

MAKING A DIFFERENCE



27th Annual CASFM Conference
September 13-16
Crested Butte Mountain Resort
Crested Butte, CO



September 14, 2016

Welcome to Crested Butte! For our longtime members, you will recall that CASFM was previously in Crested Butte in 2008 and again in 2009. The membership loved it, and we are pleased to return!

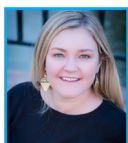
Our theme this year - **"Making a Difference"** - was inspired by Chad Pregracke, 2013 CNN Hero of the Year, founder and president of *Living Lands & Waters* (a nonprofit river cleanup organization), and author. He is proof that one person can make a difference for our rivers and waterways! We are honored to have Chad as the CASFM keynote speaker.

Thank you presenters, sponsors, and attendees! Your involvement each year makes this conference a great success! We were impressed to receive over 50 offers to present this year.

We sincerely want to thank the following individuals who donated countless hours to CASFM to organize this year's conference:

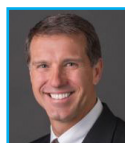
- **Stuart Gardner**, Facilities Chairman & Web Master, Colorado Department of Transportation
- **Alan Turner**, Registration, CH2M
- **Emily Murphy**, Conference Materials and Graphics, Calibre Engineering
- **Danielle Lewis**, Conference Materials and Graphics, Calibre Engineering
- **Deb Ohlinger**, Vendors & Sponsorships, Olsson Associates
- **John Pflaum**, Project Awards, Urban Drainage & Flood Control District
- **Julia Traylor**, Field Trips Coordinator, Wright Water Engineers
- **Rich Ommert**, Bike Tour Coordinator, RESPEC
- **Dave Center**, Golf Tournament, AECOM

We hope that you enjoy the conference! We look forward to your participation!



Sarah Houghland

Sarah Houghland
Program Chair
Enginuity Engineering Solutions



Robert Krehbiel

Robert Krehbiel
Conference Chair
Matrix Design Group



**JOIN THE DISCUSSION DURING THE 27TH
ANNUAL CASFM CONFERENCE AT:
#CASFM2016**

THANKS TO OUR SPONSORS!

Gold Level: Hanes GEO Components, ERO Resources Corp, Triton Environmental, Muller, Respec, Contech Engineered Solutions

Silver Level: ADS Pipe, American West Construction, Anderson Consulting Engineers, Bioclean Environmental, Borgert Products, Inc., Bowman Construction, Brierley Associates, Lithos Engineering, Nilox, Upstream Technologies



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Urban Drainage &
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AREA AND CONFERENCE CENTER MAPS

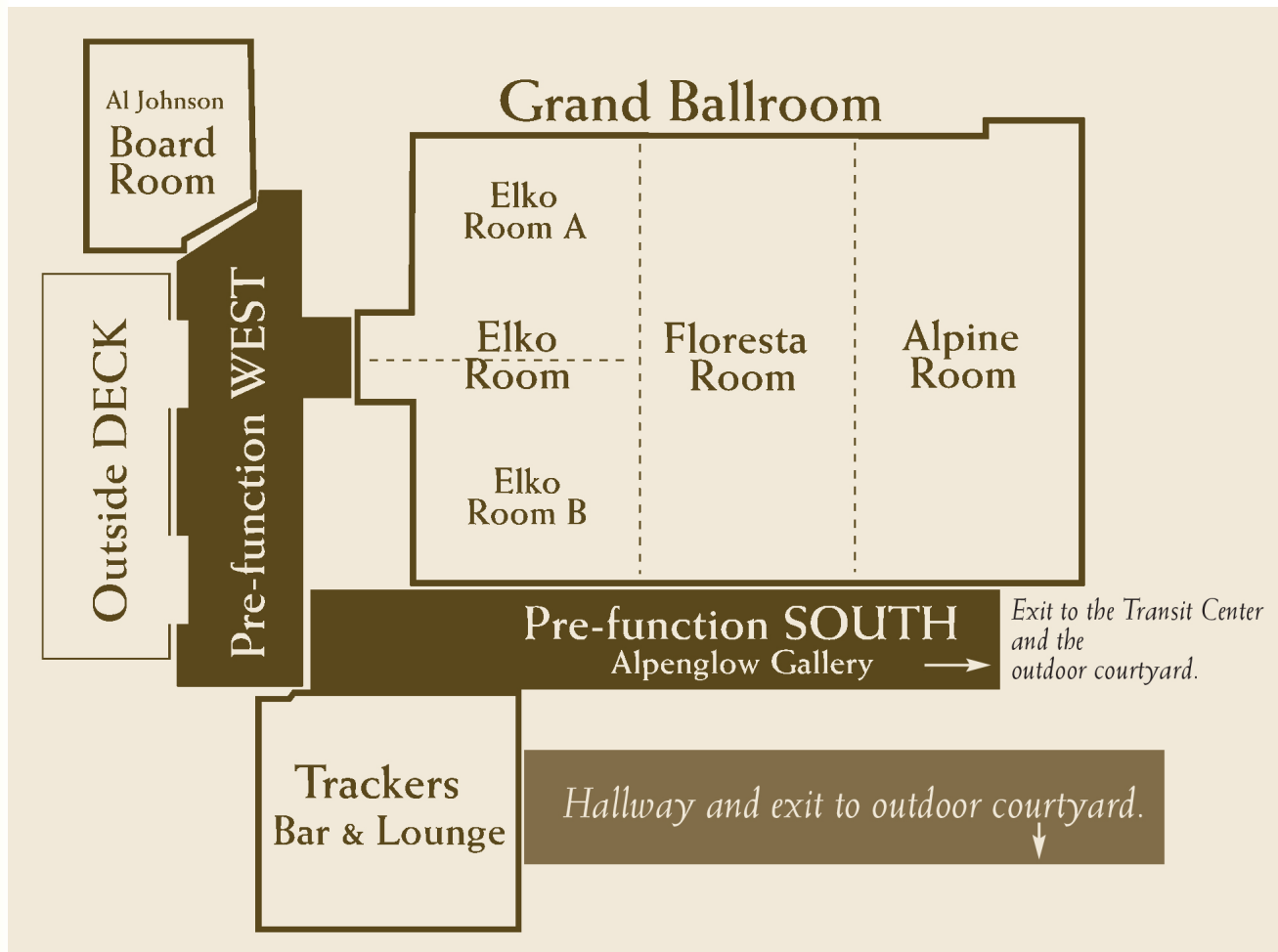
AREA MAP WITH ANNEX, LODGE, AND TENT





AREA AND CONFERENCE CENTER MAPS

MOUNTAINEER CONFERENCE CENTER





KEYNOTE SPEAKER: CHAD PREGRACKE



Chad Pregracke was the internationally-named 2013 CNN Hero of the Year and is the founder and president of *Living Lands & Waters* (a nonprofit river cleanup organization), an author, and a professional public speaker. He is proof that one person can make a difference.

Best known for starting out as a young man in East Moline, Illinois wanting a cleaner waterway, Chad has become the champion for the Mississippi River. Chad and his Living Lands & Waters crew have organized and led over 800 cleanups on 23 rivers in 20 states and removed an estimated eight million pounds of garbage. Ultimately, Chad's message inspires people to believe that they can make a difference.

FEATURED SPEAKER: DAVE SKUODAS



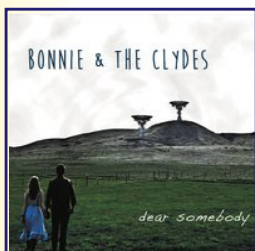
Dave Skuodas works at the Urban Drainage and Flood Control District (UDFCD), where he manages design and construction projects in Boulder and Adams Counties. Dave has worked at the District for the past 6 years. Prior to that, he was an engineering consultant for 9 years. He was heavily involved in recovering from the 2013 flood in Boulder and surrounding areas.

Dave's presentation, **The Remarkable Impact of Being an Effective Client**, is based on research he conducted to determine how effective clients attract teams, get better pricing, and build better projects. By attending this session, participants will be able to recognize the value of being an effective client and will be able to differentiate themselves as a client of choice.

SILENT AUCTION

There will be a silent auction this year to benefit future CASFM scholarships. Items will be on display throughout the conference for bidding, and the auction will end after the Thursday evening dinner at 9:30pm. Also, additional raffle tickets will be available for purchase to increase your odds of getting a great prize at the Thursday evening dinner.

BONNIE & THE CLYDES



Bonnie & the Clydes started in 2010 and has been making waves on the Colorado and national music scene ever since. Spearheaded by Bonnie Sims, Bonnie & the Clydes features strong songwriting, dynamic three part harmonies, and rippin' electric guitar solos, as well as Bonnie Sims' powerful and unique vocal style. Bonnie & the Clydes have been awarded 'Best Country Band' for 2013 & 2014 from the Denver Westword's Yearly 'Best Of' poll and independently released 3 studio albums: a self titled debut, *Wrong Side Up*, and, the most current, *Music For the People: Part 1*.



WORKSHOPS

TUESDAY, SEPTEMBER 13TH

8:00AM-5:00PM

Floodplain 101

Kevin Houck – Colorado Water Conservation Board; Craig Jacobson – ICON Engineering; Chris Tagert – Michael Baker International; Stephanie DiBettito – Colorado Water Conservation Board

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.

TUESDAY, SEPTEMBER 13TH

1:00PM-5:00PM

SRH-2D Workshop

Scott Hogan - Federal Highway Administration

This workshop will introduce hydraulic engineers to the US Bureau of Reclamation's SRH-2D two-dimensional hydraulic modeling program, recommended by FHWA for modeling channel and floodplain hydraulics through bridges and structures. The course will demonstrate data requirements, model capabilities, and application to hydraulic modeling of rivers at highway encroachments. Participants will be introduced to the SMS SRH-2D interface and new FHWA sponsored features (culvert modeling, weir flow, gates/diversions, bridge pressure flow, etc.). The session will provide a hands-on opportunity to set up a model, run an analysis, and review results. Previous modeling experience is not required. The SMS SRH-2D software was provided to participants prior to the session.

FRIDAY, SEPTEMBER 16TH

9:00AM-11:00AM

Community Rating System Showcase

Monica Bortolini - Bortolini Consultants

The CRS Showcase will highlight the work that CASFM's CRS Committee has been conducting on local, state, and federal levels. The goals of the showcase include: debunking myths about the CRS program, providing insight to help communities get started, helping CRS communities move to the next level, and offering tips on public involvement and information dissemination. A series of presentations will touch on different aspects of the program ranging from FEMA's suggestions for best practices as a result of the 2013 floods, CWCB's demonstration of the new CRS website, lessons learned from the City of Boulder's last CRS Verification Visit, and UDFCD's sponsorship of the Denver Metro Program for Public Information Process.

FRIDAY, SEPTEMBER 16TH

9:00AM-12:00PM

Slate River & Peanut Lake Restoration Field Trip

Danielle Beamer - Crested Butte Land Trust

The Crested Butte Land Trust led the charge in restoring Slate River & Peanut Lake, including assessing movement, studying causes and impacts of erosion, and crafting a plan to restore the Slate River and Peanut Lake area. Peanut Lake sits upstream from Crested Butte, and the Slate River feeds into the East River, providing drinking water for the City of Gunnison. Dozens of ranches pull their agricultural water from this river system. Identified as one of the biggest priorities in the Upper Slate River Valley, the 1.5 mile stretch encompassing Peanut Lake was in danger of capturing the lake, and a historic coal mine and silver ore processing plant had leached metals into the lake waters, even after reclamation. This restoration project returned the ecosystem to a functional condition, while protecting environmental and public health. In this field trip, conference goers will tour the Slate River and Peanut Lake area and learn about the efforts to restore these beautiful water bodies. *Note this field trip is separate from the mountain bike tour, although both trips visit this project site.*

FRIDAY, SEPTEMBER 16TH

9:00AM-12:00PM

SNOTEL Field Trip

Joe Busto - Colorado Water Conservation Board

The Natural Resources Conservation Service (NRCS) installs, operates, and maintains this extensive, automated system called SNOTEL (Snow Telemetry). This SNOTEL station provides snowpack water content data via a pressure-sensing snow pillow and collects data on snow depth, all-season precipitation accumulation, and air temperature. With the majority of the water supply in the West arriving in the form of snow, data on snowpack provides critical information to decision-makers and water managers. SNOTEL provides a reliable, cost effective way to collect snowpack and other meteorological data needed to produce water supply forecasts and support resource management activities. In this field trip, conference attendees will get a demonstration of an ice nucleus generator (cloud seeder) installed near Irwin Lake, approximately 25 minutes outside of downtown Crested Butte, as well as an explanation of the SNOTEL program.



MOUNTAIN BIKE RIDE

FRIDAY, SEPTEMBER 16TH, 9:00AM-12:00PM

Lead By: Richard Ommert P.E., RESPEC

This year's bike tour will take place on the Woods Walk Trail. While taking in the fall foliage and scenic views of Gothic Mountain, we will meet with Danielle Beamer from the Crested Butte Land Trust. She will be talking about the Land Trust's Peanut Lake restoration project.

Bike rentals are available through Big Al's Bicycle Heaven. Basic mountain bikes are available at \$20 for a half day. A helmet, fix-a-flat kit, lock, and choice of pedals are included with every rental. If 6 or more people rent, the group will receive a 10% discount. Walk-in rental availability cannot be guaranteed, so book in advance.

8:00am	Meet in Grand Lodge Hotel parking lot to arrange rides
8:15am	Leave Grand Lodge Hotel parking lot
8:30am	Park in Crested Butte Chamber of Commerce & Visitor Center parking lot
9:00am	Rendezvous at Big Al's Bicycle Heaven to begin ride
11:15am	Return to Big Al's Bicycle Heaven
12:00pm	Return to Grand Lodge Hotel parking lot





GOLF TOURNAMENT

FRIDAY, SEPTEMBER 16TH, 12:00PM - 5:00PM

Sponsored by: Contech

Lead by: Dave Center - AECOM



A tradition like none other, once a year CASFM members leave it all on the links to determine who is the best of the best. The golf tournament will once again be held at The Club at Crested Butte. This is an incredible opportunity to play a magnificent and challenging course.

**WHO
WHERE
WHEN
COST
FORMAT**

All conference participants, family members, sponsors & exhibitors
The Club at Crested Butte, 385 Country Club Drive
Friday, September 16, 2016 at 12:00 PM
\$75 entry fee per person
4-person scramble





2016 CASFM AWARD FINALISTS



CONNECTING THE PEOPLE TO THEIR RIVER

SOUTH PLATTE RIVER VISION IMPLEMENTATION PROGRAM: GRANT-FRONTIER PARK TO OVERLAND POND PARK REACH

The South Platte River Vision Implementation Program (River Vision) delivers creative solutions for valuable enhancements to the River ecosystem, public health, safety, welfare, and enjoyment of the surrounding environment. Components of the program are also serving as models for similar successful riverine corridor improvements nearby.

An Ambitious Plan:

Transforming the blighted South Platte River and surrounding environment into Denver's greatest natural resource.

In 1974, The Greenway Foundation (TGF), along with the City and County of Denver Parks and Recreation Department (DPR), began a decades-long partnership to initiate improvements positioning the nearly eleven-mile South Platte River Greenway Corridor as a valuable unifying element in the City's overall scheme for purposeful, sustainable redevelopment.

River Vision, developed as a single implementation and priority setting document for those improvements, focuses on enhancing the health of the South Platte River, and ultimately establishes a new, contemporary vision that recommends aquatic habitat; recreational, environmental, and flood control enhancements; expanded public open space; aesthetic enhancements; and improved water quality along the riverine corridor.

Focused Implementation Connecting the People to Their River

The City and County of Denver, along with TGF and Urban Drainage and Flood Control District (UDFCD), worked with CDM Smith, landscape architects THK Associates (THK), and playground designers PKM to help develop and implement River Vision, including the Grant-Frontier Park to Overland Pond Park Reach (GFO) improvements. ***River Vision focused on:***

- ***Creation of a river-focused urban environment;***
- ***Promotion of ecosystem restoration;***
- ***Enhanced accessibility, safety and security, aesthetics, and water quality;***
- ***Creation of a parks/open space-oriented model for urban living;***
- ***Maintaining or improving flood control capacity and River stability.***

The City and County of Denver, UDFCD, and Colorado Water Conservation Board (CWCB) partnered to fund the implementation of five priority projects along the Greenway Corridor. The CDM Smith Team (including THK and PKM) worked with project stakeholders and local neighborhood associations to lead the GFO project, including the analysis, design, and construction of multi-purpose improvements spanning floodplain reconnection; instream aquatic habitat, channel, and bank modifications; park enhancements, nature play, and recreational use improvements. The completed work has balanced the multiple objectives of many stakeholders (TGF, DPR, CWCB, UDFCD, Denver Public Works (DPW), Denver Water (DW), Trout Unlimited, citizens, property owners, and other City and County Departments, and public and private organizations) to deliver creative, holistic solutions enhancing the river corridor for future generations.



A Model Delivery

River Vision's implementation is already delivering tangible, healthy results to the local community. Its improvements have provided for restoration of the river corridor as a whole, as well as for the flood plain through a number of existing park improvements. River restoration efforts have included:

- Replacement of grade control structures to reduce sediment deposit transfers and promote a healthier river;
- New plantings, and the removal of non-native species for improved river ecology;
- Addition of in-stream structures such as riffles to create areas conducive to fish habitat.

Specific park improvements (completed for Pasquinel's Landing and Grant Frontier Park) have enhanced neighborhood connectivity, activity, and accessibility to the River through the addition of pathways, secondary channels, and new boat jetties. Unique park enhancements encourage education and appreciation for the River, provide nature play opportunities connecting kids to the River, highlight local history, and create a sense of place. A noticeable increase in use by the community, positive community feedback regarding the improvements, enhanced aesthetics and property values, and increased safety and security for the neighborhood are just a few of the other benefits recognized thus far.

As additional development begins to take place along the River South and River North corridors, the River Vision implementation serves as a valuable "lessons learned" tool, and a model for future development. That successful model may also be adapted for other communities beginning to develop similar urban riverine corridors, tailored to fit the history and character of each community.



2016 CASFM AWARD FINALISTS

LOWER WESTERLY CREEK FLOOD CONTROL IMPROVEMENTS AT MONTVIEW BOULEVARD, AURORA, CO

The Lower Westerly Creek flood mitigation project created safer conditions on the roadway at Montview Boulevard. SEH replaced undersized culverts, lowered the channel profile, and increased the channel capacity in order to decrease the chances of overtopping and contain the 100-year storm event.

This flood mitigation project on Lower Westerly Creek provides numerous public health, safety and welfare benefits to the community. The SEH team implemented the following key features:

- Replaced undersized culverts with a 60-ft. span twin-bridge structure to significantly reduce flooding risk to upstream properties
- Lowered the channel profile
- Increased channel capacity from 17th Avenue and 23rd Avenue in order to contain the 100-year storm event

These improvements will greatly decrease the chances of overtopping of Montview Boulevard and should remove the upstream residential structures from the floodplain. SEH contributed enhancements to the surrounding environment by improving the channel alignment so that it meanders through parks, providing informal access to the stream and incorporating wetland areas for habitat improvements.

The SEH team implemented unique solutions that offer benefits to the community, including:

- Extended the regional trail beneath Montview Boulevard to 17th Avenue
- Improved channel alignment so that it meanders through the parks
- Incorporated wetland areas along the channel for habitat improvements
- Constructed a new pedestrian bridge at 19th Avenue
- Helped initiate master planning effort for overall improvements to the park

To keep this project on track, SEH facilitated close cooperation between the agencies throughout the design process. We kept project goals on track and were able to meet each agency's requirements for the work, including the City of Aurora Water department, City of Aurora Parks, Recreation, and Open Space, UDFCD, City and County of Denver Public Works, City and County of Denver Parks, and Metro Wastewater.

SEH's task was to find a solution for the flooding risk on Lower Westerly Creek, a project that required multi-objective management and creative solutions to stay on schedule and within budget. Ultimately, SEH worked together with numerous agencies and effected property owners to deliver this project on a timeline and budget that was acceptable to those involved, resulting in a successful effort.

This project is a good example of how multi-agency cooperation can truly drive the completion of a project with the goal of improving public health, safety, and welfare. As other communities consider the need for flood mitigation projects, especially those in crucial areas similar to Lower Westerly Creek, this project serves as a model of how to meet those flood mitigation requirements while also creating benefits that extend well beyond and into the community.





TECHNICAL SESSION SCHEDULE AT A GLANCE

WEDNESDAY

	Green Infrastructure & LID Location: The Annex <i>Moderator: Kelly Crum</i>	Stormwater Quality Treatment Location: The Annex <i>Moderator: Kelly Crum</i>	Technical Modeling Location: Alpine Room <i>Moderator: Brian Murphy</i>	Stream Restoration Location: Elko Room <i>Moderator: Andy Stewart</i>
1:30PM	Drain Time of a Rain Garden Brad Bettag	-	Integrated 2-D Bridge Hydraulic Design on the South Platte River Brian Varrella	SEMSWA CIP Project Funding: A Giant Leap for Piney Creek Molly Trujillo
2:00PM	Green Infrastructure Maintenance Costs: Planning for Long-term Success Holly Piza	-	Re-defining Regulatory Hydrology: South Platte River and Clear Creek Hydrology CLOMRs Andrew Earles	Successful Use of Design-Build Contracting to Deliver Wildcat Gulch Flood Recovery On-Budget and Ahead of Schedule Robert McGregor
2:30PM	Stormwater Modeling and Centralized Treatment Systems for Addressing Redevelopment Impacts Ryan Gilliom	-	Highways in Steep Canyons: SRH-2D Modeling and GIS-automated Revetment Design Will deRosset	Waldo Canyon Post Fire Flood Mitigation John B. Chavez
3:30PM	-	Pertinent Considerations for Sub-surface Water Quality Treatment Design Eliot J. Wong, P.E., CFM	Sediment Transport and Urban Stream Channel Design, a Case Study of Fourmile Canyon Creek Tyler Rosburg	Changing Hydrology in Fountain Creek and Evaluation of Projects to Reduce Sediment Transport and Flooding Risk Downstream Anna Campbell
4:00PM	-	"10 Years and Counting...Two More to Go" E.coli Mitigation for South Platte River, Segment 14 TMDL Darren Mollendor	New Tools for Understanding and Optimizing Urban Drainage Systems Alan Turner	CWCB Bioengineering Guide and Searchable Revegetation Matrix Randy H. Mandel
4:30PM	-	All the Right Moves? – Using Multiple Years of E.coli Data to Strengthen a Water Quality Program Candice Owen	Bulletin 17C and Colorado Streams - A Kook at the Effects of EMA, etc. on Peak Flow Calculations Kenneth C Robinson	Cherry Creek Corridor Improvements: A Case Study to Look Holistically at Drainage Infrastructure Planning in Relation to Urban Amenities Jesse Clark

THURSDAY (CONTINUED AT RIGHT)

	Flash Talk: Team Building Location: Grand Ballroom <i>Moderator: Shea Thomas</i>			
10:30AM	The Social Engineering of Flood Recovery Mark Wilcox	The Impact of "Why": Improving Service, Teams, and Client Relationships Christin Shepherd	Design Should Be a Team Sport – Not a Relay: Getting the Best Out Of a Multi-disciplinary Design Team Mark Taylor	Civil Engineering + Landscape Architecture = Place Making: A Process for Creating Infrastructure that Enhances the Public Domain Paul Thomas



THURSDAY (CONTINUED)

	Floodplain Mapping Location: The Annex <i>Moderator: Kevin Doyle</i>	Professional Develop. Location: The Annex	Stormwater Mgmt. Location: Alpine Room <i>Moderator: Betsy Suerth</i>	Watershed Planning Location: Elko Room <i>Moderator: Brian Varrella</i>
1:30PM	Towards Cartographic Standards for Web-Based Flood Hazard Maps Eben Dennis	-	Denver Storm Drainage Metrics Drew Beck	Building a Stream Design Team to Deliver Resilience Jeffrey Sickles
2:00PM	FEMA's Support for Resiliency: Preparing for the Impacts of Climate Change Jordan Williams	-	The Web-Based Master Plan Craig Jacobson	Colorado Hazard Mapping Program- Creating Reliable, Post Flood Data for Colorado's Future Remmet DeGroot
2:30PM	Improving Flood Risk Communication: New Tools and Messages Tiffany Lyden	-	Stormwater Infrastructure Inventory & Network Modeling Steve Kirk	Envision Shooks Run – Expanding the Humble Drainage Basin Planning Study into a Holistic Approach to Community Planning Alan Turner
3:30PM	-	This Is Your Fault! From Blame to Understanding Difficult Conversations Seth Plas	Evaluation of Distributed BMPs in an Urban Watershed – High Resolution Modeling for Stormwater Management Timothy J Fry	The 1965 Denver Flood – Could it Happen Again? Kevin Stewart
4:00PM	-	Millennials in OUR Workplace Jeff Wulliman	Trenchless Techniques Utilized for Stormwater Management in Urban Environments Ryan Marsters	How to Stress Test a Watershed Model in Preparation of a Flood Warning System Baxter Vieux
4:30PM	-	Bridging the GAP: Utilizing Generation X for More Effective Communication Thuy Patton	Evaluation and Replacement of a Failed Recreational Drop Structure Matthew Accardo	Hydrologic Design Procedures for Incorporating Climate Change and Other Sources of Uncertainty to Estimate Flood Flows Roger Kilgore

FRIDAY

	CRS Showcase Location: Elko Room <i>Moderator: Monica Bortolini</i>
9:00AM	Floodplain Regulations and Best Practices for Avoiding Flood Losses: A Study of the September 2013 Colorado Floods Matthew Buddie
9:15AM	CWCB's New Community Rating System Website Kimberley Pirri
9:30AM	What the Manual Says, What the Manual Means: 2015 CRS Verification Visit Lessons Learned Christin Shepard
9:45AM	Denver Metro PPI – Pulverizing Public Ignorance through a Multi-Jurisdictional Program for Public Information Terri Fead

TUESDAY, SEPTEMBER 13, 2016

8:00AM TO 5:00PM

Floodplain 101

Location: The Annex

1:00PM TO 5:00PM

SRH-2D Workshop | Scott Hogan - FHWA

Location: Alpine Room

5:00PM TO 8:00PM

Dinner on your own

8:00PM TO 9:00PM

Ice Breaker Social

Location: Grand Ballroom

Sponsored By: RESPEC



WEDNESDAY, SEPTEMBER 14, 2016

7:00AM TO 10:00AM

Certified Floodplain Manager Exam

Location: The Annex

7:05AM TO 8:00AM

Yoga | Susan Pearson - Pitkin County

Location: See the Bulletin Board

8:00AM TO 9:00AM

Registration and Breakfast

Location: Grand Ballroom

9:00AM TO 9:30AM

CASFM Chair Welcoming | Shea Thomas - UDFCD

Location: Grand Ballroom

9:30AM TO 10:15AM

The Remarkable Impact of Being an

Effective Client | Dave Skudos - UDFCD

Location: Grand Ballroom

10:15AM TO 11:30AM

Keynote Address - "From the Bottom Up" |

Chad Pregracke - Living Lands and Waters

Location: Grand Ballroom

11:30AM TO 1:30PM

Lunch

Location: The Tent

11:30AM TO 1:30PM

Board Member Meeting

Location: Woodstone Grill

1:30PM TO 5:00PM

Technical Sessions

3:00PM TO 3:30PM

Break

Location: Vendor Area

GREEN INFRASTRUCTURE & LID

Location: The Annex

Drain Time of a Rain Garden 1:30PM

Brad Beftag - AMEC Foster Wheeler, brad.beftag@amecfw.com;

Dr. James Guo - UC Denver, James.Guo@ucdenver.edu

The current design process of rain gardens in EPA-SWMM does not take into account friction losses or void space in the media. By incorporating these items into the calcs, the engineer can correctly size the rain garden.

Green Infrastructure Maintenance Costs: Planning for Long-term Success 2:00pm

Holly Piza - UDFCD, hpiza@udfcd.org; Jane Clary - Wright Water Engineers, clary@wrightwater.com

A national survey of GI maintenance costs was completed to support three concurrent and interrelated efforts that Urban Drainage and Flood Control District supported during 2016. This paper will present the results.

Stormwater Modeling and Centralized Treatment Systems for Addressing Redevelopment Impacts 2:30PM

Ryan Gilliom - CO School of Mines, ryan.gilliom@gmail.com;

Chelsea Panos - CO School of Mines, cpanos@mines.edu; Dr.

John McCray - CO School of Mines, jmccray@mines.edu

This research focuses on the development of a stormwater modeling tool for implementing Best Management Practices in re-urbanized areas (infill development) using the EPA's SUSTAIN model.

STORMWATER QUALITY TREATMENT

Location: The Annex

Pertinent Considerations for Subsurface Water Quality Treatment Design 3:30PM

Eliot J. Wong, P.E., CFM - Contech Engineered Solutions LLC, ewong@conteches.com

Leveraging its resources to meet multiple regulatory requirements, Aurora Water has undertaken a pilot project to obtain in-stream water quality data to further help determine potential sources of illicit discharges to target future inspections in a limited resource environment.

Civil Engineering + Landscape Architecture = Place Making: A Process for Creating Infrastructure that Enhances the Public Domain 4:00PM

Darren Mollendor - City and County of Denver, darren.mollendor@denvergov.org

This technical presentation will bring the CASFM community up to speed on Denver's progress toward permit compliance and reduced discharges to the river.

All the Right Moves? – Using Multiple Years of E.coli Data to Strengthen a Water Quality Program 4:30PM

Candice Owen - City of Boulder, owenc@boulder.colorado.gov

The City of Boulder has collected E.coli data on Boulder Creek since the mid-2000s due to regulatory drivers (303(d) listing; TMDL). This presentation will discuss current efforts and program challenges, including in making "all the right moves"; appropriate analyses to inform effective best practices; and regulatory compliance.

TECHNICAL MODELING

Location: Alpine Room

Integrated 2-D Bridge Hydraulic Design on the South Platte River 1:30PM

Brian Varrella - CDOT, Brian.Varrella@state.co.us; George Cotton - TSH, George.Cotton@tshengineering.com; Jesse Creel - TSH, Jesse.Creel@tshengineering.com

This session will provide a candid assessment of the capabilities and limitations of 2-dimensional hydraulic modeling and the importance of stakeholder collaboration in a highly visible reach of South Platte River.

Re-defining Regulatory Hydrology: South Platte River and Clear Creek Hydrology CLOMRs 2:00PM

Andrew Earles - Wright Water, aeearles@wrightwater.com; Ken MacKenzie - UDFCD, kmackenzie@udfcd.org; Shannon Tillack - Wright Water, stillack@wrightwater.com

This presentation provides an overview of two hydrology CLOMRs that were initiated because data indicated that existing regulatory discharges were over-estimated relative to gauge data.

Highways in Steep Canyons: SRH-2D Modeling and GIS-automated Revetment Design 2:30PM

Will deRosset - Ayres Associates, derossetw@AyresAssociates.com; Anthony Alvarado - Ayres Associates, alvaradoa@ayresassociates.com; Brian Varrella - Colorado DOT, brian.varrella@state.co.us

As part of the CDOT permanent repair design team for U.S. HWY 34 through the Big Thompson River canyon, Ayres was tasked with calculating embankment toe scour and designing bank protection. This task was accomplished using innovative modeling techniques.

Sediment Transport and Urban Stream Channel Design: Case Study of Fourmile Canyon Creek 3:30PM

Tyler Rosburg - ICON Engineering, trosburg@iconeng.com; Ward Bauscher - City of Boulder, bauscherw@bouldercolorado.gov; Craig Jacobson, ICON Engineering, cjacobson@iconeng.com

During the 2013 floods, Fourmile Canyon Creek deposited 30,000 cubic yards of sediment in the City of Boulder's Palo Park. In response, a stream restoration project was initiated. Tools and techniques will be shared.

New Tools for Understanding and Optimizing Urban Drainage Systems 4:00PM

Alan Turner - CH2M, alan.turner@ch2m.com; Dan Hill - CH2M, Daniel.Hill@ch2m.com; Frans Lambrechtsen - CH2M, Frans.Lambrechtsen@ch2m.com

FEMA is exploring non-riverine urban and shallow flooding. The fully dynamic coupling of EPA-SWMM and Flood Modeller is discussed as a tool to more efficiently understand urban flooding issues, while considering storm drain systems, than traditional two model methods. The presentation will help professionals and municipalities better understand the process of building the model and a comparison of results.

Bulletin 17C and Colorado Streams - A Look at the Effects of EMA on Peak Flow Calculations 4:30PM

Kenneth Robinson - Atkins, kenneth.robinson@atkinsglobal.com

A current update is underway to revise the methodology to compute estimated peak discharges at stream gages. The newer methods in Bulletin 17C update the main algorithm for calculating the flood-frequency analysis curve, determining low outliers, incorporating censored data/periods, handling ranges or interval estimates of flows, and incorporating paleoflood information.

STREAM RESTORATION

Location: Elko Room

SEMSWA CIP Project Funding: A Giant Leap for Piney Creek 1:30PM

John McCarty - SEMSWA, jmccarty@semswa.org; David Agee - SEMSWA, dagree@semswa.org; Paul Danley - SEMSWA, pdanley@semswa.org; Molly Trujillo, SEMSWA, mtrujillo@semswa.org

Upstream development within sandy Piney Creek watershed caused severe channel instability. To safeguard houses, reclaim floodplain connection, and protect water quality, SEMSWA embraced a pioneering tax-exempt, low-interest rate \$7 Million loan to complete reclamation within an estimated three years.

Successful Use of Design-Build Contracting to Deliver Wildcat Gulch Flood Recovery On-Budget and Ahead of Schedule 2:00PM

Robert McGregor - Amec Foster Wheeler (AFW), robert.mcgregor@amecfw.com; Sara Hartley - Manitou Springs, shartley@comsgov.com; Sara Johnson - AFW, sara.johnson@amecfw.com

Describes how the design-build method for the Wildcat Gulch Flood Recovery Project fostered strong partnerships and enabled completion 45 days ahead of schedule in spite of utility conflicts and winter construction.

Waldo Canyon Post Fire Flood Mitigation 2:30PM

John B. Chavez - El Paso County Department of Public Services, johnchavez@elpasoco.com

Overview of post fire flood mitigation techniques and in-situ materials in steep slope terrain for the Upper Fountain Creek Watershed, including "rock and roll" check dams, in-channel debris and flow catchments, grade control, channel redefinition and off-channel debris, and flow catchment.

Changing Hydrology in Fountain Creek and Evaluation of Projects to Reduce Sediment Transport and Flooding Risk Downstream 3:30PM

Anna Campbell - Wright Water, anna1851@gmail.com; Dr. Andrew Earles - Wright Water, aeearles@wrightwater.com

Imported water to the Fountain Creek watershed, along with increases in urbanization, impervious areas, and wildfires, have led to increases in flow and sediment transport. This presentation will discuss projects that have potential to decrease downstream flooding and sediment transport.

CWCB Bioengineering Guide and Searchable Re-vegetation Matrix 4:00PM

Randy H. Mandel - Great Ecology, rmandel@greatecology.com

The presentation will provide an overview of the Living Streambanks: Bioengineering Manual for Colorado and Searchable Revegetation Matrix, as funded by CWCB.

Cherry Creek Corridor Improvements 4:30PM

Jesse Clark - Stream Design, jclark@streamla.com; Joseph Juergensen - Muller Engineering, jjurgensen@mullereng.com; Melanie Chenard - Muller Engineering, mchenard@mullereng.com

Over the last eight decades, the Cherry Creek corridor has been dramatically narrowed. This session will overview the holistic planning process for creating solutions on a 2.5 mile reach in Denver.

5:00PM TO 6:30PM

Happy Hour

Location: Vendor Area

Sponsored by: Triton Environmental



THURSDAY, SEPTEMBER 15, 2016

7:05AM TO 8:00AM

Yoga | Susan Pearson - Pitkin County
Location: See the Bulletin Board

8:00AM TO 9:00AM

Breakfast

Location: Grand Ballroom

Sponsored By: Hanes Geo-Components



9:00AM TO 10:00AM

2016 CASFM Award Finalists | John Pflaum - UDFCD

Location: Grand Ballroom

10:00AM TO 10:30AM

Break

Location: Vendor Area

10:30AM TO 11:30AM

FEATURED SESSION: TEAM BUILDING

FLASH TALK | Moderator: Shea Thomas, UDFCD

Location: Grand Ballroom

Civil Engineering + Landscape Architecture = Place Making: A process for creating infrastructure that enhances the public domain

Paul Thomas - Stream Design Landscape Architecture, pthomas@streamla.com; Jesse Clark - Stream Design Landscape Architecture, jclark@streamla.com; Chris Kroeger - Muller Engineering, ckroeger@MULLERENG.COM

This presentation will look at drainage and water quality projects where successful collaboration has resulted in infrastructure that is both functional and beautiful.

Design Should Be a Team Sport – Not a Relay Getting the Best Out Of a Multi-disciplinary Design Team

Mark Taylor - Architerra Group, mtaylor@architerragroup.com; Dave Skuodas - UDFCD, dskuodas@udfcd.org; Chris Kroeger - Muller Engineering, ckroeger@MULLERENG.COM

We describe how design professionals can get the most from their multi-disciplinary teams by utilizing an integrated team approach rather than a sequential design process. Boulder's Wonderland Creek Project is used as an example of a good integrated team approach.

The Social Engineering of Flood Recovery

Mark Wilcox - DHM Design, mwilcox@dhmdesign.com; Nathan Werner - s2o Design, nathan@s2odesign.com; Craig Jacobson - ICON Engineering, cjacobson@iconeng.com

This presentation centers on how true collaboration between Landscape Architects and Engineers can provide a better community driven and supported outcome that balances the social needs of a community with the technical needs of a floodplain.

The Impact of "Why": Improving Service, Teams, and Client Relationships

Christin Shepherd - City of Boulder, shepherd2@bouldercolorado.gov

In this session, we will discuss why we do what we do and how clarifying that "why" can hone your engineering skill set, improve client relationships, and generate harmonious multi-generational teams.

11:30AM TO 1:00PM

General Membership Lunch Meeting

Location: The Tent

1:00PM TO 1:30PM

Committee Meetings

Location: Announced during lunch

1:30PM TO 5:00PM

Workshops and Sessions

3:00PM TO 3:30PM

Break

Location: Vendor Area

FLOODPLAIN MAPPING

Location: The Annex

Towards Cartographic Standards for Web-Based Flood Hazard Maps 1:30PM

Eben Dennis - ICON Engineering, edennis@iconeng.com

Web-maps are rapidly becoming important tools in the communication of flood hazard and the visualization of risk. This presentation will discuss initial findings of ongoing research regarding web-based flood hazard maps.

FEMA's Support for Resiliency: Preparing for the Impacts of Climate Change 2:00PM

Jordan Williams, CDM Smith, williamsjo@cdmsmith.com

To explore how climate resiliency may be incorporated into FEMA HMA grants, CDM Smith supported FEMA to research mitigation activities that reduce risks associated with climate change. This presentation will provide a summary of the methodology and findings.

Improving Flood Risk Communication: New Tools and Messages 2:30PM

Tiffany Lyden, Montana Dept. of Natural Resources and Conservation, tlyden@mt.gov

This presentation will share newly developed outreach and communication tools and messaging for flood risk and will share community engagement lessons learned during a large Flood Risk Review effort in Bozeman.

STORMWATER MANAGEMENT

Location: Alpine Room

Denver Storm Drainage Metrics 1:30PM

Drew Beck - Matrix Design, drew_beck@matrixdesigngroup.com

The purpose of the City & County of Denver's Storm Drainage Master Plan (SDMP) Metrics Analysis is to develop a quantitative measurement tool to assist with capital project prioritization based upon drainage needs.

The Web-Based Master Plan 2:00PM

Craig Jacobson - ICON, cjacobson@iconeng.com; Eben Dennis - ICON, edennis@iconeng.com; Shea Thomas - UDFCD, sthas@udfcd.org

ICON will present past work products and a pilot project sponsored by the UDFCD, demonstrating the efficiencies and interfaces of a web-based master plan.

Stormwater Infrastructure Inventory & Network Modeling 2:30PM

Steve Kirk - SGM Inc., stevenk@sgm-inc.com; Sean Koenig - City of Vail, SKoenig@vailgov.com

This presentation provides an overview of the 2015 Town

of Vail Stormwater Infrastructure Inventory Effort, including who will use it and how will it be utilized in the future.

Evaluation of distributed BMPs in an Urban Watershed – High resolution modeling for Stormwater Management 3:30PM

Timothy J. Fry - Colorado School of Mines Enginuity Engineering Solutions, tfry@myemail.mines.edu

We will use a high-resolution, physically-based hydrologic model with inclusion of the built environment and compare the inclusion and exclusion of BMP features to evaluate the parameterization used for the model.

Trenchless techniques utilized for stormwater management in urban environments 4:00PM

Ryan Marsters - Brierley Associates, rmarsters@brierleyassociates.com; **Rebecca Brock** - Brierley Associates, rbrock@brierleyassociates.com

A combination of trenchless techniques (tunnel boring machine and pipe jacking) and ground improvement were utilized to install a 130-IN reinforced concrete pipe under five separate railroad and RTD tracks.

Evaluation and Replacement of a Failed Recreational Drop Structure 4:30PM

Mathew Accardo - Merrick & Company, mathew.accardo@merrick.com

Three key topics related to failures of drop structures will be presented: evaluation techniques and typical failure modes, analysis and design approaches for stability, and implementation of design. The Gunnison Whitewater Park Repair will be used as a case study.

WATERSHED PLANNING

Location: Elko Room

Building a Stream Design Team to Deliver Resilience 1:30PM

Jeffrey Sickles - Enginuity, jsickles@enginuity-es.com; **Chris Sturm** - Colorado Water Conservation Board, chris.sturm@state.co.us

Effective stream design must bring specialized expertise together to collaboratively, creatively, and effectively deliver stream design that results in healthy river systems.

Colorado Hazard Mapping Program- Creating Reliable, Post Flood Data for Colorado's Future 2:00PM

Remmet DeGroot - AECOM, remmet.drgroot@aecom.com; **Geoffrey Uhlemann** - AECOM, geoffrey.uhlemann@aecom.com

The Colorado Hazard Mapping Program (CHAMP) was established after the 2013 floods to help communities become more resilient through comprehensive mapping of floodplains and other natural hazards.

Envision Shooks Run – Expanding the humble Drainage Basin Planning Study into a Holistic Approach to Community Planning 2:30PM

Alan Turner - CH2M, alan.turner@ch2m.com; **Aaron Egbert** - City of Colorado Springs, aegbert@springsgov.com; **Dan Krueger** - Felsburg Holt & Ullevig, Inc., Dan.krueger@fhu.com

This presentation will describe the difficulties and opportunities of bringing together engineers and planners, the City, and the public to develop a plan that enhances the character of the surrounding neighborhoods.

The 1965 Denver Flood – Could it happen again? 3:30PM

Kevin Stewart, UDFCD, kstewart@udfcd.org

This presentation will explore whether or not a flood sim-

ilar in magnitude to the 1965 flood could ever happen again along the South Platte River through Denver.

How to Stress Test a Watershed Model in Preparation of a Flood Warning System 4:00PM

Baxter Vieux - Vieux & Associates, Inc., baxter.vieux@vieuxinc.com; **Kevin G. Stewart** - UDFCD, kstewart@udfcd.org

Stress testing is evaluated by transposition of maximum depth duration frequency (DDF) hyetograph in model preparation for flood warning operations.

Hydrologic Design Procedures for Incorporating Climate Change and Other Sources of Uncertainty to Estimate Flood Flows 4:30PM

Roger Kilgore - Kilgore Consulting & Mgmt, RKilgore@KCMwater.com

FHWA has developed new design guidance for hydraulic structures, drainage facilities, and highway encroachments that incorporates climate science, risk assessment, and infrastructure resilience, referred to as HEC 17 "Highways in the River Environment – Floodplains, Extreme Events, Risk, and Resilience."

PROFESSIONAL DEVELOPMENT

Location: The Annex

This Is Your Fault! From Blame to Understanding Difficult Conversations 3:30PM

Seth Plas - City of Westminster, splas@cityofwestminster.us

By understanding the other party's perspective and concerns during a difficult conversation, the dialogue can shift from blame and judgment to inventing options of mutual gain. This presentation will discuss tools to maximize the potential for these conversations to be productive and solution-oriented.

Millennials in OUR Workplace 4:00PM

Jeff Wulliman - Muller Engineering, jhwulliman@mullereng.com; **Jeremy Deischer** - ICON, jdeischer@iconeng.com

Members of the CASFM YMG will present what millennial attraction and retention looks like in our industry by interpreting related published content and surveying the younger employees of this billable industry.

Bridging the GAP: Utilizing Generation X for More Effective Communication 4:30PM

Thuy Patton - Colorado Water Conservation Board, thuy.patton@state.co.us

This presentation explores lessons learned through the Colorado Hazard Mapping Program, specifically how Gen Xers possess qualities that overlap with both Baby Boomers and Millennials – thereby bridging the communication and generational gap in the workplace.

5:00PM TO 6:00PM

Happy Hour

Location: Vendor Area

Sponsored By: ERO Resources Corporation



7:00PM TO 9:00PM

CASFM Dinner & Awards Ceremony

Location: Grand Ballroom

Sponsored By: Muller



9:00PM TO 11:00PM

Entertainment - Bonnie & the Clydes

Location: Grand Ballroom

FRIDAY, SEPTEMBER 16, 2016

7:05AM TO 8:00AM

Yoga | Susan Pearson - Pitkin County
Location: See the Bulletin Board

7:30AM TO 8:30AM

Location: Grand Ballroom
Breakfast

8:30AM TO 9:00AM

Location: Grand Ballroom
CASFM Chair Closing | Shea Thomas - UDFCD

9:00AM TO 11:00AM

Location: Elko Room
Final Sessions

COMMUNITY RATING SYSTEM (CRS) SHOWCASE

Location: Alpine Room

Floodplain Regulations and Best Practices for Avoiding Flood Losses: A Study of the September 2013 Colorado Floods 9:00AM

Matthew Buddie - Federal Emergency Management Agency, matthew.buddie@fema.dhs.gov

This presentation will discuss how this study was developed and will present recommended floodplain management regulations, best practices, and cost-effective strategies to reduce flood losses. Based on the observations and conclusions presented in the Colorado Regulatory Losses Avoided report and community outreach.

CWCB's New Community Rating System Website 9:15AM

Kimberley Pirri - AECOM, kimberley.pirri@aecom.com; Stephanie DiBettito - Colorado Water Conservation Board, stephanie.dibettito@state.co.us

This presentation provides an overview of the information and resources available to Colorado communities on the CWCB's new CRS website.

What the manual says, what the manual means: 2015 CRS Verification Visit Lessons Learned 9:30AM

Christin Shepard - City of Boulder, ShepherdC2@bouldercolorado.gov; Jessica Stevens - City of Boulder, stevensj@bouldercolorado.gov; Monica Bortolini - Bortolini Consulting, mbortolini@att.net

The City of Boulder went through the CRS cycle verification process using the 2013 CRS Manual and will present lessons learned from activities 310 (Elevation Certificates), 410 (Floodplain Mapping), and 450 (Stormwater Management), and answer questions.

Denver Metro PPI – Pulverizing Public Ignorance through a Multi-Jurisdictional Program for Public Information 9:45AM

Terri Fead - Urban Drainage & Flood Control District, tfead@udfcd.org; Teresa Patterson - Urban Drainage & Flood Control District, tpatterson@udfcd.org

This presentation will highlight the benefits and complications of forming the multi-jurisdictional PPI committee, the group workshops to uncover needs, and the resulting planning document. We will discuss how the Denver Metro PPI met the criteria and where it tested the limits.

9:00AM TO 5:00PM

Field Trips

Mountain Bike Tour to Peanut Lake Meet in Grand Lodge Hotel Parking Lot 9:00AM - 12:00PM

This year's bike tour will take place on the Woods Walk Trail. While taking in the fall foliage and scenic views of Gothic Mountain, we will meet with Danielle Beamer from the Crested Butte Land Trust. She will be talking about the Land Trust's Peanut Lake restoration project.

Peanut Lake & Slate River Restoration Meet at The Peanut Lake Trailhead 9:00AM - 12:00PM

The Crested Butte Land Trust led the charge in restoring Slate River & Peanut Lake, including assessing movement, studying causes and impacts of erosion, and crafting a plan to restore the Slate River and Peanut Lake area. Peanut Lake sits upstream from Crested Butte, and the Slate River feeds into the East River, providing drinking water for the City of Gunnison. Dozens of ranches pull their agricultural water from this river system. Identified as one of the biggest priorities in the Upper Slate River Valley, the 1.5 mile stretch encompassing Peanut Lake was in danger of capturing the lake, and a historic coal mine and silver ore processing plant had leached metals into the lake waters, even after reclamation. This restoration project returned the ecosystem to a functional condition, while protecting environmental and public health. In this field trip, conference goers will tour the Slate River and Peanut Lake area and learn about the efforts to restore these beautiful water bodies. *Note: this field trip is separate from the mountain bike tour, although both trips visit this project site.*

SNOTEL Location: The Annex 9:00AM - 12:00PM

The Natural Resources Conservation Service (NRCS) installs, operates, and maintains this extensive, automated system called SNOTEL (Snow Telemetry). This SNOTEL station provides snowpack water content data via a pressure-sensing snow pillow and collects data on snow depth, all-season precipitation accumulation, and air temperature. With the majority of the water supply in the West arriving in the form of snow, data on snowpack provides critical information to decision-makers and water managers. SNOTEL provides a reliable, cost effective way to collect snowpack and other meteorological data needed to produce water supply forecasts and support resource management activities. In this field trip, conference attendees will get a demonstration of an ice nucleus generator (cloud seeder) installed near Irwin Lake, approximately 25 minutes outside of downtown Crested Butte, as well as an explanation of the SNOTEL program.

Golf Tournament Location: The Club at Crested Butte 12:00pm - 5:00PM

A tradition like none other, once a year CASFM members leave it all on the links to determine who is the best of the best. The golf tournament will once again be held at The Club at Crested Butte. This is an incredible opportunity to play a magnificent and challenging course.



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JOHN PFLAUM RECOGNITION



After years of volunteering in various positions for CASFM, John Pflaum is stepping down as the CASFM Conference Awards Coordinator following this year's conference. The CASFM Board and Conference Team would like to thank John for his many years of service and for all of his contributions to the group. Although we will miss him, he has earned the right to sleep-in during the 2017 conference! Thanks again, John!



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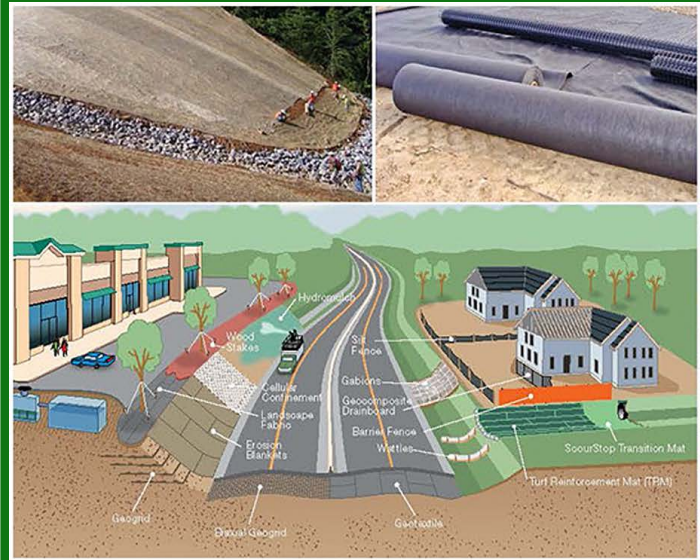
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SCHEDULE AT A GLANCE

TUESDAY, SEPTEMBER 13, 2016		
8:00	Floodplain 101	
9:00		
10:00		
11:00		
12:00		
1:00		
2:00		SRH-2D Workshop
3:00		
4:00		
5:00		Break
6:00		
7:00		
8-9:00		Ice Breaker Social Hour

WEDNESDAY, SEPTEMBER 14, 2016			
7:00	Yoga		Certified Floodplain Manager (CFM) Exam
8:00	Registration and Breakfast		
9:00	Welcoming Remarks		
	The Remarkable Impact of Being an Effective Client - Dave Skuodas - UDFCD		
10:00	Keynote Address - " From the Bottom Up" by Chad Pregracke, Living Lands & Waters		
11:00			
12:00	Lunch Board Member Meeting		
1:00			
2:00	Green Infrastructure, LID	Technical Modeling	Stream Restoration
3:00	Break		
4:00	Stormwater Quality Treatment	Technical Modeling	Stream Restoration
5:00	Happy Hour		
6:00			

THURSDAY, SEPTEMBER 15, 2016			
7:00	Yoga		
8:00	Breakfast		
9:00	2016 Project Award Finalist Presentations		
10:00			
11:00	Featured Session: Team Building Flash Talk		
12:00	Lunch		
	General Membership Meeting		
1:00	Committee Meetings		
2:00	FEMA Updates	Stormwater Management	Watershed Planning
3:00	Break		
4:00	Professional Development	Stormwater Management	Watershed Planning
5:00	Happy Hour		
6:00			
	Break		
7:00			
8:00	CASFM Association Dinner and Awards		
9-11	Entertainment		

FRIDAY, SEPTEMBER 16, 2016				
7:00	Yoga			
8:00	Breakfast			
	Closing Remarks			
9:00	CRS Showcase	Field Trip: Slate River Restoration Project	Mountain Bike Tour	Field Trip: SNOTEL
10:00				
11:00				
12:00	Golf Tournament			
1:00				
2:00				
3:00				
4:00				

Color Key

	Workshops & Sessions
	Social Events
	Meals & Food
	Break
	CFM Exam
	Field Trips & Tours