

# Association of Montana Floodplain Managers 20<sup>th</sup> Annual Conference

YOGO INN, LEWISTOWN, MT, MARCH 11<sup>TH</sup> – 14<sup>TH</sup>, 2019

## **“THE CONFERENCE AT THE CENTER OF BIG SKY COUNTRY”**

### **AGENDA**

#### **Monday, March 11**

#### **Pre-Conference Sessions**

12:00 pm – 1:00 pm      **AMFM Board Meeting**

1:00 pm – 5:00 pm      **Registration - Lobby**

1:00 pm – 5:00 pm      **Community Rating System (CRS) Workshop  
Moccasin Room**

**Constance Lake, CFM**  
CRS Specialist  
Insurance Services Office  
**Todd Kliez, RS, CFM**  
Missoula Co.  
Floodplain Administrator (FPA)

This four-hour training will focus on CRS activities 310, 360, 370, 502, 510, 520, 610, and 630. This year’s training will also include the ‘Coordinator’s Corner’ on some activities to learn about efficiencies in a CRS program from the community perspective.

3:00 pm–3:15 pm      **Afternoon Break**

*Courtesy of DNRC*

1:00 pm – 5:00 pm      **Certified Floodplain Manager (CFM®)  
Study Session\* - Snowy/Judith Room**  
(\*Review only and not intended to teach the exam.)

**Forrest Sanderson, AICP, CFM**  
KLJ  
**Adam Carlson, CFM**  
Musselshell Co. Commissioner

6:00 pm – 9:00 pm      **CFM® Exam - Snowy/Judith Room**

**Forrest Sanderson, AICP, CFM**  
KLJ  
**Adam Carlson, CFM**  
Musselshell Co. Commissioner

#### **Tuesday, March 12**

#### **Pre-Conference Session**

8:00 am – 5:00 pm      **Registration - Lobby**

9:00 am – 11:30 am      **Floodplain Program Overview and Permitting Session – Sapphire Room**

This session is tailored for those new to floodplain management and others interested in an overview of the basics of the National Flood Insurance Program (NFIP) and local floodplain programs.

**Tuesday, March 12      General Conference Sessions Begins – Sapphire Room**

1:00 pm –1:05 pm	<b>Welcome and Opening Comments</b>	<b>Pam Vosen</b> , AMFM Chair Fergus Co. FPA
1:05 pm -1:10 pm	<b>Message from Senator John Tester</b>	<b>Caitlin Avery</b> Congressional Staff
1:10 pm -1:20 pm	<b>Message from Senator Steve Daines</b>	<b>Steven Foster</b> Field Representative
1:20 pm - 1:30 pm	<b>Message from Congressman Greg Gianforte</b>	<b>Tory Scribner</b> Caseworker/Field Representative
1:30 pm - 2:00 pm	<b>Benefits to a Community Rating System (CRS) Program</b>	<b>Constance Lake</b> , CFM Insurance Services Office Inc.

Join us for the overview of CRS! If you're considering a CRS program for your community or would like to be reenergized on your existing program, come hear what CRS is about and the possible benefit to your community. This presentation will also give you an idea of the credit you could receive for what you're already doing. Look forward to meeting you!

2:00 pm -2:30 pm	<b>DNRC Technical Assistance and Outreach Programs</b>	<b>Larry Schock</b> , CFM MT DNRC <b>Worby McNamee</b> , CFM MT DNRC
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The DNRC provides technical assistance and outreach training opportunities for all of the NFIP Communities in Montana. This presentation will provide an update of these programs, outline the intent and extent of the program, while explaining the services that are available to the NFIP Communities.

2:30 pm – 3:00 pm	<b>Montana Silver Jackets Program</b>	<b>Rachel Shrader</b> , CFM USACE
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This presentation will give an update on the Montana Silver Jackets Program and current projects. An example demonstration of USACE's LifeSim program on the Ekalaka Flood Risk Identification Silver Jackets project.

<b>3:00 pm–3:15 pm</b>	<b>Afternoon Break</b>	<i>Courtesy of KLJ</i>
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3:15 pm – 4:00 pm	<b>Roles and Responsibilities of the FPA Before, During, and After a Disaster</b>	<b>Marijo Brady</b> , PE, CFM FEMA Region VIII Mitigation Division <b>Joan Huston</b> , Hazard Mitigation Assistance Specialist
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4:00 pm – 4:30 pm      **Dams and Their Inherent False Sense  
of Flood Security**      **Ben Fennelly, PE, CFM  
HDR**

Due to recent spillway events in California, awareness has risen on the role that dams play and don't play in terms of flooding. When questioned, most citizens believe that neighboring dams provide flood mitigation while in fact, most dams in Montana are considered pass through, meaning that they don't provide appreciable flood storage or mitigation. The present discussion aims to increase the awareness of the roles dams play in conveying flood discharges and how their spillway releases may produce an unknown flood risk to downstream communities that is not provided in published Flood Insurance Rate Maps.

4:30 pm - 5:00 pm      **DNRC Awards**      **Traci Sears, CFM  
MT DNRC**

6:00 pm – 9:00 pm      **Evening Social – Centermark**      ***Courtesy of DOWL &  
Pioneer Technical***

**Wednesday, March 13**      **Conference Sessions – Sapphire Room**

8:00 am – 5:00 pm      **Registration - Lobby**

9:00 am – 9:30 am      **Flood Claims Scenarios:  
What's Covered, What's Not**      **Connie Flora, ANFI  
Director of Training  
National Flood Services**

Our presentation will focus on flood claim scenarios: what's covered, not covered depending on the foundation type, Pre or Post FIRM designation and flood zone.

Examples of Scenarios Presented

1. Basements
2. PreFIRM Elevated
3. PostFIRM Elevated
4. Mobile Homes
5. Replacement Cost Value (RCV) vs Actual Cash Value (ACV) Payments

9:30 am – 10:00 am      **Fort McMurray Flood Hazard Mapping  
Ice Jam Modelling and the 1875 Disaster**      **Abdullah Mamun, MASC, PE  
Rivers Hydraulic Engineer  
Alberta Environment and Parks**

The community of Fort McMurray is located in northern Alberta, at the confluence of the Athabasca and Clearwater Rivers. This area commonly experiences ice jam flooding in the spring. To assess and identify flood hazards in the Fort McMurray area, a flood study was commissioned under the provincial Flood Hazard Identification Program. The intent of this study was to identify the unique flood hazards faced by this community.

Flood hazard identification study information informs decisions related to public safety and future flood mitigation strategies. This presentation will focus on one of the key components of the study – ice jam modelling. This area has a history of severe ice jam flooding. Historical documents retrieved from the old Hudson Bay Company fur trading post describe a severe ice jam flood in 1875. The description of this event as presented in old historical documents make it the largest ice jam event at this location. Due to the considerable influence this event has on the flood frequency analysis, an anecdotal and analytical review of this event was undertaken as part of the study to better understand the context and plausibility of this flood. Compared to open water floods, the determination of a unique reach-based water level profile that reflects a given probability of occurrence of an ice jam event is quite complex. In this study, an analytical framework was developed to create a systematic, probabilistic definition of the ice jam flood hazard that reflects the historical records. Key components of this assessment included detailed historical ice jam review, ice jam flood frequency analysis, and development of a hydraulic model capable of simulating various return period events.

10:00 am – 10:30 am      **Floodplain Projects:  
Observations, Consideration, and Conclusions**      **Brian Wilkinson, PE, CFM**  
Ravalli Co. FPA & Planner

A discussion of observations that I have had over the years regarding floodplain projects, concentrating on bank stabilization and erosion control projects. The presentation will discuss data from design of projects and physical observations regarding: Geometry of project and flow; Materials; Installation methods; Ground disturbance/compaction; Materials used; Material the project is installed in; Success or failure of projects; Suspected failure mechanism; Lessons learned.

**10:30 am - 10:45 am      Morning Break**      *Courtesy of WGM Group*

10:45 am – 11:30 am      **FEMA Mitigation Funding Opportunities**      **Jake Ganieany, MT DES**  
State Hazard Mitigation Officer  
**Andrew Long, MT DES**  
**Kyle Sturgill-Simon, MT DES**  
Mitigation Coordinators

Flooding is a top-rated hazard across the state, resulting in two presidentially declared disasters in 2018. Montana Disaster & Emergency Services, as the managing agency for FEMA mitigation funding, wants to ensure that everyone has a chance to protect against the damages of future floods. This presentation will cover the grants available from MT DES that can be used to fund flooding mitigation plans and projects. There are three major funding opportunities through FEMA’s Hazard Mitigation Assistance (HMA) Program. Pre-Disaster Mitigation and Flood Mitigation Assistance Grants are nationally competitive grant opportunities available once per year. Hazard Mitigation Grant Program (HMGP) Grants are made available to states after presidentially declared disasters. Please join us to learn about how to get started on a mitigation grant application, as well as to learn about the training opportunities that MT DES hosts throughout the state.

11:30 – 1:00 pm      **General AMFM Membership Luncheon Meeting**

11:30 – 1:00 pm      **Lunch on Your Own for Non AMFM Members**

1:00 pm – 1:30 pm      **State Floodplain Mapping Program:  
Mapping Projects Update**      **Tiffany Lyden, MT DNRC**  
**Nadene Wadsworth, MT DNRC**  
**Nicole Decker, MT DNRC**

This presentation will give an update on the current and future mapping projects around the state. Status of the LiDAR acquisition project. Discuss some of the new outreach information that is coming. As well as introduce the new staff that have joined the DNRC team.

1:30 pm – 2:00 pm

**Modification of Manning’s “n”;  
Based Upon Drag of Discrete Features,  
and Application to “No-Rise”**

**Thomas Johnson**, PE, CFM  
Ackerman-Estvold

44 CFR 60.3(d)(3) requires that communities must prohibit encroachments, including fill, new construction, substantial improvements, and other development in the regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge. Because water-related industries or other uses sometimes require minor development or new construction within the floodway, floodway “No-Rise” certification is desirable. A derivation of a Manning’s “n” adjustment based on drag of discrete features within the floodway is presented as one method to show “No-Rise.” Examples of how this methodology could be used are provided.

2:00 pm – 2:30 pm

**Regulating 2D Models:  
Opportunities and Lessons Learned in Region VIII**

**Vanessa Benavides**, PE, CFM  
AECOM  
**Isaac Allen**, EI, CFM  
AECOM

Regulatory Flood Insurance Study (FIS) guidance is predominantly focused on one-dimensional (1D) hydraulic models; leaving a lot of room for interpretation when it comes to flood studies developed using two-dimensional (2D) or hybrid 1D/2D hydraulic methods. Recent advancements in 2D modeling techniques and the release of HEC-RAS Version 5 have resulted in more frequent use of 2D modeling. How does one develop standard regulatory FIS products such as profiles, floodway data tables, etc. based on 2D analyses? 2D analysis methods also provide new opportunities to enhance the data available to manage floodplains, taking advantage of non-regulatory information available such as depth grids. This presentation will focus on real world examples where 2D models are being used in regulatory FIS updates for several communities impacted by large scale flooding. These examples will highlight some of the similarities and differences between 2D regulatory products and those generated for typical 1D studies, and some challenges and lessons learned from stakeholder and community engagement. Specific attention is also given to the development of 2D floodways, 2D considerations for CLOMR/LOMR and No-Rise applications, and available non-regulatory products and how they can be used to supplement regulatory products. Finally, preliminary thoughts on future guidance and regulatory updates will be discussed, stemming from the recent work and recent collaboration between mapping contractors and federal, state, and local agencies.

2:30 pm – 3:15 pm

**Flood Resilient Planning for Montana Communities  
and the Role of 2D Modeling Tools**

**Mike Day**, PE  
WGM Group Project Engineer

Regulatory maps are just one tool that our communities utilize for floodplain management and planning purposes. Use of only one tool is not resilient. According to Merriam-Webster resiliency is defined as...

- a. Capable of withstanding shock without permanent deformation or rupture
- b. Tending to recover from or adjust easily to misfortune or change

2D models can help floodplain managers more accurately understand how the floodplain will respond in complex environments such as: developed flood fringe areas, sinuous channels, braided river systems, and wide floodplains. While regulatory maps developed with 1D models are useful for planning acceptable development

locations; the use of a 2D model can assist in understanding many other elements that can affect emergency planning decisions from before, during, and after an emergency. This presentation will highlight how floodplain managers can utilize 2D models to strengthen their decision-making process. An example will be developed and presented, highlighting the area around the confluence of the Clark Fork and Bitterroot rivers in Missoula. This 2D model will be based on available LiDAR data from Missoula County; to highlight what a simplified 2D model can reveal vs the regulatory map and FIS data.

**3:15 pm – 3:30 pm      Afternoon Break** *Courtesy of Great West Engineering*

3:30 pm – 4:00 pm      **Field Surveying for Floodplain Studies** **Luke Carlson, PE, CFM**  
Water Resources Engineer  
Morrison-Maierle Inc.  
**Jeff Roe, PLS**  
Morrison-Maierle Inc.

Enhanced understanding of the floodplain mapping process increases the ability of every person on the project team, from technical staff to elected local officials, to credibly articulate flood risks within their community. The field surveying task is typically one of the first tasks performed for a floodplain study. The field survey data is used in the hydraulic analysis that forms the basis for the updated floodplain maps. Our presentation will address topics related to field surveying for floodplains, including the need for field data, the type of data required for hydraulic models, project planning, landowner and public coordination, safety, typical survey methods, typical field equipment, and field data synthesis and documentation. We will also discuss the challenge of dissimilar perspectives of Engineers and Surveyors as well as on-the-fly adjustments for unexpected or uncertain field features. We will wrap up the presentation with a few project highlights. The audience will have an improved understanding of the field survey process and deliverables needed for a new floodplain study.

4:00 pm – 4:15 pm      **310 Permitting in the State of MT** **Bob Flescher**, Stream Permitting Coordinator, MT DNRC

4:15 pm – 5:00 pm      **Machler Stream Restoration** **Pam Vosen, CFM**  
Fergus Co. FPA  
**Traci Sears, CFM, MT DNRC**

A history of the project area and discussion on experiences & lessons learned with the large area, multi-agency restoration project on Big Spring Creek. Presenters will provide insight into why this project was so important for the community and the surrounding area. They will also examine issues that could have reduced project timing and made the regulatory process easier.

**6:00 pm – 9:00 pm      Evening Social – Centermark** *Courtesy of AMFM*

**Thursday, March 14                      Conference Sessions – Sapphire Room**

9:00am – 9:30 am      **The EMAC Solution to Floodplain Recovery** **Traci Sears, CFM, MT DNRC**

The collaboration between South Carolina and Montana during the 2018 spring flood events highlighted the importance of establishing professional partnerships through key networking opportunities. Traci Sears, Montana NFIP Coordinator, will present on specific state disasters and how to navigate the daunting floodplain managers

responsibilities after a disaster event. It is easy for communities to overlook the EMAC process to assist with floodplain recovery efforts. Understanding the complexities and how utilizing EMACs can assist communities on the road to recovery.

9:30 am – 10:00 am

**A Statistical Comparison of LiDAR Bathymetry and Conventional Survey Bathymetry on the Clark Fork River.**

**Jon Jupka, PE, CFM**  
Project Engineer  
Pioneer Technical Services

The use of Light Detection and Ranging (LiDAR) to obtain topographic data for floodplain mapping studies has become a standard data acquisition method for topographic terrain above the water surface. Bathymetric surfaces (terrain surfaces below the water line) are typically collected by wading with conventional GPS surveying methods or with the use of an echosounder (sonar) mounted on the side of a boat. LiDAR can also be used to collect bathymetric data. As part of the Mineral County floodplain mapping activities, Montana Department of Natural Resources and Conservation (DNRC) contracted Quantum Spatial Inc. (QSI) to perform a topographic and bathymetric (LiDAR) survey on the Clark Fork River in November 2016. Between April and July 2017 Pioneer Technical Services (Pioneer) collected bathymetric data using conventional wading and boat-mounted sonar technology, upstream and downstream of 18 bridges along a 55-mile reach of the Clark Fork River within Mineral County. Four bathymetric cross sections were surveyed at each bridge location. These ground-based bathymetric data were collected in areas where LiDAR had also been used to estimate the Clark Fork River bathymetric surface. The LiDAR survey was unable to map approximately 27% of the Clark Fork River bathymetry due to poor LiDAR returns. Pioneer performed a comparative statistical analysis of the LiDAR DEM and ground-based bathymetric survey data. Results indicate good agreement between the LiDAR DEM and ground-based bathymetric data, in the areas where good bathymetric LiDAR returns were obtained.

10:00 am – 10:30 am

**How to Be Less Wrong: Errors and Uncertainty in Hydraulic Modeling**

**Andrew Park-Friend, PE**  
Michael Baker International

Planners, Engineers, and other stakeholders rely heavily on flood modeling results to perform daily functions such as permitting, development review, and CIP project design. This reliance, however, is far from absolute. In practice, professionals are using analytical techniques to forecast complex natural processes. In reality, predictive flood modeling efforts are prone to uncertainty based on the quality of inputs and selected model structure - from statistical flood discharge values, to assigned hydraulic roughness, to cross section placement, and many other user-defined variables and inputs of a 1-Dimensional hydraulic model. The uncertainty in these inputs can proliferate through a hydraulic model and ultimately may cause doubt in the confidence one has in model results. Understanding the relative magnitude of the various sources of uncertainty on model solutions is critical to creating a quality hydraulic model. So what's an engineer to do? To more accurately assess how uncertainty in model inputs impacts model reliability, Michael Baker International conducted sensitivity analyses for several case studies on streams in Colorado and throughout the Rocky Mountain region. Using Monte Carlo simulations in conjunction with HEC-RAS modeling, we looked to determine the relative effect of uncertain inputs and variables on modeled water surface elevation. In this presentation, we will share our results and make concrete suggestions on how to address uncertainty in a hydraulic model, as well as make suggestions on how to communicate this uncertainty to stakeholders

10:30 am – 11:15 am

**Montana Infrastructure Report Card**

**Melissa Matassa-Stone, PE, CFM**  
Senior Project Engineer  
WGM Group

Today, Montana is thriving from growth in the economy, a successful tourism industry, and grassroots entrepreneurship. A key component to our growth and future success is our infrastructure. Although the major cities in our state might be feeling these benefits more than other areas, it is important that we invest in

infrastructure in all corners of the state to continue this upward trend. Infrastructure is the glue that holds our cities, towns and communities together and keeps their hearts beating. Montana's 2018 Infrastructure Report Card is meant to ignite conversations and be a catalyst for action in our state. The Report Card provides a snapshot for residents and policymakers to engage in infrastructure conversations about sustainability, planned growth, resiliency in our communities, and continued economic success. The Montana Section of the American Society of Civil Engineers (ASCE) released Montana's second Infrastructure Report Card on December 6, 2018 and is now actively performing outreach to share the results and recommendations of the Report Card. This session seeks to educate AMFM members about the 2018 Montana Infrastructure Report Card.

Specifically, the session will review the following items:

1. Introduce the concept and application of state and national Infrastructure Report Cards,
2. Review highlights, grades, and recommendations of the 2018 Montana Infrastructure Report Card, and how it compares to the 2014 Report Card
3. Discuss applicability of grades/recommendations of the 2018 Infrastructure Report Card to engineers and planners who are AMFM members, and
4. Provide an update on related 2019 Legislative Session efforts

## **Adjourn**