Photo Courtesy of Chris Boyer, Kestrel Aerial Services

STATE OF MONTANA
Floodplain Program

CTP Program Management Business Plan

FFY 2021

Introduction

The State of Montana Floodplain Mapping Program Business Plan for FFY 2021 and FFY 2022 has been prepared to support the Program Management Grant Statement of Work. In accordance with FEMA guidance, this Business Plan highlights our Program's overall capabilities and accomplishments, as well as our vision for the future. This Business Plan discusses completed and ongoing projects, including the discussion of future mapping priorities as a part of a multi-year flood hazard mapping plan for Montana.

Section I: Background and Program Vision

Montana DNRC has been a Cooperating Technical Partner (CTP) since 2005. Our CTP initiated the first Map Modernization projects in the state and since that time has cooperatively worked with FEMA to scope, plan, manage, and complete multiple Map Modernization and RiskMap projects.

Our program is continually working to expand our capabilities as a CTP. We see ourselves as an integral partner with FEMA in effectively delivering flood-risk information to local Montana communities and building local capacity to mitigate flood risk.

Vision

The philosophy of our team is one of innovation and continual improvement. Together we strive to strengthen and enhance every aspect of our Floodplain Mapping Program, from regular communication with floodplain administrators and local officials during the Risk MAP process to concurrent technical reviews of task submittals. This philosophy and vision guides our work as an effective team with a proven record of success.

The Montana Floodplain Mapping Program strives to mirror the overall vision of FEMA's mapping program through every step of a mapping project's lifespan. In conjunction with FEMA's paper inventory reduction, we have identified and listed what remains of Montana's paper inventory. Our goal over the next several years is to complete all these projects, making Montana a completely digital state.

As part of this approach, our Program's vision includes:

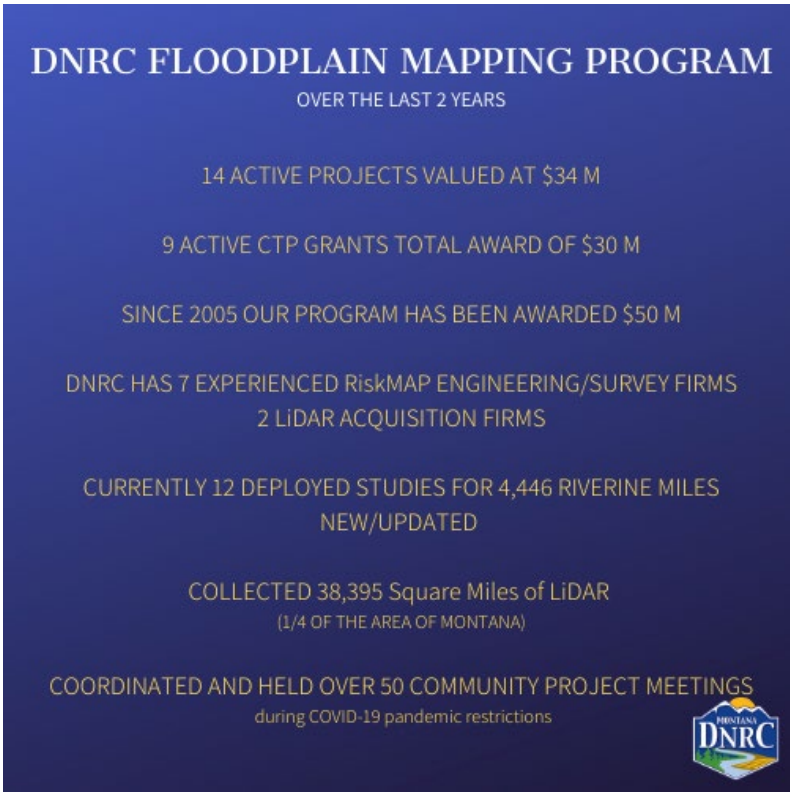
- Identifying flood risk and minimizing future flood-related damages by building community resiliency.
- Identifying opportunities for flood mitigation projects and working constructively with communities to encourage mitigation efforts.
- Undertaking new floodplain mapping projects in cooperation with stakeholders and mapping partners in communities and watersheds where new or updated floodplain information is a priority and there is strong community support.
- Providing practical, understandable flood-risk tools to communities in Montana.

- Providing information and technical support to help communities with unmet mapping and mitigation needs.
- Developing technically credible flood hazard mapping products.
- Providing accessible, model-backed data for all the effective floodplain mapping in the state. This includes evaluating and updating effective studies that were converted to digital format during MapMod and RiskMAP projects, but the actual studies and mapping were not updated.
- Working with state and federal partners to achieve statewide LiDAR acquisition.
- Reducing our state's inventory of paper-based floodplain maps, and eventually achieving statewide modernization of all of our floodplain maps.

Accomplishments and Current Activities

Montana has built a strong floodplain mapping program unit. Our current staff have the experience and capabilities to successfully support RiskMAP activities and floodplain mapping in Montana. We can manage multiple large projects, tackling complex issues, and developing innovative approaches to better identify and inform communities of their flood risks.

Over the last two years, our Program has managed the successful completion of three RiskMAP projects and initiated five new RiskMAP projects. We have built a solid repertoire of quality contractors in (and out of) the state that we are able to use for RiskMAP projects through our state-developed solicitation process.



DNRC has developed a guidance document for our contractors and have several more documents in progress that will improve consistency and utility of our floodplain study products. These documents supplement FEMA's Standards and Guidance on details such as workmap formatting and annotating model files. This effort has already led to benefits in streamlining technical reviews and clarity during public outreach, and we expect continued improvement as these documents are refined over time.

During COVID, our staff developed a comprehensive COVID outreach plan. This plan helped the program stay on track and continue with community touch points during COVID. From March 2020 through March 2021, DNRC staff successfully conducted 24 virtual meetings, of those meetings 6 were interactive hybrid public open house meetings. Through collaboration with local floodplain administrators, CERC and FEMA were key to successfully delivering these hybrid public open house meetings. As a part of the shift to the virtual environment, DNRC staff also trained local floodplain administrators on how to navigate the various virtual meeting components on Zoom and other platforms. Through this process, DNRC continued to develop relationships with local floodplain administrators and elected officials. Montana DNRC is one of the few states that has held interactive, virtual public open house meetings during the pandemic. DNRC and CERC recently developed a best practice for these virtual open house meetings.

Active Projects

Our Program currently has several active projects at various stages of completion:

Table 1: Active Projects

Project	2021	2022	2023	2024
Upper Musselshell River Watershed	DFIRM Database; Produce & Distribute Preliminary Products	Post-Preliminary Processing		
Beaverhead County	Post-Preliminary Processing			
Clearwater River	DFIRM Database; Produce & Distribute Preliminary Products	Post-Preliminary Processing		
Silverbow	Post-Preliminary Processing			
Mineral County	DFIRM Database; Produce & Distribute Preliminary Products	Post-Preliminary Processing		
Jefferson County	Hydraulics and Floodplain Mapping	DFIRM Database; Produce & Distribute Preliminary Products	Post-Preliminary Processing	
Madison/ Jefferson	DFIRM Database; Produce & Distribute Preliminary Products	Post-Preliminary Processing		
LiDAR 2018	Lodge Grass			
Milk River	Hydrology	Hydraulics BLE	Hydraulics	Floodplain Mapping
Carbon County	Hydraulics and Floodplain Mapping		DFIRM Database; Produce & Distribute Preliminary Products	Post-Preliminary Processing
Missoula/ Granite	Hydraulics and Floodplain Mapping		DFIRM Database; Produce & Distribute Preliminary Products	Post-Preliminary Processing
Powell County	Hydrology	Hydraulics	Floodplain Mapping	DFIRM Database; Produce & Distribute Preliminary Products
Teton County	Field Survey Hydrology	Hydraulics	Floodplain Mapping	DFIRM Database; Produce & Distribute Preliminary Products

Our Program is heavily involved in all aspects of these mapping projects including scoping/discovery, which DNRC staff complete in-house; contractor selection and contract management; project management and technical reviews of survey, hydrology, hydraulic, and mapping submittals; coordinating public and elected officials meetings and communication; and coordinating landowner and media outreach efforts.

Section II: Project Planning

Montana DNRC's Floodplain Mapping Unit strives to assist local communities with mapping needs. Our team leverages funding resources at the local, state, and federal levels to conduct new mapping projects, and assist communities with identifying and reducing flood risks. By reaching out, building trust, and fostering relationships with elected officials and stakeholders, we can effectively research, plan, and lay the groundwork for future projects.

Our approach has always been to coordinate with communities well in advance of a grant application submission. We meet with community elected officials and stakeholders ahead of time to assess their interests and needs, gather relevant information and data, and do a thorough scoping of potential projects. As a result, we can garner local support for these projects ahead of time, as evidenced by the letters of support and voluntary financial contributions that many communities in Montana provide. This process is equivalent to the Discovery phase of a RiskMAP project, therefore, we do not include Discovery tasks in our grant applications.

In advance of submitting this Business Plan for FFY 2021 and FFY 2022, our Floodplain Mapping Program worked with multiple communities to initiate, plan, and scope new mapping studies and develop a Multi-Year Mapping Plan. These projects will be applied for based on funding availability and would be easily scalable if funding is limited. In the past we have taken a phased approach for projects and have been successful in completing them. **Figure 1** gives an overview of our multi-year project planning and serves as a quick reference for future applications.

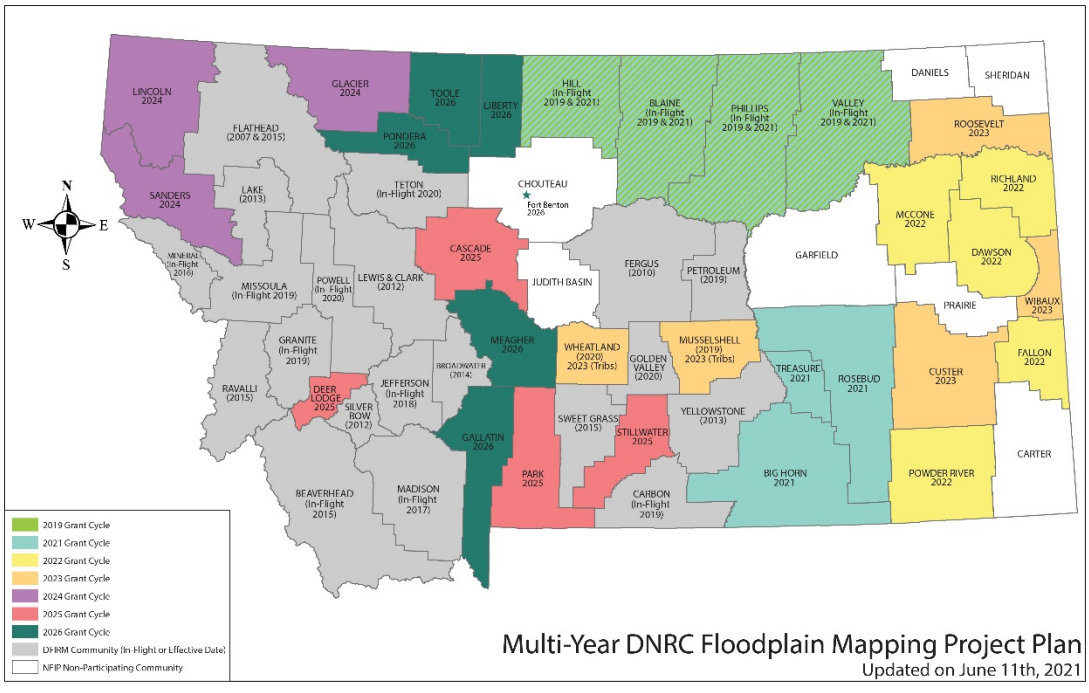


Figure 1: Multi-Year Mapping Project Plan

The projects in the Multi-Year Mapping Project Plan address local, state, and federal mapping priorities for Montana. Included in each of the following sections is documentation of how these projects will contribute to: NVUE targets, LiDAR Collection, Paper Inventory Reduction, Base Level Engineering and Levee Mapping.

New, Validated or Updated Engineering (NVUE)

In an effort to continue to improve the NVUE metrics for the State of Montana, all of the mapping projects in the Multi-Year Plan will contribute to updating currently unverified or unknown miles in the Coordinated Needs Management Strategy (CNMS) database. The countywide projects will update all of the currently effective mapped miles in the respective counties, while the PMR projects will update priority stream reaches with outdated data, which are often unverified or unknown miles, as shown in **Table 2**.

Table 2 : Impacts to NVUE and cost estimate by Project for FY 20-26

*Project Name	County	Miles anticipated to be updated with RiskMAP projects	Currently Unverified/ Unknown Miles *(from CNMS)*	**Estimated Cost
FFY 2021				
Milk River Basin Project (Modernization Valley, Phillips, and Hill Counties) Blaine County PMR Phase II	Hill	732	795.3	$4,530,000
	Blaine	500.9	528.8	
	Phillips	479.3	395	
	Valley	613.3	728.6	
BTR Modernization	Big Horn Treasure Rosebud	362.5 157 3068.1	245.5 136.7 38.1	$5,050,000
Project Management Grant				$849,100
USGS Pilot Study				$251,000
TOTAL	**--**	**5221.5**	**5909**	**$10,680,100**
FFY 2022				
McCone Countywide Modernization and LiDAR	McCone	134.6	3.75	$1,000,000
Dawson Countywide Modernization	Dawson	305	260.6	$1,550,000
Fallon Countywide Modernization	Powder River	80.4	51.6	$520,000
Richland County PMR	Custer	197	142.8	$2,100,000
Powder River Countywide Modernization	Powder River	57	80.4	$430,000
TOTAL	**--**	**857.34**	**887.7**	**$5,600,000**
FFY 2023				

Musselshell and Wheatland Tribs PMR	Musselshell Wheatland County	175	190	$350,000
Town of Wibaux Modernization	Wibaux County	2	3	$150,000
Custer County PMR	Lincoln	945.3	867.9	$1,000,000
Roosevelt Countywide Modernization	Roosevelt	304.9	262.5	$350,000
Project Management Grant				$825,000
TOTAL	**--**	**3172.3**	**4008.7**	**$2,675,000**
FFY 2024				
Lincoln County Modernization	Lincoln	886.5	945.3	$4,100,000
Glacier County Modernization	Glacier	262.5	304.9	$1,000,000
Sanders County PMR	Sanders	337.4	399.5	$1,900,000
TOTAL	**--**	**1486.4**	**1649.7**	**$7,000,000**
FFY 2025				
Park County PMR	Park	414.6	581.9	$3,000,000
Stillwater County PMR	Stillwater	226.3	222.3	$2,000,000
Deer Lodge Countywide Modernization	Deer Lodge	224.8	242.2	$1,500,000
Cascade County PMR	Cascade	179.6	193.5	$3,000,000
Project Management Grant				$900,000
TOTAL	**--**	**1045.3**	**1239.9**	**$10,400,000**
FFY 2026				
City of Fort Benton Modernization	Choteau	0	9	$200,000
Meagher Countywide Modernization	Meagher	.7	.7	$50,000
Pondera Countywide Modernization	Pondera	0.5	.46	$50,000
Liberty Countywide Modernization	Liberty	1.6	.65	$50,000
Toole Countywide Modernization	Toole	5.5	4.5	$50,000
Gallatin County PMR	Gallatin	139.9	125.8	$2,000,000
TOTAL	**--**	**10,359**	**6,651**	**$2,400,000**

**projects will be reviewed annually and are subject to change based on community or state needs and priorities*

***costs associated are estimates and may change*

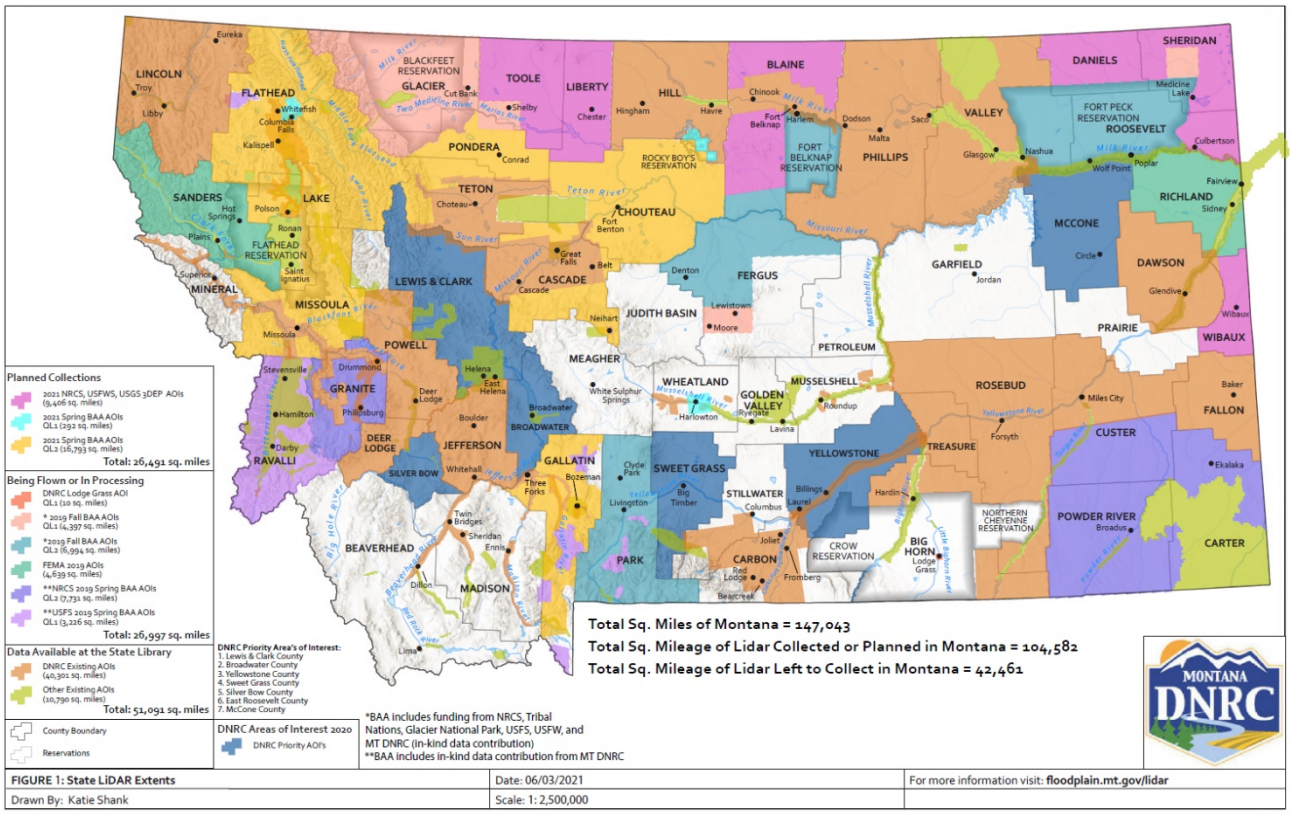
LiDAR Acquisitions

Consistent with the Multi-Year Mapping Plan, LiDAR acquisition is slated to be collected for the areas as listed below. Topographic data collection of these project areas will set the stage for subsequent Risk Map projects to update effective, unverified or unknown mapping and also provide new mapping in several priority areas. A list of planned LiDAR collection is provided in **Table 3** and a map of the areas is provided in **Figure 2**.

Table 3: Planned LiDAR Acquisitions FY 21-22

Project	Planned Fiscal Year	Square Miles
Town of Lodge Grass	FY 21	9.65
McCone County	FY 22	115

Figure 2: LiDAR status in Montana



Paper Inventory Reduction

Modernization of existing paper flood maps is an ongoing priority for Montana DNRC. Since the initiation of the MapMod program in 2005, our Floodplain Mapping program has worked with FEMA to modernize 22 counties in Montana, as shown in **Figure 3**. An additional 8 counties are currently in progress to complete modernization through the RiskMAP program, including, Mineral, Beaverhead, Madison, Jefferson, Hill, Phillips, Valley, Teton, and Powell Counties.

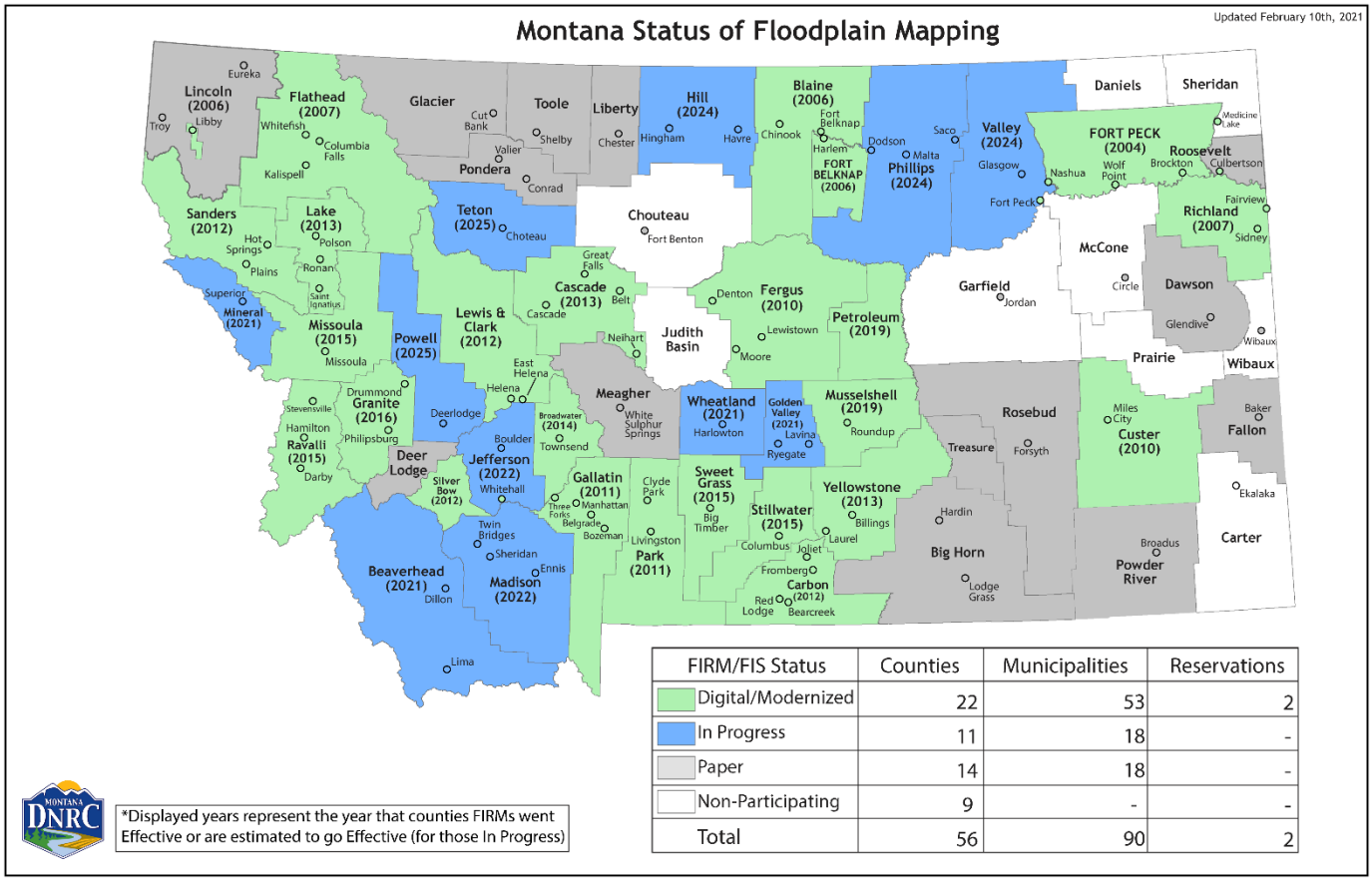


Figure 3: Status of Paper vs. DFIRM Communities in Montana

The mapping projects identified in the Multi-Year Mapping Plan have been ranked and prioritized. These projects continue to lay the groundwork to fully modernize sixteen additional counties in the state – Valley, Phillips, Hill, Big Horn, Rosebud, Treasure, Powell, Dawson, Lincoln, Fallon, Deer Lodge, Toole, Liberty, Meagher, Pondera, and Roosevelt Counties. A summary of the number of counties that have been or will be converted to digital format is provided in **Table 4**.

Table 4: Paper Inventory Reduction by County

Project	Number of Counties Modernized
Completed MapMod and RiskMap projects to date	21
In Progress RiskMap projects	9
Missoula-Granite PMR	--
Milk River Project	3
Carbon County PMR	--
Big Horn Countywide Modernization	1
Treasure Countywide Modernization	1
Rosebud Countywide Modernization	1
Powell Countywide	1
Teton Countywide	1
Custer County PMR	--
Richland County PMR	--
McCone Countywide Modernization**	1
Dawson Countywide Modernization	1
Lincoln Countywide Modernization	1
Park County PMR	--
Stillwater County PMR	--
Fallon Countywide Modernization	1
Sanders County PMR	--
Gallatin County PMR	--
Deer Lodge Countywide Modernization	1
Cascade County PMR	--
Toole Countywide Modernization	1
Liberty Countywide Modernization	1
Meagher Countywide Modernization	1
City of Fort Benton Modernization	--
Pondera Countywide Modernization	1
Roosevelt Countywide Modernization	1
TOTAL	**44***

*Currently 45 NFIP Participating Counties in Montana

** not currently participating has requested mapping so they can participate

Base Level Engineering

Montana's Floodplain Mapping Program is using Base Level Engineering (BLE) techniques for several RiskMAP projects. BLE is being used for portions of two RiskMAP projects in Montana that are currently in flight: Jefferson County (for two reservoirs), and the Milk River project (for 1,724 riverine miles). BLE techniques will also be included in Big Horn, Treasure, and Rosebud Counties which have been scoped for FY 21. Montana's use of BLE in future countywide projects with significant miles of approximate mapping, or where DFIRM projects did not include updated flood studies, include: Deer Lodge, Lincoln, Dawson, Rosebud, Treasure, Big Horn, Fallon, Park, Cascade, Sanders, and Glacier Counties.

Levee Mapping

Montana's Floodplain Mapping Program has been actively working with levee communities to help them understand and address their flood risks related to levees. In 2019, our Mapping Program staff coordinated a levee workshop targeted at nine levee communities to help improve their understanding of flood risk, along with agency and community roles and responsibilities. Additional in-person meetings have been held with all levee communities undergoing RiskMAP projects to provide them with targeted informational materials and technical assistance. The goal of our strategic engagement with these leveed communities has been to encourage risk reduction activities, including levee maintenance and mitigation action. We also strive to increase their risk understanding and awareness of levee issues, including US Army Corps of Engineers and FEMA standards and requirements.

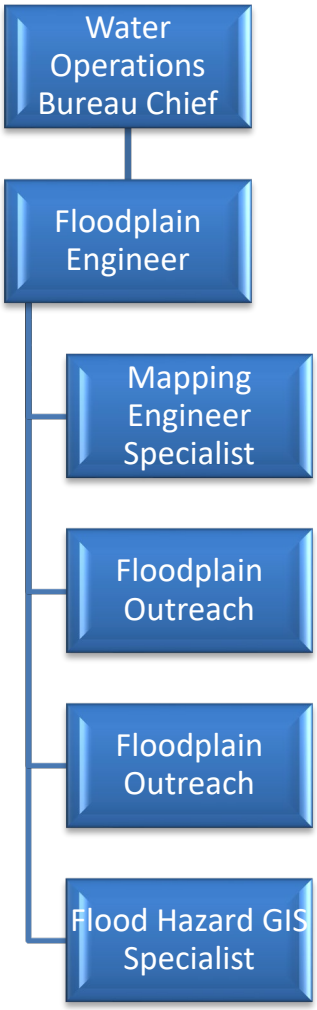
Most of the levee communities have old FIRMs depicting varying degrees of protection. As part of the Milk River project, our Mapping Program staff will be coordinating with all the leveed communities, including Hill County, Town of Chinook and Blaine County, Town of Malta, and the City of Glasgow. Hill County and the City of Glasgow have been working to correct major and minor deficiencies identified by USACE as outlined in their SWIF plans.

Havre/Hill Levee
Photo credit: Havre Daily News

In FY2020 our Mapping Program hosted a Local Levee Team meeting to continue to build on the efforts of the 2019 levee workshop. This meeting was held during the annual Association of Montana Floodplain Managers (AMFM) conference in Kalispell. This meeting continued discussions with the USACE, FEMA, DNRC, and the communities on levee certification requirements, and LAMP processes.

Section III: Staffing and Resources

Staffing



Montana's Floodplain Mapping Unit Team currently consists of five staff that support flood map production and RiskMAP activities in Montana. The Water Operations Bureau Chief and State Floodplain Engineer are funded through the State of Montana; all other positions are funded through the PM grant. Our team works with other state programs such as Disaster and Emergency Services, the Montana Silver Jackets Program, the DNRC Community Assistance Program, and Montana Department of Environmental Quality to plan and conduct flood hazard mapping activities, based on local and state priority needs.

Our team brings the following capabilities in support of FEMA's mapping process:

- Extensive staff knowledge and experience in a wide range of subjects and responsibilities
- Oversight and administration of contracts
- Technical review and evaluation of mapping submittals
- Application of FEMA's mapping guidelines and standards
- Development of Montana specific mapping guidelines and best practices
- Development of Montana specific outreach materials

Resources

Montana is fortunate to have elected officials that understand the importance of identifying and communicating flood risk in the state. In accordance with Montana's Floodplain and Floodway Management Act, the DNRC is tasked with establishing a comprehensive statewide floodplain mapping program to delineate designated floodplains and floodways (MCA 76-5-101). We accomplish this through several approaches.

- Collaboration with federal, state, and local partners and stakeholders.
- Six state-funded regional engineers stationed throughout the state that provide technical assistance and support for floodplain mapping projects.
- Continual improvement to expand our capabilities as a Cooperating Technical Partner.
- Collaboration with contractors and other partners to develop innovative technologies and techniques.

Conclusion

The Montana Floodplain Mapping Program is continually working to expand our capabilities as a Cooperating Technical Partner. We see ourselves as an integral partner with FEMA in effectively delivering flood-risk information to local Montana communities and building local capacity to mitigate flood risk. Together with FEMA, our Program is well positioned to help build additional capacity within Montana's communities.

We are grateful for FEMA's past and continued support of the Montana Floodplain Mapping Program; indeed, we share many of our Program's successes with the dedicated staff at FEMA Region VIII. We look forward to a bright future with FEMA, continuing to increase local awareness and understanding of flood hazard and provide risk information to help communities undertake actions to mitigate flood risks. Together we can help map and mitigate flood risks in Montana.