Winter 2021 Vol. 31 / Issue 1

The Open Channel

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The Colorado Association of Stormwater and Floodplain Managers

A Word From the Chair





et me start with 2020: "What in the fresh hell was that?" I am so happy to be reaching out to membership at the start of a new year. Despite challenges last year, CASFM's board, regional representatives, and committees were able to engage with our community and have an impact. We saw additional research grants awarded, collaboration across the state for lunch and learns, and our first virtual conference. Our organization is really built on the members that volunteer, and I just can't thank them enough. I specifically want to thank our outgoing board members, Thuy Patton and Rich Borchardt, and our outgoing regional representatives, Russ Anderson, Jason Messamer, and Jen Winters. I look forward to working with the new members of the board and regional representatives in 2021.

I recently asked the question, "What do you get out of being a member of CASFM?" I overwhelming heard education opportunities and networking. This year, I hope to focus on continuing our creative strategies for engagement, as well as developing new opportunities to reach the membership and network in this virtual environment. We will continue to update everyone on the status of our 2021 annual conference and keep sending positive thoughts in the hopes of seeing some smiling faces in Snowmass. Thanks again to everyone for making 2020 a little better, and hope to SEE you guys soon!

-Worgan Lynch

Afternoon Session - Engineering Excellence Project Award Presentation 3 + Down the Drainageway + Closing Remarks



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Going with the Flow



By Sarah Houghland and Jason Messamer

2020 CASFM Virtual Conference Review

ur theme this year, "Going with the Flow," could not have been more appropriate. Everyone in the organization had to alter their lives in some way and go with the flow. CASFM is an all-volunteer organization, and we appreciate all the hard work that went into getting out of our comfort zone and planning a virtual conference in a few months' time. Although the conference committee was a little nervous about the virtual conference attendance, our membership came out in force to support the organization. We had almost 450 attendees!

The Board and Conference Committee would like to thank the presenters, moderators, sponsors, volunteers, and attendees for all going with the flow to make this conference a success. We rely on you to provide guidance and leadership for CASFM and the annual conference, and this would not be possible without each of you.

We would like to especially thank Shea Thomas, our facilities coordinator, and Stacey Thompson, our digital program coordinator, for successfully renegotiating our Socio and Keystone conference center 2020 contracts. Socio will be applied to 2021, and Keystone was rescheduled for 2023. Great job by you!

The conference was a great way to reconnect with the stormwater and floodplain management community after

months of separation. It was nice to catch up with peers and to share information, new technologies, innovative ideas, and new developments that have occurred since last seeing each other in 2019. While we were unable to include many of our usual conference activities in the virtual conference schedule — workshops, FP101, CFM exam, morning yoga, field trips, golf tournament, mountain bike tour, happy hours, the awards banquet, networking — we were able to provide some sense of normalcy and continue CASFM conference traditions, like crowning the 2021 Engineering Excellence project award winner, raising funds for the CASFM scholarships, giving out raffle prizes, and providing a forum for our industry to connect.

2020 Engineering Excellence Award — Construction

As always, one of the highlights of the conference is the project award presentations and the awarding of the CASFM Engineering Excellence award. This year, we were fortunate to have three outstanding projects to choose from! Our runner-up projects, Globeville Landing Outfall (City and County of Denver) and Poudre River Whitewater Park (City of Fort Collins), were strong candidates that showcase how local officials are committed to capital im-



Sanderson Gulch improvements video

provements to make more resilient communities.

The 2020 CASFM Engineering Excellence award-winning project was the Sanderson Gulch Channel Improvements Project (City and County of Denver DOTI, MHFD, ICON Engineering, Great Ecology, and Valerian). In the past, Sanderson Gulch flowed through undersized culverts and a channel within a narrow urban corridor that had insufficient capacity for major storms. Peak flows associated with the 100-year storm event overtopped roadways and railroad tracks and spilled out from the channel. Design of the Sanderson Gulch improvements included an innovative design approach to increase capacity for stormwater conveyance. The new, unconventional chan-

Continued of page 4

2021 Conference Planning

nel and box culvert system now safely conveys the 100-year storm flows and has an additional 1,200 cfs capacity. The project includes a 12' x 4' box culvert and a geomorphic channel with flood terrace for low flows; two 14' x 8' and four 16' x 4' box culverts to convey high flows below the channel, roadways, and railroad crossing; complex and decorative boulder structures at the inlet and outfall to South Platte River; a comprehensive restoration effort for long term health and stability of the stream and habitat; trail connections; and increased safety for pedestrians. And who could forget the project ecologist Joshua Eldridge's deft footwork highlighting the benefits of wood chips versus no woodchips!

ssuming we are back to business-as-usual in time for the 2021 annual conference, the 32nd conference will be held from Tuesday, September 14, to Friday, September 17 in Snowmass, Colorado. The conference committee will provide more information regarding lodging when conference registration opens in July 2021.

The Calls for Presentation Abstracts and the Engineering Excellence Award – Non-Construction will be distributed to the CASFM membership in early March. Deadline for submission will be May 7, 2021.

We are excited to continue the Engineering Excellence Award format change that began in 2020 and will continue at the 2021 conference! For 2021, CASFM is soliciting nonconstruction project nominees that focus on planning studies, public education programs, flood response plans, criteria manuals, and other similar projects. Projects that are eligible will need to be completed between May 2019 and May 2021. Additional information will be posted to the Annual Conference page on the CASFM website when it becomes available. Please feel free to reach out to conference committee members if you have questions.



John Garrett

- » Custom CASFM page https://spark.adobe.com/page/ JpvloOQw4RPPT/
- » Podcast: Professionals who aren't "stereotypical" on What's Your And? https://thejohngarrett.com/podcast/
- » Video: Learn more about John's message https://youtu.be/fU2TnsClpGU
- » Book: Author of "What's Your And?" https://thejohngarrett.com/whats-your-and-book/



Our keynote speaker will be John Garrett – The Recovering CPA. His message encourages everyone to find and share the things that ignite them so we can all thrive at work. Unlock the person behind the professional!

If you are interested in reading more about John, please visit the websites below.



2021 and Beyond 2021: Snowmass

Tuesday, Sept. 14 - Friday, Sept. 17 The Westin Snowmass Resort 100 Elbert Lane Snowmass Village, CO 81615 www.westinsnowmass.com

2022: Steamboat

Tuesday, Sept. 13 - Friday, Sept. 16 The Steamboat Grand 230 Mount Werner Circle Steamboat Springs, CO 80487 www.steamboatgrand.com

2023: Keystone

Monday, Sept. 18 - Wednesday, Sept. 20 Keystone Conference Center 633 Tennis Club Road Keystone, CO 80435 www.keystoneresort.com

ASPFM



ASEPM Foundation Proud to Announce This Year's **Rocky Mountain Environmental Hazards Challenge Winner**

ROAD

LOSED



The ASFPM Foundation, in partnership with FEMA Region VIII and Earth Force, are proud to announce the 2020 1ST PLACE WINNER of the Rocky Mountain Environmental Challenge



INS MIDDLE SCHOOL CLICK HERE TO VIEW THE FIVE SCHOOLS ANNOUNCED AS WINNERS IN THE ROCKY MOUNTAIN ENVIRONMENTAL CHALLENGE

more about the Rocky Mountain Environmental Haraeth Challenge widt later //warthforce.com/marks.info/

Brad Anderson, ASFPM Foundation projects chair, in partnership with Tony Mendes, FEMA Region VIII, and Vince Meldrum, Earth Force, reviewed and judged proposals submitted by nine Colorado middle and high schools for this year's Rocky Mountain Environmental Hazards Challenge (RME-HC). Brad's extremely rewarding experience last year made it clear that ASFPM Foundation's support of RMEHC would continue: "The innovation and creativity of middle school and high school kids I witnessed throughout this process is nothing short of inspirational - with talent like this, our country's future managing flood risk and other hazards is bright!" said Brad.

Blevins Middle School from Fort Collins, Colorado took first place in this year's challenge. Their entry proposed a community awareness event to encourage students and their families to create family emergency plans. Click to view the five schools announced as this year's winners (https://www.fema. gov/news-release/20200807/ five-schools-announced-winners-

HIGH

rocky-mountain-environmentalchallenge).

RMEHC is an annual competition sponsored by Earth Force and FEMA Region VIII that combines project-based learning with the latest research in science, technology, engineering, and mathematics (STEM) education. Student teams from schools across Colorado submit a project that applies real-life solutions to local natural hazard risks in their community for a chance to win prize money to fund their project. Prizes range from \$1,000 for the first place winner to \$200 for the fifth place finalist. All prize money was donated by ASFPM Foundation to further its dedication to reducing the risk and impacts of floods on people and communities.

Earth Force is the driving force behind RMEHC. Established in 1994, its mission is to "engage young people as active citizens



environment and their communities now and in the future." Imagine "a world where everyone has the knowledge and

skills they need to participate in environmental decision making in their community." Through programs like the RMEHC, Earth Force is well on its way to achieving its vision through early engagement with today's youth to manifest a resilient and sustainable future.

ASFPM Foundation is currently working in partnership with FEMA and Earth Force to expand this challenge to other FEMA regions. Learn more about the Rocky Mountain Environmental Hazards Challenge (https://earthforce.org/rise-challenge/rise_colorado/rise_colorado_history/).

Scholarship Committee Update





Brenna Shuttleworth CASFM Ben Urbonas Scholarship Winner

The 2020-2021 CASFM Ben Urbonas Scholarship recipient is Brenna Shuttleworth. Brenna is a full-time graduate student at the University of Colorado Denver and is studying environmental science with a specialization in water systems. Her time at the Mile High Flood District (MHFD) has fostered interests in fluvial geomorphology and environmental management of fluvial systems in Colorado. She hopes to provide environmental education and guidance to other professionals in order to promote adaptive and holistic floodplain and stormwater management.



Tim Hunt CASFM Family Scholarship Winner

The 2020-2021 CASFM Family Scholarship award recipient is Tim Hunt, son of CASFM member and former officer John Hunt. Tim graduated in 2017 from Liberty Common High School in Fort Collins and is currently a sophomore studying mechanical engineering at Colorado State University. Tim is earning funds for his education as an automotive technician and has a full schedule of work and school. This award will significantly offset the cost of tuition and allow him more time to focus on his studies. Tim has an interest in the machines used to produce sustainable energy, and he plans to use his career to help Colorado move toward a fully sustainable power grid.



Josie Steffens Undergraduate Scholarship Winner

The 2020–2021 Undergraduate Scholarship recipient is Josie Steffens. Josie is an environmental engineering student at the Colorado School of Mines and will graduate in the spring of 2022. While studying environmental topics at the school, she became interested in hydrology and, more specifically, dams and their environmental impact. In the future, she wishes to pursue this field with the hope of making a positive impact on the planet and our waterways. In her free time, Josie likes to ski and backpack.

Technical Assistance



any areas of the state were significantly impacted by wildfires and floods in 2020. The Colorado Watershed Conservation Board (CWCB) is here to help! The CWCB has established the Colorado Watershed Restoration Program to provide technical support for grant applications, design review, engineering analysis, and construction oversight. For additional information please visit https://cwcb.colorado.gov/flood-after-fire

Summary of Technical Assistance Services

Review of technical analysis and design

» Review of emergency designs and projects by a team of multi-disciplined professionals including experts in engineering, geomorphology, vegetation, ecology, and biology.

Technical Evaluations, Analysis, Planning, and Project Prioritization

- » Data Collection and Baseline Conditions Assessment.
- » Gap analysis. Identifying where additional data and/or evaluations are needed to support decision making.
- » Pre and post-burn hydrology and evaluation of changes by scale (HEC-HMS, GSSHA, StreamStats or other).
- » Post-burn hydraulics (basin-wide) to determine increased flood risk (HEC-RAS 1D and 2D or RiverFlow2D). This analysis can include the addition of bulking factors to account for sediment and debris loading.
- » Fluvial hazard zone delineation and assessing geomorphic risk. After a wildfire, FHZ maps (https://www.coloradofhz.com/) can be quickly and cost-effectively created to delineate areas vulnerable to sediment and debris impacts spurred by rainfall over the burn scar. Mapping these post-fire hazards may allow downstream residents to prepare by preemptively moving vehicles, storage units, and other items to safer locations and to develop evacuation plans.
- » Sediment and debris flow modeling (FLO-2D, USFS, and USGS methodologies).
- » Assistance with identification of values at risk and project/area prioritization.
- » Detailed Damage Survey Report (DSR) support with NRCS.
- » Flood warning support including correlation to hydrology, hydraulics, and FHZ mapping
- » Watershed recovery plan development; technical analysis, prioritization, concept design,







2020 – Year in Review

Outreach and Training | Treasurer's Report





By Emily Villines and Tyler Rosburg

CASFM **Membership**

Current membership:

1,080

Added



744 Followers



26 tweets in the last 12 months and 28,942 impressions







Training

GeoHECRAS Two-Day In-Person Training 2/24/2020 21attendees

After the Flames Fluvial Hazard Zone Webinar 8/13/2020 91 registered

Western Slope Seminar Lunch and Learn 11/9/2020

83 registered

Western Slope Seminar

Lunch and Learn 11/18/2020 52 registered

Western Slope Seminar

Lunch and Learn 12/2/2020 77 registered 51 attendees

Western Slope Seminar

Lunch and Learn 12/15/2020 76 registered 57 attendees



One research grant awarded in 2020 in the amount of \$2,500 (see page 9)

Sponsored or promoted events with: Colorado Silver Jackets, FEMA, Colorado Stormwater Center, **OneWater Solutions Institute, Colorado Department of Public** Health and the Environment, Colorado Water Conservation Board, **Colorado Watershed Assembly**







2020 Research Grant Project



n early 2020, MHFD, in partnership with Urban Watersheds Research Institute and with support from the 2020 CASFM Water Quality Research Grant, initiated a regional stormwater research project to study bioretention basins installed across the Denver metropolitan region. This study was intended to evaluate successes of individual facilities installed over multiple decades and to understand design considerations and maintenance requirements by investigating performance metrics through infiltration testing, soil media gradation, nutrient analyses, and vegetation health assessments. Early in the study, goals were defined as the following:

- » Quantify the impact of vegetation on infiltration rates.
- » Evaluate nutrient content in the bioretention media and health of the vegetation.
- » Determine recommendations for type / coverage of vegetation to facilitate basin function.

- » Evaluate the maximum recommended runon ratio to the bioretention filter area.
- » Identify bioretention media gradation ranges that result in functional infiltration rates.
- » Determine pretreatment and maintenance recommendations based on available maintenance data and conditions within the bioretention basin.
- » Develop a map and case study library of bioretention sites in the region.

MHFD developed a field assessment approach to collect data from different bioretention basins that varied by type, location, installation date, and maintenance history. After identifying potential sites, MHFD reviewed drawings, drainage reports, maps, vegetation plans, and maintenance records (if available) and collected site background information on each facility. Following background investigation, site inspections and performance-based fieldwork would

include: infiltration testing, soil sampling of bioretention media mix (gradation and nutrients), and assessing vegetation health (e.g., health, condition, coverage, type, etc.). Results would be summarized, analyzed, and mapped interactively. With the project now underway, MHFD has identified over 20 basins and completed the first round of infiltration and soil testing for the majority of the basins.

Over the next year, MHFD plans on (one) expanding the list of facilities, (two) improving the data collection process for performance-based and vegetation assessments by creating a standard bioretention fieldwork survey, and (three) developing a beta version of an online interactive story map.

A literature review was completed by Geosyntec in June 2020.

MHFD hopes this study, which is also being performed in conjunction with a volume 3, chapter 4 and 6 update, can be used to inform the criteria.

