

# Association of Montana Floodplain Managers 25th Annual Conference

Holiday Inn Missoula Downtown | Missoula, MT | February 25th – 28th, 2025

## **CONFLUENCE ALONG THE CLARK FORK**

### AGENDA

#### **Tuesday, February 25 (Preconference NOAA Workshop - Offsite - Missoula Library)**

On Tuesday, February 25, the National Oceanic and Atmospheric Administration (NOAA) is hosting an all-day workshop at the Missoula, MT Public Library focused on exploring its newest extreme precipitation product: [NOAA Atlas 15](#). NOAA Atlas 15 is the latest update to the precipitation frequency data presented in [Atlas 14](#), the National Precipitation Frequency Atlas of the United States. Currently, a pilot version of NOAA Atlas 15 is available, using Montana as a test case. This pilot interface is being shared with the public so NOAA can collect feedback to improve the tool before final publication.

At the workshop, participants will engage directly with the National Weather Service development team for NOAA Atlas 15; discuss and provide feedback on the interface; and share the decisions they make relying on extreme precipitation products such as Atlas. Individuals interested in participating in this free, in-person workshop can register [here](#).

#### **Tuesday, February 25 (Preconference DNRC Workshop - Montana Room)**

9:30 AM - 12:00 PM

**"Floodplain Basics (101)"** - For a highly entertaining and informative workshop to understand the National Flood Insurance Program. Join the MT DNRC dynamic duo, Nadene and Traci, as they help navigate the intriguing world of floodplain management. Shylea Wingard will also be on hand to provide practical insight and commentary.

Nadene Wadsworth  
Traci Sears  
Shylea Wingard  
MT DNRC

*Please email Traci Sears ([tsears@mt.gov](mailto:tsears@mt.gov)) or Shylea Wingard ([Shylea.wingard@mt.gov](mailto:Shylea.wingard@mt.gov)) to register for this event.*

1:15 PM - 3:30 PM

**"Floodplain Bootcamp"** – In-Person Mapping Session - Focus on on-line mapping products and how to use them. This workshop is a continuation of the floodplain bootcamp mapping sections. Participants should attend the free virtual floodplain mapping sessions prior to attending this workshop. If you are interested in knowing and understanding floodplain maps and studies, this would be an excellent workshop for you.

Peri Turk  
Larry Schock  
Ryan Murphy  
MT DNRC

*Please email Traci Sears ([tsears@mt.gov](mailto:tsears@mt.gov)) or Shylea Wingard ([Shylea.wingard@mt.gov](mailto:Shylea.wingard@mt.gov)) to register for this event. **Participants should also bring their laptops if possible.***

3:30 PM - 4:30 PM

**"Letter of Map Changes (LOMCs)"** - What are LOMCs? When should they be used? More importantly how should they be submitted in the permitting process and when local officials should sign the Community Acknowledgment Forms? In-depth review of the LOMCs and Conditional Letters of Map Changes (CLOMCs). Peri and Larry are eager to address all of your burning questions surrounding LOMCS and CLOMCs.

Peri Turk  
Larry Schock  
Ryan Murphy  
MT DNRC

*Please email Traci Sears ([tsears@mt.gov](mailto:tsears@mt.gov)) or Shylea Wingard ([Shylea.wingard@mt.gov](mailto:Shylea.wingard@mt.gov)) to register for this event*

#### **Tuesday, February 25**

2:00 PM - 5:00 PM **Registration - Big Sky Atrium**

4:00 PM - 8:00 PM **Exhibitor Setup Big Sky Atrium**

5:00 PM - 7:00 PM **AMFM Board Meeting - Montana Board Room**

**Wednesday, February 26 Conference Sessions – Garden City Ballroom**

8:00 AM	-	5:00 PM	<b>Registration - Big Sky Atrium</b>	
8:00 AM	-	9:00 AM	<b>Checking in with the DNRC Floodplain Program Team</b>	<b>DNRC Floodplain Program Staff DNRC Regional Engineers</b>
<p>The DNRC Floodplain Program, including Regional Engineers, will be on hand to meet one-on-one with conference attendees. This is an opportunity to discuss general and technical questions with the teams. Or simply check in and say hello.</p>				
9:00 AM	-	9:20 AM	<b>2D Resources for Floodplain Managers and Community Officials</b>	<b>Connor Johnson, PE, CFM AECOM</b>
<p>Engineering contractors are producing two-dimensional (2D) Large Scale Base Level Engineering (BLE) models and 2D Enhanced models for FEMA more often now in Region 8, and nationally. With increasing prevalence of BLE and Enhanced models, communities will need to manage and interpret 2D risk information. Models of this scale and complexity may pose challenges for floodplain managers and communities. This presentation will center on the resources available to communities and stakeholders when using 2D data so that they can make the most informed decisions when it comes to risk or mitigation opportunities.</p> <p>One example of using a non-regulatory 2D BLE model was to help a small, resource strapped community with high-level stormwater infrastructure improvements analysis using a Mitigation Technical Assistance grant from FEMA Region 8. An example of using regulatory 2D Enhanced with Floodway modeling was in a rural county to update their decades old FIRMs as part of FEMA's Risk MAP program.</p>				
9:20 AM	-	10:20 AM	<b>Assisting and Building Capacity Through Deployment</b>	<b>Tracie J Harrison, CFM Utah NFIP Coordinator Courtney Long, CFM Great West Engineering Traci Sears, CFM MT NFIP Coordinator Sara Hartley, CFM MT DES</b>
<p>Large scale disasters can easily overwhelm local and state capacities. When this happens, impacted states often send out a request for assistance. Hear from those who have answered this call for assistance and how these mutual partnerships helped both parties fill resources and build capacity and knowledge.</p>				

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10:20 AM	-	10:35 AM	<b>Morning Break - Big Sky Atrium</b>	<b>Courtesy of NV5 Geospatial</b>
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10:35 AM	-	11:05 AM	<b>Unseen Flood Risk: Irrigation's Overlooked Hazards</b>	<b>Drew Vance PE, CFM DOWL</b>
<p>Irrigation ditches, while essential for agricultural needs, pose unique and often overlooked flood risks that can significantly impact surrounding communities and infrastructure. This presentation will explore real-world examples of irrigation-related flood events across the state, highlighting the associated challenges and risks. By accounting for the impacts of irrigation, communities can better understand comprehensive flood risks that extend beyond the scope of the NFIP.</p>				
11:05 AM	-	11:35 AM	<b>Remote sensing applications to support large-scale riverine and floodplain assessments and monitoring</b>	<b>Mischa Hey NV5 Geospatial</b>
<p>Remote sensing and spatial analytics have substantial utility to support riverine and floodplain assessment and monitoring at extents not feasible with traditional field surveys. This presentation will provide an overview of relevant technologies such as topobathymetric lidar, sonar, and multiple imagery types, as well as processes for integrating and analyzing these data. Broad-scale, objective, and reproducible analytics allow for geographic and temporal comparison across entire river systems to aid in inundation modeling, restoration prioritization, efficacy monitoring, and more. Quantification and mapping of geomorphic features, thermal refugia, floodplain connectivity, riparian vegetation, solar exposure, and water quality are some of the applications we will review. While this presentation is focused mainly on river systems, many of the concepts and data products can be applied similarly to other benthic systems such as oceans or lakes. The goal of this presentation is to provide managers and decision makers information on how to leverage the concept of digital twins in natural systems through remote sensing technologies, data fusion, and analytics.</p>				
11:35 AM	-	12:05 PM	<b>Lessons from the Animal House Case – Johnson v. City of Bozeman</b>	<b>Charity Yonker, CFM /JD MT DNRC Land Use Attorney Shylea Wingard, CFM, MS MT DNRC Floodplain Planner</b>
<p>The “Animal House” case is commonly referred to as such because it involved the permitted use of a college fraternity in a Bozeman residential neighborhood, this case challenges “time and place” notice hearing requirements, public participation, and sufficient notice regarding the “impact” of code or regulation changes to a neighborhood or community. Montana attorney, Charity Yonker and State Floodplain planner, Shylea Wingard will combine experience and expertise to highlight how the decisions by this landmark Montana Supreme court case can be used in floodplain management.</p>				

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12:05 PM	-	1:30 PM	<b>Lunch on Your Own</b>	
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1:30 PM	-	1:50 PM	<b>Welcome and Opening Comments Annual Update from the AMFM Board</b>	<b>AMFM Board Members</b>
<p>Welcome and opening comments from current AMFM Board Members. The board will also provide an annual update regarding ASFPM Sponsorship, DNRC ASFPM Sponsorship, FPA Scholarship, Brightways RISE Challenge, AMFM Bylaws update and voting information, and voting information for the 2026 AMFM Board Members.</p>				

1:50 PM	2:50 PM	<b>Keynote Speaker: The Road Less Traveled: Taking the No Adverse Impact Highway to Resilience</b>	<b>Chad M. Berginnis, CFM ASFPM Executive Chair</b>
<p>Flood losses in the nation are rapidly getting worse. Just doing the NFIP minimums is not enough and even what we thought of as higher standards may need to be even strengthened more. What does it take to achieve true community flood resilience? Through the lens of ASFPM's No Adverse Impact (NAI) initiative, a tailored approach can be developed for any community. Learn about the approaches and tools it takes to get there including the policies and resources that the Association of State Floodplain Managers is developing and promoting.</p>			
2:50 PM - 3:05 PM		<b>Afternoon Break - Big Sky Atrium</b>	<b>Courtesy of Hydrometrics and Dewberry</b>
3:05 PM	3:30 PM	<b>DNRC's Floodplain Mapping Program Updates</b>	<b>Hannah Shultz Monica Conlin MT DNRC</b>
<p>This presentation will give an update on DNRC's active mapping projects, with information on how communities can best manage their existing program while a mapping update is in-progress.</p>			
3:30 PM	4:00 PM	<b>Requiem for a Drain: Inventorying and Rehabilitating Montana's Highway Culverts</b>	<b>Jennifer Johnson, PE, CFM George Metzger, PE Layne Davies, PE Montana Department of Transportation</b>
<p>The Montana Department of Transportation has tens of thousands of culverts across the state highway system. Currently, MDT is embarking on an effort to inventory and inspect the condition of these culverts and create a cohesive, compiled database to assist the Department in managing culvert assets and planning for the future.</p>			
4:00 PM	4:45 PM	<b>Floodplain Permitting: A Jeopardy! Game (The Sequel)</b>	<b>Peri Turk, PE Ryan Murphy, PE MT DNRC</b>
<p>WE'RE BACK!!! This presentation will provide information related to floodplain permitting and how to effectively get through the process. With the influx of new floodplain administrators, we wanted to provide some insight into the floodplain permitting process such as resources available, what to expect, and roles and responsibilities. The presentation will be structured as a Jeopardy game with three contestants (floodplain administrators and/or engineers). The topics that will be included are what's new in 2025, what's in your ordinance, application for Best Available Information, enforcement, and lastly the age-old practical application. The goal for this presentation is for the audience to go home with a bit more knowledge about things to look for in a permit, what to expect, and what resources are available to them. And also make it fun!</p>			
4:45 PM	5:00 PM	<b>DNRC Awards</b>	<b>Shylea Wingard, CFM, MS MT DNRC Floodplain Planner</b>
6:00 PM - 9:00 PM		<b>Evening Social - Big Sky Atrium</b>	<b>Courtesy of KLJ</b>

**Thursday, February 27 Concurrent Sessions A (General) – Garden City Parlor AB**

8:15 AM - 9:00 AM **Floodplain Administrators Interactive Panel Discussion**

**Rob Livesay - Ravalli County  
Sean O'Callaghan - Gallatin County  
Matt Heimel - Missoula County  
Larry Schock - DNRC**

This session represents an opportunity to engage in a lively and interactive discussion with local floodplain administrators from several jurisdictions and a DNRC regional engineer about current issues with floodplain management. Floodplain administrator panelists represent communities that have or are facing a variety of different floodplain management issues, and all have different experience levels, perspectives on floodplain management, and ways of addressing the challenges they face in their jobs. Larry Schock helps support floodplain management as a regional engineer for DNRC by providing technical engineering assistance to Montana communities and local floodplain administrators. Attendees are encouraged to bring questions and topics related to floodplain management for the panel to discuss.

9:00 AM - 9:45 AM **2024 Upper Yellowstone Channel Migration Map**

**Jeannette Blank  
Montana Freshwater Partners**

This presentation will provide an overview of the recently completed 2024 Upper Yellowstone Channel Migration Zone (CMZ) Map and report. The Upper Yellowstone CMZ map is one of about 20 other CMZ maps that have been completed in Montana and is a critical, yet often overlooked resource for decision-makers, landowners, and water resource professionals. It highlights the historic and active channel migration areas as well as the ecological significance of channel migration and the risks associated with developing infrastructure within the active CMZ.

Unlike regulatory floodplain maps, which show areas of potential flood inundation, CMZ maps are a non-regulatory planning tool. They illustrate areas of historic and future lateral river movement caused by natural processes such as erosion and channel avulsion. While these processes are essential for maintaining healthy fisheries and resilient river systems, they also present significant risks to public and private infrastructure located within the migration zone.

This presentation will introduce the key concepts of channel migration zones, mapping methodologies, and tools for identifying areas of risk and vulnerability. Attendees will also receive a tutorial on accessing and navigating the online CMZ maps and data resources.

By understanding these dynamics and utilizing CMZ maps, floodplain managers and other users can make informed decisions to protect infrastructure, reduce vulnerabilities, and safeguard the ecological integrity of Montana's rivers, like the Yellowstone. This presentation underscores the importance of giving rivers space to move, highlighting the balance between informed development and natural processes for long-term environmental and community resilience.

9:45 AM - 10:15 AM **Bank Stabilization Projects Post-Flood**

**Courtney Long, CFM  
Great West Engineering, Inc.**

During a flooding event, many floodplain permitting steps are temporarily omitted as part of the Emergency Notification process in order to protect structures and critical infrastructure. However, during the recovery phase of a flood event, it is imperative to take a moment and discuss all the potential bank stabilization methods with local governments and private property owners. Clearly discussing this process with the permitting agencies ahead of submitting an application may help save time, money, and build resiliency into the community's floodplain. The presentation will cover personal experiences, reflections, and lessons learned from a Floodplain Administrator following a major flooding event in 2022.

10:15 AM - 10:30 AM **Morning Break - Big Sky Atrium**

**Courtesy of Allied and Michael Baker**

10:30 AM - 11:10 AM **Overview of FEMA's Modeling and Mapping of Levee Systems**

**Roger Denick, PE, CFM, PMP  
STARR II / Region 8 Service Center**

During a FEMA Risk MAP project and map update, FEMA updates the flood risk on their Flood Insurance Rate Maps (FIRMs) based on existing risks and community engagement. These updates include levees and other flood control structures that impact the floodplain. Identification and mapping of these risks have evolved over the past several years and FEMA has incorporated additional options and guidance as well as an aligned vision with the US Army Corps of Engineers (USACE) on risks associated with levees. This presentation will provide updates on the latest FEMA levee guidance in relation to identification of levees, accreditation requirements, options for non-accredited levees, and ongoing coordination with USACE.

11:10 AM - 11:30 AM **Belt, Montana Levee and Floodplain Evaluation**

**Bradley R. Hoefler, CFM  
U.S. Army Corps of Engineers - Omaha**

The Town of Belt, Montana is a small rural community located in a canyon and bisected by Belt Creek that is confined by two unmaintained levees. A recent technical assistance project for the community provided ground survey information, updated hydrologic and hydraulic modeling, levee performance and breach routing, and impacted structure inventory. Additionally, the project funded in-person consultations and an extensive report detailing Belt's flood risk and mitigation measures to support formulation of future flood risk reduction action. The results showed that the levee provided less protection than the community was anticipating. Most notably, before the project the right bank was identified as the area of most concern. Results demonstrated that inundation on the left bank, the location for most of Belt's critical infrastructure (schools, medical facilities, fire department, etc.), would occur more frequently between a 2% and 5% annual exceedance probability (AEP) due to low spots of the levee crest. This information is currently being used to communicate flood risk and encourage continued participation in the National Flood Insurance Program. The work was completed by the Montana Silver Jackets team, which includes U.S. Army Corps of Engineers-Omaha District, the Federal Emergency Management Agency-Region 8, and the Montana Department of Natural Resources. The project did not require any local funds to complete as all services are provided at 100% cost by the supporting agencies. This presentation will provide the project background and results, technical considerations, and an overview of project outcomes.

11:30 AM - 12:00 PM **Montana Silver Jackets – Many Partners, One Team. Statewide Collaboration to Reduce Flood Risk Throughout Montana** **Laurel J. Hamilton, P.E.**  
**U.S. Army Corps of Engineers - Omaha**

Montana Silver Jackets – Many Partners, One Team. Statewide Collaboration to Reduce Flood Risk Throughout Montana. Discover what the Montana Silver Jacket team is all about and how it has reshaped flood risk management throughout the state. Silver Jackets teams are interagency teams that bring together federal, state, and other dedicated organizations to promote a united force to reduce flood-inducing disaster risks. The Montana Silver Jackets team is a robust and effective team seeking to leverage multiple programs and perspectives to provide cohesive, and practical solutions that help identify and mitigate flood-related disaster risks throughout our state. Goals of the team include establishing a continuous interagency collaboration mechanism, identify funding sources, develop and deliver a unified flood risk message, review implementation of the State’s hazard mitigation plan, and support disaster response mitigation efforts. This presentation will highlight the history and members of the Montana Silver Jackets team, our recent efforts and projects, and ways to join or support future flood risk reduction work across the state of Montana.

12:00 PM - 1:00 PM **General AMFM Membership Luncheon - Garden City Ballroom** **Courtesy of DOWL, Great West Engineering, Morrison Maierle, and HDR**  
*(Lunch on your own for non-members)*  
**Brightways RISE Challenge Lunch Presentation**

1:30 PM - 2:00 PM **Should a LOMA Always be Trusted? Taking a Deeper Dive into a Migrating River** **Rob Livesay**  
**Ravalli County Planning**  
**Matt Johnson, PE, CFM**  
**RESPEC**

Ravalli County Planning was approached by a landowner with an interest in developing their property along the West Fork Bitterroot River. During a preliminary site visit, a preliminary development plan was shared. The significance of the development justified a deeper look into the geomorphic setting and of the background floodplain study used to secure a Letter of Map Amendment. Due to the unstable river setting and age of the existing flood study, the county opted to require a robust approach to the permitting process and recommended the owner hire an engineer to assist. The county required a channel migration study, in addition to development of a new flood study to ensure risk was sufficiently captured and conveyed, as well as serve as the basis for floodplain permitting any developments on the property. Rob will provide an overview of his perspective, regulations he leaned on, and offer recommendations to other managers while Matt will briefly overview the channel migration study, the floodplain modeling, and design and permitting process of the bridges and utility crossings required to support the development.

2:00 PM - 2:30 PM **Emergency Floodplain Permitting for the City of Malta Sewage Lift Station** **Lorie Bond**  
**City of Malta**  
**Jonathan Weaver, PE, CFM**  
**Great West Engineering**

In 2021, Great West evaluated the City of Malta’s Trafton Park sewage lift station, which collects all of the wastewater for the City. The lift station is located immediately adjacent to the Milk River and within the regulatory Floodway. In 2022, the lift station failed, submerging the dry well with sewage and toxic gases, and forcing the City to use an expensive temporary bypass pumping system. The City acted quickly and worked with Great West to design and install a new replacement lift station. Working closely with the Montana DNRC, the City used an emergency Floodplain authorization, following up with a complete permit after construction. Great West also assisted with the post-permitting, which involved recreating the old HEC-2 model and completing a No-Rise analysis.

2:30 PM - 2:50 PM **DRAFT Map Adoption for Regulatory Purposes & FEMA Policy #104-008-2** **Mike Day, PE**  
**WGM Group, Inc.**  
**Mickey Navidomskis, PE**  
**DNRC Floodplain Engineer**

In Montana we have +10 Floodplain Mapping Projects currently underway. At a certain point in the project timeline, the DRAFT Maps may be adopted for local regulatory purposes, however, the DRAFT map information is not absolute nor effective until the new FIRMs are finalized by FEMA.

2:50 PM - 3:05 PM **Afternoon Break - Big Sky Atrium** **Courtesy of WGM**

3:05 PM - 3:50 PM **Funding Partnerships for Flood Mitigation** **Kelly Smith**  
**City of Three Forks**  
**Including agency staff from DNRC, Great West Engineering, and Headwaters Economics**

Successful flood mitigation requires more than identifying hazards—it takes partnerships that align technical expertise, local knowledge, and funding opportunities. This session will highlight how the City of Three Forks, Montana—a rural community of nearly 2,000 people—leveraged diverse partnerships to assess their flood risk, identify a mitigation solution, and secure funding for flood resilience. Located at the headwaters of the Missouri River, Three Forks faces severe flood risk. Recent updates to their floodplain maps revealed that 80% of the city’s structures lie within the regulatory floodplain, with 154 acres—including its most socially vulnerable neighborhood—designated as floodway. Given the severity of the flood risk, the community faced both life-safety threats and future economic uncertainty. To tackle the problem, in 2020 the City of Three Forks formed a project team with Montana state agencies, Headwaters Economics, and Great West Engineering. Together, the partners identified a cost-effective, nature-based solution: a \$5.5 million conveyance channel that will capture overland flooding from the Jefferson River, reducing the flood risk for nearly the entire community. The project team secured funding through a FEMA Flood Mitigation Assistance grant, with Montana’s new Resiliency Fund providing the required non-federal match. To ensure long-term sustainability, the City also established a Special Improvement District (SID) to fund operations and maintenance. This panel will explore each partner’s roles in the project’s various stages with a focus on the challenges and solutions. It will highlight the state’s mitigation technical assistance support, trade-offs between funding sources and creating finance, and how partnerships can help build capacity at the local level. Attendees will leave with practical strategies for forming cross-sector partnerships and implementing flood mitigation projects that also support economic development and overall community resilience.

3:50 PM - 4:15 PM **Utah Post Wildfire Team building**

**Tracie J Harrison, CFM**  
**Utah NFIP Coordinator**

How to Build Your State (and possibly local) Post Wildfire Mitigation Team- Utah Lessons Learned. This is a look at how Utah's Floodplain Manager, State Hazard Mitigation Officer, and Forestry Fire and Start Lands pulled together State and Federal Partnerships to initiate a successful "State Post Wildfire Mitigation Team". Utah has created a "One Stop Shop" for community mitigation options post wildfire.

4:15 PM - 4:35 PM **Caras Park – Working/Permitting in the Clark Fork River Floodplain**

**Taylor Winkel, PE**  
**RESPEC**

This presentation will focus on exploring the efforts and permitting process that went into the Caras Park project. The project is in downtown Missoula, on the Clark Fork River, above Brennans Wave. The intent of the project was to replace the existing overlook structure and associated grouted boulders, to provide access to the water's edge for people with mobility impairments. The design incorporated hard bank treatments and concrete features to satisfy the 408 permit, while including vegetation to satisfy the 124 and 404 permit. These design elements were combined with ADA compliance to get all users down to the ordinary high-water mark while also meeting the no-rise requirements of work in a floodway. The project is currently under construction and will be finished in early spring of 2025. This project is also part of a larger study on the Clark Fork River that has been ongoing for the past several years. The study has looked at areas where recreational users cause erosion when accessing the river. Several other projects are in design and permitting phase to create formalized river access at designated points, while restoring the areas of historical access points. The presentation will do a high-level review of these smaller formalized access sites as well as some of the restoration efforts that are in place, and that will be put in place in the future. The presentation will look at the various access projects and restoration and how they work in conjunction to improve user access while also ensuring a healthy river system through a heavily populated river corridor.

4:35 PM - 5:50 PM **Caras Park Construction Tour**

**Morgan Valliant**  
**City of Missoula**  
**Taylor Winkel, PE**  
**RESPEC**

Following the presentation on the Caras Park project, we will walk from the Holiday Inn to the Caras Park project site for a tour. The site is approximately 400 yards from the hotel on paved trail. The construction site will not be active so PPE is not required and the pathway is currently covered in compacted dirt. We will discuss the various bank treatments and design details on the levee and how the various treatment types were designed based on inputs from different permitting agencies. We will discuss how early involvement with the permitting agencies helped shape the project and create a smooth permitting process.

6:00 PM - 9:00 PM **Evening Social - Big Sky Atrium**

**Courtesy of Pioneer Technical, RESPEC, and WET**

**Thursday, February 27 Concurrent Sessions B (Technical) – Garden City Parlor CD**

9:00 AM - 9:30 AM **Addressing Hydrologic Data Deficiencies Using Stochastic Storm Transposition** **Matthew Deshotel, PE Dewberry**

Over the past several years, FEMA has begun the process of evaluating methodologies to incorporate uncertainty into flood hazards. One of these methods, Stochastic Storm Transposition (SST), uses gridded (hourly) historical precipitation data in a Monte Carlo framework to perform thousands of permutations of existing events, by moving storms and altering initial conditions. This talk will present a case study for using the SST approach in the Upper Green watershed in Southwest Wyoming and will be implemented in Montana in the future. This high desert region was a prime location to evaluate the suitability of SST, as there is no published Atlas 14 data available. Working with USACE and FEMA, Dewberry meteorologist defined a region that is climatologically homogeneous within the study area from which to identify storm events. A catalog of historic storms was then developed using the Analysis of Record for Calibration (AORC) dataset, developed by the National Weather Service. This presentation will provide an overview of the SST process as applied in the case study, highlighting the cloud-based stochastic-framework developed, providing reusable workflow for developing hydrologic, frequency-based inputs for use with 2D HEC-RAS models to support a FEMA BLE study. Highlights will include approaches to account for topographic differences between in-place and transposed storms, a normalization process using the PRISM 30-year average precipitation dataset and provide description of how we offset (transposed) storms in the x-y direction by sampling a uniform distribution, and then de-normalized using the PRISM precipitation at the transposed location. Other considerations including sampling baseflow, snowpack, and hydrologic simulation setup and parametrization will be discussed. Result from a suite of thousands of possible runoff scenarios which were then statistically analyzed to identify hydrographs with peak frequency discharges suitable for forcing the 2D HEC-RAS models will be used throughout.

9:30 AM - 10:15 AM **NOAA Atlas 15: A Precipitation Frequency Tool to Help Build Climate Resilience** **Doug Kluck NOAA**

As a result of a changing climate, the world will experience the extremes of precipitation: more intense rainfall and increasingly frequent flooding, as well as longer droughts that stress communities and ecosystems. It is crucial that decision-makers are equipped with the precipitation information they need to make the country's water resources more resilient to climate change. Through the Bipartisan Infrastructure Law, NOAA received its first ever direct Federal funding to update its Atlas 14 precipitation frequency standard to account for future climate trends, and create precipitation frequency estimates for the entire United States and its territories. This new product, Atlas 15, uses Montana as a test case to share data with the public and collect feedback prior to full launch.

NOAA's National Centers for Environmental Information's (NCEI) Regional Climate Services program is launching an initiative to engage with partners to improve NOAA's capacity to deliver climate-informed extreme precipitation products that end-users want and need. The effort will focus on two "super-users" of extreme precipitation data, the water resources and transportation sectors, to incorporate user input into the product development lifecycle. NCEI is also prioritizing engagement with underserved communities—including Tribal Nations, Indigenous communities and rural areas—throughout this effort, to equip communities most vulnerable to the impacts of climate change with the information necessary to become more resilient to increasing weather and climate challenges.

This talk, building on the pre-conference workshop, will discuss the update to NOAA's precipitation frequency estimate, Atlas 15, and the myriad ways in which water resource professionals can utilize the product to improve and make climate-smart decisions around flood risk assessment, infrastructure design, emergency preparedness, and environmental conservation. It will discuss the significant changes to Atlas 15 compared to Atlas 14, demonstrate the new web interface, and discuss how this new dataset will address needs shared by end-users.

10:15 AM - 10:30 AM **Morning Break - Big Sky Atrium** **Courtesy of Allied and Michael Baker**

10:30 AM - 11:00 AM **Flood History of Northwest Montana and U.S. Geological Survey Flood Frequency Updates** **Seth Siefken, PE USGS**

The far northwest corner of Montana is drained by the Kootenai River, a large river that originates in Canada and flows into the Columbia River. Several extraordinary floods have occurred in the Kootenai River basin in Montana. Some of these were regional floods resulting from exceptional snowmelt that affected northwest Montana and large portions of the Columbia River basin. Among these, the 1894 and 1948 floods caused damage all the way downstream to the mouth of the Columbia River. However, one of the most damaging floods for the Montana portion of the Kootenai River basin was the relatively isolated January 1974 flood. The unusual mid-winter timing of the 1974 flood was the result of a multi-day rainstorm and caused severe damage in and around Libby, Montana. This flood resulted in hundreds of damaged homes and the evacuation of more than 1,000 people. This presentation will examine the causes and magnitudes of these floods and discuss a forthcoming USGS study of flood frequency for streamgages in northwest Montana.

11:00 AM - 11:20 AM **USGS Indirect Flood Measurements in Montana** **Dan Armstrong USGS**

The U.S. Geological Survey (USGS) conducts surveys of high-water marks and stream cross sections after floods to estimate flood magnitudes (peak flows). Peak flows are used to understand flood processes across the country and in peak-flow frequency analyses that inform floodplain mapping, design infrastructure, and emergency planning and responses. Peak-flow frequency analyses are improved by incorporating more years of data, and updating and maintaining flood databases can add pertinent information to the analyses. The USGS conducts flood surveys after the actual occurrence of large flood events, known as indirect measurements, with some surveys dating back to the early 1900s in Montana. Records of these indirect measurements include the original hard copies of notes, newspaper articles, field survey sketches and photographs associated with the indirect surveys, and measurement calculations by the USGS Wyoming-Montana Water Science Center. These indirect measurements records are being cataloged, digitized, and added into publicly available repositories through a cooperative agreement with the National Geological and Geophysical Data Preservation Program. The project goals are to create a digital repository for historic flood records and to update the USGS peak-flow records. The scanning and organization of the indirect measurements will help flood-related resource managers in Montana and in states downstream of Montana. This project will also aid in future indirect measurement surveys by centralizing all indirect data into a single digital repository, making accessing and referencing past survey data possible for resource managers, researchers, and the public. This presentation will outline this project and include updates to the 2023 and 2024 indirect measurements in Montana.

11:20 AM - 11:40 AM **Paleofloods – What they are and what we can learn from them**

**Haylie Brown**  
USGS

Records of extreme flood events measured by humans in Montana are limited as extreme floods occur infrequently, the operation of streamgages only began in the late 1800s, and streamgages in Montana have a median period of record of only 25 years. Meanwhile, extreme flood information is critical for decisions about building infrastructure (dams and roadways), land use planning, and floodplain management. Paleofloods, defined as floods before humans began recording floods, can leave behind evidence of the stage of floods that may have occurred up to thousands of years ago. Geologic and botanical evidence of paleofloods includes observations of slack-water deposits, high-water marks, and tree rings. When available, paleoflood evidence can be used to establish a flood-stage elevation which can be used to determine an estimated flood discharge. Generally, the paleoflood evidence still preserved today is that of large, infrequent floods. Conversely, a lack of paleoflood evidence may indicate that no floods of a given magnitude have occurred above a specific elevation that can be aged. Therefore, this lack of paleoflood evidence can be used to determine a period of time where a threshold of an estimated discharge has not been exceeded. Once the magnitude of a paleoflood is calculated, it can be used to inform a peak-flow frequency analysis to evaluate flood risk. Paleoflood information extends the length of the peak-flow record at a site and thus reduces the uncertainty of a peak-flow frequency analysis. Estimates of large and infrequent flood events improved by including paleoflood data can help better inform decision-makers. This presentation will highlight examples of past paleoflood studies and ideas for potential paleoflood studies on streams in Montana.

11:40 AM - 12:00 PM **A Tale of Two Hydrographs: Comparative Analysis Between HEC-RAS 2D Rain-on-Mesh and Traditional Rainfall-Runoff Modeling**

**Sarah Pfieffe**  
**Michael Baker**

Too conservative, not conservative enough, just the right amount of planning? In the world of hydrology and hydraulics we tend to defer to conservative estimates when developing models and reporting results. The Colorado Urban Hydrograph Procedure (CUHP) and Storm Water Management Model (SWMM) are staples of rainfall-runoff modeling in the master planning practice, however, 2D HEC-RAS rain-on-mesh (RoM) models are becoming more common as modelers and project managers gain familiarity with the software and approach. As 2D RoM models gain popularity the question of comparability between studies begins to arise. This study took an in-depth look at hydraulic results developed within a watershed located in the north of Denver and compared peak flow values from previous studies generated using traditional rainfall-runoff modeling to those generated using 2D RoM models. The need for a comparative analysis between the two modeling approaches outlined above became apparent when analyzing the results generated during the 2D RoM study to those generated from previous studies within the watershed. As modelers began to compare results a concerning trend began to appear, the peak flow values generated by the 2D RoM models were considerably lower than those reported by previous studies. Were the rainfall depths different? Were there errors in the models? Did we make incorrect assumptions regarding losses or roughness values? After thoroughly investigating the input parameters, everything checked out. So, what was going on? This presentation will outline the methodology used to investigate the differences between the two modeling approaches as well as comparing/contrasting the assumptions made within each modeling software that led to these differences. Additionally, it will provide an in-depth look at the progression of a hydrograph through each of the models to illustrate how the results diverge over the course of a simulation and the impact this has on reported peak flows.

12:00 PM - 1:00 PM **General AMFM Membership Luncheon - Garden City Ballroom**  
*(Lunch on your own for non-members)*  
**Brightways RISE Challenge Lunch Presentation**

**Courtesy of DOWL, Great West Engineering,  
Morrison Maierle, and HDR**

1:30 PM - 2:00 PM **Silver King Wildfire Flood and Debris Flow Study: Applying FEMA Region VIII Post-Fire Hydrology Guidance in a 2-D Rain-On-Mesh Model**

**Drew Burman, PE, CFM**  
**WSP**

The Silver King Fire began on July 5th and burned for over two weeks in the Fishlake National Forest in Central Utah, burning a total of 18,266 acres. WSP was hired to conduct a post-wildfire flood and debris flow analysis by the Utah Department of Emergency Management (UDEM). The Study Area contained the watersheds of Pine, Beaver, and Deer Creeks. The primary goal of this study was to provide post-fire flood and debris flow maps for each of the three watersheds, focusing on the Town of Marysville, where most of the critical infrastructure resides. WSP used a 2-dimensional rain on mesh modeling approach using area average rainfall depths from NOAA Atlas 14 to simulate different recurrence interval events. Infiltration was calculated using spatially varied, pre-fire infiltration rates, which were obtained utilizing a proprietary GIS tool that converts satellite imagery into landcover. The flow rates that this produced were checked against the USGS regression equations for the region, and the infiltration parameters were calibrated accordingly. Using maps provided from the Burned Area Emergency Response (BAER) Team, WSP increased the spatially varied infiltration data based on the burn severity to account for the wildfire induced changes in the soil characteristics. Utilizing the hydrology from the post-fire model, debris flow runout and volumes were estimated through the three primary reaches. WSP prescribed a range of sediment concentration, yield stress, and dynamic viscosity to demonstrate the potential hazard of various debris flow events. The team used the results to develop preliminary mitigation designs to protect important infrastructure. The information produced by WSP is currently being used by the Town of Marysville and local engineering consultants to develop mitigation designs.

2:00 PM - 2:30 PM **A Comparison of Complex Hydraulic Modeling along Crabtree Creek using HEC-RAS 1D/2D and SRH-2D**

**Emma Bones, PE**  
**Dewberry**

Ever have trouble selecting 1D versus 2D modeling? Or what type of software to use for that modeling? This presentation will compare results on a project in Raleigh, NC for a series of roadway and bridge improvements proposed in the vicinity of Crabtree Valley Mall that will impact Crabtree Creek and its tributaries. The project site includes multiple bridges, culverts, stream confluences, and Crabtree Mall, which is completely contained within the FEMA floodplain. Given the complex hydraulics of the project site, NCDOT elected to complete the preliminary modeling in a 2D modeling software to provide the most accurate results to support decision-making for future improvements. There are numerous sources that provide guidance on when to select a 1D or 2D model, but there is much less guidance to support proper selection of a 2D model, such as HEC-RAS 2D or SRH-2D, based on the particular hydraulic features to be modeled. Given this lack of information, NCDOT elected to create both a HEC-RAS 2D model and an SRH-2D model of the existing conditions and compare the results to support future decision making when selecting 2D models. This presentation will compare the setup and results of each of the 2D models as well as the 1D HEC-RAS model. Calibration of each model will also be reviewed for agreement with Tropical Storm Alberto. Finally, the presentation will provide suggestions on when each 2D model may be most applicable for these particular modeling needs.



2:30 PM - 2:50 PM **Advancing Floodplain Modeling and Mapping: Overcoming Challenges Using 2D HEC-RAS Models** Meredith Miller, EIT, CFM  
Dani Halloran  
AECOM

During AECOM's recent RiskMAP hydraulics studies in Montana and Colorado, the flat terrain and non-levee embankments (NLEs), such as berms and irrigation canals, have posed significant modeling challenges when using traditional 1D HEC-RAS modeling. Key difficulties include issues with cross-section containment, split flow layouts, uncertain flow paths, and shallow flooding. To address these challenges, AECOM has developed several HEC-RAS 2D models that inform the creation of 1D models or, where appropriate, fully replace 1D models with 2D solutions. During the model development for Williams Creek, a Zone A stream in Powder River County, Montana, our team identified a split flow created by a man-made NLE that diverted flow from the existing effective streamline. Given the scoped zone of the stream and the effort required to accurately model this reach with 1D methods, a preliminary 2D model was created to evaluate the stream's suitability for either 2D modeling or 2D-informed 1D modeling. After reviewing the results of the preliminary 2D model, it was determined that a 2D model would best represent the flooding in this area.

The use of 2D models, or 2D-informed 1D models, offers greater flexibility in floodplain modeling, enabling modelers to gain a deeper understanding of flood dynamics. This approach is particularly valuable for supporting recent 1D studies, like Letters of Map Revision (LOMRs), and in certain instances, for use in complex floodplain mapping. This method strikes a balance between the need for precision and practical considerations, providing a solution that can be more readily accepted by communities that may be hesitant to regulate floodplains based solely on 2D models.

2:50 PM - 3:05 PM **Afternoon Break - Big Sky Atrium** Courtesy of WGM

3:05 PM - 3:35 PM **HEC-RAS 2025: Advancing Floodplain Modeling**

Hudson White, EI  
DOWL

The upcoming release of HEC-RAS 2025 provides new capabilities in 2D to more effectively develop, model, and review. This presentation will focus on the tools and advancements, focusing on their benefits for model development. We will showcase the application of HEC-RAS 2025 mesh in our current Upper Yellowstone Project.

3:35 PM - 4:05 PM **The Great (West) Yellowstone Adventure – Data Collection in the Upper Yellowstone Basin**

Justin Evertz, PE  
Ben Windauer, EI  
Great West Engineering

In 2023 and 2024, Great West conducted field data collection in Park and Stillwater Counties to support floodplain mapping updates following the 2022 flooding in the Upper Yellowstone Basin. In total, over 500 hydraulic structures and 2,000 bathymetric cross sections were collected during the project. The project required navigating diverse topography, varying site conditions, employing various data collection methods, and addressing coordination challenges. This presentation will share insights, tips, and lessons learned throughout the process. Key topics will include overcoming access challenges, coordinating with landowners, managing data and personnel, and implementing effective collection techniques.

4:05 PM - 4:25 PM **Sevenmile Creek Restoration – Reconnecting Floodplain to an Incised Stream and Revising Flood Maps**

Ronda Burns, PE, CFM  
Confluence Consulting, Inc.

This presentation will include a case study of a stream restoration project completed with the goal of restoring floodplain connectivity to an incised stream within a FEMA mapped flood hazard area and the required permitting. The project was completed on Sevenmile Creek near Helena, in Lewis and Clark County. This project involved relocating approximately 2,800 feet of channel within a Zone A flood hazard area. A CLOMR was prepared for the proposed project and the LOMR included expanding the mapped Zone A flood hazard area farther upstream. A unique solution to tying in to the existing conditions at the downstream end of the project reach will also be presented.

6:00 PM - 9:00 PM **Evening Social - Big Sky Atrium** Courtesy of Pioneer Technical, RESPEC, and WET

## Friday, February 28 Conference Sessions – Garden City Ballroom

8:30 AM	-	9:30 AM	<b>From Risk to Action: How BLE data leads to Floodplain Management, Mitigation Projects, and Funding</b>	<b>Jerri Daniels, CFM Dewberry</b>
<p>What is BLE data, what datasets will be delivered, and how can you use them to fund a mitigation project using AOMI? What is AOMI? This presentation will address how BLE data are created along with its many flood risk products and practical examples of how to use BLE for floodplain management. Often a point of confusion is when to use BLE for best available data versus your FIRM. Finally, this presentation will include what is considered Areas of Mitigation Interest and how you can leverage that data to get technical assistance and ultimately resilience grants. Examples will include projects in Montana and Montana resources.</p>				
9:30 AM	-	10:00 AM	<b>Resilient Montana: FEMA's Hazard Mitigation Assistance Funding Overview</b>	<b>Sara Hartley CFM MT DES Andrew Long MT DES</b>
<p>Montana Disaster &amp; Emergency Services' presentation will introduce the multiple funding programs that are under FEMA's Hazard Mitigation Assistance Program. They will discuss the similarities and differences, as well as eligible sub-applicants and project types for the programs. They will feature completed projects showcasing the intersection of Emergency Management and Floodplain Management. MT DES will also highlight the 1st year successes of the State Resiliency Fund.</p>				
10:00 AM	-	10:30 AM	<b>Dam Safety and Downstream Development</b>	<b>Karl Kingery PE, CFM Hydrometrics, Inc.</b>
<p>In many counties in Montana in recent years there has been an influx of new residents, and subsequently, additional building the low areas of the state. This construction includes construction inside and outside of mapped floodplains and low areas. In many areas where there is not a mapped floodplain, or adjacent to a mapped floodplain, there is some upstream surface water regulation such as a dam or a reservoir. In Montana, dams are classified as "High-hazard" or "not High Hazard". A high hazard dam means "a dam or reservoir with an impounding capacity of 50 acre-feet or more at the maximum normal operating pool, the failure of which would be likely to cause loss of life." For dams built after the Montana Dam Safety Act, they are assessed for this classification at time of construction, or during major modification. Further, the size of the spillway required for a dam is based on the risk to downstream persons that the dam causes. This presentation discusses the timing of these assessments, presents several case studies of dams where the hazard classification has changed as a result of development, and discusses the impact to existing dam owners when downstream development occurs.</p>				
10:30 AM	-	10:45 AM	<b>Morning Break - Big Sky Atrium</b>	<b>Courtesy of Forerunner</b>
10:45 AM	-	11:05 AM	<b>Flooding Tools for More Effective Decision-Making</b>	<b>Eli Goldstein Forerunner</b>
<p>Effectively managing data and documentation is critical for successful floodplain management, leading to better compliance and a safer community. However, prioritizing this can be challenging due to the complexity of flood risk information, shifts in insurance, and residents seeking more detailed property information. It can be difficult to manage nuanced data and even harder to keep track of it for internal recordkeeping and the CRS. Using a case study of Forerunner's work with Las Cruces, New Mexico, this session will outline how the community uses technology to streamline floodplain management. We'll discuss how tools can help communities pull together disparate datasets and mobilize information for a variety of use cases. We'll explore how digital workflows can ensure faster response time to resident requests, better compliance enforcement, and stronger data continuity. The session will also include suggestions on how other communities can leverage data to strengthen their programs.</p>				
11:05 AM	-	11:30 AM	<b>How to Communicate Like a Hostage Negotiator</b>	<b>Shylea Wingard, CFM, MS MT DNRC, Floodplain Planner</b>
<p>Whether you are a project manager, consultant, community official or floodplain manager there will come a time you are in a high stakes meeting or situation where effective communication and negotiation skills matter. So, who could be better to teach essential communication skills than a hostage negotiator? Shylea will share 9 counterintuitive tactics and strategies from a former FBI agent that you can use to help you improve your emotional intelligence and be more persuasive and intuitive to gain a competitive edge in your next meeting or community discussion.</p>				
11:30 AM	-	12:00 PM	<b>Beavers as Floodplain Engineers and Stewards</b>	<b>Elissa Chott National Wildlife Federation</b>
<p>Beaver-created wetlands provide many benefits, including reconnecting floodplains, storing water, retaining sediment, and attenuating floods. Beaver activity is critical for wildlife habitat and helps build resilient, healthy ecosystems. Infrastructure in and near floodplains, however, may be negatively impacted by damming and tree-felling. The National Wildlife Federation's Beaver Conflict Resolution Program increases tolerance for beavers on the landscape by assisting landowners with long-term solutions for common beaver conflicts such as culvert plugging, free standing dam flooding, and tree cutting. Considerations for installing projects include long-term efficacy of the devices in each system, stream fluctuations and impacts to the floodplains, nearby infrastructure, and overall habitat benefits a beaver wetland complex would bring to a given site. This approach enables the program to meet landowners' needs, protect human infrastructure, and enhance habitat for wildlife by keeping beavers in place (where they are appropriate). The program is a collaborative effort involving many regional NGO partners, state and federal agencies, conservation districts, municipalities, and private landowners. Education and outreach are key components to the program, and NWF strives to engage as many partners as possible with hands-on experience through training events and workshops.</p>				

**Adjourn**