending this presentation participants will understand key changes made to the HMA Policy guide, the types of grants included in the HMA Program, and minimum eligibility requirements. We will primarily discuss FMA grants, but we hope to also provide a general understanding of the other grants (HMGP, HMGP Post Fire, and BRIC) available in the HMA Program as well. Participants will be aware of the changes to the HMA Guidance issued by FEMA in March of 2023.

2:30 pm – 3:00 pm

H2 LET'S GO, It's the 2023 FMA NOFO!

Presenter: Marla Waters, CTCD, CTCM - Texas Water Development Board, Austin

FEMA's 2023 Flood Mitigation Assistance Application cycle has opened! The Texas Water Development Board (TWDB) will take you through the 2023 Notice of Funding Opportunity (NOFO) for this upcoming application cycle, specifically looking at the requirements for FMA applications, the required documentation and actions needed for the Environmental Planning & Historic Preservation assistance section of the application and ways to best practices for selection. Participants will gain a better understanding of how to develop administratively complete competitive subapplications and increase the likelihood of your community getting selected for funding. TWDB will also discuss common FMA grant writing shortfalls, user pain points, and some solutions to these issues to help optimize subapplications for this nationally competitive grant program.

By attending this session, participants will have baseline knowledge of FEMA's 2023 FMA NOFO and be prepared to start developing their FMA application.

3:05 pm – 3:35 pm

H3 Stormwater Utilities and Impact Fees in Texas

Presenters: Kate Ploetzner, PE, CFM - Kimley-Horn, Dallas
Steve Galloway, PE, CFM, LEED AP - Kimley-Horn, Dallas

Drainage utilities and impact fees are both potential funding sources for drainage programs, but the implementation of the sources, the items they can fund, and the funds they can generate differ significantly. Both funding sources typically require analysis of impervious area to determine the use of the drainage system. Utilities require an inventory of the properties in the City, assess a monthly fee to most of those properties, and can be used to fund a multitude of drainage needs. An impact fee is an one-time fee assessed at the development of the property which charges the developer for their use of the City's drainage system, and can only be used to fund projects identified as part of the fee development. The items necessary for the implementation of these funds will be discussed in detail, using real world case examples to address their benefits and drawbacks. By attending this session, the key takeaways for participants will be 1) Contrast Drainage Utilities and Drainage Impact Fees in Texas, 2) Identify the situations where utilities and/or impact fees would be appropriate for drainage funding, and 3) Understand the process to establish these funding mechanisms.



3:40 pm – 4:00 pm BREAK

2:00 PM – 5:05 PM

TRACK H – STATE AND LOCAL TOPICS

4:00 pm – 4:30 pm

H4 Regional Flood Planning - That's a Wrap!

Presenters: Stephanie Griffin, PE, CFM, F.ASCE – Halff Associates, Fort Worth
Cindy Engelhardt, PE, CFM – Halff Associates, Austin
Sam Hinojosa, PE, CFM – Halff Associates, Conroe

The first cycle of the TWDB's Regional Flood Planning effort is complete! The TWDB went from establishing guidelines to completing the first-ever flood plans in record time. The regional flood plans contain recommend actions that when implemented will better protect people and property from flooding. This presentation includes challenges and strategies to compile massive amounts of data into meaningful results in an expedited schedule. Project planning, coordination, and management are key elements to the success of flood mitigation and planning projects.

This presentation will also discuss the future of regional flood planning, including project prioritization and anticipated state funding. Upcoming regional and state flood planning activities will be discussed as the second cycle of planning gets underway.

4:35 pm – 5:05 pm

H5 MT-2s: A Strategic Option to Accurately Map a Communities' Risk

Presenters: Sushban Shrestha, PE, CFM – AECOM, Fort Worth
Bosulu Lokulutu EIT, CFM – AECOM, Dallas

There is always an ongoing effort by FEMA to update flood map products to keep up with the constant landscape changes due to natural or manmade activities in flood prone areas. The LOMC process was developed to amend or revised the published flood hazard information by letter. MT-2 requests refer to requests to revise Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) reports. These are called Letters of Map Revision (LOMRs) and Conditional Letters of Map Revision (CLOMRs).

This presentation will touch on the Letter of Map Change submittal and review processes and will outline the reviewer's perspective on what are the essential elements in an MT-2 request. The presentation will focus on required data necessary while submitting the application; review process and timeline, and where to look for further guidance. In addition, the presentation will touch on issues specifically relevant to CLOMRs and LOMRs in Texas. By participating in this session, attendees will have a knowledge on MT-2 requests; required data; review process and timeline; relevant issues, and where/how to find further guidance.



2:00 PM – 5:05 PM
TRACK I – CASE STUDIES

2:00 pm – 2:30 pm

I1 A Holistic Stormwater Approach for the City of Tyler Storm Water Master Plan

Presenter: Lauren Haworth, PE, CFM – Halff Associates, Richardson

The City of Tyler’s Comprehensive Storm Water Master Plan (CSWMP) was a wide-ranging, multi-year effort to inventory the City’s stormwater program and assets, develop recommendations to reduce urban flood hazards throughout the city, and provide a framework for maintenance of stormwater data. Many tasks came together to form the CSWMP, such as high-level assessment of urban flooding, flooding hot spot identification, erosion hot spot identification, conceptual CIP development for flooding and erosion, CIP prioritization, stormwater policy benchmarking, asset inventory, and asset management planning. Performing these tasks as part of a single project provided synergies between tasks, such as adapting the asset management prioritization algorithm to prioritize the erosion and stormwater hot spots. As a result, the City of Tyler now has a program and the data necessary to manage stormwater issues efficiently and effectively while helping to guide rapid growth within the City.

By attending this session, the key takeaways for participants will be an understanding of what stormwater issues can benefit from a holistic, innovative approach and the synergies and efficiencies that can be achieved when stormwater issues are examined comprehensively.

2:30 pm – 3:00 pm

I2 Master Drainage Planning in a Fully Developed Town

Presenters: Steven Galloway, PE, CFM – Kimley-Horn, Dallas
Jessica Little, EIT – Kimley-Horn, Dallas

The Town of Highland Park has been “fully developed” for decades. Much of the existing storm infrastructure was constructed on an as-needed basis, without consistent parameters or strict record keeping.

The town initiated a program to map the existing infrastructure and developed a GIS of existing assets. A 1D/2D model of the storm sewer infrastructure for the entire Town was prepared using PCSWMM. The modeling identified locations where the existing infrastructure was inadequate to convey the 100-year event and identified properties at risk of flooding. Following the storms of August 2022, communication with residents confirmed the flood risk identified in the modeling. The modeling was used to develop projects to reduce the impacts of the 100-year event. The master plan was used to develop a capital improvement plan (CIP) for the Town, update the drainage utility, and apply for funding from various sources.

3:05 pm – 3:35 pm

I3 Taking on Giants: A Comprehensive Plan for West Irving Creek

Presenters: Justin Oswald, PE, CFM – Freese and Nichols, Fort Worth
Emily Sestak, PE, CFM – Freese and Nichols, Fort Worth
Jonathan Schwartzenberg, PE, CFM – Freese and Nichols, Fort Worth

With the recent trend toward funding sources dedicated to improving drainage, the size and complexity of these projects has continued to increase, straining the abilities of cities to execute them. The City of Irving is investing in a \$100 million bond program funded by the Municipal Drainage Utility (MDU) to address long-standing drainage issues. The largest and highest priority need for this program is the West Irving Creek (WIC) project to improve four miles of concrete channel running through mostly residential areas. The project team was tasked with identifying the project solution and developing a plan for implementing it. Our presentation will outline the project planning effort conducted for WIC, demonstrating how these practices were beneficial during the first phase of design. The planning exercise includes several major components that can be applied to similar large-scale projects to minimize delays and allow agencies to move forward with confidence with their projects.



3:40 pm – 4:00 pm BREAK

2:00 PM – 5:05 PM
TRACK I – CASE STUDIES

4:00 pm – 4:30 pm

I4 Greenfield Acres - The Cost of the Past

Presenter: Michael Wellbaum, PE, CFM, PMP – Shield Engineering Group, Fort Worth

Greenfield Acres is a large lot subdivision in north Fort Worth that was built in 1961 as a Tarrant County subdivision. At the time, there were no drainage criteria for the county and the concept of extra territorial jurisdiction did not exist. Furthermore, the flood control act was just starting to gain steam. Consequently, the development followed common thinking at the time and natural ditches were simply placed in a pipe or shifted into a borrow ditch. Little thought was given to overland flow or drainage areas. The result? 68 homes within the development experience flooding and 13 are in a Zone A floodplain. To mitigate the flooding, the City of Fort Worth engaged an engineering firm to perform an H&H study and develop a multi-phase plan. Construction of improvements began in 2018 and the final phase of construction is underway. To date, the City has committed to spend \$16.8 million to resolve a problem created by a lack of standards and oversight when the development began. By the end of this session, attendees will have a better understanding of the consequences of poor planning and inadequate standards.

4:35 pm – 5:05 pm

I5 A History of Flooding, A Look at the Progress, and A Plan for the Future

Presenters: Eric Scheibe, PE, CFM – Scheibe Consulting, Austin
 Daniel Harris, PE, CFM – Scheibe Consulting, Austin
 Alan Moore, PE, CFM – Cameron County Drainage District #5, Harlingen
 Rolando Vela – Cameron County Drainage District #5, Harlingen

The history of South Texas dates back to the famed explorer Cabeza de Vaca, who was shipwrecked in 1528. His 8-year journey that followed, included the exploration of South Texas. By the late 1800's most of south Texas was fenced off, with the prospect of agriculture dominating the region. By the late 19th century, irrigation canals significantly changed to the landscape. By the late 20th century population growth resulted in the need for more residential development. These changes impacted how the region drains and resulted in the need for intervention to manage the resulting flood challenges. Cameron County Drainage District #5 was established in 1993 managing 70 miles of open channels. Over the last 15 years, CCDD5 has implemented state-of-the-art flood modeling, tapped into grants, and is actively collaborating with stakeholders to reduce flood risk. This presentation takes a historic look at flood risk in the region, the success of the district, and the plan moving forward. By the end of this session, attendees will have a better understanding of the unique challenges faced by coastal communities and South Texas.

Zone X Sponsor





2:00 PM – 5:05 PM

TRACK J: FLOOD MITIGATION

2:00 pm – 2:30 pm

J1 Purgatory Creek Improvements - A Holistic Design Approach

Presenters: John Espinoza, PE, CFM – City of San Marcos
Laura Casset, PE, CFM, CPESC – Lockwood, Andrews & Newnam, Austin

Nature-based solutions are the way to go! The City of San Marcos is taking on chronic flooding on Purgatory Creek by implementing a 2-mile flood mitigation project with natural stream solutions, native blackland prairie plants, and trail systems. Over 100 homes and businesses will benefit from reduced flooding. Let's work towards a more sustainable future by incorporating nature into civil engineering projects! The City's Project Manager, John Espinoza and LAN's Laura Casset will be presenting on the importance of addressing flood mitigation with holistic design solutions that improve water quality, provide ecosystem uplift, and improve trails and connectivity for pedestrians in urban stream systems. The presentation will include an update on project designs, the permitting process and funding constraints and or opportunities.

By attending this presentation, attendees will understand flood mitigation design requirements for an urban stream considering a holistic approach to reduce flooding, improve water quality, and enhance pedestrian connectivity.

2:30 pm – 3:00 pm

J2 Flood Mitigation Planning for Resilient Urban Watersheds

Presenters: Pol Bouratsis, PE, PhD, CFM, PMP – AECOM, Houston
Isabella Gandara EIT, CFM – AECOM, Houston
Burton Johnson, PE, CFM – AECOM, Katy

Identifying the most effective flood mitigation projects in urban regions with flooding history is not always straightforward. Often, flooding is attributed to multiple compounding factors such as riverine flooding, low stream capacity, overflows from adjacent watersheds, etc. In these cases, the identification of the projects with the greatest value and the development of long-term plans require a deep understanding of complex hydraulic processes, stakeholder needs, environmental constraints and social vulnerabilities. Here, we describe the methodology for a pre-feasibility study by Harris County Flood Control District (HCFCD) and AECOM in the San Jacinto River watershed. We discuss the modeling strategy, alternatives analysis and stakeholder engagement efforts to identify a project to be funded by available funds and develop a watershed plan with short- and long-term recommendations. Additionally, we present a new project prioritization framework developed by HCFCD. By participating in this session, attendees will have a better understanding Flood Risk in Urban Watersheds, Performing Alternatives Analysis for Flood Mitigation Projects; Considering Environmental Social and Governance Criteria

3:05 pm – 3:35 pm

J3 Comanche Trail Hazardous Road Overtopping Mitigation (HROM), Fort Worth, TX

Presenters: Randy Haney, PE, CFM – Pape-Dawson Engineers, Plano
Jamie Hughes, EIT, CFM – Pape-Dawson Engineers, Rowlett

On the border of Lake Worth and Fort Worth, Pape-Dawson designed two 32'x8' precast arch pipe culverts to mitigate a hazardous road overtopping and provide the crossing with a 100-year LOS. By an innovated use of drainage drop structures, we were able excavate the existing limestone rock shelves into stairs to reduce erosion. The project also includes the relocation of water and sanitary sewer along Comanche Trail. Communities can expect to learn about how this drainage project greatly increased the safety and aesthetic of the surrounding neighborhood. By participating in this session, attendees will learn how to leverage existing conditions to improve costs, learn ways to span floodplains using an alternative method other than bridges, how to balance adjacent municipality requirements, and how to mitigate potential historic impacts



3:10 pm – 3:25 pm BREAK

2:00 PM – 5:05 PM

TRACK J: FLOOD MITIGATION

4:00 pm – 4:30 pm

J4 Flood Risk Reduction in Flat Terrain, A Case Study of Lubbock City

Presenters: Amir Ahmadi, Ph.D., PE, CFM – Lockwood, Andrews & Newnam, Leander
 Kimberly K. Cornett, PE, CFM - Lockwood, Andrews & Newnam, Fort Worth

Lockwood, Andrews & Newnam, Inc. (LAN) was hired by the City of Lubbock to complete a roadway expansion project including the preparation of a comprehensive drainage plan for the 82nd street and MLK Jr. Boulevard improvements. The project involved analyzing the existing/proposed conditions and designing a storm system conveyance infrastructure that meets the City's drainage and environmental criteria. The design plan includes closed storm pipes and inlet systems, open back inlets, inline channel storage, and playa lake expansion to collect the drainage conveyance and attenuation with the roadway extension and improvements. The design faced challenges in implementing the project, including the flat area elevation, multiple existing ponds, and coordination with various entities and concurrent designs of adjacent roadways. This presentation will highlight the specific considerations to address the challenges and provide insights into the project's successful implementation.

Participants of this session, will receive an introduction to the ICPR Model, and have a better understanding of storm water challenges in flat terrain, and how to address them.

4:35 pm – 5:05 pm

J5 Guadalupe Corridor - 24th St Improvements

Presenters: Andrew M. Rooke, PE, CFM – CAS Consulting & Services, Austin
 Angelica Yap, PE, CFM – CAS Consulting & Services, Austin
 Govinda Karki, PhD, PE, CFM – CAS Consulting & Services, Austin

As part of Austin's Mobility Corridor Improvements, CAS prepared a drainage design that not only addresses the requirements of the City's minimum drainage requirements but also includes a betterment to reduce the loading on an existing stormdrain network. The mobility/roadway improvements span 2 separate stormdrain networks, and our design diverts flow from the headwaters of the eastern system, discharging at the western system outfall, which is upstream of the eastern outfall. This design reduces the current overcapacity of the eastern stormdrain network until that system can be improved by a later project. The design included analysis with ICM, HMS, RAS, and StormCAD, and included an NAI analysis of the receiving stream, which required updating the effective models to reflect Atlas 14 precipitation. The design also avoids numerous utilities in this highly urbanized area. The design addresses not only the basic needs of the project but also reduces flooding in off-project areas. By participating in this session, attendees will have an understanding of the opportunities available by designing to meet the needs of all stakeholders.

Zone X Sponsor





2:00 PM – 5:05 PM

TRACK K: FEDERAL TOPICS

2:00 pm – 2:30 pm

K1 Informed Flood Decisions and The Estimated Base Flood Elevation Viewer

Presenters: Jon Thomas – U.S. Geological Survey
Diane Howe, CFM – FEMA, Denton

With flooding remaining the leading cause of natural-disaster loss across the United States, the Interagency Flood Risk Management (InFRM) team, comprised of FEMA, US Army Corps of Engineers, US Geological Survey, and the National Weather Service, was formed in 2014 to evaluate flood risk. The InFRM team brings together Federal Partners with mission areas of hazard mitigation, emergency management, floodplain management, natural resources management or conservation to leverage the skillsets, resources, and programs to determine the needs of communities and define solutions and implement measures to reduce long term flood risk throughout the States of Arkansas, Louisiana, New Mexico, Oklahoma and Texas. No single agency has all the answers, but through a coordinated effort of multiple programs and various perspectives, a cohesive solution can be found.

While floods are impossible to prevent completely, and there is no way to guarantee protection of property, loss of life can be greatly reduced when communities have access to good data, practice sound land use, floodplain management and development practices and incorporate warning systems. Local communities can partner with the InFRM team to investigate solutions to reduce their communities flood risk.

2:30 pm – 3:00 pm

K2 The Flood Decision Support Toolbox: Leveraging Existing Data for High-Resolution Flood Risk Information

Presenter: Sam Wallace – U.S. Geological Survey, Fort Worth

The Flood Decision Support Toolbox (FDST) is a publicly available web application developed by the Interagency Flood Risk Management (InFRM) team. The FDST offers flood-inundation maps linked to real-time streamgaging stations to enhance flood preparedness and awareness before, during, and after flood events; the maps depict the estimated areal extent and depth of flooding at half-foot intervals. The ready-to-use flood-inundation maps enable pre-flood risk assessments and support informed emergency response, particularly at streamgages with real-time and forecasted stage information. What sets apart the FDST is its collaborative approach involving Federal, State, and local team members. The InFRM team is committed to empowering communities so that they can leverage their existing datasets and resources and effectively communicate flood-risk information through a grass-roots approach based on the needs of local stakeholders. For example, existing hydraulic models, such as FEMA’s Base Level Engineering models, may easily be adapted for flood mapping within the FDST.

The InFRM team actively encourages local participation by providing submittal guidance and geoprocessing software, streamlining the modeling and mapping process for a wide range of stakeholders. Meanwhile, the InFRM team continues to develop new flood-inundation maps for different communities in the FDST. Ultimately, the InFRM team aims to eliminate barriers and provide accessible high-resolution flood risk information to communities of all sizes.



2:00 PM – 5:05 PM

TRACK K: FEDERAL TOPICS

3:05 pm – 3:35 pm

K3 Forecast River Flood Mapping: How to Utilize Flood Mapping to Make Operational Decisions Before the Flood

Presenter: Derek Giardino – National Weather Service

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3:40 pm – 4:00 pm BREAK

4:00 pm – 4:30 pm

K4 Update on the InFRM WHAs for Large River Basins in Texas

Presenter: Helena Mosser – U.S. Army Corps of Engineers, Fort Worth District

The Interagency Flood Risk Management (InFRM) team has been performing Watershed Hydrology Assessments (WHAs) to update the flood risk estimates in large, complex river basins in Texas. The InFRM team brings together Federal Partners with mission areas in water resources (including FEMA, USACE, USGS and NWS) to create tools, information, datasets and resources that can help communities reduce their long-term flood risk. The InFRM WHAs examine the hydrology across the entire river basin using the latest advances in hydrologic science and technology to help tell the story of how the 1% annual chance (100-yr) flow estimate has changed over time. The recommended frequency flows resulting from the WHAs represent best available flood risk information based on multiple lines of evidence. Furthermore, the results, models and data from these studies are made freely available to communities and stakeholders through the InFRM website (www.InFRM.us).

Zone AE Sponsors





2:00 PM – 5:05 PM
TRACK K: FEDERAL TOPICS

4:35 pm – 5:05 pm

K5 Regional Storm Shifting for Flood Frequency Analysis Verification

Presenter: Landon Erickson – U.S. Army Corps of Engineers, Fort Worth District

This presentation will highlight recent technological advances as well as innovative, yet feasible ways to provide critical flood hazard information needed by decision makers at the federal, state, and local levels. There are many commonly used and accepted methods for estimating flood hazards (flood frequency flows, elevations, and floodplain widths) and each of the methods involve varying levels of effort and accuracy. In Texas, these methods have been shown to produce differences of more than 10 feet of depth for the 1% annual chance (100-yr) flood. The problem is that these estimates are regularly used to manage development and for emergency management purposes, and it is often the case that flood hazard is underestimated, negatively affecting the health and welfare of the public. People who locate themselves in and around bodies of water, generally are not aware of the variability of the information used to estimate flood hazard for their area.

Primary presentation topics include variability in flood flow frequency analysis estimates and shifting of observed storm events. The variability in flood flow frequency analysis estimates topic will show how estimates such as those developed using Bulletin 17C generally change significantly as additional years are added. This topic will also highlight the new tool (Compute Using Expanding Window) within HEC-SSP 2.3 that is now available to show this variability. The storm shifting topic will illustrate how observed storm events, that narrowly missed an area, can be shifted to verify flood frequency analysis estimates, and understand flood potential based on storms that came very close to happening.

END OF THURSDAY

Zone AE Sponsors



MCADAMS





FRIDAY CONCURRENT WORKSHOPS (3.5 CECs)

8:00 AM – 12:00 PM

SEPTEMBER 15, 2023

Workshop E

Step by Step Reviewing of HEC-RAS 2D

Instructors: David Coburn, EIT, CFM; Sarah Davis, PE, CFM HDR Engineering

This workshop will walk step by step through the review process for a 2D HEC-RAS model including terrain, domain, grid and grid refinements, boundary conditions (including rain-on-grid), 2D connections (including 2D bridges), land use/roughness/infiltration layers, model time step, computational methods, runtime messages, RASMapper, and file management. In addition to the step-by-step review, we will discuss good modeling practices and identify common mistakes both modelers and reviewers make. Through a live demonstration of two different working models, participants will play a reviewer's role in finding model issues using a provided model review checklist. The workshop will also highlight new modeling features in the HEC-RAS v 6.x series and how to review them. Attendees should have some experience with reviewing or creating HEC-RAS 2D models.

Workshop F

Unlocking Federal Funding for Flood and Stormwater Projects

Instructors: Annie Vest & Mark Evans - Texas Water Development Board

The workshop will cover various funding programs, including those from the Federal Emergency Management Agency (FEMA), the Department of Housing and Urban Development (HUD), and the Environmental Protection Agency (EPA). The speakers will discuss the eligibility requirements for these programs, application processes, and tips for successful grant writing. Attendees will also learn about the specific projects eligible for funding, such as floodplain restoration, stormwater management, and infrastructure improvement. Instructors will use real examples from projects selected through the national competition in FEMA's Building Resilient Infrastructure and Communities program. This workshop is designed for engineers, planners, and other professionals involved in flood and stormwater management and seeking to expand their knowledge of federal funding opportunities.

Workshop G

Bridge Scour Prediction for Transportation Infrastructure in Texas

Instructors: Trenton Ellis, PE, CFM - TxDOT; Ramesh Chintala, PE, CFM - WEST Consultants
Lacy Rhoades, PE, CFM - Huitt-Zollars; Brent Travis - WEST Consultants

Most engineers struggle applying the standard methods for computing bridge scour provided in FHWA's HEC 18 and HEC 20 manuals. Interpreting these computed scour estimates requires local experience and considerable engineering judgement. This workshop will help participants understand core principles and develop key interpretative skills needed to better evaluate bridge scour. The course covers applied fluvial geomorphology and corresponding practical concepts such as geomorphic thresholds, channel evolution, meander retreat and migration, and dynamic equilibrium.

Scour estimation for transportation infrastructure in Texas is guided by the TxDOT Scour Evaluation Guide. Participants will learn what the Scour Evaluation Guide covers (including summer 2023 revisions) and gain experience through guided examples and discussion. This course will benefit owners, engineers, planners, construction personnel, operations and maintenance personnel, and all others impacted bridge scour.



FRIDAY CONCURRENT WORKSHOPS (3.5 CECs)

8:00 AM – 12:00 PM
SEPTEMBER 15, 2023

Workshop H

Nature-based Solutions for Flood Mitigation

Instructors: Kelley Rich, PE, CFM – Texas Water Development Board, Austin
George Fowler, PE, CFM – Freese and Nichols, Austin
Shena Providence, EIT, CFM – Freese and Nichols, Dallas
Kathy Jack, PhD – The Nature Conservancy
Justin Kozak, PhD – The Nature Conservancy

Nature-based Solutions can build a community’s flood resiliency, enhance water quality, improve aquatic habitat and improve overall quality of life in a watershed. This workshop will provide an update on the TWDB initiative to develop a statewide guidance manual on the application of Nature-based solutions in Texas.

Participants will be provided an overview of common nature-based solutions used for flood mitigation and will learn how to compare and contrast these solutions to achieve project goals. A learning module on proper size evaluation, best practices and considerations when selecting nature-based solutions will be presented. Participants will work in small groups to apply concepts presented.

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