



Montana Department
of Natural Resources
and Conservation

FLOODPLAIN MANAGEMENT PROGRAM

Serving Montana's Communities
Since 1974

HIGHGROUND

February 2010

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Wetlands, Riparian Areas and Floodplains

Information shared by Lynda Saul, Wetland Program Coordinator, Montana Department of Environmental Quality



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Sun River – photo by Mark Boesch

On the Montana Front



Floodplains, wetlands and riparian areas share common ground. Aptly, more sharing is occurring between wetland and floodplain

professionals. For example, land use planning resources for local governments, including floodplain administrators are now available as a result of a Montana DEQ grant, administered through the Wetland Program. Resources can be found at the Montana Audubon website: <http://www.mtaudubon.org/issues/wetlands/planning.html>. View floodplain and other regulations adopted by different local governments, see pictures of Montana property in jeopardy from flooding or river meandering and more.

Funding from a Montana DEQ/ EPA grant is furthering progress on a floodplain wetland mapping plan and report. As a result of this wetland/floodplain cooperation, the production of a state-wide map, the WORM map, showing the squiggly stretches of floodplains that have been studied by Approximate, Limited Detail or Detailed levels for Flood Insurance Rate maps will resume! For earlier story see Highground September, 2008. The WORM map and resulting data layer, scheduled

to be available this summer, will be useful for a number of State and Countywide applications including: identifying floodplain mapping gaps and assessing mapping needs. The data layer will be flexible allowing for future expansion to add additional mapping categories (such as Subdivision Studies) as well as additional attributes.

On the National Front

The Association of State Floodplain Managers, (ASFPM), a non-profit professional organization dedicated to reducing flood losses and protecting floodplain functions and resources in the United States has prepared a position paper that may be useful in your work as floodplain managers, titled “*Natural and Beneficial Floodplain Functions: Floodplain Management—More than Flood Loss Reduction*” http://www.floods.org/PDF/WhitePaper/ASFPM_NBF%20White_Paper_%200908.pdf

ASFPM points out that current floodplain management in this country has twin goals: (1) flood loss reduction and (2) the conservation and protection of the natural and beneficial functions of our water resources. Although considerable effort has been expended on the first goal (with mixed success), the second has received only minor consideration. They have recommended a call for renewed direction and a new approach to floodplain management.

Communities to Identify Unmet Floodplain Mapping Needs

By Celinda Adair, DNRC Map Modernization Program Specialist



In November 2009, a survey was sent out to all of Montana's communities in order to gather information regarding floodplain mapping needs and related topics. The survey was sent primarily to floodplain administrators/managers. A number of communities responded by the initial deadline and those that did not were contacted by the DNRC floodplain outreach specialist, Mary Guokas. Both efforts yielded responses from a total of eighty-one (81) communities. Currently, the floodplain mapping needs information has been compiled and the rest of the survey response information is still being processed.

The information provided by the communities has been integrated into the **State of Montana Unmet Floodplain Mapping Needs List**. This list has been posted on the DNRC website: www.mtfloodplain.mt.gov under the floodplain mapping heading. The information is listed alphabetically by county and then further sorted by municipality and individual study area. The responses range from no needs to multiple

needs for a single jurisdiction. The purpose of this document is to provide a State-wide list of unmet floodplain mapping needs to be used by multiple programs in DNRC and other entities to establish priorities for floodplain mapping grants and funding.

Please review this document and provide any corrections via email to Celinda Adair, Risk MAP/Map Modernization Program Coordinator, cadair@mt.gov (if you do not have access to email please call Briona Shipman, at 406.444.0862 to make other arrangements for submitting information.) The next steps are to send this document to other local, State and Federal organizations to gather additional information regarding floodplain mapping needs from their perspective and to identify any partnership or funding opportunities. The **State of Montana Unmet Floodplain Mapping Needs List** is a working document and will continue to be updated as new needs or issues are identified. Thanks to everyone who responded or assisted with making this survey a success!

Training and Conference Calendar

Montana

March 1-4
Association for Montana Floodplain Managers (AMFM) 11th Annual Conference
Chico Hot Springs Resort
Pray, Montana

September 7-9
Water Symposium
Helena, Red Lion Inn

Emmitsburg Maryland

July 26-29 – Advanced Floodplain Management Concepts (E194)
March 22-25, May 3-6, Aug. 23-26 – Managing FP Development thru the NFIP (E273)
Apr. 19-22, June 14-17, Aug. 9-12 – NFIP Community Rating System (E278)
June 21-24 – Advanced Floodplain Concepts III (E284)

FEMA hosts on-campus training for a host of emergency management subjects <http://training.fema.gov/EMICourses/EMICourse.asp> including floodplain management courses.

If interested, submit your application <http://training.fema.gov/Apply/>. See tips for applying. On the back-side of the application, #23 is reserved for the "State Office".

In Montana, contact Fred Naeher with the Department of Military Affairs at 841-3968, FAX 841-3965



Miles City Hosts Second River Awareness Summit

By Steve Craddock,
Miles City Planning Office



Miles City Mayor Joe Whalen

The City of Miles City hosted its second River Awareness Summit on November 9, 2009. The conference offered 13 unique sessions organized around three zones of concern: Water Quality, Flood Abatement and the Economics of River Recreation.

The conference, which was funded in part with a grant from the Montana Department of Environmental Quality, provided residents, property owners, business operators and government officials in the Yellowstone and Tongue River area with better techniques for protecting and enhancing water quality while also enhancing their understanding of the critical role that rivers play in both human and natural environments.

Miles City Mayor Joe Whalen emphasized the importance of taking a holistic approach to watershed management, especially regarding the intrinsic value of watersheds and how their upstream use (and abuse) impacts biosystems and human communities downstream.

Keynote speaker Char Miller, director of the Environmental Analysis

Program at Pomona College and author of several books related to water quality and environmental resource management, explored the historical methods used to manage, conserve and allocate finite water resources, most of which have been organized around artificial political boundaries. He then advocated a more effective water management approach organized around natural watershed boundaries to address the unprecedented issues and challenges emerging as a result of climate change and population growth.

Eighteen additional speakers from 16 different federal, state and local agencies and organizations were involved in presenting the classroom sessions, which included: water quality, flood control and river recreation.

The effort is already underway to produce the 2010 Miles City River Awareness Summit. Anyone interested in participating may contact Steve Craddock in the Miles City Planning Office at 406-234-3493 or scraddock@milescity-mt.org.

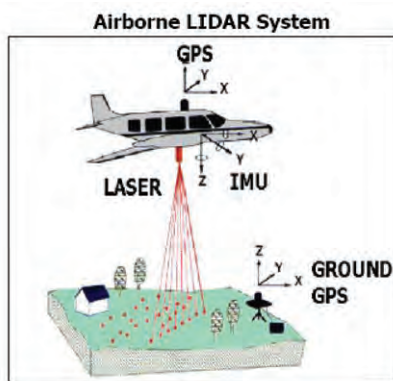


Photo credit - City of Miles City

What is LIDAR?

By Steve Story,
DNRC Floodplain Engineer

*The October, 2009 Issue of **Highground** featured an article on New LiDAR for Flathead Valley. The following answers, what you may, or may not have been wondering since then.*



Lidar is an airborne laser system, flown aboard rotary or fixed wing aircraft, used to create digital elevation data of the surface topography including manmade and natural features. The term “Lidar” is an acronym for “light detection and ranging”. Lidar is similar to Radar (radio detection and ranging) but uses pulses of light instead of radio waves. The technology provides a means to complete large topographic surveys significantly faster and more economically than traditional methods. Over the last decade, Lidar has revolutionized the mapping industry.

Components of the aircraft mounted Lidar System:

- **Global Positioning System (GPS)** – determines coordinates of the aircraft mounted Lidar sensor, surveyed relative to one of more GPS ground base stations.
- **Inertial Measurement Unit (IMU)** – records the exact spatial orientation of the aircraft and Lidar sensor.
- **Lidar Sensor Unit** – consists of a laser source and receiver, along with a scanning mechanism and controller.
- **Electronics and Data Storage Equipment** – including a high resolution clock to record laser emissions and returns; high performance computers; and high capacity data recorders.

The Lidar system collects tremendous quantities of 3-dimensional (3D) point data where laser pulses have hit the ground and reflected back to the sensor. Reflections are generated from all types of ground features including vegetation, man-made structures, and the existing ground surface. The dense spatial data collected provide a high resolution, 3D representation of the earth’s

surface terrain and above-ground features. The resultant 3D model is generally referred to as a Digital Elevation Model (DEM). The raw data set requires post processing routines in order to filter and calibrate the data, along with development of a Bare-Earth data set; which represents only the ground surface.

The Bare-Earth DEM is used to develop contour maps and is used for floodplain mapping. Along with providing highly accurate surface and topographic maps, Lidar has many other derivative uses including: vegetation assessment – such as riparian and wetland area delineation, canopy characterization and forest surveys; geologic and geomorphic feature mapping including landslide feature identification; environmental assessment and development planning. Lidar technology has advanced rapidly and is capable of achieving accuracies to within a few inches vertically and a few feet horizontally. The cost of Lidar averages around \$500 per square mile but can vary significantly with a projects size, location, terrain and types of data products

Additional Information and Lidar Resources:

- The International Lidar Mapping Forum <http://www.lidarmap.org/>
- American Society for Photogrammetry and Remote Sensing (ASPRS) <http://www.asprs.org/>
- FEMA’s Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A – Guidance for Aerial Mapping and Surveying <http://www.fema.gov/library/viewRecord.do?id=2206>
- NOAA Lidar Webpage <http://www.csc.noaa.gov/products/sccoasts/html/tutlid.htm>

Joint (Multi-Agency) Site Visits

By Larry Schock, Civil Engineering Specialist,
DNRC Missoula Regional Office

I got my 310 permit and I thought that it was OK to start my project.” “I didn’t realize that I needed a Floodplain Development Permit.” How many times have you heard this, or similar statements from landowners or consultants? Quite a few times I bet. Today’s regulatory world can often be confusing and difficult to understand, especially for the average landowner, or consultants who are new to the process. This is a good reason to try and conduct joint site visits with other regulatory agencies on floodplain applications.

Joint site visits are an efficient and economical way to conduct business in today’s regulatory world that is not only beneficial to all parties concerned, but it can also help foster a better understanding of the permitting process. Coordinating site visits with other permitting agencies will not only save the applicant time and money, it will also help streamline the process, shortening your processing time. A joint site visit will allow all of the permitting agencies to look at the same project at the same time, insuring that everyone is hearing the same thing and is on the same page. The joint site visit will also allow the applicant and their consultant to fully understand what will be needed from each regulatory agency in order to issue a permit for the project.

Since the local Conservation District <http://www.macdnet.org/conservationdistrictdirectory/contact.htm>, the US Army Corps of Engineers, the Department of Environmental Quality, the Department of Fish Wildlife and Parks, the Department of Natural Resources and Conservation and the local Floodplain Administrator will

(editor’s note: may all) be required to issue permits on projects associated with a stream or river, it is important that all of the parties understand what each agency regulates and what is needed for each respective application.

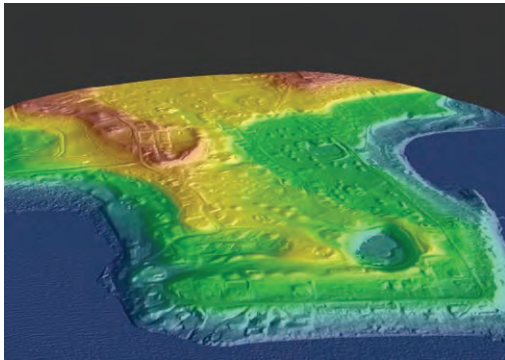
[This link](#) takes you to a short 1-minute plus video about 310 permits issued by the local Conservation Districts.

The video is courtesy of the Montana Department of Fish Wildlife and Parks.



Also, FEMA regulations require that all other applicable permits be issued for a project before the local floodplain permit can be issued. Remember, it is better to have the landowners and consultants inquire with each agency to determine if the agency’s respective permit is needed for a project, rather than start a project and have it stopped or held up because all necessary permits were not acquired. A joint site visit is not only a valuable tool from a permitting standpoint, it will also help to insure that the landowners and consultants are fully informed, helping to avoid unnecessary violations.

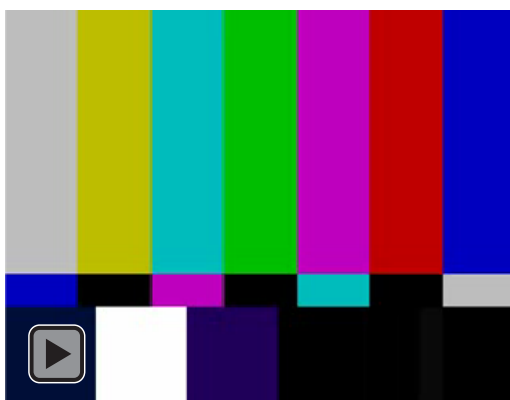
Reprinted with permission from the Fall/Winter 2009 Newsletter, “Floodplain (and Simple)” produced by the Association of Montana Floodplain Managers (AMFM) by Larry Schock.



Images provided by Watershed Sciences, Inc.

Looking southwest over Polson Bay Golf Club: **top** image is derived from bare-earth lidar data set;

bottom image is derived from orthophotographs draped over digital surface model.



DNRC Floodplain Website Tools and Resources

By Larry Schock,
Civil Engineering Specialist,
DNRC Missoula Regional Office



Do you often have floodplain related questions and are not sure where to turn to find the answers? Are you tired of trying to track down floodplain information on the web? Have you ever wished that there was just one website that you could go to that would answer your questions and provide you with the needed information? Well, the answers and information may be easier to find than you think.

The Montana DNRC Water Resources Division Floodplain Management website (<http://www.mtfloodplain.mt.gov/>) is specifically designed to help provide one stop shopping for local Floodplain Administrators, the consulting community, and the general public. The page contains a host of valuable information and links to other helpful websites. There is even a section where you can see pictures of actual flood events from across the state.

The Floodplain Management website lists contact information for all of the local, state, and federal floodplain agencies as well as state and national professional floodplain organizations.

Do you have questions about the floodplain permitting process? There is a section dedicated to the floodplain permitting process which provides application forms, instructions, submittal requirements, and an application review checklist for local floodplain administrators. There is also a guide to other permits that may be required when working in or near a stream or river.

The page contains links to State and Federal Floodplain rules, regulations, and codes. The page also has an example of a model floodplain ordinance that can be downloaded and used as an example

when updating local community regulations.

Links on the page explain and update the FEMA Map Modernization process from a Federal and State point of view and help you find the appropriate FEMA FIRM map of your specific location.

Do you or your insurance agent have questions about the National Floodplain Insurance Program (NFIP)? Do you need a FEMA form for a LOMA, LOMR, or Elevation Certificate? If so there are links on the DNRC Floodplain Management website that will take you to sites that will provide you with the appropriate forms, information and answers.

As a consultant or a local Floodplain Administrator have you ever wondered what is needed for a detailed floodplain study in an unmapped area or for a mapped "A zone"? The website contains guidelines for the surveying and hydraulic modeling standards needed for a reasonable study.

Do you need to find floodplain training opportunities to help you perform your duties, or for continuing education credits for your CFM or other professional licensees? Yes, it's there on the website too.

Engineers Corner - DNRC “Engineering” Technical Review Services

As many Floodplain Administrators and others around the state are well aware, DNRC offers complimentary technical assistance to communities (counties and municipalities) throughout Montana that participate in the National Flood Insurance Program (NFIP).

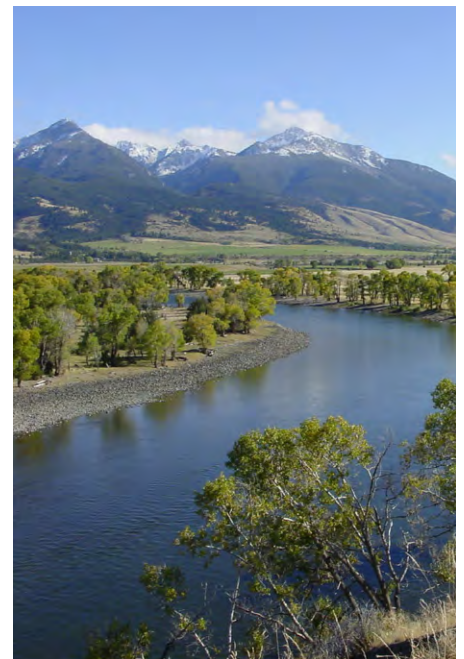


The services provided under the technical assistance umbrella include general program support along with Engineering Technical Reviews. General technical assistance is offered as a resource on the wide range of floodplain related topics including NFIP, State and local Floodplain Ordinance regulations and interpretation. Engineering Technical Reviews provide a conduit for communities with limited budgets and technical expertise to evaluate floodplain submittals that include scientific and engineering analysis such as: floodplain permit applications; Letter of Map Changes (i.e. LOMAs, LOMRs, etc.); subdivision applications; floodplain studies; and proposed projects near or within the floodplain.

Community requests for Engineering Technical Reviews should be directed in writing to the appropriate DNRC Regional Engineering Specialist (see contact list on last page). The Regional Engineering Specialists complete the reviews and are supported by the State Floodplain Engineer for additional guidance and expertise as needed. The State reviews provide comments and recommendations regarding technical submittals, their sufficiency concerning the scientific and engineering analysis completed and conformance with the local floodplain ordinance criteria. DNRC review comments serve as professional recommendations, not mandates or

approvals from the State and it's the community's responsibility to make the final determination regarding the sufficiency and adequacy of technical submittals to meet the local permit requirements. Communities always have the option of soliciting independent technical review and evaluation from professionals in the private sector as well.

DNRC protocol for technical reviews requires our staff to communicate directly with the community and any contact with an applicant or their representative is only performed under the approval of the community; and preferably with their participation. For additional information please contact your Regional Engineering Specialist and [register](#) for the upcoming AMFM Conference (Chico Hot Springs, March 1st – 4th) to attend a presentation on this topic.



Yellowstone River, Paradise Valley

Flooding History in Your County

By Tanja Fransen,
NOAA National Weather Service
and Mary Guokas, Montana DNRC

Where and when has it been flooding in your area since the date of your Flood Insurance Study (FIS)? The Flood Insurance Study provides a history of flooding, up to the time of the study. Then it stops. What about flooding between the dates of the FIS to the present? Memory and photos may help. Also, try filling in the historic gaps with data from The NOAA/National Climate Data Center (NCDC). The Center has an archive of storm events, including floods from 1950-present. Prior to 1993, the data is in .pdf

Scroll down to "Storm Data (final)". It's in section "Free Data E". Then pick the month/year data is sought. The result is a national record of storm data, listed alphabetically by state.

3. For other data, contact NCDC directly. They send .pdf files of storm events for Montana from 1950-1992. The data from 1950-1992 would be available for a small fee by contacting NCDC at 828-271-4800.

1. The data from 1993-current is available online for free, <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms>: select Montana: in next screen select your county and "Flood" after "Event Type". Results include "deaths", "\$ Crop Damage" and "\$ Property Damage" This NCDC database revealed a 1996 drowning in Ravalli County, "An 18-month old boy drowned in Antrim Creek near Florence, when playing along the swollen creek. He slipped into the creek and was swept away".
2. When you know the year and month, access 1950-present data for free from a .gov, .mil, .edu or .k12 web domain <http://www.ncdc.noaa.gov/oa/mpp/freedata.html>

On many occasions, your local NWS office may be able to provide you with additional information on these events as well. Montana has four National Weather Service offices that serve the state, all willing to assist you. Contact your local Warning Coordination Meteorologist (they are responsible for all the Storm Data entries) or the Hydrologists at NWS Missoula (west of the divide) and Great Falls (east of the divide).

Contact information is available at: <http://www.stormready.noaa.gov/stormmaps/mt-cwa.htm>



24 MONTANA

MTZ005-008

25 0400MST 1 1 7 7 Flood

Four to eight inches of rain fell over North-Central and Central Montana, ending on Thursday, September 25th. The heaviest rains fell over the headwaters of Lodge and Battle Creeks in southern Saskatchewan (Canada) and northern Blaine County. Record flooding occurred on these streams and major damage occurred on the Milk River from near Chinook to Malta. Rapid rises on other small streams in Blaine County flooded many homes in north Harlem and took the life of a woman as she attempted to reach high ground from her stalled automobile. Major damage to crops and roads also took place in southern Phillips County from Beaver Creek. The Milk River was in flood through Valley County until October 16th. Total damage is estimated at 29 million dollars.

From Storm Data September, 1986 with record flooding in north-central and northeast Montana. The numbers on top, following 0400MST indicate # of human deaths, # of human injuries, property damage and crop damage.

Correction from October, 2010 Highground

Professional Insurance Trainer, Sonja Wood will not be at AMFM Conference in March, due to scheduling conflicts but will be presenting in Helena in July. More details to follow.



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Graphic Design - Martha Hodder

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