Respecting Water

2012 CASFM CONFERENCE

Steamboat Springs, Colorado
September 25-28, 2012

23rd Annual

CASFM

WELCOME CASFM MEMBERS!

Welcome back to Steamboat Springs! We welcome the new attendees and appreciate the returning CASFM members. Your attendance to our annual conference has doubled in the last 10 years, and tripled since 1999. CASFM's annual conference has been held in Steamboat Springs 6 times in the past, more than any other location. Attendees have always enjoyed this location, and the wonderful setting it provides. We intend to hold the 2013 CASFM conference in the same location.

The Conference Committee has lined up an exciting conference full of technical presentations, workshops, field trips and social gatherings packed into 3½ days. This year's format is similar to last year where we spread the technical presentations over two days. We hope you enjoy the format and we welcome your feedback to make the conference even better next year.

We are pleased to announce addresses at this conference from two nationally recognized leaders in floodplain management and river restoration. **Michael Brown,** former Director of FEMA, will provide our keynote address; and **Jeff Shoemaker**, Executive Director of the Greenway Foundation, will be our featured speaker.

We would like to thank the many speakers who have worked hard to prepare presentations for this conference; you are really the cornerstone of this event. We would also like to express special gratitude and appreciation to the following individuals for donating their time and effort to organize this year's conference:

- Shea Thomas, Program Chairman
- Stuart Gardner, Facilities Chairman & Web Master
- Alan Turner, Registration
- David Krickbaum, Vendors & Sponsorships
- John Pflaum, Project Awards
- Brian Murphy, Field Trips Coordinator
- Rich Ommert, Bike Tour Coordinator
- Dave Center, Golf Tournament
- Janae Newman, Conference Announcement and Brochures

We hope you find the conference to be beneficial, educational and entertaining!

Robert Krehbiel
Conference Chairman

David Bennetts
CASFM Chairman

A special thanks to our conference sponsors!

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ICON Engineering

Gold Sponsors:
Muller Engineering Company
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THANK YOU

Exhibitors:
Triton Environmental
North Fork Native Plants
Sustainable Paving Systems

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XP Solutions
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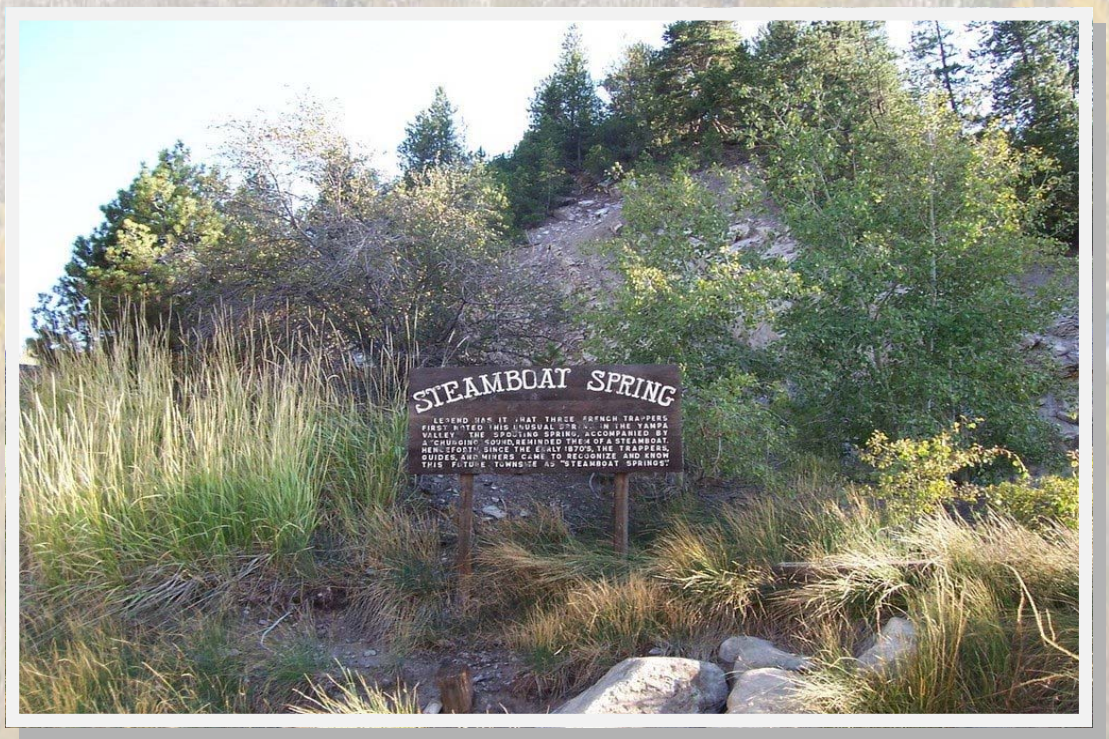
TABLE OF CONTENTS



Source: www.city-data.com (all photos)

SCHEDULE AT-A-GLANCE

Tuesday, September 25, 2012

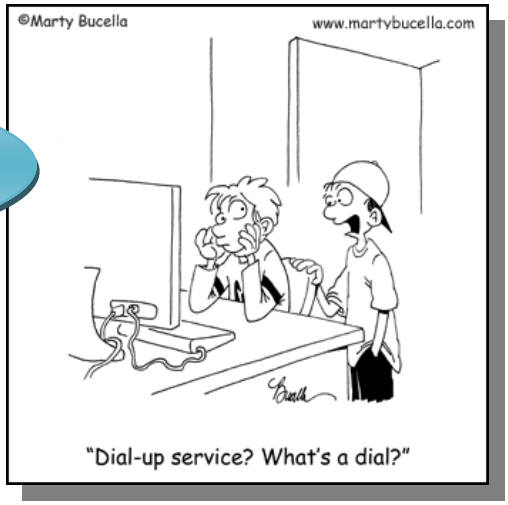
7:00			
8:00	Certified Floodplain Manager Training Session (Lunch provided)		
9:00			
10:00			
11:00			
12:00			
1:00		Workshop #1 CRS Revisions Workshop	
2:00			Workshop #2 Fluvial Geomorphology Workshop
3:00			
4:00			
5:00	Dinner on your own		
6:00			
7:00			
8:00	Ice Breaker Social Hour		

Wednesday September 26, 2012

7:00		Certified Floodplain Manager Exam
8:00	Registration and Breakfast	
9:00	Introduction and Welcome	
	RFP—Request for Personality	
10:00	Keynote Address: Michael Brown—Former Under Secretary of Homeland Security	
11:00		
12:00	Lunch Introduction of 2012/2013 Officers and Committee Chairs Scholarship Recipients	
1:00		
2:00	**Concurrent Technical Sessions**	
3:00	Floodplain Management	Stream Restoration / Technical Modeling
4:00	< - - - - - - Break - - - - - - >	
5:00	Dinner on your own	
6:00		
7:00		
8:00		

Stay informed of CASFM proceedings throughout the year at:
www.casfm.org

www.casfm.org



"Dial-up service? What's a dial?"

SCHEDULE AT-A-GLANCE

Thursday, September 27, 2012

7:00	
	General Membership Breakfast Meeting
8:00	
	2012 CASFM Award Finalist Presentations
9:00	
10:00	Break
	Featured Speaker:
11:00	Jeff Shoemaker—Greenway Foundation
	ASFPM Foundation
12:00	Lunch (starts at 11:45)
	Board Member Meeting
1:00	
	Concurrent Technical Sessions
2:00	Emergency Preparedness | Water Quality | Hydraulic Structures
3:00	< - - - - - - Break - - - - - - >
4:00	
5:00	
6:00	
7:00	CASFM Association Dinner
	Grand Prize Drawings
	2012 CASFM Project Awards Presentation
8:00	

Friday, September 28, 2012

7:00				
	Continental Breakfast			
8:00				
	Closing Remarks: Dave Bennetts, CASFM Chair			
9:00	Field Trips & Workshop			
10:00	2D Modeling Workshop	Mountain Bike Tour	Yampa River Restoration Walk	Golf Tournament
11:00				
12:00				
1:00				
2:00				

The Tugboat Grill & Pub

Join us at The Tugboat!

1860 Ski Time Square

Thursday night after the Awards Presentation Dinner.

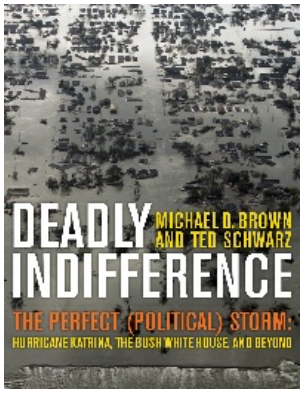
Live music!

FEATURED SPEAKERS

MICHAEL BROWN

Michael Brown served as the first Under Secretary of Homeland Security for President George W. Bush from 2003-2005, Director, Deputy Director and General Counsel, Federal Emergency Management Agency from 2001-2005. At the White House he served on the Consequence Management Committee, comprised of cabinet deputies, following the attacks of 9/11, and headed the White House transition team for Emergency Preparedness & Response, Department of Homeland Security. He also served on the National Security Council's Deputies Committee.

Michael has a unique perspective on homeland security issues, being the only Presidential appointee to have served in a legacy agency (FEMA), the transition team to create DHS, and as an Under Secretary in the newly created cabinet department.



Michael is the author of "Deadly Indifference: The Perfect (Political) Storm" in which he poignantly describes the role of politics in a risk-aversion society facing natural or manmade disasters. He has spoken around the world on issues of homeland security, crisis management and disaster response.

An Oklahoma native, he attended the University of Central Oklahoma , the Oklahoma City University School of Law, and holds a juris doctorate in law. He currently hosts The Rundown on 630 KHOW with David Sirota in Denver.

JEFF SHOEMAKER

Since 1982, Jeff Shoemaker has been the Executive Director of the Greenway Foundation. Under the course of his leadership, The Foundation has partnered with numerous public and private organizations to create over $100 Million of environmental and recreational improvements along the South Platte River and its numerous tributaries throughout the Denver Metro Area, including the C&C of Denver, Adams, Arapahoe, Boulder, Douglas and Jefferson Counties as well as numerous related municipalities.

In addition, The Foundation has created and oversees an award winning Youth Education Program – SPREE (South Platte River Environmental Education), numerous cultural and community events as well as a variety of youth employment opportunities – all focused on engaging the Metro community with our City's greatest natural resources – our urban waterways. The Greenway Foundation prides itself on having one "master" – the South Platte River (and her tributaries) – meaning that working with stakeholders from all regional communities is of equal importance and priority.

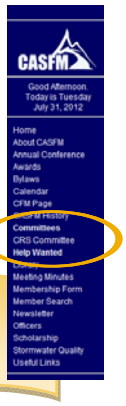
Since 2000, Jeff has also served as the Executive Director of the Foundation for Colorado State Parks that, working with the Colorado Division of Outdoor Parks and Recreation, provides funding, advocacy and community outreach for the benefit of our state's 44 State Parks. Jeff was a public school teacher from 1977-1982, served as a member of the Colorado Legislature from 1987-1992 and was appointed to two terms on the CSU Board of Trustees from 1999-2008. Jeff and his wife Nancy are active runners and bicyclists and are the proud parents of four adult daughters.

WORKSHOPS

CRS REVISION WORKSHOP Tuesday, September 25 1:00 pm

Kerry Redente—ISO
Barbara Fitzpatrick—FEMA
Marsha Hilmes-Robinson—City of Fort Collins

Learn about the upcoming changes to the FEMA National Flood Insurance Program's Community Rating System that will be published in the 2012 edition of the CRS Coordinator's Manual. The CRS Coordinator's Manual spells out the credits and credit criteria of the CRS program for community activities and programs that go above and beyond the minimum requirements for participation in the NFIP. This workshop will give an overview of those changes in the 2012 edition.



Keep up with the CRS Committee by visiting the Committee page on the CASFM website.

FLUVIAL GEOMORPHOLOGY Tuesday, September 25 2:00 pm

David Williams—NV5

This presentation discusses the morphology of rivers and fluvial landscapes. It introduces the main geomorphic processes that occur in rivers due to the flow of water. It also discusses the techniques for analysis of river morphology including the measurement as physical features, understanding the processes and understanding river response to natural and human-induced environmental changes.

David Williams has over 35 years of experience in the water resources industry and is known nationally and internationally for his contributions to the industry. He served as Principal-in-Charge for several FEMA flood insurance studies in San Diego and Orange counties. He wrote the new HEC-6 User Manual for the U.S. Corps of Engineers Hydrologic Engineering Center. He is well-versed in the computer programs HEC-1, HEC-HMS, HEC-2, HEC-RAS, HEC-6, STORM and WQRRS. David is a nationally recognized expert in sedimentation engineering and in developing innovative solutions to difficult hydraulic and hydrologic design problems in rivers and estuaries.

2D HYDRAULIC MODELING Friday, September 28 9:00 am

Alan Turner—CH2M Hill
Cory Hooper—CH2M Hill
Aaron Cook—CH2M Hill

With the advancement in computing power and available data, two dimensional hydraulic modeling has become a powerful tool in analyzing surface flows. This workshop will present the fundamentals of 2-D models that are required to develop and run these models. The workshop will be presented utilizing FLO-2D software with trial licenses provided by FLO-2D. Laptop computers will be provided by UWRI with the software pre-loaded for training proposes. The workshop will be hands on and will provide attendees the opportunity to build a two-dimensional model with sample data.

This workshop has a limit of 30 attendees. Check with Alan Turner for availability.

2012 CASFM AWARD FINALISTS

CANAL IMPORTATION PONDS AND OUTFALL DESIGN
City of Fort Collins
Ayres Associates
Anderson Consulting Engineers

The Canal Importation Ponds and Outfall (CIPO) project provides needed flood mitigation, water quality improvements, habitat improvements, stream restoration, and opportunities for outdoor wetland education activities for the community of Fort Collins, Colorado. The $21.5 million project's key accomplishment is flood mitigation for nearly 200 homes and several roadways in an area immediately upstream of Colorado State University in the heart of Fort Collins. Despite the size of the project – five regional storm ponds, 4,500 feet of large-diameter (78-to-102-inch) concrete pipe, and 250,000 cubic yards of excavation – the project earned solid public support.

The project re-established a riparian stream corridor through the detention ponds to improve habitat and water quality for this tributary to Spring Creek. The regional detention/water quality ponds were treated as opportunities to restore natural areas to the urban setting.

Using its Alternative Product Delivery System (APDS), the City assembled a team in 2006 of two engineering consultants – Ayres Associates and Anderson Consulting Engineers – and general contractor Garney Construction to work in concert with the City. A key aspect of the APDS system is that the design team becomes the construction team, providing a seamless transition from design to construction because each team member understands how each decision is made along the way.

The design team implemented several innovative technologies to accomplish the goals of the project while maintaining public trust. For example, the team designed a round baffle structure, rather than the traditional rectangular-shaped structure, to slow the large volume of water at the final outfall so it would not create a large scour hole in the pond. This round design dramatically changed the look of the structure and made it more aesthetically appealing. Artevia-colored Agilia concrete with a custom hand-carved form liner was incorporated into the structure's design, which created art on the hydraulic structure to take advantage of Art in Public Places funding that had been set aside for stormwater projects.

Great effort was made to avoid creating traditional "bathtub" detention ponds. Instead, the team designed multipurpose facilities for not only flood mitigation but also wildlife habitat and public trails.

The project resulted in no claims, was finished on schedule, and was completed within the $21.5 million budget with total change orders a remarkable negative $3.9 million.

As you're wrapping up your projects in 2012, keep the 2013 CASFM Project Award in mind!

LYKINS GULCH STREAM RESTORATION PROJECT
City of Longmont
Ayres Associates

Flooding potential of 150 acres on the southwest side of the City of Longmont coupled with the lack of a drainage outfall 1 mile away from the St. Vrain Creek provided a major challenge that seemed impassable. To improve drainage and flood control, the City had a vision of re-establishing the Lykins Gulch drainageway, which is a major outfall to St. Vrain Creek. However, property owners and residents were skeptical: Evidence of the natural Lykins Gulch drainage outfall had been filled in for agricultural purposes more than two generations ago, with stormwater diverted to the Niwot irrigation ditch. The City proceeded with the design of the Lykins Gulch Stream Restoration – a design that ultimately was supported by the chance discovery of a 1914 map showing the natural outfall into St. Vrain Creek.

Challenges en route to making the Lykins Gulch Stream Restoration project a reality included property acquisition, crossing up to five irrigation channels, avoiding conflicts with a major water supply pipeline, roadway realignment, consistency with ongoing agricultural activities, legalities of a conservation easement, impacts to a fishing club, endangered fish habitat, water quality, water rights, and coordination with the State Engineers Office.

The final plan included constructing a 1-mile-long, 275-foot-wide channel through a conservation easement and an existing gravel pit lake, resulting in a drainage channel and two private fishing lakes. This unconventional design resulted in less land acquisition cost, minimal earthwork import, no water augmentation cost, and transformation of an unused City pond into a water quality pond and City amenity. A multi-use path was built along the channel, connecting Airport Road to the St. Vrain Greenway trail system, providing a valuable link to the City's trail system.

The water quality pond has several unique features including a fish barrier system to protect endangered fish in St. Vrain Creek and a boulder trail that extends down to the water and across the upper end of the pond. The City pond was enhanced for safer access, and an island was provided for wildlife and woody vegetation to promote wildlife and fish habitat. The pedestrian trail winds around the City pond, creating multiple access points for the public to enjoy the scenery and recreational opportunities. Hikers, educational groups, and mountain bikers use the boulder path and enjoy the scenery and recreational opportunities. A 100-year spillway characterized by wildlife footprints embedded in the colored landform adds a unique feature to the improved ecosystem of the area.

SOUTH PLATTE RIVER AND LOWER LAKEWOOD GULCH IMPROVEMENT PROJECT
City and County of Denver
Urban Drainage and Flood Control District
Matrix Design Group

Construction of the $20 million South Platte River and Lower Lakewood Gulch improvement project through Denver's Upper Central Platte Valley near Mile High Stadium was completed primarily to reduce flood hazards and provide much needed environmental restoration. The result is a more natural, vibrant, recreational amenity for all who visit.

Channel improvements to the South Platte River portion, over 3,800 linear feet, will remove 385 acres of high value land from the 100-year floodplain. Improvements included channel widening and lowering, recreation-compatible drop structures, natural-looking outcrop jetties, surface water diversion, utility protection and relocation, retaining walls, regional trail improvements, re-vegetation and wildlife habitat enhancement. Most notable was the removal of Xcel Energy's old inflatable diversion dam, the last major obstruction to boatability on the river in Denver.

The reconstructed Lower Lakewood Gulch outfall into the South Platte River, over 1,600 linear feet, created a broad-open environmentally enhanced floodplain corridor. Improvements included a meandering low flow channel, extensive wetlands and upland vegetation, and a new trail system that vastly improves public safety and recreational opportunities. Denver's Fleet Maintenance Facility building was demolished to make room for this expanded waterway.

The project required significant coordination and cooperation between Denver Public Works, Urban Drainage and Flood Control District, Denver Parks, RTD, Xcel Energy and others. The reduction of flood hazards on both waterways was instrumental in allowing the construction of RTD's FasTracks West Corridor outside or above the new 100-year floodplains.

A special thanks to this year's Awards Committee:

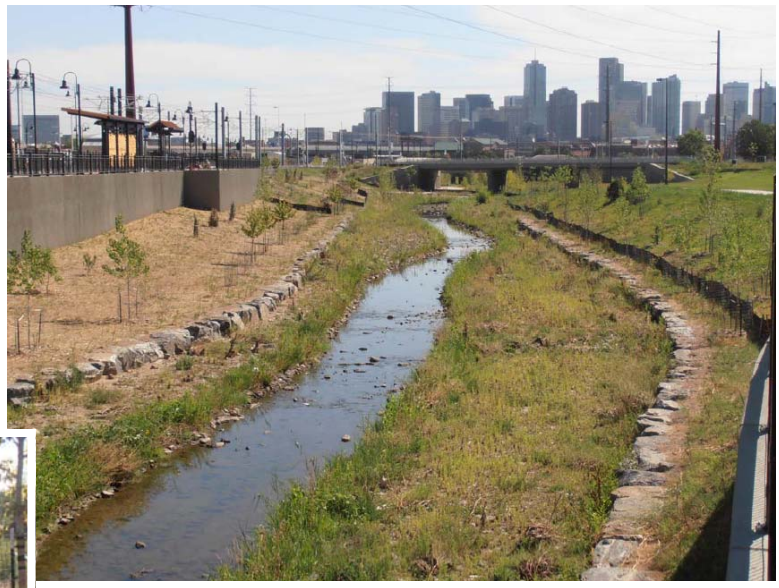
* John Pflaum—Chair
* Kevin Wegener, City of Aurora
* Thuy Patton—CWCB
* Lanae Raymond—SEMSWA

WEST CORRIDOR FASTRACKS PROJECT—STORMWATER IMPROVEMENTS
Regional Transportation District
Muller Engineering

The West Corridor Light Rail Transit (LRT) project is the first segment of the RTD FasTracks Program to be constructed, which is 12.1 miles long. The Full Funding Grant Agreement indicates a total cost of $709,830,000 for the project. The many facets of stormwater design that were completed for the project included floodplain modeling, CLOMR submittal and approval, 2.5 miles of major drainageway improvements, 7 drop structures, 9 major drainageway cross culvert designs, 36 UDFCD maintenance eligible outfall designs, local drainage design for the entire corridor and adjacent roadway improvements, trackway drainage, a 2,000 lineal foot box culvert that removed the 100- year floodplain, which took close to 30 structures out of the floodplain, detention and/or water quality for 3 Park n Ride stations and major roadway improvements, a water quality assessment for the ballasted trackway, irrigation ditch designs and numerous other spinoff tasks. The construction drawing set for the aforementioned design included 236 drawings.

The West Corridor alignment begins at the Auraria Campus, meanders its way through the downtown area, crossing the South Platte River, then follows the old Trolley track corridor paralleling the north side of Lakewood Gulch for over one mile to just east of Perry Street, then parallels the Dry Gulch alignment for approximately 1.4 miles from the confluence with Lakewood Gulch up to Harlan Street. This stretch of the project is where most of the major drainageway channel improvements were built. Channel improvements were required for two purposes. The first is to reduce the 100-year floodplain elevations from inundating or damaging the trackway and the second is to stabilize the channel so that channel degradation does not impact the trackway structure in the future. Additionally, bridges and concrete box culverts were improved at the following crossings: LRT at Lower Lakewood Gulch, Decatur Street, Federal Boulevard, Knox Court, Perry Street, and two LRT crossings of Dry Gulch upstream from Perry Street along these drainageways. The LRT alignment then follows the 13th Avenue alignment through the Two Creeks and Eiber neighborhoods up to near Quail Street. There the alignment turns to the south extending through Lakewood Industrial Park into the Federal Center, and then extends west to the Jefferson County Government Center along the 6th Avenue alignment. The track alignment crosses other drainageways including North Dry Gulch at Harlan Street, Lakewood Gulch at Collins Street, Lakewood Gulch at 6th Avenue near Red Rocks Community College entrance, Drainageway G at 6th Avenue and Kendrick Street, and Lena Gulch at 6th Avenue and Ulysses Street.

A project this big could not be completed without a huge collaborative effort, which included working with RTD, multiple local governments and agencies including the City and County of Denver, City of Lakewood, City of Golden, Jefferson County, CDOT, and the Urban Drainage and Flood Control District (UDFCD), the track designers, the roadway designers, the Construction Manager/General Contractor (CMGC), as well as coordination with the project team for the Lower Lakewood Gulch project. The project has stayed on schedule from the beginning in 2005, and is on track to open eight months early, in the spring of 2013.



FIELD TRIPS

YAMPA RIVER RESTORATION (FLY FISHING OPTIONAL)
Leader

A project is in the third and final phase to conduct in-stream and riparian habitat improvements on the Yampa River within the Chuck Lewis State Wildlife Area. This project proposes river channel stabilization and riparian rehabilitation activities that will allow the river to function in a more natural state and will eventually allow for enhanced floodplain function and lower width to depth ratios. Improved river processes will provide better channel stability and less bank erosion, better sediment transport, improved riparian habitat, decreased pike habitat and increased trout habitat.

The Yampa in this section experiences excessive sedimentation, lack of bank cover for habitat and stream shading, and provides minimal in-stream cover. This reach of the Yampa is characterized by wide, shallow riffles, shallow runs and few pools.

Meet at Conference Center At 9:00 am.
Carpool if possible.

MOUNTAIN BIKE TOUR
Rich Ommert, RESPEC

Join Rich Ommert for a day you will never forget! We will ride alongside the scenic Yampa River, taking in the surroundings and chatting about structural restoration that has been done to the river. This is something you don't want to miss!

9:00 am	Meet at Hotel Conference Center
10:30 am	Arrive at Bear River Park
12:00 pm	Return to Ski Haus/Conference Center

Bikes are available to rent at the Ski Haus, only a short drive from the Sheraton Hotel. Rental costs range from $12 to $44, depending on the bicycle you wish to ride.

The ride will begin near the Ski Haus, once everyone is settled and has a bike to ride. From the Ski Haus we will enter the Yampa River Core Trail, a short bike ride away. We will set off for the downtown section of the Yampa River, observing restoration work such as bank stabilization and fishery habitats.

The ride will continue for about an hour until Bear River Park, at which point we will turn around and head the same way back towards the Ski Haus.

Bike rentals available at the Ski Haus.

CONFERENCE SCHEDULE

TUESDAY, SEPTEMBER 25, 2012

8:00 am—5:00 pm CERTIFIED FLOODPLAIN MANAGER TRAINING SESSION
Location: Storm Peak
Kallie Bauer, Chris Tagert—Michael Baker
Kevin Houck—Colorado Water Conservation Board
Craig Jacobson—ICON

2:00 pm—5:00 pm CRS REVISIONS WORKSHOP
Location: Twilight
Kerry Redente—ISO
Barbara Fitzpatrick—FEMA
Marsha Hilmes-Robinson—City of Fort Collins

2:00 pm—5:00 pm FLUVIAL GEOMORPHOLOGY WORKSHOP
Location: Rainbow
David Williams—NV5

5:00 pm—8:00 pm DINNER ON YOUR OWN

8:00 pm—9:00 pm ICE BREAKER SOCIAL HOUR
Location: Saddles Deck

There is a list of Steamboat Springs restaurants at the Registration Desk.

7:00 am—10:00 am CERTIFIED FLOODPLAIN MANAGER EXAM
Location: Storm Peak
Kallie Bauer, Proctor—Michael Baker

See Conference Facilities Map on Page 43 for room locations.

8:00 am—9:00 am REGISTRATION AND BREAKFAST
Location: Conference Center Lobby and Vendor Area
Alan Turner—CH2M Hill

9:00 am—9:30 am WELCOME AND INTRODUCTION
Location: Werner/Sunshine
Dave Bennetts, CASFM Chair—Urban Drainage and Flood Control District

9:30 am—10:00 am RFP—REQUEST FOR PERSONALITY: KEYS TO WINNING MORE GOVERNMENT CONTRACTS
Location: Werner/Sunshine
John Burke—City of Westminster

10:00 am—11:30 am KEYNOTE ADDRESS
Location: Werner/Sunshine
Michael Brown—Former Under Secretary of Homeland Security

11:30 am—1:30 pm LUNCH
Location: Pool Tent
Introduction of 2012/2013 Officers and Committee Chairs

1:30 pm—2:00 pm CONCURRENT TECHNICAL SESSIONS:

FM1 THE BIG SIOUX RIVER—CONDITIONAL LETTER OF MAP REVISION CHALLENGES AND SOLUTIONS
Location: Storm Peak
Eliot Wong, Andrew Earles—Wright Water Engineers
Jon Jacobson—Confluence

SR1 CONSTRUCTION OF SOUTH PLATTE RIVER SEGMENT 15 HABITAT IMPROVEMENTS
Location: Werner
Brian Murphy—CDM
Katie Goodwin—Metro Wastewater Reclamation District

TM1 IMPROVING HYDROLOGIC ANALYSIS AND APPLICATIONS THROUGH THE USE OF QUALITY CONTROLLED RADAR DATA AND THE STORM PRECIPITATION ANALYSIS SYSTEM
Location: Sunshine
Tye Parzybok—METSTAT, Inc.
Douglas Hultstrand—HydroMeteorological Solutions
Beth Clarke—Weather Decision Technologies

Presentation abstract summaries start on Page 21. Look up by the 3-digit code next to the title.
FM = Floodplain Management
SR = Stream Restoration
TM = Technical Modeling

2:00 pm—2:30 pm CONCURRENT TECHNICAL SESSIONS:

FM2 LESSONS LEARNED DURING DFIRM
Location: Storm Peak
Lisa Biggs, Jarod Skrivanek—Atkins
Thuy Patton—Colorado Water Conservation Board

SR2 GRANGE HALL CREEK IN THORNTON: A PLETHORA OF ISSUES ALL ROLLED INTO ONE PROJECT
Location: Werner
Deb Ohlinger, Chance Uhrich—Olsson Associates
Jim Kaiser—City of Thornton
Dave Skuodas—Urban Drainage and Flood Control District

TM2 SEDIMENT TRANSPORT MODELING: LESSONS LEARNED
Location: Sunshine
Moosub Eom—CDM Smith

2:30 pm—3:00 pm CONCURRENT TECHNICAL SESSIONS:

FM3 KEEPING TRACK OF CLOMRs, LOMRs AND THE PROJECTS THAT DRIVE THEM
Location: Storm Peak
Joanna Czarnecka, Bill DeGroot—Urban Drainage and Flood Control District

SR3 WEST HARVARD GULCH REHABILITATION—TALE OF A CREEK, A RAILROAD, A COTTONWOOD AND BRICKS
Location: Werner
Dave Bennetts—Urban Drainage and Flood Control District
Carolyn Roan—Muller Engineering Company
Deborah Kemmerer—The Restoration Group

TM3 EXCEL AS A DATA MANAGEMENT TOOL FOR HEC-RAS
Location: Sunshine
Joel McGuire—Belt Collins West

3:00 pm—3:30 pm BREAK
Location: Vendor Area

3:30 pm—4:00 pm CONCURRENT TECHNICAL SESSIONS:

FM4 ONE CLICK FLOODPLAIN™
Location: Storm Peak
Josh Hollon—Atkins

SR4 BRIDGING THE GAP BETWEEN FLOOD SAFETY AND ENVIRONMENTAL VITALITY
Location: Werner
Mark Kempton, Shane Boyle—City of Fort Collins Stormwater Utility

TM4 1D SPLIT FLOW MODELING AT BEAVER CREEK IN MORGAN COUNTY, COLORADO
Location: Sunshine
Charlton Kennedy—AECOM

4:00 pm—4:30 pm CONCURRENT TECHNICAL SESSIONS:

FM5 ADMINISTERING THE STATE RULES AND REGULATIONS FOR FLOODPLAINS
Location: Storm Peak
Jamie Prochno—Colorado Water Conservation Board

SR5 WEST TOLL GATE CREEK AT FOX HILL PARK—PRESERVING STREAM CHARACTER WHILE RECLAIMING A CREEK
Location: Werner
Melanie Chenard, Jim Wulliman—Muller Engineering Company
Jon Nelson—Southeast Metro Stormwater Authority

TM5 TECHNIQUES IN CORRELATION BETWEEN 1D AND 2D HYDRULIC MODELING
Location: Sunshine
Brian LeDoux, Craig Jacobson—ICON Engineering

4:30 pm—5:00 pm CONCURRENT TECHNICAL SESSIONS:

FM6 SOLID FOUNDATION
Location: Storm Peak
Dusty Robinson, Jason Krueger—Ayres Associates

SR6 (empty)

TM6 FLOW-3D ANALYSIS OF A BOAT BYPASS ON THE BIG HOLE RIVER, MONTANA
Location: Sunshine
Brian Chevalier—WHPacific

5:00 pm—6:30 pm HAPPY HOUR
Location: Vendor Area
Sponsored by ERO Resources

ERO Resources Corp.

6:30 pm DINNER ON YOUR OWN

Thanks

A special thanks to the moderators of the technical sessions!

- Floodplain Management— Mark Glidden, CH2M Hill
- Stream Restoration—Jim Wullimam, Muller Engineering
- Technical Modeling—Darren Mollendor, Denver Wastewater
- Emergency Preparedness— Betsy Suerth, Garfield County
- Water Quality—Lucas Babbitt, Matrix Design Group
- Hydraulic Structures—Dave Jula, Baker

7:30 am—8:30 am GENERAL MEMBERSHIP BREAKFAST MEETING
Location: Pool Tent

8:30 am—10:00 am 2012 CASFM AWARD FINALISTS
Location: Werner/Sunshine

CANAL IMPORTATION PONDS AND OUTFALL DESIGN
City of Fort Collins, Ayres Associates, Anderson Consulting Engineers

LYKINS GULCH STREAM RESTORATION PROJECT
City of Longmont, Ayres Associates

SOUTH PLATTE RIVER AND LOWER LAKEWOOD GULCH IMPROVEMENT PROJECT
City and County of Denver, Urban Drainage and Flood Control District, Matrix Design Group

WEST CORRIDOR FASTRACKS PROJECT—STORMWATER IMPROVEMENTS
Regional Transportation District, Muller Engineering

See Conference Facilities Map on Page 43 for room locations.

10:00 am—10:30 am BREAK
Location: Vendor Area

10:30 am—11:30 am FEATURED SPEAKER
Location: Werner/Sunshine
Jeff Shoemaker—Greenway Foundation

11:30 am—11:45 am ASFPM FOUNDATION PRESENTATION
Location: Werner/Sunshine
Josh Hollon—Atkins

11:45 pm—1:30 pm CONFERENCE ATTENDEE LUNCH
Location: Pool Tent

BOARD MEMBER MEETING
Officers and Committee Chairs
Location: Aspen Room

1:30 pm—2:00 pm CONCURRENT TECHNICAL SESSIONS:

EP1 DISASTER RECOVERY—THE SURVIVOR, PUBLIC, PRIVATE, NON-PROFIT AND VOLUNTEER PARTNERSHIP
Location: Storm Peak
Penn Gildersleeve, ICON Engineering
Iain Hyde—Colorado Division of Emergency Management

WQ1 CDOT'S I-70 CLEAR CREEK CORRIDOR SEDIMENT CONTROL ACTION PLAN
Location: Werner
Robert Krehbiel—Matrix Design Group

HS1 DOUBLE DUTY OR DOUBLE TROUBLE: DESIGN CONSIDERATIONS FOR PEDESTRIAN UNDERPASSES THROUGH DRAINAGE STRUCTURES
Location: Sunshine
Teresa Patterson—RESPEC Consulting
Rich Borchardt—Urban Drainage and Flood Control District

Presentation abstract summaries start on Page 21. Look up by the 3-digit code next to the title.
EP=Emergency Preparedness
WQ=Water Quality
HS=Hydraulic Structures

2:00 pm—2:30 pm CONCURRENT TECHNICAL SESSIONS:

EP2 STAY SAFE—SEMSWA'S FLOOD AWARENESS PLAN
Location: Storm Peak
Monica Bortolini—Southeast Metro Stormwater Authority
Kallie Bauer, Chris Tagert—Michael Baker Jr.

WQ2 PERVIOUS CONCRETE—LESSONS LEARNED FROM 7 YEARS OF MONITORING
Location: Werner
Holly Piza—Urban Drainage and Flood Control District

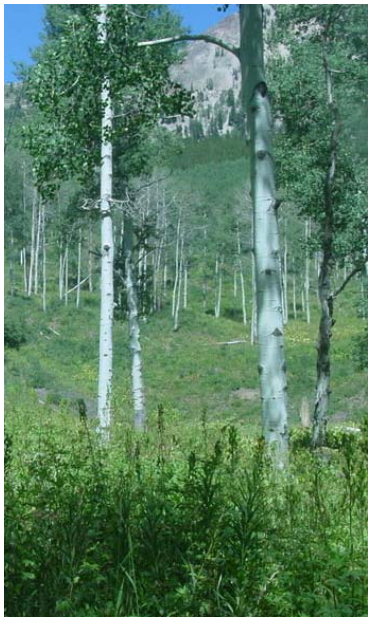
HS2 FISH PASSAGE DESIGN FOR CULVERTS USING HEC-26
Location: Sunshine
Roger Kilgore—Kilgore Consulting and Management

2:30 pm—3:00 pm CONCURRENT TECHNICAL SESSIONS:

EP3 ASSESSING THE PROBABILITY OF IMPACTS FROM STORM RUNOFF FOLLOWING WILDFIRE: THE FOURMILE CANYON BURN AREA
Location: Storm Peak
Ian Pater, Andrew Earles, Shannon Tillack—Wright Water Engineers

WQ3 MODELING BALLASTED TRACKS FOR POLLUTANT AND C VALUE
Location: Werner
Albert Molinas—Hydrau-Tech, Inc.
Amanullah Mommandi, Khan Aziz—CDOT
John Shonsey—RTD-FasTracks

HS3 TEMPORARY DIVERSION SIZING WHEN WORKING IN WATERWAYS
Location: Sunshine
Dave Bennetts—Urban Drainage and Flood Control District
Shannon Tillack, Andrew Earles—Wright Water Engineers



3:00 pm—3:30 pm BREAK
Location: Vendor Area

3:30 pm—4:00 pm CONCURRENT TECHNICAL SESSIONS:

EP4 DENVER'S JULY 2011 STORMS—A LOOK BACK
Location: Storm Peak
Saeed Farahmandi, Bruce Uhernik—City and County of Denver

WQ4 BUSINESS MODEL TO DRIVE REGULATORY COMPLIANCE
Location: Werner
Lanae Raymond—Southeast Metro Stormwater Authority
Janel Servis—Aqua Terra Compliance

HS4 REGION 2 BRIDGE ENTERPRISE EXPERIENCES
Location: Sunshine
Lee Rosen—RESPEC Consulting

4:00 pm—4:30 pm CONCURRENT TECHNICAL SESSIONS:

EP5 FLOOD RESPONSE—JULY 7, 2011—A LOOK BACK
Location: Storm Peak
Mark Donelson—City of Aurora

WQ5 A YEAR IN THE LIFE OF AN URBAN BIORETENTION AREA
Location: Werner
Chris Carlson—City of Loveland

HS5 CDOT'S PLAN OF ACTION FOR SCOUR CRITICAL BRIDGES AND BRIDGES WITH UNKNOWN FOUNDATIONS
Location: Sunshine
Amanullah Mommandi—CDOT
Rick Moser—RESPEC Consulting
Albert Molinas—Hydrau-Tech

4:30 pm—5:00 pm CONCURRENT TECHNICAL SESSIONS:

EP6 DESIGN BUILD—IS IT FOR YOU?
Location: Storm Peak
Duane Launder—City of Aurora

WQ6 EFFECTS OF RACCOON PROCYON LOTO HABITATION WITHIN MUNICIPAL SEPARATE STORM SEWER SYSTEMS AND BACKTERIAL IMPACTS ON STORMWATER DISCHARGES
Location: Werner
Andy Taylor, Donna Scott, Emily Barber—City of Boulder

HS6 NEW CORROSION/ABRASION GUIDELINES FOR CULVERT PIPE MATERIALS
Location: Sunshine
Albert Molinas—Hydrau-Tech, Inc.
Amanullah Mommandi, Khan Aziz, Roberto Dedios—CDOT

5:00 pm—6:30 pm HAPPY HOUR
Location: Vendor Area
Sponsored by Michael Baker Jr.

7:00 pm—9:00 pm CASFM ASSOCIATION DINNER AND AWARDS
Location: Werner/Sunshine
Sponsored by Muller Engineering Company
Grand Prize Drawings: Stuart Gardner—CDOT
2012 CASFM Project Awards Presentation: John Pflaum

9:00 pm—2:00 am LIVE MUSIC AND ENTERTAINMENT
Location: The Tugboat Bar and Grill

FRIDAY, SEPTEMBER 28, 2012

7:30 am—8:30 am CONTINENTAL BREAKFAST
Location: Vendor Area

8:30 am—9:00 am CLOSING REMARKS
Location: Werner/Sunshine
Dave Bennetts, CASFM Chair—Urban Drainage and Flood Control District

9:00 am—12:00 pm 2D MODELING WORKSHOP
Location: Twilight
Alan Turner, Cory Hooper, Aaron Cook—CH2M Hill

FIELD TRIPS:
YAMPA RIVER RESTORATION WALK
Coordinated by Brian Murphy—CDM

MOUNTAIN BIKE TOUR
Coordinated by Rich Ommert—RESPEC

If you didn't sign up for a field trip during registration, it may not be too late. Check with the field trip coordinator to see if there is room available.

10:00 am—3:00 pm GOLF TOURNAMENT—ROLLINGSTONE RANCH GOLF CLUB
Sponsored by Oldcastle Precast
Coordinated by Dave Center—AECOM

Save the date for next year's conference:

September 24-27, 2013

In Steamboat Springs

PRESENTATION ABSTRACTS

FLOODPLAIN MANAGEMENT TRACK
Wednesday, September 26th
Location: Storm Peak

FM1 1:30 pm
THE BIG SIOUX RIVER—CONDITIONAL LETTER OF MAP REVISION CHALLENGES AND SOLUTIONS
Eliot Wong, Andrew Earles—Wright Water Engineers | ewong@wrightwater.com, aearles@wrightwater.com
Jon Jacobson—Confluence

The Greenway Improvements Project in Sioux Falls, South Dakota consists of new boardwalks and bike paths, multiple scenic overlook areas, open spaces, a community stage, and renovations to two existing bridges along the Big Sioux River. The Big Sioux River, like the South Platte River in Denver, runs through Downtown Sioux Falls. Most of the Greenway Improvements encroach not only on the 100-year floodplain, but also on the regulatory floodway. This presentation will address the challenges faced by the project team and the successful floodplain management and permitting approaches employed to evaluate and address regulatory floodway encroachments, as well as the approach for creating a Duplicate Effective model in the absence of an effective model.

FM2 2:00 pm
LESSONS LEARNED DURING DFIRM
Lisa Biggs, Jarod Skrivanek—Atkins | lisa.biggs@atkinsglobal.com
Thuy Patton—Colorado Water Conservation Board | thuy.patton@state.co.us

Many communities in Colorado have either completed or are in the DFIRM process. Several issues have been identified along the way including digitization errors from inaccurate effective vector maps when overlaid on aerials, LOMR and existing data study incorporation difficulties, and community outreach concerns. Some of these issues have caused inaccurate map products, delays in project schedules, and unanticipated additional work. This presentation will share the knowledge gained from these projects along with potential solutions and will discuss how to use this knowledge to improve the DFIRM products and process.

FM3 2:30 pm
KEEPING TRACK OF CLOMRs, LOMRs AND THE PROJECTS THAT DRIVE THEM
Joanna Czarnecka, Bill DeGroot—UDFCD | jczarnecka@udfcd.org, bdegroot@udfcd.org

In 2001, the Urban Drainage & Flood Control District (District) started reviewing LOMCs (CLOMRs and LOMRs) for FEMA. We developed an Access 2007 database to keep track of all LOMC's we process. This presentation will demonstrate the uses of the database as a very effective tool in management of LOMRs and CLOMRs within the District. The database helps with searching through multiple combinations of attributes. This database is a very helpful tool not only for District staff but also for the local communities, and engineers researching available studies to support their designs.

FM4 3:30 pm
ONE CLICK FLOODPLAIN
Josh Hollon—Atkins | Joshua.hollon@atkinsglobal.com

One Click Floodplain™ is an automated floodplain mapping tool that can create approximate floodplain delineations with one click of the mouse. Using U.S. Geological Survey (USGS) topography, National Hydrography Dataset stream center-lines, USGS gage data (with automated processing), and HEC-RAS and RASMapper, One Click Floodplain™ can produce basin-wide, countywide, statewide, and even countrywide floodplain delineations in a matter of minutes. These approximate delineations can be a valuable tool for floodplain managers with limited resources to fund detailed studies and to identify risks beyond the limits of the effective Flood Insurance Rate Maps.

FLOODPLAIN MANAGEMENT TRACK (continued)
Wednesday, September 26th
Location: Storm Peak

FM5 4:00 pm
ADMINISTERING THE STATE RULES AND REGULATIONS FOR FLOODPLAINS
Jamie Prochno—Colorado Water Conservation Board | Jamie.prochno@state.co.us

In September 2011, the Colorado Water Conservation Board finalized a State Model Floodplain Damage Prevention Ordinance intended to assist communities in updating floodplain regulations to meet the requirements of both the National Flood Insurance Program and the State Rules and Regulations for Floodplains. This presentation will introduce participants to the changes in floodplain regulations and provide examples of updated ordinances and municipal codes from several Colorado communities. Strategies for administering the Rules will be discussed as well as the supplemental guidance document developed by CWCB to clarify the intent and application of the Rules.

FM6 4:30 pm
SOLID FOUNDATION
Dusty Robinson, Jason Krueger—Ayres Associates | robinsond@ayresassociates.com, kruegerj@ayresassociates.com

Geospatial data such as topographic mapping, aerial imagery, and planimetrics create the digital foundation for any project. How educated are you about the foundation for your projects? Do you know the difference between all of the data collection options? Are you collecting geospatial data in the most cost effective way? Join us as we discuss the collection methods, geospatial data basics, and more cost effective options for acquiring custom data.

NOTES

STREAM RESTORATION TRACK
Wednesday, September 26th
Location: Werner

SR1 1:30 pm
CONSTRUCTION OF SOUTH PLATTE RIVER PHASE II HABITAT IMPROVEMENTS
Brian Murphy—CDM | murphybm@cdmsmith.com
Katie Goodwin—Metro Wastewater Reclamation District | kgoodwin@mwrd.dst.co.us

The Metro Wastewater Reclamation District is implementing a habitat improvements program in Reach 9 of Segment 15 (Brantner Ditch diversion to 124th Avenue). The improvements are intended to provide increased aquatic habitat diversity and channel structure through varying flow depth, velocity, and protective cover. Phase II of the habitat improvements were recently completed. The presentation will describe the construction of Phase II improvements, including the overall phasing of construction. Photos (pre-construction and post-construction) will illustrate the Reach 9 Phase II improvements.

SR2 2:00 pm
GRANGE HALL CREEK IN THORNTON: A PLETHORA OF ISSUES ALL ROLLED INTO ONE PROJECT
Deb Ohlinger, Chance Ulrich—Olsson Associates | dohlinger@olssonassociates.com, cuhrich@olssonassociates.com
Jim Kaiser—City of Thornton | jim.kaiser@cityofthornton.net
Dave Skuodas—UDFCD | dskuodas@udfcd.org

Sanitary sewer lines were exposed in Grange Hall Creek, which was also eroding toward a pedestrian trail. The presentation will cover topics such as the variety of bank stabilization techniques including soil wrapped lifts and biolog toe protection, challenging tie-in points, constructability problems in saturated conditions, re-establishing vegetation in the midst of prairie dogs, and creative use of available funds.

SR3 2:30 pm
WEST HARVARD GULCH REHABILITATION—TALE OF A CREEK, A RAILROAD, A COTTONWOOD AND BRICKS
Dave Bennetts—UDFCD | dbennetts@udfcd.org
Carolyn Roan—Muller Engineering Company | croan@mullereng.com
Deborah Kemmerer—The Restoration Group | deb@restorationecology.us

The West Harvard Gulch Rehabilitation project in Denver resulted from a partnership between the Urban Drainage and Flood Control District, City and County of Denver, City of Englewood, General Shale Brick Company, and Burlington Northern Santa Fe Railroad. After a long and complex history spanning 2 decades, the project was finally constructed by L&M Enterprises in 2011/2012. The project substantially improves West Harvard Gulch, neighborhood and regional trail linkages, local site drainage, and overall stormwater quality.

SR4 3:30 pm
BRIDGING THE GAP BETWEEN FLOOD SAFETY AND ENVIRONMENTAL VITALITY
Mark Kempton, Shane Boyle—City of Fort Collins Stormwater Utility | mkempton@fcgov.com, sboyle@fcgov.com

The City of Fort Collins Stormwater Department has completed an update to the City's stormwater master plan to include stream restoration and stormwater retrofit projects, alongside already identified flood control projects. The update includes the restoration of 18 miles of streams and adds storm water quality treatment to large areas of developed land in the City. The update also includes measures to deal with irrigation flows that are conveyed through the City's streams, causing severe stability and habitat degradation issues throughout the City. Using innovative evaluation techniques, the City has prioritized the stream restoration and water quality BMP projects for funding and construction,

STREAM RESTORATION TRACK (continued)
Wednesday, September 26th
Location: Werner

SR5 4:00 pm

WEST TOLL GATE CREEK AT FOX HILL PARK—PRESERVING STREAM CHARACTER WHILE RECLAIMING A CREEK

Melanie Chenard , Jim Wulliman—Muller Engineering Company | mchenard@mullereng.com, jwulliman@mullereng.com
Jon Nelson—SEMSWA | jnelson@semswa.org

Over a period of years, this meandering reach of West Toll Gate Creek in Fox Hill Park had experienced severe bank erosion and down cutting. The challenge was to implement stabilization improvements in a manner that would preserve as much as possible the natural character and vegetation of the creek. Great care was taken to understand which areas of existing channel and vegetation could be preserved; improvements were designed to minimize the footprint of their disturbance and transition quickly into the areas that were left intact. The result was a project that appeared "green" even right after construction, with a varied, natural channel alignment and cross section.

NOTES

TECHNICAL MODELING TRACK
Wednesday, September 26th
Location: Sunshine

TM1 1:30 pm
IMPROVING HYDROLOGIC ANALYSIS AND APPLICATIONS THROUGH THE USE OF QUALITY CONTROLLED RADAR DATA AND THE STORM PRECIPITATION ANALYSIS SYSTEM
Tye Parzybok—METSTAT, Inc. | type@metstat.com
Douglas Hultstrand—HydroMeteorological Solutions
Beth Clarke—Weather Decision Technologies

Utilizing innovative algorithms, the Storm Precipitation Analysis System (SPAS) combines rain gauge observations, high resolution NEXRAD radar data and climatological maps for producing high-resolution (1-km2) gridded precipitation across any terrain at temporal scales as fine as 5-minutes. The gridded precipitation data eliminates assumptions associated with the precipitation input into hydrologic modeling. An overview of SPAS and some case studies will be provided.

TM2 2:00 pm
SEDIMENT TRANSPORT MODELING: LESSONS LEARNED
Moosub Eom—CDM Smith | eomm@cdmsmith.com

This presentation will explain basic concept of sediment transport analysis, selection of appropriate sediment transport equations/models, and general procedures used in sediment transport modeling. In addition, an overview several recent sediment transport modeling projects performed by CDM Smith will be presented.

TM3 2:30 pm
EXCEL AS A DATA MANAGEMENT TOOL FOR HEC-RAS
Joel McGuire—Belt Collins West | jmcguire@beltcollins.com

HEC-RAS is a powerful tool for the analysis of surface water hydraulics. A well implemented Graphical User Interface (GUI), combined with a rich feature set, makes set up and modeling of complex riverine systems accessible to users of all abilities. But what do you do when faced with a stream that starts as three tributaries on an alluvial fan, traverses through residential neighborhoods that have an insufficient drainage network and converge in a built up, urbanized area that has been improved in discontinuous sections? This paper will explore the use of EXCEL as a relational database tool to manage the output of two dependent Steady State models totaling 59 reaches, 545 cross sections, 27 bridges and culverts, and 107 lateral structures.

TM4 3:30 pm
1D SPLIT FLOW MODELING AT BEAVER CREEK IN MORGAN COUNTY, COLORADO
Charlton Kennedy—AECOM | chuck.kennedy@aecom.com

Accurate modeling and delineation of floodplains and floodways allows engineers and regulators to design and regulate future projects in a manner that minimizes hazard to the public. The Beaver Creek Floodplain Project illustrates solutions to several common problems encountered in floodplain modeling, including cross jurisdictional floodplains, split flows, and non-levee embankments. The Colorado Department of Transportation (CDOT) and the Colorado Water Conservation Board demonstrated strong intergovernmental cooperation by funding modeling and surveying for the Beaver Creek floodplain. CDOT's consultant, AECOM, updated the existing 1D floodplain model to depict split flows in a manner that conformed with historic flood information and modeled existing non-levee embankment in conformance with current FEMA requirements. The model demonstrates the value of split flow modeling to better understand floodplain encroachment limitations.

TM5 4:00 pm

TECHNIQUES IN CORRELATION BETWEEN 1D AND 2D HYDRAULIC MODELING

Brian LeDoux, Craig Jacobson—ICON Engineering | bledoux@iconeng.com, cjacobson@iconeng.com

The 2D model may eventually find a home in the world of floodplain regulation, but until that time comes, we find ourselves in cross-roads of quazi-2D and 1D hydraulic modeling. Current approaches typically use the 2D modeling as a roadmap to help define the limits of the 1D floodplain analysis, but how well do these two methods compare to one another? As part of several recent projects, ICON had the opportunity to compare and contrast FLO-2D and HEC-RAS results under varying drainage conditions, including an alluvial floodplain and urban flooding along a perched roadway corridor. The correlation between the two models was very reasonable, but only after several key observations were made and techniques were adjusted, accordingly. Project approaches and observations will be presented.

TM6 4:30 pm

FLOW-3D ANALYSIS OF A BOAT BYPASS ON THE BIG HOLE RIVER, MONTANA

Brian Chevalier—WHPacific | bchevalier@whpacific.com

Water resources engineers are accustomed to using one-dimensional hydraulic models such as HECRAS to determine hydraulic characteristics of existing conditions and proposed improvements for a variety of open channel projects. Many of these projects have complex hydraulic conditions, and in many cases the actual performance of a planned structure may not be fully understood due to the limitations of these models. This presentation will review the use of a Computational Fluid Dynamic model (CFD) to determine the complex existing conditions at a dam site on the Big Hole River in Montana, and the performance of proposed improvements relating to boating, fish passage and safety.

NOTES

EMERGENCY PREPAREDNESS TRACK
Thursday, September 27th
Location: Storm Peak

EP1 1:30 pm
DISASTER RECOVERY—THE SURVIVOR, PUBLIC, PRIVATE, NON-PROFIT AND VOLUNTEER PARTNERSHIP
Penn Gildersleeve—ICON Engineering | pgildersleeve@iconeng.com
Iain Hyde—Colorado Division of Emergency Management | iain.hyde@state.co.us

Assistance for disaster response and recovery is provided to survivors by many agencies including government entities, private companies; not-for-profit organizations and a myriad of volunteer groups. This session explores the working relationship among all these groups, and how you, either as a working professional, or as a concerned citizen, can best be of assistance in the time of need.

EP2 2:00 pm
STAY SAFE—SEMSWA'S FLOOD AWARENESS PLAN
Monica Bortolini—Southeast Metro Stormwater Authority | mbortolini@semswa.org
Kallie Bauer, Chris Tagert—Michael Baker Jr. | kallie.bauer@mbakersoorp.com, ctagert@mbakercorp.com

STAY SAFE is a broad floodplain and emergency preparedness outreach plan that SEMSWA and Baker have developed with the goal of communicating risk in a manner that increases awareness and changes behavior in order to keep people safe. Developing and launching an outreach campaign can be a daunting undertaking requiring substantial time and resources. The idea was to create a basic plan outline including documents that others could use. The goal is to have as many people as possible hear the same message. Eventually the plan will be submitted to the ISO for CRS credit and possibly modified when the new CRS manual becomes effective.

EP3 2:30 pm
ASSESSING THE PROBABILITY OF IMPACTS FROM STORM RUNOFF FOLLOWING WILDFIRE: THE FOURMILE CANYON BURN AREA
Ian Paton, Andrew Earles, Shannon Tillack—Wright Water Engineers | ipaton@wrightwater.com, aearles@wrightwater.com, stillack@wrightwater.com

The Fourmile Canyon wildfire burned approximately 6,200 acres of forest and 168 homes in the foothills west of Boulder, Colorado in September 2010. To simulate the hydrology of the burned watershed, post-fire peak runoff rates were predicted with a Curve Number loss method using HEC-HMS for the 2-, 10-, 25- and 100-year, 1-hour storm events. The projected runoff rates were plotted along with the probability of occurrence of storm events of varying return frequencies. This approach assisted decision-makers with understanding the relative risks and implications of different storm event scenarios over time as the hydrologic recovery of the watershed progresses.

EP4 3:30 pm
DENVER'S JULY 2011 STORMS—A LOOK BACK
Saeed Farahmandi, Bruce Uhernik—City and County of Denver | saeed.farahmandi@denvergov.org, bruce.uhernik@denvergov.org

The presentation will feature videos and photos from the string of Denver storms in July 2011.
New media has been added since the March CASFM Social.
The daily storms from July 6th to July 14th produced 5.5" at City Park and over 6.5" at Stapleton. By comparison, the average monthly precipitation in Denver for July is 1.68". This presentation provides a look back at the multi-day flooding, the damage caused to vehicles, homes, city streets, and the reactions of Denver residents.

EMERGENCY PREPAREDNESS TRACK (continued)
Thursday, September 27th
Location: Storm Peak

EP5 4:00 pm
FLOOD RESPONSE—JULY 7, 2011—A LOOK BACK
Mark Donelson—City of Aurora | mdonelso@auroragov.org

The rain event on July 7, 2011 certainly challenged the storm system as it was inundated in many areas for a short period of time. Rain fall intensities exceeded 100 year levels in many areas for a short period. Streets and roadways became part of the conveyance system and turned into creeks and rivers. Landscape materials along roadways were especially vulnerable to the high flows and contributed to the debris that reduced the efficiency of the system. Overall, the efficient response efforts helped to reduce the impact of the storm while also remind us of the ongoing need to respect water.

EP6 4:30 pm
DESIGN BUILD—IS IT FOR YOU?
Duane Launder—City of Aurora | dlaunder@auroragov.org

Design-build is a method of getting a project built in a shorter timeframe and at a reduced cost. Design-build is an Integrated approach that delivers design and construction under one contract. This presentation will give a brief overview of the Design-build format, it's advantages and disadvantages, and how it can save a municipality, a county, or even the state, time, money and resources.

NOTES

WATER QUALITY TRACK
Thursday, September 27th
Location: Werner

WQ1 1:30 pm
CDOT'S I-70 CLEAR CREEK CORRIDOR SEDIMENT CONTROL ACTION PLAN
Robert Krehbiel—Matrix Design Group | robertk@matrixdesigngroup.com

The Colorado Department of Transportation (CDOT) is voluntarily undertaking efforts to reduce erosion and sedimentation along the I-70 mountain corridor. CDOT is working with stakeholders in the Clear Creek watershed to improve the water quality and the ecosystem of Clear Creek by reducing sedimentation. Excessive sediment is produced from traction sand applied to the roadway during the winter, along with erosion of existing highway road cut and fill areas. The team developed a Sediment Control Action Plan for the 30-mile reach of I-70 adjacent to Clear Creek from Eisenhower Tunnel to Floyd Hill to address sediment management from roadway maintenance activities and natural erosion into Clear Creek.

WQ2 2:00 pm
PERVIOUS CONCRETE—LESSONS LEARNED FROM 7 YEARS OF MONITORING
Holly Piza—Urban Drainage and Flood Control District | hpiza@udfcd.org

Permeable pavements are an important tool in reducing and disconnecting imperviousness. In an effort to provide guidance in selection and maintenance practices as well as develop criteria for permeable pavements, Urban Drainage and Flood Control District (UDFCD) continues with an active stormwater quality monitoring program. The results of a recently released seven year report on the pervious concrete site show consistent and significant differences between the reference site and the BMP site for most constituents analyzed. This paper presents the monitoring components at the pervious concrete site, presents the design of the BMP, a summary of the monitoring results, and discussion on the maintenance schedule of pervious concrete.

WQ3 2:30 pm
MODELING BALLASTED TRACKS FOR POLLUTANT AND C VALUE
Albert Molinas—Hydrau-Tech, Inc. | molinas@hydrau-tech.com
Amanullah Mommandi, Khan Aziz—CDOT |
John Shonsey—RTD-FasTracks |

In this study, the RTD's light rail operations are examined for pollutant production and runoff. In order to accomplish this, a laboratory study utilizing a rainfall-runoff facility was conducted. The input to this laboratory model was provided by using RTD's design criteria, data from existing installations, and by a field study to sample surface materials along ballasted tracks. The study was directed to determine the state of runoff in regards to inflows, and if there are minor pollutants entering the system, to determine their amounts and their fate.

WQ4 3:30 pm
BUSINESS MODEL TO DRIVE REGULATORY COMPLIANCE
Lanae Raymond—SEMSWA | lraymond@semswa.org
Janel Servis—Aqua Terra Compliance | janelservis@aol.com

SEMSWA aims to move Contractors and Engineers more efficiently through the SEMSWA Grading, Erosion and Sediment Control (GESC) process so the resources of the Developer, Contactor and the Engineer can be placed more appropriately on controls at the construction site. SEMSWA looks to encourage Contractors to create a cost-effective, pro-active, practical management program that reduces the potential of erosion and sediment transport from the site even before construction begins. After construction begins, SEMSWA would like to expand the BMPs to those that are more cost-effective for the Contractor, while still highly functional. SEMSWA would also like to promote equivalent BMP use and encourage Engineers to initiate BMP 'trains' in their site plans, develop 'typical' BMP plans for similar construction operations, use the equipment the Contractor has on site as much as possible, and add an element of sustainability to the project.

WATER QUALITY TRACK (continued)
Thursday, September 27th
Location: Werner

WQ5 4:00 pm

A YEAR IN THE LIFE OF AN URBAN BIORETENTION AREA
Chris Carlson—City of Loveland | carlsc@ci.loveland.co.us

In 2011 the City of Loveland installed two experimental bioretention areas in the Cleveland Avenue (U.S. Highway 287) right-of-way in downtown Loveland. This presentation will discuss not only the design approach and unique features, but more importantly, the lessons learned when the design engineer volunteered to personally maintain the BMPs for one year, including shoveling, watering, cleaning, planting, and documenting the entire process – a year in the life of an urban bioretention area.

WQ6 4:30 pm
EFFECTS OF RACCOON PROCYON LOTOR HABITATION WITHIN MUNICIPAL SEPARATE STORM SEWER SYSTEMS AND BACTERIAL IMPACTS ON STORMWATER DISCHARGES
Andy Taylor, Donna Scott, Emily Barber—City of Boulder | taylorand@bouldercolorado.gov

The City of Boulder began a basic monthly in-stream monitoring schedule of Boulder Creek in 2000 for *E. coli* and, in response to increasing regulations, expanded the study to include several additional in-stream sites in 2006. A separate study of the water quality of the storm system outfalls in Segment 2b revealed elevated levels of *E. Coli* were being discharged to Boulder Creek with higher concentrations occurring during summer months. Physical inspections of the storm system and interviews with city sewer worker staff revealed active habitation of raccoons within the MS4 as well as large quantities of raccoon fecal matter in the flowlines of the MS4. In October 2011 a small drainage basin within Segment 2b, Basin 9, with a single outfall was selected to conduct an *E. Coli* elimination/Best Management Practices (BMP) study. The success of the Basin 9 study has prompted City of Boulder supervisors to reconsider the effects wildlife have on the MS4 water quality.

NOTES

HYDRAULIC STRUCTURES TRACK
Thursday, September 27th
Location: Sunshine

HS1 1:30 pm
DOUBLE DUTY OR DOUBLE TROUBLE: DESIGN CONSIDERATIONS FOR PEDESTRIAN UNDERPASSES THROUGH DRAINAGE STRUCTURES
Teresa Patterson—RESPEC Consulting | Teresa.patterson@respec.com
Rich Borchardt—Urban Drainage and Flood Control District | rborchardt@udfcd.org

Incorporating pedestrian underpasses into drainage structures can often provide safer routes for trail patrons and stretch tax-payer dollars. It can also introduce a public safety risk when drainage structures fill with water during major storm events. Two recent UDFCD-sponsored culvert replacement projects with pedestrian underpasses will be highlighted as the lessons learned and future design considerations will be discussed.

HS2 2:00 pm
FISH PASSAGE DESIGN FOR CULVERTS USING HEC-26
Roger Kilgore—Kilgore Consulting and Management | rkilgore@kcmwater.com

The Federal Highway Administration released Hydraulic Engineering Circular (HEC) 26 "Culvert Design for Aquatic Organism Passage" in 2010. The fundamental approach in this stream simulation design method is to provide hydraulic conditions within an embedded culvert similar to those found upstream and downstream of the culvert over a wide range of flow rates. By simulating the depth, velocity, and sediment transport capabilities of the channel through the culvert, it is reasonable to infer that fish capable of passing up and down the channel can also pass through the culvert. The presentation will review the basics of the design procedure and illustrate its application on a case study using a western mountain stream. The case study results will be compared with design conclusions generated from other methodologies.

HS3 2300 pm
TEMPORARY DIVERSION SIZING WHEN WORKING IN WATERWAYS
Dave Bennetts—UDFCD | dbennetts@udfcd.org
Shannon Tillack, Andrew Earles—Wright Water Engineers | stillack@wrightwater.com, aearles@wrightwater.com

The Urban Storm Drainage Criteria Manual (USDCM) Volume 3 guidance on temporary diversion method sizing criteria when working in or around a waterway has recently been revised. The previous temporary diversion channel sizing criteria suggested using a curve that estimates the 2-year peak flow rates based on watershed imperviousness for small waterways. Requiring complete diversion of the 2-year peak flow rate for all projects requiring diversions is too general. general and does not address important factors including the temporal length of the project, the time of year for construction, current condition of the stream channel, and the different types of work (bank stabilization, roadway crossings, below-stream utility placement, etc.) that have different corresponding diversion needs, and other factors.

HS4 3:30 pm
REGION 2 BRIDGE ENTERPRISE EXPERIENCES
Lee Rosen—RESPEC Consulting | lee.rosen@respec.com

The Colorado Bridge Enterprise's (CBE) objective is to repair or reconstruct bridges throughout the state considered structurally deficient or functionally obsolete. The southeastern plains of Colorado, within CDOT Region 2, contain a number of bridges slated for reconstruction as part of the CBE program, many of which were built in the early 1900's and are structurally deficient based on years of service and outdated construction materials. This presentation will discuss the design, contracting process and construction of several bridge replacements within CDOT Region 2 as part of the CBE that CDOT and RESPEC Consulting have collaborated on over the past several years. This will include case studies to provide insight to the hydrology and hydraulics as well as touch on the CM/GC contracting process and innovative construction means and methods such as sliding bridges.

HYDRAULIC STRUCTURES TRACK (continued)
Thursday, September 27th
Location: Sunshine

HS5 4:00 pm
CDOT'S PLAN OF ACTION FOR SCOUR CRITICAL BRIDGES AND BRIDGES WITH UNKNOWN FOUNDATIONS
Amanullah Mommandi—CDOT | amunullah.mommandi@dot.state.co.us
Rick Moser—RESPEC Consulting | rick.moser@respec.com
Albert Molinas—Hydrau-Tech | molinas@hydrau-tech.com

A renewed effort to address CDOT's scour critical bridges was undertaken in 2010 for the purpose of re-evaluating the scour critical list and developing an updated Plan of Action (POA) for each scour critical structure. To complete this task, CDOT created a project and selected a multi-disciplinary consultant team to develop the POAs. This ongoing effort Involves reviewing past scour history, performing site visits and surveys, developing hydraulic models, calculating theoretical scour depths, and producing a POA for each structure including scour countermeasure recommendations and cost estimates. The presentation will provide an overview of the CDOT POA program and several bridge sites will be reviewed including a description of scour countermeasures that were recommended.

HS6 4:30 pm
NEW CORROSION/ABRASION GUIDELINES FOR CULVERT PIPE MATERIALS
Albert Molinas—Hydrau-Tech, Inc. | Molinas@hydrau-tech.com
Amanullah Mommandi, Khan Aziz, Roberto Dedios—CDOT

In this paper, current methodologies for estimating the service life of various pipe materials employed by various state Departments of Transportation (DOTs) are presented. A new service life chart for steel pipes based on the information collected from the field observations and data analysis was developed. It was found that for the steel pipe failure cases along I-70 and I-25, the previously published service life predictors for steel pipes deviated from observations by as much as 10 times and that service life multipliers to account for pipe thickness effects were greatly exaggerated. Data from Colorado pipe failure cases was used in relating service life of steel pipes to soil resistivity and pH levels. For aluminum pipes, the research identified chloride and sulfate concentrations to be factors that reduced the service life of these pipes dramatically.

NOTES

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A lawyer and an engineer were fishing in the Caribbean. The lawyer said, "I'm here because my house burned down and the insurance company paid for everything."

"That's quite a coincidence," said the engineer. "I'm here because my house was destroyed by a flood and my insurance company also paid for everything."

The puzzled lawyer asked, "How do you start a flood?"

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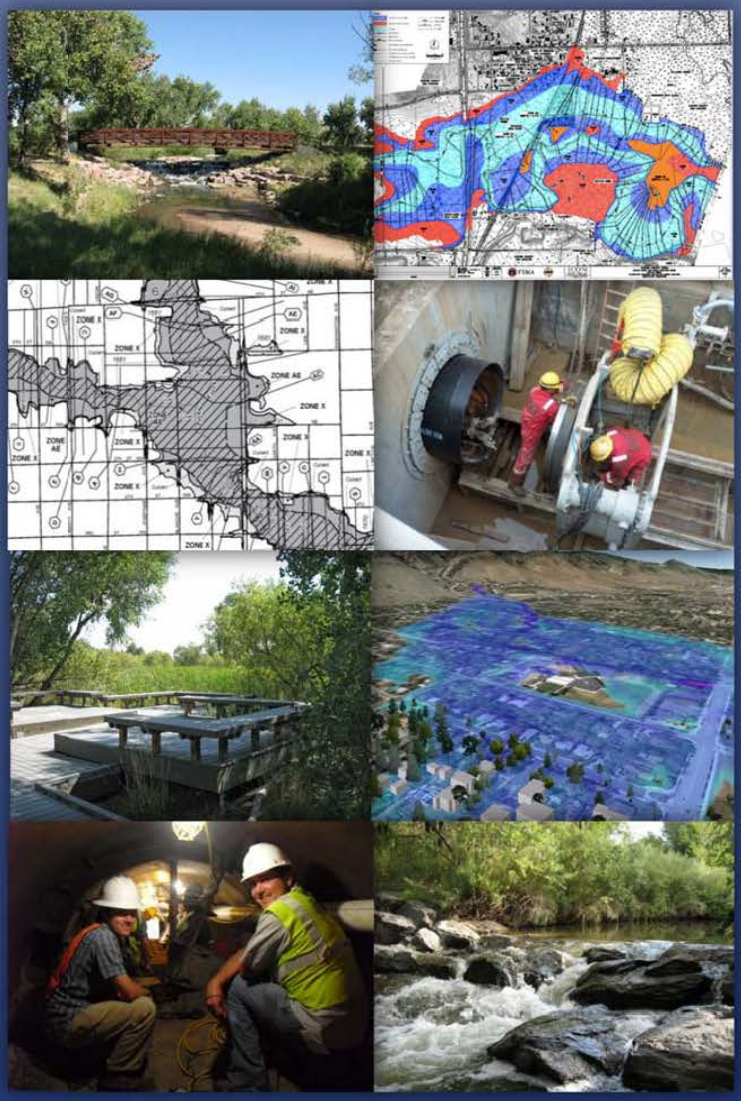

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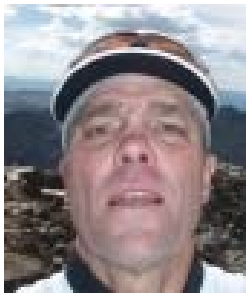

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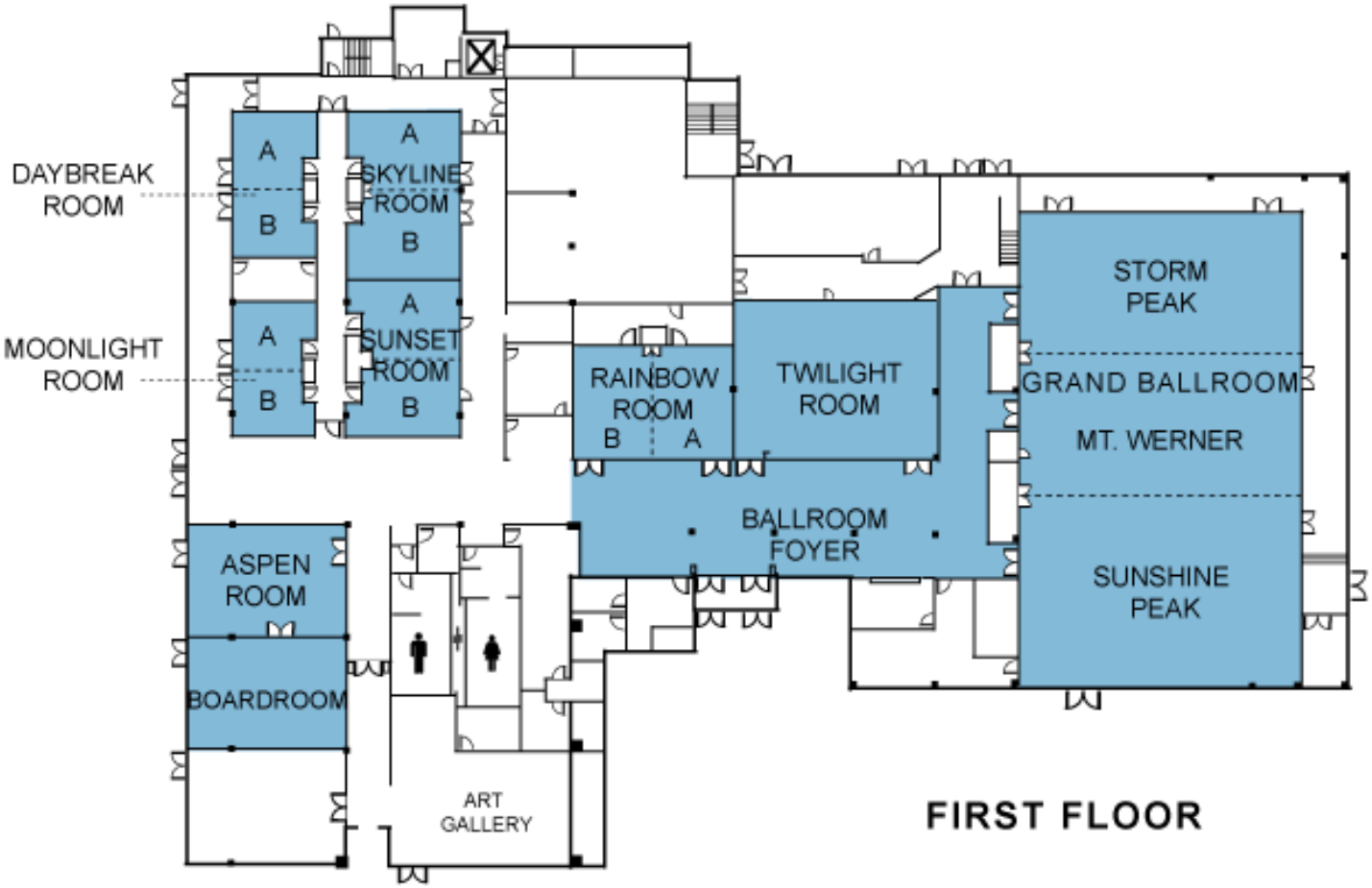

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