
Floodplain Management *Today*



NEBRASKA DEPARTMENT OF NATURAL RESOURCES FLOODPLAIN SECTION

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Ice Jam Partnership on the Lower Platte River

By Mitch Paine, CFM

As ice builds up in the shallow Platte River every winter, there is a false sense of security about a river that appears stopped in motion. But, as the temperatures rise later in the season, so does residents' and communities' anxiety about the potential for ice jam flooding. The large ice chunks that break up with warming temperatures and late winter rainfall flow downstream, and too much ice can cause flooding.

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When ice builds up against a bridge or a bend in the river, it backs the river up, potentially for miles. The water flowing from upstream spills out onto the floodplain and can destroy roads, bridges, crops, or wellhouses as well as homes and businesses. When the ice finally gives way, water held back flushes down and can then cause significant flooding downstream.



Figure 1. Ice Jam in Louisville on February 16th, 1907

A wide swath of the northern United States suffers similar frozen river fates every winter. Flooding from ice jams affects states like Montana, Wyoming, New York, and New Hampshire. Many rivers in Nebraska see this problem as well. The Loup River and its tributaries are among the most notorious for the number of ice jams every year in the country, although flooding causes much less damage than other places.

Because flooding can happen very quickly and can imperil riverside residents, ice jams cause major worry for emergency managers along the Lower Platte River. The best way to

reduce the risk is continuous monitoring. The Papio-Missouri River Natural Resources District partners with the Lower Platte South and Lower Platte North NRDs and county emergency managers as well as NDNR, the Nebraska Emergency Management Agency, the National Weather Service, and the U.S. Army Corps of Engineers to monitor ice on the river. Once or twice a week, designated observers visit the Platte and record conditions like ice cover, ice condition, and local weather. The Papio NRD takes measurements of the ice thickness regularly to get a better picture of the total build-up. The data is compiled and stored on NDNR's website, all of which can be monitored and used to evaluate the potential for ice jams.

This partnership among agencies is key to keeping people along the Lower Platte River safe during the winter and spring months. It was one of the first partnerships of its type in the country when it started in the 1990's. In addition to monitoring the river, the partnership takes action on ice jams if necessary. When an ice jam looks likely, coal bottom ash from the Sheldon Power Station can be laid down on the ice. This "dusting" helps the sunlight heat the ice and melt faster. If ice jams actually occur and cause significant flooding, the Papio NRD holds a contract with an explosives company to strategically blast the ice in spots to open the river up and help it flow. Both the dusting and blasting are done with extreme caution and significant consultation among the partnership. NEMA obtains NDEQ permits every year for coal bottom ash dusting to ensure the river's ecology is not adversely impacted.

Many people and communities have memories and stories of ice jams from Plattsmouth to Ogallala. The last major ice jam on the Lower Platte occurred in 1998 and the Papio NRD called in the blasting company. From Fremont to Ashland, communities faced flooding as the ice from the Elkhorn and Platte Rivers converged and started to build up. The floodwaters inundated thousands of acres of lowlands along the river and threatened hundreds of houses in Saunders and Sarpy Counties. The Papio NRD decided that blasting could alleviate the problem and called the company in. After many hours of preparation, a helicopter dropped explosive charges in a target area of ice and blasted open a small channel. Almost immediately, the water and ice began to flow downstream and the pressure was relieved. The partnership did its work to reduce the risk from flooding. Without it, our communities wouldn't be as safe from this annual winter flood risk.



Figure 2. A helicopter sets charges in an ice jam during flooding in 1998 along the Platte

Find out more about ice jams, the partnership, and the ice observations by visiting the Ice Jam Partnership website: dnr.nebraska.gov/fpm/ice-jam

NDNR Receives Federal Funds for FEMA Projects

By Katie Ringland, PE, CFM

The Floodplain section at the NDNR has received funds from the Federal Emergency Management Agency (FEMA) to deploy two Risk MAP (Mapping, Assessment and Planning) Projects in the Upper Little Blue and West Fork Big Blue Watersheds. The Risk MAP project goal is to deliver quality data that increases public awareness and leads to action that reduces risk to life and property. The funded Risk MAP project will include conducting workshops for the communities throughout the watersheds to enhance awareness of flood risk and how communities, homeowners, and building owners can reduce their own flood risk. The project will also complete a new basic study for streams that drain one square mile or more in Clay County, update the basic study that was done for Adams County in 2010, and provide new enhanced flood studies for streams in Hastings and Juniata.

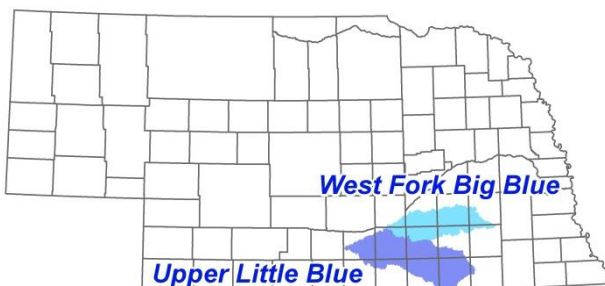


Figure 3. Watershed Overview

Basic studies produce FEMA's Special Flood Hazard Area, Zone A. Basic study analysis uses simple hydrology and hydraulics methods that generally use bare earth topography without the consideration of structures (bridge, culverts, dams, etc.). Regression equations will be used to complete the hydrologic analysis, while the normal depth equation will be used for the hydraulic analysis. This is the most common analysis and zone throughout Nebraska. It was developed as a cost effective way to provide flood risk information for low population areas.

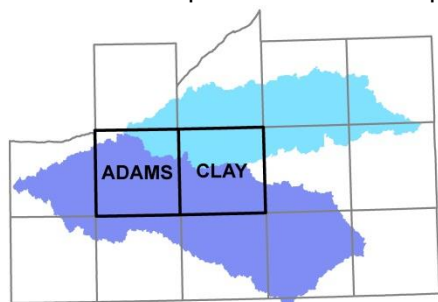


Figure 4. Basic Study Locations

Enhanced studies produce FEMA's Special Flood Hazard Area: Zone AE (with base flood elevations determined) with floodway. Enhanced studies include detailed hydrology and hydraulics. For this project the hydrologic analysis will be determined using HEC-HMS 4.0, and hydraulic analysis will be modeled using HEC-RAS 4.1. The studies will utilize survey data currently being collected, and the 2009 Light Detection and Ranging (LiDAR) elevation data. Enhanced studies will be completed for the Lake Heartwell Tributary, North Branch West Fork Big Blue River, South Branch West Fork Big Blue River, West Fork Big Blue River, and Pawnee Creek in the City of Hastings jurisdiction; and Main Ditch and East Tributary in the Village of Juniata jurisdiction. These studies will include models for the 10%, 4%, 2%, 1%, and 0.2% annual chance storms.

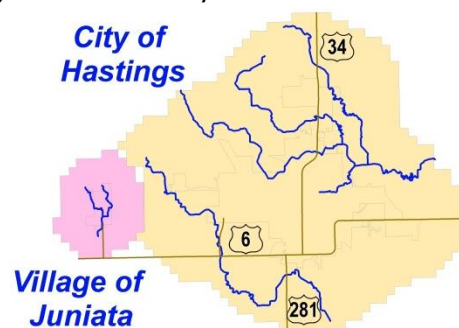


Figure 5. Enhanced Study Locations

It is important to note that FEMA has only provided funding through the tasks listed above. NDNR hopes to receive funding to create preliminary maps during the next federal funding cycle (starts in October 2015).

Upgrade of the Floodplain Interactive Map

By Andrew Christenson, CFM

Many of our floodplain administrators, realtors, bankers, and the general public use the NDNR Floodplain Interactive Map to get information about floodplain management. We at NDNR are excited to debut a new version that fixes many of the less user-friendly parts of our current map! Soon, you will be able to use a map that runs faster, has more capabilities, and is overall easier to use.

The Map

NDNR, with its mission of providing floodplain management technical assistance to communities throughout Nebraska, created the Floodplain Interactive Map to provide floodplain information through a web-based mapping platform. The users of the map have a variety of needs and are connected to floodplain information in many different ways through the interactive map. Floodplain Administrators need access to Flood Insurance Rate Maps, Flood Insurance Studies, and overlays of floodplains on aerial photography. The general public often needs the floodplain boundaries overlay, community contact information, and Letters of Map Change. One of the most popular uses of the map is simply to check if a property or structure is "in the floodplain."

The Platform

NDNR currently hosts the interactive map via a web-based platform. It brings the floodplain information from our servers to the user. It consists of the base map layout, the 'print' and 'find' functions, the organization of the layers, and the toolset that lets you zoom around and identify data in the map. The web mapping platform is being replaced by a new platform called Geocortex Essentials and is **anticipated to be launched in January 2015**.

What Will Change

With this new platform the user can expect a greatly improved experience. The base map layout makes better use of space and organizes tools and information in a more intuitive and user-friendly way. All functions such as: print, find, zoom, pan, and identify still exist only with a new button in a new location that will function in a slightly different manner for some tools. Data and information will still be gathered using the 'identify' tool, which will have new capabilities and will be easier to use. The main goal is to make the map faster, more user-friendly, and capable of serving new data.

Speaking of new data, one of the more exciting additions to the map will be the overlay of paper (non-digital) Flood Insurance Rate Maps, where available, across the state. The paper maps were georeferenced (put into GIS format for overlay) and some may recognize them as the maps seen on some Base Flood Elevation Determinations issued by NDNR. With the new platform we can serve this new layer with a disclaimer regarding their accuracy for floodplain management and determination purposes. Since these maps are georeferenced the paper FIRM is still the governing document for floodplain determinations; however, the digital overlay provides additional useful information.

Web Browser Capability and Mobile Devices

Did someone mention multiple web browsers and capability? The new platform will be compatible with at least the popular web browsers: Chrome, Firefox, Safari, and Internet Explorer. In the future the map will also be tailored to function on smartphones, tablet computers, and other mobile devices.

Troubleshooting

As with the current web mapping platform there will possibly be hiccups and bumps in the road. Sometimes a server or service doesn't quite reboot overnight or a piece of data isn't connected properly to the interactive map. Potentially the user will click to get information and they will not get it. These bumps should be less frequent with the updated platform but your assistance and feedback on any issues you do encounter is appreciated.

Feedback

We provide floodplain information to external users that over time have been the most requested and relevant. There is always room for improvement to the features and services of the map. Is there additional data that you'd like to see on the map? What data is most important for you? If there are suggestions for improvement or better focus let us know.

Conclusion

Yes, the user will have to learn how to use a new interface. Don't worry because the staff at the Department of Natural Resources have to learn all kinds of new software and applications in order to serve floodplain information using this new platform; only we love doing it.

For information regarding the current or soon-to-come Floodplain Interactive Map please contact Andrew Christenson with the Nebraska Department of Natural Resources at 402-471-1223 or at andrew.christenson@nebraska.gov. Also, check out the training listed in the training section on page 7.

Nebraska Silver Jackets High Water Mark Campaign

The Nebraska Silver Jackets team, made up of various federal, state, and local agencies including the U.S. Army Corps of Engineers, NDNR, and the Nebraska Emergency Management Agency, are looking for locations throughout Nebraska to place high water mark signs. These signs, when put in prominent locations, build local awareness of flood risk and encourage the public to be ready.

The Silver Jackets project would like to place several signs throughout the state. The signs will also provide information on historic flooding via web content. These signs will serve as a physical reminder and the web content will provide further information about the communities' history and interaction with flood risk.

The nomination form has been attached to the newsletter email or inserted as a flyer to the paper newsletter. Please contact Tony Krause at the Corps. His email and phone are tony.d.krause@usace.army.mil or (402) 995-2326 if you would like to request a form. The deadline to nominate your community/location is February 1st, 2015.



Figure 6. Highwater Sign for Bartley remembering the Republican River Flood in 1935

Tracking Floodplain Development in Communities Without Building Codes

By John Callen, PE, CFM

When a local government joins the National Flood Insurance Program (NFIP), it agrees to adopt and enforce a floodplain management ordinance to ensure development is safe from flooding and local building owners can purchase flood insurance. In addition, Nebraska Statutes say, in part, that when a local government has been provided with sufficient data and flood maps, that community shall adopt, administer, and enforce floodplain management regulations which meet or exceed State minimum standards for floodplain management programs. Based on these provisions, communities implementing floodplain management in Nebraska oversee development activity in the floodplain within their jurisdiction. Communities are required, as part of their ordinance, to obtain and track floodplain permits for any floodplain development activity. Many communities do this via the building permit process that involves new buildings or other developments as defined by the ordinance. However, for communities or counties without building codes this can be challenging.

If this situation describes your community, there are some strategies to help you fulfill your floodplain management duties. One of these strategies is implementing a system of zoning permits. This strategy would work best in a community that has established zoning requirements which need to be reviewed prior to construction of a building. For example, this would typically include building setback requirements. A zoning permit process could be used by the community to require submittal of all proposed buildings for zoning regulation review, including floodplain management. For the purposes of floodplain management, a permit is also required for any non-building development as defined in the floodplain management ordinance. This includes but is not limited to grading, filling, or obstructions such as new bridges or culverts. It also includes activities undertaken by the local government. Due to this, any zoning permit process a community establishes would also need to include review of these types of developments.

Another strategy a community can use is training for local maintenance crews or other officials regarding the community's floodplain management responsibilities. As community staff completes their regular duties, they can observe development activity in the floodplain and alert the local administrator to any unexpected activity. By working with other community officials, the local floodplain manager can improve the amount of area under observation for activity in the community's flood hazard areas that may require a permit. However, this approach is not ideal, as it may lead to developments being started without a permit. This could cause significant problems for both the community and the property owner after the activity is discovered.

Overall, if a community is responsible for implementing State and Federal minimum floodplain management standards, a clear set of administrative procedures and an established permitting process is valuable to the community. This helps ensure floodplain management requirements are adhered to and helps the community maintain good status with the NFIP. Additional resources regarding minimum standards for floodplain management programs and administrative procedures can be found in NDNR's digital desk reference, located here: dnr.nebraska.gov/fpm/digital-desk-reference.

Mark Your Calendar

If you have questions about any of these opportunities, please contact John Callen or Mitch Paine.

The Nebraska Planning and Zoning Association and the Nebraska chapter of the American Planning Association coordinate an annual conference. The 2015 conference will be held from March 11th – 13th, 2015 in Kearney and will feature a session on flood risk and long-range planning from NDNR. For more information, go to www.npza.org.

The Nebraska Floodplain and Stormwater Managers Association (NeFSMA) Annual Conference will be held from July 29th – 30th, 2015 in Nebraska City. Be sure to put this on your calendar!

Nebraska Webinar

This webinar will be presented by Andrew Christenson and John Callen of NDNR on **Wednesday, January 28th, 2015**. The training will show Nebraska community officials how to use the features of the interactive flood map and how the map can be used to support local floodplain management and planning. No pre-registration necessary. To join, just use the following URL and phone number to connect:

- January 28th, 2015 at 10:00am Central Time.
<https://fema.connectsolutions.com/r68qhti13kv/> and 1-800-320-4330, conference code 508469

Community Rating System Webinar Series

This series of trainings is targeted to new communities that are not yet participating in CRS, as well as to local government staff with some CRS experience. This series includes basic introductory sessions and more advanced topics. To register go to <http://atkinsglobalna.webex.com/tc> and click the "upcoming" tab. Upcoming online trainings include:

- **Preparing for a Verification Visit** on January 20
- **Series 600: Flood Warning and Response** on January 21
- **Introduction to CRS** on February 17
- **Developing Outreach Projects** on February 18

The Iowa Department of Natural Resources has produced some great web-based videos about floodplains, flood risk, and basic floodplain management principles. Check them out, but keep in mind that Iowa's minimum standards are different than Nebraska's. <http://www.extension.iastate.edu/floodinginiowa/>



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WANT MORE INFORMATION?



Visit DNR's Floodplain Website at
<http://dnr.nebraska.gov/fpm>

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