



Building Bridges to Our Past, Present, and Future



2019 Annual CASFM Conference
Crested Butte Mountain Resort
September 24-27, 2019

CRESTED BUTTE, CO

WELCOME TO THE 30TH ANNUAL CASFM CONFERENCE!

The CASFM Board and Conference Committee have spent the past year planning informative activities for conference attendees, while also including time to socialize with old friends and to, hopefully, make new acquaintances in a beautiful mountain setting. It is our hope that everyone who attends the Annual Conference in Crested Butte gets to experience fantastic speakers, outstanding workshops, informative presentations, and enjoy the mountains.

Our theme this year - "Building Bridges to Our Past, Present, & Future" - was inspired by David Primus, Community Engagement Facilitator with the School of Environment and Sustainability at Western Colorado University. David will present Beneath Blue Mesa: The Gunnison River Valley Before Blue Mesa Reservoir, which will feature the history of the Gunnison River Valley before Blue Mesa Reservoir was completed in 1965. He will discuss fishing resorts, ranches, towns, and the narrow gauge railroad that now lie beneath the reservoir as remembered by local residents.

The Board and Conference Committee would like to thank the numerous presenters, sponsors, volunteers, and attendees that make the conference a success. We rely on you to provide guidance and leadership for CASFM and the annual conference.



Sarah Houghland
Conference Chair
Enginuity Engineering Solutions



Deb Ohlinger
Outgoing CASFM Chair
Olsson

2019 CASFM CONFERENCE COMMITTEE!



Jason Messamer
Program Chair
Colorado Springs
Utilities



Amy Gabor
Vendors
Olsson



Shea Thomas
Facilities
UDFCD (MHFD)



Colin Wagoner
Awards
Calibre Systems



Alan Turner
Registration
AECOM



John Loranger
Golf Tournament
Wood PLC



Stacey Thompson
Socio Admin.
SEMSWA



Molly Trujillo
Photography
SEMSWA



Emily Villines
Media
Calibre Eng.



Lilly Murphy
Media
Calibre Eng.



Mike Bannister
Mtn Bike Tour
RESPEC



Kevin Doyle
Moderator Coord.
Michael Baker Int'l



Saman Mehdi
Entertainment
WSP



JOIN THE CONFERENCE CONVERSATION:
#CASFM2019

2019 - 2020 OFFICERS & REGIONAL REPRESENTATIVES

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Colorado Water Conservation Board



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Michael Baker



METRO REGION REP

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OUTGOING CHAIR

DEB OHLINGER

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RESORT MAP

A Adventure Park

Ski Valet
POWERADE® Bungy Trampolines
Rock Climbing Pinnacle

B Axtel Building

Ski & Ride Private Lesson Lounge
Gunnison Valley Health Mountain Clinic
Resort Administrative Offices

C Crested Mountain Village

D Elevation Hotel & Spa

Elevation Spa & Fitness Center
Elevè Salon

E Emmons Building

Crested Butte Vacations
Group Sales & Wedding Planning

F Grand Lodge

Logo'd Gift Shop
WoodStone Grille
Wildflower Spa

G Guest Service Kiosk

Information / Assistance
Lost & Found

H Mountaineer Square

Adventure Center:
Lift Ticket & Pass Sales
Epic Day Express Ticket Pick-Up
Ski & Ride School Sales
Elevation Imaging ~ Photos & Portraits
Thin Air Sports
Jefe's Mexican Eatery
The Divvy
Trackers Bar & Lounge
Uley's Sleigh Ride Pick Up
Christy Sports
The Coffee Lab
Bank of the West - ATM
Conference Center
Alpenglow Art Gallery
Resort Real Estate

I Kelsey Wright Building

Under Construction ~ Future Home
of the Adaptive Sports Center

J Plaza Condominiums

K Kids' Ski & Ride School Meeting Area

L Treasury Center Day Lodge

CBMR Rental & Demo Center:
Lift Ticket & Pass Sales
Ski & Ride School Sales
Ski & Snowboard Rentals
Repair & Tuning
CB Mountain Outfitters
Day Lockers
Butte 66 Roadhouse Bar & Grille
Spellbound Pizza Co.
Adaptive Sports Center
Flatiron Sports
Coal Breaker Coffee Co.

M Whetstone Building

Camp CB:
Lift Ticket & Pass Sales
Ski & Ride School Sales
Nursery

N Zipline Tour Yurt

Zipline Meeting Area

O Red Lady Express Lift

Adult Ski & Ride School
Meeting Area



Ticket Sales

Rental & Demos

Dining

Transit Center
FREE Town Shuttle to
Town and Mt. Crested
Butte Condos

Visitor Information

ATM
 Real Estate
Sales Office

Parking

Electric Car Charger

Restroom

Water Refill

Medical Clinics

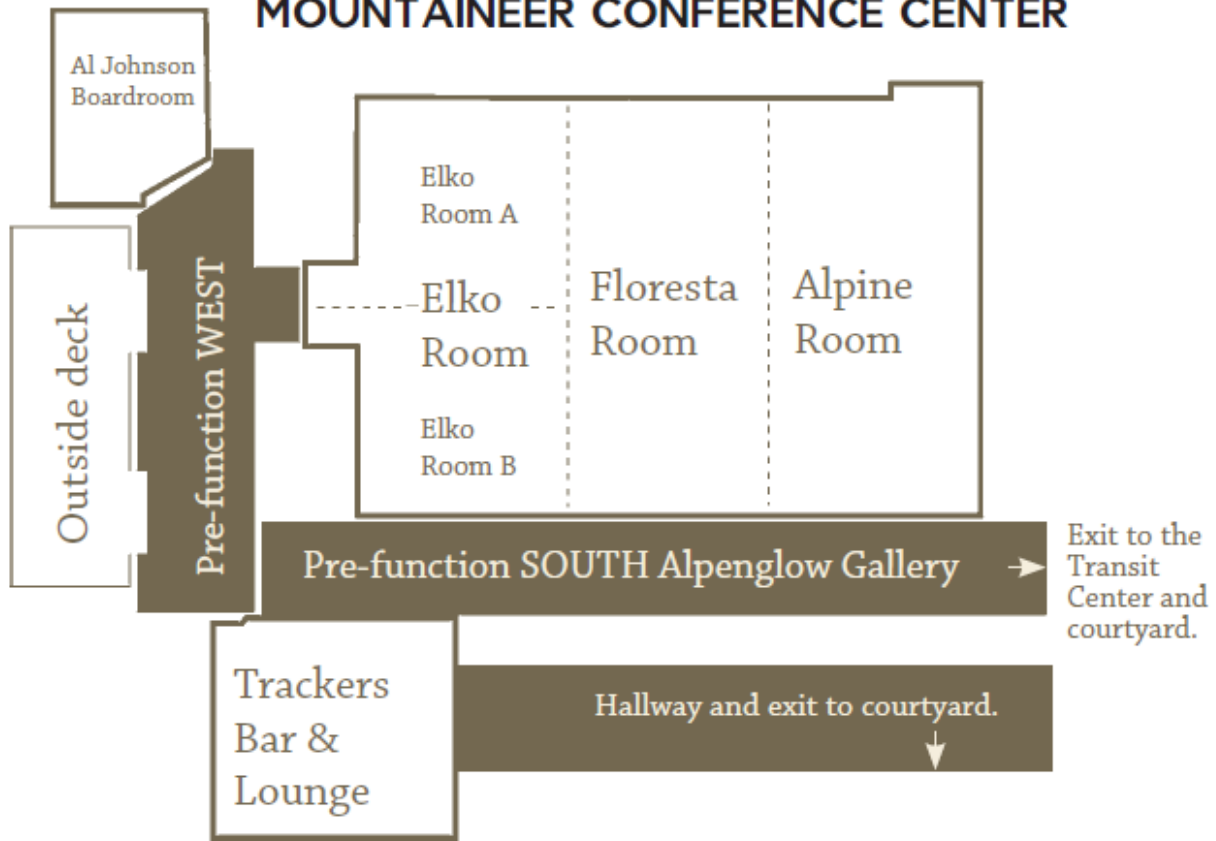
Gunnison Valley Health Mountain Clinic
(970) 349-0321

Crested Butte Ski Patrol
(970) 349-2236

Crested Butte Ski Area Clinic
(970) 349-2677

MAP OF CONFERENCE CENTER

MOUNTAINEER CONFERENCE CENTER



TUESDAY, SEPTEMBER 24, 2019

8:00AM TO 5:00PM

Floodplain 101

Location: Elevation Peaks Ballroom

2:00PM TO 5:00PM

Workshop: SMS and Hydraulic Toolbox Bridge Scour Tutorial

William deRosset and Scott Zey - Ayres Associates

Location: Elko Room

In October 2018, Aquaveo released version 13.0 of SMS, which has evolved through 8 subsequent updates. Version 13.0 includes a new and revolutionary set of tools to analyze, extract, and export hydraulic scour variables to FHWA's Hydraulic Toolbox 4.4 bridge scour calculator. Using these tools will help all practitioners perform more efficient and consistent bridge scour analyses. In this 3-hour workshop we will invite participants to work through this new scour analysis procedure. Along the way we will provide technical insights into how the tool functions, the rationale behind it, and the tips and tricks necessary produce accurate results. If participants want to follow along (optional) they should bring a laptop with AquaVeo's SMS 13.0.8 with a license for SRH-2D and [FHWA's Hydraulic Toolbox 4.4](#) installed.

2:00PM TO 5:00PM

Workshop: Hydrologic & Hydraulic Modeling Fundamentals for Municipal Reviewers

Chris Olson & Andrew Earles - Wright Water Engineers

Location: Alpine Room

This short course is intended for municipal engineers and others who want to learn or improve skills for reviewing hydrologic and hydraulic models, such as the Colorado Urban Hydrograph Procedure and the Stormwater Management Model. The intent is not to create expert modelers but instead to give municipal reviewers the skills needed to effectively review models created by others.

5:00PM

Dinner on Your Own

8:00PM TO 9:00PM

Ice Breaker Social

Sponsored By: CORVUS Environmental

Location: Alpenglow Gallery



WEDNESDAY, SEPTEMBER 25, 2019

7:00AM TO 8:00AM

Yoga

Lauren Winnen - City and County of Denver

Location: Gunnison River (Grand Lodge)

7:00AM TO 10:00AM

Certified Floodplain Manager Exam

Location: Elevation Peaks Ballroom

8:30AM TO 9:30AM

Registration and Breakfast, Committee Information Tables, Sign-Up For CFM Credits

Location: Alpenglow Gallery

10:00AM TO 10:15AM

CASFM Chair Welcome Remarks

Deb Ohlinger - Olsson

Location: Grand Ballroom

10:15AM TO 11:30AM

Keynote Address - "Beneath Blue Mesa: The Gunnison River Valley Before Blue Mesa Reservoir"

David Primus

Location: Grand Ballroom

11:30AM TO 1:00PM

General Membership Meeting & Lunch

Sponsored by: Bohannon Huston, Inc.

Location: Butte 66



1:00PM TO 1:30PM

Break

Location: Alpenglow Gallery

1:30PM TO 3:00PM

Technical Sessions

Emergency Preparedness

Stream Restoration

Stormwater Quality & Green Infrastructure

3:00PM TO 3:30PM

Break

Location: Alpenglow Gallery

3:30PM TO 5:00PM

Technical Sessions

Emergency Preparedness

Stream Restoration

Stormwater Quality & Green Infrastructure

EMERGENCY PREPAREDNESS

Moderator: Kim Pirri - AECOM

Location: Floresta Room

HOT N COLD FLOODING – POST-FIRE, ICE JAMMING, & SNOWMELT IN THE ANIMAS RIVER WATERSHED

1:30PM

Geoff Uhlemann, Leylin Marroquin, & Griffin Cullen - AECOM

Non-regulatory products can be tailored to specific needs of communities to help mitigate risk. This presentation will focus on useful products that are not typically created including post-fire hydrology and hydraulics, snowmelt runoff analysis, and point source timing.

AUGMENTED REALITY FLOOD WALK

2:00PM

Matthew Buddie & Tony Mendes - FEMA Region VIII

FEMA Region 8 has worked with many partners such as the City of Denver, MHFD (UDFCD), and the Greenway Foundation to develop an augmented reality floodwalk at Confluence Park. FEMA Region 8 is identifying and developing new ways to engage the public around better understanding flood risk and the role that mitigation actions can play in their lives.

WORKING TOGETHER TO REDUCE FLOOD RISK: SILVER JACKETS INTERAGENCY PROGRAM AND PROJECTS IN CO

2:30PM

Melissa Weymiller & Jamie Prochno - US Army Corps of Engineers

One agency cannot stand alone to reduce flood risk. It takes multiple agencies with overlapping missions and authorities working together to manage and reduce flood risk. The Silver Jackets program brings together multiple state, federal, tribal, and local agencies to learn from one another in reducing flood risk and natural disasters. This presentation will provide an overview of water resource programs the USACE has available to assist communities and will also discuss USACE projects throughout Colorado.

BREAK

THE USGS FLOOD INUNDATION MAPPING PROGRAM: USING FLOOD INUNDATION MAPS AND REAL-TIME STREAM GAGES WITH A CASE STUDY FROM FORT MORGAN, COLORADO 3:30PM

Mike Kohn - US Geological Survey & Thuy Patton - CWCB

The USGS Flood Inundation Mapping Program (https://water.usgs.gov/osw/flood_inundation) provides USGS flood-inundation study information to the public.

PROJECTING CHANGES IN FUTURE RAINFALL EXTREMES ACROSS COLORADO DUE TO A CHANGING CLIMATE 4:00PM

Page Weil - Lynker Technology

This presentation is on the results of a study to project changes in rainfall Intensity-Duration-Frequency curves across Colorado under climate change.

USING ARCGIS PRO AND ARCGIS ONLINE FOR HYDRAULIC FIELD APPLICATIONS AND STAKEHOLDER OUTREACH 4:30PM

Anthony Alvarado - Ayres Associates; Brian Varrella - Colorado Department of Transportation

With the release and direction of ArcGIS Pro and the advances of ArcGIS Online, it has become infinitely easier to publish web maps and applications which can be used for data collection during site visits or for public and stakeholder outreach without additional cost. On top of these advances, CDOT is working to build a more advanced statewide database of assets and hydrologic information.

STREAM RESTORATION

Moderator: Brent Kaslon - Valerian

Location: Alpine Room

FAT BIKES & SAND CREEK CHANNEL RESTORATION 1:30PM

Walter Pennington - Merrick & Company; Adam Copper - City of Colorado Springs Stormwater Enterprise

The City of Colorado Springs restored ½ mile of Sand Creek overcoming many challenges including 30 feet of channel incision, 66,000 cy of channel fill, and incorporating drop structures that were navigable for fat tire bicycles while protecting major infrastructure.

THE APPLICATION OF 'FULL SPECTRUM' RIVER RESTORATION DESIGN IN COLORADO 2:00PM

Travis Stroth - Stillwater Sciences

This talk discusses the use of tools developed in recent research to aid in stream restoration and channel stability design, focusing on the 'CSR Tool', which uses the latest principles of sediment transport analyses to inform channel designs.

GOLDSMITH GULCH - USING CONTEMPORARY DESIGN TO RESTORE A HEALTHY CHANNEL 2:30PM

Mark Taylor - The Architerra Group, Suzanne Moore, City of Greenwood Village

This project restores a segment of Goldsmith Gulch in Greenwood Village with a naturalized channel alignment with drop structures, braided riparian gardens, and walkways that invite visitors to experience, enjoy, and learn from the water, the channel, and the wetlands.

BREAK

A NEW MODEL FOR PARK DESIGN: INTEGRATING NATURE PLAY WITH A HIGH FUNCTIONING LOW MAINTENANCE STREAM 3:30PM

Cassie Kaslon - Valerian; Frans Lambrechtsen - Jacobs

Valerian, Jacobs, and Naranjo Civil will discuss techniques for integrating nature play and HFLMS principles into First Creek Park. Utilizing the strengths of the multi-disciplinary team, unique strategies for promoting nature play were woven into First Creek Park.

THE DEVELOPMENT AND APPLICATION OF UNIFORM HYDROSERES IN RIPARIAN AND WETLAND RESTORATION 4:00PM

John Giordanengo - Aloterra

The right plants, in the right place, at the right time. Methods to designing plant palettes and seed mixes for various hydroseres (i.e., zones) in a formulaic way, sharing technical tips and design approaches to improving revegetation success in floodplains & wetlands.

STREAM RESTORATION PROJECTS - THE REVEGETATION SIDE OF THE STORY 4:30PM

Jenelle Kreutzer & Moneka Worah - ERO Resources

The presentation includes review of several project sites within the Denver Metro area 5+ years post-construction as well as trends emerging from the 2017 and 2018 vegetation sampling efforts associated with 5 recently constructed stream restoration projects along Piney Creek in Centennial, Colorado.

STORMWATER QUALITY & GREEN INFRASTRUCTURE

Moderator: Troy Carmann - ICON Engineering

Location: Elko Room

E. COLI TMDLS IN COLORADO: FINDING SOLUTIONS 1:30PM

Jane Clary & Chris Olson - Wright Water Engineers

Streams impaired for E. coli are typically high priority for TMDL completion, which results in MS4 permit requirements targeting E. coli reduction. This presentation will summarize lessons learned in TMDL implementation based on experiences across the Front Range and nationally.

DEVELOPMENT OF A NEW INTEGRATED DECISION SUPPORT TOOL (I-DST) 2:00PM

Elizabeth Gallo - Colorado School of Mines

Using an integrated decision support tool (i-DST), that allows for the optimization and comprehensive life-cycle cost assessment of grey, green, and hybrid stormwater infrastructure, to determine the optimal stormwater strategy in the Berkeley Watershed (Denver, CO).

INTEGRATING LID INTO MUNICIPAL DESIGN CRITERIA - A COLORADO MS4 PERSPECTIVE 2:30PM

Kevin Koryto - City of Boulder

This presentation will explore lessons learned, outcomes, and ongoing work related to LID policy in Boulder.

BREAK

BENEFICIAL USE OF WATER TREATMENT RESIDUALS (WTRs) AS A BIORETENTION MEDIA AMENDMENT FOR PHOSPHORUS REMOVAL FROM STORMWATER

3:30PM

Basil Hamdan - City of Fort Collins; Tyler Dell - Colorado State University

Water treatment residuals (WTRs), a byproduct of treating drinking water, was used as an amendment to bioretention media to reduce dissolved phosphorus in stormwater. Column and field tests were conducted to determine the effectiveness of WTRs in bioretention facilities.

SUBWATERSHED WATER QUALITY BMP RETROFIT ANALYSIS

4:00PM

Shawn Tracy - HR Green

Presents a return on investment-based subwatershed evaluation process for water quality retrofits that's objective and data-driven, enabling a prioritized, targeted and measurable implementation plan.

REIMAGINING A DENVER LANDMARK - CITY PARK GOLF COURSE

4:30PM

Drew Beck - Matrix Design Group; Amy Forman - City and County of Denver; Ryan Byrne - Martin/Martin

Denver's City Park Golf Course leveraged a city asset to provide flood detention with water quality enhancement. Daylighting the existing 102-in storm drain introduced a wetland channel to increase golf difficulty while also providing water quality improvement and 220- ac-ft of flood detention.

5:00PM TO 6:30PM

Happy Hour

Sponsored By: RESPEC

Location: Alpenglow Gallery



6:30PM

Dinner on Your Own

THURSDAY, SEPTEMBER 26, 2019

7:00AM TO 8:00AM

Yoga

Lauren Winnen - City and County of Denver

Location: Gunnison River (Grand Lodge)

8:00AM TO 9:00AM

Breakfast: Get to Know Committees!

Floodplain Management:

Chris Hodyl (Chris.Hodyl@jacobs.com)

Outreach and Training & YMG:

Emily Villines (ecv@calibre.us.com)

Tyler Rosburg (trosburg@iconeng.com)

Jeremy Deischer (jdeischer@iconeng.com)

Sponsored By: Triton Environmental

Location: Alpenglow Gallery



9:00AM TO 10:00AM

Featured Speakers - "Building Bridges to Our Past, Present, & Future"

Mentors and Ambassadors

Location: Grand Ballroom

10:00AM TO 11:30AM

2019 CASFM Award Finalists

Moderated By: Colin Wagoner - Calibre Systems

Location: Grand Ballroom

11:30AM TO 1:00PM

CASFM Board Meeting

Location: Woodstone Grill (Grand Lodge)

11:30AM TO 1:00PM

Lunch

Sponsored By: ERO Resources

Location: Butte 66



1:00PM TO 1:30PM

Break

Location: Alpenglow Gallery

1:30PM TO 3:00PM

Technical Sessions

Floodplain Management

Technical Modeling

Stormwater Management

3:00PM TO 3:30PM

Break

Location: Alpenglow Gallery

3:30PM TO 5:00PM

Technical Sessions

Floodplain Management

Technical Modeling

Stormwater Management

FLOODPLAIN MANAGEMENT

Moderator: Chris Ide - Wood PLC

Location: Floresta Room

"IS THAT A COMPLETE PANEL NUMBER?" OR COMMON ELEVATION CERTIFICATE ERRORS & WHAT YOU CAN DO TO FIX THEM... IT'S A CRS THING

1:30PM

Kimberley Pirri - AECOM; Jeremy Hamer - City and County of Denver

Does your community participate in the CRS? Are your Elevation Certificates correct? Join us to review all the nit-picky details of the Elevation Certificate, common errors, and what you, as a community, can do to correct those pesky errors.

FLUVIAL HAZARD ZONE MODEL LAND USE REGULATIONS

2:00PM

Jeffrey Brislawn, Amy Carr - Wood PLC; Kevin Houck - CWCB

This presentation will cover the considerations and challenges in developing land use regulations to accompany new fluvial hazard mapping products, while balancing property rights and the protection of human life and safety.

LOMAS FOR THE MASSES - A QUICK GUIDE TO MULTIPLE LIDAR LOMAS

2:30PM

Tim Benenati - AECOM; Terri Fead - UDFCD (MHFD)

CWCB funded a Pilot study to test the new LiDAR LOMA capabilities over a large area and develop a how-to guide for communities to replicate the process within their floodplains. This presentation will talk about the process developed and the results of the Pilot Study.



BREAK

VETERANS MEMORIAL PARK DETENTION POND: HOW WATER BRINGS PEOPLE TOGETHER

3:30PM

Carrie Gudorf - Mesa County; Dale Mathison - Ayres Associates

Veteran's Memorial Detention Pond reduced potential flooding, created a partnership between two Mesa County departments, and built a park with an innovative design with wetlands and walking trail. It was an inter-agency achievement, meeting concurrent but differing needs in one project.

PLANNING FOR HAZARDS: IMPLEMENTING FLOODING-SPECIFIC TOOLS AND STRATEGIES TO REDUCE RISK AND BUILD RESILIENCE

4:00PM

Ryan Carroll - Michael Baker International; Matthew Buddie - FEMA Region VIII

How can communities plan appropriately for flood hazards? What strategies and tools exist? We'll preview options presented the Colorado Department of Local Affairs' Planning for Hazards guide, and check in with a few communities that are taking steps toward implementation.

LOCALIZED FLOODPROOFING TECHNIQUES AND CAPITAL PROJECTS FOR RESIDENTIAL COMMUNITIES

4:30PM

Suleyman Akalin, Michael Lopes, & Emily Villines - Calibre Engineering

In response to flooding in July of 2018 that resulted in a fatality and residential and business damages, the City of Englewood and Calibre Engineering have worked together to remodel and remap the Areas of Probable Flooding and 5-, 10-, 25-, and 100-year flood depths. In addition, we developed capital improvement projects and localized floodproofing recommendations aimed at helping the public to mitigate flood damage and safety risk to individual properties.

TECHNICAL MODELING

Moderator: Michelle Iblings - Drexel Barrell

Location: Elko Room

THE HOMESTAKE PROJECT'S ARKANSAS RIVER DIVERSION REHABILITATION, TIERED HYDRAULIC MODELING APPLIED TO A RECREATIONAL IN-CHANNEL PROJECT

1:30PM

Brian C. McCormick - Colorado Springs Utilities

The Homestake ARD Rehabilitation project will rehabilitate dated infrastructure, improve whitewater navigability and reduce risk. Design included a tiered numerical and physical modeling program. This presentation will share lessons learned from design, modeling, and construction of a recreational, in-channel project.

A NEW LOOK TO MANNING 'N' VALUES

2:00PM

Craig Jacobson - ICON Engineering; Jennifer Boussetot - Colorado State University

Can the selection of Manning's 'n' values for roughness in floodplain modeling better correlate with site specific vegetation coverage? This presentation reflects on a collaboration between ICON Engineering and Jennifer Boussetot, Ph.D (CSU) to correlate native vegetation properties with roughness selection along the South Platte River.

EVALUATING AND IMPROVING LARGE-SCALE 2D H&H STUDIES IN CHALLENGING MOUNTAINOUS REGIONS

2:30PM

Garrett Sprouse & Eli Gruber - CDM Smith

Understanding broader applicability of large-scale 2D H&H modeling in mountainous regions and terrain. Presents results from a follow-on R&D project to a 2018 Garfield County floodplain study, focusing on balance of accuracy and efficiency, and rain-on-grid hydrologic parameter selection.

BREAK

COLORADO RISK MAP: PAST, PRESENT, AND FUTURE

3:30PM

Thuy Patton, CWCB; Rigel Rucker - AECOM

The CWCB manages all Risk MAP projects outside of the Denver metro area. This presentation will summarize the Risk MAP program in Colorado from its very beginning to where it is now and where it is headed in the future.

WHAT 4,000 HEC-RAS RUNS TAUGHT US ABOUT MAINTENANCE PRIORITIZATION

4:00PM

Mike Bannister - RESPEC; Jon Villines - MHFD; Ryan Tigera - Aurora Water

Vegetation growth, debris blocking culverts, and sediment deposition in channels all have the potential to reduce conveyance and increase flood hazards. Several streams within Aurora were analyzed to determine where flooding depths would increase to help prioritize maintenance activities.

USING 2D MODELS TO PRIORITIZE CAPITAL IMPROVEMENTS: A CASE STUDY OF THE BENEFIT COST ANALYSIS OF THE OLD TOWN DRAINAGE BASIN IN FORT COLLINS

4:30PM

Jeremy Deischer - ICON Engineering; Sandra Bratlie - City of Fort Collins

A benefit cost analysis of over 1300 structures in the Old Town Basin in Fort Collins was completed to assist the City in prioritizing capital improvement storm drain projects.

STORMWATER MANAGEMENT

Moderator: Frans Lambrechtsen - Jacobs

Location: Alpine Room

WHERE DO WE START? A COMPREHENSIVE WATER APPROACH TO OVERCOME OVER A CENTURY OF NEGLECT

1:30PM

Dave Julia - Denver Public Works; Beth Vogelsang - OV Consulting

Established in 1889, the Globeville Neighborhood is a residential island surrounded by industry. This community is a victim of neglect: Inadequate storm drainage, a non-compliant levee, poor water quality, virtually no green spaces, pollution, and substandard infrastructure in one of the City's most socially vulnerable communities. Where do we start?

2018 WESTMINSTER DRAINAGE STUDY

2:00PM

Andrew Hawthorn - City of Westminster; Colin Barry - Enginuity Engineering Solutions

The City of Westminster developed a new template for rapid baseline assessments and implemented it across the City's drainageways so that the data could be leveraged to aid the City in prioritizing, communicating, and address drainageway needs. A large part of the assessments involves using the Omni Collection System, a FishViews product, to capture and create a visual tour along 67.3 miles of drainageway. Using this "street-view" style tour, it's possible for city officials, community members, or designers to walk every step of the creek with only an Internet connection.

BOULDER CIVIC AREA - A PARK, A PLACE, A COMMUNITY

2:30PM

Cody Gratny - JVA

The Boulder Civic Area was a park that was underutilized and needed a facelift. The project focused on revitalizing a park in a floodplain, in the center of a town.

BREAK

BRIDGING THE GAP BETWEEN PLANNING AND PERFORMANCE: STORMWATER MANAGEMENT

3:30PM

Nick McMurtrey - Murray Smith

A landmark venture addressing pavement rehabilitation and pedestrian accessibility under new stormwater requirements compelled by national environmental policy changes. Design includes traffic calming and extensive landscaping combined with 40+ Low Impact Development stormwater facilities over 10 blocks of meandering alignment.

DO YOU WISH YOU HAD MORE CONFIDENCE ON A CONSTRUCTION SITE? PRESENTING THE UDFCD (MHFD) PROJECT PARTNERS CONSTRUCTION MANAGEMENT HANDBOOK

4:00PM

Laura Kroeger - MHFD; Richard Borchardt - R2R Engineers; Jerry Naranjo - Naranjo Civil Constructors

Many talented engineers struggle with being effective and even comfortable on a construction site. If this sounds familiar, MHFD is working on a tool for you. Come hear about the new MHFD Project Partners Construction Management Handbook and Training Program.

CHALLENGES WITH CREATING EFFECTIVE LOCAL DRAINAGE CRITERIA MANUALS BASED ON THE URBAN STORM DRAINAGE CRITERIA MANUAL

4:30PM

Andrew Earles - Wright Water Engineers; Holly Piza - MHFD

This presentation will provide an overview of several recent storm drainage criteria manual update projects along the Front Range and in western Colorado to identify approaches that have been successfully applied to create local storm drainage criteria manuals drawing on the content in the MHFD Urban Storm Drainage Criteria Manual.

5:00PM TO 6:30PM

Happy Hour

Sponsored By: Stream Landscape Architecture

Location: Alpenglow Gallery

stream
landscape architecture + planning

7:00PM TO 9:00PM

CASFM Dinner & Awards Ceremony

Sponsored By: Muller Engineering Company

Location: Grand Ballroom

MULLER
ENGINEERING COMPANY

9:00PM TO 12:00AM

Entertainment: Karaoke!

Not interested in karaoke? The bar outside the ballroom will be open.

Location: Butte 66

9:30AM TO 11:30AM

Workshop: Hands-On Flood Safety Presenter Training for the WARD's Floodplain Tabletop Model for Outreach

Jeremy Deischer - ICON Engineering & Teresa Patterson - MHFD

Location: Elko Room

This workshop will provide training on how to effectively use the WARD'S Stormwater Floodplain Simulation System for education and outreach in your community. The Simulation System is not a computer model...it is a "get your hands wet interactive tabletop watershed in a box". All that is needed to run the Simulation System is your imagination and a bucket of water. Attendees will learn how to engage audiences with interactive "hands-on" activities with the Simulation System. These activities will illustrate the importance of floodplains and raise awareness of the benefits of properly managed floodplains while promoting the profession of floodplain management. The Simulation System is easy to use and very "hands-on", and offers a real opportunity to educate children and adults alike about the dangers and impacts of unplanned development and human activity in the floodplain.

IF CASFM members are interested in borrowing WARD's Stormwater Floodplain Simulation System, please contact Jeremy Deischer (jdeischer@iconeng.com) or Teresa Patterson (tpatterson@udfcd.org) for more information

9:30AM TO 12:00PM

Field Trips

Mountain Bike Tour 9:30AM - 12:00PM

\$20 Shuttle Fee

The 2019 Mountain Bike Tour will follow the 401 trail, which is one of the most iconic bike trails in Crested Butte. Shuttle will pick up bike riders at The Lodge at Mountaineer Square

Led by: Mike Bannister, RESPEC

Rocky Mountain Biological Laboratory Tour 10:00AM - 11:00AM

No Fee

Staff from the RMBL will conduct a tour of the facilities and provide information regarding RMBL's mission. Please meet at the RMBL visitor's center located at 8000 County Road 317 in Gothic, CO, which is approximately 20 minutes from the conference center.

Led by: Sarah Houghland, shoughland@enginuity-es.com

11:00AM TO 2:00PM

Golf Tournament

Sponsored By: Valerian, LLC

Location: The Club at Crested Butte

Shotgun Start 11:00 AM

Cost: \$60/player

Led by: John Loranger, Wood PLC

 **VALERIAN**
LANDSCAPE ARCHITECTURE | PLANNING | IRRIGATION

FRIDAY, SEPTEMBER 27, 2019

7:30AM TO 8:30AM

Breakfast

Sponsored By: Valerian, LLC

Location: Alpenglow Gallery

 **VALERIAN**
LANDSCAPE ARCHITECTURE | PLANNING | IRRIGATION

8:30AM TO 8:45AM

CASFM Chair Closing Remarks

Morgan Lynch - MHFD (UDFCD)

Location: Grand Ballroom





SCHEDULE AT A GLANCE - TECHNICAL SESSIONS

WEDNESDAY

	EMERGENCY PREPAREDNESS Location: Floresta Room Moderator: Kim Pirri	STREAM RESTORATION Location: Alpine Room Moderator: Brent Kaslon	STORMWATER QUALITY & GREEN INFRASTRUCTURE Location: Elko Room Moderator: Troy Carmann
1:30PM	Hot N Cold Flooding – Post-Fire, Ice Jamming, & Snowmelt In The Animas River Watershed <i>Geoff Uhlemann, Leylin Marroquin, & Griffin Cullen - AECOM</i>	Fat Bikes & Sand Creek Channel Restoration <i>Walter Pennington - Merrick; Adam Copper - City of Colorado Springs Stormwater Enterprise</i>	E. Coli Tmdls In Colorado: Finding Solutions <i>Jane Clary & Chris Olson - Wright Water Engineers</i>
2:00PM	Augmented Reality Flood Walk <i>Matthew Buddie & Tony Mendes - FEMA Region VIII</i>	The Application Of 'Full Spectrum' River Restoration Design In Colorado <i>Travis Stroth - Stillwater Sciences</i>	Development Of A New Integrated Decision Support Tool (I-Dst) <i>Elizabeth Gallo - Colorado School of Mines</i>
2:30PM	Working Together To Reduce Flood Risk: Silver Jackets Interagency Program And Projects In Colorado <i>Melissa Weymiller & Jamie Prochno - USACE</i>	Goldsmith Gulch - Using Contemporary Design To Restore A Healthy Channel <i>Mark Taylor - The Architerra Group, Suzanne Moore, Greenwood Village</i>	Integrating LID Into Municipal Design Criteria - A Colorado MS4 Perspective <i>Kevin Koryto - Boulder</i>
3:30PM	The USGS Flood Inundation Mapping Program: Using Flood Inundation Maps And Real-Time Stream Gages With A Case Study From Fort Morgan, Colorado <i>Mike Kohn - US Geological Survey & Thuy Patton - CWCB</i>	A New Model For Park Design: Integrating Nature Play With A High Functioning Low Maintenance Stream <i>Cassie Kaslon - Valerian; Frans Lambrechtsen - Jacobs</i>	Beneficial Use Of Water Treatment Residuals (WTRS) As A Bioretention Media Amendment For Phosphorus Removal From Stormwater <i>Basil Hamdan - Fort Collins; Tyler Dell - Colorado State University</i>
4:00PM	Projecting Changes In Future Rainfall Extremes Across Colorado Due To A Changing Climate <i>Page Weil - Lynker Technology</i>	The Development And Application Of Uniform Hydroseres In Riparian And Wetland Restoration <i>John Giordanengo - Aloterra</i>	Subwatershed Water Quality BMP Retrofit Analysis <i>Shawn Tracy - HR Green</i>
4:30PM	Using ARCGIS Pro And ARCGISs Online For Hydraulic Field Applications And Stakeholder Outreach <i>Anthony Alvarado - Ayres; Brian Varrella - CDOT</i>	Stream Restoration Projects – The Revegetation Side Of The Story <i>Jenelle Kreutzer & Moneka Worah - ERO</i>	Reimagining A Denver Landmark - City Park Golf Course <i>Drew Beck - Matrix; Amy Forman - City and County of Denver; Ryan Byrne - Martin/Martin</i>



SCHEDULE AT A GLANCE - TECHNICAL SESSIONS

THURSDAY

	FLOODPLAIN MANAGEMENT Location: Floresta Room Moderator: Chris Ide	TECHNICAL MODELING Location: Elko room Moderator: Michelle Ibings	STORMWATER MANAGEMENT Location: Alpine Room Moderator: Frans Lambrechtsen
1:30PM	"Is That A Complete Panel Number?" Or Common Elevation Certificate Errors & What You Can Do To Fix Them... It's A CRS Thing <i>Kimberley Pirri - AECOM; Jeremy Hamer - Denver</i>	The Homestake Project's Arkansas River Diversion Rehabilitation, Tiered Hydraulic Modeling Applied To A Recreational In-Channel Project <i>Brian C. McCormick - Colorado Springs Utilities</i>	Where Do We Start? A Comprehensive Water Approach To Overcome Over A Century Of Neglect <i>Dave Jula - Denver; Beth Vogelsang - OV Consulting</i>
2:00PM	Fluvial Hazard Zone Model Land Use Regulations <i>Jeffrey Brislawn, Amy Carr - Wood PLC; Kevin Houck - CWCB</i>	A New Look To Manning 'N' Values <i>Craig Jacobson - ICON; Jennifer Bousselot - Colorado State University</i>	2018 Westminster Drainage Study <i>Andrew Hawthorn - Westminster; Colin Barry - Enginuity</i>
2:30PM	Lomas For The Masses - A Quick Guide To Multiple Lidar Lomas <i>Tim Benenati - AECOM; Terri Fead - MHFD</i>	Evaluating And Improving Large- Scale 2D H&H Studies In Challenging Mountainous Regions <i>Garrett Sprouse & Eli Gruber - CDM Smith</i>	Boulder Civic Area - A Park, A Place, A Community <i>Cody Gratny - JVA</i>
3:30PM	Veterans Memorial Park Detention Pond: How War Brings People Together <i>Carrie Gudorf - Mesa County; Dale Mathison - Ayres</i>	Colorado Risk Map: Past, Present And Future <i>Thuy Patton, CWCB; Rigel Rucker - AECOM</i>	Bridging The Gap Between Planning And Performance: Stormwater Management <i>Nick McMurtrey - Murray Smith</i>
4:00PM	Planning For Hazards: Implementing Flooding-Specific Tools And Strategies To Reduce Risk And Build Resilience <i>Ryan Carroll - Michael Baker International; Matthew Buddie - FEMA Region VIII</i>	What 4,000 HEC-RAS Runs Taught Us About Maintenance Prioritization <i>Mike Bannister - RESPEC; Jon Villines - MHFD; Ryan Tigera - Aurora Water</i>	Do You Wish You Had More Confidence On A Construction Site? Presenting The MHFD Project Partners Construction Management Handbook <i>Laura Kroeger - MHFD; Richard Borchardt - R2R; Jerry Naranjo - Naranjo Civil Constructors</i>
4:30PM	Localized Floodproofing Techniques And Capital Projects For Residential Communities <i>Suleyman Akalin & Emily Villines - Calibre Engineering</i>	Using 2D Models To Prioritize Capital Improvements: A Case Study Of The Benefit Cost Analysis Of The Old Town Drainage Basin In Fort Collins <i>Jeremy Deischer - ICON; Sandra Brattie - Fort Collins</i>	Challenges With Creating Effective Local Drainage Criteria Manuals Based On The Urban Storm Drainage Criteria Manual <i>Andrew Earles- Wright Water Engineers; Holly Piza - MHFD</i>

WEDNESDAY KEYNOTE SPEAKER

Location: Grand Ballroom

BENEATH BLUE MESA: THE GUNNISON RIVER VALLEY BEFORE BLUE MESA RESERVOIR

David Primus will present a slide show of the history of the Gunnison River Valley before Blue Mesa Reservoir was completed in 1965. He will discuss fishing resorts, ranches, towns, and the narrow gauge railroad that now lie beneath the reservoir as remembered by local residents.

DAVID PRIMUS - KEYNOTE SPEAKER



Primus has lived in Gunnison since 1978, graduating from Western State College in 1981. After enjoying a 30-year career in technology management, he is currently the Community Outreach Facilitator for the School of Environment & Sustainability at Western Colorado University. His life-long passion has been the history of the American West, specializing in Colorado history. A third generation Coloradoan, he has written the book *Steamboat Springs: Memories of a Colorado Pioneer*, a collection of his grandfather's stories of growing up in the early 1900s, and was a member of a small team producing *Medicine in the Mountains*, a history of the Lake City Area Medical Center. He serves on the Gunnison County Historic Preservation Commission, writes regular historical articles for the *Gunnison Country Times*, and has helped develop a historical mapping project with Gunnison County.

THANKS TO OUR MODERATORS!



Chris Ide is a Senior Water Resources Engineer and Project Manager at Wood with 13 years of experience in advanced Hydrology and Hydraulics modeling and design. He provides technical expertise on projects involving dams and levees, site stormwater design, flood mitigation, floodplain mapping, and watershed modeling for numerous projects across the United States. He has also worked extensively with the Colorado Water Conservation Board, Federal Emergency Management Agency, State Departments of Transportation, and local municipalities providing technical support.



Kim Pirri is a Senior Consultant in AECOM's Colorado Surface Water Practice. She enjoys applying her 21 years of experience to support floodplain and stormwater management needs of clients across local, state, and private sectors. Recent projects have included rain-on-grid analyses, probabilistic hydrology, rain-on-snow hydrology, hazard mitigation planning, CRS support, flood risk studies, and urban stormwater design. Kim spends her off-hours hanging out with her dogs, Lola and Diesel, and motoring on the roadways of Colorado with multiple Mini Cooper car clubs.



Brent Kaslon is an Associate Principal at Valerian LLC and has been a member of CASFM for 7 years. As a certified floodplain manager, land planner, and landscape designer, Brent is a versatile asset to the Valerian team working on stream corridor restoration, parks and open space, neighborhood planning and entitlements, and urban design. In his free time, he loves to spend time with his wife, Cassie, and two sons – Parker and Holden, he also loves to ski, garden, and grow apple trees.



Michelle Iblings is a Senior Hydraulics Engineer for Drexel, Barrell & Company. She has over 15 years experience in Water Resources and Storm Water Management, focusing on floodplain modeling and management projects. She has a BS and MS in Civil Engineering, and holds Professional Engineer licenses in Colorado, California, and Texas. In her free time, she enjoys traveling, hiking, triathlons, skiing, yoga, scuba, and watching sports.



Troy Carmann. Engineering found Mr. Carmann at a young age, courtesy of a bag of legos and a neighborhood creek that drained the county dump. Spending junior high lunch in the library established his persistent educational social patterns. A scout role on the football team at Iowa State kept him in school earning a degree in Civil Engineering. One summer included 3500 miles of roadway inspections and another was spent as a survey intern for ICON Engineering. Over 20 years later, Troy is honored his career with ICON has allowed him to serve people and projects all over the state of Colorado.



Frans Lambrechtsen works for Jacobs and is a native of Utah. He moved to Colorado in 2014, following the completion of his master's degree at BYU. For those who are curious, he does have an uncle named Hans, but they live too far apart to get together to wear sweats and talk in German accents. Frans has worked at Jacobs for the last 7 years, primarily working on water resources and stormwater projects in Colorado. He has also supported Jacobs' work across the country. He works on everything from MDPs to construction, recently supporting the First Creek Park and Trail project.

THURSDAY FEATURED SPEAKERS

Location: Grand Ballroom

BUILDING BRIDGES TO OUR PAST, PRESENT, & FUTURE

The St. Charles Place Park Project sought to connect Industry, a new development, and the Five Points community. Where similar situations have ended at odds, the St. Charles and Industry partnership has demonstrated a positive collaboration. The Park at St. Charles symbolizes not just a park but a coming together of communities through transparent intent and thoughtful design. This entire process would not have been possible without the St. Charles Ambassadors. Their mission's values - to preserve Unity, Safety, Identity, and Presence in their community - have sustained the voice of Five Points. What started as a single Park Project can continue as a legacy of inspiration. Let's invite our young people to engage and be heard. Let's hold governments, planners, and developers accountable to holding the existing stories and values of the places we work in.



Kyntashia - Original Ambassador (OA)
Kyntashia attends the Contemporary Learning Academy and is 18 years old. She has a great passion for the St. Charles Rec Center. She also loves to dance and participates in a local dance group.



Tavi - OA
Tavi is 20 and attends Emily Tech College. He loves St. Charles as a second home, and loves making people happy. He wishes to make a change in the world and believes it will start at St. Charles.



Phranklin - OA
Phranklin is a graduate of the Contemporary Learning Academy and is attending Langston University on scholarship to study Organizational Development. He is an advocate for his community.



Tomas - OA
A part of this community for his entire life, Tomas is hoping to work at the City of Denver expanding Ambassador programs. He loves basketball and spending time with his family & baby girl.



Lonzel - Junior Ambassador (JA)
Lonzel is 17 and attends Manual High School, playing point guard for their 3A State Champion Basketball Team. He hopes to inspire kids to serve the community from "inside the hood."



Rose - JA
Rose is 17 and a senior at Manual High School. She is passionate about helping her community and making a difference. She loves to dance and smile. Her mom is her very best friend. Rose wants to attend Langston University.



Virgyl - JA
Virgyl is a senior at the Contemporary Learning Academy. He joined the program to carry the torch to the community's young people, showing them their voices can be heard.



Susan - Mentor
Susan is the founding principal with Valerian. Her 40 years of experience in leadership, mentoring, and outreach prepared her to develop of the ambassador training program.



Sloane - Mentor
Sloane has extensive experience in city park planning, construction, and redevelopment. She is currently the Regional Business Manager for Bienenstock Natural Playgrounds.





OPTIONAL WORKSHOPS

FLOODPLAIN 101 (TUESDAY) 8:00AM-5:00PM - \$75

Led by: Matthew Buddie, FEMA Region VIII; Kevin Houck, CWCB; Jim Kaiser, City of Thornton; Kim Pirri, AECOM | Facilitator: Chris Hodyl, Jacobs

Location: Elevation Peaks Ballroom

The Floodplain 101 workshop will cover subjects including overall floodplain management, floodplain maps and Flood Insurance Studies, key National Flood Insurance Program (NFIP) regulatory and non-regulatory standards, flood insurance, and flood hazard mitigation, among other topics. If you need a refresher, this is a course you don't want to miss.

SMS AND HYDRAULIC TOOLBOX BRIDGE SCOUR TUTORIAL (TUESDAY) 2:00PM-5:00PM

Led by: William deRosset and Scott Zey - Ayres Associates

Location: Elko Room

In October 2018, Aquaveo released version 13.0 of SMS, which has evolved through 8 subsequent updates. Version 13.0 includes a new and revolutionary set of tools to analyze, extract, and export hydraulic scour variables to FHWA's Hydraulic Toolbox 4.4 bridge scour calculator. Using these tools will help all practitioners perform more efficient and consistent bridge scour analyses. In this 3-hour workshop, we will invite participants to work through this new scour analysis procedure. Along the way we will provide technical insights into how the tool functions, the rationale behind it, and the tips and tricks necessary produce accurate results. If participants want to follow along (optional) they should bring a laptop with AquaVeo's SMS 13.0.8 with a license for SRH-2D and [FHWA's Hydraulic Toolbox 4.4](#) installed.

H&H MODELING FUNDAMENTALS FOR MUNICIPAL REVIEWERS (TUESDAY) 2:00PM-5:00PM

Led by: Chris Olson & Andrew Earles - Wright Water Engineers

Location: Alpine Room

This course is intended for municipal engineers and others who want to learn or improve skills for reviewing hydrologic and hydraulic models, such as the Colorado Urban Hydrograph Procedure (CUHP) and the Stormwater Management Model (SWMM). Most Colorado municipalities have detailed drainage and water quality requirements for development and redevelopment. For more complex projects, the submittals often include H&H models that perform rainfall-runoff calculations and route flows through the existing and proposed drainage systems. Models often are created at a watershed master planning scale and refined to the development scale to plan and design stormwater infrastructure including conveyance, detention and water quality.

This course will introduce participants to the basics of CUHP and SWMM. The intent is not to create expert modelers but instead to give municipal reviewers the skills needed to effectively review models. The course will focus on CUHP and SWMM since these are the most commonly used models along the Front Range; although, many of the types of analyses that will be presented also apply to other models. The course will include an overview of major model components and inputs, different tools for viewing and analyzing model outputs, common methods of checking for reasonableness of model results, and some of the more common errors in modeling. The course will be hands-on, and all attendees will need to bring a computer with current versions of CUHP and SWMM loaded. Course instructors will provide example model files for class exercises and discussion.

HANDS-ON FLOOD SAFETY PRESENTER TRAINING FOR THE WARD'S FLOODPLAIN TABLETOP MODEL FOR OUTREACH (FRIDAY) 9:30AM-11:30AM

Location: Elko Room

Led by: Jeremy Deischer - ICON Engineering; Teresa Patterson - UDFCD (MHFD)

This workshop will provide training on how to effectively use the WARD'S Stormwater Floodplain Simulation System for education and outreach. The Simulation System is not a computer model...it is a "get your hands wet interactive tabletop watershed in a box.. All that is needed to run the Simulation System is your imagination and a bucket of water. Attendees will learn how to engage audiences with interactive "hands-on" activities with the Simulation System. These activities will illustrate the importance of floodplains and raise awareness of the benefits of properly managed floodplains while promoting the profession of floodplain management. The Simulation System is easy to use and very "hands-on," and offers a real opportunity to educate children and adults alike about the dangers and impacts of unplanned development and human activity in the floodplain.

IF CASFM members are interested in borrowing WARD's Stormwater Floodplain Simulation System, please contact Jeremy Deischer (jdeischer@iconeng.com) or Teresa Patterson (tpatterson@udfcd.org) for more information.



FIELD TRIP

ROCKY MOUNTAIN BIOLOGICAL LABORATORY TOUR (FRIDAY 10:00AM - 11:00AM)

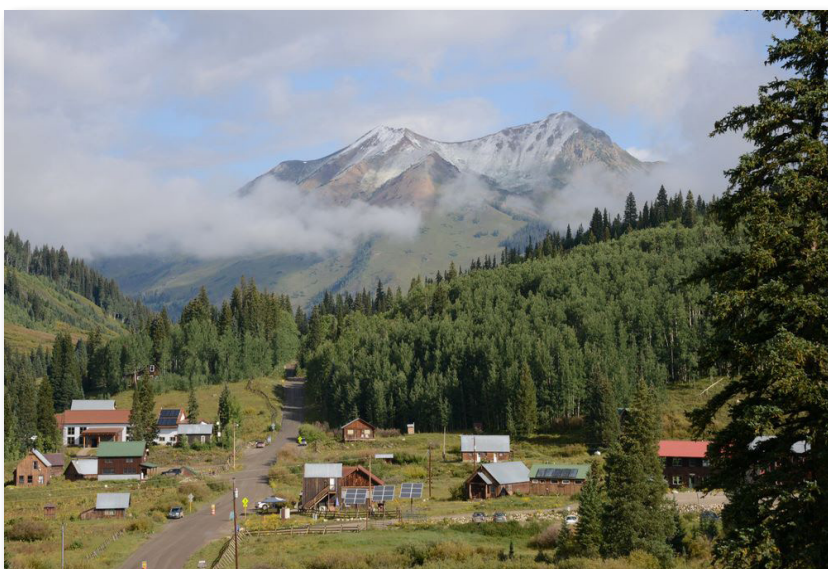
Rocky Mountain Biological Laboratory

No Fee

Staff from the RMBL will conduct a tour of the facilities and provide information regarding RMBL's mission. RMBL invests in its people and places, its communications systems, and its physical plant. Scientists take full advantage of the research done by previous RMBL scientists using modern bioinformatics tools. They track the environment year-round using automated sensors. While training the next generation, they develop a comprehensive understanding of biological processes that illuminates all ecosystems. RMBL serves as a unique resource for policy makers who need to understand a changing and complex world.

Please meet at the RMBL visitor's center located at 8000 County Road 317 in Gothic, CO, which is approximately 20 minutes from the conference center.

Led By: Sarah Houghland, shoughland@enginuity-es.com



MOUNTAIN BIKE TOUR

The 2019 Mountain Bike Tour will follow the 401 trail, which is one of the most iconic bike trails in Crested Butte. The 14.1 mile loop ascends 2,249' with an average grade of 6% and a max grade of 29%.

The definition of alpine mountain biking, the loop provides endless views of Colorado's breathtaking Elk range, winding its way around alpine lakes, through aspen groves, while immersing riders in shoulder high skunk cabbage. This ride ranks among the best of its style, and the among best in the area.

www.mtbproject.com/trail/338027/401-trail-loop

Date: Friday, September 27, 2019
Time: 9:30AM - 12:00PM
Fee: \$20 Shuttle Fee
Led By: Mike Bannister, RESPEC
Mike.Bannister@respec.com
Meet: Shuttle will pick up bike riders at The Lodge at Mountaineer Square

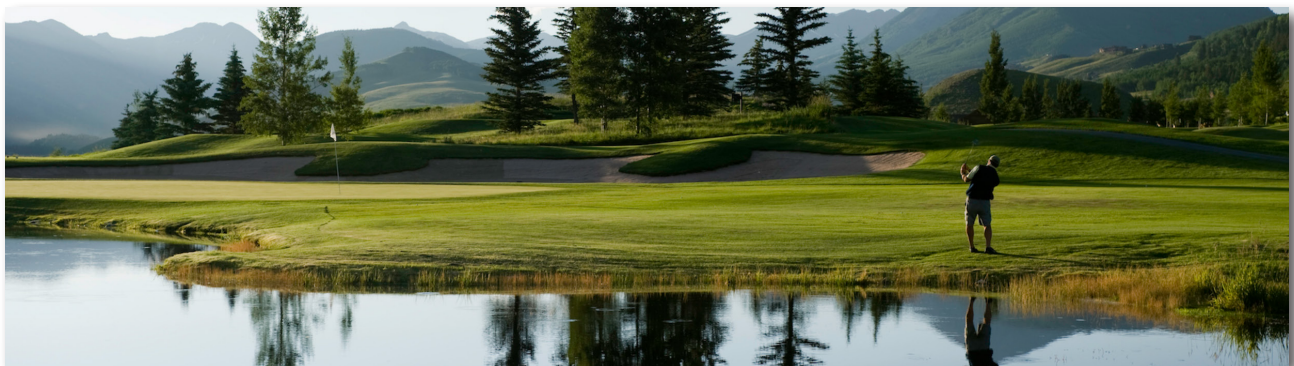


GOLF TOURNAMENT

The Club at Crested Butte, located in the heart of Crested Butte, Colorado, sprawls over 160 acres among a tranquil setting of trout filled lakes, aspen trees, mountaintops and pristine wilderness. The Club offers many amenities and great hospitality, from the fine cuisine to Robert Trent Jones II Championship Golf Course.

Who: Conference participants, family, sponsors, and exhibitors
Where: The Club at Crested Butte
385 Country Club Drive, Crested Butte, CO 81224
When: Friday, September 27, 2019
11:00 AM Shotgun Start
Cost: \$60 per player
Format: 4-person scramble
Led By: John Loranger, Wood PLC, john.loranger@woodplc.com

Sponsored By: Valerian, LLC



ADDITIONAL EVENT INFORMATION

MORNING YOGA

Per CASFM Annual Conference tradition, we will be offering morning yoga. The sessions will be guided by Lauren Winnen, PE (City and County of Denver), from 7:00AM-8:00AM in the Gunnison Room (Grand Lodge). All practice levels welcome. Attendees are encouraged to bring their own mats, but there will be some mats available to borrow.

SILENT AUCTION

We are now accepting donations for our Silent Auction!

Proceeds from the CASFM Silent Auction fund our CASFM Family Scholarships, delineated below. Since we began our scholarship program in 2002, CASFM has awarded more than \$70,000 in scholarship funds to students in Colorado. If you are interested in donating, please contact Dan Hill:

Dan Hill, PE, CFM
UDFCD (MHFD)
(303) 455-6277
DHill@udfcd.org

BEN URBONAS SCHOLARSHIP:

This scholarship is awarded to a graduate level student studying in a field closely related to the goals of CASFM. The purpose of this scholarship is to promote interest among students and the engineering community in CASFM and to promote the goals of the organization.

FAMILY SCHOLARSHIP:

This scholarship is awarded to an accredited undergraduate student (Sophomore level or above) or a graduate student whose parent or legal guardian is a current member of CASFM. The purpose of this scholarship is to assist members of CASFM and their immediate offspring in paying for the cost of higher education and to further promote interest in the goals of the organization.

UNDERGRADUATE SCHOLARSHIP:

This scholarship was originally funded by the Urban Watersheds Research Institute and is awarded to an undergraduate student in the field of Civil Engineering or a closely related field in Colorado. The purpose of this scholarship is to promote interest among students and the engineering community in CASFM and to promote the goals of the organization.

GRANT AWARD WINNER

The CASFM research grant supports CASFM's goal to be stewards of stormwater principles and practices, support engineers, academics, and friends, and to advance stormwater practice. For the 2019 year, CASFM awarded an annual research grant to Donny Roush (City of Denver) and Troy Carmann (ICON Engineering) to support their joint proposal to construct two end-of-storm-drain trash collection and measuring devices. The devices would be placed near Bruce Randolph High School and Joe Shoemaker School in Denver. Donny and Troy propose to engage students and teachers in the data collection and analysis process through an existing partnership between Denver Public Schools and Denver Public Works.

THURSDAY AWARD BANQUET

Thursday is a night for celebration! The Awards Banquet gives CASFM an opportunity to thank our volunteers and member organizations with a night of great food, comradery, and entertainment. At Thursday's award ceremony, we will announce the CASFM Project Award Recipient, present awards to out-going officers, and raffle items to benefit the Scholarship Committee.

The Engineering Excellence Project Award Selection committee included:

- John Pflaum, Retired MHFD
- Colin Wagoner, Calibre Systems
- Terry Rogers, City of Lakewood
- Jim Watt, MHFD
- Alan Searcy, City of Lakewood

Sponsored By: Muller Engineering Company



CASFM ENGINEERING EXCELLENCE PROJECT AWARD

2018 CASFM AWARD RECIPIENT: COLORADO EMERGENCY WATERSHED PROTECTION PROGRAM

In early September 2013 several days of rain caused massive flooding across Colorado's Front Range communities. Streams reclaimed floodplains, destroyed roads, bridges, and buildings and ripped vegetation from riverbanks. In total, the flood caused approximately \$4 billion in damage to infrastructure and public and private property. Emergency repairs opened highway corridors but often bulldozed rivers, leaving them in dysfunctional alignments and often with channels that were too small to safely convey normal river flows. Unable to self-repair, the damaged and unstable rivers needed a boost.

Communities came together with encouragement and support from Federal and State partners. Recognizing the impacts of historic encroachment on floodplains and seeing a need to build resiliency into the systems, the State took a new, more holistic approach to recovery. In the past, disaster recovery was often completed on an individual property within a single local jurisdiction. With this new approach, the State remained committed to protecting life and property, but implemented projects on a much larger scale.

Thanks to early and bold visioning and partnership building by the Colorado Water Conservation Board (CWCB) and continued dedication to recovery principles by other State agencies like the Department of Local Affairs (DOLA), Division of Local Government, as well as numerous local and private partners, the recovery of Colorado's flood impacted watersheds have created a new model for disaster recovery.



PREVIOUS CASFM AWARD RECIPIENTS (LAST 10 YEARS)

Year	Winning Project	Companies & Agencies
2018	Colorado Emergency Watershed Protection Program	Colorado Water Conservation Board
2017	Little Dry Creek Park	City of Westminster, MHFD, Adams County, State of Colorado, Muller, and Matrix
2016	South Platte River Vision Implementation Program: Grant- Frontier Park to Overland Pond Park	The Greenway Foundation, City and County of Denver Parks and Recreation Department, CDM Smith
2015	Cherry Creek Balley Ecological Park	Arapahoe County Open Space, SEMSWA, MHFD, Cherry Creek Basin Water Quality Authority, Muller Engineering Company, Valerian
2014	To Move a River- Saving Loveland's Water Supply	City of Loveland, Ayres Associates, and Tetra Tech
2013	Lefthand Creek Flood Control Project	City of Longmont, Muller, Went, ERO, Naranjo
2012	Canal Importation Pond and Outfall Design	City of Fort Collins, Ayres Associates, and Anderson Consulting Engineers
2011	Pine Creek Stream Stabilization, Bridge and Storm Sewer Project	SEMSWA, MHFD, Arapahoe County, Centennial, and Ayres Associates
2010	Elmer's Two-mile Greenways Project	City of Boulder, Urban Drainage (MHFD), WH Pacific, and Centennial Engineering
2009	South Platte River Globeville and North Areas Flood Control and Greenways Project	City and County of Denver, MHFD, and Belt Collins West

2019 ENGINEERING EXCELLENCE AWARD NOMINEE #1

WONDERLAND CREEK FLOODPLAIN & GREENWAY IMPROVEMENTS

Wonderland Creek Floodplain and Greenway Improvements Abstract

The improvement of the one-mile stretch of Wonderland Creek that extends from Foothills Parkway to Winding Trail Drive is a project that spanned over 10 years from concept to completion. It was accomplished with a budget of \$30 million that included a mixture of funds from the City of Boulder (City), the Urban Drainage and Flood Control District (District), and several federal grants. The City and the District partnered in the planning, design, and construction of this project that protected health, safety, and welfare of the public by reducing the flood risk to 450 dwelling units, six road crossings, a ditch, and a railroad. During the 2013 flood several structures were inundated, and the rapidly rising floodwaters threatened the life and safety of many residents. Flood related fatalities were only narrowly avoided in some cases. The project also extended a regional trail and grade separated it from the railroad and two road crossings, providing a safer trail experience for recreational users and bicycle commuters.

The narrow corridor required integrating multiple channel design ideas. In some areas, the channel had to be deepened to convey the flows during a 100-year event. This resulted in thousands of feet of concrete walls to protect adjacent structures. Unique form liners along with integral color concrete were used for the channel walls to visually enhance the project. Where the channel could not be deepened or feasibly rerouted to reduce flood risk, a property was purchased and the existing structure on it was demolished.



An innovative flow control structure and a curved wall spillway system were constructed to reduce known flooding problems in the Boulder White Rock Ditch. A new bridge (built by the BNSF Railroad) allows flood flows to pass underneath and provides a grade separated alignment for the regional trail.

Although the primary objectives of the project were to reduce flood risk to the community and to extend the regional trail, the project was also able to create a naturalized active channel throughout the project. Highly diverse landscaping was used to provide not only a visual enhancement but also an ecological amenity to the wildlife that frequents the area.

Rather than responding to project goals with one-dimensional solutions, the project team saw each as a multi-faceted response to the site. For example, the channel needed to accommodate larger flows, so the project team widened the channel, but that required retaining walls. The project team found ways to beautify the walls with integral color in the mix and artistic elements along them. Since landscaping was necessary to restore the project area, the team elected to diversify the plant palate to provide a more interesting and attractive aesthetic as well as more diverse habitat.

The project team worked together with the surrounding residents and affected agencies to create a design that incorporated functionality, aesthetics, and community welfare into the final overall product. The project delivered on the overall goal of reducing the flood risk to surrounding people and structures while delivering an amenity to the community through the new regional trail and ecological and water quality enhancements. Given the size and complexity of a project like this, it would be hard to compare it to any other project in terms of budget and schedule, but it did manage to meet expectations in all regards.

The Wonderland Creek project serves as a model for other communities by showing how significant site constraints can be overcome and by showing what's possible for community and ecological benefits beyond flood control even along a narrowly confined urban corridor. It also shows how, even though coordination can be immense with outside agencies and multiple stakeholders, it can be done to achieve a project that greatly enhances the health, safety, and welfare of our communities.

2019 ENGINEERING EXCELLENCE AWARD NOMINEE #2

MONUMENT CREEK STREAM STABILIZATION UPSTREAM OF PIKEVIEW

Project Abstract

The Colorado Springs Utilities (Utilities) Sanitary Sewer Creek Crossing (SSCC) Rehabilitation/Replacement program recently restored a portion of Monument Creek near I-25 and Mark Dabbling Blvd. The purpose of the Monument Creek Stream Stabilization Upstream of Pikeview Project (Project) was to stabilize a degrading reach of Monument Creek to protect a 36" wastewater main crossing Monument Creek, a 54" wastewater main paralleling Monument Creek, and an upstream drop structure threatened by channel degradation.



This Project serves as an example to the community that stream stabilization projects can include additional objectives beyond reducing erosion for infrastructure protection. In this case, those additional objectives include reconnection of the main channel to adjacent floodplains, wetland mitigation, proactive restoration, recreational and aesthetic enhancements, and improved safety. The true success of the Project is that it demonstrates for the community the value in converting degraded natural drainageways into assets that can be enjoyed between storms while simultaneously allowing for floodwater conveyance. Design features like sculpted concrete drop structures, void-filled riprap riffles, and a large boulder W-weir were installed not simply to

provide grade control but also to enhance the viewshed for trail users and provide a feeling of connection to the creek. When site conditions present unique opportunities for restoration, recreation, and floodplain reconnection, engineers and owners should consider how to maximize the overall benefit of a Project to the community in which they serve. To accomplish all of this, the Project team had to overcome challenging conditions during construction and navigate the CLOMR/ LOMR process to prevent any negative impacts to the FEMA floodplain. Finally, this Project serves as a model championing proactive stormwater management in that restoration activities took place before the reach degraded to a state that made it impossible to reconnect overbank floodplain areas.

The true success of the Project is that it demonstrates for the community the value in converting degraded natural drainageways into assets that can be enjoyed between storms while simultaneously allowing for floodwater conveyance.



2019 ENGINEERING EXCELLENCE AWARD NOMINEE #3

US 34 BIG THOMPSON CANYON FLOOD RECOVERY PROJECT

In September 2013, extreme flood waters washed away homes, cars, and much of US 34 through the Big Thompson Canyon between the City of Loveland and the Town of Estes Park in northern Colorado. The Emergency Response reconstructed the lost roadway and reopened the highway to traffic by December 2013, to fulfill a promise made to the citizens of Colorado by Governor John Hickenlooper. The Governor issued a second promise regarding US 34, that we would “build back better than before.” The permanent repairs, completed with the Construction Manager/General Contractor (CM/GC) delivery method, involved extensive stakeholder coordination and innovative engineering to help the roadway and river recover and coexist to better withstand future disasters.

Health, Safety, and Welfare

This project not only permanently repaired the highway, but also included resiliencies to help reduce the impact of similar events in the future. Entire communities were stranded after the 2013 floods, and this project prioritized providing at least 15-ft passable surface post-flood as emergency access to as many communities and local canyon residents as possible. The project team collaborated with stakeholders to ensure the health of the wildlife and river long-term and during construction, including an intensive multi-agency water quality monitoring program. Safety during construction was also a priority, with over 587,000 man-hours and 5,000 vehicles passing through a permitted closure without one incident.

Creative, unique, and innovative solutions

Innovative and cost-effective solutions had to be developed to maximize post-flood emergency access. Accurate 2D modeling and GIS-based design enabled nimble, focused embankment protection designs and landowner protection to improve resiliency. The design process also included the formation of a “challenge team”, made up of contractors, designers, and CDOT representatives that took an objective look at the canyon’s problems in order to suggest possible solutions. One such solution, soil-cement mixing, involved the mixing of concrete and native material to form a 15-ft minimum width surface that adhered to bedrock. Additionally, set-back matrix riprap protection used materials generated by the project. Both solutions provided a cost-effective alternative in tight sections that expanded the floodplain allowed for additional resiliency scope to be included elsewhere in the canyon.

Multiple objective management

The project team successfully coordinated with many stakeholders, including the US Forest Service, CPW, the City of Loveland, Larimer County, and the Big Thompson Watershed Coalition. By creating a unified vision for the canyon and meeting monthly in offices and the field to review design, dewatering, and other construction practices, stakeholder needs were met. Critical to the project’s success was the CM/GC delivery, which provided the flexibility to accommodate cost-effective adaptations to the river design during construction as input was received from stakeholders and the contractor.

Problem solution, budget, and schedule

By working 7 days a week, night and day over two permitted closure winter construction seasons, the project was able to shorten construction by 18 months. The project used the \$280M program budget to maximize resiliency scope, providing 15-ft emergency access through the vast majority of the canyon.

A model for other communities and projects?

With the success of this project and of the flood recovery program, CDOT and the state of Colorado are expanding their focus of resiliency to incorporate all phases of the project life cycle, from planning and design to construction. The concept of resiliency can help communities identify risks and develop resiliency opportunities to reduce those risks and provide durable and adaptable infrastructure.

The 2019 Nominees are listed in no particular order.

2019 WATER QUALITY AWARD

INAUGURAL CASFM STORMWATER QUALITY AWARD

We are excited to present the inaugural Stormwater Quality Award during the 2019 CASFM Annual Conference! This summer nominees were asked to submit applications based on the merits of the project, program or study where water quality is a feature or main objective. Poster boards for each of the finalists are being displayed at the back of the main ballroom along with project descriptions in the program and in Socio. Voting will be conducted at the conference, and the winner will be announced during the Thursday night Awards Banquet. Voting should be based on the evaluation criteria listed below. More details regarding voting will be provided at the start of the conference.

EVALUATION CRITERIA

1. Innovation - New technology used or adaption of current technology.
2. Benefits - Quantified benefits to water quality, a population, or a community.
3. New Thinking - Demonstrates new thinking in problem solving or creativity in meeting water quality requirements.
4. Did the project meet its goal with respect to problem solution, budget, and schedule?
5. How did the project/program/study improve water quality?
6. Can the project/program/study serve as a model for other communities and/or projects/programs/studies?

RUSTIC HILLS NEIGHBORHOOD FULL SPECTRUM DETENTION POND PROJECT

SUBMITTED BY: CITY OF COLORADO SPRINGS



The Rustic Hills Neighborhood was developed in the early 60's as a rural El Paso County subdivision. In the 70's it was annexed into the City with the existing gravel-surfaced roads and no water quality BMPs. In an effort to "retrofit" the neighborhood with asphalt surfaced roads, a water quality pond was required to handle the added run-off. In addition, the City owned a parcel large enough to provide treatment for the entire upstream basin. The parcel of land was controlled by the City Parks Department; thus requiring their approvals of the final structure designs. Parks required that the BMP be aesthetically pleasing and blend into the natural setting of the area. Therefore, the BMP included a vegetated trickle channel using tied concrete block mats, modular block concrete walls with stamped concrete face, 4'-6' natural boulder baffle blocks and stained concrete outlet structures. The pond was sized to provide water quality and detain the 100-yr capture volume (11.3 ac/ft). Additionally, space was provided along the outskirts of the pond for a future trail connection with outside parks trails.

RIO GRANDE STORMWATER QUALITY PARK

SUBMITTED BY: RESPEC



Rio Grande Park is one of Aspen's largest parks, located next to the Roaring Fork River, just south of downtown. The goal of the project was to incorporate water quality treatment of City runoff within a natural-looking and aesthetically pleasing park. The water quality improvements include two pre-treatment sediment vaults, wetlands, streams, settling ponds, cascading pools, and waterfalls that work as an innovative and beautiful treatment train, cleaning runoff before it enters the Roaring Fork. The park has thousands of yards of sculpted earth, hundreds of strategically placed boulders, and groves of native trees, shrubs, and wildflowers.

2019 - 2020 CASFM SCHOLARSHIP RECIPIENTS

BEN URBONAS SCHOLARSHIP

KATIE KERSTEINS

Katie Kersteins is an undergraduate student in Environmental Engineering at Colorado School of Mines and will graduate in May of 2019. She first became interested in stormwater and floodplain work at her internship with Urban Drainage and Flood Control District (MHFD). Katie is furthering her education and going to graduate school for Environmental and Water Engineering at Mines. After, she hopes to work as a water resource engineer in stormwater management.

FAMILY SCHOLARSHIP

DANIEL HUNT

Daniel Hunt is the son of CASFM member and past officer John Hunt, and graduated in 2015 from Liberty Common High School in Fort Collins. He is currently a senior studying mechanical engineering at Colorado State University. Learning about the tools and processes necessary for mass production through firsthand co-op experience sparked a great appreciation for advances in manufacturing technology, and he hopes to one day be a contributor to the next technology breakthrough allowing better products to be made available at a lower costs.

UNDERGRADUATE SCHOLARSHIP

ARIELLE RAINEY

Arielle Rainey is an Environmental Engineering student at the Colorado School of Mines graduating in spring of 2020. Arielle was drawn to the water industry from understanding the importance of safe water and realizing that it is not a resource of infinite availability. She has worked with graduate students doing storm water quality research under ReNUWIt and is interning with Aurora Water in the planning and engineering division. She enjoys church activities and hiking in her free time. In the future, Arielle hopes to continue working in the water industry with the public sector.

2018 GRANT RECIPIENT UPDATE

In 2018, CASFM awarded \$2500 to the Rocky Mountain Environmental Challenge (RMEC) Program through our Grant Program. Below represents an update from the organization.

In 2018-2019, the RMEC Program experienced a successful and pivotal year of program growth. Through their innovative and pragmatic projects, participating students learned how to increase their community's resilience to natural hazards, making their communities stronger, safer, and more prepared to deal with environmental challenges. Some exciting updates include that we have:

- Expanded from just two communities in the 2017/18 program year to four communities this year, including Estes Park, Fort Collins, Longmont, & Loveland.
- Saw the return of the 2017-2018 classroom educators, demonstrating that the RMEC can sustain perennial engagement with educators.
- The support and facilitation of Estes Park School District, Poudre School District, and, our newest partner, Thompson School District.
- Students from five schools who presented their project proposals to a crowded district board room and handled tough questions from our expert panel of RMEC judges representing the City of Fort Collins, Larimer County, State of Colorado, FEMA Region VIII, CASFM, and ASFPM
- Experienced a 200% increase in student proposals directly addressing community natural hazard issues:
- Produced nine projects from six school groups in the 2018/19 program year, compared to the three quality projects in the initial 2017/18 pilot year.



THANKS! TO OUR 2018-2019 OUTGOING OFFICERS, COMMITTEE CHAIRS, & REGIONAL REPRESENTATIVES!

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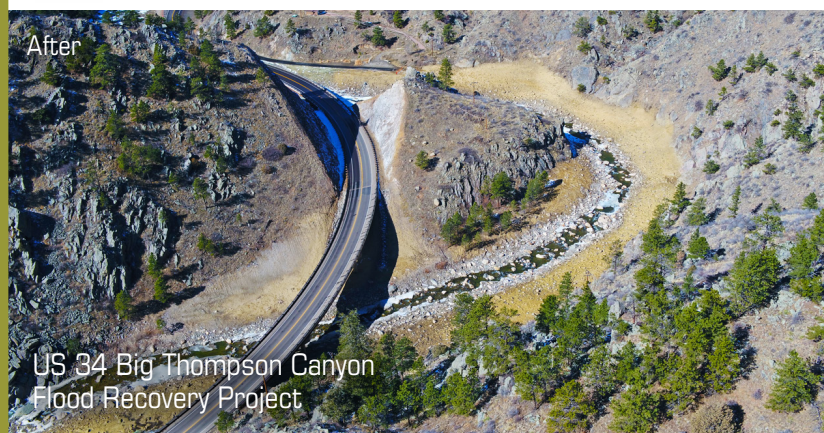
WESTERVELT



Wonderland Creek
Floodplain and Greenway Improvements



Before



After

US 34 Big Thompson Canyon
Flood Recovery Project

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SCHEDULE AT A GLANCE

Tuesday, September 24, 2019			
8:00 AM	Floodplain 101		
8:30 AM			
9:00 AM			
9:30 AM			
10:00 AM			
10:30 AM			
11:00 AM			
11:30 AM			
12:00 PM			
12:30 PM			
1:00 PM			
1:30 PM			
2:00 PM			
2:30 PM		SMS and Hydraulic Toolbox Bridge Scour Tutorial	H&H Modeling Fundamentals for Municipal Reviewers
3:00 PM			
3:30 PM			
4:00 PM			
4:30 PM			
5:00 PM		Dinner on your own	
5:30 PM		Break	
6:00 PM			
6:30 PM			
7:00 PM			
7:30 PM			
8:00 PM		Ice Breaker Social	
8:30 PM			
9:00 PM			

Wednesday, September 25, 2019			
7:00 AM	Yoga	CFM Exam	
7:30 AM			
8:00 AM			
8:30 AM			Registration & Breakfast
9:00 AM			
9:30 AM			
10:00 AM	Welcome Remarks & Keynote Address "Beneath Blue Mesa: The Gunnison River Valley Before Blue Mesa Reservoir"		
10:30 AM			
11:00 AM			
11:30 AM	General Membership Meeting & Lunch		
12:00 PM			
12:30 PM			
1:00 PM	Break		
1:30 PM	Technical Sessions: Emergency Preparedness	Technical Sessions: Stream Restoration	Technical Sessions: Stormwater Quality & Green Inf.
2:00 PM			
2:30 PM			
3:00 PM	Break		
3:30 PM	Technical Sessions: Emergency Preparedness	Technical Sessions: Stream Restoration	Technical Sessions: Stormwater Quality & Green Inf.
4:00 PM			
4:30 PM			
5:00 PM	Happy Hour		
5:30 PM			
6:00 PM			
6:30 PM	Dinner on your own		

Thursday, September 26, 2019			
7:00 AM	Yoga		
7:30 AM			
8:00 AM	Breakfast		
8:30 AM			
9:00 AM	Featured Speaker: Building Bridges		
9:30 AM			
10:00 AM	2019 CASFM Award Finalists		
10:30 AM			
11:00 AM			
11:30 AM	CASFM Board Meeting		Lunch
12:00 PM			
12:30 PM			
1:00 PM	Break		
1:30 PM	Technical Sessions: Floodplain Management	Technical Sessions: Technical Modeling	Technical Sessions: Stormwater Management
2:00 PM			
2:30 PM			
3:00 PM	Break		
3:30 PM	Technical Sessions: Floodplain Management	Technical Sessions: Technical Modeling	Technical Sessions: Stormwater Management
4:00 PM			
4:30 PM			
5:00 PM	Happy Hour		
5:30 PM			
6:00 PM			
6:30 PM			
7:00 PM	CASFM Dinner & Awards Ceremony		
7:30 PM			
8:00 PM			
8:30 PM			
9:00 PM	Entertainment		
10:00 PM			
10:30 PM			
11:00 PM			
11:30 PM			

Friday, September 27, 2019			
7:00 AM			
7:30 AM	Breakfast		
8:00 AM			
8:30 AM	CASFM Chair Closing Remarks		
9:00 AM			
9:30 AM	Hands-On Flood Safety Presenter Training	Mountain Bike Tour	
10:00 AM			
10:30 AM			RMBL Tour
11:00 AM			
11:30 AM			Golf Tournament
12:00 PM			
12:30 PM			
1:00 PM			
1:30 PM			

	CFM Exam
	Workshops & Sessions
	Meals
	Social Events

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