



Montana Department
of Natural Resources
and Conservation

FLOODPLAIN MANAGEMENT PROGRAM

Serving Montana's Communities
Since 1974



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Sun River – photo by Mark Boesch

Earlier Highground articles related to LiDAR can be found at

<http://www.mtfloodplain.mt.gov/>

- February, 2010, page 4, "What is LiDAR?"
- October, 2009, cover story, "New LiDAR & Aerial Imagery for Flathead Valley"

HIGHGROUND

February 2011

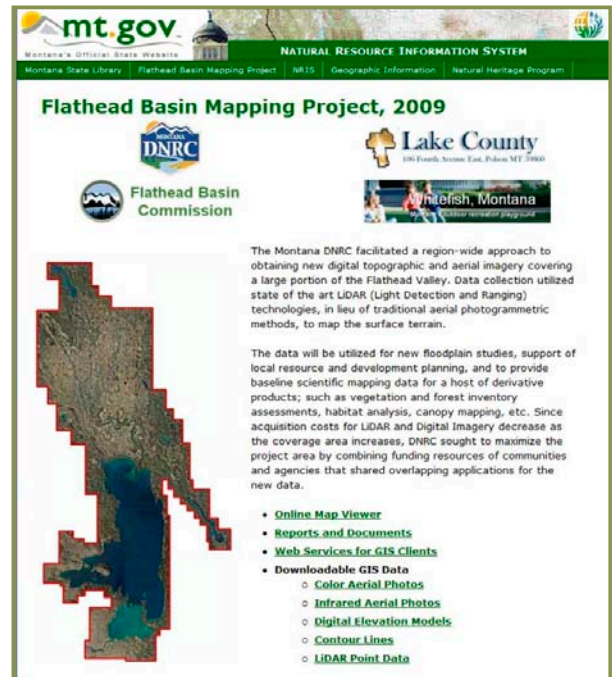
This newsletter and other state floodplain management activities are funded, in part, through grants from FEMA.

Now Available - New LiDAR and Aerial Imagery Data for the Flathead Valley

By Steve Story, P.E., State Floodplain Engineer, Montana DNRC

Over 500 square miles of new LiDAR and Aerial Imagery data for the Flathead Valley region are now publically available online through a new web page hosted by the State's Natural Resource Information System (NRIS). The data was collected in 2009 through a project facilitated by DNRC and funded through the combined resources of Lake County, the Flathead Basin Commission and the City of Whitefish. The data products that are available for download include: color and infrared aerial imagery; digital elevation models; 2-foot interval contours; LiDAR point data; breaklines; project reports and more. In general, utilizing the data products requires the application of GIS or CADD software. The project home page is: http://nr.is.mt.gov/Flathead_2009/

For folks that don't have GIS or CADD software capabilities, an Online Map Viewer was developed by NRIS to view the data products and print custom maps. The Map Viewer is a handy tool that allows you to browse the Flathead Basin data, including the color and infrared aerial imagery, contour lines and a shaded relief image of the Digital Elevation model, along with other Montana Framework data layers such as land ownership, geographic names, roads, municipal boundaries and USGS topographic maps. The Map Viewer



View Flathead mapping online

can be accessed via a link from the home page, or directly through this web address: http://nr.is.mt.gov/Flathead_2009/MapViewer.asp

The LiDAR data meets FEMA floodplain mapping standards and is currently utilized for new floodplain studies and channel migration zone studies in Lake and Flathead Counties. Downloading large areas from the web page may be very time consuming and inefficient. Therefore, folks interested in procuring the entire project dataset are advised to contact NRIS (406-444-5358) and provide them an external hard drive to copy the data onto. Questions related to the project itself should be directed to Steve Story at DNRC, (406) 444-6664.

Requesting Your Input on Draft Floodplain Recommendations

March 11 Meeting in Helena
Information Submitted by Lynda Saul
Montana DEQ



See you in Lewistown!

How many of the past eleven AMFM (Association of Montana Floodplain Managers) conferences have you attended? Whether it's none or eleven, the twelfth will not be one to miss!

*A return of great information from previous conference speakers such as Kent Atwood presenting on hazard mitigation grants is sure to interest many. New presentations to the conference such as "iFlood-Mobile Flood Hazard Mapping" by Joshua Price and "Taking the Pulse of Riparian Protection in Montana" by Jeff Tiberi are also sure to make it worth your while to attend. There is more, come and see for yourself in Lewistown, **March 7-10.***

To see the full conference agenda, visit - http://www.mtfloods.org/uploads/2011_AMFM_Conference_Packet.pdf

Please plan to attend a March 11, 2011 meeting from 9:00 am to 11:00 am at the Montana Department of Environmental Quality (DEQ) building, 1520 Sixth Ave., Helena, Room 111. Alan Luloff, PE, CFM, from the national Association of State Floodplain Managers will present draft findings and recommendations from a Montana floodplain management assessment study.

The objective of the study was to evaluate existing tools (laws, policies, programs, and practices) used for floodplain management and regulation in order to provide recommendations that the State of Montana and local governments could use to protect natural and beneficial floodplain functions and to improve public safety and reduce flood risk. This project has been guided by a 15 member Technical Advisory Committee, involved interviews with 20 professionals with diverse roles in Montana floodplain management and investigated 8 Montana case studies regarding floodplain activities.

Alan Luloff will also present the draft findings and recommendations of this study on the first day of the March 8-10 Association of Montana

Floodplain Managers (AMFM) Conference in Lewistown, see <http://www.mtfloods.org/>

For more information about this project, please contact Lynda Saul at lsaul@mt.gov or Laurence Siroky at lsiroky@mt.gov or 444-6816.

Flood Insurance Tentative Training Dates

Tentative dates have been set for flood insurance training in Montana as follows:

Bozeman – July 19
Great Falls – July 22
Helena – July 21
Missoula – July 20

The training is scheduled to be conducted by national instructor, Sonja Wood, working for H2O Partners, a FEMA contractor. Look for training details later as they will be posted at: http://www.fema.gov/business/nfip/a_wshop.shtm

Granite County to Receive LiDAR Mapping

The cost of LiDAR mapping keeps it beyond reach for many Montana communities. Fortunately, one more community, Granite County will be receiving LiDAR mapping. Thanks to the swift action and smart thinking by Celinda Adair, the state's Map Modernization/RiskMap Program Manager, funding for Granite County LiDAR mapping is being made available through FEMA Headquarters in Washington D.C.



Celinda Adair

Savings on Flood Insurance Through FEMA's Community Rating System

By Marijo Brady, FEMA Region VIII



The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements.

The CRS recognizes community efforts beyond those minimum standards by reducing flood insurance premiums for the community's property owners. The CRS is similar to — but separate from — the private insurance industry's programs that grade communities on the effectiveness of their fire suppression and building code enforcement.

CRS discounts on flood insurance premiums range from 5% up to 45%. Those discounts provide an incentive for new flood protection activities that can help save lives and property in the event of a flood.

To participate in the CRS, your community can choose to undertake some or all of the 18 public information and floodplain management activities organized under four categories:

1. Public Information,
2. Mapping and Regulations,
3. Flood Damage Reduction, and
4. Flood Preparedness.

You're probably already doing many of these activities. To get credit, community officials will need to prepare an application documenting the efforts. The CRS assigns credit points for each activity. To be eligible for a CRS discount, your community must require Elevation Certificates to be completed (Activity 310). Based on the total number of points your community earns, the CRS assigns you to one of ten rating classes.

Your discount on flood insurance premiums is based on your rating class. For example, if your community earns as little as 500 points, it's in Class 9 and property owners in the floodplain get a 5% discount. If a community does not apply or fails to receive at least 500 points, it's in Class 10 and property owners get no discount.

Many communities can qualify for what the CRS calls "uniform minimum credit," based on the activities a state or regional agency implements on behalf of its communities.

Your community's chief executive officer (mayor, City manager, or other top official) must appoint a CRS coordinator to handle the application work and serve as the liaison between the community and FEMA. Your designated CRS coordinator should fill out and submit your community's CRS application to Kerri Redente kredente@iso.com Insurance Specialists Office (ISO) (719) 539-6501 (cell).

continued...

continued from page 3 - Savings on Flood Insurance Through FEMAs Community Rating System

| <i>Community</i> | <i>Savings per Community per Year</i> | <i>Savings per Policy per Year</i> |
|---|---------------------------------------|------------------------------------|
| Belt, Town of | \$2,604 | \$59 |
| Bozeman, City of | \$2,864 | \$81 |
| Cascade County | \$28,492 | \$79 |
| Circle, Town of | \$52 | \$52 |
| Flathead County | \$17,096 | \$52 |
| Great Falls, City of | \$7,483 | \$35 |
| Lewis and Clark County | \$10,653 | \$79 |
| Miles City, City of | \$19,637 | \$13 |
| Missoula County | \$12,482 | \$54 |
| Missoula, City of | \$3,856 | \$73 |
| Three Forks, Town of | \$14,458 | \$81 |
| Yellowstone County | \$8,343 | \$56 |
| | | |
| Total Savings in Montana | \$128,020 | |
| | | |
| Note: Preferred Risk Flood Insurance Policies are not eligible for CRS discounts. | | |

High Flood Insurance with “Out Of Compliance” Homes

Costly flood insurance premiums await the homeowner who builds their home out of compliance in a Special Flood Hazard Area (SFHAs), also known as a 100-year floodplain. Traci Sears, the State NFIP (National Flood Insurance Program) Coordinator learned of these costly occurrences happening in Montana while she attended a multi-state FEMA Conference in Denver. In one Montana example, a yearly premium of \$2,444 is being paid on a home sitting 1.0 foot below the Base Flood

Elevations (BFE). Had the same home been built in compliance, the yearly premium would have been \$993. In another Montana example, a homeowner is paying \$1,527 annually versus what would have been a \$509 yearly premium, had the structure been built in compliance. Building to compliance within SFHAs or building outside of SFHAs is worth considering for many reasons, for one, high cost flood insurance premiums are less likely to be awaiting the homeowner.

So Long, Good Luck and Thank You!

Keith Bell, who served in Stillwater County's planning department and served as the local floodplain administrator for Stillwater County as well as the Town of Columbus has retired. Thank you for your service, Keith and for your past helpfulness in coordinating Digital Flood Insurance Rate Map meetings.

Ron Hanson, former Planning Director for Powell County retired early this year. We wish you all the best, Ron! Thank you Peggy Kerr, Powell County Assistant Planner for remaining a steady and knowledgeable constant, especially during the change of Directors.

Welcome New Local Floodplain Administrators

Additions/Corrections

The previous issue of the *Highground* contained contact information for *Yellowstone County Floodplain Management*, which was moved from *Disaster and Emergency Services* to the *Public Works Department* within the last year with Director *Tim Miller* and staff *Darin Swenson*. Unfortunately and inadvertently, **Mike Black** who is also on the staff was not mentioned. Mike's contact information is as follows.
(406) 256-2735 or mblack@co.yellowstone.mt.gov
Sorry Mike, it was an honest mistake.

Wade Humphriesw in *Dawson County* - name is spelled correctly this time around! He may be reached at (406) 345-4139 or humphriesw@dawsoncountmail.com.

Brian Bender is the new **Powell County** Planning Director as well as local Floodplain Administrator and can be contacted by phone at (406) 846-3680 or bbender@co.powell.mt.us. Good luck in your new role as planning director.

Suzanne Cross is beginning her career in floodplain management as the Floodplain Administrator for the **Town of Ennis**. She is also serving as the Zoning Administrator for the town. Suzanne can be reached at (406) 682-4287 or scross@ennismontana.org. Glad to have you aboard, Suzanne.

Stephanie Moodry, Registered Sanitarian has been busy working as the County Sanitarian in both Sweet Grass and Stillwater Counties. Now she will also be conducting floodplain administrator duties in **Stillwater County**. Even with her full schedule, you may contact Stephanie at (406) 322-8055 or smoodry@stillwater.mt.gov.

Your Website Address Welcomed!



Many communities are now extending their outreach efforts by posting their floodplain management information on the web. Feel free to Email me at mguokas@mt.gov with your community's website address, if your community has a floodplain

management website address. Our office will work at compiling these web addresses for future sharing, promoting greater ease for viewing local floodplain management websites used across the state.

The Rivers are Jamming!

By Gina Loss
Senior Service Hydrologist
NOAA National Weather Service
Great Falls Weather Forecast Office



Break-up ice jam composed of snow covered thermal ice chunks on Missouri River in Great Falls, December 22, 2010.

This past December, the week before Christmas, an ice jam formed in Great Falls that caused some flooding along River Road – enough in fact that a portion of the road had to be closed for several days. Ice jamming is not something that happens commonly in Great Falls, even though we experience temperatures well below freezing for much of the winter as well at the autumn and spring seasons. Typically, any ice that forms here in cold weather is relatively quickly removed by warm Chinook winds.

Types of Ice Jams

There are two basic types of ice jams – freeze-up jams and break-up jams. Freeze-up jams tend to form early to midwinter on slow or steady flowing water when temperatures are below freezing. Freeze-up jams display a surface that is generally smooth, and they are unlikely to release suddenly.

Break-up jams can occur any time after ice cover formation, and can form more than once per season. Break-up jams form with near-freezing air temperatures. They exhibit moderate to extreme surface roughness as they are composed of chunks of broken ice. Break-up jams are highly unstable and subject to sudden failures with associated surges in water flow. If, after formation, the temperature drops several degrees or more below freezing, break-up jams may freeze in place causing additional problems later.

Types of River Ice

Fine-grained (frazil) ice and columnar (thermal) ice are the two basic ice types. **Frazil ice** tends to occur in dynamic, turbulent flowing water, and forms from small ice particles or snow. Frazil ice is found in virtually all ice-affected rivers and is the predominant ice type in northern rivers. It is often called “white ice” because of its white appearance. Frazil ice tends to be buoyant, rough and resistant to solar penetration.

Columnar ice is thermally grown and tends to occur in more quiescent flow. It is often called “black ice” because of its clear, dark appearance. Because of its transparency, this ice type readily allows solar penetration, and becomes “candled” as it decays, rotting in long, slender columns that resemble candles. It is thermally grown, its thickness can be estimated using heat transfer theory.

Ice Cover Breakup

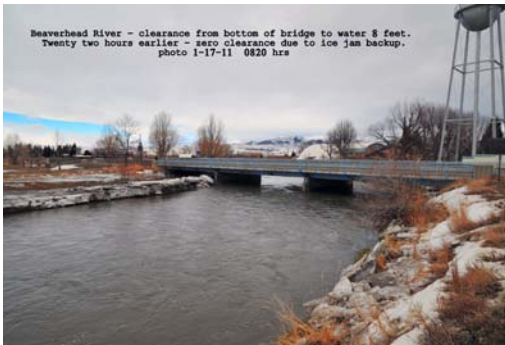
Once ice has formed over a river, there are two ways to remove the ice from a water body – thermal or mechanical break-up. With a thermal breakup, the ice cover melts in place.

Because thermally formed ice allows for solar penetration, direct sunlight plays a large role. Additionally, surface color

influences absorption of sunlight, and dusting the ice can promote melting. Water running on the ice and areas of open water decreases reflection and absorbs sunlight and may also promote melting. **With thermal break-up, chances of flash flooding are minimal.**

Mechanical breakup occurs when forces acting on the ice cover exceed ice cover strength. The increase of forces into the system can result from stream rises caused by runoff from a precipitation event or snowmelt. It could also be caused by a large and sudden release from a dam, though this is rare. A rule of thumb is that it takes an increase in water depth of 1.5 to 3 times the thickness of the ice to cause ice breakup. Prior to breakup, hinge cracks in the ice might be noticed near the stream bank edges. Mechanical break-up often occurs unexpectedly and can result in flash floods. As the chunks of ice are swept downstream, they can be steered up on the banks causing significant damage to property and vegetation.

“...Nearly half of our (Montana) ice jams occur in March...”



“...Break-up jams are highly unstable and subject to sudden failures...” Beaverhead River, Ennis Montana. Photo credit: Steve DiGiovanna, Madison County DES

Montana Jams

In Montana, we experience freeze-up and break-up jams, as well as jams that are a combination of these. While our ice jam season typically starts in December, nearly half of our ice jams occur in March with two-thirds in February and March combined. In part because of its length, the Missouri River has more reported ice jams than any other river in the state.

Also, the US Army Corps of Engineers hosts a website solely devoted to ice jams: <http://www.crrel.usace.army.mil/icejams/>.

Thanks for remembering to report Montana ice jams that occur in your local area. Call Gina Loss at at 406-453-208 or email Gina at gina.loss@noaa.gov.

Notes from the editor:

Additional information is available from National Weather Service websites, in general serving Montana areas east of the Continental Divide - Great Falls: <http://www.wrh.noaa.gov/tfx/icejam/>, and west of the Continental Divide - Missoula: <http://www.wrh.noaa.gov/tfx/icejam/?wfo=mso>.

Just for Fun...

Cartoon from the Billings Gazette June, 1937 after disastrous flooding from the Yellowstone River, it's tributaries and associated canals.



“...drawn for The Gazette by Mrs. Ethel Hays Simms of Kansas City, NEA feature service artist and former resident of Billings....” From the Billings Gazette, June, 1937.

