



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

TUESDAY – AUGUST 28, 2018  
CONCURRENT EARLY BIRD WORKSHOPS

8:00 am – 5:00 pm

**WORKSHOP 1:**

**BASICS OF FLOODPLAIN MANAGEMENT 101**

**Instructor:**

Michael Segner, CFM/ Texas Water Development Board

**Topic:** This workshop will cover the following:

- Texas and Federal laws and the National Flood Insurance Program (NFIP)
- Flood Mitigation Grant Programs
- Local Communities & the NFIP
- Flood Damage Prevention Ordinance
- Variances and NFIP Requirements
- Community Assistance Visits & Contacts
- Elevation Certificates
- FEMA Map Amendments
- Substantial Improvements/Damage

8:00 am – 5:00 pm

**WORKSHOP 2:**

**NFIP 201: INTERMEDIATE FLOODPLAIN MANAGEMENT**

**Instructor:**

David Hiegel/ Federal Emergency Management Agency, Region 6

**Topic:** This workshop will focus on what the local floodplain administrator should know and do during the day-to-day conduct of the community's flood damage prevention program. The importance of the local ordinance will be emphasized. The majority of the course will involve the permitting process, how to establish an effective system, permitting requirements, inspections, and follow-up to ensure development has met the provisions of the community's ordinance. Letters of Map Change (LOMCs) will be discussed. At the end of the course, we will briefly cover other aspects of floodplain management, to include post flood activities, the elevation certificate, etc.

8:00 am – 5:00 pm

**WORKSHOP 3:**

**HANDS-ON HEC-RAS 2D (FOR INTERMEDIATE 1D USERS)**

**Instructors:**

Garrett Johnston, PE, CFM, GISP/ Freese and Nichols  
Boris Minot, PE, CFM/ Freese and Nichols

**Objective:** To build 2D and 1D/2D HEC-RAS models from scratch, with plenty of hands-on practice creating models and exporting results.

**Topic:** This hands-on workshop will provide an overview of the new capabilities of HEC-RAS 5. For over two decades, the US Army Corps of Engineers' free HEC-RAS software has been the industry-leading standard for hydraulic river modeling and channel design. Version 5, released in 2016, is a major update that allows engineers to model two-dimensional surface flow.

Class time will alternate between brief lectures and instructor-led hands-on practice with HEC-RAS at individual computers. Participants are expected to bring their own laptops to run HEC-RAS, and should have basic to intermediate familiarity with HEC-RAS 1D modeling. All participants will be provided with printed handouts of the lecture materials and worksheets, along with flash drives containing example datasets and a copy of HEC-RAS 5.0.4 (or newest version at the time of the training.)



SUMMIT ABSTRACTS

**WEDNESDAY – AUGUST 29, 2018**

**CONCURRENT EARLY BIRD WORKSHOPS – 8:00 AM - NOON**

**8:00 am – 12:00 pm**

**WORKSHOP 4: MANUFACTURED HOMES & FLOODPLAIN PERMITTING**

**Instructors:** John Johnston, PE, CFM/ City of Victoria  
 John Espinoza, PE, CFM/ City of San Marcos

**Topic:** This workshop will cover two topics, manufactured homes and the NFIP and the floodplain development permitting process. The first part of the workshop objectives include identifying measures to reduce damages to manufactured homes and identify applicable rules and standards. The second part of the workshop includes discussing the floodplain permitting process including reviewing what other communities are doing including the cities of Victoria and San Marcos. Throughout the workshop, questions from the attendees will be encouraged.

**8:00 am to 12:00 pm**

**WORKSHOP 5: LETTER OF MAP CHANGE FOR COMMUNITY OFFICIALS**

**Instructor:** Angela Batiz, PE, CFM/ LJA Engineering

**Topic:** Community officials and other attendees will receive an overview of the FEMA Letter of Map Change (LOMC) process from the perspective of an engineer that has successfully prepared hundreds of LOMC's. Community officials will be encouraged to share experiences, problems, and their solutions throughout the workshop. Topics will include:

- What are all these Types of Changes: Fill, Appeal, Conditional, Amendment, and Revision?
- When is a LOMC or Conditional LOMC Required?
- MT-1 and MT-2 Forms Overview
- What do Public Notices Really Tell the Public?
- Online vs. Paper Submittals
- Community Responsibilities
- The Disconnect between the Community Acknowledge Form and the Letter of Final Determination
- Engineering Terms for the Non-Scientist
- Where to Find and How to Interpret Data in the Flood Insurance Study to assist in your Technical Review
- Future Mapping Products and How they MAY Change the LOMC Process
- How Long does LOMC Take?

**8:00 am to 12 pm**

**WORKSHOP 6: REVIEWING HEC-RAS 2D MODELS FOR COMMUNITY OFFICIALS**

**Instructors:** Brandon Hilbrich, PE, CFM/ HDR Engineering  
 Sunit Deo, PE, CFM/ HDR Engineering  
 Kelley Rich, PE, CFM/ HDR Engineering

**Objective:** To understand the review process for HEC-RAS 2D models as well as be able to successfully review the models.

**Topic:** For past two years, the H&H community is delighted to see and use the official release of HEC-RAS 5.0 and its subsequent versions, which are public domain, free, trusted, and meticulously tested software from HEC and include fully 2-dimensional (2-D) and combined 1-dimensional (1-D) and 2-D unsteady flow modeling in addition to its traditional 1-D modeling capabilities. In this period, use of HEC-RAS for 2-D modeling has increased exponentially. The newest version of HEC-RAS 5.0.4, released in May 2018, has many added capabilities and features including faster speeds, variable time step, and 1D pre-processing (No need for GeoRAS anymore). This will attract even more users using this software. There are many advantages of using a 2-D RAS model, including the ease with which a 2-D model can be set up. Does that mean all 2-D models that run and provide results are justified and correct? That is the most important question when tasked with reviewing a 2-D model. This workshop will discuss good modeling practices and identify common mistakes that are overlooked in creating a 2-D RAS model. The workshop will include a live interactive demonstration of HEC-RAS 2-D during which all participants will play a reviewer's role in finding problems with the models. This workshop is not intended to teach attendees how to use HEC-RAS 5.0 and its 2-D capabilities; instead it will focus on providing information for those who review HEC-RAS 2-D models.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
 2018 Fall Technical Summit – August 28-31, 2018  
 San Antonio, Texas



SUMMIT ABSTRACTS

8:00 am to 12 pm  
 FIELD TRIP:

SAN PEDRO CREEK IMPROVEMENT PROJECT

**Tour Guides:** San Antonio River Authority Staff

**Topic:** Bexar County and the San Antonio River Authority, in coordination with the City of San Antonio, partnered to transform San Pedro Creek into a world-class linear park that represents the cultural identity of our community and inspires the people of Bexar County. The project will improve flood control, restore natural habitat and improve water quality, encourage economic development, celebrate San Antonio’s culture, and create connectivity in western downtown San Antonio. The project starts at the tunnel inlet near Fox Tech High School and winds through the 2.2 miles on the west side of downtown San Antonio. Work from the tunnel inlet near Fox Tech High School up to Houston Street was completed in time for the Bexar County 300<sup>th</sup> Anniversary celebration on May 5, 2018. This tour will start at the opened portion of the San Pedro Creek Culture Park from Santa Rosa to Houston Street, then continue on to the portions under construction from Houston Street to Dolorosa Street.

**NOTE:** In order to tour the portions of the project under construction, attendees must wear long pants (NO shorts) and closed toe shoes (NO sandals). Hard hats and vests will be provided, but please feel free to bring your own. If a tour of the construction site is not of interest, attendees are free to enjoy the San Pedro Creek Culture Park during this time – audio tours are available on our App (available to download for free).

**FULL CONFERENCE BEGINS AT 1:00 PM FOR THOSE THAT ARE REGISTERED FOR THE FULL CONFERENCE. IF YOU REGISTERED FOR WORKSHOPS ONLY, YOUR REGISTRATION IS COMPLETE. CONCURRENT SESSIONS MOVING FORWARD ARE FOR FULL CONFERENCE REGISTRATIONS ONLY.**

**AFTERNOON TECHNICAL CONCURRENT SESSIONS**

**TRACK A – HYDROLOGY & HYDRAULICS (PART 1)**

1:00 pm – 1:30 pm

**AI 1D/2D HEC-RAS – THE NEXT STEP IN FEMA MAPPING**

**Presenters:** Lonnie Anderson, PE, CFM/ Pape-Dawson Engineers  
 Brian Edmondson, PE, CFM/ Harris County Flood Control District

**Objective:** To understand the benefits of 1D/2D unsteady state modeling for flood risk determinations and applicability for use as a FEMA mapping product.

**Topic:** With a large percentage of flood damages occurring outside of the regulated floodplains across Harris County in recent years, a better reflection of flood risk is being sought. This presentation will discuss the use of 1D/2D Unsteady State modeling for a watershed remapping study being conducted by Harris County Flood Control District on Hunting Bayou. Hunting Bayou has a watershed of approximately 31 square miles in size with 30 river miles of channels located within the City of Houston, Texas. The entire watershed is a coupled 1D/2D model with 2D flow areas in the overbanks and 1D in the main channels and tributaries.

This presentation provides the audience with insight into how the modeling approach was developed, hydrologic conditions assigned and how the calibration results reflected historic events. We will also present the differences noted in comparison to the current effective FEMA mapping.

Additionally, discussion will be provided about how the models may be used in a regulatory fashion, along with some of the non-regulatory products envisioned.



**SUMMIT ABSTRACTS**

**TRACK A – CONTINUED:**

**1:30 pm – 2:00 pm**

**A2 APPLICATIONS OF 2D RAIN-ON-MESH IN GRAND PRAIRIE, TEXAS**

**Presenters:** Romin A. Khavari, PE, CFM/ City of Grand Prairie, Engineering  
 Jeff Whanger, PE, CFM, GISP, SIT/ RLG, Inc.

**Objective:** To be better able to understand, deploy, and implement the use of advanced surface water modeling to identify previously undocumented flood hazards.

**Topic:** The City of Grand Prairie has recently completed multiple regional rain-on-mesh 2D surface water flood modeling initiatives. Regional 2D surface water modeling has provided value and new insights to the City’s stormwater management efforts. From Citywide planning tools which identify local flood areas outside the FEMA floodplain, to neighborhood studies and even preliminary design models, these initiatives have applied this “up and coming” engineering method to develop better stormwater management solutions. This presentation will discuss the real-world application of this technology and some unique challenges specific to this approach.

**2:00 pm – 2:30 pm**

**A3 AVOIDING UNINTENDED CONSEQUENCES WITH 2D MODELING**

**Presenter:** Mathieu Leclair, PE, CFM, CPESC/ Pape-Dawson Engineers

**Objectives:**

- Demonstrate the use of 2D modeling to evaluate flow patterns to determine existing drainage issues that are not as clearly visible by typical drainage area delineation.
- Utilize 2D modeling results to aid in finding viable solutions for proposed conditions.

**Topic:** H&H engineers often do impact studies to support land development for private clients or infrastructure improvements for public entities with the goal of showing no adverse impact on adjacent properties. Many times it’s just a flow comparison...but it’s not always just about the flows! A comparison of pre-project vs. post-project flows may show no adverse impact, but when looking closer there can be potential for instances when flow can be inadvertently blocked, diverted, or redirected to another location which does cause an adverse impact.

Using 2D modeling can help mitigate these potential occurrences by identifying the natural drainage patterns so an impact study can truly assess the drainage hazards which exist and determine a solution which avoids these issues which would not have been found by simpler methods.

This presentation will showcase 3 examples where implementing 2D modeling can help avoid unintended consequences and impacts to an adjacent property.

**2:30 pm – 3:00 pm**

**A4 PLAZA SALTILLO - STORMCAD AND ICM ANALYSES**

**Presenters:** Andrew Rooke, PE, CFM/ CAS Consulting & Services  
 Chris Wright, PE/ AECOM  
 Glen Taffinder, PE, CFM/ City of Austin

**Objective:** Review the watershed planning approach and modeling methodologies used to mitigate flood risks in a rapidly re-developing urban watershed in Austin. Both StormCAD & ICM were used in the design process.

**Topic:** In response to the intense redevelopment surrounding the Plaza Saltillo TOD just east of downtown Austin, and the condition of its aging drainage infrastructure, the City tasked CAS Consulting to perform an analysis of the existing storm drain network, and to prepare a preliminary design for system improvements. URS/AECOM assisted the CAS team in the modeling efforts for the analysis and design. This presentation will discuss the processes, issues, and resolutions for development of models and design alternatives for the Plaza Saltillo drainage system, using both StormCAD and InfoWorks ICM modeling platforms



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK A – CONTINUED:**

3:30 pm – 4:00 pm

**A5 SUDA/XPSWMM/CORRIDOR MODELING: GONE WILD!**

**Presenters:** Justin Murray, PE/ Lockwood, Andrews, and Newnam, Inc.  
Ramin Howiadost, EIT, CFM/ Lockwood, Andrews, and Newnam, Inc.

**Objective:** By attending this session, attendees will learn new techniques to improve reliability of planning studies.

**Topic:** The Aldine Mail Route (AMR) study used MicroStation OpenRoads SS4 corridors, Subsurface Utility Design and Analysis (SUDA) modeling, and XPSWMM 1D/2D analyses to improve reliability of planning studies. The study focused on two components of flood recovery issues: 1) localized flooding, mitigation of RepLoss and Severe RepLoss properties; 2) regionalized benefit by enhancing performance of regional stormwater and transportation infrastructure. A preliminary rain-on-mesh model was run using InfoWorks ICM to clarify drainage area boundary assumptions given the flat nature of the terrain in the study area. Bentley OpenRoads corridor modeling and Subsurface Utility Design and Analysis (SUDA) was used to prototype storm sewer and channel routes to give confidence to design solutions, right-of-way needs, and provide a DTM for better modeling of flood protection post-project. The rapid prototyping allowed for multiple route analyses without the delays typically caused by 1D/2D XPSWMM model calculations. Corridor modeling was completed for each of the roadway corridors to be constructed above the storm drainage alignments. Multiple outfall routes were analyzed using the corridor model as a basis for making sure that adequate cover could be maintained at a schematic level in each route. This method also provided a realistic DTM for the 2D portion of the model so that flood storage could be accounted for when the storm drainage surcharged. Such completeness gives confidence that fewer major changes will result in design. Additionally, there is a higher confidence that the level of flood protection shown by the project modeling will ultimately be the result for the affected residents.

4:00 pm – 4:30 pm

**A6 MODELING TO REALITY: FROM CONCEPT TO CONSTRUCTION**

**Presenters:** Zhi Gao Lee, PE, CFM/ Jones|Carter  
David Cornyn, EIT/ Jones|Carter

**Objectives:** By attending this session, participants should be better able to:

- Implement innovative design solutions based on 2D modeling results.
- Get an overview of the erosion at the washout area.
- Outline the design constraints within the area, including the existing conditions, CenterPoint Energy Easement and designated wetlands.
- Get an overview of the 2D modeling performed for the design, including HEC-RAS.
- Discussion of design concepts for erosion protection and velocity mitigation.
- Highlight the key steps and complications of the construction.

**Topic:** As a result of the historical flooding that has occurred in the Houston area in 2015, 2016, and 2017, major erosion has occurred along rivers, channels, creeks and bayous throughout the Houston area. From damaged outfalls to major slope failures, Hydrology and Hydraulics engineers in Texas have been tasked with not only repairing these areas, but applying solutions that may prevent similar issues in the future. The use of Two-Dimensional (2D) modeling can be used to predict where areas of high velocities and potential erosion may occur. 2D modeling can also be applied to analyze how a proposed solution would perform under different scenarios. Once these solutions have been sufficiently analyzed, it is time to turn the model into reality.

Jones|Carter (JC) was the engineering consultant assigned to complete the repair of a large washout in south central Montgomery County. The area is located north of Spring Creek and south of the Harmony Development in Spring, TX. JC was tasked with repairing the area and mitigating the potential for future erosion and washouts. The washout occurred in an area that had existing soils with very low plasticity indexes. As well, the area contained both a CenterPoint Energy maintenance easement and designated wetlands. These constraints led to the implementation of innovative design concepts to lower the velocities, reinforce the slopes, allow for the wetlands to be returned to their natural condition and provide CenterPoint access across the area.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK A – CONTINUED:**

4:30 pm – 5:00 pm

**A7 XPSWMM: NEW HIGHLY PARALLELIZED SCHEME BENCHMARK RESULTS**

**Presenters:** Anthony Kuch, MSc (Eng)/ Innovyze  
Matthew Anderson, PE, CFM/ Innovyze

**Objectives:** To understand new simulation options in XPSWMM to improve model run times.  
To use objective measures for selecting Integrated 1D/2D Models.

**Topic:** Hardware and software advances now allow engineers to simulate Integrated 1D/2D Hydrologic and Hydraulic simulations with reasonable simulation times. XPSWMM is a nationally FEMA approved model for 1D and 2D hydraulics used extensively in Texas. Recent enhancements to XPSWMM now take advantage of multiple core processors and GPU cards in a new highly parallelized scheme. Previously, the software used a single core or was restricted to 2D only models using a GPU card.

This new solution scheme will be presented and benchmarked against the previous “classic” solution, InfoWorks ICM and HEC-RAS. The benchmarked models will be representative of Texas urban floodplain models and include traditional benchmark models from FMA and the UK Environment Agency. Fast model run times are the goal for risk based assessments involving many simulations and adaption of the model for flood forecasting and live modeling.

**TRACK B – INFRASTRUCTURE & ETHICS**

1:00 pm – 1:30 pm

**B1 RISK-BASED ASSESSMENT AND PRIORITIZATION OF TWENTY-THREE HIGH HAZARD DAMS IN URBAN SPRAWL TEXAS: A CASE STUDY**

**Presenters:** Kelley Rich, PE, CFM/ HDR Engineering, Inc.  
Sunit Deo, PE, CFM/ HDR Engineering, Inc.  
Cris Parker, PE, CFM/ HDR Engineering, Inc.

**Objective:** To know a case-study of a risk-based comprehensive approach to prioritizing dam safety projects.

**Topic:** The Upper Brushy Creek Water Control and Improvement District (District) operates and maintains twenty three small to medium sized, high hazard NRCS floodwater detention dams within the Upper Brushy Creek watershed located in Central Texas. The earthen embankment structures were built by the NRCS in the 1950s and 1960s in remote agricultural areas. The extensive urban sprawl in this area has resulted in numerous residential subdivisions nestled up against these previously isolated flood retarding structures with homes now existing directly downstream of many dams, crowding into auxiliary spillways, upstream flood pools, and downstream breach inundation areas. The rapid development coupled with the expiring original design life of these dams dramatically increased dam safety risk and consequences. Recognizing this problem, the District became a taxing authority in 2002 to generate revenue to start “buying down” the risk by proactively upgrading and maintaining the dams through a “Dam Modernization Program”.

The bulk of the modernization program was complete in 2012 but with continued development expanding within the watershed, significant remediation and maintenance work will be ongoing. Given this fact, the District desired a systematic approach to prioritize this future work. In 2017, the District started to develop a comprehensive risk-based assessment of its dam infrastructure to identify deficiencies and prioritize remediation and maintenance efforts and funding for the next ten years. Prioritization is based on evaluations of risk associated with current dam infrastructure conditions, updated hydraulic loading, potential failure mode analyses (PFMA), and estimated consequences. Hydrologic loading was updated using new statewide PMP data developed by TCEQ. Estimated loss of life consequences were developed using USBR’s Reclamation Consequence Estimating Methodology (RCEM) along with new dam breach analyses using HEC-RAS 2D modeling. PFMA workshops were conducted for each dam, ultimately resulting in a risk-based implementation plan of proposed remediation and O&M activities.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK B – CONTINUED:**

1:30 pm – 2:00 pm

**B2 THE WEST FORK SAN JACINTO RIVER AND THE BIG STORMS**

**Presenters:** Sam Hinojosa, PE, CFM/ Halff Associates, Inc  
Andrew Moore, PE, CFM/ Halff Associates, Inc  
David Parkhill, PE / San Jacinto River Authority

**Objective:** To use grant funds to enhance flood monitoring systems and develop calibrated hydrologic and hydraulic models to improve flood monitoring capabilities.

**Topic:** Lake Conroe is the 30 square mile water supply reservoir located in Montgomery and Walker Counties, and jointly owned by the San Jacinto River Authority and the City of Houston. Since the reservoir's completion in 1973, the SJRA has always sought to obtain as much real-time information as possible to best perform in its responsibilities for operation and maintenance of the dam and reservoir, and for maintaining dam safety. While the reservoir and its dam were not designed for flood control purposes, they have been shown to provide mitigation of potential downstream flooding that would likely occur in their absence.

In 2016, the SJRA received a grant from the Texas Water Development Board to develop the West Fork San Jacinto River Flood Protection Study (FPP). The goal of the FPP, which is being conducted in cooperation with Montgomery County and the City of Conroe, is to provide the SJRA greater real-time information about hydrologic conditions in the West Fork San Jacinto River.

This study includes installation of new rain gauges with expanded real-time hydrologic monitoring capabilities to provide even more data of river conditions. Additional data will also allow the study partners to develop updated runoff and water surface elevation model, as well as updated hydrologic and hydraulic models, for the area.

This presentation focuses on the TWDB study results including the data collection, hydrologic and hydraulic model development, model calibration, and expanded real-time hydrologic monitoring capabilities.

2:00 pm – 2:30 pm

**B3 WE'VE GOT A DAM PROBLEM (AND OPPORTUNITY)**

**Presenters:** Murphy Parks, PE / Freese and Nichols, Inc.  
Kenneth (Lynn) Schaub, CPESC/ Fort Hood Directorate of Public Works

**Objectives:** To understand dam safety regulations in Texas.  
To utilize asset management (AM) principles for dam ownership.

**Topic:** Fort Hood Directorate of Public Works is increasing installation resiliency by implementing a dam safety program to address its portfolio of 49 dams located throughout the cantonment and training areas. The focus of the dam safety program has been to protect public safety, protect the environment, and protect the installation's infrastructure investments by making sure the dams and lakes are safe, resilient, and risks are minimized.

Asset management principles have been utilized to develop dam condition assessments, quantify regulatory compliance status, implement a maintenance program, and develop a "roadmap" for future projects prioritization and investment. This presentation will: 1) provide an overview of the Fort Hood Dam Safety Program, 2) explain dam safety regulations in Texas, 3) discuss basic risk management strategies for dam owners, 4) discuss economic analysis of dam ownership, and 5) share valuable lessons learned throughout the program implementation.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK B – CONTINUED:**

2:30 pm – 3:00 pm

**B4 SAN PEDRO CREEK CULTURE PARK – PHASE 1.1 COMPLETION AND BEYOND**

**Presenters:** Steven Dean, PE, CFM/ Pape-Dawson Engineers, Inc.  
Kerry Averyt, PE / San Antonio River Authority  
Ron Branyon, PE, CFM, CSM/ HDR, Inc.

**Objective:** To leverage a public drainage project into a public amenity/park.

**Topic:** The San Pedro Creek Culture Park project is landmark project for Bexar County, San Antonio River Authority and the City of San Antonio. This project is taking a drainage improvement/flood control project and leveraging it to become a linear park, a focal point for activity for the San Antonio Residents and an opportunity to share the history of the San Antonio, which celebrated its 300th anniversary in May 2018.

The amazing section of Phase 1.1 was completed in time for the tri-centennial celebration. Phase 1.2 is currently in design with a construction start of late 2018. With the placement of art and other amenities it is hard to believe this is a flood control project. Phase 1.2 will continue the vision of the linear Culture Park while providing much needed drainage improvements to the people of San Antonio.

Through this presentation, we will review and expand on all these challenges and how they were mitigated. These include extensive utility coordination along with coordination with USCOE, Texas Historic Commission, FEMA, TCEQ, San Antonio River Authority, Bexar County, City of San Antonio and others.

3:30 pm – 4:00 pm

**B5 PROMOTING LOW IMPACT DEVELOPMENT - GETTING DEVELOPER BUY-IN**

**Presenter:** Joseph duMenil, CFM/ Construction EcoServices

**Objective:** Understand the value proposition associated with Green Infrastructure/Low Impact Development and how to communicate that to the development community.

**Topic:** It's obvious that green infrastructure offers a multitude of ecological benefits that development throughout Texas should be taking advantage of. If this is true, then why is it so hard to get developers to use it? The reason is simple; we aren't speaking their language. This session will dive deep into how to persuade your next developer or municipality to move towards a business model that encompasses green infrastructure by focusing more on why they should utilize it and focusing less on what it is.

4:00 pm – 5:00 pm

**B6 & B7 ENGINEERING ETHICS**

**Presenter:** Gina Smith, SPHR/ Freese and Nichols, Inc.

**Objectives:** To recognize ethical situations faced by engineers.  
To analyze the issues of an ethical situation.  
To resolve the situation in a creative and professional manner.

**Topic:** During this session, participants will discuss the definition of ethics and explore the National Society of Professional Engineers (NSPE) Professional Code of Ethics for Engineers. Participants will apply the NSPE Code of Ethics to case studies published by the Board of Ethical Review (BER). This class will equip participants to be confident in handling ethical situations that may arise.

During the session's lecture, participants will discuss definitions of Ethics and reflect on which one best fits their personal code of conduct. The NSPE Code of Ethics will be introduced and it's six fundamental cannons reviewed.

The remainder of the workshop is highly interactive, during which participants will review pertinent case studies published by the Board of Ethical Review. Small group discussions of each case will enable dialogue about ethical behavior in each situation. The facilitator will ask groups to report their opinion of the case and cite supporting sections in the NSPE Code of Ethics. Finally, the groups will review the BER's decision on the cases.



SUMMIT ABSTRACTS

**TRACK C – WATERSHED MANAGEMENT**

**1:00 pm – 1:30 pm**

**C1 LOW WATER CROSSING PRIORITIZATION IN THE CIBOLO CREEK WATERSHED**

**Presenters:** Brett Sachtleben, PE, CFM/ Atkins North America, Inc.  
 Erin Cavazos, PE, CFM/ San Antonio River Authority  
 Darren Siegmund, EIT/ Atkins North America, Inc.

**Objective:** To identify dangerous stream crossings and prioritize stream crossings for improvement.

**Topic:** The San Antonio River Authority has recently completed the Cibolo Creek Holistic Watershed Master Plan which identified risks throughout the watershed associated with flooding, water quality and stream health. The master plan ultimately provided communities with a list of sustainable solutions to address these risks. Evaluating and recommending improvements to low water crossings was a major component of the master plan. The master plan quantified flood risk at each of the modeled crossings, developed a prioritized list of dangerous crossings and recommended improvements to the most dangerous of these crossings. Crossing flood risk was quantified using guidance found in the City of San Antonio Unified Development Code (UDC), which categorizes crossings as either “safe” or “dangerous” based upon anticipated overtopping depth and overtopping velocity. This process was refined to yield a single number, a dangerous crossing factor, to reflect the potential for dangerous overtopping events at each of the 97 modeled crossings in watershed. The crossings were prioritized using the calculated dangerous crossing factors, average daily traffic (ADT) and the distances to the nearest safe crossing.

This presentation will discuss the master plan’s methodology for identifying dangerous crossings, present the process for prioritizing crossings for improvement, and provide a brief overview of the low water crossing recommendations from the Cibolo Creek Holistic Watershed Master Plan.

**1:30 pm – 2:00 pm**

**C2 FALLWELL LANE FLOOD MITIGATION: A COLLABORATIVE APPROACH TO OPTIMIZE THE RETURN ON INVESTMENT**

**Presenters:** Ashley Lowrie, PE/ Halff Associates  
 Thuan Nguyen, PE, PMP, CFM/ City of Austin

**Objective:** To consider multi-discipline, integrated solutions while also accomplishing flood mitigation.

**Topic:** Fallwell Lane area includes several City of Austin infrastructure assets including the South Austin Regional (SAR) Wastewater Treatment Plant (WWTP). This area was severely damaged by flood waters in October 2013 and October 2015. Massive sheet flowed from Onion Creek passed over banks to inundate this low area and flowed into the Colorado River. Bank erosion along this portion of the Colorado was severe and requires stabilization. Additionally, flood waters nearly overtopped the berm that protects this area, further jeopardizing valuable city assets. Texas Commission on Environmental Quality requires wastewater treatment facilities to have a minimum of one all-weather access road above the 100-year floodplain. Fallwell Lane serves as the single access road for the SAR WWTP, and is currently within the 100-year floodplain. While TCEQ has grandfathered the SAR WWTP from this rule, Austin Water Utility cannot expand the plant as currently planned, without meeting this all-weather access rule.

Austin is expected to adopt NOAA Atlas 14 rainfall depths within the next year. These Atlas 14 rainfall depths are expected to increase to the current preliminary FEMA 0.2% ACE (500-yr). Without final rainfall data, the existing FEMA 0.2% ACE event was used for evaluation of conceptual alternatives. This was important to consider when establishing the criteria for a flood mitigation solution.

This project has several goals: reconstruct Fallwell Lane above the 100-yr floodplain, raise the existing berm above the 100-yr floodplain, adjust several utilities, and stabilize the Colorado River bank. The variety of needs and constraints with this project brings many challenges: flood protection, relocation of Fallwell Lane, environmental impacts, conflict with utilities, land and easement acquisition, levee compliance, etc. Several combinations of alternatives were analyzed and compared to find a solution that meets the goals of the project while still being easily maintained, efficient, and cost effective.



SUMMIT ABSTRACTS

**TRACK C – CONTINUED:**

2:00 pm – 2:30 pm

**C3 OVERCOMING CHALLENGES - IMPROVING A STORM DRAIN SYSTEM IN AN URBAN SETTING**

**Presenter:** Annabell Ulary PE, CFM/ City of Austin, Watershed Protection Department

**Objectives:** Understand the difficulties in reducing the risk of localized flooding within a fully developed urban watershed.  
 Evaluate adverse impact mitigation alternatives that are different than the standard approaches.  
 Evaluate the implementation of small pro.

**Topic:** It’s been said before that the majority of localized flooding problems are in areas that used to be creeks or open channels. That is exactly the case in Austin’s Annie Street Storm Drain Improvement area. The storm drain system in this area was installed in the 1920s when the neighborhood was developing. Unfortunately the pipes are too small for the amount of runoff that needs to be conveyed and many of them were installed along the natural flowpaths which are now under houses. Not surprisingly, residents experience frequent flooding during storm events. However, solving this drainage problem isn’t as simple as upgrading the system with bigger pipes in the streets. Allowing more water to drain to the creek faster may solve the problem for houses in the neighborhood, but increases flood risk for creekside houses. This project needs to overcome the challenges of working in an urban watershed to reduce the risks of localized flooding.

2:30 pm – 3:00 pm

**C4 ONE WATERSHED, ONE PLAN: CASE STUDY OF INTEGRATED WATERSHED PLANNING FRAMEWORK**

**Presenter:** Shawn Tracy/ HR Green, Inc.

**Objectives:** Integrated Watershed Planning  
 Legislative Framework  
 Planning and Implementation

**Topic:** Watershed-based sustainable implementation via integrated planning is growing, with agencies like the EPA, NACWA, WEF, APWA, and ISI providing guidance and recommendations for watershed management. Multifunctional planning promotes sustainability and with that idea in mind, comprehensive watershed management is being used in Minnesota to prioritize, target and measure implementation programs and projects that address multiple benefits for each dollar spent within the watershed. Utilizing this approach, flood damage reduction and landscape and infrastructure resiliency efforts can be paired with water quality, water supply, habitat and recreational use benefits.

In 2011, a state legislation was passed that allowed local governments charged with water management responsibility to organize and develop focused implementation plans on watershed boundaries. This legislation is referred to as One Watershed, One Plan (1W1P). This presentation provides an overview of the formation of the Watershed Approach and Minnesota’s One Watershed, One Plan process that achieves truly comprehensive, optimized water management on the HUC8 to field scale.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK C – CONTINUED:**

3:30 pm – 4:00 pm

**C5 FLOODPLAIN IMPROVEMENTS IN EXISTING FULLY DEVELOPED COMMUNITIES**

**Presenter:** Steve Sparks, PE, CFM / HR Green, Inc.

**Objective:** To understand the complexities involved in stormwater management and drainage improvements when working in a fully developed area.

**Topic:** This three phase, \$40M drainage and pavement improvement project provides storm sewer improvements and a new outfall structure into Buffalo Bayou. This project achieved the following:

- relieving an undersized storm sewer system that provides conveyance for a 1,070 acre drainage area located near downtown Houston;
- improving local flooding problems by installing approximately two miles of 10 ft. x 10 ft. concrete boxes;
- relieving an undersized outfall from excessive flows that have caused flooding by subdividing the existing drainage area; and
- redirecting additional flows when the system becomes overloaded by intercepting numerous storm sewer pipes and connecting to the existing outfall system.

The location near downtown Houston presented additional challenges because improvements were constructed within existing road rights-of-way in a densely populated area consisting of schools, condominiums, apartments and retail establishments. As a result, mitigation of traffic impacts, control of heavy pedestrian traffic, maintaining driveway access to local properties and coordination around public events in a nearby City of Houston park were major design considerations.

Considering the limited shared space along the route, HR Green coordinated the relocation of existing water and sewer facilities and private utilities within the right of way to eliminate disrupting utility services during the installation of large storm sewer boxes. Construction of the storm sewer was predominantly by open cut with selective tunneling used at major traffic routes and where major utilities could not be moved.

4:00 pm – 4:30 pm

**C6 7TH AVENUE CREEK FLOOD MITIGATION MASTER PLAN**

**Presenter:** Ajay Jain PE / HR Green, Inc.

**Objectives:** Learn methodologies utilized in developing a comprehensive flood mitigation master plan along a riverine floodplain in order to meet multiple objectives.  
Learn about funding opportunities.  
Learn about sustainable flood mitigation alternatives.  
Learn how to build consensus with stakeholders.

**Topic:** During the 2008 flood, the 7th Avenue Creek flood extents impacted many residential and commercial structures, including roadways. While the 2008 flood was not even a 100-year flood, the flood extents reached wider than the regulatory 100-year flood map. City in partnership with FEMA is undergoing a map revision. Approximately 118 properties (55 residential and 13 commercial structures) are impacted. Concurrently, the City has been proactively working on a master plan to mitigate the impacts of the new revised floodplain and floodway. Challenges include urban stream corridor with limited right of way and social and economic impacts. The master plan includes identification of projects including a phasing and implementation plan that will require property acquisition, floodplain enhancement, habitat improvements, and natural areas along the creek including trails and recreation. The presentation will discuss the City's master planning process including public engagement process, funding options and City's plan going forward.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
 2018 Fall Technical Summit – August 28-31, 2018  
 San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK C – CONTINUED:**

4:30 pm – 5:00 pm

**C7 THE IMPACT OF REGIONAL DETENTION**

**Presenter:** Shannon L. Nave, PE, CFM/ Baird, Hampton, and Brown, Inc.

**Objective:** To see the value of regional detention ponds and the roles government, developers, and citizens have in their planning and implementation.

**Topic:** Site drainage has long been a key component of civil site design. In recent years onsite detention has become the ubiquitous answer to minimize downstream drainage impacts. This may take the form of a detention pond for a single site or a single subdivision, but they rarely have secondary benefits (recreation or aesthetics), and they are often considered a loss of developable land, an eyesore and a maintenance headache.

A regional detention pond is a potential solution that, in the right circumstances, can require a smaller total foot print than several individual detention ponds, provide secondary benefits such as open spaces or parks, and greater ease of maintenance.

This presentation discusses case studies of three very different regional detention ponds. The first pond was implemented by a city that removed repetitive loss structures by the purchase and demolition of some structures for the pond site which removed downstream structures from flooding. The second pond comes from a consortium of developers planning and participating in a regional pond that allowed each of them to utilize more of their property for development while realizing an economic savings. This pond also decreased downstream flows and provided a park area with a dual purpose soft surface hike and bike trail. The final pond was the result of the initiative of the local government and developers to both address preexisting local drainage concerns and to open large areas to new development in a single pond with only limited storm drain improvements.

Each of these cases are very different, but each one required forethought, planning and cooperation, and each provide substantial benefits to the participants and the communities in which they are found. This presentation will discuss the planning process as well as the advantages and disadvantages of regional detention pond.

**TRACK D – FLOODPLAIN MANAGEMENT & FUNDING**

1:00 pm – 1:30 pm

**D1 CRS ACTIVITY 540 DRAINAGE SYSTEM MAINTENANCE**

**Presenter:** Deidra Mares, CFM/ Insurance Services Office

**Objectives:** Create an inventory.  
 Map the drainage system.  
 Sample inspection records.

**Topic:** New and existing CRS Communities often struggle with CRS Activity 540 Drainage System Maintenance. We will walk through how to successfully put together a submittal for Activity 540 Drainage System Maintenance.

Preparing documentation for 540 Drainage System Maintenance ahead of the CRS visit is particularly helpful and can make a difference in the turnaround time of the cycle or new application. We will dive into some examples and how to clean up documentation.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
 2018 Fall Technical Summit – August 28-31, 2018  
 San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK D – CONTINUED:**

**1:30 pm – 2:30 pm**

**D2 & D3 GRANTS, HMAP, AND CRS: HOW THESE PROGRAMS HELP COMMUNITIES BECOME MORE FLOOD RESILIENT**

**Presenters:** Janine E Ellington, CFM/ LAN, Inc.  
 Laura Casset, PE, CFM, CPESC/ LAN, Inc.

**Objective:** To understand how the various federal programs available to communities can help them become less flood prone and more resilient.

**Topic:** To be more flood resilient, a community should take into account actions that can make the community less prone to flooding and save tax payer money. FEMA has created programs that help communities achieve these actions, and this session will provide in-depth knowledge on how these programs are designed to help communities become more resilient. Federal and State Grants from a variety of agencies help with planning and the building of infrastructure to reduce the effects of flooding. A Hazard Mitigation Action Plan is designed as a planning tool, so a community has a “users manual” on how to achieve their goals over time, and CRS is the rewards program for following through and becoming more resilient. If you would like learn how these programs can benefit all communities who are in the NFIP, this is the session to attend.

**2:30 pm – 3:00 pm**

**D4 COMBINING PROJECT FUNDS FOR A WIN, WIN, WIN AT THE OL' BALL GAME!**

**Presenters:** Justin Murray, PE/ Lockwood, Andrews, and Newnam, Inc.  
 Kelly Craighead/ City of Cibolo

**Objective:** Attendees will gain meaningful ways to combine project needs for funding infrastructure enhancements that result in other benefits for a better project.

**Topic:** How do municipal governments build quality of life projects, maintain MS4 compliance, and enhance the beauty of an otherwise utilitarian infrastructure component? Low Impact Development (LID). The city’s MS4 program requires the establishment of Green Infrastructure (GI) design guidelines. With no other GI in the city, they sought to create a demonstration project which would be used as an example and test project for future Design Criteria Manual and Unified Development Code (UDC) updates. The result was combining a need for detention to offset increases in runoff from a proposed ballpark. The city constructed more than 10,000 sq. ft. of bioswales using the San Antonio River Authority (SARA) Low Impact Development Design Guidance Manual. Allowed to infiltrate into the underlying soils, these bioswales are unique given the stratigraphy of the San Antonio area. By utilizing these techniques the City avoided spending limit public funds on creating a detention pond to accomplish the peak runoff reductions, gained a demonstration project, and enhanced the otherwise utilitarian parking lot. Throughout construction insight was gained into the improvements that could be incorporated into the design and construction requirements of code revisions. Since construction was completed, City maintenance staff have gained beneficial knowledge of the function and maintenance requirements for GI. Cibolo Director of Parks & Recreation will comment on the “lessons learned” from the incorporation of these facilities.



**SUMMIT ABSTRACTS**

**TRACK D – CONTINUED:**

**3:30 pm – 4:00 pm**

**D5, D6 & D7 DEVELOPING GOOD ELEVATION GRANTS & FLOOD MITIGATION FUNDING**

**Presenter:** Kathy Hopkins, CFM, CTCM/ Texas Water Development Board

**Objectives:** Homeowner engagement  
 Understanding Budget Development  
 Identifying potential structures for elevation  
 FEMA approved BCA Methods  
 Better understanding of the different flood mitigation funding opportunities at the TWDB. How to optimize those funds, and what the successful implementation of those funds looks like.

**Topic:** Over the past five years, flooding has become a major concern among property owners and communities throughout Texas. Community officials are struggling with identifying and determining the best mitigation solutions that will improve the flood resiliency of their communities. Traditionally in Texas, acquisition and demolition of flood-prone structures has been the main mode of mitigation, but times are changing. Communities are becoming more aware of the benefits of structural elevation—that is, elevation as a part of an overall, well-planned flood mitigation strategy. As a result, grant funding for elevation is becoming more competitive.

This presentation will discuss the key elements to developing a successful (competitive) grant application for the elevation of existing flood-prone structure as a mitigation action under FEMA’s Hazard Mitigation Assistance programs. In addition, the discussion will include tips on best practices and clarification of grey areas and actions to avoid.

The changeable Texas weather has always kept Texans on their toes. Within a single year, Texans could experience extreme drought which could be quickly followed by massive flooding. Communities are consistently looking for mitigation solutions to ensure that their communities are more resilient to future extreme weather events.

This presentation will discuss the different funding opportunities available at the Texas Water Development Board for planning, identifying risks, and flood mitigation through State and Federal programs. The discussion will end with some success stories illustrating how Texas communities optimized these funding opportunities to become more flood resilient.

**TRACK E – FEDERAL AGENCY UPDATE**

**1:00 pm – 2:00 pm**

**E1 & E2 InFRM – HOW FEDERAL AGENCIES ARE WORKING TOGETHER TO SUPPLY DATA THAT COULD HELP INFORM AND SUPPORT FLOOD DISCUSSIONS**

**Presenters:** Jerry Cotter/ US Army Corps of Engineers Fort Worth District  
 Kristine Blicherstaff/ US Geological Survey

**Topic:** Extreme Weather and Weather Anomalies - What the Federal Agencies Are Doing and What You Can Be Doing to Make Texas Better Prepared

Texas experiences significant variability in climate and weather. Since 2015, Texas has experience a significant number of extreme storms, including Hurricane Harvey. In response, the federal agencies are engaged in brining NOAA Atlas 14 to Texas, Watershed Hydrology Assessments, Inundation Mapping and Mitigation Planning Mapping Tools. There are things the engineering and scientific community as well as state, and local leaders, to help prepare make Texas more resilient and prepared for these events.

During the recent Texas floods of 2015, 2016, and 2018 state and local emergency managers were searching for real-time inundation mapping from all available sources to help guide their emergency response efforts. Generation of inundation mapping products during a flooding event poses many challenges such as identification of available models, identification of available topographic data sets and knowledge of exactly where inundation maps will be needed to best benefit local emergency managers. These inundation mapping products could be developed in advance of an actual event and prepositioned for use by decision makers, emergency responders, and the public via the InFRM Flood Inundation Mapping viewer.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK E – CONTINUED:**

2:00 pm – 3:00 pm

**E3 & E4 DATA FOR THE MASSES – BASE LEVEL ENGINEERING & THE ESTIMATED BASE FLOOD ELEVATION VIEWER**

**Presenter:** Larry Voice, CFM / FEMA Region VI

**Topic:** Strategic investments over the past couple years have produced hundreds of thousands of miles of flood risk information throughout the states of Arkansas, Louisiana, New Mexico, Oklahoma and Texas. FEMA Region 6 embarked on developing an Interactive Viewer to allow residents, communities and states to interact and utilize this information publicly. The information shared through this viewer includes stream wide network analysis prepared with 1D and 2D modeling approaches to produce estimated flood extents, water surface elevation grids, depth grids and flood risk assessments.

The Estimated Base Flood Elevation Viewer (estBFE) is the initial release of interactive mapping platform to allow residents, communities, emergency management, local and regional planners and watershed groups to interact with flood risk, providing an overview of flood potential based on the Region's Base Level Engineering efforts. Personal reports allow users to interact with engineering results, returning point and click estimated water surface and estimated flood depth within the regulatory floodplain.

3:30 pm – 4:00 pm

**E5 HARVEY FLOOD INUNDATION MAPPING AND FLOOD FLOW FREQUENCIES**

**Presenters:** Kara Watson/ US Geological Survey  
Glenn Harwell/ US Geological Survey

**Topic:** In the immediate aftermath of the Hurricane Harvey-related flood event, the U.S. Geological Survey (USGS) and the Federal Emergency Management Agency (FEMA) initiated a cooperative study to evaluate the magnitude of the flood, determine the probability of occurrence, and map the extent of the flood in Texas. Seventy-four USGS streamflow-gaging stations in Texas with at least 15 years of record and no large data gaps in the period of record had a 2017 annual peak streamflow related to Harvey ranking in the top five of all annual peaks for a given station. New peaks of record streamflow were recorded at 40 of the 74 USGS streamflow-gaging stations. The number of years of peak streamflow record for the 74-analyzed streamflow-gaging stations ranged from 18 to 105, with a mean number of 55 years. The annual exceedance probability estimates for the analyzed streamflow-gaging stations ranged from less than 0.2 to 14.0 percent. USGS field crews identified 2,123 high-water marks (HWMs) with a depth above land-surface measurement recorded in feet, resulting in 1,258 surveyed water-surface elevations. Using a selection of these HWMs, 19 flood inundation maps were created to document the extent and depth of the flooding within selected communities.

4:00 pm – 4:30 pm

**E6 COLLABORATIVE FORECAST OPERATIONS DURING HURRICANE HARVEY**

**Presenter:** Greg Waller/ National Weather Service West Gulf Forecast Center

**Topic:** When the forecast isn't enough...scientists must find new methods to communicate the threat and convey the urgency of action of an approaching storm. Hurricane Harvey posed multiple significant threats to Texas, ranging from high winds and ocean surge associated with the onset of a major hurricane to the catastrophic impact of intense heavy rainfall associated with a slow moving tropical system. The National Weather Service (NWS) River forecast Centers (RFCs) provide flood guidance to the Weather Forecast Offices (WFOs) that issue the various river flood products out to the public. As Harvey approached the coast, it was apparent that the NWS needed to adjust and expand the messaging of this event to appropriately educate and warn the public. The West Gulf RFC used a coordinated and collaborative approach with NWS offices and federal, state and municipal stakeholders to ensure consistent messaging of the impending threat to address national, regional, state, and local interests.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK E – CONTINUED:**

4:30 pm – 5:00 pm

**E7 100-YEAR PEAK FLOW ESTIMATE FROM OBSERVED FLOWS: SHOULD YOU OR SHOULD YOU NOT?**

**Presenter:** Heirem Ghanuni/ US Army Corps of Engineers District

**Topic:** Utilizing gage statistics has always been a quick, and somewhat painless, way of determining frequency flows. Gathering data, processing terrain, developing variables and assembling models can be very time consuming and expensive making gage statistics that much more alluring. Are there possible pitfalls? Are there situations where gage statistics should or shouldn't be used? This presentation will illustrate a few of the findings of recent USACE studies involving statistical and deterministic methods. Differences in methodology and possible causes will be presented illustrating how data availability, physical factors, and climate variability can all impact the results of statistical analysis.

**THURSDAY – AUGUST 30, 2018 - PLENARY SESSION**

8:00 am – 8:15 am

**OPENING SESSION SUMMIT WELCOME**

8:15 am – 9:00 am

**LOUISIANA FLOODPLAIN MANAGEMENT ASSOCIATION – DISASTER RESPONSES TEAM**

**Presenter:** Shandy Heil, CFM/ Louisiana Floodplain Management Association/ Stantec

**Objective:** Understand considerations for the formation of a disaster response team.

**Topic:** DRT 101 – This presentation will describe the steps taken by the Louisiana Floodplain Management Association (LFMA) to form their Disaster Response Team (DRT), providing guidance and lessons learned for other states wishing to form a DRT.

9:00 am – 9:30 am

**SLOW DOWN – ADVICE FOR THE FLOODPLAIN MANAGER, DESIGN PROFESSIONAL AND ALL THE US**

**Presenter:** Kevin Shunk, PE, CFM/ City of Austin

**Objective:** To make more effective decisions under pressure have a better understanding and appreciation of their work assignments; and be happier.

**Topic:** Life comes at you fast. We are all busy being floodplain managers, design professionals, or planners in addition to having lives outside of the workplace. It would serve us well in addition to our clients, residents, and family to slow things down and take time to think through the decisions we have to make. Whether you are responding to a significant flood event in the Emergency Operations Center, preparing to compare design alternatives on a major flood risk reduction project, or trying to decide what to do with your family this weekend, I recommend that you slow things down and think through the options of each decision. I plan on sharing a significant life experience that is teaching me that slowing down pays dividends in many ways. After this discussion I hope you are better able to make decisions under pressure, have a better understanding and appreciation of your work assignments, and be happier overall.



**SUMMIT ABSTRACTS**

**PLENARY SESSION CONTINUES:**

**9:30 am – 10:00 am**

**THE NATIONAL FLOOD INSURANCE PROGRAM – A RISKY BUSINESS**

**Presenter:** Mark Lujan, CFM / FEMA

**Objective:** Learn about the NFIP and risk factors.

**Topic:** This presentation will high-light the National Flood Insurance Program (NFIP) and the various risk factors. Hurricane Harvey damages will be discussed including asking the question, how would my community be impacted if Harvey had visited including New Orleans and the DFW area.

**10:30 pm – 11:00 am**

**UPDATE ON EFFORTS TO CREATE THE FIRST STATE FLOOD ASSESSMENT FOR TEXAS**

**Presenters:** Mindy M. Conyers Ph.D./ Texas Water Development Board  
 Carla G. Guthrie Ph.D./ Texas Water Development Board

**Objective:** To be better able to understand the State Flood Assessment effort and communicate the key takeaways from the information gathered.

**Topic:** In 2017, the 85th Texas Legislature passed an exceptional item directing the Texas Water Development Board (TWDB) to survey floodplain managers about their flood mitigation projects, associated costs, and thoughts on the future of flood planning in Texas. We gathered information on existing programs, risks, and needs for floodplain management and mitigation through extensive outreach in spring 2018 via workshops, conferences, and an online survey. This summer we posted the draft State Flood Assessment report for public comment and held a work session to round out opportunities for stakeholder participation. This presentation highlights the results of this effort and provides a preview of the final report to be delivered to the Texas Legislature prior to the 2019 session.

**11:00 am – 11:30 am**

**TEXAS COOPERATING TECHNICAL PARTNERS PROGRAM UPDATE**

**Presenter:** Manuel Razo, GISP, CFM/ Texas Water Development Board

**Objective:** To understand what the TWDB is doing with the Cooperating Technical Partners Program to update the Flood Insurance Rate Maps in Texas.

**Topic:** The TWDB will discuss the upcoming projects for the Cooperating Technical Partners program and give a brief overview of Base Level Engineering data and its availability through out the state.

**11:30 am – 1:30 pm TFMA MEMBERSHIP LUNCHEON**

**AFTERNOON TECHNICAL CONCURRENT SESSIONS - TRACKS F, G, H, I, J**

**TRACK F – HYDROLOGY & HYDRAULICS (PART 2)**

**2:00 pm – 2:30 pm**

**F1 HARNESS THE POWER OF 2D FOR ROAD DESIGN**

**Presenters:** Justin Oswald, PE, CFM/ Freese and Nichols, Inc.  
 Boris Minot, PE, CFM/ Freese and Nichols, Inc.

**Objectives:** Understand the capabilities of HEC-RAS to model proposed culvert crossings in 2D simulations.  
 Know what to consider when selecting a modeling method.  
 Learn the process for performing alternatives analysis in a 2D model.

**Topic:** 2D modeling has become a valuable tool for designing roadways. Its greater level of detail enables design teams to evaluate how specific improvements would perform, especially within complex floodplains. As a case study, this presentation examines the Alsbury Boulevard extension project in Burleson, Texas. This new roadway will cross the floodplain of Shannon Creek near its confluence with a minor tributary; the floodplain has been significantly altered by landowners, causing floodwaters to flow in unexpected ways. The proposed road will be constructed on fill above the floodplain, obstructing the flow of water. The project design team used HEC-RAS in 1D and 2D to evaluate the impact of this fill and evaluate multiple alternative designs to pass the base flood without impacting adjacent properties.



**SUMMIT ABSTRACTS**

**TRACK F CONTINUES:**

**2:30 pm – 3:00 pm**

**F2 FAR WEST TEXAS HYDRAULICS AND FLOODPLAIN MITIGATION**

**Presenter:** Rodrigo Vizcaino, PE, CFM/ HDR

**Objective:** Understand the history and challenges of hydraulics and floodplain mitigation in far West Texas.

**Topic:** Climatic and terrain conditions in far west Texas are different than any other region in the big state. This is an arid region with mountainous terrain and silty and sandy soils. Although not as frequent as other Texas regions, strong storm events can happen and can cause severe flooding and devastation. This presentation will discuss some of the flooding history in the El Paso region; it will review natural formations and terminology in this region as it relates to meteorology, hydrology and hydraulics, and will also discuss recent project challenges related to drainage infrastructure.

The frequency of flooding in El Paso has not occurred as often as other Texas regions that are closer to the gulf. However, when the right storms have hit, they have created a significant devastation. The region regularly sees monsoons in the late summer. These heavy rains fall on steep and mountainous terrain that can be dangerous as runoff makes its way to lower valley areas. Alluvial fans and arroyos are common to this region and over time, the deposits accumulate along culverts and storm drain increasing the risk of flooding.

HDR has worked on various projects in El Paso that have presented challenging design conditions for transportation and flood mitigation related projects. Runoff can rush down the arroyos carrying a vast amount of sediment and silt. The USACE has built various retention/detention basin structures in an attempt to stop and collect these fast moving waters and avoid an impact to the highway and the lower Rio Grande communities. However, these are not sufficient and more growing urban areas are threatened by these rushing waters. The presentation will identify the challenges in analyzing and designing these retention structures in an attempt to mitigate potential floodplain impacts to downstream vulnerable communities.

**3:00 pm – 3:30 pm**

**F3 FORENSIC STUDY OF RESIDENTIAL FLOODING UPSTREAM OF ADDICKS RESERVOIR DURING HARVEY**

**Presenter:** Pol Bouratsis, PhD/ AECOM

**Objective:** To develop efficiently coupled 1D-2D models in HEC-RAS.

**Topic:** When Hurricane Harvey hit Houston in August 2017, Addicks and Barker reservoirs became a national focus. Unprecedented reservoir stage elevations and release rates caused severe flooding in the areas upstream and downstream. This presentation focuses on the technical aspects of a forensic study that was carried out for a residential area located upstream of Addicks reservoir. Coupled unsteady 1D-2D modeling was carried out in HEC-RAS to simulate the Hurricane Harvey rain event and examine the timing of locally driven and regionally influenced flooding in the area. Precipitation time series were developed via rainfall radar data and were applied as “rain-on-grid” in the model. FEMA models and stream-gage stage hydrographs in upstream channels and in the reservoir were also integrated in the model. Additionally, digital building footprints were developed via image processing of publically available maps to enhance the accuracy of the terrain and the surface runoff. The results of the study provide insight on the effects of differing reservoir stage elevation on flooding in the upstream communities.

**4:00 pm – 4:30 pm**

**F4 HURRICANE HARVEY, BEFORE, DURING, AND AFTER**

**Presenters:** Hector Olmos, PE, CFM/ Freese and Nichols Inc.  
 Mike Stone, PMP, CFM/ Fort Bend County Levee Improvement District #2

**Objectives:** Understand how a levee system works.  
 Understand the drainage criteria used in Fort Bend County.  
 Learn how FBCLID2 and Sugar Land dealt with Hurricane Harvey.

**Topic:** Hurricane Harvey produced a flood record on the Brazos River and more than \$5 billion in property was protected from this flood by Fort Bend County Levee Improvement District No. 2 (FBCLID2). Harvey produced over 31-in of rain inside the levees, flooding over 200 homes. Immediately following Harvey, FBCLID2 partnered with the City of Sugar Land and Freese & Nichols (FNI) to perform an H&H analysis in all neighborhoods with flooded homes. FNI completed their study of both City storm sewers as well as FBCLID2 drainage ditches and pump stations.

Less than 6 months after Harvey, FBCLID2 has engaged engineering firms to begin the design for a new pump station and evaluate other improvements. The FBCLID2 prompt and analytical response to Harvey included many public forums to keep all residents informed of what happened during Harvey and, more importantly, what will be done to keep it from happening again.



**SUMMIT ABSTRACTS**

**TRACK F CONTINUES:**

**4:30 pm – 5:00 pm**

**F5 WHAT WAY TO GEAUX? A NEW WATERSHED PLANNING TOOL FOR SOUTHEAST LOUISIANA**

**Presenters:** Jacob Lesue, PE, CFM/ Dewberry  
 Matt Deshotel, EIT, CFM/ Dewberry

**Objective:** To learn new technology and improved approaches for performing flood risk management on a watershed level.

**Topic:** In August 2016, southeast Louisiana was devastated by a slow-moving system that dumped more than 30 inches of rain in parts of East Baton Rouge and nearby parishes in a three-day span spawning historic flooding. To better understand why the flooding was so catastrophic and to proactively plan and prepare for the future, Louisiana Department of Transportation and Development (LADOTD) is developing a hydrologic and hydraulic numerical model of the Amite River Basin using the USACE HEC suite of tools. Their ultimate goal is to provide stakeholders with the tools to assess flood risks and project impacts on a watershed scale through the development of a living model that can be utilized for a variety of purposes including flood mitigation feasibility studies, no adverse impacts assessments, consequence assessment, and risk assessment. Once completed, the LSU Center for River Studies will be responsible for storing, distributing, and maintaining these models so stakeholders can utilize and contribute to them.

The Amite River Basin encompasses over 1,800 square miles ranging from southwest Mississippi to southeast Louisiana. The project scope includes 385 miles of 1D and 850 square miles of 2D modeling and will consider climate change. HEC-WAT will be used to integrate all of the modeling including HEC-FIA which will be used to estimate economic damages and potential loss of life. Annual Exceedance Probability will be computed to convey degrees of risk, rather than the blunt lines of a 100-year floodplain.

This presentation strives to outline new technology and improved approaches for performing flood risk management on a watershed level. The living model will be used to plan regional flood control measures and review large-scale projects that could affect the watershed.

**TRACK G – WATERSHED MANAGEMENT**

**2:00 pm – 2:30 pm**

**G1 RETURN TO PURGATORY: WATERSHED PLANNING FOR HISTORIC HOPKINS STREET**

**Presenters:** Garrett Johnston, PE, CFM, GISP/ Freese and Nichols  
 Richard Reynosa, PE, CFM/ City of San Marcos

**Objectives:** Recognize opportunities to incorporate watershed master plans into roadway reconstruction projects.  
 Understand the tradeoffs between lumped hydrology and rain-on-mesh models.  
 Depict complex modeling results for public outreach.  
 Understand water-quality issues.

**Topic:** The historic Hopkins Street residential in downtown San Marcos has no subsurface storm drain system and faces perennial urban flooding problems. This corridor reconstruction project includes new curb inlets and storm drain to convey runoff to Purgatory Creek a quarter-mile away. The offsite drainage area upstream of Hopkins Street is over 400 acres and requires a phased flood mitigation approach. As part of this project, three future drainage projects were designed at a conceptual level using a dynamic rain-on-mesh stormwater model. The rain-on-mesh analysis not only informed the sizing of the Hopkins Street main trunk line, but also led to the production of informative public outreach maps that depict residual flood risk as each project is constructed. This project also includes water quality improvements at the outfall to Purgatory Creek.

This presentation will include an overview of the project and detailed discussion of the phased flood mitigation improvements.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK G CONTINUES:**

**2:30 pm – 3:00 pm**

**G2 LITTLE LOTS AND LITTLE TOWNS: RAPID GROWTH AND STORMWATER CHALLENGES**

**Presenters:** Josh Logan, PE/ Halff Associates, Inc.  
Sam Edwards, PE, CFM/ Halff Associates  
Brandon Melland, AICP, CNU-A / City of Leon Valley

**Objective:** To understand some environmental strategies that have been added to area subdivision ordinances that help to limit the scale of alteration to the natural environment and reduce potential for flood risk.

**Topic:** While the rocky, hilly terrain had been a deterrent for small lot/high density residential communities in the past, the high demand and close proximity to San Antonio has developers looking to the neighboring hill country counties and towns for their next Master Planned Communities.

Adding high density development to varied terrain has its challenges, and the flood-weary residents are more than a little concerned about their possible new neighbors and the impacts of thousands of rooftops on the rural communities. As a result, the City of Bulverde has been taking a fresh look at their Subdivision Ordinance, and has adopted some changes that limit the scale of alteration of the natural environment in order to protect both the stormwater quantity and quality. Steep slopes ordinances, vegetative buffer zones, and other riparian planning strategies will be discussed while looking at what those hope to accomplish for the small hill country community.

**3:00 pm – 3:30 pm**

**G3 THE MIGHTY BRAZOS RIVER – FLOOD PROTECTION STUDY RESULTS**

**Presenters:** Angela Davidson, PE, CFM/ Halff Associates, Inc  
Sam Hinojosa, PE, CFM/ Halff Associates, Inc  
Pamela Hannemann/ Brazos River Authority

**Objective:** To understand the results of the Brazos River Flood Protection Study.

**Topic:** The Brazos River Authority (BRA) along with Texas Water Development Board (TWDB), in cooperation with local cities, counties, and drainage districts, have collaborated to develop the Lower Brazos River Floodplain Protection Planning Study (FPP). The study is developing a flood protection plan for the main stem of the lower Brazos River from the Grimes/Waller County line to the Gulf of Mexico.

The lower Brazos River has a watershed area of over 42,000 square miles and includes some of the fastest growing areas in the state of Texas. Although construction of USACE reservoirs throughout the basin have greatly reduced flooding over the years, there are still approximately 10,000 square miles of uncontrolled drainage area below these projects. Existing floodplain information is limited and/or dated throughout much of the study area, especially outside of Fort Bend County. The Lower Brazos FPP study included the development of a detailed hydrologic model, flood frequency analysis, and unsteady floodplain modeling utilizing recent LiDAR and topographic data sources. Future tasks include a flood damage assessment and flood reduction alternatives analysis.

This presentation focuses on the TWDB study results including the data collection, hydrologic and hydraulic model development, alternative analysis, flood damage analysis, and environmental constraints.



**SUMMIT ABSTRACTS**

**TRACK G CONTINUES:**

**4:00 pm – 4:30 pm**

**G4 JOHNSON CREEK WATERSHED STUDY AND PHYSICAL MAP REVISION (PMR), CITY OF ARLINGTON, TEXAS IN CONJUNCTION WITH FEMA DIGITAL FLOOD INSURANCE RATE MAP (DFIRM) DEVELOPMENT IN SUPPORT OF FEMA'S COOPERATIVE TECHNICAL PARTNER AGREEMENT, CITY OF GRAND PRAIRIE, TEXAS**

**Presenters:** Larissa Knapp-Scott, CFM/ Jacobs Engineering  
 Olivia Whittaker, P.E. (TX), MSE, CFM/ Jacobs Engineering  
 Amy Cannon, PE, CFM/ Public Works and Transportation, City of Arlington  
 Stephanie W. Griffin, PE, CFM/ City of Grand Prairie

**Objective:** To prepare a watershed study from beginning to ending with a PMR mapping revision.

**Topic:** Johnson Creek Watershed, with a drainage area of 20.8 square miles, is a highly urbanized watershed straddling two major cities namely City of Arlington and City of Grand Prairie nestled within the Dallas - Fort Worth metropolitan area. Johnson Creek, with 14.3 river miles, has been a chronic source of flooding in this area. Watersheds have no City, County or stakeholder boundaries.

A detailed hydrologic and hydraulic study was completed, including updated digital mapping products, for Johnson Creek within the corporate limits of the City of Grand Prairie. This watershed required coordination with both City of Grand Prairie and City of Arlington. During the scoping phase, it was determined that the entire watershed would require updated hydrology. The City of Arlington was approached and agreed to support this effort of a seamless hydrologic analysis of the watershed and hydraulic analysis for the main stem of Johnson Creek through local funding. Collaborating and communicating with multiple stakeholders in the watershed minimized the number of reviews and comments by the City and the City's review engineer and ensured that Jacobs' technical and modelling results were comprehensive for both communities.

A Johnson Creek Corridor plan for each City was developed and provides comprehensive, updated technical data for management of the Johnson Creek watershed to assist in minimizing existing and potential damages caused by flooding or stream instabilities and provides recommendations to mitigate flood hazards, erosion hazards, scouring, and structural damages. Several projects were outlined for both Cities through their prioritizing and ranking plan. The plan included a geomorphologic analysis to assess stream stability and existing erosion problems along Johnson Creek. Unsteady state hydraulic modeling using HEC-RAS and XP-SWMM was used within the City of Arlington to help identify potential at-risk areas and determine potential flood mitigation locations. The final analysis included updated digital floodplain mapping products for a physical map revision (PMR) in the City of Arlington.

**4:30 pm – 5:00 pm**

**G5 PROACTIVE PROTECTION: THE UPPER LANGHAM CREEK FRONTIER PROGRAM**

**Presenters:** Cory Stull, PE, CFM, GISP/ Freese and Nichols, Inc.  
 Jonathan St. Romain, PE/ Harris County Flood Control District  
 Ashley Poe, PE, CFM/ Freese and Nichols, Inc.

**Objective:** Identify proactive and innovative approaches to floodplain management and flood risk mitigation for growing communities.

**Topic:** A January 2018 report sponsored by several public and private organizations, including FEMA, recently found that investing in mitigation projects can save \$6 in future disaster costs for every \$1 spent today.

Understanding the benefit and importance of a regional mitigation strategy, the Harris County Flood Control District (HCFCD) created the Upper Langham Creek Frontier Program – an impact-fee based program which takes a proactive approach to providing infrastructure necessary for anticipated development. The aim of the Program is to guide development of the region by designing and managing an open conveyance system of wide, floodplain corridor channels and detention facilities designed with a fully developed watershed in mind, while also offering unparalleled opportunities to enhance the community through the incorporation of recreational, environmental, open space, and other multi-use features. The Program has provided the opportunity for various entities, both public and private, to work together to develop mutually-beneficial projects which help realize economies of scale in developing coordinated, regional solutions to stormwater drainage.

This presentation will provide an update on implementation progress and how the design of the Program has evolved over the past 5 years to respond to unique flooding challenges, changes to rainfall data, and new regulations which have been adopted by Harris County after Hurricane Harvey. In addition to coordinating, reviewing, and tracking development as it occurs, HCFCD has been proactive in identifying and analyzing innovative enhancements to the Program. Projects like the Upper Langham Creek Frontier Program can prove the success of an alternative planning process which identifies and secures sufficient right-of-way and accommodates the future floodplain instead of reacting to flooding impacts associated with an encroached floodplain. This intentional and methodical regional



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

planning helps develop stormwater management infrastructure which can be integrated into and provide great benefit to communities both between and during flood events.

**TRACK H – FLOODPLAIN ADMINISTRATOR'S TOPICS**

2:00 pm – 2:30 pm

**H1 STORM DEBRIS LOADING AT CULVERTS AND BRIDGES AND WHY IT'S IMPORTANT**

**Presenter:** Bryan Martin, PE, CFM/ HDR

**Objective:** Understanding the importance of debris and impacts to culverts and or bridges.

**Topic:** Stormwater doesn't travel alone and carries with it debris of all types, shapes, and sizes. This debris can cause serious issues to our culverts and bridges. The problems come in terms of increased flooding, scour, hydraulic loading, and increased maintenance costs. An understanding of the nature of storm debris and its potential loading improves the odds of overcoming these problems. But what methods and tools are available to those that maintain and/or design our culverts and bridges? This presentation explores the issue of storm debris and looks at the current industry guidelines and requirements.

2:30 pm – 3:00 pm

**H2 POTENTIAL PITFALLS OF USING FLOOD DAMAGE RECORDS TO GUIDE LOCAL DECISION-MAKING**

**Presenter:** Paula Lorente, PhD, Texas A&M University

**Objective:** Learn now the selection of insurance flood data can impact community disaster decisions.

**Topic:** Local officials, community planners and mitigation decision-makers rely on accurate evaluations of risk and mitigation cost-benefit analysis. Flood insurance data from the National Flood Insurance Program (NFIP) may be used by different groups for evaluating flood impacts. For example, community officials and floodplain managers can use the data to guide pre-disaster mitigation activities and post-disaster damage assessment efforts. Researchers have used insurance claim payment information associated with past extreme events to develop statistical relationships between different flood-inducing and flood-mitigating factors. Flood damage data are also key for the development and calibration of more sophisticated synthetic models of flood risk used by insurance and major planning organizations. In all of these cases, the selection of the type of data and analytical method can have dramatic results on characterization of risk. Using verified insurance flood damage information associated with a major disaster event in Texas, this study describes potential pitfalls of different approaches for analyzing flood risk across a community. Findings from this work suggest that the selection of data types and analytical approaches can bias the characterization of flood risk and thereby affect important community disaster decisions, mitigation investments and resilience outcomes.

3:00 pm – 3:30 pm

**H3 OPEN DISCUSSIONS WITH FLOODPLAIN MANAGERS**

**Presenters:** John Espinoza, PE, CFM/ City of San Marcos

**Objective:** Learn various floodplain management topics.

**Topic:** This session will consist of open discussions with floodplain administrators regarding various floodplain management topics. Bring your questions and we will find you the answer. Attendee participation will be solicited.

4:00 pm – 5:00 pm

**H4 & H5 OPEN DISCUSSIONS WITH FLOODPLAIN MANAGERS**

**Presenters:** John Espinoza, PE, CFM/ City of San Marcos  
To be determined

**Topic:** A continuation of the Session H3, which consists of open discussions with floodplain administrators regarding various floodplain management topics. Bring your questions and we will find you the answer. Attendee participation will be solicited.



## SUMMIT ABSTRACTS

### TRACK I – MAPPING & HMPS

2:00 pm – 3:30 pm

#### ***II, I2 & I3***      **MAPPING 101**

**Presenters:** Ben Pylant, PE, CFM/ Halff Associates, Inc  
John Ivey, PE, CFM/ Halff Associates (VP retired)

**Objective:** Show new CFM's and help floodplain managers how to use digital mapping.

**Topic:** Mapping 101 is a two hour training class designed to showcase riverine and coastal DFIRM's. FEMA's 4 day workshop, E 273 "Managing Floodplain Development Through the NFIP" was developed in 2008 and does not address digital flood insurance rate maps (DFIRM's). TFMA has developed this mini workshop to help floodplain managers and new CFM's how to use this digital mapping product developed by FEMA. Two recently published Texas community DFIRM's will be showcased. One focused on riverine floodplains and one focused on coastal flooding. This will be a proactive mini workshop where audience participation is required.

4:00 pm – 5:00 pm

#### ***I4 & I5*** **HOW YOUR HAZARD MITIGATION PLAN CAN WORK FOR YOUR JURISDICTION: PLANNING, ACTIONS, AND GRANTS / SECOND TOPIC: PUBLIC ASSISTANCE FUNDING**

**Presenters:** Rachel Andrews, PE, CFM/ H2O Partners  
Erin Capps, JD/ H2O Partners  
Bryan McSween/ H2O Partners

**Objective:** To utilize a Hazard Mitigation Plan, FEMA mitigation grants, and FEMA Public Assistance funds to reduce losses of life and property in your jurisdiction.

**Topic:** First 30 minute segment: A FEMA-approved Hazard Mitigation Plans are a requirement for any jurisdiction to obtain FEMA Mitigation funds. FEMA provides mitigation grants, such as HMGP (Hazard Mitigation Grant Program), PDM (Pre-Disaster Mitigation Program), and FMA (Flood Mitigation Assistance Program) to cities, counties and other jurisdictions (such as school districts) for projects designed to reduce long-term risk to life and property. This workshop will review how to leverage grant funding and the importance of including specific mitigation projects in the Plan.

Second 30-minute segment: After a Federally-declared disaster, a City, County, or School District can apply for repairs of its infrastructure such as roadways and water/wastewater treatment plants. We will provide a case example of work with communities in combining Public Assistance funding, specifically 406 Hazard Mitigation with 404 Hazard Mitigation and best practices for communities such as pre-positioned contracts prior to a disaster.

### TRACK J – FLOODPLAIN MANAGEMENT TOOLS

2:00 pm – 2:30 pm

#### ***J1***      **GEOGRAPHIC INFORMATION SYSTEMS AND FLOODPLAIN MANAGEMENT**

**Presenter:** Laura Haverlah, CFM/ Atkins

**Objective:** To understand the role of GIS in the collection, analysis, and production of enhanced spatial data for hazard mitigation.

**Topic:** GIS (Geographic Information Systems) provides a platform for innovation within the flood mitigation world. Currently, FEMA's Risk Map Flood Insurance Rate Maps (FIRMs) are relied upon to provide basic information concerning flood risk. While this product provides helpful information, it has limitations. By utilizing tools that interface with GIS software users can create data that is more spatially accurate and is more efficiently captured and analyzed. These applications include Hazus, a FEMA software application for multi-hazard loss estimation, Substantial Damage Estimator, or SDE, a FEMA tool for damage estimation, and FMD, Floodmap Desktop, an Atkins proprietary ArcGIS extension. These applications create data outputs through the use of GIS's spatial component that expand our understanding of risk to people, properties, assets, and resources for either pre-disaster planning and in post-disaster response.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK J CONTINUES:**

2:30 pm – 3:00 pm

**J2 DRONES AND FLOODPLAINS – TECHNOLOGY UPDATES ON HOW sUAS IS BEING USED IN FLOODPLAIN MANAGEMENT**

**Presenters:** Trent Lewis, FPC/ PondMedics Incorporated

**Objectives:** Assess the practical use of drones in different disciplines of floodplain management, choose the correct aerial data set and qualify a sUAS team for a project.

**Topic:** As drones increase in abundance and technology advances, costs are coming down and usage is going up. Drones (also known as sUAS – small Unmanned Aerial Systems) have many practical purposes for floodplain managers. Beyond the ability to take a simple photo or video, drones are able to carry sophisticated instrument payloads into the sky and capture data useful for surveys, modeling and engineering. But, because the technology is still so new, it's hard to decipher what a drone's practical uses are that you can rely upon in floodplain management. Is the accuracy really there? When surveying, is it actually better than boots on the ground? Can I trust drone data like I trust traditionally acquired data? Also, what is needed to get into performing drone data acquisition yourself? What do you need in order to start flying and capturing your own data?

In this concurrent session, attendees will learn how to assess the practical use of drones in different disciplines of floodplain management, choose the correct aerial data set and qualify a sUAS team for a project. Additionally, session attendees will learn the most pertinent technology updates to floodplain management and sUAS.

3:00 pm – 3:30 pm

**J3 THE PATH FORWARD: FEMA GUIDELINES AND STANDARDS**

**Presenter:** John Refolo, CFM, Sr. GIS Analyst / Stantec

**Objective:** Better understand FEMA's evolving set of Guidelines and Standards for Risk MAP and see the road ahead for continuing maintenance.

**Topic:** FEMA began a transformation of the Risk MAP Program's standards and guidance in 2013, setting a goal to overhaul how technical requirements and direction are delivered. The transformation process was completed this past February, moving the program into a new maintenance phase. The goal of this presentation is present a brief history of where guidelines and standards started, where it's at today, and the road ahead. Tips and useful skills for accessing, finding, and tracking floodplain mapping standards will be provided so that attendees will come out with tools for working in the Risk MAP Program.

4:00 pm – 4:30 pm

**J4 DATA DRIVEN HURRICANE IRMA AND MARIA RECOVERY**

**Presenter:** Michael DePue, PE / Atkins

**Objective:** To understand the data availability and usability with the identification, inspection, evaluation, and mitigation of substantially damaged structures.

**Topic:** The impacts of Hurricane Irma and Maria have been devastating to Puerto Rico and the U.S. Virgin Islands. Flooding and wind damage has affected large portions of the larger islands of Puerto Rico, St. Thomas, St. John, and St. Croix, Culebra, and Vieques. The resulting damaged and destroyed structures present an immediate threat to the health and safety of the public. To support local officials who are overstretched in carrying out their essential community services while also having to deal with the thousands of nonconforming structures, FEMA establishing a Substantial Damage Task Force to serve as a single coordination point between Federal, state and local governments, contracted firms, and non-governmental organizations. The goals of the Task Force is to assist with the identification, inspection, evaluation, and mitigation of substantially damaged structures. To overcome the sheer number of damaged structure that need to be processed, FEMA's contractor, STARR II (a joint venture of Atkins, Stantec, and Dewberry) stood up an analytics cell. An initial focus of the cell was to leverage available data and analytical tools to identify and prioritize areas for SDE inspections. Data driven structure identification and prioritization of SDE inspections led to significant reductions in the number of inspections and resulted in cost and time savings. The presentation will discuss the data used and analytics performed along with lessons learned for the next time such an analytics cell is stood up for disaster recovery.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**TRACK J CONTINUES:**

4:30 pm – 5:00 pm

**J5 USING 2D MODELING TO REFINE STREAM RESTORATION DESIGN**

**Presenter:** Tami Norton, PE, CFM, PMP/ Ecosystem Planning and Restoration

**Objective:** By attending this session, participants will be better able to understand how 2D modeling can be used to identify high risk areas, and design considerations for specialized structures.

**Topic:** Stream restoration projects often restore channel dimension, pattern and profile to provide natural stream functions, such as water and sediment transport, using specialized in-stream structures for grade control and bank protection, and are designed based on bank full conditions. This presentation will demonstrate how 2D modeling can be used to identify high risk areas for a range of flow frequencies and magnitudes and evaluate project performance during large flood events, as well as more frequent and bankfull events, by examining flow patterns, velocities and shear stresses along the project reach. Additionally, the example presented will show how 2D modeling can assist with designing a floodplain overflow channel and evaluating the maximum potential of each stream reach. This type of modeling has been used as a communication tool with agencies during the permitting process to show the difference between pre- and post-project conditions.

**FRIDAY – AUGUST 31, 2018**  
**CONFERENCE PLENARY SESSION**

8:00 am – 8:30 am

**TFMA'S 2 FOOT RULE**

**Presenters:** John Ivey PE, CFM / Halff Associates (VP – Retired)  
Roy D. Sedwick. CFM / TFMA Executive Director

**Objective:** To incorporate higher standards into your community flood damage prevention ordinance or court order.

**Topic:** The NFIP was created in 1968 and after 50 years of floodplain management we still have major flood losses, especially in Texas. It is time for TFMA to take action. TFMA is the largest Chapter of the Association of State Floodplain Managers (ASFPM) 37 chapters and associations. TFMA's members also hold over 20% of all the CFM certifications in the Nation. In other words, there is not a task too big for us to tackle.

In 2004, TFMA initiated a higher standards survey to document community higher floodplain management practices and to encourage all communities to incorporate higher standards into their flood damage prevention ordinances and court orders. Fifteen years later and after 15 annual surveys, 331 Texas communities have adopted higher standards. This is a major accomplishment since there are no Texas state laws mandating higher floodplain management standards and each community must develop and implement their own higher standards. There are 1,251 NFIP (floodprone) communities in Texas. While we applaud the 331 Texas cities and counties that have adopted higher floodplain management standards we need to reach out to the remaining 900+ communities. We also realize that most Texas communities have minimal staff and budget and developing, adopting and enforcing higher standard ordinances and court orders is highly unlikely. Therefore, we recommend a simplified solution for the 900+ communities that are “stuck” with the mandatory NFIP minimum standards floodplain ordinance. TFMA recommends that, at a minimum, all Texas communities adopt TFMA's “2 Foot Rule” and utilize whatever FEMA FIRM or FHBM (maps) you may have or not have. Yes, the TFMA “2 Foot Rule” is applicable even to unmapped communities.

This paper will describe the 4 classifications that all Texas communities fall into and explain how to easily incorporate the TFMA “2 Foot Rule”. We will discuss several Texas city and county higher standard ordinances/court orders and showcase the new (1/1/18) Harris County Floodplain Regulations that have set a new high in the Nation.



TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION  
2018 Fall Technical Summit – August 28-31, 2018  
San Antonio, Texas



SUMMIT ABSTRACTS

**PLENARY SESSION CONTINUES:**

**8:30 am – 9:00 am**

**HURRICANE HARVEY – EMERGENCY PREPAREDNESS AND RESPONSE**

**Presenters:** Andrew Swirsky, PE/ Stantec  
John Keane, PE, PMP/ Stantec  
Javier Cantu, PE, PMP/ Stantec

**Objective:** Prepare for and respond to hurricanes.

**Topic:** On August 26, 2017, Hurricane Harvey made land fall in Rockport, Texas and brought torrential rains to the greater Houston area. Over a period of five days, Southeast Texas experienced record breaking rainfall totals exceeding 50 inches. The impacts to the City of Houston included over 30 wastewater treatment plants and over 400 lift stations that required damage assessments to identify immediate emergency repairs.

Stantec engaged the community on day one of the disaster and aided in response efforts, damage assessments, and within 48 hours of the storm passing Stantec had established two teams of three engineers each: one civil/structural, one electrical, and one mechanical to begin assessing damage to identify and prioritize emergency repairs. Within the next 36 hours, our team completed damage assessments at 10 of the City of Houston's 38 wastewater treatment plants and various lift stations. We also established a Health, Safety, Security, and Environmental Advisor to participate in the entire processes and work closely with our teams to ensure the safety of our staff.

The presentation will discuss the tools and management practices used to navigate around the challenges these conditions created and will discuss the lessons learned and importance of emergency planning prior to any event. The first phase of emergency response begins before the disaster. Preventive design, establishing an emergency action plan and using standardized documentation of practices is essential to proper response. Once an emergency occurs, communication, transportation, health and safety, external support, facility operations, and recovery are immediate obstacles that must be recognized and overcome. The last phase of the response focuses on making the community whole by capturing available emergency funding, engaging stakeholders and documenting the event damage.

**9:00 am – 9:30 am**

**WATER, WATER, WHERE ARE YOU? UNIQUE HYDROLOGIC DECISION SUPPORT SERVICES DURING HURRICANE HARVEY**

**Presenter:** Katie Landry-Guyton/ National Weather Service Houston/Galveston

**Objective:** To better understand the decision support services the National Weather Service provided to core partners in unique hydrologic situations during Hurricane Harvey.

**Topic:** When the National Weather Service (NWS) is faced with a catastrophic flood, are the standard tools of deterministic forecasts, impact statements, and historical high water marks enough to answer critical public safety and economic questions?

Core partners called upon the NWS to help answer fundamental questions requiring an additional level of detail and accuracy that would aid in the decision making process. On Friday, August 25th, several members of the marine industry consulted the NWS concerning the high freshwater flows emptying into the Houston Ship Channel. They asked, "What are the impacts?" Two days later, Phillips 66 Headquarters sought out the NWS because one of their refineries began taking on water. The refinery is located approximately 4 miles from the San Bernard River and is not located in the floodplain. They asked, "Where is the water coming from?" On Tuesday, August 29th, refrigeration was lost at the Arkema plant in Crosby, Texas, due to significant flooding. More questions arose including "Where do evacuations need to occur?"

Ultimately, our office was unable to answer these types of questions using the traditional forecasts and historical data. This presentation will explore the various situations in which core partners relied on the NWS to answer lifesaving, economically driven questions that required NWS Houston and partnering agencies to seek other resources, such as imagery and ensembles, in order to provide a deeper level of decision support services.

Although the resources that were used throughout Harvey can and should be utilized in future events, we must ask ourselves, "Can we provide even better service?" In an agency that is ever-evolving, it is imperative the NWS work toward new and improved resources for hydrology specific decision support services, because we know Harvey was not the first event of this magnitude and certainly will not be the last.



**SUMMIT ABSTRACTS**

**PLENARY SESSION CONTINUES:**

**10:00 am – 10:30 am**

**CITY OF HOUSTON HARVEY DAMAGE ASSESSMENT, DATA ANALYSIS, MITIGATION STRATEGIES AND REGULATORY CHANGES**

**Presenters:** Jamila Johnson, PE, CFM/ City of Houston  
 Juan Diaz Ortiz, PE, CFM/ City of Houston

**Objective:** To be better able to plan for damage assessment activities and leverage flood damage information to make decisions about mitigation strategies and floodplain management regulations.

**Topic:** After the devastating flood damage caused by Hurricane Harvey, the City of Houston has resolved to leverage every opportunity to make the City more resilient to future flooding disasters. Part of this effort began with employing City resources to complete a preliminary damage assessment of the City’s floodplain. This data was carefully analyzed to make decisions on the City’s mitigation strategy. The intent of this effort is to recommend which properties to target for mitigation projects, which mitigation strategies to employ and how to prioritize projects. This data was also carefully analyzed to evaluate the effectiveness of the City’s floodplain regulations and to determine what type of changes should be made to reduce the risk of flooding to better protect citizens and their property. Lesson’s learned from the City’s experiences will help floodplain managers to plan for future disasters and look at data from previous disasters in new ways.

**10:30 am – 11:00 am**

**BEXAR COUNTY FLOOD WARNING SYSTEM – THEN, NOW AND THE FUTURE**

**Presenters:** Brandon Hilbrich, PE, CFM/ HDR  
 Ron Branyon, PE, CFM, CSM/ HDR

**Objective:** Learn how the use of existing hydraulic models can be utilized in flood warning systems.

**Topic:** HDR helped the San Antonio River Authority develop a first of its kind in the United States flood warning system for the Greater San Antonio area. Since its development in 2013, HDR has completed a pilot study to convert the existing Innoyze software InforWorks RS system to the latest InfoWorks ICMLive software. This presentation will discuss the development of the FWS to date and how the system approach can be applied to other cities. Additionally, this type of FWS allows for other uses including predictive flood warning, evaluating “what if” catastrophic events or estimating impacts to regulatory changes.

**11:00 am – 12:00 pm**

**DEVELOPING A FLOOD WARNING SYSTEM**

**Presenters:** Justin McInnis, Hays County  
 Richard Wade, Texas Natural Resources Information System  
 John Espinoza, PE, CFM/ City of San Marcos

**Objective:** Learn considerations for a regional flood warning system.

**Topic:** The Homeland Security Task Force, a committee under the Capital Area Council of Governments (CAPCOG), was given the directive to form a sub-committee that was tasked with creating flood/flashflood focused public safety material, find research/projects that could be funded to help better understand flooding in Central Texas, find new technology and help improve upon current technologies that aid in data collection and dissemination. The committee, meeting since January 2018, includes local, state, federal, private, higher education, first responders and many others at one time to discuss, collaborate and act upon our findings.

This presentation will summarize meeting findings including regional flood warning system considerations. In addition, the Geospatial Emergency Management Support System Version 2.0 (GEMSS/2) being developed by the Texas Natural Resources Information System will be discussed.